LEGACY™ LINE
580J 08-16
Single Package Rooftop with Gas Heat/Electric Cooling

Installation Instructions

580J units for installation in the United States contain use of a Bryant's 2-Speed Indoor Fan Motor System. This complies with the U.S. Department of Energy (DOE) efficiency standard of 2018.
580J units for installation outside the United States may or may not contain use of the 2-Speed Indoor Fan Motor System as they are not required to comply with the U.S. Department of Energy (DOE) efficiency standard of 2018.
For specific details on operation of the Bryant 2-Speed Indoor Fan Motor System refer to the Variable Frequency Drive (VFD) Factory-Installed Option 2-Speed Motor Control Installation, Setup, and Troubleshooting manual.

CONTENTS

SAFETY CONSIDERATIONS

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

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

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

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

⚠ WARNING

Failure to follow this warning could result in personal injury or death. Disconnect gas piping from unit when leak testing at pressure greater than 0.5 psig (3450 Pa). Pressures greater than 0.5 psig (3450 Pa) will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than 0.5 psig (3450 Pa), it must be replaced before use. When pressure testing field-supplied gas piping at pressures of 0.5 psig (3450 Pa) or less, a unit connected to such piping must be isolated by closing the manual gas valve.

⚠ WARNING

Failure to follow this warning could cause personal injury or death. Before performing service or maintenance operations on unit, always turn off main power switch to unit and install lock(s) and lockout tag(s). Unit may have more than one power switch.

⚠ WARNING

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

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

GENERAL

⚠ WARNING

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

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

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

⚠ CAUTION

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.

These installation instructions cover the 580J units with gas heat and electric cooling. Units are pre-wired and pre-charged with environmentally sound Puron® (R-410A) refrigerant at the factory. See Fig. 1 for model number nomenclature. See Fig. 2-4 for unit dimensions. See Fig. 5 and 6 for service clearances.

Rated Indoor Airflow (cfm)

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

Table 1 — AHRI Efficiency — Rated Indoor Airflow

MODEL NUMBER	FULL LOAD AIRFLOW (CFM)
580J*08A/C	2,400
580J*08D/F/K/M	2,250
580J*09A/C	3,000
580J*09D/F/K/M	3,400
580J*12A/C	3,600
580J*14A/C	3,000
580J*14D/F/K/M	3,600
580J*16D	5,250

Pre-Installation

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.

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Example:	5	8	0	J	E	0	8	A	1	2	5	A	1	B	0	A	A

Unit Type
580 - Gas Heat RTU
Legacy Series

Model
J - Puron® (R-410A) Refrigerant

Voltage
E = 460-3-60
P = 208/230-3-60
T = 575-3-60

Cooling Tons
08 - 7.5 tons
09 - 8.5 tons
12 - 10 tons
14 - 12.5 tons
16 - 15 tons

Refrig. System/Gas Heat Options
A = Standard One Stage cooling models/Natural Gas Heat
B = Standard One Stage cooling models/Low NO_x Heat
C = Standard One Stage cooling models/Stainless Steel HX Heat
D = Two stage cooling models (08-12 and 16)
F = Two stage cooling models and Stainless Steel gas heat exchanger (08-12)
K = Two stage cooling models/Aluminum gas heat exchanger with Perfect Humidity™ (08-14)
M = Two stage cooling models/Stainless Steel gas heat exchanger with Perfect Humidity (08-14)

Heat Level
Standard/Stainless Steel
125 = 125,000
150 = 150,000
180 = 180,000
224 = 224,000
250 = 250,000

Coil Options For Round Tube/Plate Fin Condenser Coil Models Only (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

Coil Options For All Aluminum - Novation Condenser Coil Models Only (Outdoor - Indoor - Hail Guard)
G = Al/Al - Al/Cu
H = Al/Al - Cu/Cu
J = Al/Al - E-coat Al/Cu
K = E-coat Al/Al - Al/Cu
L = E-coat Al/Al - E-coat Al/Cu
T = Al/Al - Al/Cu — Louvered Hail Guard
U = Al/Al - Cu/Cu — Louvered Hail Guard
V = Al/Al - E-coat Al/Cu — Louvered Hail Guard
W = E-coat Al/Al - Al/Cu — Louvered Hail Guard
X = E-coat Al/Al - E-coat Al/Cu — Louvered Hail Guard

Indoor Fan Options
1 = Standard Static Option
2 = Medium Static Option
3 = High Static Option

Outdoor Air Options
A = None
B = Temperature Economizer, Barometric Relief, Standard Leak (W7212 or W7220)
E = Temperature Economizer, Barometric Relief, Standard Leak w/CO_2, (W7212 or W7220)
H = Enthalpy Economizer, Barometric Relief, Standard Leak, (W7212 or W7220)
L = Enthalpy Economizer,Barometric Relief, Standard Leak w/CO_2, (W7212 or W7220)
Q = Motorized 2 Position Damper
U = Temperature Economizer, Barometric Relief, Ultra Low Leak, (W7220)
W = Enthalpy Economizer, Barometric Relief, Ultra Low Leak, (W7220)

Factory Installed Options
0A = None
NOTE: See the 580J 3 to 15 ton Price Pages for a complete list of factory installed options.

Packaging & 2-Speed Indoor Fan Motor
A = Standard Packaging, electro mech. controls that require W7212 EconoMi$er IV
B = LTL Packaging, electro mech. controls that require W7212 EconoMi$er IV
C = Standard Packaging, electro mech. controls that require W7220 EconoMi$er X
D = Standard Packaging and 2-Speed Indoor Fan Motor (VFD) Controller
E = LTL Packaging and 2-Speed Indoor Fan Motor (VFD) Controller
F = LTL Packaging, electro mech. controls that require W7220 EconoMi$er X

Fig. 1 — 580J*08-16 Units Model Number Nomenclature

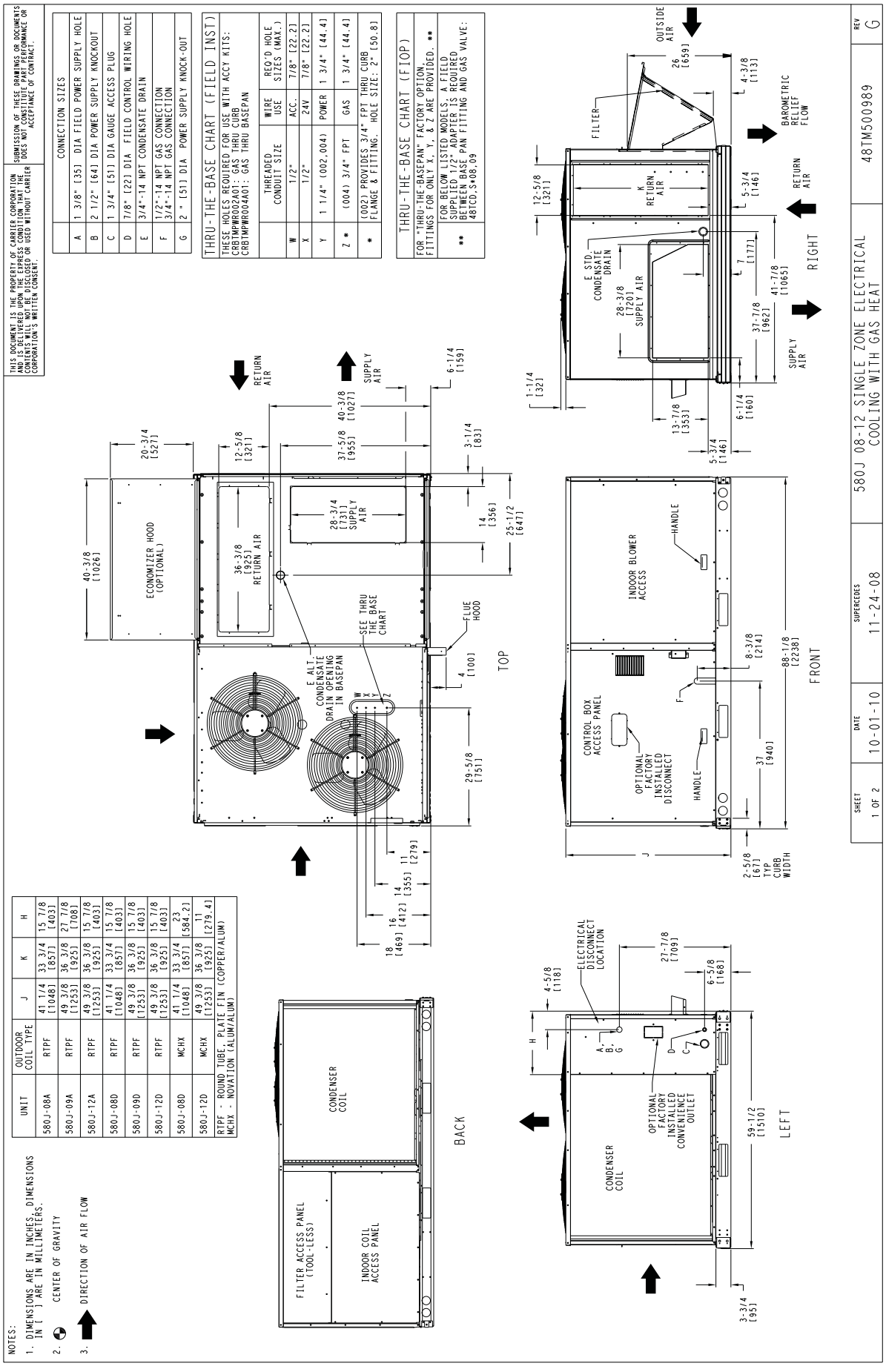
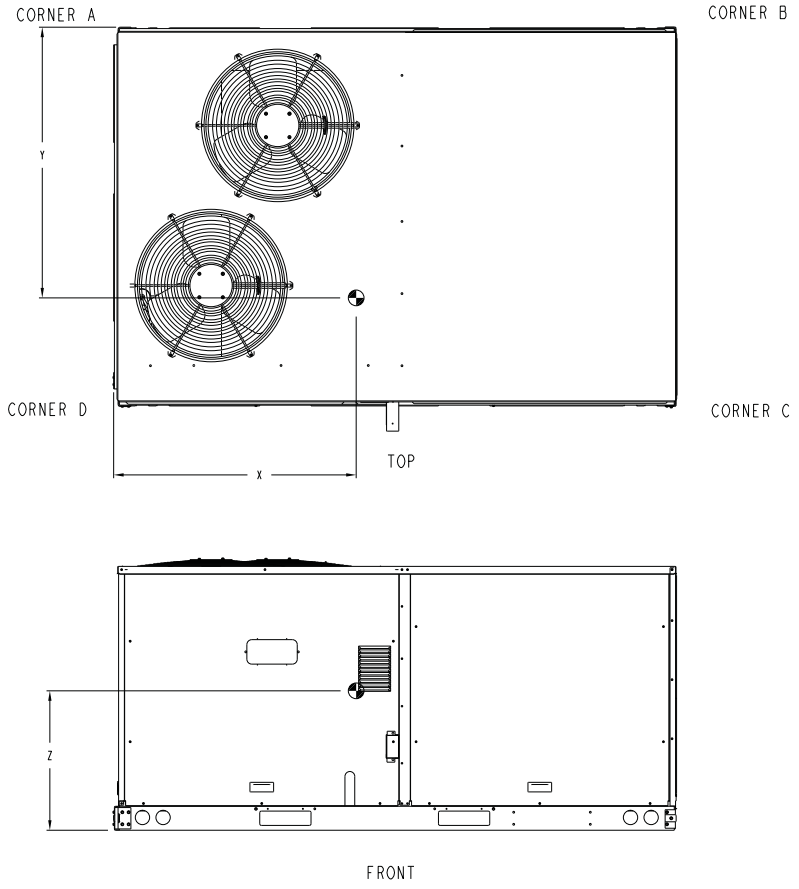


Fig. 2 — Unit Dimensional Drawing Sizes 08, 09, and 12

UNIT	OUTDOOR COIL TYPE	STD. UNIT WEIGHT ***		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
580J-08A	RTPF	780	354	178	81	158	72	209	95	236	107	41 1/2 [1054]	33 7/8 [860]	20 1/2 [521]
580J-09A	RTPF	920	418	212	96	183	83	243	110	282	128	40 7/8 [1038]	34 [864]	23 1/8 [587]
580J-12A	RTPF	930	422	216	98	196	89	247	112	272	123.5	42 [1067]	33 1/8 [841]	24 1/4 [616]
580J-08D	RTPF	835	379	164	74.5	170	77.2	255	115.8	246	111.7	44 7/8 [1140]	35 5/8 [905]	19 3/8 [492]
580J-09D	RTPF	930	422	228	103.5	187	85	232	105.3	283	128.5	39 3/4 [1010]	32 7/8 [835]	18 5/8 [473]
580J-12D	RTPF	940	427	231	104.9	189	85.8	234	106.2	286	129.8	39 3/4 [1010]	33 [838]	18 1/2 [470]
580J-08D	MCHX	805	365.5	160	72.6	153	69.5	240	109	260	118	43 [1092]	36 3/8 [924]	20 3/8 [517.7]
580J-12D	MCHX	895	406.3	185	84	176	79.9	260	118	274	124.4	42 7/8 [1089]	35 1/2 [902]	22 7/8 [581]

RTPF - ROUND TUBE, PLATE FIN (COPPER/ALUM)
MCHX - NOVATION (ALUM/ALUM)

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



SHEET	DATE	SUPERCEDES			REV
2 OF 2	10-01-10	11-24-08	580J 08-12 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	48TM500989	G

Fig. 2 — Unit Dimensional Drawing Sizes 08, 09, and 12 (cont)

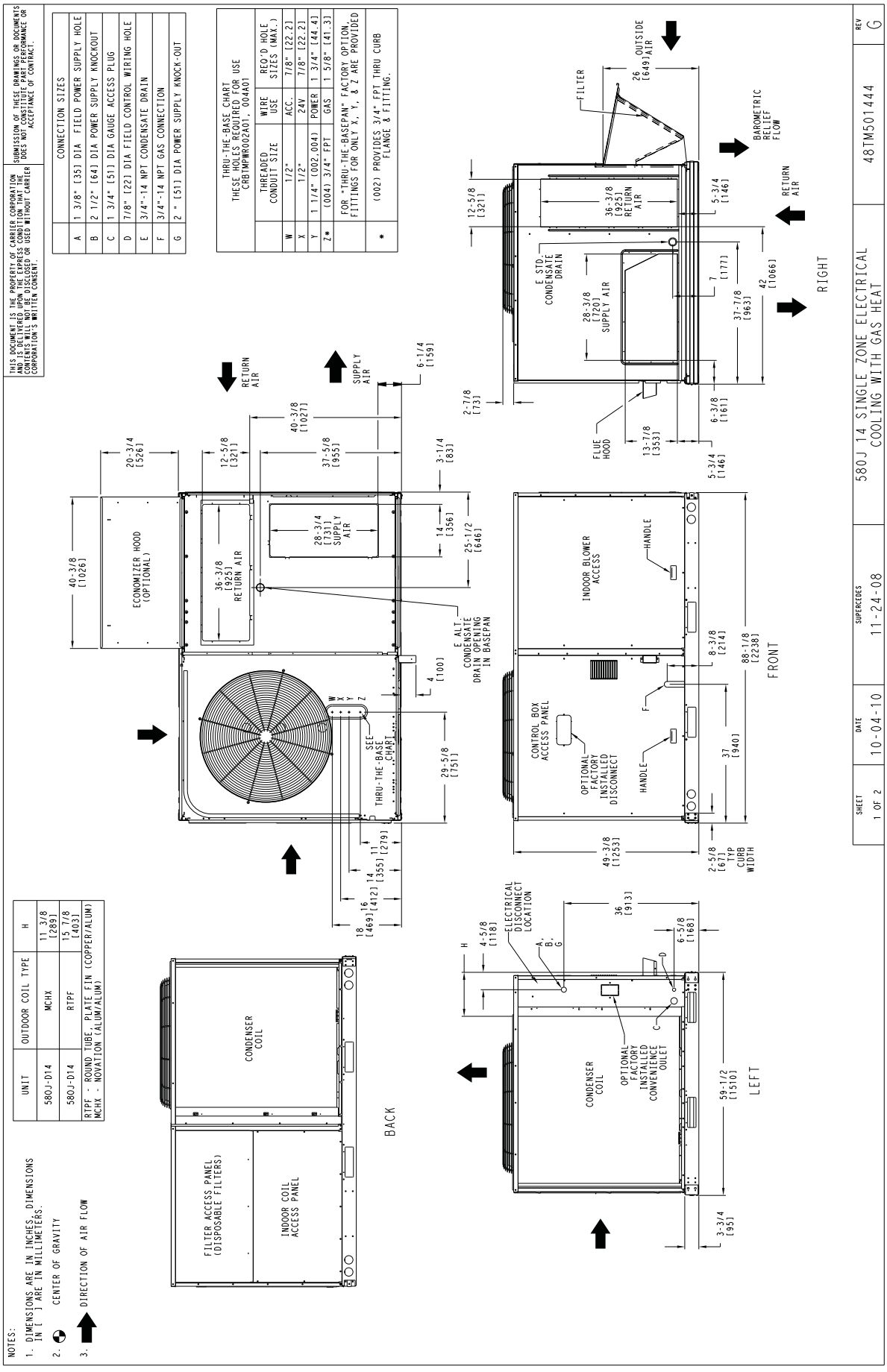


Fig. 3 — Unit Dimensional Drawing Size 14

UNIT	OUTDOOR COIL TYPE	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
580J-14D	MCHX	1116	506	297	135	157	71	229	104	434	197	29 1/2 [749]	34 1/4 [870]	20 1/4 [514]
580J-14D	RTPF	1167	530	349	159	167	76	211	96	440	200	31 3/8 [797]	34 3/4 [883]	21 7/8 [556]

RTPF - ROUND TUBE, PLATE FIN (COPPER/ALUM)
MCHX - MICROCHANNEL (ALUM/ALUM)

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

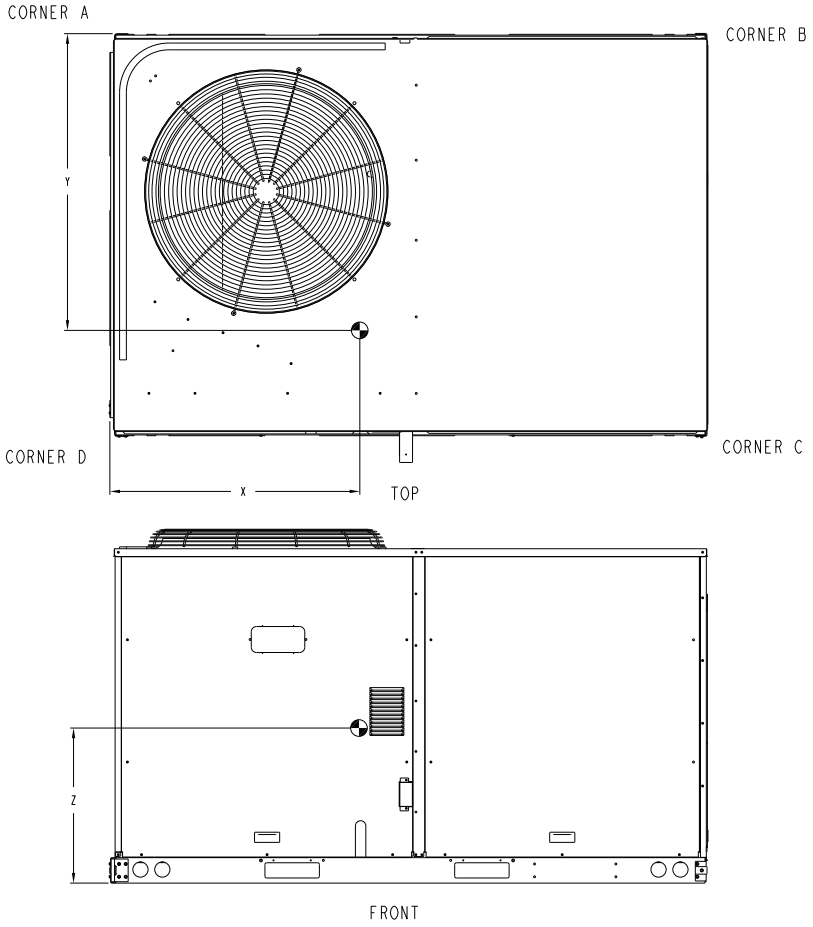


Fig. 3 — Unit Dimensional Drawing Size 14 (cont)

SHEET	DATE	SUPERCEDES			REV
2 OF 2	10-04-10	11-24-08	580J 14 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	48TM501444	G

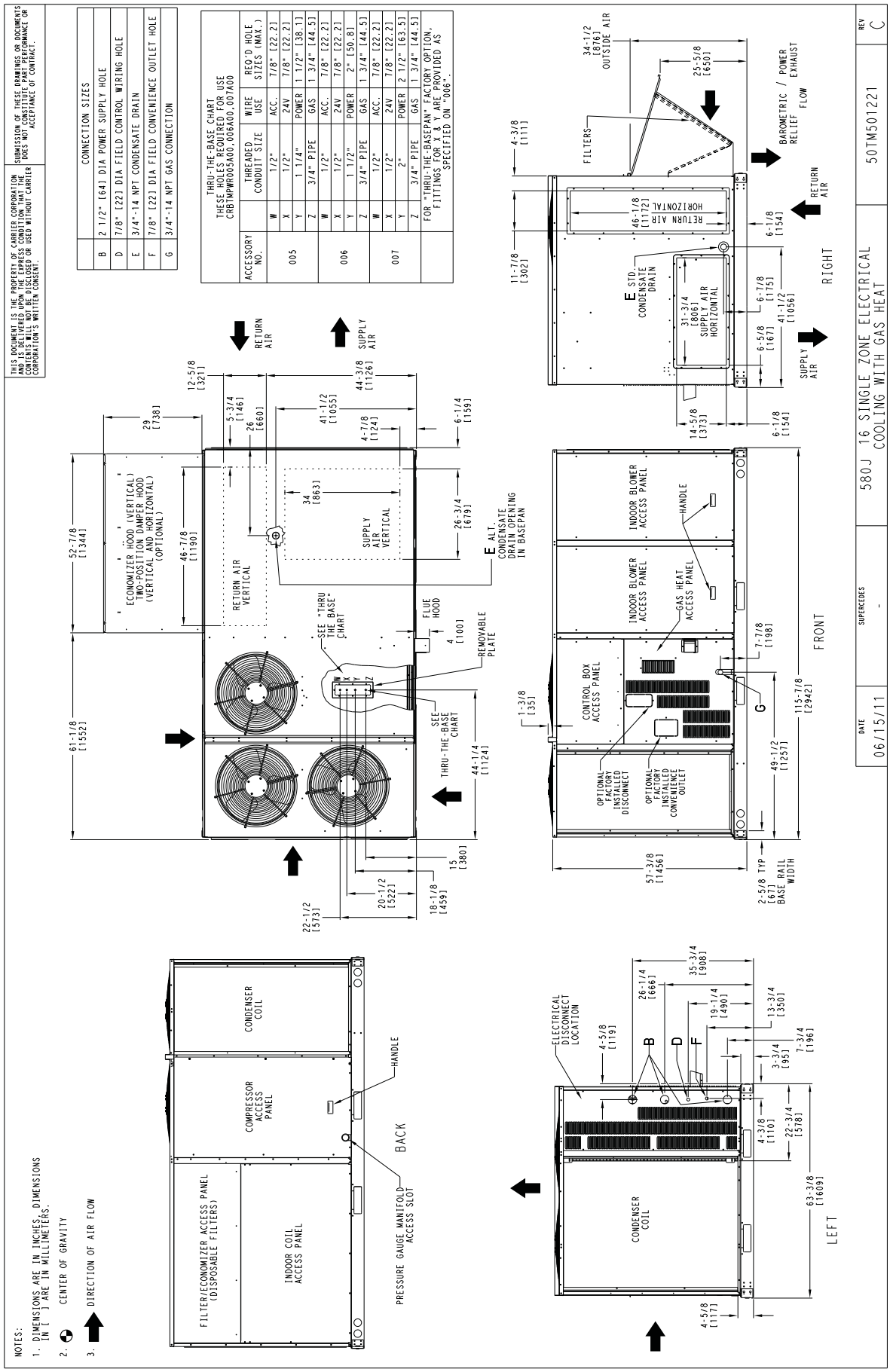
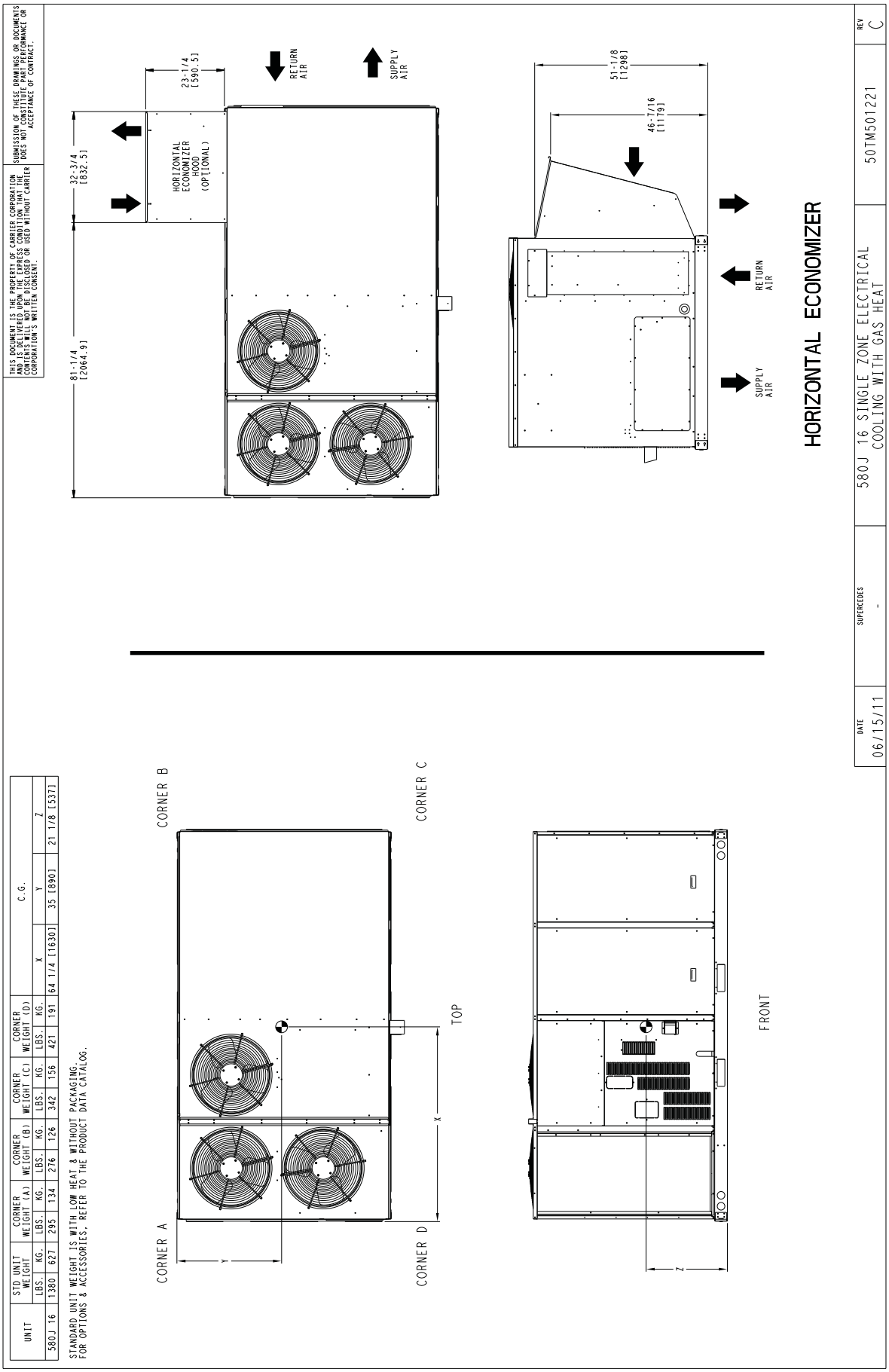


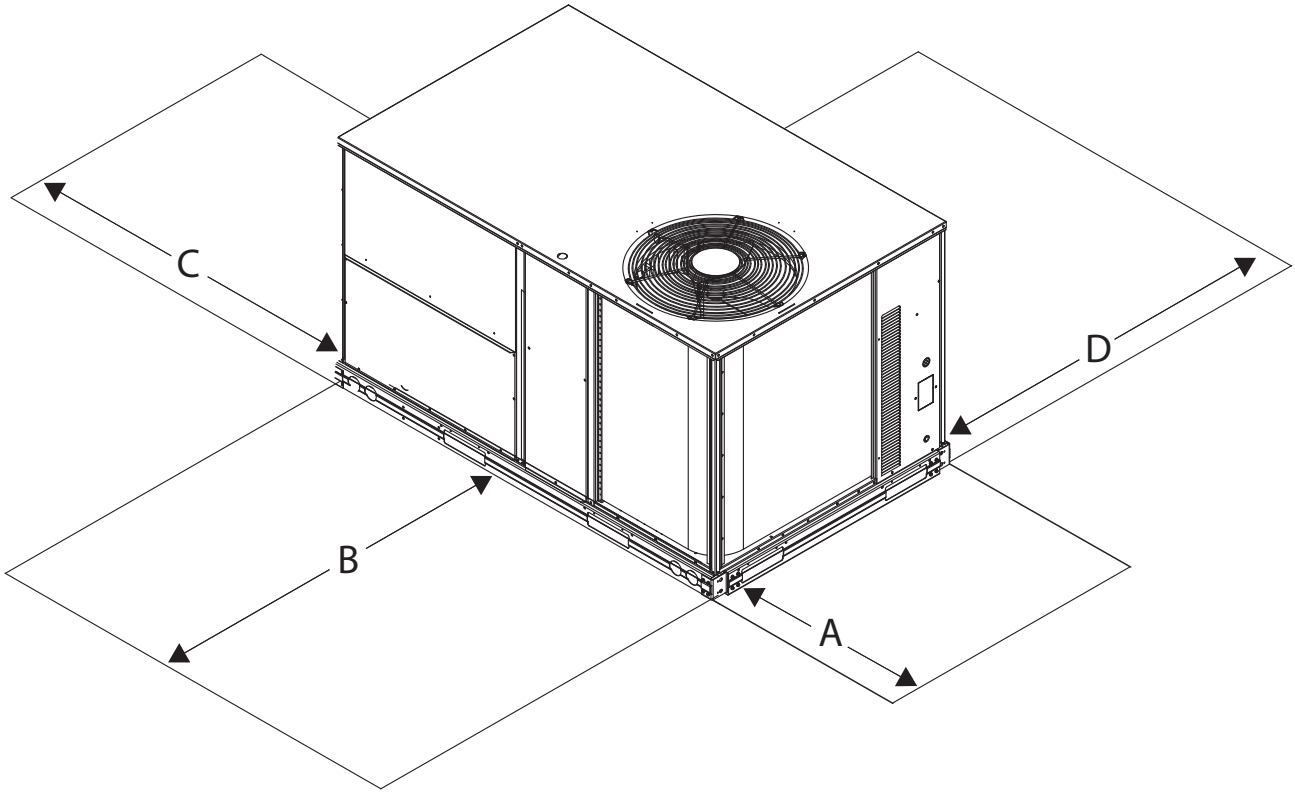
Fig. 4 — Unit Dimensional Drawing Size 16



UNIT	STD UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.			
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X		Y	Z
580J 16	1380	627	295	134	276	126	342	156	421	191	64 1/4 [1630]		35 [890]	21 1/8 [537]

STANDARD UNIT WEIGHT IS WITH LOW HEAT & WITHOUT PACKAGING.
FOR OPTIONS & ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

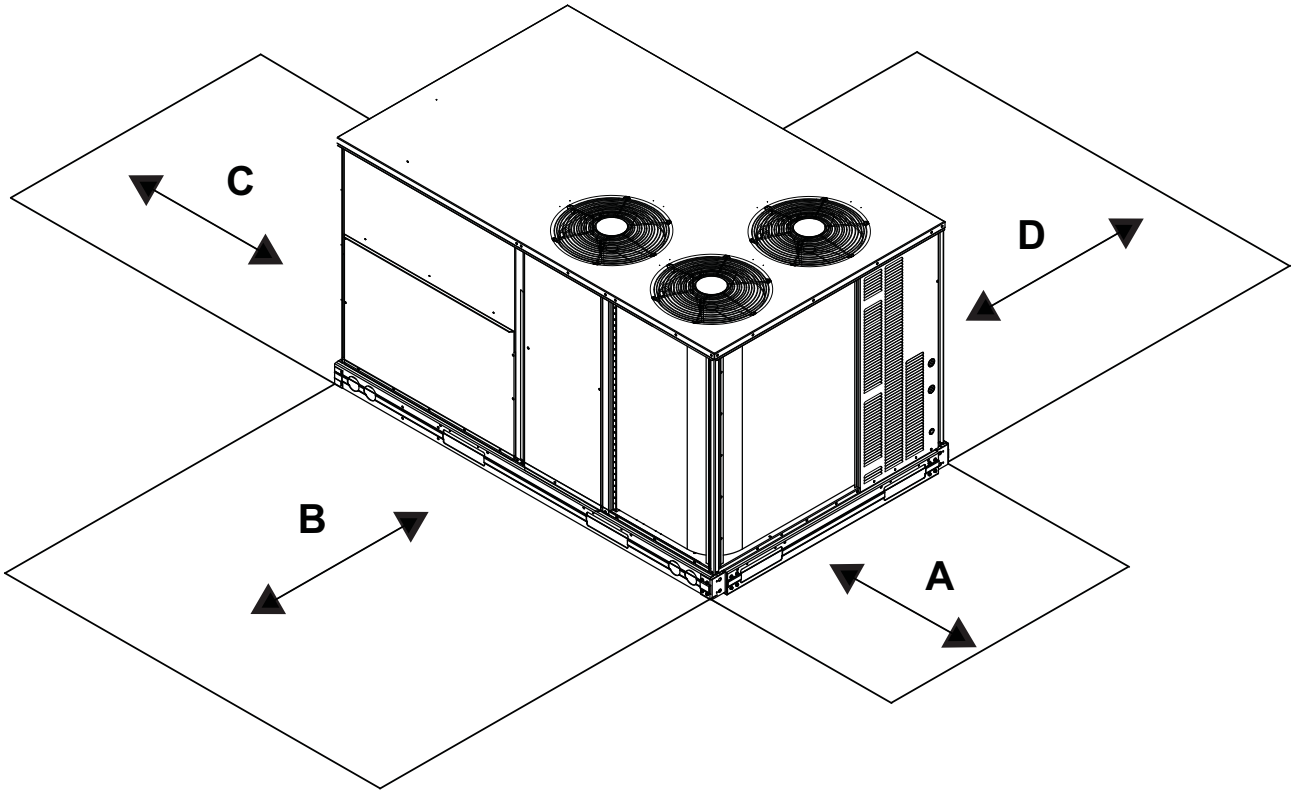
Fig. 4 —Unit Dimensional Drawing Size 16 (cont)



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

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

Fig. 5 — Service Clearances — 580J*08-14 Units



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

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

Fig. 6 — Service Clearances — 580J*16 Units

INSTALLATION

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. 2-4.

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.

For sizes 08-14 only, 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. See

Step 11 — Install External Condensate Trap and Line on page 24 for required trap dimensions.

ROOF MOUNT — Check building codes for weight distribution requirements. Unit operating weight is shown in Table 2.

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-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 (see Step 11 — Install External Condensate Trap and Line on page 24 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

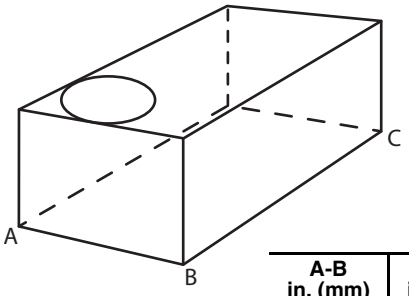
FRAME-MOUNTED INSTALLATION — Frame-mounted applications generally follow the sequence for a curb installation. Adapt as required to suit specific installation plan.

Step 3 — Inspect Unit — Inspect unit for transportation damage. File any claim with transportation agency. Confirm before installation of unit that voltage, amperage and circuit protection requirements listed on unit data plate agree with power supply provided.

Step 4 — Provide Unit Support

ROOF CURB MOUNT — Accessory roof curb details and dimensions are shown in Fig. 2-4. Assemble and install accessory roof curb in accordance with instructions shipped with the curb.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are show in Fig. 7. Refer to Accessory Roof Curb Installation Instructions for additional information as required.



A-B in. (mm)	B-C in. (mm)	A-C in. (mm)
0.5 (13)	1.0 (25)	1.0 (25)

Fig. 7 — Unit Leveling Tolerances

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. 8 and 9. Improperly applied gasket can also result in air leaks and poor unit performance.

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

IMPORTANT: If the unit has the factory-installed Thru-the-base option, make sure to complete installation of the option before placing the unit on the roof curb.
See the following sections:

Factory-Option Thru-Base Connections
(Gas Connection) on page 22 for sizes 08-14 and page 22 for size 16

Factory-Option Thru-Base Connections
(Electrical Connections) on page 29 for sizes 08-14 and page 30 for size 16

NOTE: For size 16, if gas and/or electrical connections are not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

FOR SIZES 08-14 ONLY — 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.

Table 2 — Operating Weights

48TC	UNITS — lb (kg)				
	08	09	12	14	16
580J*A	810 (367)	910 (412)	965 (437)	N/A	N/A
580J*D	900 (408)	970 (440)	980 (444)	1075 (487)	1305 (592)
Economizer					
Vertical	75 (34)	75 (34)	75 (34)	75 (34)	130 (47)
Horizontal	122 (55)	122 (55)	122 (55)	122 (55)	242 (110)
Perfect Humidity™ System	80 (36)	80 (36)	80 (36)	85 (39)	90 (41)
Powered Outlet	35 (16)	35 (16)	35 (16)	35 (16)	35 (16)
Curb					
14-in. (356 mm)	143 (65)	143 (65)	143 (65)	143 (65)	180 (82)
16-in. (610 mm)	245 (111)	245 (111)	245 (111)	245 (111)	255 (116)

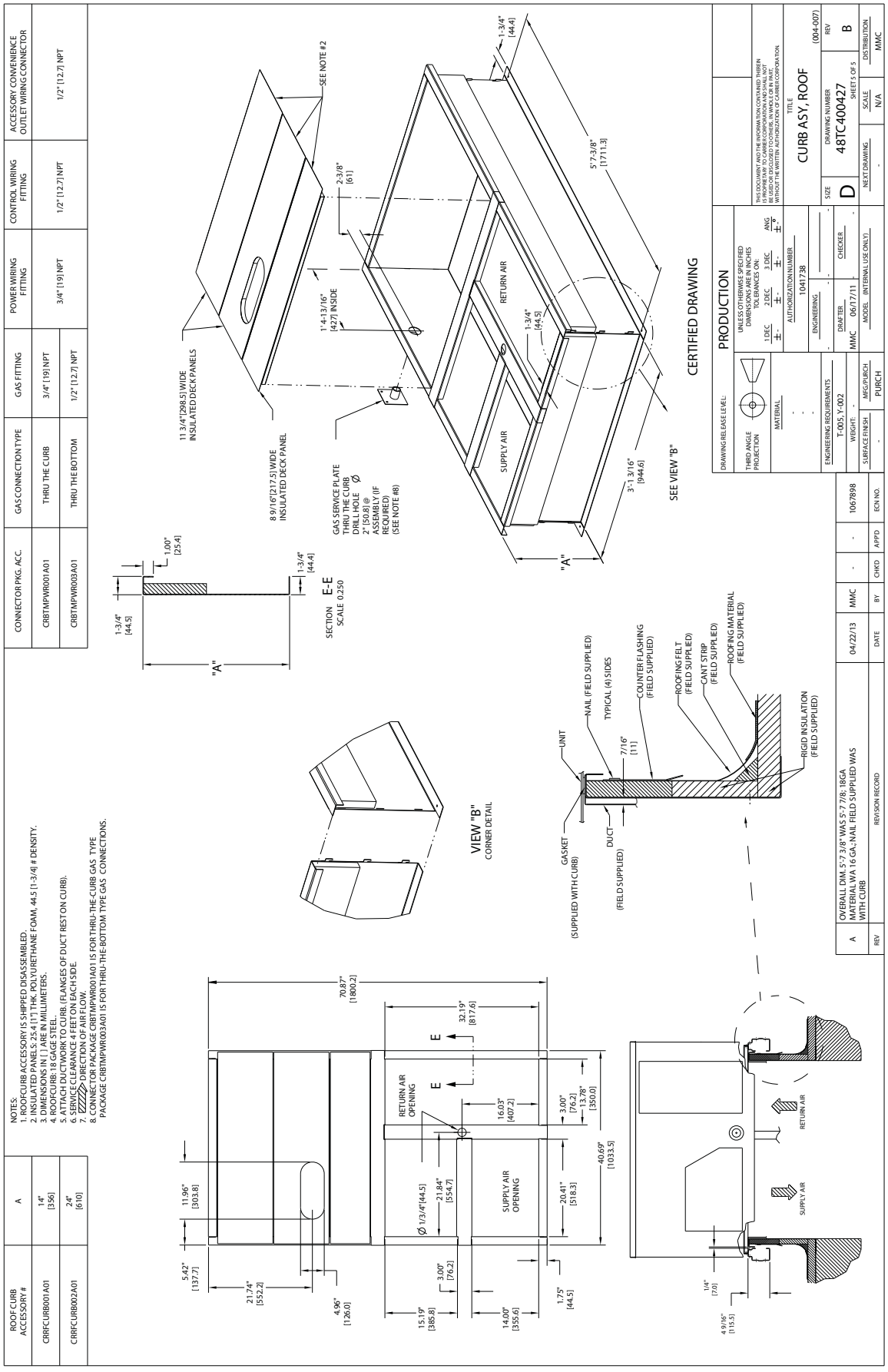


Fig. 8 — 580J*08-14 — Roof Curb Details

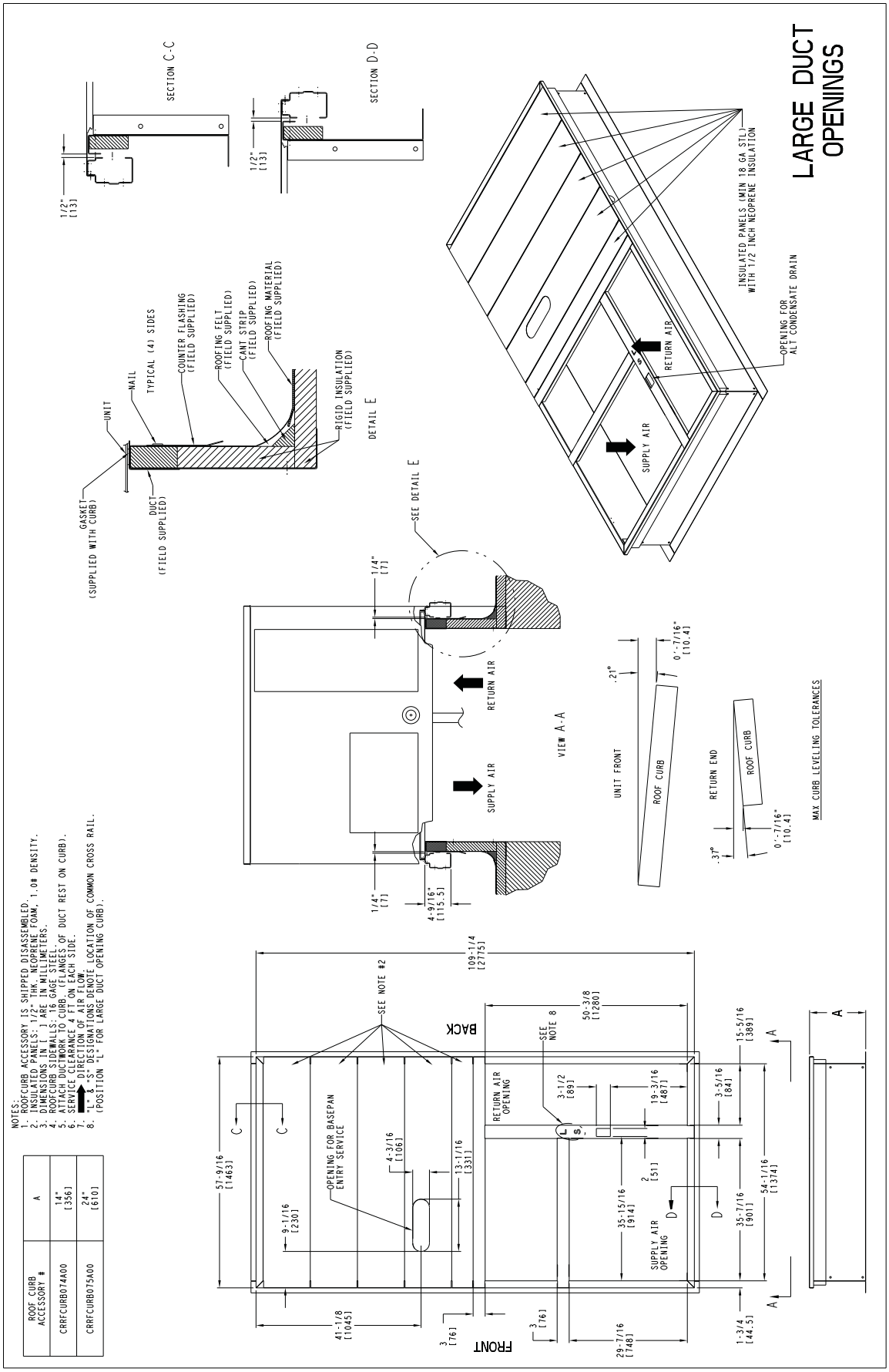


Fig. 9 — 580J*16 — Roof Curb Details

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

NOTE: 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.

⚠ CAUTION

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.

Step 6 — Rig and Place Unit — Keep unit upright and do not drop. Spreader bars are not required. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 2 and Fig. 10 for additional information.

Lifting holes are provided in base rails as shown in Fig. 10. Refer to rigging instructions on unit.

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

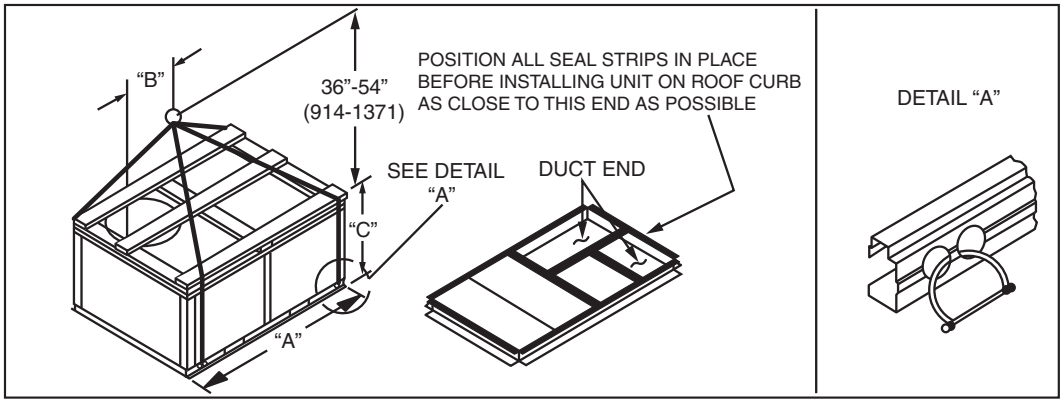
When using the standard side drain connection, ensure the red plug in the alternate bottom connection is tight. Do this before setting the unit in place. The red drain pan can be tightened with a $^1/_2$-in. square socket drive extension. For further details see Step 11 — Install External Condensate Trap and Line on page 24.

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

⚠ CAUTION

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.



UNIT	MAX WEIGHT		DIMENSIONS					
			A		B		C	
	LB	KG	LB	KG	LB	KG	LB	KG
580J*08A/C	1325	602	88.0	2235	42.0	1065	41.5	1055
580J*09A/C	1440	655	88.0	2235	41.5	1055	49.5	1255
580J*12A/C	1550	705	88.0	2235	42.5	1080	49.5	1255
580J*08D/F/K/M	1445	657	88.0	2235	43.0	1090	41.5	1055
580J*09D/F/K/M	1565	711	88.0	2235	42.5	1080	49.5	1255
580J*12D/F/K/M	1605	730	88.0	2235	42.0	1065	49.5	1255
580J*14D/F/K/M	1760	800	88.0	2235	29.5	750	53.0	1345
580J*16D	2130	968	116.0	2945	60.5	1535	59.5	1510

NOTES:
1. SPREADER BARS REQUIRED FOR SIZES 08-14 — Top damage will occur if spreader bars are not used. Not required for size 16.
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. 10 — Rigging Details

POSITIONING ON CURB

For Size 08-14 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 back, 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).

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.

For Size 16, full perimeter curbs CRRFCURB074A00 and 075A00, the clearance between the roof curb and the front and rear base rails should be 1/4 in. (6.4 mm). The clearance between the curb and the end base rails should be 1/2 in. (13 mm). For retrofit applications with curbs CRRFCURB003A01 and 4A01, the unit should be position as shown in Fig. 11. Maintain the 15.5 in. (394 mm) and 8 5/8 in. (220 mm) clearances and allow the 22 5/16 in. (567 mm) dimension to float if necessary.

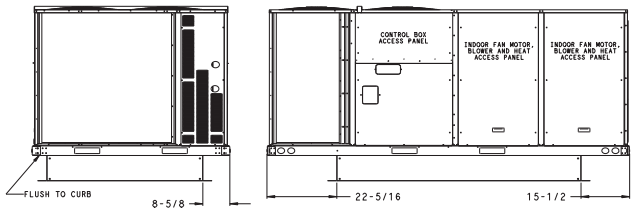


Fig. 11 — Retrofit Installation Dimensions (Size 16 Shown)

If the alternative condensate drain location through the bottom of the unit is used in conjunction with a retrofit curb, the hole in the curb must be moved 12.5 in. (320 mm) towards the duct end of the unit. See Fig. 12.

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

Remove all shipping materials and top skid. Remove extra center post from the condenser end of the unit so that the condenser end of the unit matches Fig. 39 and 40. Recycle or dispose of all shipping materials.

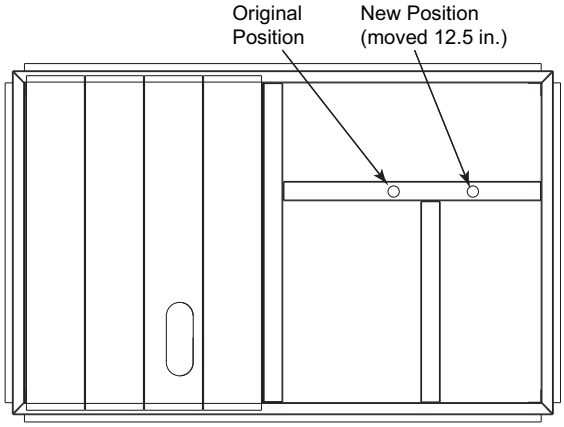


Fig. 12 — Alternative Condensate Drain Hole Positions

IMPORTANT: If the unit has the factory-installed thru-the-base option, make sure to complete installation of the option before placing the unit on the roof curb. See the following sections:

Factory-Option Thru-Base Connections (Gas Connection) on page 22 for sizes 08-14 and page 22 for size 16

Factory-Option Thru-Base Connections (Electrical Connections) on page 29 for sizes 08-14 and page 30 for size 16

NOTE: If gas and/or electrical connections are not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

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

SIZES 08-14 CONVERSION — Unit is shipped in the vertical duct configuration. Unit without factory-installed economizer or return air smoke detector option may be field-converted to horizontal ducted configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation-side down. Seals around duct openings must be tight. See Fig. 13.

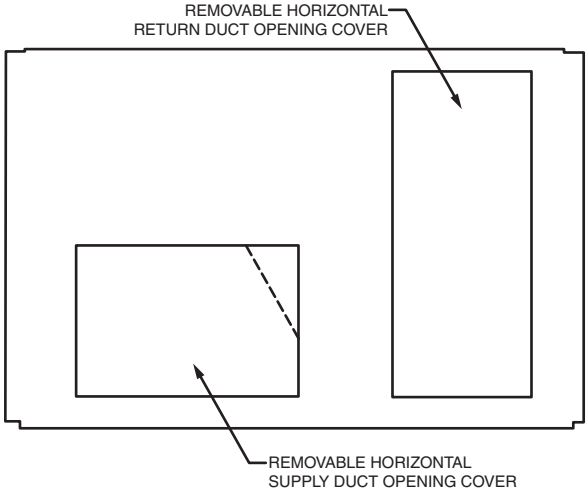


Fig. 13 — Horizontal Conversion Panels

SIZE 16 CONVERSION — 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 using accessory CRDUCTCV002A00. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers.

Discard the supply duct cover. Install accessory CRDUCTCV002A00 to cover the vertical supply duct opening. Use the return duct cover removed from the end panel to cover the vertical return duct opening.

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

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

Step 8 — Install Outside Air Hood

ECONOMIZER AND TWO POSITION DAMPER HOOD PACKAGE REMOVAL — FACTORY OPTION (SIZE 08-14)

1. The hood is shipped in knock-down form and must be field assembled. The indoor coil access panel is used as the hood top while the hood sides, divider and filter are packaged together, attached to a metal support tray using plastic stretch wrap, and shipped in the return air compartment behind the indoor coil access panel. The hood assembly's metal tray is attached to the basepan and also attached to the damper using two plastic tie-wraps.
2. To gain access to the hood, remove the filter access panel. (See Fig. 14).
3. Locate the (2) screws holding the metal tray to the basepan and remove. Locate and cut the (2) plastic tie-wraps securing the assembly to the damper (see Fig. 15). Be careful to not damage any wiring or cut tie-wraps securing any wiring. The indoor coil access panel will be used as the top of the damper hood. Remove the screws along the sides and bottom of the indoor coil access panel.
4. Carefully lift the hood assembly (with metal tray) through the filter access opening and assemble per the steps outlined in Economizer Hood and Two–Position Hood, on page 19.

ECONOMIZER HOOD REMOVAL — FACTORY OPTION (SIZE 16)

NOTE: Economizer and two position damper are not available as factory installed options for single phase (-J voltage code) models.

1. The hood is shipped in knock-down form and located in the return air compartment. It is attached to the economizer using two plastic tie-wraps.
2. To gain access to the hood, remove the filter access panel (see Fig. 14).
3. Locate and cut the (2) plastic tie-wraps being careful (see Fig. 16). Be careful to not damage any wiring or cut tie-wraps securing any wiring.
4. Carefully lift the hood assembly (with metal tray) through the filter access opening and assemble per the steps outlined in *Economizer Hood and Two–Position Hood*, on page 20.

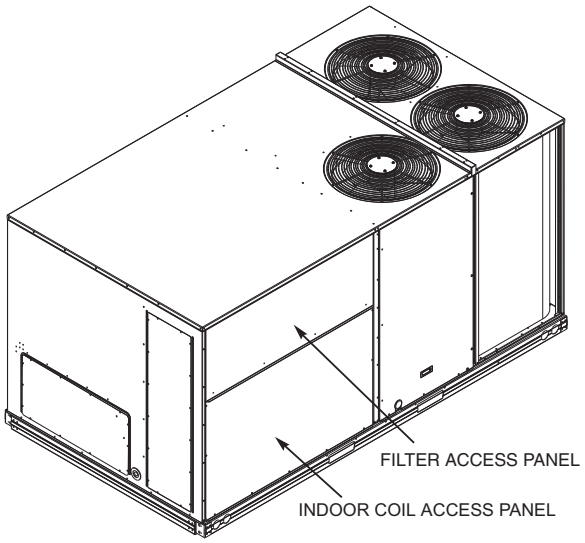


Fig. 14 — Typical Access Panel Locations (Size 16 Shown)

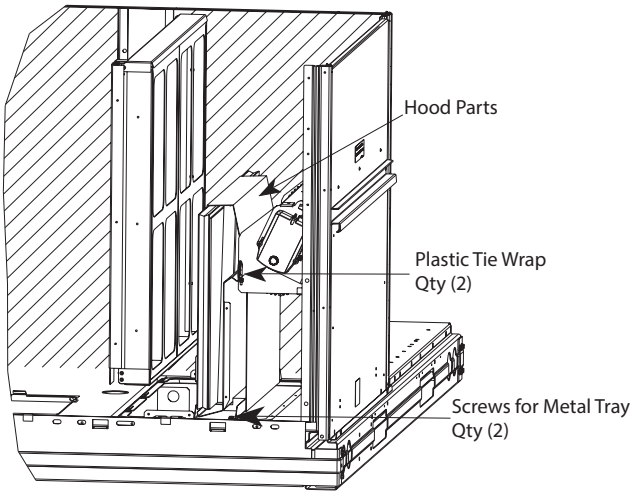


Fig. 15 — Economizer and Two Position Damper Hood Package Location (Two Position Damper Only for Size 16)

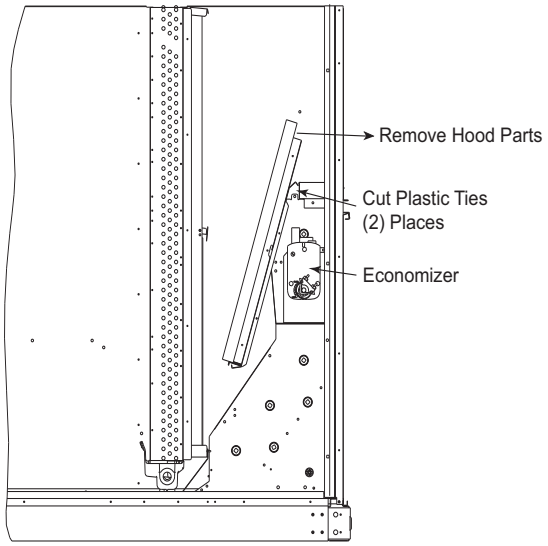


Fig. 16 — Economizer Hood Package Location (Size 16)

TWO-POSITION DAMPER HOOD REMOVAL — FACTORY OPTION (SIZE 16)

1. The hood is shipped in knock-down form and assembled to a metal support tray using plastic stretch wrap. Located in the return air compartment, the assembly's metal tray is attached to the basepan and also attached to the damper using two plastic tie-wraps.
2. To gain access to the hood, remove the filter access panel. See Fig. 14.
3. Locate the (2) screws holding the metal tray to the basepan and remove. In order to remove the screws, it may be necessary to remove the panel underneath the two-position damper. Remove the two screws. Locate and cut the (2) plastic tie-wraps securing the assembly to the damper. (See Fig. 16.) Be careful to not damage any wiring or cut tie-wraps securing any wiring.
4. Carefully lift the hood assembly (with metal tray) through the filter access opening and assemble per the steps outlined in ECONOMIZER AND TWO-POSITION DAMPER HOOD SETUP, SIZE 16 on page 20.
5. If removed, reattach the panel under the damper.

ECONOMIZER AND TWO-POSITION DAMPER HOOD SETUP (SIZE 08-14)

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. 17.
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. 18.
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. 18 and 19. 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. 19.
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

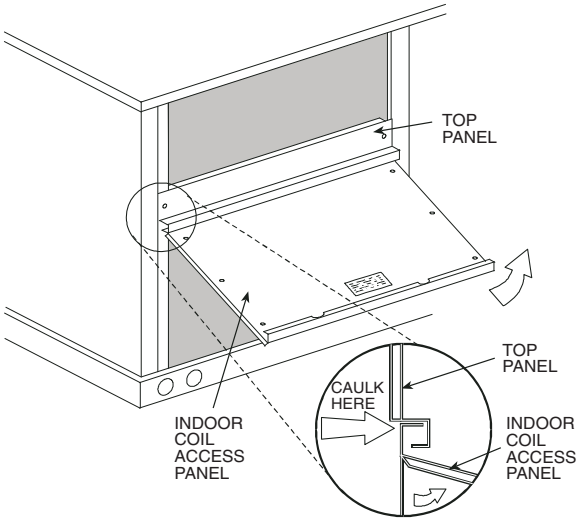


Fig. 17 — Indoor Coil Access Panel Relocation (Size 08-14 Shown)

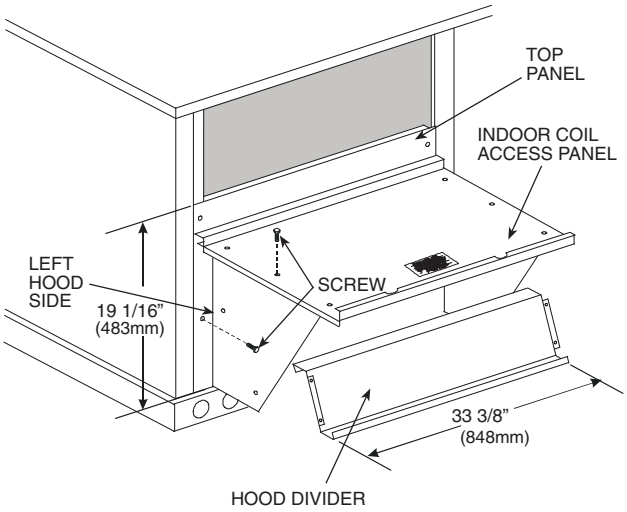


Fig. 18 — Economizer Hood Construction (Size 08-14 Shown)

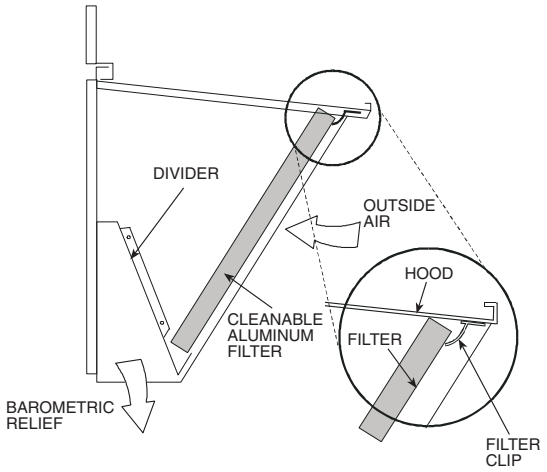


Fig. 19 — Economizer Filter Installation (Size 08-14 Shown)

ECONOMIZER AND TWO-POSITION DAMPER HOOD SETUP, SIZE 16

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. If the panel is still attached to the unit, remove the screws along the sides and bottom of the panels. See Fig. 20.
2. Swing out indoor coil access panel and insert the hood sides under the panel (hood top). Be careful not to lift the panel too far as it might fall out. 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. 21.
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. 21 and 22. 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.

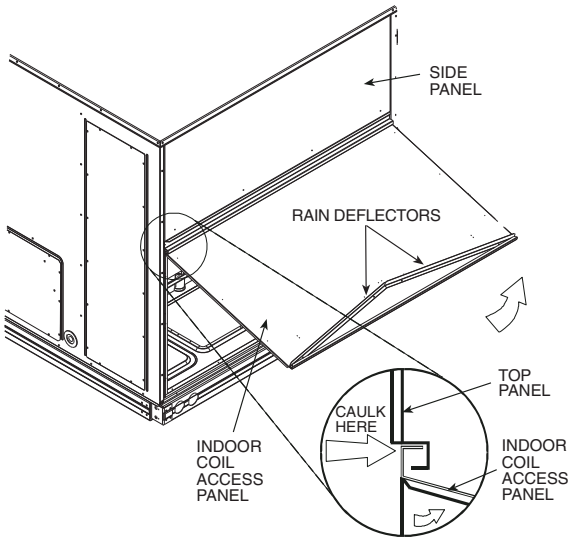


Fig. 20 — Indoor Coil Access Panel Relocation (Size 16 Shown)

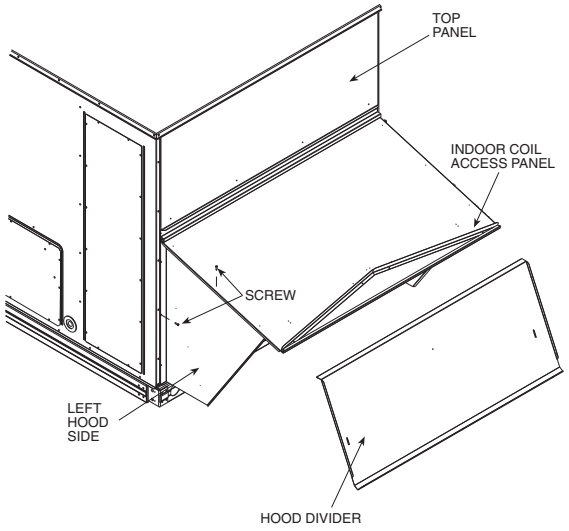


Fig. 21 — Economizer Hood Construction (Size 16 Shown)

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. 22.
6. Caulk the ends of the joint between the unit top panel and the hood top.
7. Replace the filter access panel.

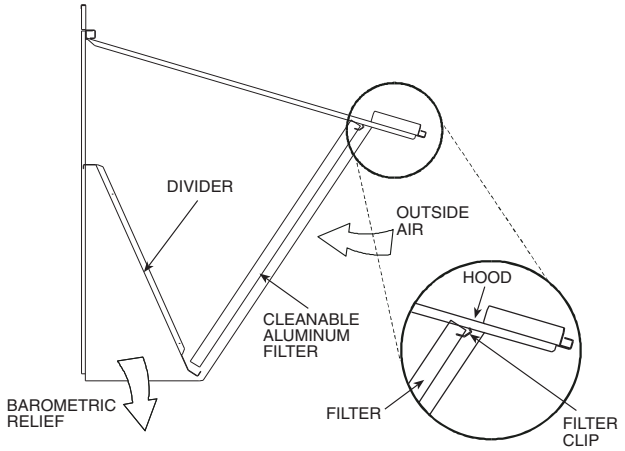


Fig. 22 — Economizer Filter Installation (Size 16 Shown)

Step 9 — 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. 23 for size 08-14 and Fig. 24 for size 16.

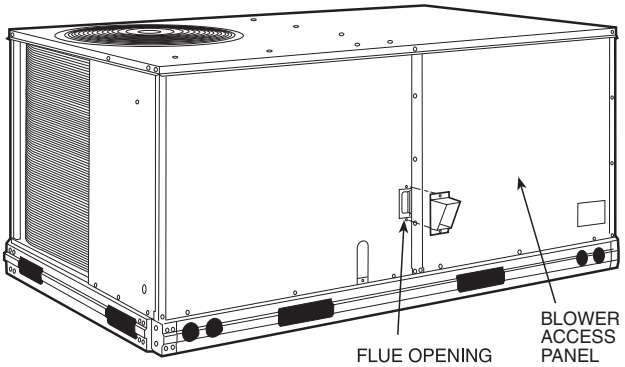


Fig. 23 — Flue Hood Details (Sizes 08-14)

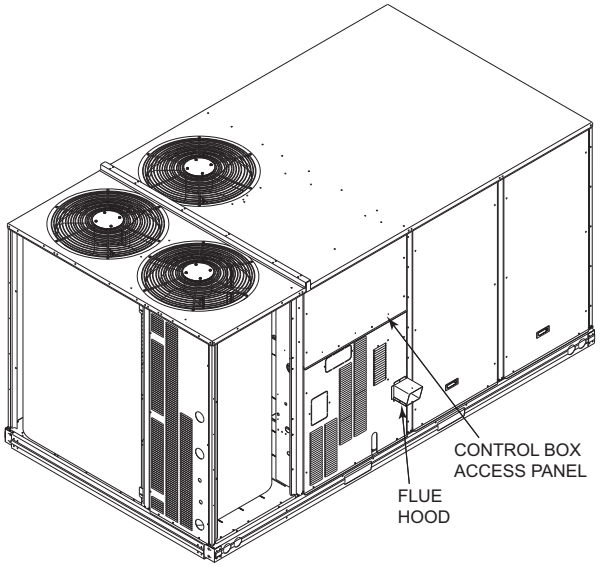


Fig. 24 — Flue Hood Details (Size 16)

Step 10 — Install Gas Piping — Installation of the gas piping must be 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 fuel at elevations up to 2000 ft (610 m) above sea level. Unit may be field converted for operation at elevations above 2000 ft (610 m) and/or for use with liquefied petroleum fuel. See accessory kit installation instructions regarding these accessories.

NOTE: Furnace gas input rate on rating plate is for installation up to 2000 ft (610 m) above sea level. In U.S.A. the input rating for altitudes above 2000 ft (610 m) must be derated by 4% for each 1000 ft (305 m) above sea level. In Canada the input rating must be derated by 10% for altitudes of 2000 ft (610 m) to 4500 ft (1372 m) above sea level.

For natural gas applications, gas pressure at unit gas connection must not be less than 4 in. wg (996 Pa) or greater than 13 in. wg (3240 Pa) while the unit is operating for size 08 to 14 and 5 in. wg (996 Pa) or greater than 13 in. wg (3240 Pa) while the unit is operating for size 16 (see Table 3). For liquefied petroleum applications, the gas pressure must not be less than 11 in. wg (2740 Pa) or greater than 13.0 in. wg (3240 Pa) at the unit connection, see Table 4.

Table 3 — Natural Gas Supply Line Pressure Ranges

UNIT MODEL	UNIT SIZE	MIN.	MAX.
580J	08, 09, 12, 14	4.0 in. wg (996 Pa)	13.0 in. wg (3240 Pa)
	16	5.0 in. wg (1250 Pa)	13.0 in. wg (3240 Pa)

Table 4 — Liquid Propane Supply Line Pressure Ranges

UNIT MODEL	UNIT SIZE	MIN.	MAX.
580J	08, 09, 12, 14, 16	11.0 in. wg (2740 Pa)	13.0 in. wg (3240 Pa)

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 for sizes 08-14 and $^3/_4$-in. FPT gas inlet port on the unit gas valve for size 16, see Table 5.

Manifold pressure is factory-adjusted for NG fuel use. Adjust as required to obtain best flame characteristics.

Table 5 — Natural Gas Manifold Pressure Ranges

UNIT MODEL	UNIT SIZE	HIGH FIRE	LOW FIRE*
580J	08, 09, 12, 14	3.5 in. wg (872 Pa)	2.0 in. wg (498 Pa)
	16	3.0 in. wg (747 Pa)	

*LOW FIRE, 1.7 in. wg (423 Pa), applies to the following units only: 580JD/E/F*08 and 580JD09.

Manifold pressure for LP fuel use must be adjusted to specified range, see Table 6. Follow instructions in the accessory kit to make initial readjustment.

Table 6 — Liquid Propane Manifold Pressure Ranges

UNIT MODEL	UNIT SIZE	HIGH FIRE	LOW FIRE*
580J	08, 09, 12, 14	10.0 in. wg (2490 Pa)	5.7 in. wg (1420 Pa)
	16		6.6 in. wg (1644 Pa)

*LOW FIRE, 5.0 in. wg (1420 Pa), applies to the following units only: 580JD/E/F*08 and 580JD09.

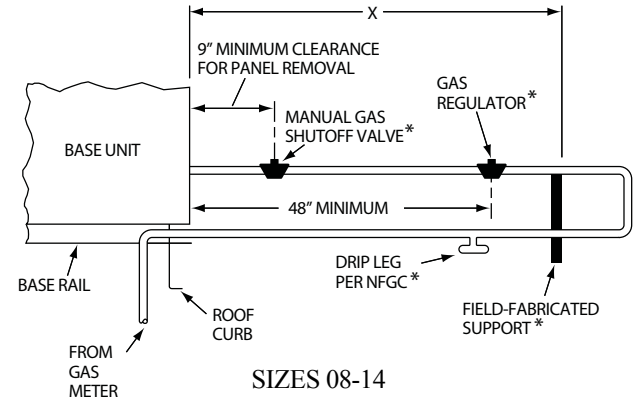
⚠ CAUTION

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

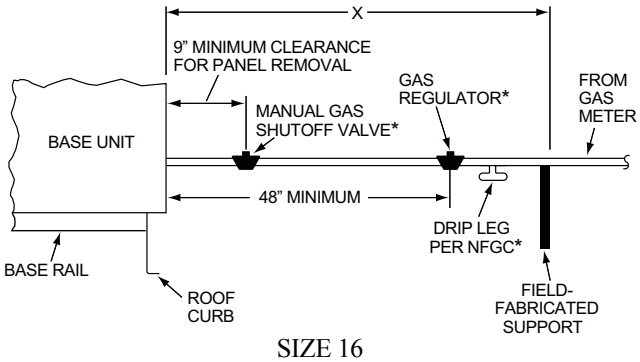
When connecting the gas line to the unit gas valve, the installer MUST use a backup wrench to prevent damage to the valve.

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. 25.



SIZES 08-14



SIZE 16

* Field supplied.

STEEL PIPE NOMINAL DIAMETER (in.)	SPACING OF SUPPORTS X DIMENSION (ft)
$^1/_2$	6
$^3/_4$ or 1	8
1 $^1/_4$ or larger	10

Fig. 25 — Gas Piping Guide (with Accessory Thru-the-Curb Service Connections)

FACTORY-OPTION THRU-BASE CONNECTIONS (GAS CONNECTIONS) (SIZES 08-14) — 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. See Fig. 26.

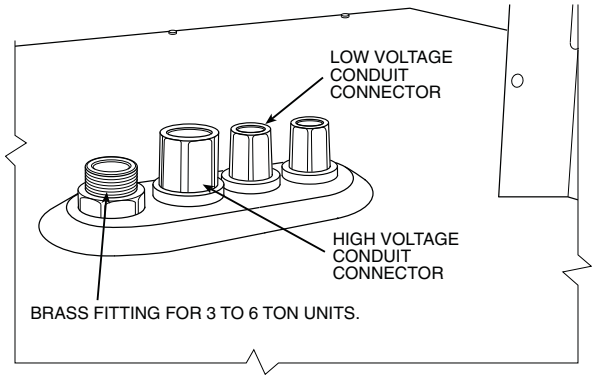


Fig. 26 — Thru-Base Connection Fittings

The thru-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-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. 27.

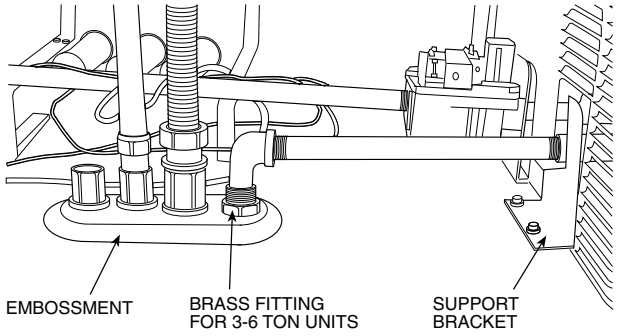


Fig. 27 — Gas Line Piping (Sizes 08-14)

FACTORY-OPTION THRU-BASE GAS CONNECTIONS (SIZE 16) — This service connection kit consists of a 3/4-in. NPT gas adapter fitting (stainless steel), a 1/2-in. electrical bulkhead connector and a 1 1/2-in. electrical bulkhead connector, connected to an "L" bracket covering the embossed (raised) section of the unit basepan in the condenser section. See Fig. 28.

1. Remove the "L" bracket assembly from the unit (see Fig. 28).
2. Cut and discard the wire tie on the gas fitting. Hand tighten the fitting if it has loosened in transit.
3. 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.

4. Place the gasket over the embossed area in the basepan, aligning the holes in the gasket to the holes in the basepan. See Fig. 29.
5. Install the connector plate assembly to the basepan using 8 of the washer head screws.

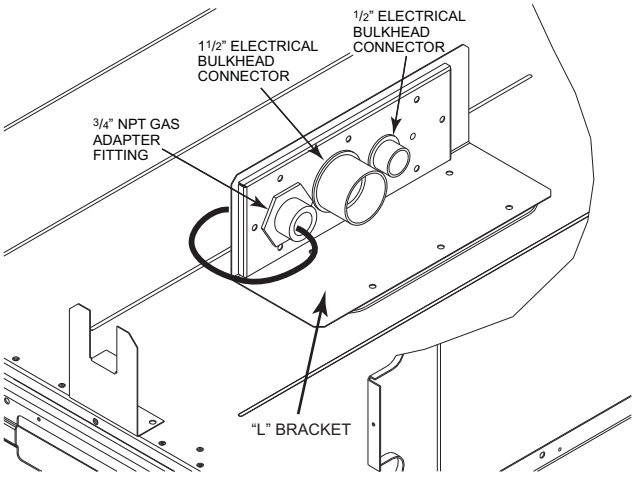


Fig. 28 — Thru-Base Connection Fittings (Size 16 Shown)

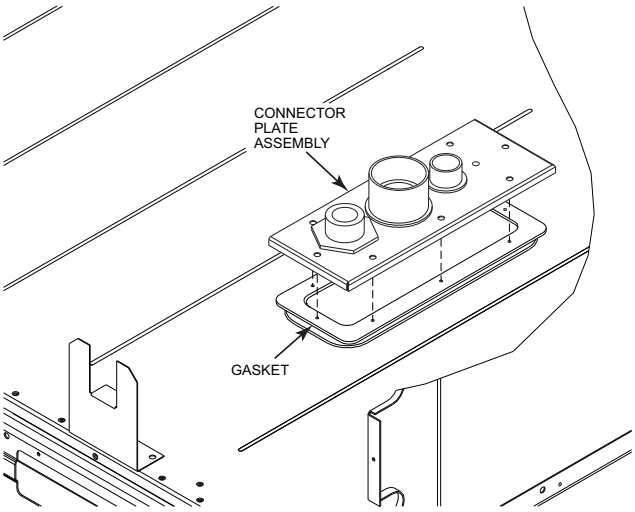


Fig. 29 — Completing Installation of Thru-the-Base Option (Size 16 Shown)

NOTE: If gas and/or electrical connections are not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

The thru-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 3/4-in. NPT street elbow (field-supplied) on the thru-base gas fitting. Attach a 3/4-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. 30).

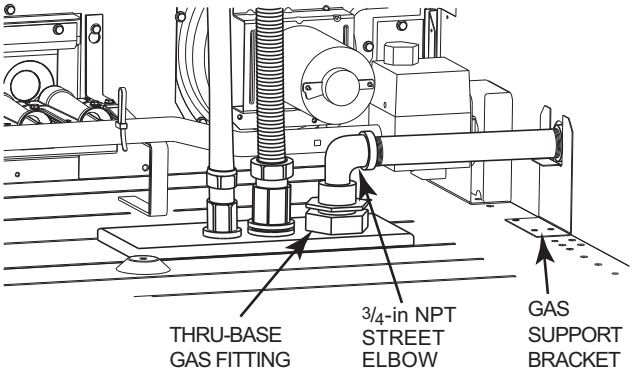


Fig. 30 — Gas Line Piping (Size 16)

ALL UNITS — Other hardware required to complete the installation of the gas supply line will include 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. 31 and 32 for typical piping arrangements for gas piping that has been routed through the sidewall of the curb. See Fig. 33 for typical piping arrangement when thru-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.

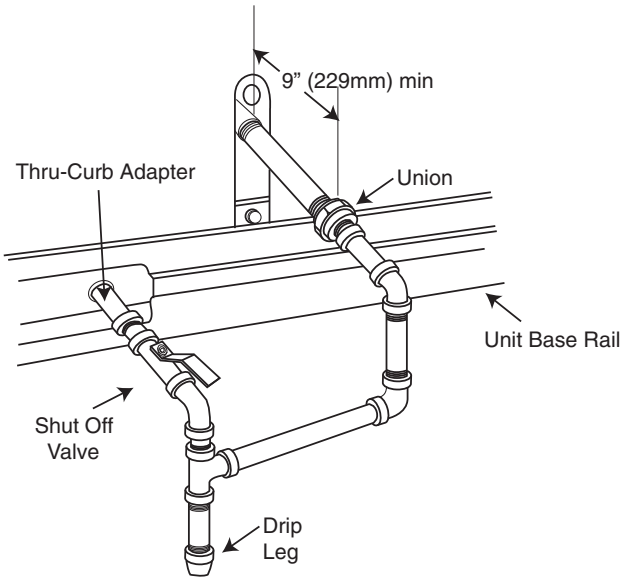


Fig. 31 — Gas Piping with Thru-Curb Accessory

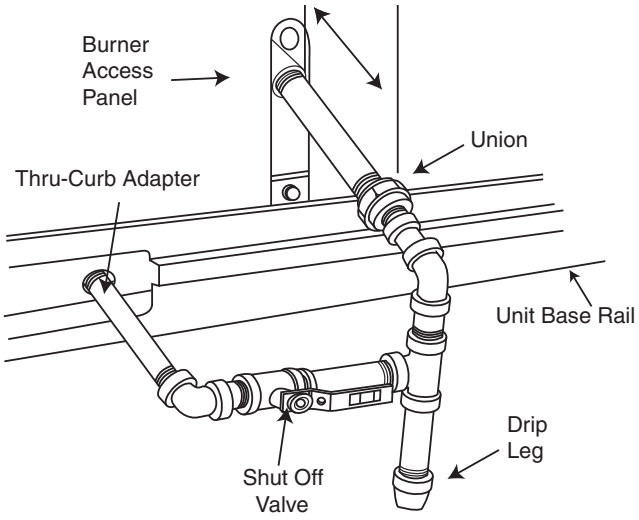


Fig. 32 — Gas Piping with Thru-Curb Accessory (Alternate Layout)

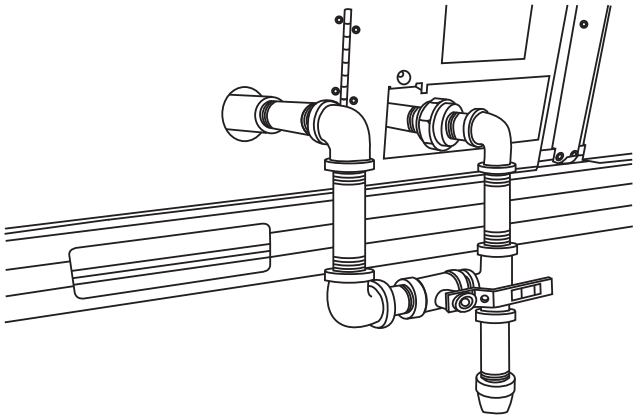


Fig. 33 — Gas Piping Thru-Base Connections

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:

1. Avoid low spots in long runs of pipe. Grade all pipe 1/4-in. in every 15 ft (7 mm in every 5 m) to prevent traps. Grade all horizontal runs downward to risers. Use risers to connect to heating section and to meter.
2. 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.
3. 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*) tape, ensure the material is Double Density type and is labeled for use on gas lines. Apply tape per manufacturer's instructions.
4. Pressure-test all gas piping in accordance with local and national plumbing and gas codes before connecting piping to unit.

*Teflon is a registered trademark of DuPont Corporation.

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 re-drilled, check orifice hole with a numbered drill bit of correct size. Never re-drill an orifice (see Fig. 34). A burr-free and squarely aligned orifice hole is essential for proper flame characteristics.

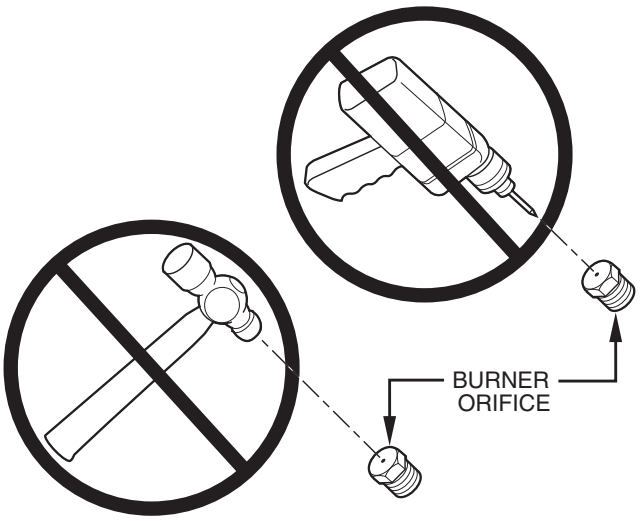


Fig. 34 — Orifice Hole

Step 11 — 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. 35. Unit airflow configuration does not determine which drain connection to use. Either drain connection can be used with vertical or horizontal applications.

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. 35 and 36.

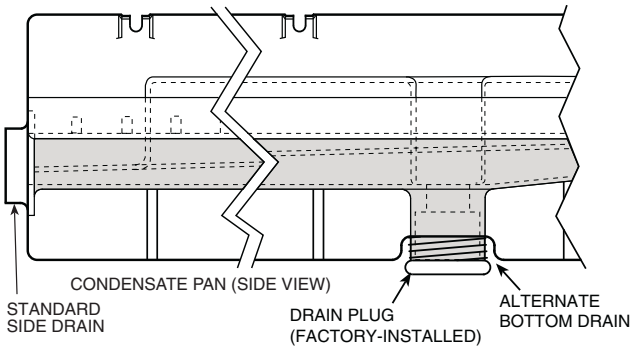
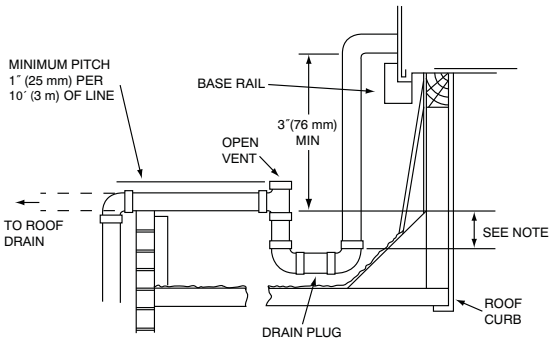


Fig. 35 — Condensate Drain Pan (Side View)

NOTE: If the alternate bottom drain is not used check the drain plug for tightness prior to setting the unit on the roof curb.



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

Fig. 36 — Condensate Drain Piping Details

All units must have an external trap for condensate drainage. Install a trap at least 4-in. (102 mm) deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1-in. per 10 ft (25 mm in 3 m) of run. Do not use a pipe size smaller than the unit connection ($^3/_4$-in.).

Step 12 — 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 (SIZES 08-14) — 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 opera-

tion of the convenience outlet is desired, connect the source leads to the load side of the unit disconnect. On a unit without a unit-mounted disconnect, connect the source leads to compressor contactor C and indoor fan contactor IFC pressure lugs with unit field power leads (see Fig. 37).

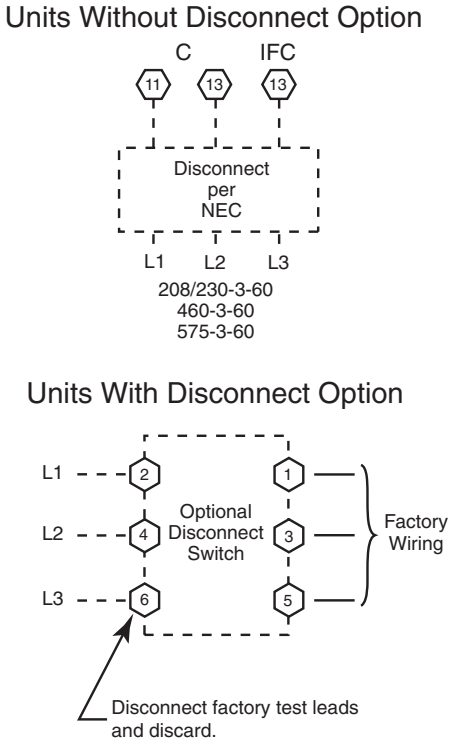


Fig. 37 — Power Wiring Connections (Sizes 08-14)

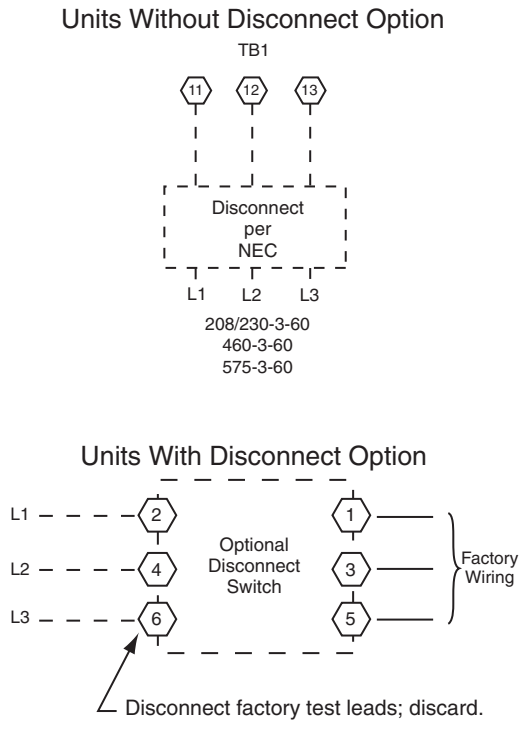


Fig. 38 — Power Wiring Connections (Sizes 16)

Field power wires are connected to the unit at line-side pressure lugs on compressor contactor C and indoor fan contactor IFC (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Max wire size is #4 AWG (copper only).

NOTE: TEST LEADS – Unit may be equipped with short 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.

FIELD POWER SUPPLY (SIZE 16) — For those units without through-the-curb power, conduit must be used to route the main power from the condenser end, via the power entry in the corner post of the unit (see Fig. 39 and 40) to either the factory option disconnect or the bottom of the control box. 1 in. conduit is provided wrapped around compressor. A second conduit is provided with factory installed powered convenience outlet. For those units that require conduit larger than 1 in., it must be field supplied. Fig. 39 and 40 show the wire routings.

If the field disconnect is larger than 100A, it must be attached to the unit using accessory CRDISBKT001A00 — disconnect switch bracket (see Fig. 41). Follow the instructions provided with this accessory. For smaller field disconnects, be sure to use $^1/_2$ in. screws to mount the disconnect directly to the end panel (see Fig. 42). In either case, set the disconnect vertical location on the unit so that a 90 degree fitting can be used to connect the conduit to the disconnect.

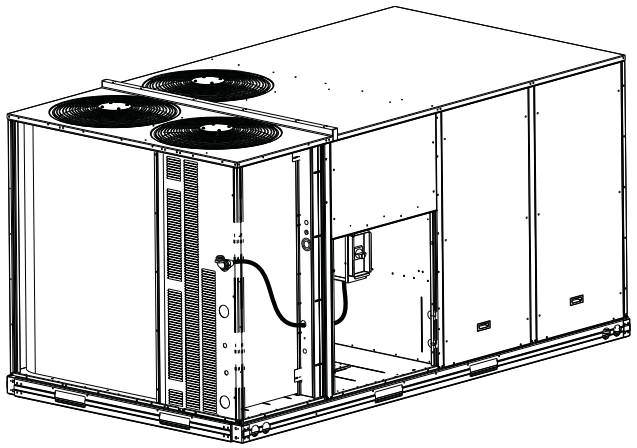


Fig. 39 — Conduit into Factory Option Disconnect

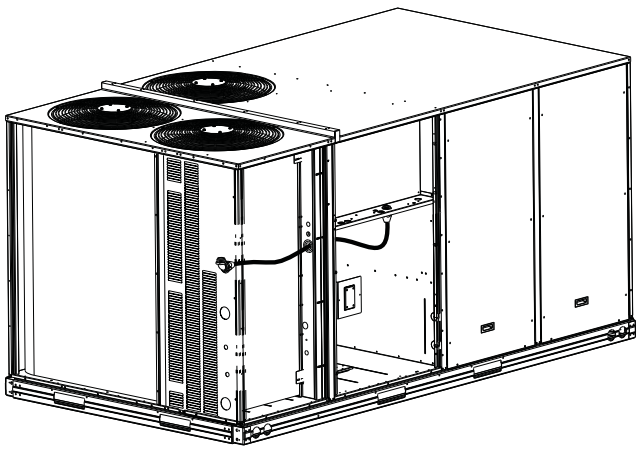


Fig. 40 — Conduit into Control Box

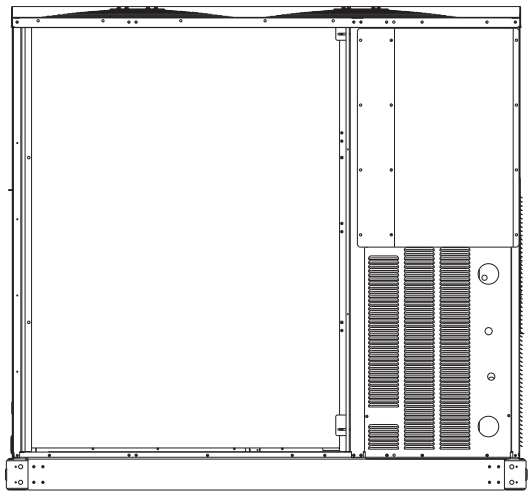


Fig. 41 — Mounting Position for Field Disconnects (over 100A)

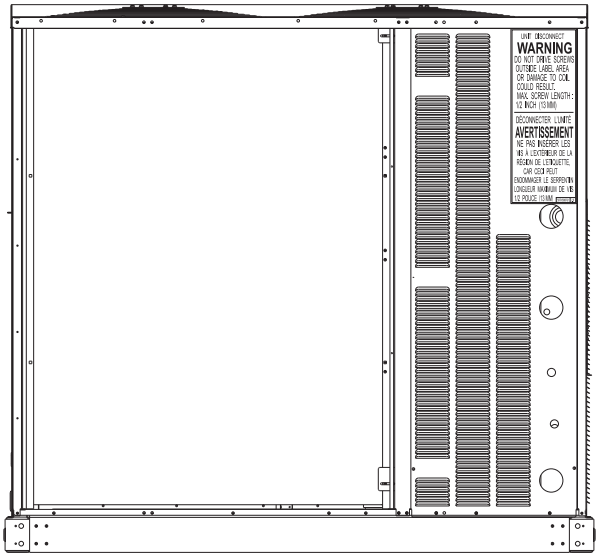


Fig. 42 — Mounting Position for Field Disconnects (up to 100A)

Field power wires are connected to the unit at line-side pressure lugs on compressor contactor C and indoor fan contactor IFC (see wiring diagram label for control box component arrangement) or at factory-installed option non-fused disconnect switch. Max wire size is #2 AWG (copper only). See Fig. 38.

Refer to Table 7 for maximum wire size at connection lugs. Use copper wire only. See Fig. 38.

Table 7 — Connection Lug Min/Max Wire Sizes

	Minimum	Maximum
TB1 In Unit Control Box	#14	#1
80A Disconnect Option	#14	#4
100A Disconnect Option	#8	1/0

NOTE: TEST LEADS - Unit may be equipped with short leads (pigtails) on the field line connection points on contactor C or optional disconnect switch, see Fig. 38. These leads are for factory run-test purposes only; remove and discard before connecting field power wires to unit connection points. Make field power connections directly to line connection pressure lugs only.

⚠ WARNING

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

Do not connect aluminum wire between disconnect switch and 580J unit. Use only copper wire. (See Fig. 43.)

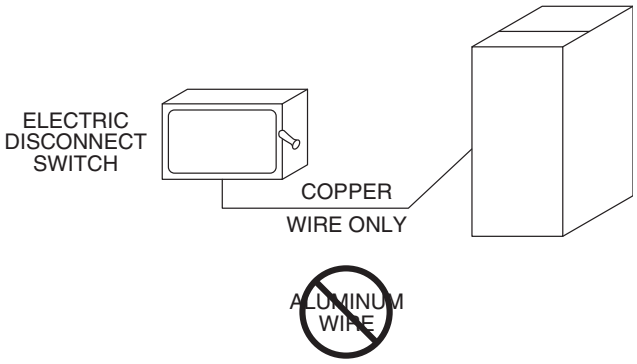


Fig. 43 — Disconnect Switch and Unit

UNITS WITH FACTORY-INSTALLED NON-FUSED DISCONNECT — The factory-installed option non-fused disconnect (NFD) switch is located in a weatherproof enclosure located under the main control box. The manual switch handle and shaft are shipped in the disconnect enclosure. Assemble the shaft and handle to the switch at this point. Discard the factory test leads (see Fig. 44 and 45).

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

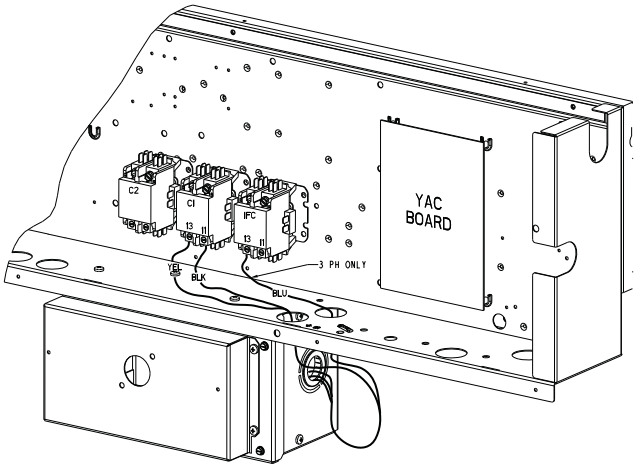


Fig. 44 — Location of Non-Fused Disconnect Enclosure (Sizes 08-14)

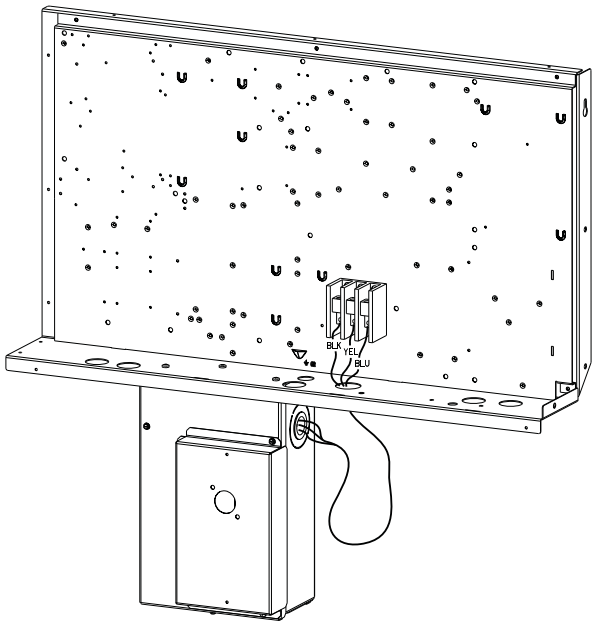


Fig. 45 — Location of Non-Fused Disconnect Enclosure (Sizes 16)

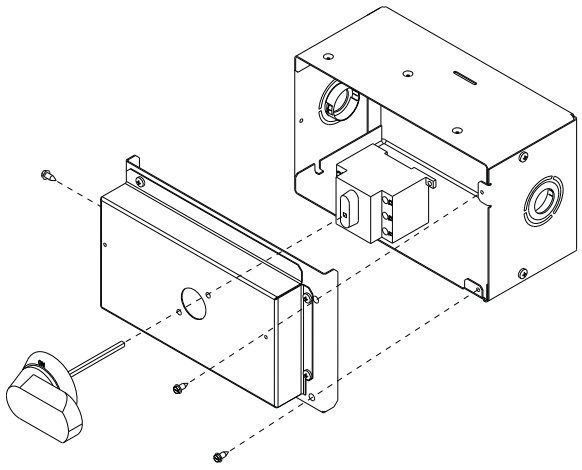


Fig. 46 — Handle and Shaft Assembly for NFD (Sizes 08-14)

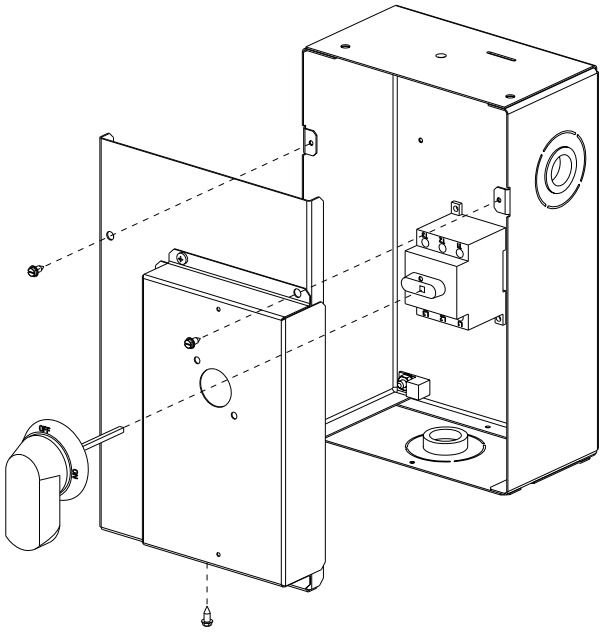


Fig. 47 — Handle and Shaft Assembly for NFD (Size 16)

To field install the NFD shaft and handle:

1. Remove the unit front panel (see Fig. 46 and 47).
2. Remove (3) hex screws on the NFD enclosure - (2) on the face of the cover and (1) on the left side cover.
3. Remove the front cover of the NFD enclosure.
4. Make sure the NFD shipped from the factory is at OFF position (the arrow on the black handle knob is at OFF).
5. Insert the shaft with the cross pin on the top of the shaft in the horizontal position.
6. For sizes 08 to 14, 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). For size 16, measure the tip of the shaft to the top surface of the pointer to be 3.75 to 3.88 in. (95 to 99 mm) for 80A and 100A NFD and 3.43 to 3.56 in. (87 to 90 mm) for 200A NFD.
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.

UNITS WITHOUT FACTORY-INSTALLED NON-FUSED DISCONNECT — When installing units, provide a disconnect switch per NEC (National Electrical Code) of adequate size. Disconnect sizing data is provided on the unit informative plate. Locate on unit cabinet or within sight of the unit per national or local codes. Do not cover unit informative plate if mounting the disconnect on the unit cabinet.

ALL UNITS — 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. 37 and 38 and the unit label diagram for power wiring connections to the unit power terminal blocks and equipment ground. Maximum wire size is #2 ga AWG per pole.

Provide a ground-fault and short-circuit over-current protection device (fuse or breaker) per NEC Article 440 (or local codes). Refer to unit informative data plate for MOCP (Maximum Over-current Protection) device size.

All 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.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. See Tables 26 and 27. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Tables 26 and 27 (see page 61), 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.

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

CONVENIENCE OUTLETS

⚠ WARNING

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 580J models: Non-powered and unit-powered. Both types provide a 125-volt GFCI (ground-fault circuit-interrupter) duplex receptacle rated at 15-A behind a hinged waterproof access cover, located on the end panel of the unit. See Fig. 48 and 49.

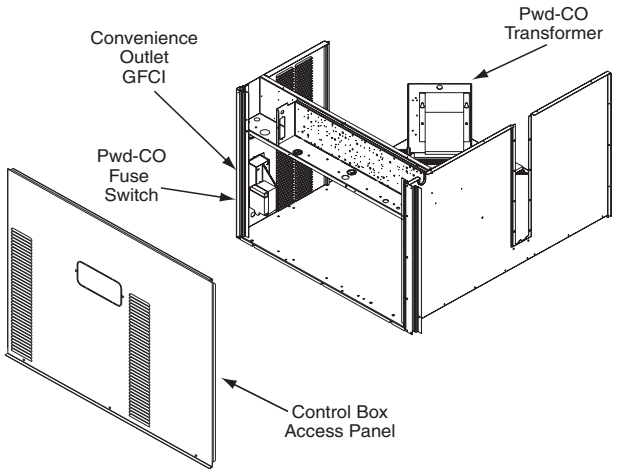


Fig. 48 — Convenience Outlet Location (Sizes 08-14)

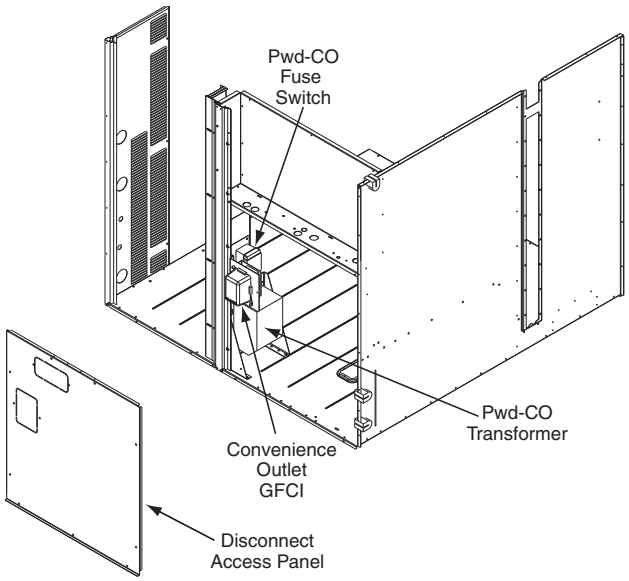


Fig. 49 — Convenience Outlet Location (Size 16)

Installing Weatherproof Cover — A weatherproof cover is now required by UL standards for the factory-installed convenience outlets. 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.

On units with electro-mechanical controls the weatherproof cover kit is shipped in the unit's control box. The kit includes the hinged cover, a backing plate and gasket. On units with a factory installed direct digital controller or RTU Open controller the weatherproof cover kit is secured to the basepan underneath the control box. See Fig. 50.

Disconnect All Power To Unit and Convenience Outlet. Lock-Out and Tag-Out All Power — Remove the blank cover plate at the convenience outlet; discard the blank cover.

Loosen the two screws at the GFCI duplex outlet, until approximately $^1/_2$ in. (13 mm) under screw heads are exposed. Press the gasket over the screw heads. Slip the backing plate over the screw heads at the keyhole slots and align with the gasket; tighten the two screws until snug (do not over-tighten).

Mount the weatherproof cover to the backing plate as shown in Fig. 50. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover. Check for full closing and latching.

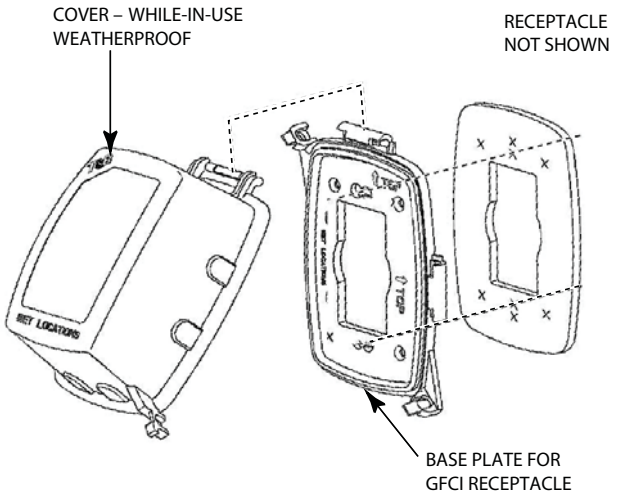
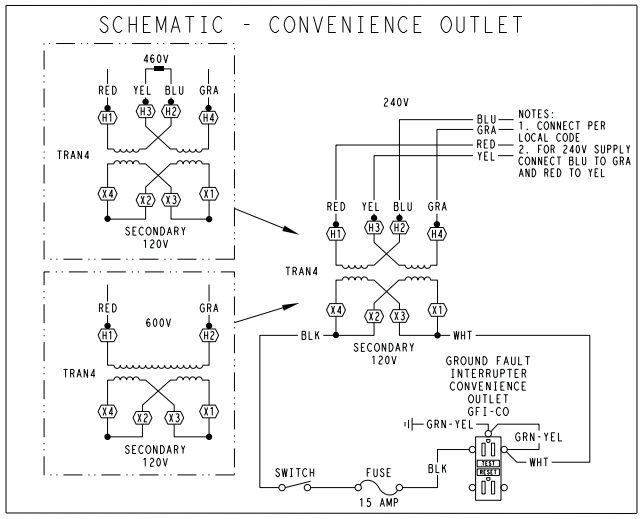


Fig. 50 — Weatherproof Cover Installation

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

Unit-powered type — A unit-mounted transformer which 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. 48 and 49.

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. 51. On a unit without a unit-mounted disconnect, connect the source leads to the main terminal block (TB1 for sizes 08-14, TB3 for size 16).



UNIT VOLTAGE	CONNECT AS	PRIMARY CONNECTIONS	TRANSFORMER TERMINALS
208, 230	240	L1: RED+YEL L2: BLU+YEL	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. 51 — Powered Convenience Outlet Wiring

On size 16 units, if the convenience outlet transformer is connected to the line side of a field disconnect, the conduit provided with the unit must be used to protect the wire as they are routed from the transformer to the field disconnect. The end of the conduit with the straight connector attaches to the field disconnect. The other end does not need to connect to the transformer; however, the conduit must be routed so that all wiring is either in the conduit or behind the access panel.

On size 16 units, if the convenience outlet transformer is connected to the line side of the factory disconnect option, route the wires through the web bushing located on the bottom of the disconnect box. For the load side wiring to the factory option disconnect, route the wires through the hole on the right side of the disconnect. Be sure to create a drip loop at least 6 in. long.

ALL UNITS — 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.

Unit-mounted convenience outlets — Outlets 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 "Fusetron" T-15, non-renewable screw-in (Edison base) type plug fuse. See Fig. 52 for maximum continuous use amp limitations.

NOTICE

Convenience Outlet Utilization

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

50HJ542739 C

Fig. 52 — Convenience Outlet Utilization Notice Label

FACTORY-OPTION THRU-BASE CONNECTIONS (ELECTRICAL CONNECTIONS) (SIZE 08-14) — 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. 26.

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 through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (through unit side panel). A hole must be field cut in the main control box bottom on the left side so the 24-v control connections can be made. Connect the control power conduit to the unit control box at this hole.

Units Without Thru-Base Connections

1. Install power wiring conduit through side panel openings. Install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 51.

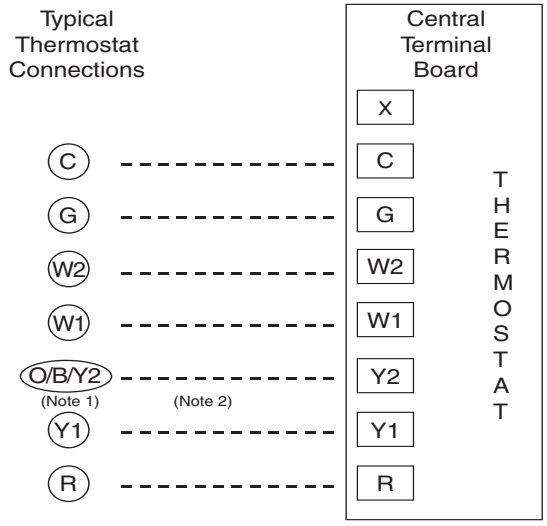
Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate. See Tables 31 and 32. On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Tables 26 and 27, note 2 (see page 61) 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 Bryant warranty.

Field Control Wiring — The 580J unit requires an external temperature control device. This device can be a thermostat emulation device provided as part of a third-party Building Management System.

Thermostat — Install a Bryant-approved accessory 2-stage thermostat according to installation instructions included with the accessory. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions.

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

For wire runs up to 50 ft. (15 m), use no. 18 AWG (American Wire Gage) insulated wire [35°C (95°F) minimum]. For 50 to 75 ft. (15 to 23 m), use no. 16 AWG insulated wire [35°C (95°F) minimum]. For over 75 ft. (23 m), use no. 14 AWG insulated wire [35°C (95°F) minimum]. All wire sizes larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.



NOTES:
1. Typical multi-function marking. Follow manufacturer's configuration instructions to select Y2. Do not configure for O output.
2. Y2 to Y2 connection required on single-stage cooling units when integrated economizer function is desired.

– – – Field-Wiring

Fig. 53 — Low-Voltage Connections

Unit Without Thru-Base Connection Kit — Pass the thermostat control wires through the hole provided in the corner post; then feed the wires through the raceway built into the corner post to the control box. Pull the wires over to the terminal strip on the upper-left corner of the Controls Connection Board. See Fig. 54.

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

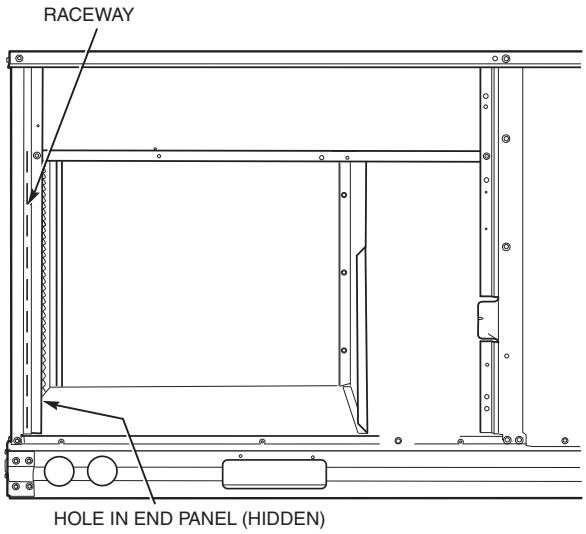


Fig. 54 — Field Control Wiring Raceway (08-14 Only)

FACTORY-OPTION THRU-BASE CONNECTIONS (ELECTRICAL CONNECTIONS) (SIZE 16) — This service connection kit consists of a 1/2 in. electrical bulkhead connector and a 1 1/2 in. electrical bulkhead connector, connected to an "L" bracket covering the embossed (raised) section of the unit basepan in the condenser section. See Fig. 55. The 1/2 in. bulkhead connector enables the low-voltage control wires to pass through the basepan. The 1 1/2 in. electrical bulkhead connector allows the high-voltage power wires to pass through the basepan.

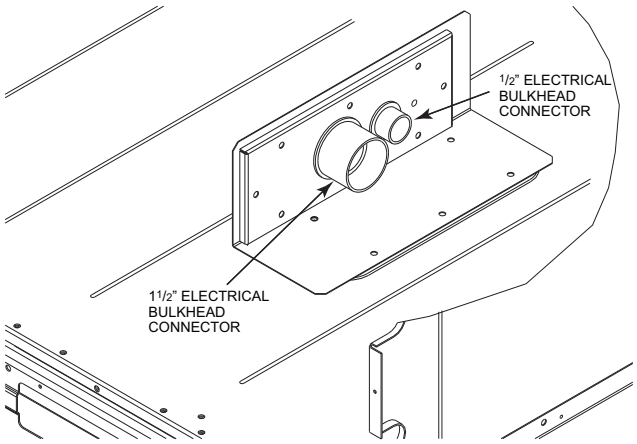


Fig. 55 — Thru-the-Base Option, Shipping Position (Size 16)

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. 56.
4. Install the connector plate assembly to the basepan using 8 of the washer head screws.

NOTE: If electrical connections are not going to occur at this time, tape or otherwise cover the fittings so that moisture does not get into the building or conduit in the interim.

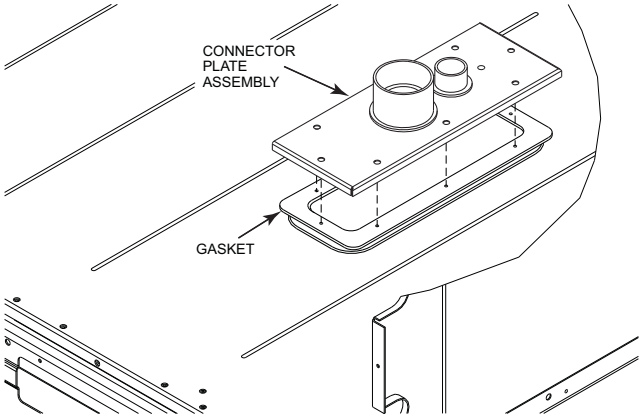


Fig. 56 — Completing Installation of Thru-the-Base Option

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 through appropriate conduits. Connect the power conduit to the internal disconnect (if unit is so equipped) or to the external disconnect (through unit side panel). A hole must be field cut in the main control box bottom on the left side so the 24-v control connections can be made. Connect the control power conduit to the unit control box at this hole.

Units Without Thru-Base Connections

1. Install power wiring conduit through side panel openings. Install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 38.

Field Control Wiring — The 580J*16 unit requires an external temperature control device. This device can be a thermostat emulation device provided as part of a third-party Building Management System.

Thermostat — Install a Bryant-approved accessory 2 stage Cooling/Heating thermostat according to installation instructions included with the accessory. If using an electronic thermostat, configure it for "non-heat pump" operation. Locate the thermostat accessory on a solid wall in the conditioned space to sense average temperature in accordance with the thermostat installation instructions.

If the thermostat contains a logic circuit requiring 24-v power, use a thermostat cable or equivalent single leads of different colors with minimum of seven leads. If the thermostat does not require a 24-v source (no "C" connection required), use a thermostat cable or equivalent with minimum of six leads. Check the thermostat installation instructions for additional features which might require additional conductors in the cable. For wire runs up to 50 ft. (15 m), use no. 18 AWG (American Wire Gage) insulated wire 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). All wire sizes larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

Unit without Thru-Base Connection Kit — Pass the thermostat control wires through the bushing on the unit end panel. Route the wire through the snap-in wire tie and up to the web bushing near the control box. Route the wire through the bushing and into the bottom left side of the control box after removing one of the two knockouts in the corner of the box. Use a connector at the control box to protect the wire as it passes into the control box. Pull the wires over to the terminal strip at the upper left corner of the Central Terminal Board (CTB). Use the connector at the control box and the wire tie to take up any slack in the thermostat wire to ensure that it will not be damaged by contact with the condenser coil. See Fig. 57.

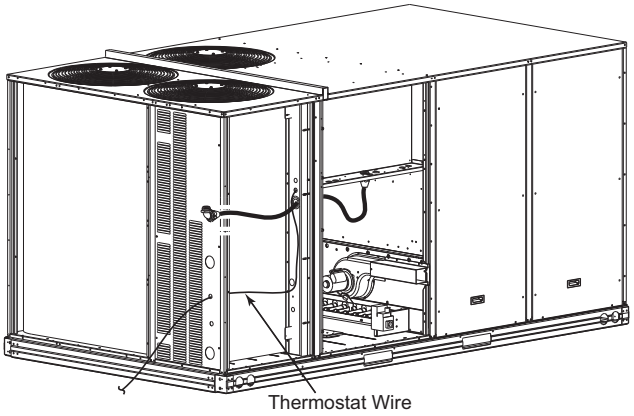


Fig. 57 — Thermostat Wire Routing

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

Heat Anticipator Settings — Set heat anticipator settings at 0.14 amp for the first stage and 0.14 amp for second-stage heating, when available.

PERFECT HUMIDITY™ CONTROL CONNECTIONS

Perfect Humidity – Space RH Controller

NOTE: Perfect Humidity is a factory installed option.

The Perfect Humidity dehumidification system requires a field-supplied and installed space relative humidity control device. This device may be a separate humidistat control (contact closes on rise in space RH above control setpoint) or a combination thermostat-humidistat control device with isolated contact set for dehumidification control, see Fig. 58 and 59. The humidistat is normally used in applications where a temperature control is already provided (such as a third-party Building Management System).

To Connect a Field-Supplied Humidistat for Sizes 08-14:

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. 54) to the 24-v 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. Use wire nuts to connect humidistat cable to two PINK leads in the low-voltage wiring as shown in Fig. 58.

To Connect a Field-Supplied Humidistat for Size 16:

1. Route the humidistat 2-conductor cable (field-supplied) through the bushing the unit's louvered end panel.
2. Route the cable through the snap-in wire tie and up to the web bushing near the control box.
3. Feed the cable through the bushing and into the bottom left side of the control box after removing one of the two knockouts in the corner of the box. Use a connector to protect the cable as it enters the control box.
4. Use the connector and the wire tie to reduce any slack in the humidistat cable to ensure that it will not be damaged by contact with the condenser coil.
5. Use wire nuts to connect humidistat cable to two PINK leads in the low-voltage wiring as shown in Fig. 59.

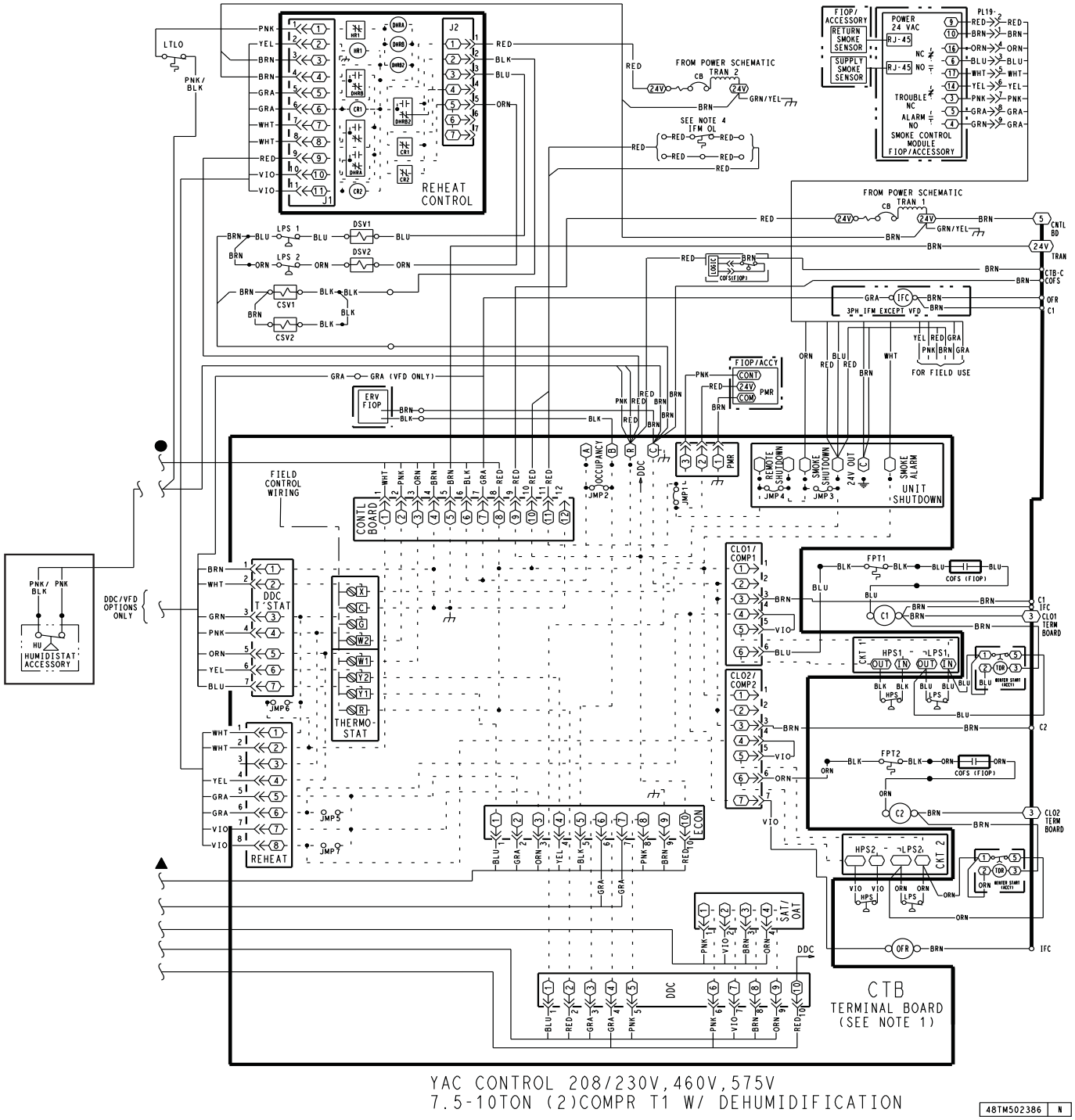


Fig. 58 — 580J*08-14, Typical Perfect Humidity™ Dehumidification System Humidistat Wiring

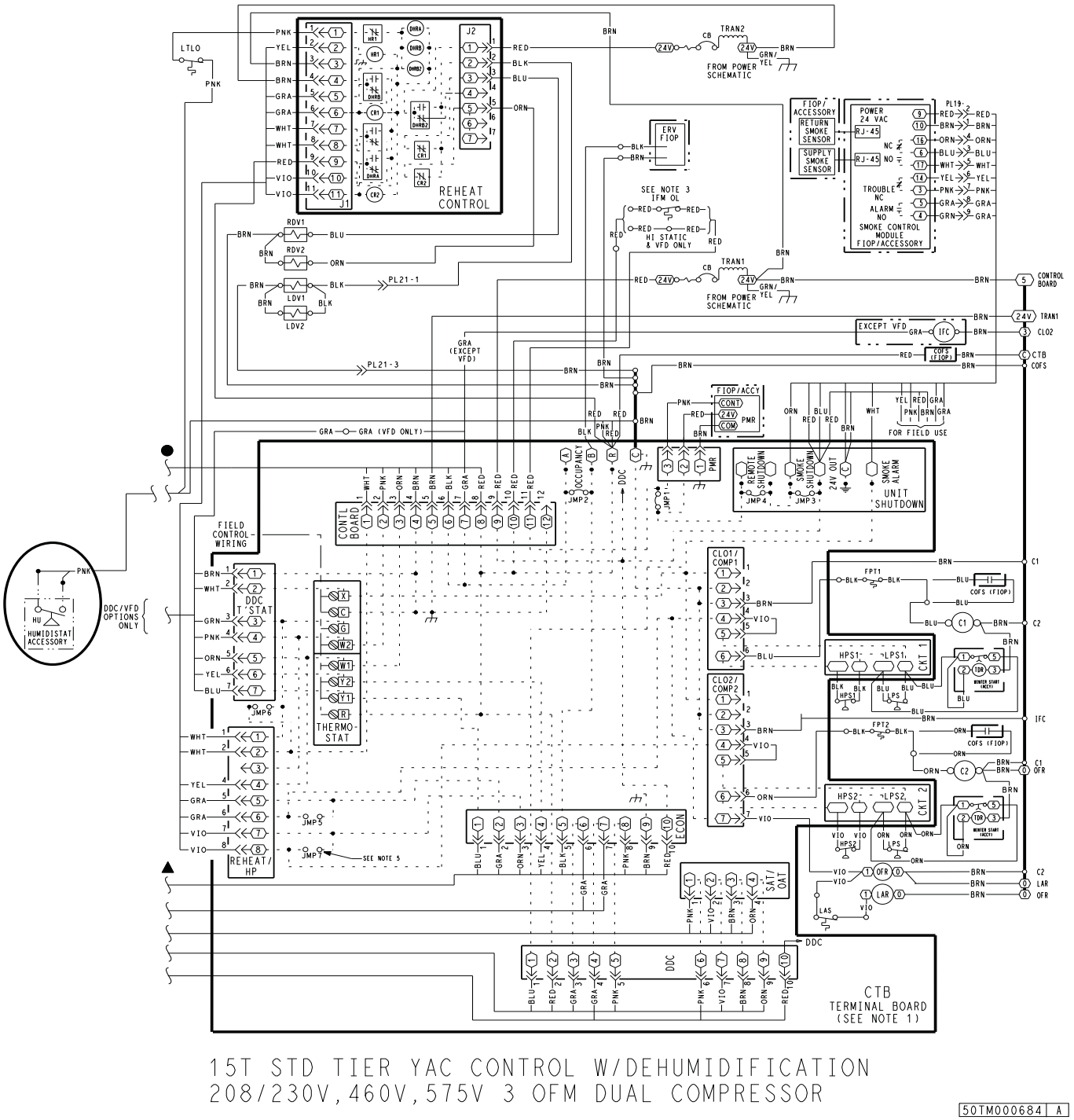


Fig. 59 — 580J*16, Typical Perfect Humidity Dehumidification System Humidistat Wiring

EconoMi$er® X (Factory-Installed Option)

PRODUCT DESCRIPTION — The EconoMi$er X system is an expandable economizer control system, which includes a W7220 economizer module (controller) with an LCD and keypad (See Fig. 60). The W7220 can be configured with optional sensors.

Fig. 60 — W7220 Economizer Module

The W7220 economizer module can be used as a standalone economizer module wired directly to a commercial setback space thermostat and sensors to provide outside air dry-bulb economizer control.

The W7220 economizer module can be connected to optional sensors for single or differential enthalpy control. The W7220 economizer module provides power and communications for the sensors.

The W7220 economizer module automatically detects sensors by polling to determine which sensors are present. If a sensor loses communications after it has been detected, the W7220 economizer controller indicates a device fail error on its LCD.

SYSTEM COMPONENTS — The EconoMi$er X system includes an economizer module, 20k mixed air sensor, damper actuator, and either a 20k outdoor air temperature sensor or S-Bus enthalpy sensors.

Economizer Module — The module is the core of the EconoMi$er X system. The module is mounted in the unit's control box, and includes the user interface for the system. The W7220 economizer module provides the basic inputs and outputs to provide simple economizer control. When used with the optional sensors, the economizer module provides more advanced economizer functionality.

S-Bus Enthalpy Control Sensors — The sensor is a combination temperature and humidity sensor which is powered by and communicates on the S-Bus. Up to three sensors may be configured with the W7220 economizer module.

CO_2 Sensor (optional) — The sensor can be added for Demand Controlled Ventilation (DCV).

SPECIFICATIONS

W7220 Economizer Module — The module is designed for use with 2 to 10 Vdc or bus communicating actuator. The module includes terminals for CO_2 sensor, Mixed Air sensor, and an Outdoor Dry Bulb sensor. Enthalpy and other options are available with bus sensors.

User Interface — Provides status for normal operation, setup parameters, checkout tests, and alarm and error conditions with a 2-line 16 character LCD display and four button keypad.

Electrical

Rated Voltage — 20 to 30 Vac RMS, 50/60 Hz

Transformer — 100 va maximum system input

Nominal Power Consumption (at 24 Vac, 60 Hz) — 11.5 VA without sensors or actuators

Relay Digital Output Rating at 30 Vac (maximum power from Class 2 input only) — 1.5A run:

3.5A inrush at 0.45PF (200,000 cycles) or

7.5A inrush at 0.45PF (100,000 cycles)

External Sensors Power Output — 21 Vdc ± 5% at 48mA

IMPORTANT: All inputs and outputs must be Class 2 wiring.

INPUTS

Sensors

NOTE: A Mixed Air (MA) analog sensor is required on all W7220 units; either an Outdoor Air (OA) sensor for dry bulb change over or an OA bus sensor for outdoor enthalpy change over is required in addition to the MA sensor. An additional Return Air (RA) bus sensor can be added to the system for differential enthalpy or dry bulb changeover. For differential dry bulb changeover a 20k ohm sensor is required in the OA and a bus sensor in the RA. DIP switch on RA bus sensor must be set in the RA position.

Dry Bulb Temperature (optional) and Mixed Air (required), 20k NTC

2-wire (18 to 22 AWG);

Temperature range -40 to 150°F (-40 to 65°C)

Temperature accuracy -0 F/+2°F

Temperature and Humidity, C7400S1000 (optional)

S-Bus; 2-wire (18 to 22 AWG)

Temperature: range -40 to 150°F (-40 to 65°C)

Temperature accuracy -0 F/+2°F

Humidity: range 0 to 100% RH with 5% accuracy.

NOTE: Up to three (3) S-Bus sensors may be connected to the W7220 economizer module. For outdoor air (OA), return air (RA) and discharge (supply) air (DA).

4 Binary Inputs — 1-wire 24 Vac + common GND.

24 Vac power supply — 20 to 30 Vac 50/60Hz; 100 VA Class 2 transformer.

OUTPUTS

Actuator Signal: 2-10 Vdc; minimum actuator impedance is 2k ohm; bus two-wire output for bus communicating actuators.

Exhaust fan, Y1, Y2 and AUX1 O:

All Relay Outputs (at 30 Vac):

Running: 1.5A maximum

Inrush: 7.5A maximum

ENVIRONMENTAL

Operating Temperature:

-40 to 150°F (-40 to 65°C).

Exception of display operation down to -4°F with full recovery at -4°F from exposure to -40°F

Storage Temperature:

-40 to 150°F (-40 to 65°C)

Shipping Temperature:

-40 to 150°F (- 40 to 65°C)

Relative Humidity:

5% to 95% RH non-condensing

ECONOMIZER MODULE WIRING DETAILS — Use Fig. 61 and Tables 8 and 9 to locate the wiring terminals for the Economizer module.

NOTE: The four terminal blocks are removable. You can slide out each terminal block, wire it, and then slide it back into place.

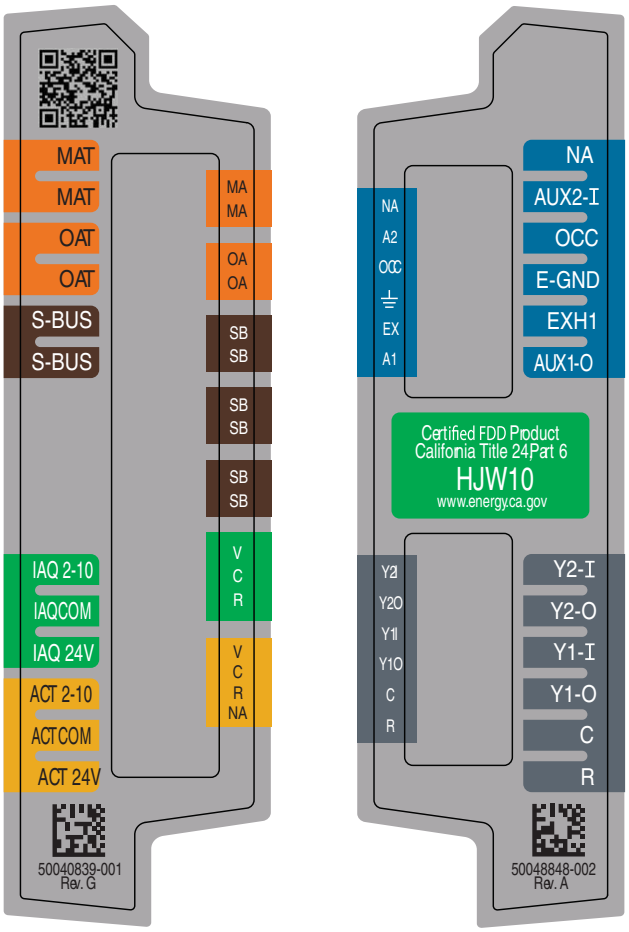


Fig. 61 — W7220 Wiring Terminals

Table 8 — Economizer Module - Left Hand Terminal Blocks

LABEL	TYPE	DESCRIPTION
Top Left Terminal Block		
MAT MAT	20k NTC and COM	Mixed Air Temperature Sensor (Polarity Insensitive Connection)
OAT OAT	20k NTC and COM	Outdoor Air Temperature Sensor (Polarity Insensitive Connection)
S-BUS S-BUS	S-BUS (Sylk Bus)	Enthalpy Control Sensor (Polarity Insensitive Connection)
Bottom Left Terminal Block		
IAQ 2-10	2-10 vdc	Air Quality Sensor Input (e.g. CO_2 sensor)
IAQ COM	COM	Air Quality Sensor Common
IAQ 24V	24 vac	Air Quality Sensor 24 vac Source
ACT 2-10	2-10 vdc	Damper Actuator Output (2-10 vdc)
ACT COM	COM	Damper Actuator Output Common
ACT 24v	24 vac	Damper Actuator 24 vac Source

Table 9 — Economizer Module - Right Hand Terminal Blocks

LABEL	TYPE	DESCRIPTION
Top Right Terminal Blocks		
AUX2 I	24 vac IN	The first terminal is not used.
OCC	24 vac IN	Shut Down (SD) or HEAT (W) Conventional only and Heat Pump Changeover (O-B) in Heat Pump mode.
E-GND	E-GND	Occupied/Unoccupied Input
EXH1	24 vac OUT	Exhaust Fan 1 Output
AUX1 O	24 vac OUT	Programmable: Exhaust fan 2 output or ERV or System alarm output
Bottom Right Terminal Blocks		
Y2-I	24 vac IN	Y2 in - Cooling Stage 2 Input from space thermostat
Y2-O	24 vac OUT	Y2 out - Cooling Stage 2 Output to stage 2 mechanical cooling
Y1-I	24 vac IN	Y1 in - Cooling Stage 2 Input from space thermostat
Y1-O	24 vac OUT	Y1 out - Cooling Stage 2 Output to stage 2 mechanical cooling
C	COM	24 vac Common
R	24 vac	24 vac Power (hot)

S-BUS SENSOR WIRING — The labels on the sensors and controller are color coded for ease of installation. Orange labeled sensors can only be wired to orange terminals on the controller. Brown labeled sensors can only be wired to S-bus (brown) terminals. Use Fig. 62 and Table 10 to locate the wiring terminals for each S-Bus sensor.

Use Fig. 62 and Table 10 to locate the wiring terminals for each enthalpy control sensor.

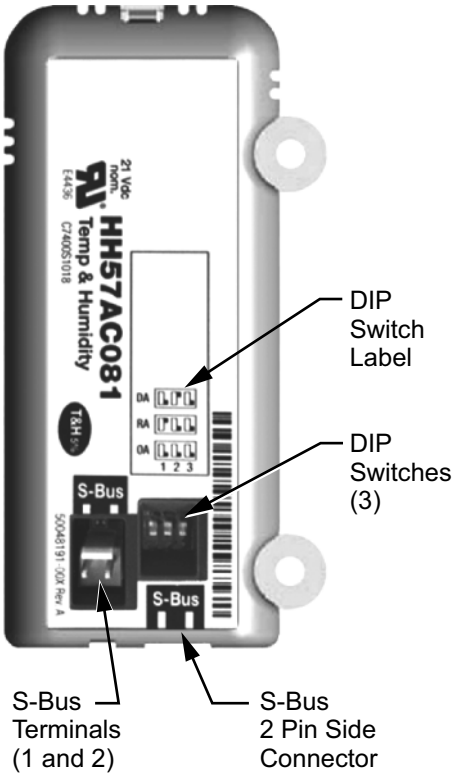


Fig. 62 — S-Bus Sensor DIP Switches

Table 10 — HH57AC081 Sensor Wiring Terminations

TERMINAL		TYPE	DESCRIPTION
NUMBER	LABEL		
1	S-BUS	S-BUS	S-BUS Communications (Enthalpy Control Sensor Bus)
2	S-BUS	S-BUS	S-BUS Communications (Enthalpy Control Sensor Bus)

Use Fig. 62 and Table 11 to set the DIP switches for the desired use of the sensor.

Table 11 — HH57AC081 Sensor DIP Switch

USE	DIP SWITCH POSITIONS FOR SWITCHES 1, 2, AND 3		
	1	2	3
DA	OFF	ON	OFF
RA	ON	OFF	OFF
OA	OFF	OFF	OFF

NOTE: When a S-Bus sensor is connected to an existing network, it will take 60 minutes for the network to recognize and auto-configure itself to use the new sensor.

During the 60 minute setup period, no alarms for sensor failures (except SAT) will be issued and no economizing function will be available.

CO_2 SENSOR WIRING — When using a CO_2 sensor the black and brown common wires are internally connected and only one is connected to "IAQ COM" on the W7220. Use the power from the W7220 to power the CO_2 sensor OR make sure the ground for the power supplies are common. See Fig. 63 for CO_2 sensor wiring.

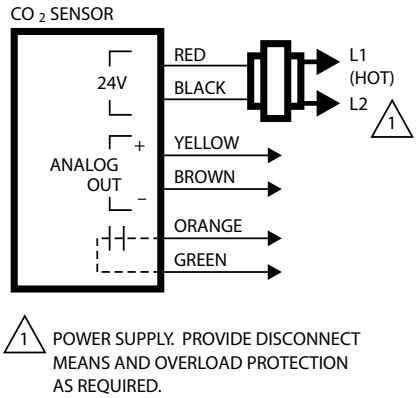


Fig. 63 — CO_2 Sensor Wiring

INTERFACE OVERVIEW — This section describes how to use the Economizer's user interface for:

- Keypad and menu navigation
- Settings and parameter changes
- Menu structure and selection

USER INTERFACE — The user interface consists of a 2-line LCD display and a 4-button keypad on the front of the economizer controller.

KEYPAD — The four navigation buttons (see Fig. 64) are used to scroll through the menus and menu items, select menu items, and to change parameter and configuration settings.

To use the keypad when working with menus:

- Press the ▲ (Up arrow) button to move to the previous menu.
- Press the ▼ (Down arrow) button to move to the next menu.
- Press the (Enter) button to display the first item in the currently displayed menu.

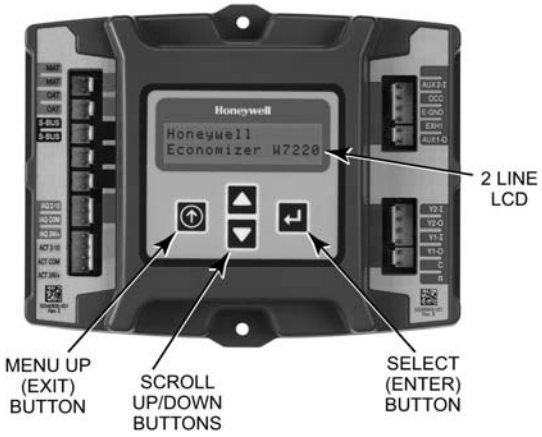


Fig. 64 — W7220 Controller Navigation Buttons

Press the (Menu Up/Exit) button to exit a menu's item and return to the list of menusTo use the keypad when working with Setpoints, System and Advanced Settings, Checkout tests and Alarms:

1. Navigate to the desired menu.
2. Press the (Enter) button to display the first item in the currently displayed menu.
3. Use the ▲ and ▼ buttons to scroll to the desired parameter.
4. Press the (Enter) button to display the value of the currently displayed item.
5. Press the ▲ button to increase (change) the displayed parameter value.
6. Press the ▼ button to decrease (change) the displayed parameter value.

NOTE: When values are displayed, pressing and holding the or button causes the display to automatically increment.

7. Press the (Enter) button to accept the displayed value and store it in nonvolatile RAM.
8. "CHANGE STORED" displays.
9. Press the (Enter) button to return to the current menu parameter.
10. Press the (Menu Up/Exit) button to return to the previous menu.

MENU STRUCTURE — Table 12 illustrates the complete hierarchy of menus and parameters for the EconoMi$er® X system.

The Menus in display order are:

- STATUS
- SETPOINTS
- SYSTEM SETUP
- ADVANCED SETUP
- CHECKOUT
- ALARMS

IMPORTANT: Table 12 illustrates the complete hierarchy. Your menu parameters may be different depending on your configuration.

For example if you do not have a DCV (CO_2) sensor, then none of the DCV parameters appear and only MIN POS will display. If you have a CO_2 sensor, the DCV MIN and DCV MAX will appear AND if you have 2 speed fan DCV MIN (high and low speed) and DCV MAX (high and low speed will appear).

NOTE: Some parameters in the menus use the letters MA or MAT, indicating a mixed air temperature sensor location before the cooling coil. This unit application has the control sensor located after the cooling coil, in the fan section, where it is designated as (Cooling) Supply Air Temperature or SAT sensor.

SETUP AND CONFIGURATION — Before being placed into service, the W7220 Economizer module must be setup and configured for the installed system.

IMPORTANT: During setup, the economizer module is live at all times.

The setup process uses a hierarchical menu structure that is easy to use. Press the ▲ and ▼ arrow buttons to move forward and backward through the menus and press the button to select and confirm setup item changes.

TIME-OUT AND SCREENSAVER — When no buttons have been pressed for 10 minutes, the LCD displays a screen saver, which cycles through the Status items. Each Status items displays in turn and cycles to the next item after 5 seconds.

Table 12 — Menu Structure

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT	NOTES
STATUS	ECONO AVAIL	NO	YES/NO	FIRST STAGE COOLING DEMAND (Y1–IN) YES = economizing available; the system can use outside air for free cooling when required
	ECONOMIZING	NO	YES/NO	FIRST STAGE COOLING RELAY OUTPUT YES = outside air being used for 1 stage cooling
	OCCUPIED	NO	YES/NO	OCCUPIED YES = OCC signal received from space thermostat or unitary controller YES = 24 Vac on terminal OCC NO = 0 Vac on terminal OCC
	HEAT PUMP	N/A	COOL HEAT	HEAT PUMP MODE Displays COOL or HEAT when system is set to heat pump (Non-conventional)
	COOL Y1—IN	OFF	ON/OFF	FIRST STAGE COOLING DEMAND (Y1-IN) Y1–I signal from space thermostat or unitary controller for cooling stage 1. ON = 24 Vac on terminal Y1–I OFF = 0 Vac on terminal Y1–I
	COOL Y1—OUT	OFF	ON/OFF	FIRST STAGE COOLING RELAY OUTPUT Cool stage 1 Relay Output to stage 1 mechanical cooling (Y1–OUT terminal)
	COOL Y2—IN	OFF	ON/OFF	SECOND STAGE COOLING DEMAND (Y2–IN) Y2–I signal from space thermostat our unitary controller for second stage cooling. ON = 24 Vac on terminal Y2–I OFF = 0 Vac on terminal Y2–I
	COOL Y2—OUT	OFF	ON/OFF	SECOND STAGE COOLING RELAY OUTPUT Cool Stage 2 Relay Output to mechanical cooling (Y2–OUT terminal)
	MA TEMP	_ _ . _ F	0 to 140°F	SUPPLY AIR TEMPERATURE, Cooling Mode Displays value of measured mixed air from MAT sensor. Displays _ _ . _ F if not connected, short or out-of-range.
	DA TEMP	_ _ . _ F	0 to 140°F	DISCHARGE AIR TEMPERATURE, after Heating section Displays when Discharge Air sensor is connected and displays measured discharge temperature. Displays _ _ . _ F if sensor sends invalid value, if not connected, short or out-of-range.
	OA TEMP	_ _ . _ F	-40 to 140°F	OUTSIDE AIR TEMP Displays measured value of outdoor air temperature. Displays _ _ . _ F if sensor sends invalid value, short or out-of-range.
	OA HUM	_ _ %	0 to 100%	OUTSIDE AIR RELATIVE HUMIDITY Displays measured value of outdoor humidity from OA sensor. Displays _ _% if not connected short, or out-of-range.
	RA TEMP	_ _ . _ F	0 to 140°F	RETURN AIR TEMPERATURE Displays measured value of return air temperature from RAT sensor. Displays _ _ . _ F if sensor sends invalid value, if not connected, short or out-of-range
	RA HUM	_ _ %	0 to 100%	RETURN AIR RELATIVE HUMIDITY Displays measured value of return air humidity from RA sensor. Displays _ _% if sensor sends invalid value, if not connected, short or out-of-range
	IN CO2	_ _ _ ppm	0 TO 2000 ppm	SPACE/RETURN AIR CO_2 Displays value of measured CO_2 from CO_2 sensor. Invalid if not connected, short or out-of-range
	DCV STATUS	N/A	ON/OFF	DEMAND CONTROLLED VENTILATION STATUS Displays ON if above setpoint and OFF if below setpoint, and ONLY if a CO_2 sensor is connected.
	DAMPER OUT	2.0v	2.0 TO 10.0v	Displays voltage output to the damper actuator.
	ACT POS	N/A	0 to 100%	Displays actual position of outdoor air damper actuator

Table 12 — Menu Structure (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT	NOTES
STATUS (CONT)	ACT COUNT	N/A	1 to 65535	Displays number of times actuator has cycled. 1 cycles equals 180 deg. of actuator movement in any direction.
	ACTUATOR	N/A	OK/Alarm (on Alarm menu)	Displays ERROR if voltage or torque is below actuator range.
	EXH1 OUT	OFF	ON/OFF	EXHAUST STAGE 1 RELAY OUTPUT Output of EXH1 terminal: ON = relay closed OFF = relay open
	EXH2 OUT	OFF	ON/OFF	EXHAUST STAGE 2 RELAY OUTPUT Output of AUX terminal; displays only if AUX = EXH2
	ERV	OFF	ON/OFF	ENERGY RECOVERY VENTILATOR Output of AUX terminal; displays only if AUX = ERV
	MECH COOL ON or HEAT STAGES ON	0	0, 1, or 2	Displays stage of mechanical cooling that is active. Displays the stage of heat pump heating that is active.
	FAN SPEED	N/A	LOW or HIGH	SUPPLY FAN SPEED Displays speed setting of fan on a 2-speed fan unit.
	W (HEAT ON)	N/A	ON/OFF	HEAT DEMAND STATUS Displays status of heat demand on a 2-speed fan unit.
SETPOINTS	MAT SET	53°F	38 to 65°F; increment by 1	SUPPLY AIR SETPOINT Setpoint determines where the economizer will modulate the OA damper to maintain the mixed air temperature.
	LOW T LOCK	32°F	-45 to 80°F; increment by 1	COMPRESSOR LOW TEMPERATURE LOCKOUT Setpoint determines outdoor temperature when the mechanical cooling cannot be turned on. Commonly referred to as the Compressor lockout.
	DRYBLB SET	63°F	48 to 80°F; increment by 1	OA DRY BULB TEMPERATURE CHANGEOVER SETPOINT Setpoint determines where the economizer will assume outdoor air temperature is good for free cooling; e.g.; at 63°F unit will economize at 62°F and below and not economize at 64°F and above. There is a 2°F deadband.
	ENTH CURVE	ES3	ES1,ES2,ES3,ES4, or ES5	ENTHALPY CHANGEOVER CURVE Enthalpy boundary “curves” for economizing using single enthalpy.
	DCV SET	1100ppm	500 to 2000ppm; increment by 100	DEMAND CONTROLLED VENTILATION Displays only if CO_2 sensor is connected. Setpoint for Demand Control Ventilation of space. Above the setpoint, the OA dampers will modulate open to bring in additional OA to maintain a space ppm level below the setpoint.
	MIN POS	2.8 V	2 to 10 Vdc	VENTILATION MINIMUM POSITION Displays ONLY if a CO_2 sensor is NOT connected.
	VENTMAX With 2-speed fan units VENTMAX L (low speed fan) and VENTMAX H (high speed fan) settings are required	2.8 V	2 to 10 Vdc	DCV MAXIMUM DAMPER POSITION Displays only if a CO_2 sensor is connected. Used for Vbz (ventilation max cfm) setpoint. Displays 2 to 10 V if <3 sensors (RA,OA, and MA). In AUTO mode dampers controlled by CFM.
			100 to 9990 cfm; increment by 10	If OA, MA, RA, and CO_2 sensors are connected and DCV CAL ENABLE is set to AUTO mode, the OA dampers are controlled by CFM and displays from 100 to 9990 CFM.
			2 to 10 Vdc	With 2-speed fan units VENT L (low speed fan) and MIN POS H (high speed fan) settings are required. Default for VENTMAX L is 3.2V and VENTMAX H is 2.8V
	VENTMIN With 2-speed fan units VENTMIN L (low speed fan) and VENTMIN H (high speed fan) set	2.25 V	2 to 10 Vdc or 100 to 9990 cfm increment by 10	DCV MINIMUM DAMPER POSITION Displays only if a CO_2 sensor is connected. Used for Ba (ventilation min cfm) setpoint. Displays 2 to 10 V if <3 sensors (RA, OA, and MA). Va is only set if DCV is used. This is the ventilation for less than maximum occupancy of the space. In AUTO mode dampers controlled by CFM.
			100 to 9990 cfm; increment by 10	If OA, MA, RA, and CO_2 sensors are connected and DCV CAL ENABLE is set to AUTO mode, the OA dampers are controlled by CFM and displays from 100 to 9990 CFM.
			2 to 10 Vdc	With 2-speed fan units VENTMIN L (low speed fan) and MIN POS H (high speed fan) settings are required. Default for VENTMIN L is 3.2V and VENTMIN H is 2.8V
	ERV OAT SP	32°F	0 to 50°F; increment by 1	ENERGY RECOVERY VENTILATOR UNIT OUTDOOR AIR TEMPERATURE SETPOINT Only when AUX1 O = ERV
	EXH1 SET With 2-speed fan units Exh1 L (low speed fan) and Exh1 H (high speed fan) settings are required	50%	0 to 100%;increment by 1	EXHAUST FAN STAGE 1 SETPOINT Setpoint for OA damper position when exhaust fan 1 is powered by the economizer. With 2-speed fan units Exh1 L (low speed fan) and Exh1 H (high speed fan) settings are required. Default for Exh1 L is 65% and Exh1 H is 50%
	EXH2 SET With 2-speed fan units Exh2 L (low speed fan) and Exh2 H (high speed fan) settings are required	75%	0 to 100%; increment by 1	EXHAUST FAN STAGE 2 SETPOINT Setpoint for OA damper position when exhaust fan 2 is powered by the economizer. Only used when AUX1 O is set to EHX2. With 2-speed fan units Exh2 L (low speed fan) and Exh2 H (high speed fan) settings are required. Default for Exh2 L is 80% and Exh2 H is 75%

Table 12 — Menu Structure (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT	NOTES
SYSTEM SETUP	INSTALL	01/01/10	N/A	Display order = MM/DD/YY Setting order = DD, MM, then YY.
	UNITS DEG	F	F or C	Sets economizer controller in degrees Fahrenheit or Celsius
	EQUIPMENT	CONV	Conventional or HP	CONV = conventional; HP O/B = Enable Heat Pump mode. Use AUX2 I for Heat Pump input from thermostat or controller. See Menu Note 7.
	AUX2 IN	W	SD/W or HP(O)/ HP(B)	In CONV mode: SD + Enables configuration of shutdown (default); W = Informs controller that system is in heating mode. NOTE: If using 2-speed fan mode, you must program CONV mode for W. Shutdown is not available in 2-speed fan mode. See Menu Note 7. In HP O/B mode: HP(O) = energize heat pump on Cool (default); HP(B) = energize heat pump on heat.
	FAN SPEED	2 speed	1 speed/2 speed	Sets the economizer controller for operation of 1 speed or 2 speed supply fan. NOTE: 2-speed fan option also needs Heat (W1) programmed in AUX 2 In. See Menu Note 7.
	FAN CFM	5000cfm	100 to 15000 cfm; increment by 100	UNIT DESIGN AIRFLOW (CFM) Enter only if using DCVAL ENA = AUTO The value is found on the nameplate label for the specific unit.
	AUX1 OUT	NONE	NONE ERV EXH2 SYS	Select OUTPUT for AUX1 O relay • NONE = not configured (output is not used) • ERV = Energy Recovery Ventilator • EXH2 = second damper position relay closure for second exhaust fan • SYS = use output as an alarm signal
	OCC	INPUT	INPUT or ALWAYS	OCCUPIED MODE BY EXTERNAL SIGNAL When using a setback thermostat with occupancy out (24 vac), the 24 vac is input “INPUT” to the OCC terminal. If no occupancy output from the thermostat then change program to “ALWAYS” OR add a jumper from terminal R to OCC terminal.
	FACTORY DEFAULT	NO	NO or YES	Resets all set points to factory defaults when set to YES. LCD will briefly flash YES and change to NO but all parameters will change to the factory default values. NOTE: RECHECK AUX2 IN and FANTYPE for required 2-speed values.
ADVANCED SETUP	MA LO SET	45°F	35 to 55°F; Incremented by 10	SUPPLY AIR TEMPERATURE LOW LIMIT Temperature to achieve Freeze Protection (close damper and alarm if temperature falls below setup value).
	FREEZE POS	CLO	CLO or MIN	FREEZE PROTECTION DAMPER POSITION Damper position when freeze protection is active (closed or MIN POS).
	CO2 ZERO	0ppm	0 to 500 ppm; Increment by 10	CO_2 ppm level to match CO_2 sensor start level.
	CO2 SPAN	2000ppm	1000 to 3000 ppm; Increment by 10	CO_2 ppm span to match CO_2 sensor.
	STG3 DLY	2.0h	0 min, 5 min, 15 min, then 15 min intervals. Up to 4 hrs or OFF	COOLING STAGE 3 DELAY Delay after stage 2 cool has been active. Turns on 2nd stage of cooling when economizer is 1st stage and mechanical cooling is 2nd stage. Allows three stages of cooling, 1 economizer and 2 mechanical. OFF = no Stage 3 cooling
	SD DMPR POS	CLO	CLO or OPN	Indicates shutdown signal from space thermostat or unitary controller. When controller receives 24 Vac input on the SD terminal in conventional mode, the OA damper will open if programmed for OPN and OA damper will close if programmed for CLO. All other controls, e.g., fans, etc. will shut off.
	DA LO ALM	45°F (7°C)	35 to 65°F; (2 to 18°C) Incremented by 5 deg.	Used for alarm for when the DA air temperature is too low. Set lower range of alarm, below this temperature the alarm will show on the display.
	DA HI ALM	80°F (27°C)	70 to 180°F; (21 to 82°C) Incremented by 5 deg.	Used for alarm for when the DA air temperature is too high. Set upper range of alarm, above this temperature the alarm will show on the display.
	DCVCAL ENA	MAN	MAN (manual) AUTO	Turns on the DCV automatic control of the dampers. Resets ventilation based on the RA, OA, and MA sensor conditions. Requires all 3 RA, OA, and MA sensors.

Table 12 — Menu Structure (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT	NOTES
ADVANCED SETUP (CONT)	MAT T CAL	0.0°F	±2.5°F	SUPPLY AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration temperature sensor.
	OAS T CAL	0.0°F	±2.5°F	OUTSIDE AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration temperature sensor.
	OA H CAL	0% RH	±10% RH	OUTSIDE AIR HUMIDITY CALIBRATION Allows for operator to adjust for an out of calibration humidity sensor.
	RA T CAL	0.0°F	±2.5°F	RETURN AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration temperature sensor.
	RA H CAL	0% RH	±10% RH	RETURN AIR HUMIDITY CALIBRATION Allows for operator to adjust for an out of calibration humidity sensor.
	DA T CAL	0.0°F	±2.5°F	DISCHARGE AIR TEMPERATURE CALIBRATION Allows for the operator to adjust for an out of calibration temperature sensor.
	2SP FAN DELAY	5 Minutes	0 to 20 minutes in 1 minute increments	TIME DELAY ON 2nd STAGE ECONOMIZING When in economizing mode this is the delay for the high speed fan to try to satisfy the call for second stage cooling before the first stage mechanical cooling is enabled.
CHECKOUT	DAMPER MINIMUM POSITION	N/A	N/A	The checkout for the damper minimum position is based on the system. See Table 13.
	DAMPER OPEN	N/A	N/A	Position damper to the full open position. Exhaust fan contacts enable during the DAMPER OPEN test. Make sure you pause in the mode to allow exhaust contacts to energize due to the delay in the system.
	DAMPER CLOSE	N/A	N/A	Positions damper to the fully closed position
	CONNECT Y1–O	N/A	N/A	Closes the Y1-O relay (Y1-O)
	CONNECT Y2–O	N/A	N/A	Closes the Y2-O relay (Y2-O)
	CONNECT AUX1-O	N/A	N/A	Energizes the AUX output. If Aux setting is: • NONE — not action taken • ERV — 24 Vac out. Turns on or signals an ERV that the conditions are not good for economizing but are for ERV operation. • SYS — 24 Vac out. Issues a system alarm
	CONNECT EXH1	N/A	N/A	Closes the power exhaust fan 2 relay (EXH1)
ALARMS	Alarms display only when they are active. The menu title “ALARMS(#)” includes the number of active alarms in parenthesis ( ). When using SYLK bus sensors, “SYLK” will appear on the screen, and when using 20k OA temperature sensors, “SENS T” will appear on the screen			
	MA T SENS ERR	N/A	N/A	SUPPLY AIR TEMPERATURE SENSOR ERROR Mixed air sensor has failed or become disconnected - check wiring then replace sensor if the alarm continues.
	CO2 SENS ERR	N/A	N/A	CO_2 SENSOR ERROR CO_2 sensor has failed, gone out of range or become disconnected - check wiring then replace sensor if the alarm continues.
	OA SYLK T ERR	N/A	N/A	OUTSIDE AIR S-BUS SENSOR ERROR Outdoor air enthalpy sensor has failed or become disconnected - check wiring then replace sensor if the alarm continues.
	OA SYLK H ERR	N/A	N/A	
	RA SYLK T ERR	N/A	N/A	RETURN AIR S-BUS SENSOR ERROR Return air enthalpy sensor has failed or become disconnected - check wiring then replace sensor if the alarm continues.
	RA SYLK H ERR	N/A	N/A	
	DA SYLK T ERR	N/A	N/A	DISCHARGE AIR S-BUS SENSOR ERROR Discharge air sensor has failed or become disconnected - check wiring then replace sensor if the alarm continues.
	OA SENS T ERR	N/A	N/A	OUTSIDE AIR TEMPERATURE SENSOR ERROR Outdoor air temperature sensor has failed or become disconnected - check wiring then replace if the alarm continues.
	ACT ERROR	N/A	N/A	ACTUATOR ERROR Actuator has failed or become disconnected - check for stall, over voltage, under voltage and actuator count. Replace actuator if damper is movable and supply voltage is between 21.6 V and 26.4 V. Check actuator count on STATUS menu.
	FREEZE ALARM	N/A	N/A	Check if outdoor temperature is below the LOW Temp Lockout on setpoint menu. Check if Mixed air temperature on STATUS menu is below the Lo Setpoint on Advanced menu. When conditions are back in normal range then the alarm will go away.

Table 12 —Menu Structure (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT	NOTES
ALARMS (CONT)	SHUTDOWN ACTIVE	N/A	N/A	AUX2 IN is programmed for SHUTDOWN and 24 V has been applied to AUX2 IN terminal.
	DMP CAL RUNNING	N/A	N/A	DAMPER CALIBRATION ROUTINE RUNNING If DCV Auto enable has been programmed, when the W7220 is completing a calibration on the dampers, this alarm will display. Wait until the calibration is completed and the alarm will go away. Must have OA, MA and RA sensors for DCV calibration; set up in the Advanced setup menu.
	DA SENS ALM	N/A	N/A	DISCHARGE AIR TEMPERATURE SENSOR ALARM Discharge air temperature is out of the range set in the ADVANCED SETUP Menu. Check the temperature of the discharge air.
	SYS ALARM	N/A	N/A	When AUX1-0 is set to SYS and there is any alarm (e.g., failed sensors, etc.), the AUX1-0 terminal has 24 Vac out.
	ACT UNDER V	N/A	N/A	ACTUATOR VOLTAGE LOW Voltage received by actuator is above expected range.
	ACT OVER V	N/A	N/A	ACTUATOR VOLTAGE HIGH Voltage received by actuator is below expected range.
	ACT STALLED	N/A	N/A	ACTUATOR STALLED Actuator stopped before achieving commanded position.

LEGEND

CLO — Compressor Lockout
ERV — Energy Recovery Ventilator
LCD — Liquid Crystal Display
MA — Mixed Air
MAT — Mixed Air Temperature
N/A — Not Applicable
OA — Outdoor Air
OAT — Outdoor Air Temperature
OCC — Occupied
RA — Return Air
RAT — Return Air Temperature
RTU — Rooftop Unit
SYS — System

NOTES:
1. Table 12 illustrates the complete hierarchy. Your menu parameters may be different depending on your configuration. For example if you do not have a DCV (CO_2) sensor, then none of the DCV parameters appear.
2. When values are displayed, pressing and holding the ▲ or ▼ button causes the display to automatically increment.
3. ERV Operation: When in cooling mode AND the conditions are NOT OK for economizing - the ERV terminal will be energized. In the Heating mode, the ERV terminal will be energized when the OA is below the ERV OAT setpoint in the setpoint menu.
4. STATUS —> OCCUPIED — The factory-standard Occupancy signal originates with a thermostat or other controller call for indoor fan operation at CTB terminal G. This signal passes through the Central Terminal Board's OCCUPIED jumper JMP1 to the ECONO connector and to the W7220's OCC input terminal. An external timeclock or relay is required to implement an Occupancy schedule on the economizer damper position.
5. STATUS —> MA TEMP, SETPOINTS —> MAT SET — The W7220 menu parameters and labels include designations MA , MAT and Mixed Air for the economizer cooling control sensor. On these rooftop units, the economizer control sensor is located downstream of the evaporator/indoor coil in the supply fan section where this sensor is designated as Supply Air Temperature (SAT) sensor.
6. SETPOINTS —> DRYBLB SET — This point is not displayed if a Return Air (differential) temperature sensor or an Outdoor Air enthalpy sensor is connected.
7. SYSTEM SETUP parameters must be configured as noted for 2-Speed unit operation:
   EQUIPMENT = CONV
   AUX2 IN = W
   FAN SPEED = 2SPEED

For damper minimum position settings and checkout menu readings, see Table 13. For dry bulb operation with a 1 speed indoor fan, with or without DCV, see Tables 14 and 15. For enthalpy operation with a 1 speed indoor fan, with or without DCV, see Tables 16 and 17. For dry bulb operation with a 2 speed indoor fan, with or without DCV, see Tables 18 and 19. For enthalpy operation with a 2 speed indoor fan, with or without DCV, see Tables 20 and 21.

Table 13 — Damper Minimum Position Settings and Readings on Checkout Menu

DEMAND CONTROLLED VENTILATION (CO_2 SENSOR)	FAN SPEED	SETPOINTS	CHECKOUT
NO	1	MIN POS	VMAX–HS
		N/A	N/A
	2	MIN POS H	VMAX–HS
		MIN POS L	VMAX–LS
YES	1	VENT MIN	VMAX–HS
		VENT MAX	VMAX–HS
	2	VENT MIN H	VMAX–HS
		VENT MAX H	VMAX–LS
		VENT MIN L	N/A
		VENT MAX L	N/A

Table 14 — Dry Bulb Operation No DCV (CO_2 Sensor) — 1 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
NONE	NO	OFF	OFF	HIGH	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	HIGH	24v/On	0v/Off	MIN POS	Closed
		ON	ON	HIGH	24v/On	24v/On	MIN POS	Closed
NONE	YES	OFF	OFF	HIGH	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	HIGH	0v/Off	0v/Off	MIN POS to Full Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	MIN POS to Full Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 15 — Dry Bulb Operation With DCV (CO_2 Sensor) — 1 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
Below CO_2 Set	No	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	HIGH	24v/On	0v/Off	VENTMIN	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN	Closed
	Yes	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	HIGH	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
Above CO_2 Set	No	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	HIGH	24v/On	0v/Off	VENTMIN to VENTMAX	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN to VENTMAX	Closed
	Yes	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	HIGH	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	VENTMIN to Full-Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 16 — Enthalpy Operation No DCV (CO_2 Sensor) — 1 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
NONE	NO	OFF	OFF	HIGH	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	HIGH	24v/On	0v/Off	MIN POS	Closed
		ON	ON	HIGH	24v/On	24v/On	MIN POS	Closed
NONE	YES	OFF	OFF	HIGH	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	HIGH	0v/Off	0v/Off	MIN POS to Full Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	MIN POS to Full Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 17 — Enthalpy Operation With DCV (CO_2 Sensor) — 1 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
Below CO_2 Set	No	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	HIGH	24v/On	0v/Off	VENTMIN	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN	Closed
	Yes	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	HIGH	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
Above CO_2 Set	No	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	HIGH	24v/On	0v/Off	VENTMIN to VENTMAX	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN to VENTMAX	Closed
	Yes	OFF	OFF	HIGH	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	HIGH	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	VENTMIN to Full-Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 18 — Dry Bulb Operation No DCV (CO_2 Sensor) — 2 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
NONE	NO	OFF	OFF	LOW	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	LOW	24v/On	0v/Off	MIN POS	Closed
		ON	ON	HIGH	24v/On	24v/On	MIN POS	Closed
NONE	YES	OFF	OFF	LOW	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	LOW	0v/Off	0v/Off	MIN POS to Full Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	MIN POS to Full Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 19 — Dry Bulb Operation With DCV (CO_2 Sensor) — 2 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
Below CO_2 Set	No	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	LOW	24v/On	0v/Off	VENTMIN	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN	Closed
	Yes	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	LOW	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
Above CO_2 Set	No	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	LOW	24v/On	0v/Off	VENTMIN to VENTMAX	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN to VENTMAX	Closed
	Yes	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	LOW	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	VENTMIN to Full-Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 20 — Enthalpy Operation No DCV (CO_2 Sensor) — 2 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
NO CO_2 SENSOR	NO	OFF	OFF	LOW	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	LOW	24v/On	0v/Off	MIN POS	Closed
		ON	ON	HIGH	24v/On	24v/On	MIN POS	Closed
	YES	OFF	OFF	LOW	0v/Off	0v/Off	MIN POS	Closed
		ON	OFF	LOW	0v/Off	0v/Off	MIN POS to Full Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	MIN POS to Full Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

Table 21 — Enthalpy Operation With DCV (CO_2 Sensor) — 2 Speed Fan

DEMAND CONTROLLED VENTILATION (DCV)	OUTSIDE AIR GOOD TO ECONOMIZE	Y1-I	Y2-I	FAN SPEED	Y1-O	Y2-O	OCCUPIED	UNOCCUPIED
Below CO_2 Set	No	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	LOW	24v/On	0v/Off	VENTMIN	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN	Closed
	Yes	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN	Closed
		ON	OFF	LOW	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
Above CO_2 Set	No	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	LOW	24v/On	0v/Off	VENTMIN to VENTMAX	Closed
		ON	ON	HIGH	24v/On	24v/On	VENTMIN to VENTMAX	Closed
	Yes	OFF	OFF	LOW	0v/Off	0v/Off	VENTMIN to VENTMAX	Closed
		ON	OFF	LOW	0v/Off	0v/Off	VENTMIN to Full-Open	Closed to Full-Open
		ON	ON	HIGH	24v/On	0v/Off*	VENTMIN to Full-Open	Closed to Full-Open

*With stage 3 delay (STG3 DLY) in Advanced setup menu can turn on second stage of mechanical cooling Y2-O after the delay if the call for Y1-I and Y2-I have not been satisfied.

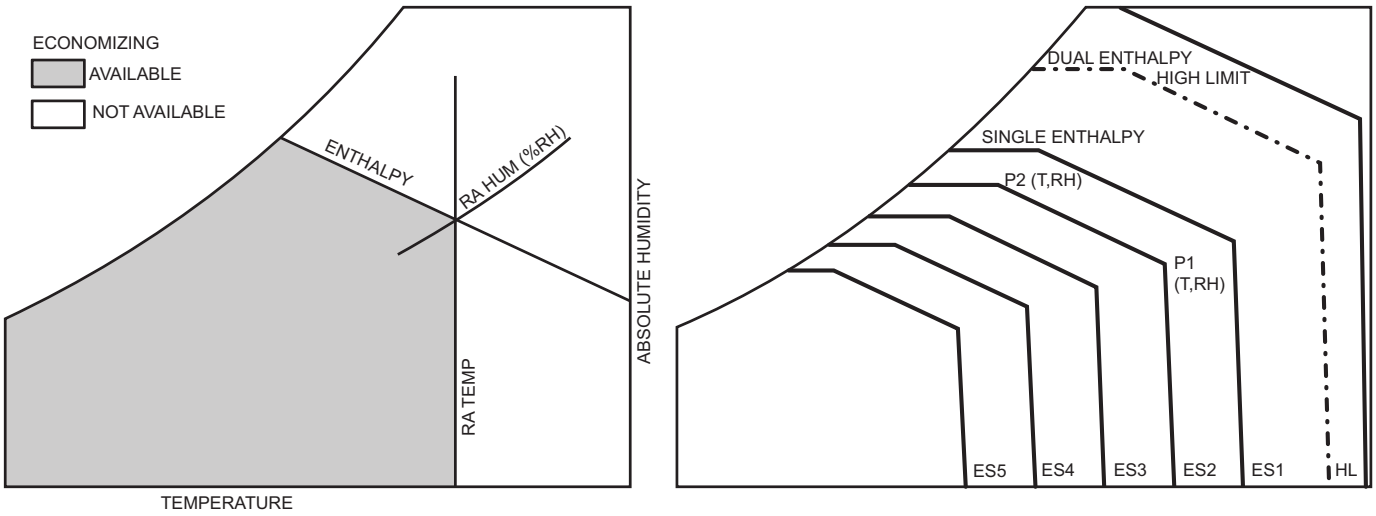


Fig. 65 — Single Enthalpy Curve Boundaries

Table 22 — Single Enthalpy and Dual Enthalpy High Limit Curves

ENTHALPY CURVE	TEMP. DRY BULB (F)	TEMP. DEWPOINT (F)	ENTHALPY (btu/lb/da)	POINT P1		POINT P2	
				TEMP. (F)	HUMIDITY (%RH)	TEMP. (F)	HUMIDITY (%RH)
ES1	80	60	28.0	80	36.8	66.3	80.1
ES2	75	57	26.0	75	39.6	63.3	80.0
ES3	70	54	24.0	70	42.3	59.7	81.4
ES4	65	51	22.0	65	44.8	55.7	84.2
ES5	60	48	20.0	60	46.9	51.3	88.5
HL	86	66	32.4	86	38.9	72.4	80.3

ENTHALPY SETTINGS — When the OA temperature, enthalpy and dew point are below the respective setpoints, the Outdoor Air can be used for economizing. Fig. 65 shows the new single enthalpy boundaries in the W7220. There are 5 boundaries (setpoints ES1 through ES5), which are defined by dry bulb temperature, enthalpy and dew point.

Refer to Table 22 for ENTH CURVE setpoint values.

The W7220 calculates the enthalpy and dew point using the OA temperature and humidity input from the OA enthalpy sensor. When the OA temperature, OA humidity and OA dew point are all below the selected boundary, the economizer sets the economizing mode to YES, economizing is available.

When all of the OA conditions are above the selected boundary, the conditions are not good to economize and the mode is set to NO.

Fig. 65 shows the 5 current boundaries. There is also a high limit boundary for differential enthalpy. The high limit boundary is ES1 when there are no stages of mechanical cooling energized and HL (high limit) when a compressor stage is energized.

Table 22 provides the values for each boundary limit.

TWO-SPEED FAN OPERATION — The W7220 controller has the capability to work with a system using a 2-speed supply fan. The W7220 does not control the supply directly but uses the following input status to determine the speed of the supply fan and controls the OA damper to the required position, see Table 23.

Table 23 — Fan Speed

STATE	FAN SPEED
OCC	Low
Y1	Low
Y2	High
W	High

The W (heating mode) is not controlled by the W7220 but it requires the status to know where to position the OA damper for minimum position for the fan speed.

The 2 speed fan delay is available when the system is programmed for 2 speed fan (in the System Setup menu item). The 2 speed fan delay is defaulted to 5 minutes and can be changed in the Advanced Setup menu item. When the unit has a call for Y1 In and in the free cooling mode and there is a call for Y2 In, the 2-speed fan delay starts and the OA damper will modulate 100% open, the supply fan should be set to high speed by the unit controller.

After the delay one of two actions will happen:

- The Y2 In call will be satisfied with the damper 100% open and fan on high speed and the call will turn off

  OR
- If the call for additional cooling in the space has not been satisfied then the first stage of mechanical cooling will be enabled through Y1 Out or Y2 Out.

CHECKOUT — Inspect all wiring connections at the economizer module's terminals, and verify compliance with the installation wiring diagrams.

For checkout, review the Status of each configured parameter and perform the Checkout tests.

NOTE: For information about menu navigation and use of the keypad see Interface Overview on page 36.

⚠WARNING

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

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

If any wiring changes are required, first be sure to remove power from the Economizer module before starting work. Pay particular attention to verifying the power connection (24 Vac).

Power Up — After the W7220 module is mounted and wired, apply power.

Initial Menu Display — On initial start up, Honeywell displays on the first line and economizer W7220 on the second line. After a brief pause, the revision of the software appears on the first line and the second line will be blank.

Power Loss (Outage or Brownout) — All setpoints and advanced settings are restored after any power loss or interruption.

NOTE: All settings are stored in non-volatile flash memory.

Status — Use the Status menu (see Table 12) to check the parameter values for the various devices and sensors configured.

NOTE: For information about menu navigation and use of the keypad see Interface Overview on page 36.

Checkout Tests — Use the Checkout menu (on page 42) to test the damper operation and any configured outputs. Only items that are configured are shown in the Checkout menu.

NOTE: For information about menu navigation and use of the keypad see Interface Overview on page 36.

To perform a Checkout test:

1. Scroll to the desired test in the Checkout menu using the ▲ and ▼ buttons.
2. Press the ↵ button to select the item.
3. RUN? appears.
4. Press the ↵ button to start the test.
5. The unit pauses and then displays IN PROGRESS.
6. When the test is complete, DONE appears.
7. When all desired parameters have been tested, press the ⓘ (Menu Up) button to end the test.

The Checkout tests can all be performed at the time of installation or at any time during the operation of the system as a test that the system is operable.

TROUBLESHOOTING

Alarms — The economizer module provides alarm messages that display on the 2-line LCD.

NOTE: Upon power up, the module waits 60 minutes before checking for alarms. This allows time for all the configured devices (e.g. sensors, actuator) to become operational. The exception is the SAT sensor which will alarm immediately.

If one or more alarms are present and there has been no keypad activity for at least 5 minutes, the Alarms menu displays and cycles through the active alarms.

You can also navigate to the Alarms menu at any time.

Clearing Alarms — Once the alarm has been identified and the cause has been removed (e.g. replaced faulty sensor) the alarm can be cleared from the display.

To clear an alarm, perform the following:

1. Navigate to the desired alarm.
2. Press the ↵ button.
3. ERASE? displays.
4. Press the ↵ button.
5. ALARM ERASED displays.
6. Press the (Menu up/Exit) button to complete the action and return to the previous menu.

NOTE: If the alarm still exists after you clear it, it is redisplayed within 5 seconds.

⚠CAUTION

Failure to follow this caution may result in damage to equipment. Be sure to allow enough time for compressor startup and shutdown between checkout tests so that you do not short-cycle the compressors.

RTU OPEN CONTROL SYSTEM — The RTU Open controller is an integrated component of the Bryant rooftop unit. Its internal application programming provides optimum performance and energy efficiency. RTU Open enables the unit to run in 100% stand-alone control mode or a Third Party Building Automation System (BAS). On-board DIP switches allow you to select your protocol (and baud rate) of choice among the four most popular protocols in use today: BACnet*, Modbus†, Johnson N2 and LonWorks** (see Fig. 66).

The RTU Open control is factory-mounted in the 580J unit's main control box, to the left of the CTB. See Fig. 67-70. Factory wiring is completed through harnesses connected to the CTB. Field connections for RTU Open sensors will be made at the Phoenix connectors on the RTU Open board. The factory-installed RTU Open control includes the supply-air temperature (SAT) sensor. The outdoor air temperature (OAT) sensor is included in the FIOP/accessory EconoMi$er2 package.

Refer to Table 24, RTU Open Controller Inputs and Outputs for locations of all connections to the RTU Open board. See Fig. 67-70 for wiring diagrams.

* BACnet is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers).

† Modbus is a registered trademark of Schneider Electric.

** LonWorks is a registered trademark of Echelon Corporation.

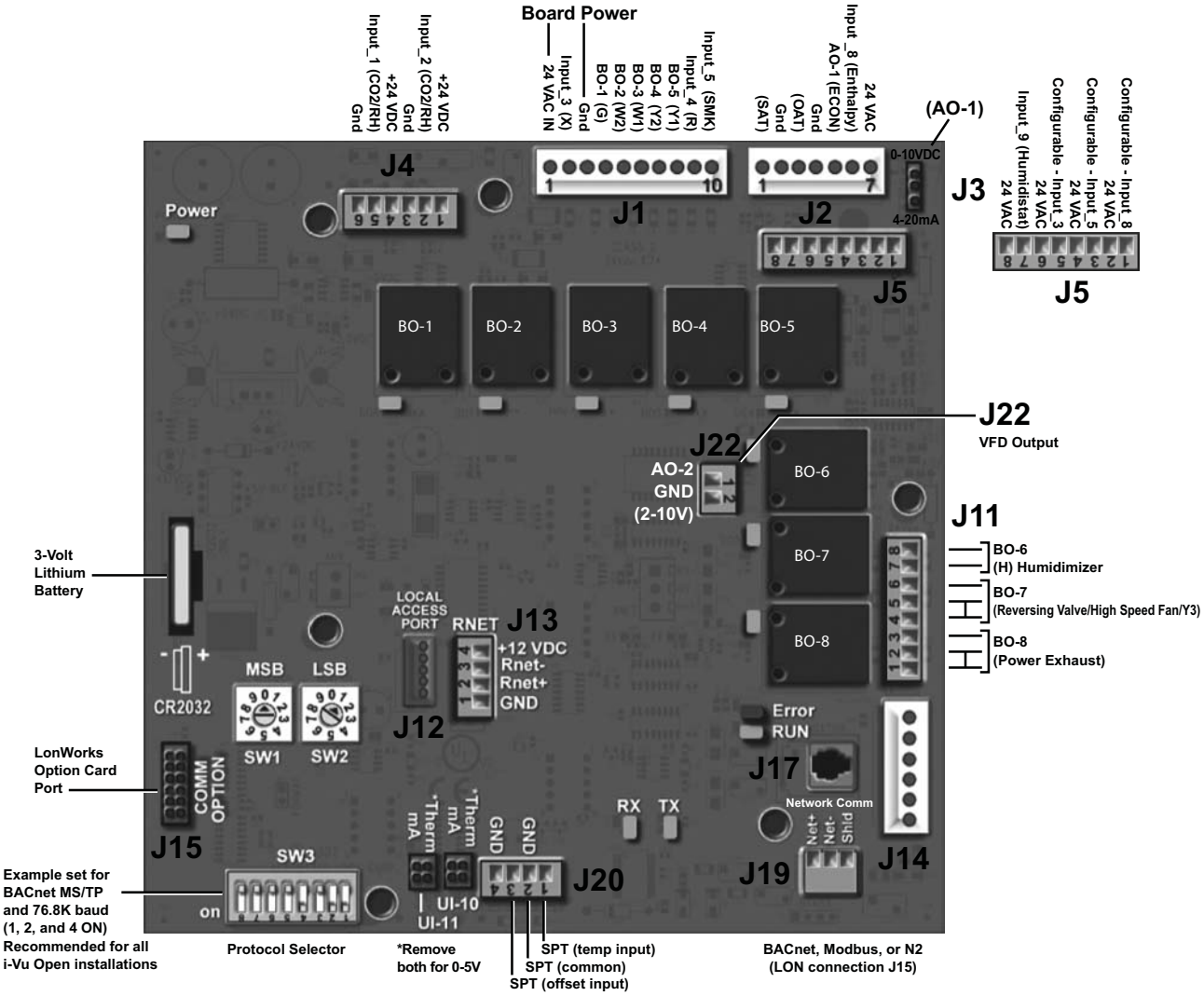


Fig. 66 — RTU Open Multi-Protocol Control Board

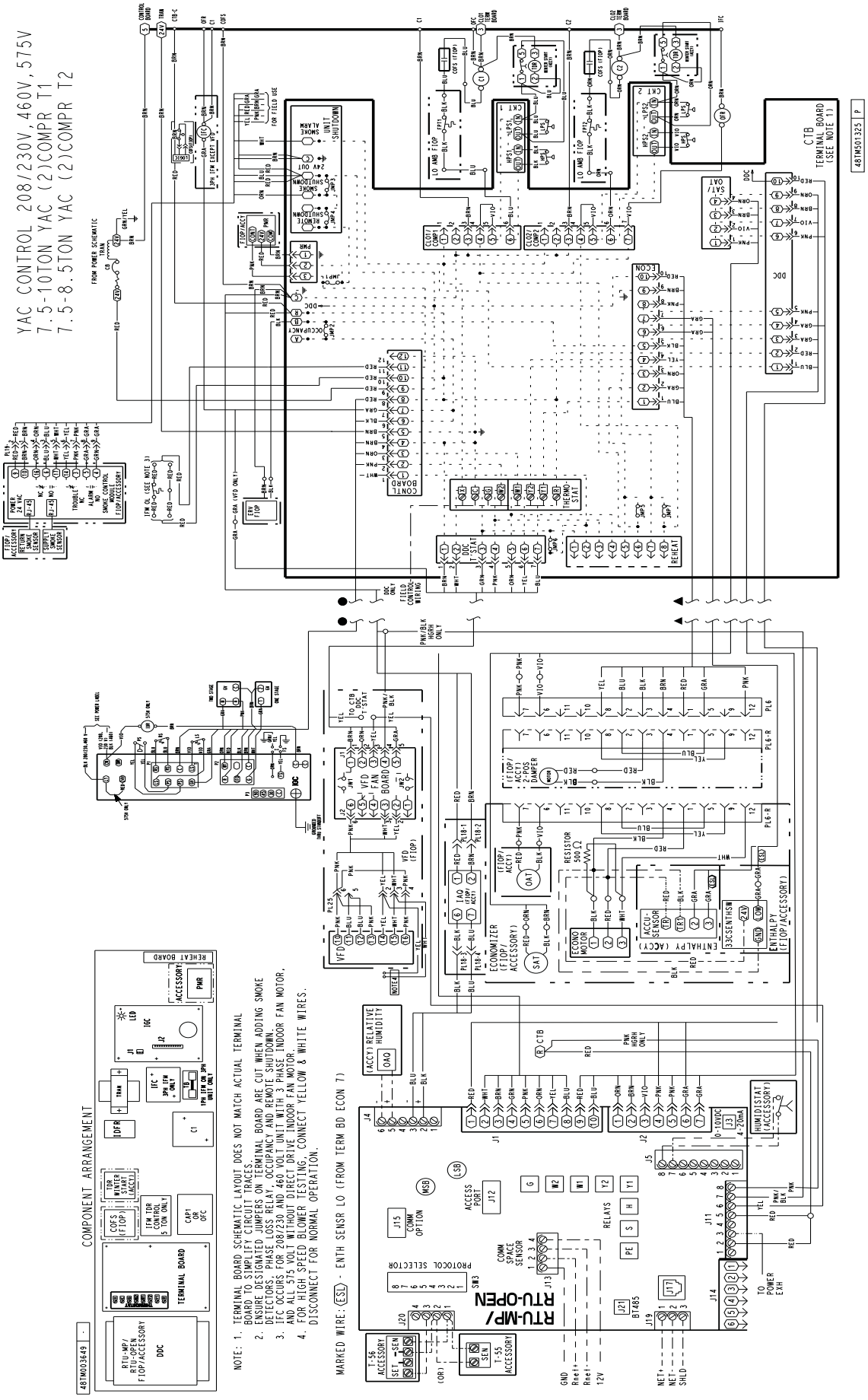


Fig. 67 — 580J*08-14, Typical RTU Open System Control Wiring Diagram

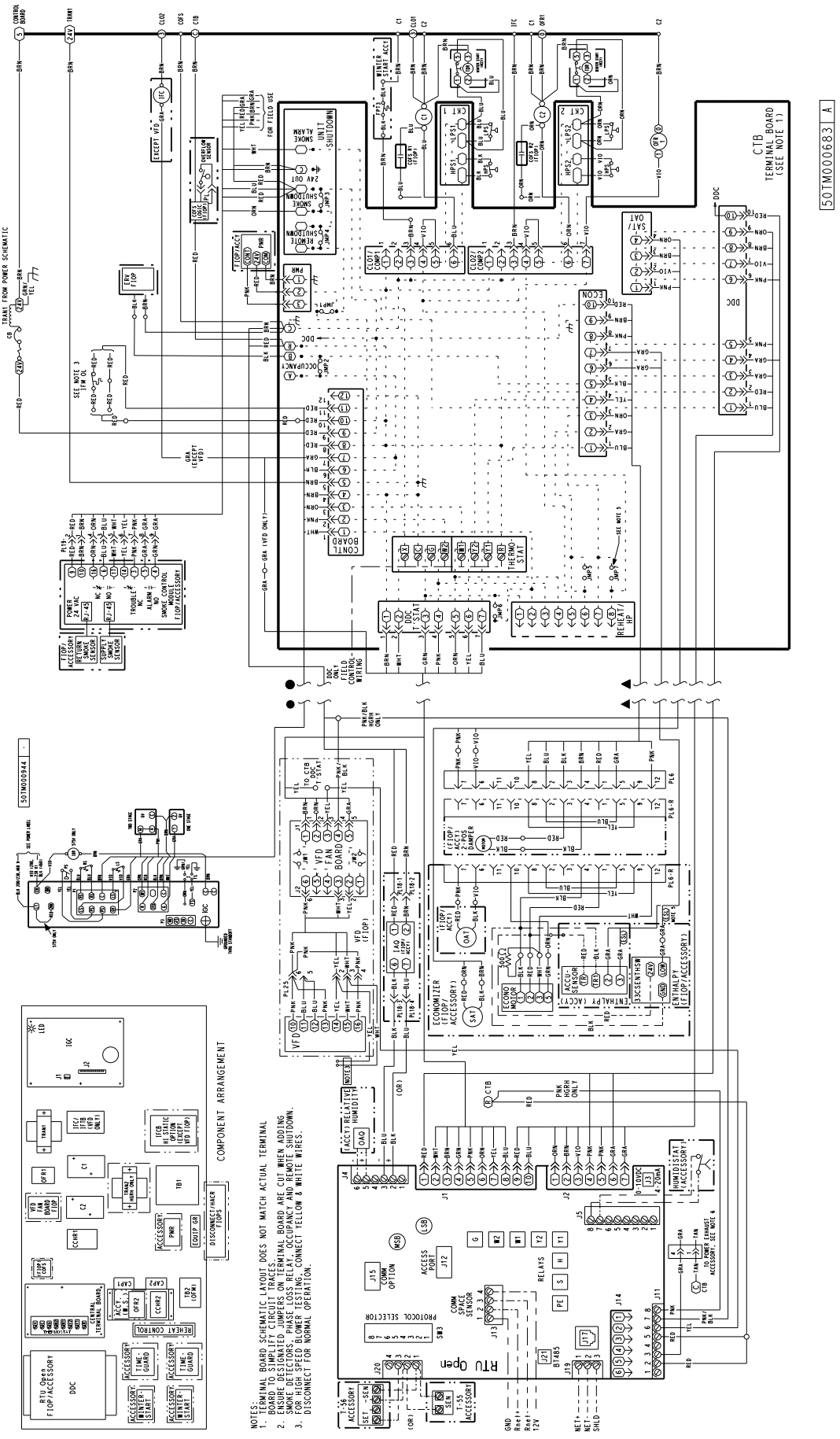


Fig. 68 — 580J*16, Typical RTU Open System Control Wiring Diagram

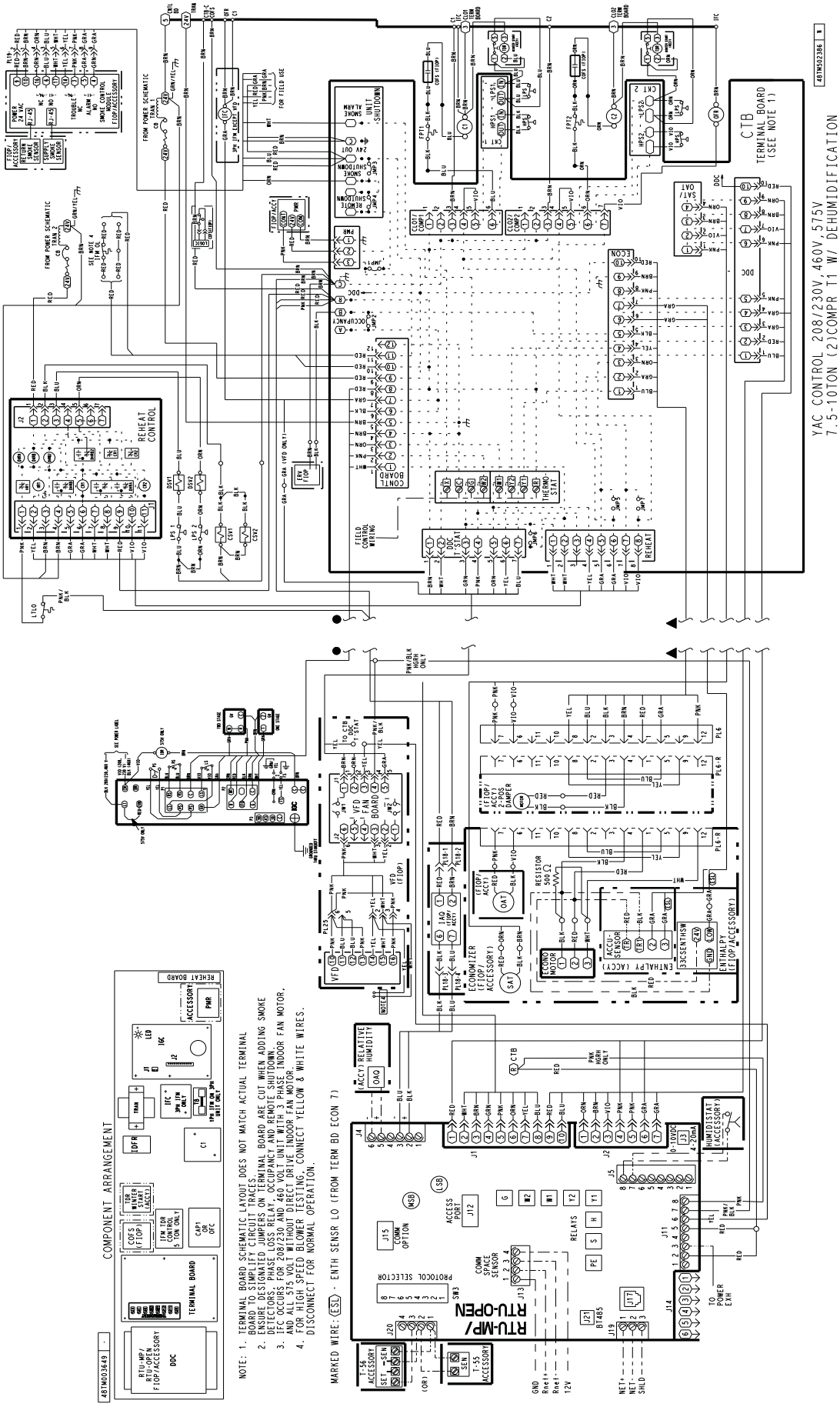


Fig. 69 — 580J*8-14, Typical RTU Open System Control Wiring Diagram with Perfect Humidity™ System

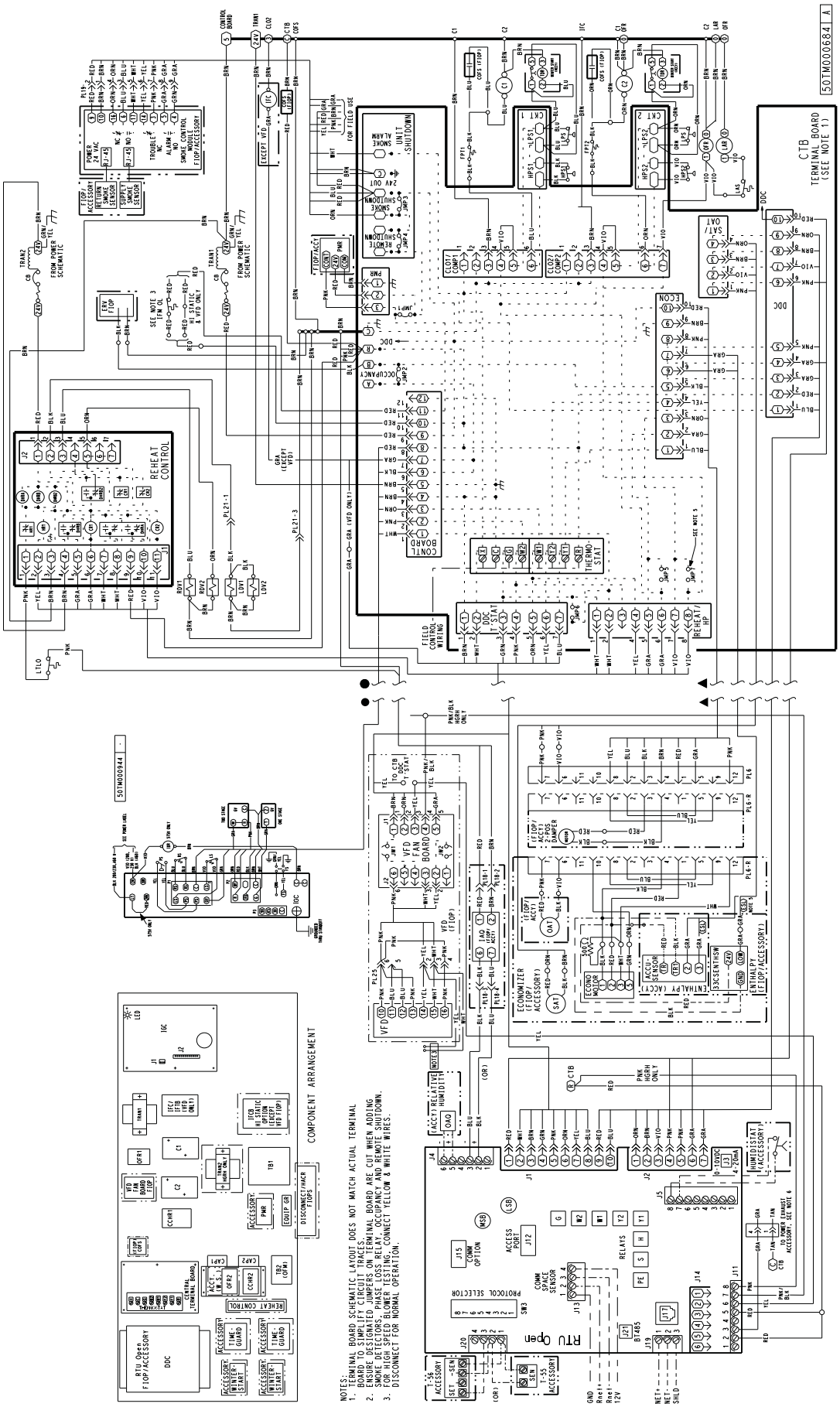


Fig. 70 — 580J*16, Typical RTU Open System Control Wiring Diagram with Perfect Humidity™ System

Table 24 — RTU Open Controller Inputs and Outputs

POINT NAME	BACNET OBJECT NAME	TYPE OF I/O	CONNECTION PIN NUMBER (S)	CHANNEL DESIGNATION
DEDICATED INPUTS				
Space Temp / Zone Temp	zone_temp	AI (10K Thermistor)	J20–1 and 2	Analog Input 10
Supply Air Temperature	sa_temp	AI (10K Thermistor)	J2–1 and 2	Analog Input 6
Outside Air Temperature	oa_temp	AI (10K Thermistor)	J2–3 and 4	Analog Input 7
Space Temperature Offset Pot	stpt_adj_offset	AI(100K Potentiometer)	J20–3 and 4	Analog Input 11
Safety Chain Feedback	safety_status	BI (24 VAC)	J1–9	Binary Input 4
Compressor Safety Status[1]	comp_status	BI (24 VAC)	J1–2	Binary Input 3
Fire Shutdown Status	firedown_status	BI (24 VAC)	J1–10	Binary Input 5
Enthalpy Status	enthalpy_status	BI (24 VAC)	J2–6 and 7	Binary Input 8
Humidistat Input Status	humstat_status	BI (24 VAC)	J5–7 and 8	Binary Input 9
Zone Temperature	n/a	n/a	J13–1–4	Rnet
CONFIGURABLE INPUTS[4]				
Indoor Air CO_2	iaq	AI (4–20 mA)	J4–2 and 3 or J4–5 and 6	Analog Input 2
Outdoor Air CO_2	oaq	AI (4–20 mA)		Analog Input 1
Space Relative Humidity	space_rh	AI (4–20 mA)		Analog Input 10
Supply Fan Status[2]	sfan_status	BI (24 VAC)	J5–1 and 2 or J5–3 and 4, J5–5 and 6 or J5–7 and 8[3]	Binary Input 3, 5, 8, or 9, except where intrinsic input is used
Filter Status[2]	filter_status	BI (24 VAC)		Binary Input 3, 5, 8, or 9, except where intrinsic input is used
Door Contact[2]	door_contact_status	BI (24 VAC)		Binary Input 3, 5, 8, or 9, except where intrinsic input is used
Remote Occupancy Input[2]	occ_contact_status	BI (24 VAC)		Binary Input 3, 5, 8, or 9, except where intrinsic input is used
IGC Input[2]	igcovr_status	BI (24 VAC)		Binary Input 9. Mandatory input on gas heat units.
OUTPUTS				
Economizer Output	econ_output	AO (4–20mA)	J2–5	Analog Output 1
Supply Fan VFD	vfd_output	AO (2–10Vdc)	J22–1 and 2	Analog Output 2
Supply Fan Relay	sfan	BO Relay (24VAC, 1A)	J1–4	Binary Output 1 (G)
Cool 1 Relay State	comp_1	BO Relay (24VAC, 1A)	J1–8	Binary Output 5 (Y1)
Cool 2 Relay State	comp_2	BO Relay (24VAC, 1A)	J1–7	Binary Output 4 (Y2)
Cool 3 Relay State	comp_3	BO Relay (24VAC, 1A)	J11–5 and 6	Binary Output 7 (Y3)
Heat 1 Relay State	heat_1	BO Relay (24VAC, 1A)	J1–6	Binary Output 3 (W1)
Heat 2 Relay State	heat_2	BO Relay (24VAC, 1A)	J1–5	Binary Output 2 (W2)
Power Exhaust Relay State	pexh	BO Relay (24VAC, 1A)	J11–2 and 3 (N.O.)	Binary Output 8 (PE)
Dehumidification Relay	dehum	BO Relay (24VAC, 1A)	J11–7 and 8 (N.O.)	Binary Output 6

LEGEND

AI — Analog Input
AO — Analog Output
BI — Binary Input
BO — Binary Output

1. Safety Chain Feedback: 24Vac required at this terminal to provide “Run Enable” status. See Input/Output section for additional instructions.
2. These inputs are configurable. If installed, they take the place of the default input on the specific channel. See appropriate Input Configuration Section for wiring and setup instructions.
3. Refer to the input configuration and accessory sections of the RTU Open Multi–Protocol Controller Controls, Start–Up, Operation and Troubleshooting manual for more detail.
4. Parallel pins J5–1 = J2–6, J5–3 = J1–10, J5–5 = J1–2 are used for field installation.

The RTU Open controller requires the use of a Bryant space sensor. A standard thermostat cannot be used with the RTU Open system.

Supply Air Temperature (SAT) Sensor (33ZCSENSAT) — The sensor is supplied with the 580J unit. This sensor is a tubular probe type, approx 6-inches (152 mm) in length. It is a nominal 10-k ohm thermistor.

The SAT is factory-wired. The SAT probe is wire-tied to the supply-air opening (on the horizontal opening end) in its shipping position. Remove the sensor for installation. Re-position the sensor in the flange of the supply-air opening or in the supply air duct (as required by local codes). Drill or punch a $^1/_2$-in. hole in the flange or duct. Use two field-supplied, self-drilling screws to secure the sensor probe in a horizontal orientation. See Fig. 71.

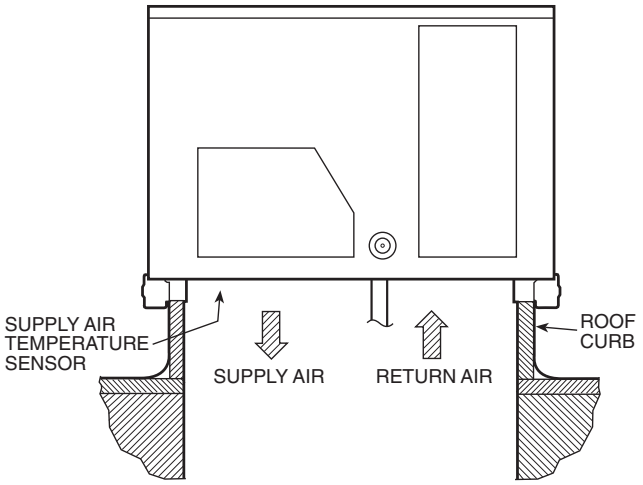


Fig. 71 — Typical Mounting Location for Supply Air Temperature (SAT) Sensor on Small Rooftop Units

Outdoor Air Temperature (OAT) Sensor — The sensor is factory-mounted in the EconoMi$er® 2 (FIOP or accessory). It is a nominal 10k ohm thermistor attached to an eyelet mounting ring.

EconoMi$er 2 — The EconoMi$er 2 (option or accessory) is used with the RTU Open control for outdoor air management. The damper position is controlled directly by the RTU Open control; EconoMi$er 2 has no internal logic device.

Outdoor air management functions can be enhanced with field-installation of these accessory control devices:

- Enthalpy control (outdoor air or differential sensors)
- Space CO_2 sensor
- Outdoor air CO_2 sensor

FIELD CONNECTIONS — Field connections for accessory sensors and input devices are made the RTU Open, at plugs J1, J2, J4, J5, J11 and J20. All field control wiring that connects to the RTU Open must be routed through the raceway built into the corner post as shown in Fig. 54. The raceway provides the UL required clearance between high and low-voltage wiring. Pass the control wires through the hole provided in the corner post, then feed the wires thorough the raceway to the RTU Open. Connect to the wires to the removable Phoenix connectors and then reconnect the connectors to the board.

Space Temperature (SPT) Sensors — There are two types of SPT sensors available from Bryant, resistive input non-communicating (T55, T56, and T59) and Rnet communicating (SPS, SPPL, SPP, and SPPF) sensors. Each type has a variety of options consisting of: timed override button, set point adjustment, a LCD screen, and communication tie in. Space temperature can be also be written to from a building network or zoning system. However, it is still recommended that return air duct sensor be installed to allow stand-alone operation for back-up. Refer to the configuration section for details on controller configurations associated with space sensors.

- 33ZCT55SPT, space temperature sensor with override button (T-55)
- 33ZCT56SPT, space temperature sensor with override button and setpoint adjustment (T-56)
- 33ZCT59SPT, space temperature sensor with LCD (liquid crystal display) screen, override button, and setpoint adjustment (T-59)

Use 20 gauge wire to connect the sensor to the controller. The wire is suitable for distances of up to 500 ft. Use a three-conductor shielded cable for the sensor and setpoint adjustment connections. If the setpoint adjustment (slidebar) is not required, then an unshielded, 18 or 20 gauge, two-conductor, twisted pair cable may be used.

Connect T-55 — See Fig. 72 for typical T-55 internal connections. Connect the T-55 SEN terminals to RTU Open J20-1 and J20-2. See Fig. 73.

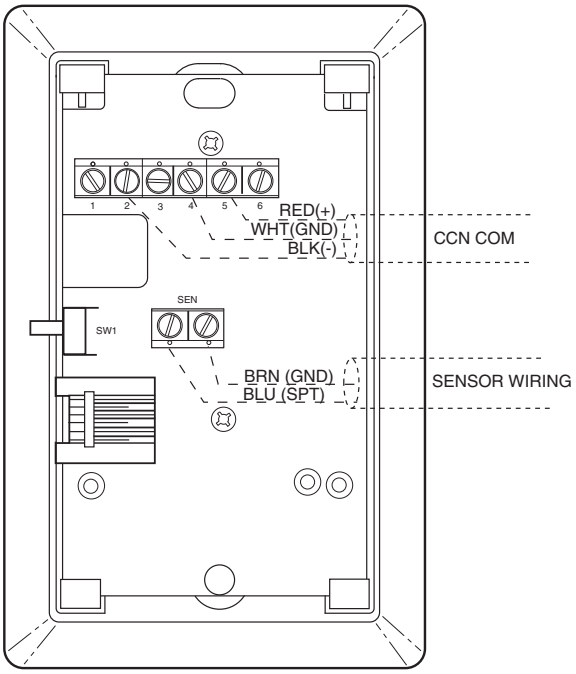


Fig. 72 — T-55 Space Temperature Sensor Wiring

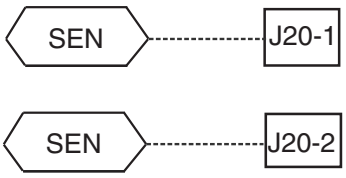


Fig. 73 — RTU Open T-55 Sensor Connections

Connect T- 56 — See Fig. 75 for T-56 internal connections. Install a jumper between SEN and SET terminals as illustrated. Connect T-56 terminals to RTU Open J20-1, J20-2 and J20-3 per Fig. 75.

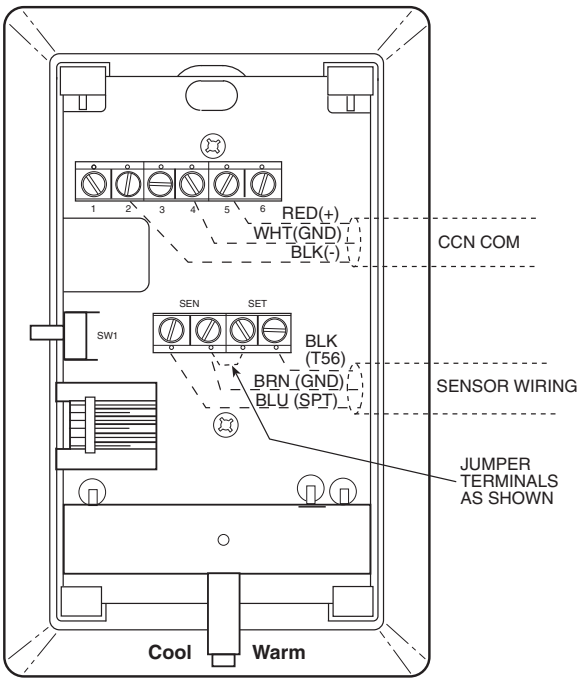


Fig. 74 — T-56 Internal Connections

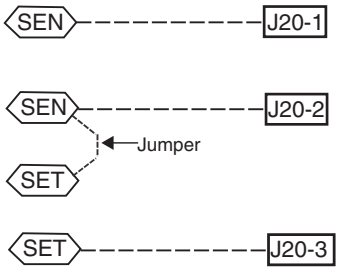
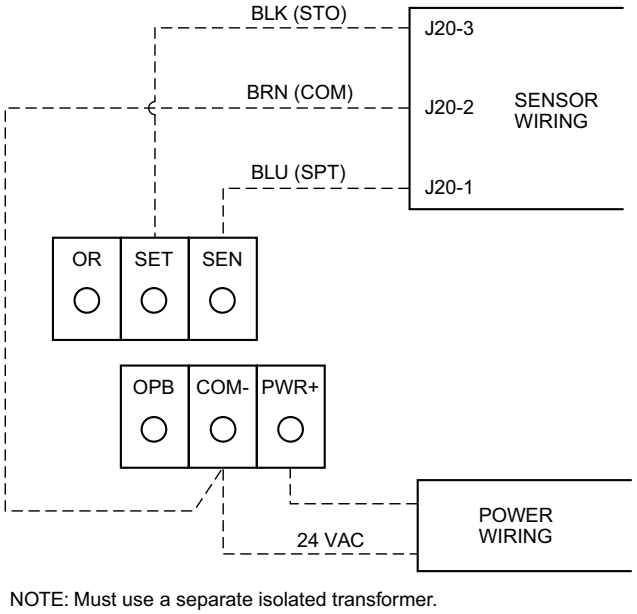


Fig. 75 — RTU Open T-56 Sensor Connections

Connect T- 59 — The T-59 space sensor requires a separate, isolated power supply of 24 VAC. See Fig. 76 for internal connections at the T-59. Connect the SEN terminal (BLU) to RTU Open J20-1. Connect the COM terminal (BRN) to J20-2. Connect the SET terminal (STO or BLK) to J20-3. See Fig. 76.



NOTE: Must use a separate isolated transformer.

Fig. 76 — Space Temperature Sensor Typical Wiring (33ZCT59SPT)

Indoor Air Quality (CO_2) Sensor — The indoor air quality sensor accessory monitors space carbon dioxide (CO_2) levels. This information is used to monitor IAQ levels. Several types of sensors are available, for wall mounting in the space or in return duct, with and without LCD display, and in combination with space temperature sensors. Sensors use infrared technology to measure the levels of CO_2 present in the space air.

The CO_2 sensors are all factory set for a range of 0 to 2000 ppm and a linear mA output of 4 to 20. Refer to the instructions supplied with the CO_2 sensor for electrical requirements and terminal locations. See Fig. 78 for typical CO_2 sensor wiring schematic.

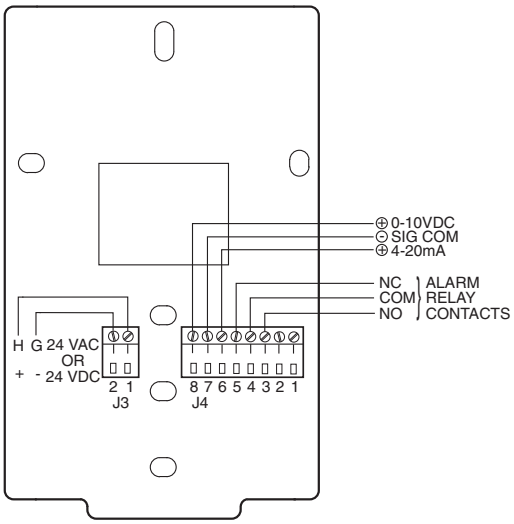


Fig. 77 — Indoor/Outdoor Air Quality (CO_2) Sensor (33ZCSENCO2) — Typical Wiring Diagram

To accurately monitor the quality of the air in the conditioned air space, locate the sensor near a return-air grille (if present) so it senses the concentration of CO_2 leaving the space. The sensor should be mounted in a location to avoid direct breath contact.

Do not mount the IAQ sensor in drafty areas such as near supply ducts, open windows, fans, or over heat sources. Allow at least 3 ft (0.9 m) between the sensor and any corner. Avoid mounting the sensor where it is influenced by the supply air; the sensor gives inaccurate readings if the supply air is blown directly onto the sensor or if the supply air does not have a chance to mix with the room air before it is drawn into the return airstream.

Wiring the Indoor Air Quality Sensor — For each sensor, use two 2-conductor 18 AWG (American Wire Gage) twisted-pair cables (unshielded) to connect the separate isolated 24 vac power source to the sensor and to connect the sensor to the control board terminals.

To connect the sensor to the control, identify the positive (4 to 20 mA) and ground (SIG COM) terminals on the sensor. See Fig. 77. Connect the 4-20 mA terminal to RTU Open J4-2 and connect the SIG COM terminal to RTU Open J4-3. See Fig. 78.

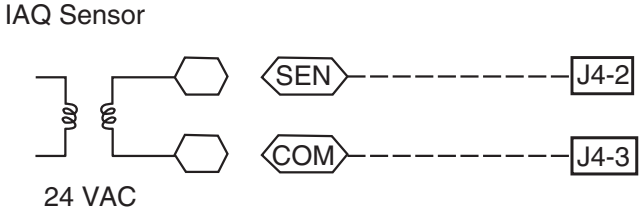


Fig. 78 — RTU Open/Indoor CO_2 Sensor (33ZCSENCO2) Connections

Outdoor Air Quality Sensor (P/N 33ZCSENCO2 plus weatherproof enclosure) — The sensor is designed to monitor carbon dioxide (CO_2) levels in the outside ventilation air and interface with the ventilation damper in an HVAC system. The OAQ sensor is packaged with an outdoor cover. See Fig. 79. The outdoor air CO_2 sensor must be located in the economizer outside air hood.

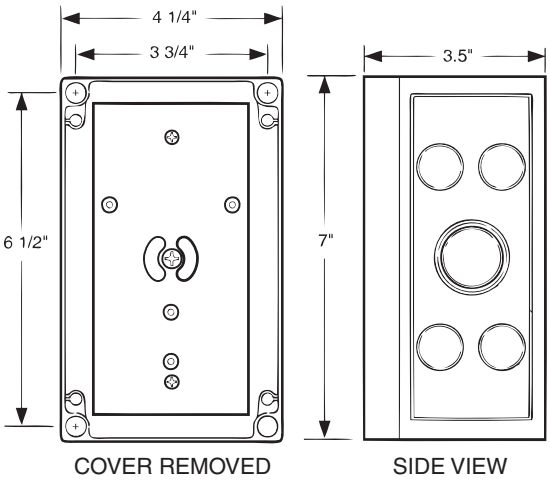


Fig. 79 — Outdoor Air Quality Sensor Cover

Wiring the Outdoor Air CO_2 Sensor — A dedicated power supply is required for this sensor. A two-wire cable is required to wire the dedicated power supply for the sensor. The two wires should be connected to the power supply and terminals 1 and 2.

To connect the sensor to the control, identify the positive (4 to 20 mA) and ground (SIG COM) terminals on the OAQ sensor. See Fig. 77. Connect the 4 to 20 mA terminal to RTU Open J4-5. Connect the SIG COM terminal to RTU Open J4-6. See Fig. 80.

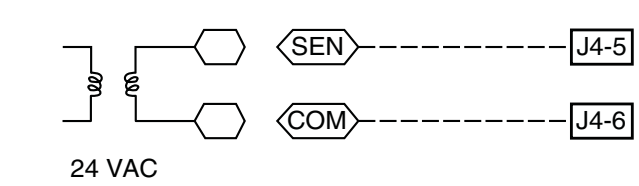


Fig. 80 — RTU Open / Outdoor CO_2 Sensor (33ZCSENCO2) Connections

Space Relative Humidity Sensor or Humidistat

NOTE: The accessory space relative humidity sensor and humidistat are not available for single phase (-J voltage code) models.

Perfect Humidity™ Control Wiring — In units equipped with the Perfect Humidity option there are two pink (PNK) wires loose in the control box used to control the dehumidification function of the unit. These pink wires are meant to be tied to a space humidistat or thermidistat on an electromechanical unit. On RTU Open equipped units these pink wires must be connected to J11-7 and 8 to allow the Open board to operate the dehumidification function for the unit. Disconnect the J11 Phoenix style connector from the board and use the plug screws to secure the pink wires in pins 7 and 8, reconnect the plug to the board at J11.

Relative Humidity Sensors (Space or Duct Mounted) — The accessory space humidity sensor (33ZCSENSRH-01) or duct humidity sensor (33ZCSENDRH-01) is used to measure the relative humidity of air within the space or return air duct. The RH reading is used to control the Perfect Humidity option of the rooftop unit. For wiring distances up to 500 ft (152 m), use a 3-conductor, 18 or 20 AWG shielded cable. The shield must be removed from the sensor end of the cable and grounded at the unit end. The current loop power for sensor is provided by the RTU Open controller as 24vdc. Refer to the instructions supplied with the RH sensor for the electrical requirements and terminal locations. RTU Open configurations must be changed after adding an RH sensor. See Fig. 81 and 82 for typical RH sensor wiring.

- J4-1 or J4-4 = 24vdc loop power
- J4-2 or J4-5 = 4-20mA signal input

NOTE: The factory default for dehumidification control is normally open humidistat.

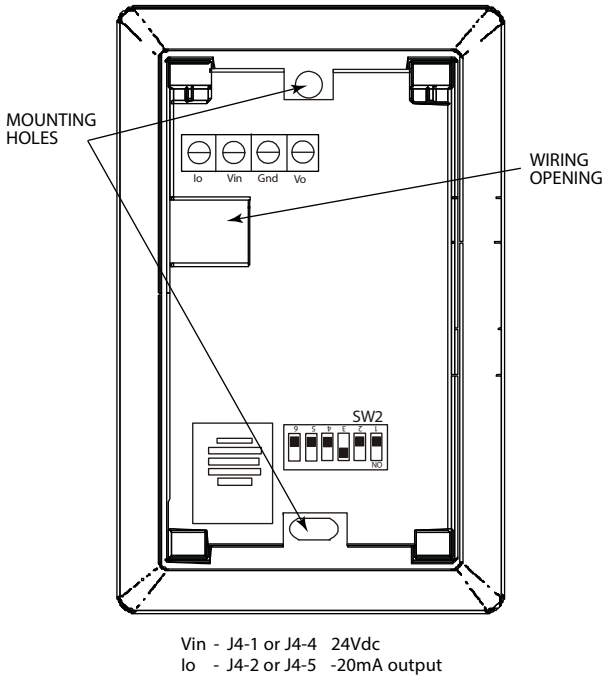


Fig. 81 — Space Relative Humidity Sensor Typical Wiring

Humidistat — The accessory humidistat provides the RTU Open insight to the relative humidity in the space. The humidistat reads the RH level in the space and compares it to its setpoint to operate a dry contact. The humidistat is a dedicated input on the configurable input 9 and tells the RTU Open when the RH level is HIGH or LOW. The normal condition for humidity is LOW. A normally open humidistat is the factory default control for the Perfect Humidity option. See Fig. 82.

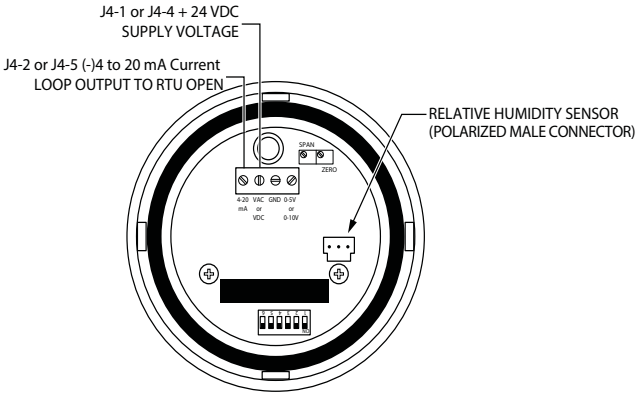


Fig. 82 — Duct Relative Humidity Sensor Typical Wiring

To wire in the field:

- J5-8 = 24 VAC source for dry contact
- J5-7 = Signal input

Smoke Detector/Fire Shutdown (FSD) is installed on 580J units equipped with factory-installed Smoke Detector(s). The smoke detector controller implements the unit shutdown through its NC contact set connected to the unit's CTB input. The FSD function is initiated via the smoke detector's Alarm NO contact set. The RTU Open controller communicates the smoke detector's tripped status to the BAS building control. See Fig. 67-70, the RTU Open System Control wiring schematics.

The Fire Shutdown Switch configuration, ***MENU→Config→Inputs→input*** 5, identifies the normally open status of this input when there is no fire alarm.

Connecting Discrete Inputs

Filter Status — The filter status accessory is a field-installed accessory. This accessory detects plugged filters. When installing this accessory, the unit must be configured for filter status by setting ***MENU→Config→Inputs→input*** 3, 5, 8, or 9 to Filter Status and normally open (N/O) or normally closed (N/C). Input 8 or 9 is recommended for easy of installation. Refer to Fig. 66-70 for wire terminations at J5.

Fan Status — The fan status accessory is a field-installed accessory. This accessory detects when the indoor fan is blowing air. When installing this accessory, the unit must be configured for fan status by setting ***MENU→Config→Inputs→input*** 3, 5, 8, or 9 to Fan Status and normally open (N/O) or normally closed (N/C). Input 8 or 9 is recommended for easy of installation. Refer to Fig. 66-70 for wire terminations at J5.

Remote Occupancy — The remote occupancy accessory is a field-installed accessory. This accessory overrides the unoccupied mode and puts the unit in occupied mode. When installing this accessory, the unit must be configured for remote occupancy by setting ***MENU→Config→Inputs→input*** 3, 5, 8, or 9 to Remote Occupancy and normally open (N/O) or normally closed (N/C).

Also set ***MENU→Schedules→occupancy*** source to DI on/off. Input 8 or 9 is recommended for easy of installation. Refer to Fig. 66 and Table 24 for wire terminations at J5.

Power Exhaust (output) — The relay used by the RTU Open board to control power exhaust is a dry contact which means it does not have 24vac. This 24vac must be connected to the relay to allow it to operate the power exhaust relay in the PE accessory. A 24vac source must be provided to J11-2 on the RTU Open control board. This can be provided by the unit's transformer from various sources. The "R" terminal on the unit's terminal board (LVTB) is a logical source. Refer to Fig. 66 and Fig. 67 or 69 for wire terminations at J11.

COMMUNICATION WIRING- PROTOCOLS — Protocols are the communication languages spoken by control devices. The main purpose of a protocol is to communicate information in the most efficient method possible. Different protocols exist to provide different kinds of information for different applications. In the BAS application, many different protocols are used, depending on manufacturer. Protocols do not change the function of a controller; just make the front end user different.

The RTU Open can be set to communicate on four different protocols: BACnet, Modbus, N2, and LonWorks. Switch 3 (SW3) on the board is used to set protocol and baud rate. Switches 1 and 2 (SW1 and SW2) are used to set the board's network address. See Fig. 83 and 84 for protocol switch settings and address switches. The third party connection to the RTU Open is through plug J19. See Fig. 85 for wiring.

NOTE: Power must be cycled after changing the SW1-3 switch settings.

Refer to the *RTU Open v3 Integration Guide* for more detailed information on protocols third party wiring and networking.

SW3 PROTOCOL SELECTION

PROTOCOL	DS8	DS7	DS6	DS5	DS4	DS3	DS2	DS1
BACnet MS/TP (Master)	Unused	OFF	OFF	OFF	ON	OFF	Select Baud	Select Baud
Modbus (Slave)	Unused	OFF	OFF	ON	ON	OFF	Select Baud	Select Baud
N2 Slave	Unused	OFF	OFF	OFF	ON	ON	OFF	OFF
Lon Works	Unused	ON	ON	OFF	ON	OFF	OFF	ON

LEGEND

DS — DIP Switch

NOTE: BACnet MS/TP SW3 example shown.

Baud Rate Selection

BAUD RATE	DS2	DS1
9,600	OFF	OFF
19,200	ON	OFF
38,400	OFF	ON
76,800	ON	ON

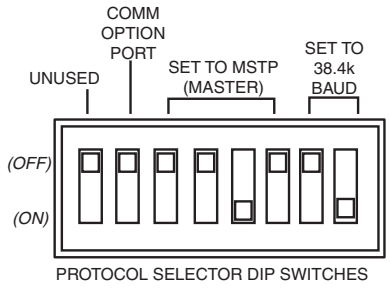


Fig. 83 — RTU Open SW3 DIP Switch Settings

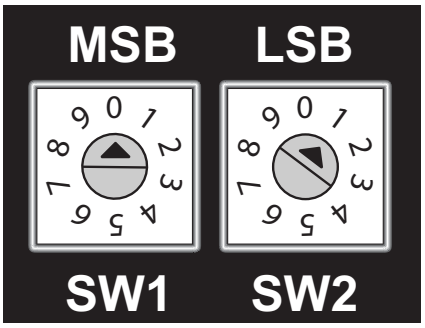


Fig. 84 — RTU Open Address Switches

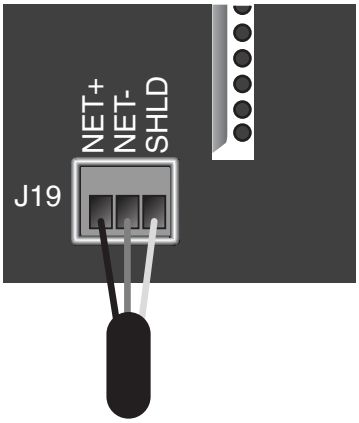


Fig. 85 — Network Wiring

LOCAL ACCESS

Wall Mounted Equipment Touch —The Equipment Touch is a wall mounted interface used to connect to the RTU Open to access the control information, read sensor values, and maintenance. This is an accessory interface that does not come with the RTU Open controller. Wire the Equipment Touch to the RTU Open's J13 local access port. There are 2 password protected levels in the display (User and Admin). See the Equipment Touch Installation and Setup Guide for more information. See Appendix A of the guide for navigation and screen content.

Field Assistant — Field Assistant is a computer program included with the purchase of the Tech Tool Kit (USB-TKIT). This is a field Tech Tool to set-up, service, or download application software to the RTU Open controller and includes a USB Link Cable. The link cable connects a USB port to the J12 local access port. See Fig. 86.

RTU Open Troubleshooting — Troubleshooting is accomplished by viewing the communication LEDs, see Fig. 66. The LEDs indicate if the controller is speaking to the devices on the network. The LEDs should reflect communication traffic based on the baud rate set. The higher the baud rate the more solid the LEDs will appear. See Table 25.

NOTE: Refer to the RTU Open Multi-Protocol Controller Controls, Start-Up, Operation, and Troubleshooting manual for complete configuration of RTU Open, operating sequences and troubleshooting information. Refer to the RTU Open v3 Integration Guide for details on configuration and troubleshooting of connected networks. Have a copy of these manuals available at unit start-up.

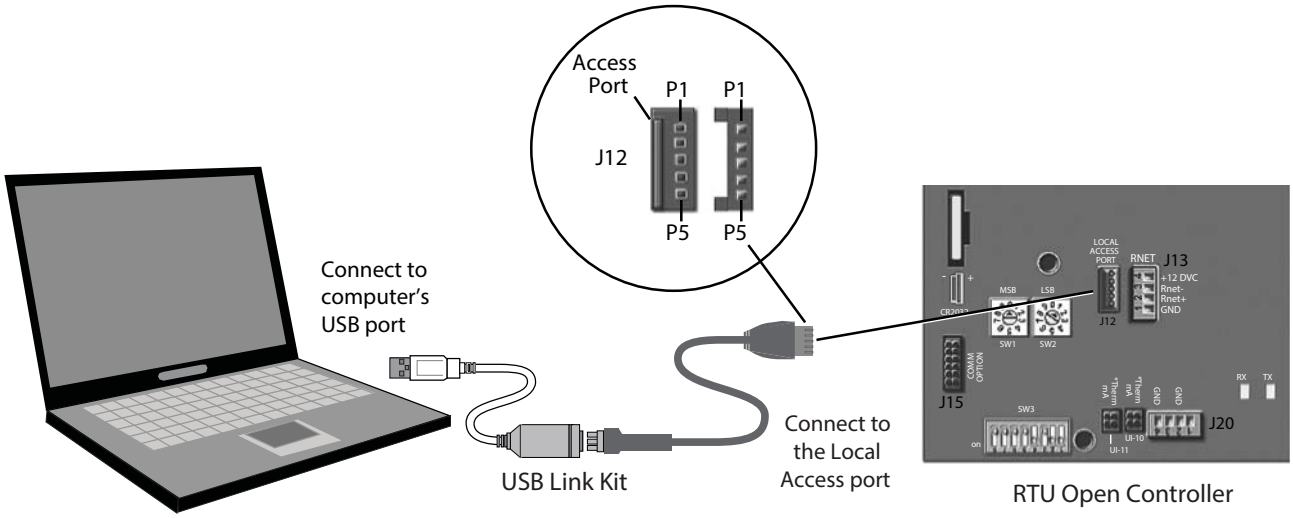


Fig. 86 — PC Running Field Assistant

Table 25 — LEDs

(The LEDs on the RTU Open show the status of certain functions)

IF THIS LED IS ON...	THE STATUS IS...	
Power	RTU Open has power	
Rx	RTU Open is receiving data from the network segment	
Tx	RTU Open is transmitting data over the network segment	
DO#	The digital output is active	
The **Run** and **Error** LEDs indicate control module and network status		
2 Flashes Per Second	Off	Normal
2 Flashes Per Second	2 flashes, alternating with **Run** LED	Five minute auto-restart delay after system error
2 Flashes Per Second	3 flashes, then off	Control module has just been formatted
2 Flashes Per Second	4 flashes, then pause	Two or more devices on this network have the same MSTP network address
2 Flashes Per Second	On	Exec halted after frequent system errors or control programs halted.
5 Flashes Per Second	On	Exec start-up aborted, Boot is running
5 Flashes Per Second	Off	Firmware transfer in progress, Boot is running
7 Flashes Per Second	7 flashes per second, alternating with **Run** LED	Ten second recovery period after brownout
14 Flashes Per Second	14 flashes per second, alternating with **Run** LED	Brownout
On	On	Failure. Try the following solutions: • Turn RTU Open off, then on • Format RTU Open • Download memory to RTU Open • Replace RTU Open

NOTE: Refer to the RTU Open Multi-Protocol Controller Controls, Start-Up, Operation and Troubleshooting manual for complete configuration of RTU Open, operating sequences and troubleshooting information. Refer to the RTU Open v3 Integration Guide for details on configuration and troubleshooting of connected networks. Have a copy of these manuals available at unit start-up.

OUTDOOR AIR ENTHALPY CONTROL — (PN: 33CSENTHSW) — The enthalpy control is available as a field-installed accessory to be used with the EconoMi$er2 damper system. The outdoor air enthalpy sensor is part of the enthalpy control. (The separate field-installed accessory return air enthalpy sensor (33CSENTSEN) is required for differential enthalpy control (see Fig. 87).

Locate the enthalpy control in the economizer next to the Actuator Motor. Locate two GRA leads in the factory harness and connect the gray lead labeled "ESL" to the terminal labeled "LOW". See Fig. 87. Connect the enthalpy control power input terminals to economizer actuator power leads RED (connect to 24V) and BLK (connect to GND).

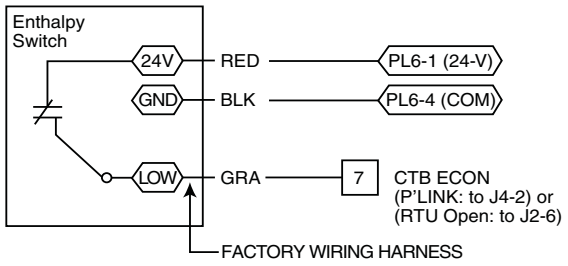


Fig. 87 — Enthalpy Switch (33CSENTHSW) Connections

The outdoor enthalpy changeover setpoint is set at the enthalpy controller.

Differential Enthalpy Control — Enthalpy control is provided by sensing and comparing the outside air and return air enthalpy conditions. Install the outdoor air enthalpy control as described above. Add and install a return air enthalpy sensor.

Return Air Enthalpy Sensor (33SENTSEN) — The sensor is mounted in the return-air section of the economizer. The return air sensor is wired to the enthalpy controller (33CSENTHSW). See Fig. 88.

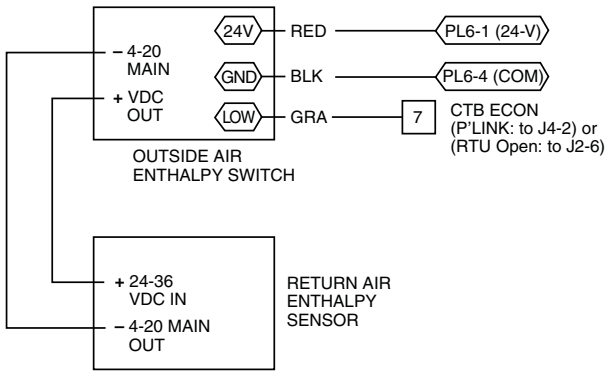


Fig. 88 — Outside and Return Air Enthalpy Sensor Wiring

SMOKE DETECTORS — Smoke detectors are available as factory-installed options on 580J models. Smoke detectors may be specified for Supply Air only or for Return Air without or with economizer or in combination of Supply Air and Return Air. All components necessary for operation are factory-provided and mounted. The unit is factory-configured for immediate smoke detector shutdown operation; additional wiring or modifications to unit terminal board may be necessary to complete the unit and smoke detector configuration to meet project requirements.

Units equipped with factory-optional Return Air smoke detectors require a relocation of the sensor module at unit installation. See Fig. 89 for the as shipped location.

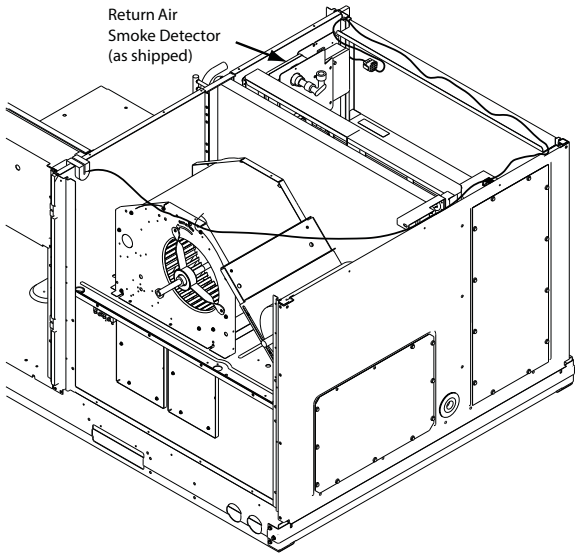


Fig. 89 — Return Air Smoke Detector; Shipping Position

COMPLETING INSTALLATION OF RETURN AIR SMOKE SENSOR

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

ADDITIONAL APPLICATION DATA — Refer to the application data sheet titled "Factory-Installed Smoke Detector, for Small and Medium Rooftop Units 2 to 25 Tons" for discussions on additional control features of these smoke detectors including multiple unit coordination.

See Tables 26 and 27 for electrical data.

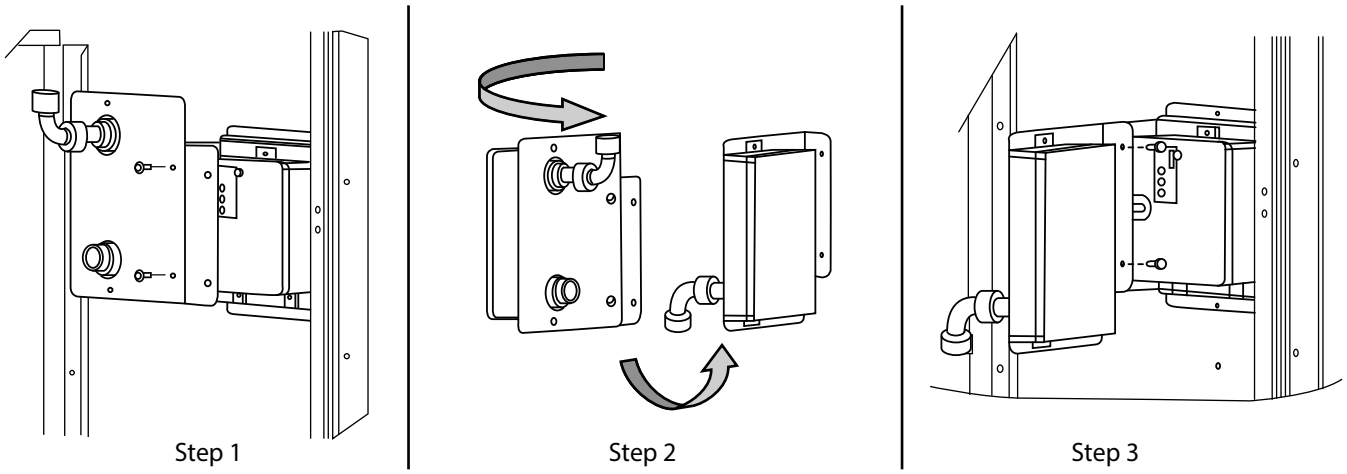


Fig. 90 — Completing Installation of Return Air Smoke Sensor

LEGEND FOR TABLES 26 AND 27

LEGEND

BRKR	—	Circuit Breaker
DISC	—	Disconnect
FLA	—	Full Load Amps
IFM	—	Indoor Fan Motor
LRA	—	Locked Rotor Amps
MCA	—	Minimum Circuit Amps
P.E.	—	Power Exhaust
PWRD FR	—	Powered From

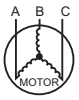
NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. Unbalanced 3-Phase Supply Voltage:

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

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

Example: Supply voltage is 230-3-60



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

$$\text{Average Voltage} = 100x \frac{(224 + 231 + 226)}{3} = \frac{681}{3} = 227$$

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.

Table 26 — Unit Wire/Fuse or HACR Breaker Sizing Data

UNIT	NOM. V-Ph-Hz	IFM TYPE	NO CONVENIENCE OUTLET OR UNPOWERED CONVENIENCE OUTLET								WITH POWERED CONVENIENCE OUTLET							
			NO P.E.				w/ P.E. (PWRD FR/ Unit)				NO P.E.				w/ P.E. (PWRD FR/ Unit)			
			MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA
580J*08	208/230-3-60	STD	47	60	50	201	47	60	50	201	52	60	56	206	52	60	56	206
		MED	51/50	60/60	54/54	254	51/50	60/60	54/54	254	55/55	60/60	59/59	259	55/55	60/60	59/59	259
		HIGH	56/55	60/60	60/59	270	56/55	60/60	60/59	270	61/60	70/70	65/64	275	61/60	70/70	65/64	275
	460-3-60	STD	22	25	23	99	22	25	23	99	24	30	26	101	24	30	26	101
		MED	24	25	25	126	24	25	25	126	26	30	28	128	26	30	28	128
		HIGH	26	30	28	134	26	30	28	134	28	30	30	136	28	30	30	136
	575-3-60	STD	17	20	17	81	17	20	17	81	18	20	19	83	18	20	19	83
		MED	18	20	19	96	18	20	19	96	19	25	21	98	19	25	21	98
		HIGH	21	25	22	110	21	25	22	110	23	25	24	112	23	25	24	112
580J*09	208/230-3-60	STD	52	60	56	220	52	60	56	220	57	70	61	225	57	70	61	225
		MED	54/54	60/60	58/57	258	54/54	60/60	58/57	258	59/59	70/70	63/63	263	59/59	70/70	63/63	263
		HIGH	58	70	62	287	58	70	62	287	63	70	67	292	63	70	67	292
	460-3-60	STD	24	30	25	115	24	30	25	115	26	30	28	117	26	30	28	117
		MED	25	30	26	134	25	30	26	134	27	30	29	136	27	30	29	136
		HIGH	27	30	29	149	27	30	29	149	29	35	31	151	29	35	31	151
	575-3-60	STD	21	25	22	91	21	25	22	91	23	25	24	93	23	25	24	93
		MED	21	25	22	95	21	25	22	95	23	25	24	97	23	25	24	97
		HIGH	22	25	23	106	22	25	23	106	24	25	25	108	24	25	25	108
580J*12	208/230-3-60	STD	56	60	59	270	56	60	59	270	61	70	65	275	61	70	65	275
		MED	61	70	66	326	61	70	66	326	66	80	71	331	66	80	71	331
		HIGH	64/64	70/70	69/68	328	64/64	70/70	69/68	328	69/68	80/80	75/74	333	69/68	80/80	75/74	333
	460-3-60	STD	27	30	29	129	27	30	29	129	30	35	31	131	30	35	31	131
		MED	30	35	32	157	30	35	32	157	32	35	34	159	32	35	34	159
		HIGH	31	35	33	158	31	35	33	158	33	40	36	160	33	40	36	160
	575-3-60	STD	22	25	23	99	22	25	23	99	24	25	25	101	24	25	25	101
		MED	23	25	24	110	23	25	24	110	25	30	26	112	25	30	26	112
		HIGH	26	30	27	124	26	30	27	124	27	30	29	126	27	30	29	126
580J*14	208/230-3-60	STD	35	40	36	199	35	40	36	199	37	45	39	201	37	45	39	201
		MED	36	45	38	206	36	45	38	206	38	45	40	208	38	45	40	208
		HIGH	37	45	39	207	37	45	39	207	39	45	41	209	39	45	41	209
	460-3-60	STD	27	30	29	153	27	30	29	153	29	35	31	155	29	35	31	155
		MED	27	30	29	153	27	30	29	153	29	35	31	155	29	35	31	155
		HIGH	30	35	32	167	30	35	32	167	32	35	34	169	32	35	34	169
	575-3-60	STD	85/85	100/100	91/90	428	85/85	100/100	91/90	428	90/90	100/100	96/96	433	90/90	100/100	96/96	433
		MED	88	100	93	442	88	100	93	442	92	100	99	447	92	100	99	447
		HIGH	94/92	100/100	100/98	440	94/92	100/100	100/98	440	99/97	110/110	106/104	445	99/97	110/110	106/104	445
580J*16	208/230-3-60	STD	97	110	104	448	97	110	104	448	102	125	110	453	102	125	110	453
		MED	42	50	44	249	42	50	44	249	45	50	47	251	45	50	47	251
		HIGH	43	50	46	256	43	50	46	256	46	50	48	258	46	50	48	258
		HIGH-HE	46	50	48	255	46	50	48	255	48	60	51	257	48	60	51	257
	460-3-60	STD	48	60	51	259	48	60	51	259	51	60	54	261	51	60	54	261
		MED	34	40	36	191	34	40	36	191	36	45	38	193	36	45	38	193
		HIGH	34	40	36	191	34	40	36	191	36	45	38	193	36	45	38	193
		HIGH-HE	37	45	40	194	37	45	40	194	39	45	41	196	39	45	41	196
	575-3-60	STD	40	45	43	203	40	45	43	203	42	50	45	205	42	50	45	205
		MED	47	60	50	201	47	60	50	201	52	60	56	206	52	60	56	206
		HIGH	51/50	60/60	54/54	254	51/50	60/60	54/54	254	55/55	60/60	59/59	259	55/55	60/60	59/59	259
		HIGH-HE	56/55	60/60	60/59	270	56/55	60/60	60/59	270	61/60	70/70	65/64	275	61/60	70/70	65/64	275

Table 27 — Unit Wire/Fuse or HACR Breaker Sizing Data Without 2-Speed Indoor Fan Motor

UNIT	NOM. V-Ph-Hz	IFM TYPE	NO CONVENIENCE OUTLET OR UNPOWERED CONVENIENCE OUTLET								WITH POWERED CONVENIENCE OUTLET							
			NO P.E.				w/ P.E. (PWRD FR/ Unit)				NO P.E.				w/ P.E. (PWRD FR/ Unit)			
			MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
580J*08	208/230-3-60	STD	48/48	60/60	51/50	205	48/48	60/60	51/50	205	53/53	60/60	56/56	210	53/53	60/60	56/56	210
		MED	51/50	60/60	54/53	235	51/50	60/60	54/53	235	56/55	60/60	59/59	240	56/55	60/60	59/59	240
		HIGH	56/55	60/60	60/59	270	56/55	60/60	60/59	270	61/60	70/70	65/64	275	61/60	70/70	65/64	275
	460-3-60	STD	22	25	24	101	22	25	24	101	25	30	26	103	25	30	26	103
		MED	23	25	25	117	23	25	25	117	26	30	27	119	26	30	27	119
		HIGH	26	30	28	134	26	30	28	134	28	30	30	136	28	30	30	136
	575-3-60	STD	18	20	19	83	18	20	19	83	19	25	21	85	19	25	21	85
		MED	19	25	21	96	19	25	21	96	21	25	23	98	21	25	23	98
		HIGH	22	25	23	110	22	25	23	110	23	25	25	112	23	25	25	112
580J*09	208/230-3-60	STD	53/53	60/60	56/56	224	53/53	60/60	56/56	224	58/58	70/70	62/62	229	58/58	70/70	62/62	229
		MED	54/54	60/60	58/57	228	54/54	60/60	58/57	228	59/59	70/70	63/63	233	59/59	70/70	63/63	233
		HIGH	58/57	70/70	62/61	278	58/57	70/70	62/61	278	63/62	70/70	68/66	283	63/62	70/70	68/66	283
	460-3-60	STD	24	30	26	117	24	30	26	117	27	30	28	119	27	30	28	119
		MED	25	30	26	120	25	30	26	120	27	30	29	122	27	30	29	122
		HIGH	26	30	28	145	26	30	28	145	29	30	31	147	29	30	31	147
	575-3-60	STD	22	25	23	93	22	25	23	93	24	25	25	95	24	25	25	95
		MED	23	25	24	97	23	25	24	97	25	30	26	99	25	30	26	99
		HIGH	24	25	25	106	24	25	25	106	26	30	27	108	26	30	27	108
580J*12	208/230-3-60	STD	58/58	70/70	62/61	267	58/58	70/70	62/61	267	63/62	70/70	67/67	272	63/62	70/70	67/67	272
		MED	62/61	70/70	66/65	317	62/61	70/70	66/65	317	66/65	80/80	71/70	322	66/65	80/80	71/70	322
		HIGH	64/64	70/70	69/68	328	64/64	70/70	69/68	328	69/68	80/80	75/74	333	69/68	80/80	75/74	333
	460-3-60	STD	28	30	30	128	28	30	30	128	30	35	32	130	30	35	32	130
		MED	30	35	31	153	30	35	31	153	32	35	34	155	32	35	34	155
		HIGH	31	35	33	158	31	35	33	158	33	40	36	160	33	40	36	160
	575-3-60	STD	24	25	25	101	24	25	25	101	25	30	27	103	25	30	27	103
		MED	25	30	26	110	25	30	26	110	26	30	28	112	26	30	28	112
		HIGH	26	30	28	124	26	30	28	124	28	30	30	126	28	30	30	126
580J*14	460-3-60	STD	34	40	36	190	34	40	36	190	36	45	38	192	36	45	38	192
		MED	35	45	37	202	35	45	37	202	38	45	40	204	38	45	40	204
		HIGH	37	45	39	207	37	45	39	207	39	45	41	209	39	45	41	209
	575-3-60	STD	29	35	31	153	29	35	31	153	31	35	33	155	31	35	33	155
		MED	29	35	31	153	29	35	31	153	31	35	33	155	31	35	33	155
		HIGH	31	35	33	167	31	35	33	167	33	35	35	169	33	35	35	169
580J*16	208/230-3-60	STD	86/85	100/100	91/90	409	86/85	100/100	91/90	409	90/90	100/100	96/95	414	90/90	100/100	96/95	414
		MED	88/87	100/100	93/92	433	88/87	100/100	93/92	433	93/92	100/100	99/98	438	93/92	100/100	99/98	438
		HIGH	97	110	104	448	97	110	104	448	102	125	110	453	102	125	110	453
	460-3-60	STD	42	50	44	240	42	50	44	240	44	50	47	242	44	50	47	242
		MED	43	50	45	252	43	50	45	252	45	50	48	254	45	50	48	254
		HIGH	48	60	51	259	48	60	51	259	51	60	54	261	51	60	54	261
	575-3-60	STD	36	45	38	191	36	45	38	191	37	45	40	193	37	45	40	193
		MED	36	45	38	191	36	45	38	191	37	45	40	193	37	45	40	193
		HIGH	40	45	43	203	40	45	43	203	42	50	45	205	42	50	45	205

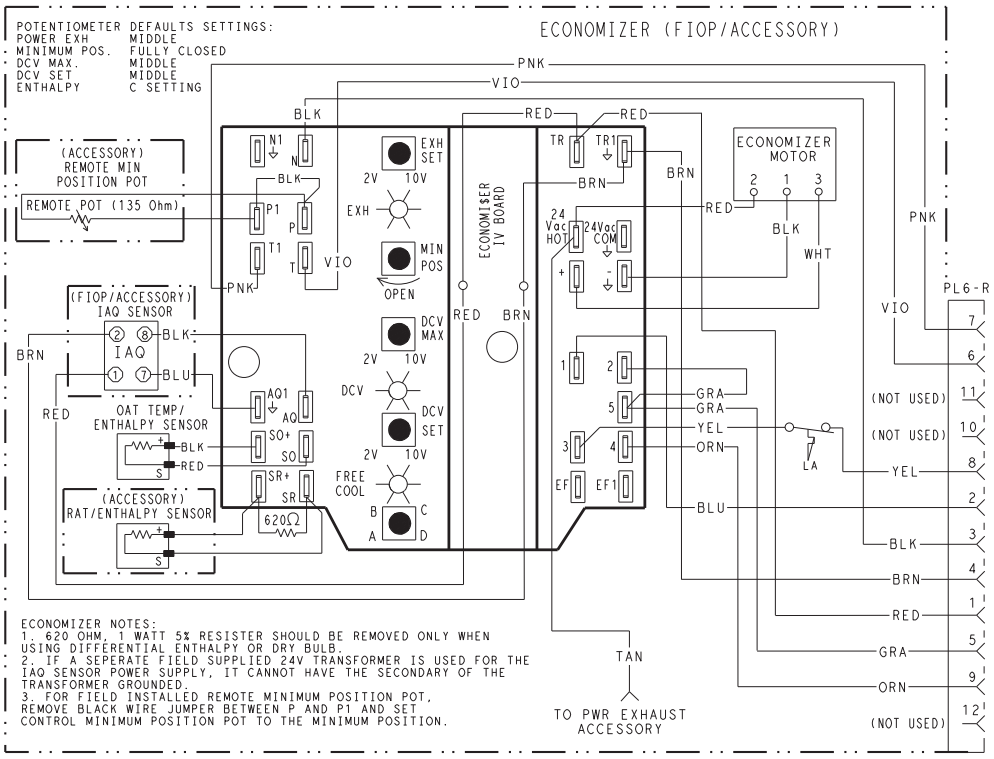


Fig. 91 — EconoMi$er® IV Wiring

Step 13 — Adjust Factory- Installed Options

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

**ECONOMI$ER IV OCCUPANCY SWITCH —** Refer to Fig. 91 for general EconoMi$er IV wiring. External occupancy control is managed through a connection on the Controls Connections Board.

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

Step 14 — Install Accessories

Available accessories include:

- Roof curb
- Thru-base connection kit (must be installed before unit is set on curb)
- Manual outside air damper
- Two-position motorized outside air damper
- EconoMi$er IV (with control)
- EconoMi$er 2 (without control/for external signal)
- Power exhaust
- Differential dry-bulb sensor (EconoMi$er IV)
- Outdoor enthalpy sensor
- Differential enthalpy sensor
- CO_2 sensor
- Louvered hail guard
- Phase monitor control

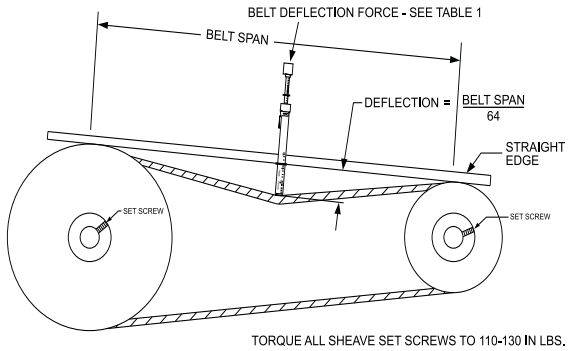
Refer to separate installation instructions for information on installing these accessories.

Step 15 — Check Belt Tension — Measure the belt span length as shown in Fig. 92. Calculate the required deflection by multiplying the belt span length by $^1/_{64}$. For example, if the belt span length is 32 inches: 32 x $^1/_{64}$ = $^1/_2$ inch deflection.

BELT FORCE — DEFLECTION METHOD — Check the belt tension with a spring-force belt force deflection gauge (available from drive belt manufacturer).

1. Place a straightedge along the belt between the two pulleys. Measure the distance between the motor shaft and the blower shaft.
2. Set the tension gauge to the desired tension (see Table 1 in Fig. 92). Place the large O-ring at that point.
3. Press the tension checker downward on the belt until the large O-ring is at the bottom of the straightedge.
4. Adjust the belt tension as needed.

Adjust belt tension by loosing the motor mounting plate front bolts and rear bolt (see Fig. 93) and slide the plate towards the fan (to reduce tension) or away from the fan (to increase tension). Ensure the blower shaft and motor shaft are parallel to each other (pulleys aligned). Tighten all bolts securely when finished.



BELT CROSS SECTION	SMALLEST SHEAVE DIAMETER	BELT DEFLECTION FORCE (LBS)			
		UNNOTCHED BELTS		NOTCHED BELTS	
		USED	NEW	USED	NEW
A, AX	3.0-3.6	3.7	5.5	4.1	6.1
	3.8-4.8	4.5	6.8	5.0	7.4
	5.0-7.0	5.4	8.0	5.7	8.4
B, BX	3.4-4.2	—	—	4.9	7.2
	4.4-5.6	5.3	7.9	7.1	10.5
	5.8-8.6	6.3	9.4	8.5	12.6

Table 1

BELT CONDITION	TENSION FORCE IN BELT (LBS)
New	100
Used	80

Table 2

Fig. 92 — V-Belt Force Label

BELT TENSION METHOD — Requires belt tension gauge that measures tension in belt in units of lbs force.

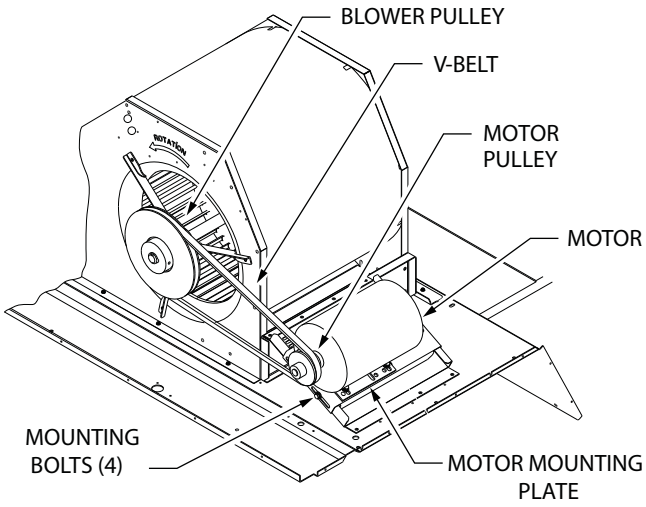


Fig. 93 — Belt Drive Motor Mounting

Pre-Start and Start-Up — This completes the mechanical installation of the unit. Refer to the unit's Service Manual for detailed Pre-Start and Start-Up instructions. Download the latest versions from HVAC Partners (www.hvacpartners.com).

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START-UP CHECKLIST — 580J PACKAGED ROOFTOP UNITS WITH GAS HEAT AND ELECTRIC COOLING

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 verify that all electrical (Y/N) _____
Connections and terminals are tight (Y/N) _____
Verify gas pressure to unit gas valve is within specified range (Y/N) _____
Check gas piping for leaks (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) _____
Check fan wheels and propeller for location in housing/orifice and verify setscrew is tight (Y/N) _____
Verify that fan sheaves are aligned and belts are properly tensioned (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) _____

II. 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	CIRCUIT A	_____ PSIG
	CIRCUIT B	_____ PSIG
REFRIGERANT DISCHARGE	CIRCUIT A	_____ PSIG
	CIRCUIT B	_____ 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) _____

III. PERFECT HUMIDITY™ START-UP

STEPS

1. Check CTB for jumper 5, 6, 7 (Jumper 5, 6, 7 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. Check unit charge per charging chart (Y/N) _____
5. Switch unit to high-latent mode (sub-cooler) by closing humidistat with Y1 closed (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)
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) _____

REPEAT PROCESS FOR 2 COMPRESSOR SYSTEMS

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

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