Carrier
United Technologies

WeatherMaster®
50HC04-14
Single Package Rooftop Electric Cooling Unit
with Puron® (R-410A) Refrigerant

Service and Maintenance Instructions

CONTENTS

SAFETY CONSIDERATIONS

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

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

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

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

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

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

Before performing service or maintenance operations on unit, LOCKOUT/TAGOUT the main power switch to unit. Electrical shock and rotating equipment could cause severe injury.

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

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

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

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.

⚠ WARNING

FIRE, EXPLOSION HAZARD

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

Never use air or gases containing oxygen for leak testing or for operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.

⚠ WARNING

FIRE, EXPLOSION HAZARD

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

Never use non-certified refrigerants in this product. Non-certified refrigerants could contain contaminates that could lead to unsafe operating conditions. Use ONLY refrigerants that conform to AHRI Standard 700.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in reduced unit performance or unit shutdown.

High velocity water from a pressure washer, garden hose, or compressed air should never be used to clean a coil. The force of the water or air jet will bend the fin edges and increase airside pressure drop.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
Pressing the controller's test/reset switch for longer than seven seconds will put the duct detector into the alarm state and activate all automatic alarm responses.

IMPORTANT: Lockout/tag-out is a term used when electrical power switches are physically locked preventing power to the unit. A placard is placed on the power switch alerting service personnel that the power is disconnected.

UNIT ARRANGEMENT AND ACCESS

General

Figure 1 and 2 show general unit arrangement and access locations.

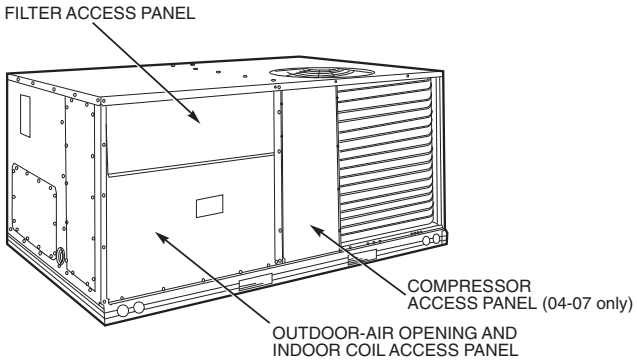


Fig. 1 — Typical Access Panel Locations

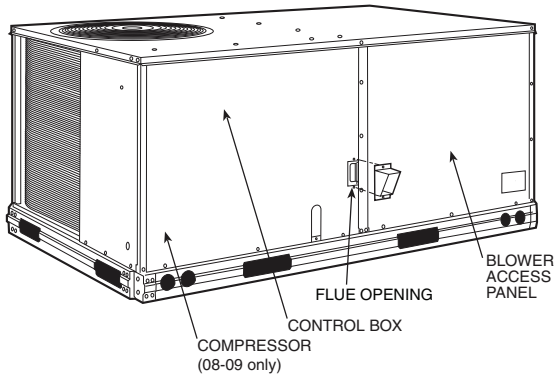


Fig. 2 — Blower Access Panel Location

Routine Maintenance

These items should be part of a routine maintenance program, to be checked every month or two, until a specific schedule for each can be identified for this installation:

QUARTERLY INSPECTION (AND 30 DAYS AFTER INITIAL START)

- Return air filter replacement
- Outdoor hood inlet filters cleaned
- Belt tension checked
- Belt condition checked
- Pulley alignment checked
- Fan shaft bearing locking collar tightness checked
- Condenser coil cleanliness checked
- Condensate drain checked

SEASONAL MAINTENANCE

These items should be checked at the beginning of each season (or more often if local conditions and usage patterns dictate):

Air Conditioning

- Ensure outdoor fan motor mounting bolts are tight
- Ensure compressor mounting bolts are tight
- Inspect outdoor fan blade positioning
- Ensure control box is clean
- Check control box wiring condition
- Ensure wire terminals are tight
- Check refrigerant charge level
- Ensure indoor coils are clean
- Check supply blower motor amperage

Electric Heating

- Inspect power wire connections
- Ensure fuses are operational
- Ensure manual reset limit switch is closed

Economizer or Outside Air Damper

- Check inlet filters condition
- Check damper travel (economizer)
- Check gear and dampers for debris and dirt

Air Filters and Screens

Each unit is equipped with return air filters. If the unit has an economizer, it will also have an outside air screen. If a manual outside air damper is added, an inlet air screen will also be present.

Each of these filters and screens will need to be periodically replaced or cleaned.

Filters

RETURN AIR FILTERS

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this CAUTION can result in premature wear and damage to equipment.

DO NOT OPERATE THE UNIT WITHOUT THE RETURN AIR FILTERS IN PLACE.

Dirt and debris can collect on heat exchangers and coils possibly resulting in a small fire. Dirt buildup on components can cause excessive current used resulting in motor failure.

Return air filters are disposable fiberglass media type. Access to the filters is through the small lift-out panel located on the rear side of the unit, above the evaporator/return air access panel. (See Fig. 3.)

To remove the filters:

1. Grasp the bottom flange of the upper panel.
2. Lift up and swing the bottom out until the panel disengages and pulls out.
3. Reach inside and extract the filters from the filter rack.
4. Replace these filters as required with similar replacement filters of same size.

To re-install the access panel:

1. Slide the top of the panel up under the unit top panel.
2. Slide the bottom into the side channels.
3. Push the bottom flange down until it contacts the top of the lower panel (or economizer top).

OUTSIDE AIR HOOD

Outside air hood inlet screens are permanent aluminum-mesh type filters. Check these for cleanliness. Remove the screens when cleaning is required. Clean by washing with hot low-pressure water and soft detergent and replace all screens before restarting the unit. Observe the flow direction arrows on the side of each filter frame.

ECONOMIZER INLET AIR SCREEN

This air screen is retained by filter clips under the top edge of the hood. (See Fig. 3.)

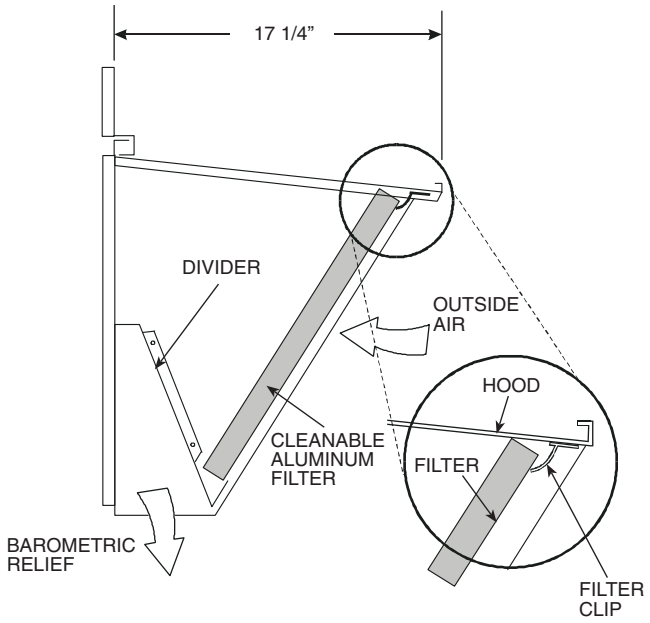


Fig. 3 — Filter Installation

To remove the filter, open the filter clips. Re-install the filter by placing the frame in its track, then closing the filter clips.

MANUAL OUTSIDE AIR HOOD SCREEN

This inlet screen is secured by a retainer angle across the top edge of the hood. (See Fig. 4.)

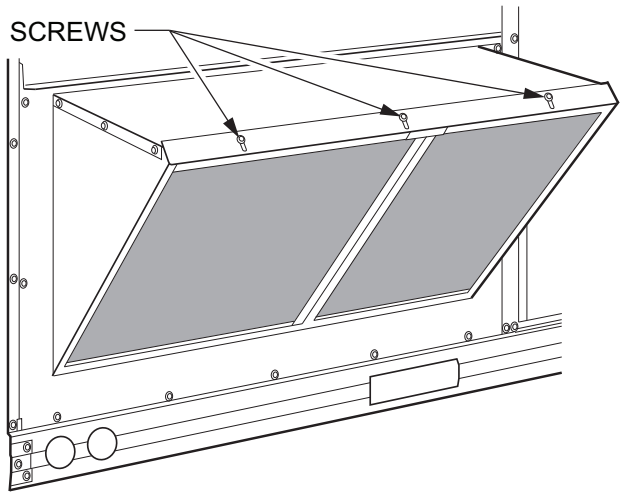


Fig. 4 — Screens Installed on Outdoor-Air Hood (Sizes 7½ to 8½ Tons Shown)

To remove the screen, loosen the screws in the top retainer and slip the retainer up until the filter can be removed. Re-install by placing the frame in its track, rotating the retainer back down, and tightening all screws.

SUPPLY FAN (BLOWER) SECTION

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

Before performing service or maintenance operations on unit, LOCKOUT/TAGOUT the main power switch to unit. Electrical shock and rotating equipment could cause severe injury.

Supply Fan (Direct-Drive)

For unit sizes 04, 05 and 06, a direct-drive forward-curved centrifugal blower wheel is an available option. The motor has taps to provide the servicer with the selection of one of five motor torque/speed ranges to best match wheel performance with attached duct system. See Fig. 5 and 6.

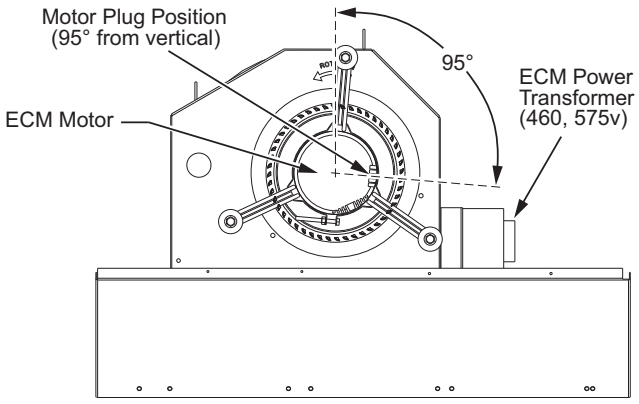


Fig. 5 — Direct-Drive Supply Fan Assembly

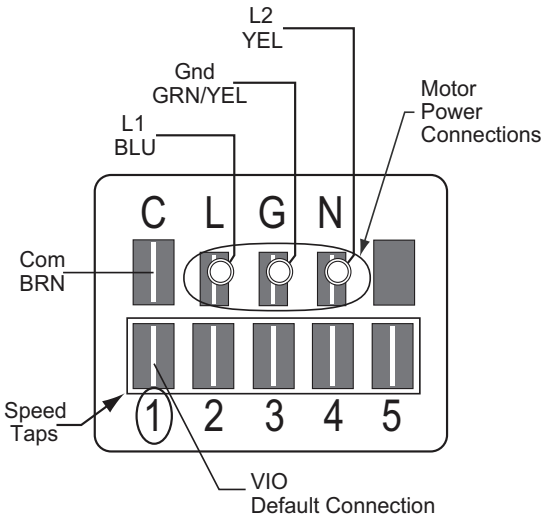


Fig. 6 — ECM Motor Connectors

ECM MOTOR

The direct-drive motor is an X13 Electronically Commutated Motor (ECM). An ECM motor contains electronic circuitry used to convert single-phase line AC voltage into 3-phase DC voltage to power the motor circuit. The motor circuit is a DC brushless design with a permanent magnet rotor. On the X13 ECM Motor design, the electronic circuitry is integral to the motor assembly and cannot be serviced or replaced separately.

The 208/230-v units use a 230-v motor. 460-v units use a 230-v motor with a stepdown transformer (mounted on the end of the fan housing, see Fig. 5). 575-v units use a 460-v motor with an autotransformer. Motor power voltage is connected to motor terminals L and N (see Fig. 6 and 10); ground is connected at terminal G. The motor power voltage is ALWAYS present; it is not switched off by a motor contactor.

Motor operation is initiated by the presence of a 24-v control signal to one of the five motor communications terminals. When the 24-v signal is removed, the motor will stop. The motor control signal is switched by the defrost board's IFO output.

Evaluating motor speed

The X13 ECM Motor uses a constant torque motor design. The motor speed is adjusted by the motor control circuitry to maintain the programmed shaft torque. Consequently, there is no specific speed value assigned to each control tap setting. At the

Position 5 tap, the motor speed is approximately 1050 rpm (17.5 r/s) but varies depending on fan wheel loading.

Selecting speed tap

The five communication terminals are each programmed to provide a different motor torque output. See Table 1. Factory default tap selection is Position 1 for lowest torque/speed operation.

Table 1 — Motor Tap Programing (percent of full-load torque)

50HC UNIT SIZE	TAP 1	TAP 2	TAP 3	TAP 4	TAP 5
04	32	38	45	50	100
05	46	58	61	69	100
06	73	82	85	90	100

Factory Default: Tap 1 (VIO).

Selecting another speed:

1. Disconnect main power to the unit. Apply lockout/tag-out procedures.
2. Remove the default motor signal lead (VIO) from terminal 1 at the motor communications terminal.
3. Reconnect the motor signal lead to the desired speed (terminals 1 through 5).
4. Connect main power to the unit.

Motor "rocking" on start-up

When the motor first starts, the rotor (and attached wheel) will "rock" back and forth as the motor tests for rotational direction. Once the correct rotational direction is determined by the motor circuitry, the motor will ramp up to the specified speed. The "rocking" is a normal operating characteristic of ECM motors.

Troubleshooting the ECM motor

ECM Motor Testing Procedure

1. Inspect motor bearing. ECM motors have sealed stainless steel bearings. Turn the motor shaft by hand to ensure that it turns freely and that there is no excessive play or friction as it rotates. Be mindful that motors have permanent magnetized rotors, which will add a stepping feel to the shaft rotation.
2. Inspect motor windings. ECM motors have 3 electrically identical windings. Once the motor is detached from the module, check the winding resistance.
   a. Using an Ohm meter set to the 200Ω scale, measure resistance as follows (see Fig. 7).
      Blue (A) to Black (B)
      Blue (A) to Red (C)
      Black (B) to Red (C)

The difference between any two leads should be less than 20 Ohms. The resistance from A to B, A to C, and B to C should be approximately the same (should differ by a maximum of ±10%). See Fig. 8.

3. Inspect resistance to ground.
   a. Measure the resistance of each lead to the unpainted motor plate (see Fig. 9).
   b. Resistance should be >100KΩ.
   c. If measure resistance is outside the above range, replace the motor.

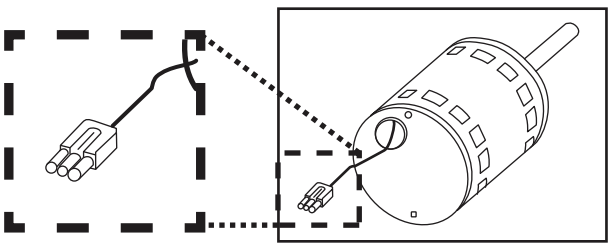


Fig. 7 — Winding Leads

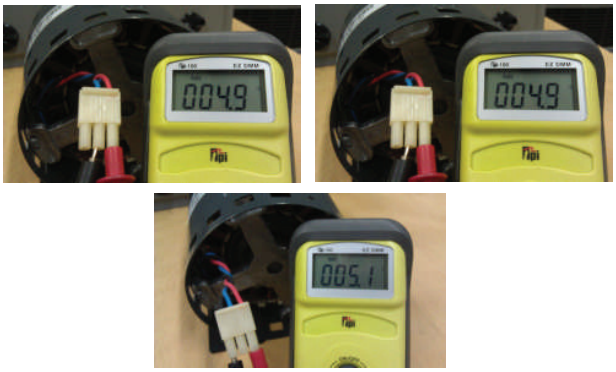


Fig. 8 — Testing Winding Resistance

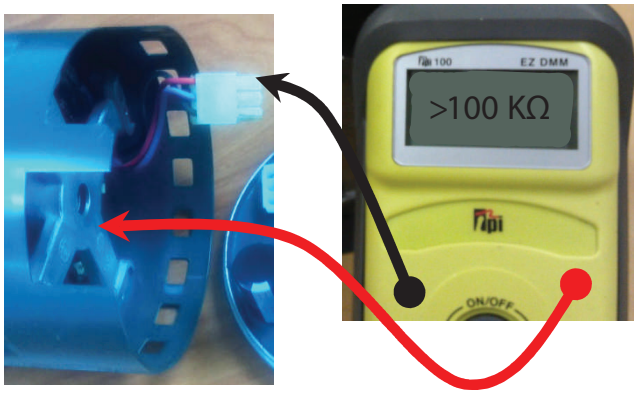


Fig. 9 — Resistance to Ground

If the motor passes steps 1-3, then it is in good condition.

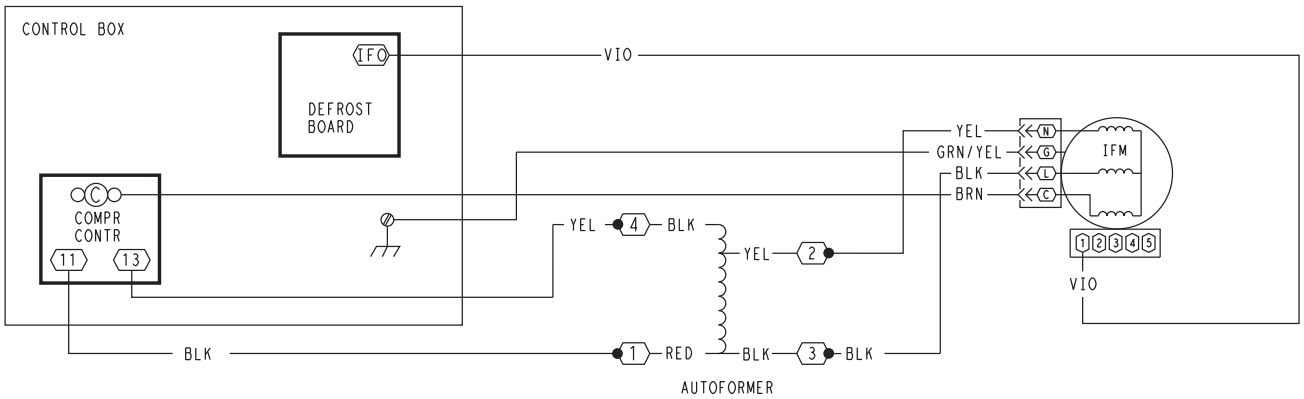
Troubleshooting the X13 ECM requires a voltmeter.

1. Disconnect main power to the unit.
2. Remove the motor power plug (including the control BRN lead) and VIO control signal lead at the motor terminals.
3. Restore main unit power.
4. Check for proper line voltage at motor power leads BLK (at L terminal) and YEL (at N terminal). See Table 2.

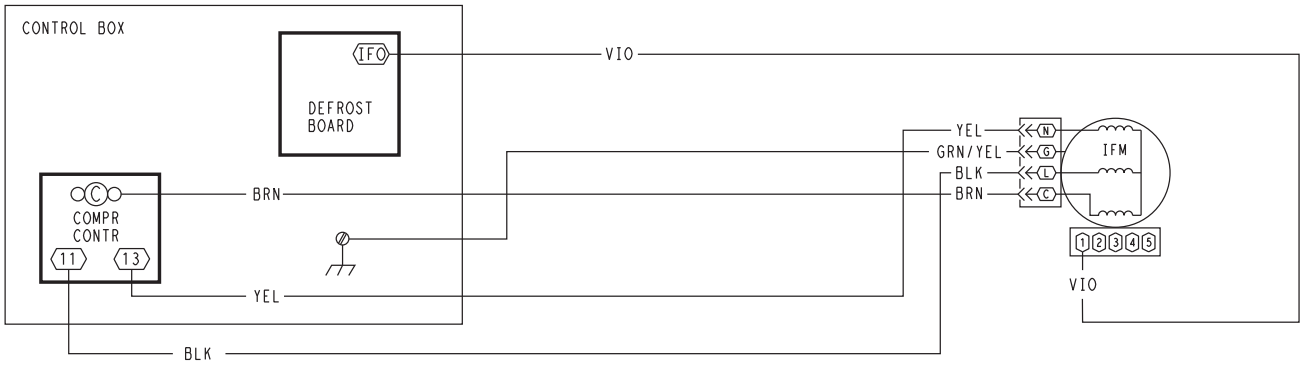
Table 2 — Motor Test Volts

50HC UNIT VOLTAGE	MOTOR VOLTAGE	MIN-MAX VOLTS
208/230	230	190-250
460	230	210-250
575	460	420-500

5. Using a jumper wire from unit control terminals R to G, engage motor operation. Check for 24-v output at the defrost board terminal IFO.
6. Check for proper control signal voltages of 22-v to 28-v at motor signal leads VIO and BRN.
7. Disconnect unit main power. Apply lockout/tag-out procedures.
8. Reconnect motor power and control signal leads at the motor terminals.
9. Restore unit main power.
10. The motor should start and run. If the motor does not start, remove the motor assembly. Replace the motor with one having the same part number. Do not substitute with an alternate design motor as the torque/speed programming will not be the same as that on an original factory motor.



460, 575-v Units



208/230-v Units

Fig. 10 — Direct-Drive Supply Fan Assembly Wiring Diagram

Replacing the X-13 ECM Motor

Before removing the ECM belly-band mounting ring from old motor:

1. Measure the distance from base of the motor shaft to the edge of the mounting ring.
2. Remove the motor mounting band and transfer it to the replacement motor.
3. Position the mounting band at the same distance that was measured in Step 1.
4. Hand-tighten mounting bolt only. Do not tighten securely at this time.
5. Insert the motor shaft into the fan wheel hub.
6. Securely tighten the three motor mount arms to the support cushions and torque the arm mounting screws to 60 in.-lb (6.8 Nm).
7. Center the fan wheel in the fan housing. Tighten the fan wheel hub setscrew and torque to 120 in.-lb (13.6 Nm).
8. Ensure the motor terminals are located at a position below the 3 o'clock position (see Fig. 5). Tighten the motor belly-band bolt and torque to 80 in.-lb (9.0 Nm).

Supply Fan (Belt-Drive)

The belt-drive supply fan system consists of a forward-curved centrifugal blower wheel on a solid shaft with two concentric type bearings, one on each side of the blower housing. A fixed-pitch driven pulley is attached to the fan shaft and an adjustable-pitch driver pulley is on the motor. The pulleys are connected using a V-belt. (See Fig. 11.)

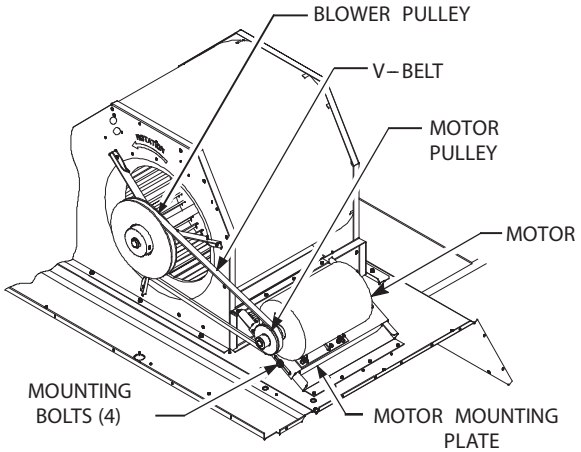


Fig. 11 — Typical Belt Drive Motor Mounting

BELT

Check the belt condition and tension quarterly. Inspect the belt for signs of cracking, fraying, or glazing along the inside surfaces. Check belt tension by using a spring-force tool, such as Browning's "Belt Tension Checker" (P/N: 1302546 or equivalent tool); tension should be 6 lb at $^{5}/_{8}$-in. (1.6 cm) deflection when measured at the centerline of the belt span. This point is at the center of the belt when measuring the distance between the motor shaft and the blower shaft.

NOTE: Without the spring-tension tool, place a straight edge across the belt surface at the pulleys, then push down on the belt at mid-span using one finger until a $^{1}/_{2}$-in. (1.3 cm) deflection is reached. See Fig. 12.

Adjust belt tension by loosening the motor mounting plate front and rear bolts and sliding the plate toward the fan (to reduce tension) or away from fan (to increase tension). Ensure the blower shaft and the motor shaft are parallel to each other (pulleys aligned). When finished, tighten all bolts and torque to 65 to 70 in.-lb (7.4 to 7.9 Nm).

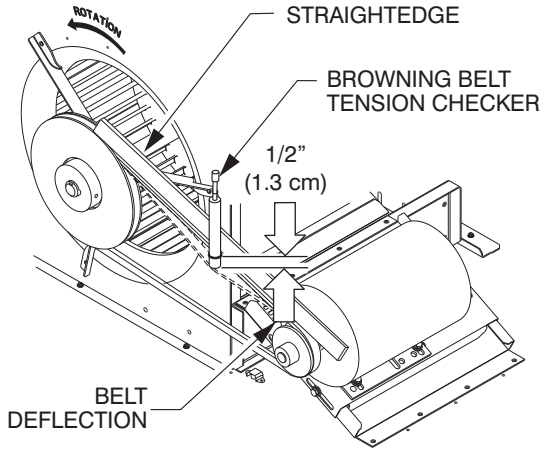


Fig. 12 — Checking Blower Motor Belt Tension

Replacing the Belt

NOTE: Use a belt with same section type or similar size. Do not substitute a FHP-type belt. When installing the new belt, do not use a tool (screwdriver or pry-bar) to force the belt over the pulley flanges; this will stress the belt and cause a reduction in belt life. Damage to the pulley can also occur.

Use the following steps to replace the V-belt. See Fig. 11.

1. Loosen the front and rear motor mounting plate bolts.
2. Push the motor and its mounting plate towards the blower housing as close as possible to reduce the center distance between fan shaft and motor shaft.
3. Remove the belt by gently lifting the old belt over one of the pulleys.
4. Install the new belt by gently sliding the belt over both pulleys and then sliding the motor and plate away from the fan housing until proper tension is achieved.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this CAUTION can result in premature wear and damage to equipment.

Do not use a screwdriver or a pry bar to place the new V-belt in the pulley groove. This can cause stress on the V-belt and the pulley resulting in premature wear on the V-belt and damage to the pulley.

5. Check the alignment of the pulleys and adjust if necessary.
6. Tighten all bolts and torque to 65 to 70 in.-lb (7.4 to 7.9 Nm).
7. Check the tension after a few hours of runtime and readjust as required.

ADJUSTABLE-PITCH PULLEY ON MOTOR

The motor pulley is an adjustable-pitch type that allows a servicer to implement changes in the fan wheel speed to match as-installed ductwork systems. The pulley consists of a fixed flange side that faces the motor (secured to the motor shaft) and a movable flange side that can be rotated around the fixed flange side that increases or reduces the pitch diameter of this driver pulley. (See Fig. 13.)

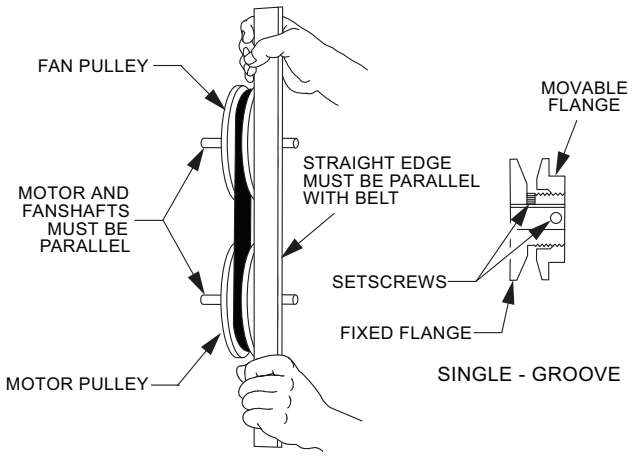


Fig. 13 — Supply-Fan Pulley Adjustment

As the pitch diameter is changed by adjusting the position of the movable flange, the centerline on this pulley shifts laterally (along the motor shaft). This creates a requirement for a realignment of the pulleys after any adjustment of the movable flange. Reset the belt tension after each realignment.

Inspect the condition of the motor pulley for signs of wear. Glazing of the belt contact surfaces and erosion on these surfaces are signs of improper belt tension and/or belt slippage. Replace pulley if wear is excessive.

Changing the fan speed:

1. Shut off unit power supply. Use proper lockout/tag-out procedures.
2. Loosen belt by loosening fan motor mounting nuts. (See Fig. 11.)
3. Loosen movable pulley flange setscrew. (See Fig. 13.)
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed the maximum specified speed.
5. Set movable flange at nearest keyway of pulley hub. Tighten setscrew and torque to 65 to 70 in.-lb (7.4 to 7.9 Nm).

ALIGNING BLOWER AND MOTOR PULLEYS:

1. Loosen blower pulley setscrews.
2. Slide blower pulley along blower shaft. Make angular alignment by loosening motor mounting plate front and rear bolts.
3. Tighten blower pulley setscrews and motor mounting bolts. Torque bolts to 65 to 70 in.-lb (7.4 to 7.9 Nm).
4. Recheck belt tension.

Bearings

The fan system uses bearings featuring concentric split locking collars. A Torx[1] T-25 socket head cap screw is used to tighten the locking collars. Tighten the locking collar by holding it tightly against the inner race of the bearing. Tighten the socket head cap screw. Torque cap screw to 65 to 70 in.-lb (7.4 to 7.9 Nm). See Fig. 14. Check the condition of the motor pulley for signs of wear. Glazing of the belt contact surfaces and erosion on these surfaces are signs of improper belt tension and/or belt slippage. Pulley replacement can be necessary.

1. Torx is a registered trademark of Acument Intellectual Properties, LLC.

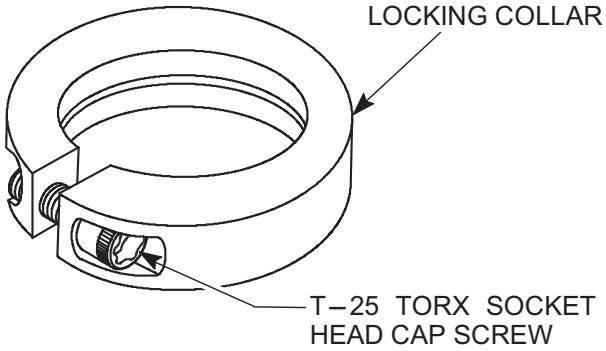


Fig. 14 — Tightening Locking Collar

STAGED AIR VOLUME CONTROL — 2 SPEED FAN WITH VARIABLE FREQUENCY DRIVE (VFD)

Staged Air Volume (SAV™) Indoor Fan Speed System

The Staged Air Volume (SAV) system utilizes a Fan Speed control board and Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the unit's ventilation, cooling and heating operation. Per ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 90.1-2016 standard section 6.4.3.10.b, during the first stage of cooling operation the SAV system will adjust the fan motor to provide two-thirds ($^2/_3$) of the design airflow rate for the unit. When the call for the second stage of cooling is required, the SAV system will allow the design airflow rate for the unit established (100%). During the heating mode, the SAV system will allow total design airflow rate (100%) operation. During ventilation mode, the SAV system will operate the fan motor at $^2/_3$ speed.

Identifying Factory Option

This supplement only applies to units that meet the criteria detailed in Table 3. If the unit does not meet that criteria, discard this document.

Table 3 — Model-Size / VFD Option Indicator

MODEL / SIZES	POSITION IN MODEL NUMBER	VFD FIOP INDICATOR
50HC / 07-28	17	G, J

See Appendix A for an example of model number nomenclature.

Unit Installation with SAV Option

50HC ROOFTOP

Refer to the base unit installation instructions for standard required operating and service clearances.

IMPORTANT: The remote VFD keypad is a field-installed option. It is not included as part of the factory-installed VFD option.

See "Variable Frequency Drive (VFD) Installation, Setup and Troubleshooting Supplement" for wiring schematics, performance charts, and configuration.

See Fig. 15-17 for locations of the variable frequency drive (VFD) as mounted on the various 50HC models.

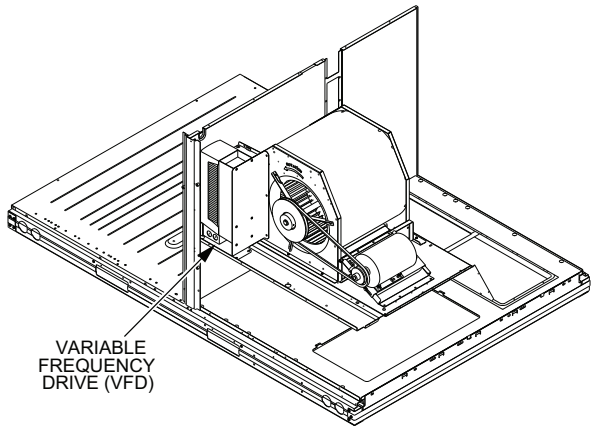


Fig. 15 — VFD Location for Sizes 07-09

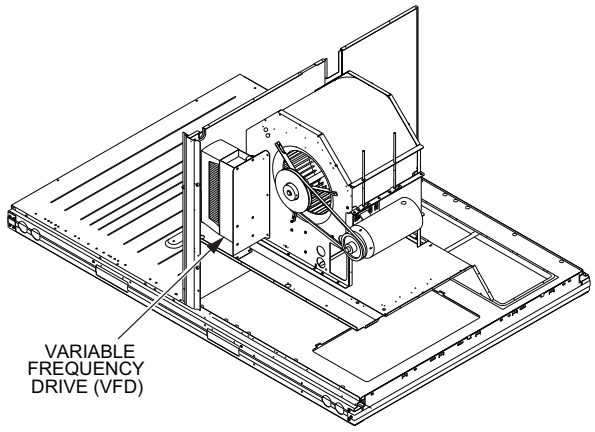


Fig. 16 — VFD Location for Size 12

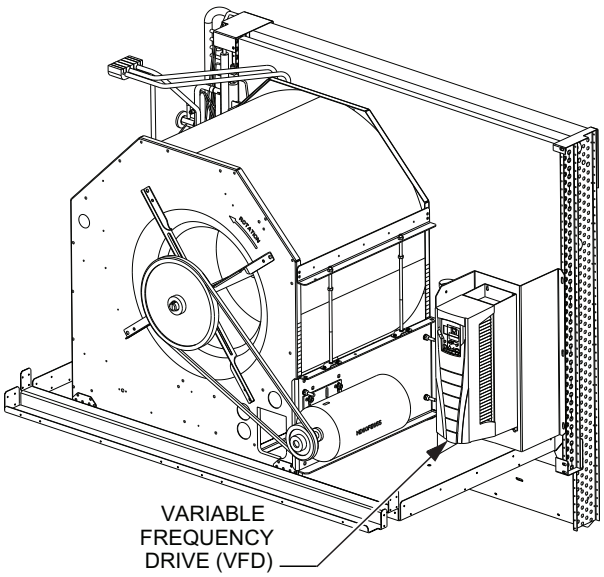


Fig. 17 — VFD Location for Size 14

ADDITIONAL VARIABLE FREQUENCY DRIVE (VFD) INSTALLATION AND TROUBLESHOOTING

Additional installation, wiring, and troubleshooting information for the Variable Frequency Drive can be found in the following manual: "Variable Frequency Drive (VFD) Installation, Setup and Troubleshooting Supplement."

MOTOR

When replacing the motor, use the following steps. See Fig. 18.

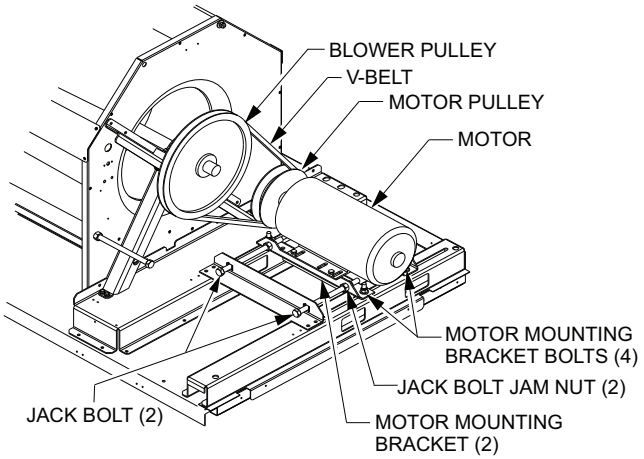


Fig. 18 — Replacing Belt-Driven Motor

Replacing the Motor

Use the following steps to replace the belt-driven motor.

1. Turn off all electrical power to the unit. Use approved lockout/tag-out procedures on all electrical power sources.
2. Remove cover on motor connection box.
3. Disconnect all electrical leads to the motor.
4. Loosen the two jack bolt jamnuts on the motor mounting bracket.
5. Turn two jack bolts counterclockwise until motor assembly moves closer to blower pulley.
6. Remove V-belt from blower pulley and motor pulley.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this CAUTION can result in premature wear and damage to equipment.

Do not use a screwdriver or a pry bar to place the new V-belt in the pulley groove. This can cause stress on the V-belt and the pulley resulting in premature wear on the V-belt and damage to the pulley.

7. Loosen the four mounting bracket bolts and lock washers.
8. Remove four bolts, four flat washers, four lock washers and four nuts attaching the motor mounting plate to the unit. Discard all lock washers.
9. Remove motor and motor mounting bracket from unit.
10. Remove four bolts, flat washers, lock washers and single external-tooth lock washer attaching motor to the motor mounting plate. Discard all lock washers and external-tooth lock washer.
11. Lift motor from motor mounting plate and set aside.
12. Slide motor mounting band from old motor.
13. Slide motor mounting band onto new motor and set motor onto the motor mounting plate.
14. Remove variable pitch pulley from old motor and attach it to the new motor.
15. Inspect variable pitch pulley for cracks and wear. Replace the pulley if necessary.
16. Secure the pulley to the motor by tightening the pulley setscrew to the motor shaft.
17. Insert four bolts and flat washers through mounting holes on the motor into holes on the motor mounting plate.
18. On one bolt, place a new external-tooth lock washer between the motor and motor mounting band.
19. Ensure the teeth of the external-tooth lock washer make contact with the painted base of the motor. This washer is essential for properly grounding motor.
20. Install four new lock washers and four nuts on the bolts on the bottom of the motor mounting plate.

NOTE: Do not tighten the mounting bolts at this time.

21. Set new motor and motor mounting bracket back onto the unit. See Fig. 18.
22. Install four bolts, four flat washers, four new lock washers and four nuts attaching the motor assembly to the unit.

NOTE: Do not tighten the mounting bolts at this time.

23. Install motor drive V-belt to motor pulley and blower wheel pulley. See CAUTION.
24. Align the motor pulley and blower wheel pulley using a straight edge. See Fig. 13.
25. Adjust the V-belt tension using adjustment tool.
26. Turn two jack bolts clockwise, moving the motor assembly away from the blower pulley, increasing the V-belt tension.
27. Tighten the four bolts securing the motor mounting brackets to the unit. Torque four bolts to 120 ± 12 in.-lb (14 ± 1.4 Nm).
28. Remove cover on motor connection box.
29. Re-connect all electrical leads to the motor and replace the connection box cover.
30. Re-connect all electrical power to the unit. Remove lockout tags on all electrical power sources.
31. Start unit and allow to run for a designated period.
32. Shut off unit and make any necessary adjustments to the V-belt tension or the motor and blower wheel pulley alignment.

When replacing the motor, also replace the external-tooth lock washer (star washer) under the motor mounting base; this is part of the motor grounding system. Ensure the teeth on the lock washer are in contact with the motor's painted base. Tighten motor mounting bolts to 120 ± 12 in.-lb.

Changing Fan Wheel Speed

Changing fan wheel speed by changing pulleys: The horsepower rating of the belt is primarily dictated by the pitch diameter of the smaller pulley in the drive system (typically the motor pulley in these units). Do not install a replacement motor pulley with a smaller pitch diameter than provided on the original factory pulley. Change fan wheel speed by changing the fan pulley (larger pitch diameter to reduce wheel speed, smaller pitch diameter to increase wheel speed) or select a new system (both pulleys and matching belt).

Before changing pulleys to increase fan wheel speed, check the fan performance at the target speed and airflow rate to determine new motor loading (bhp). Use the fan performance tables (see Appendix C) or use the Packaged Rooftop Builder software program. Confirm that the motor in this unit is capable of operating at the new operating condition. Fan shaft loading increases dramatically as wheel speed is increased.

To reduce vibration, replace the motor's adjustable pitch pulley with a fixed pitch pulley (after the final airflow balance adjustment). This will reduce the amount of vibration generated by the motor/belt-drive system.

See Tables 4 and 5 for VFD unit parameters.

Table 4 — SRT Unit VFD Parameters for Remote VFD Keypad — 50HC** 07-12

VFD Part Number	ABB Part Number	Description	Motor Part Number	Voltage (9905)	Nom Amps (9906)	Motor Nom Freq (9907)	Nom RPM (9908)	Nom HP (9909)	Const Speed Sel (1201)	Const Speed 1 (1202)	Const Speed 2 (1203)	Const Speed 3 (1204)	Relay Out 3 (1403)	Max Amps (2003)	Min Freq (2007)	Max Freq (2008)	Switch Freq (2606)	Start Fcn (2101)	Stop Fcn (2102)	Accel/ Decel (2201)	Accel (2202)	Decel (2203)
HK30WA364	ACH550–U0–012A–2	1.7 HP 230V	HD56FR233	230	5.8	60Hz	1725	1.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	6.7	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA356	ACH550–U0–012A–2	1.7 HP 460V	HD56FR463	460	2.9	60Hz	1725	1.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	3.3	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA366	ACH550–U0–017A–2	1.7 HP 575V	HD56FR579	575	3.1	60Hz	1725	1.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	3.6	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA352	ACH550–U0–024A–2	2.4 HP 230V	HD56FE653	230	7.9	60Hz	1725	2.4	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	9.1	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA356	ACH550–U0–06A9–4	2.4 HP 460V	HD56FE653	460	4	60Hz	1725	2.4	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	4.6	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA360	ACH550–U0–06A9–4	2.4 HP 575V	HD56FE577	575	3.4	60Hz	1725	2.4	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	3.9	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA352	ACH550–U0–06A9–4	2.9 HP 230V	HD58FE654	230	9.2	60Hz	1725	2.9	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	10.6	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA356	ACH550–U0–08A8–4	2.9 HP 460V	HD58FE654	460	4.6	60Hz	1725	2.9	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	5.3	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA353	ACH550–U0–012A–4	3.7 HP 230V	HD60FE656	230	11.2	60Hz	1725	3.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	12.9	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA357	ACH550–U0–03A9–6	3.7 HP 460V	HD60FE656	460	5.6	60Hz	1725	3.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	6.4	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA361	ACH550–U0–06A1–6	3.7 HP 575V	HD58FE577	575	4.2	60Hz	1725	3.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	4.8	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA354	ACH550–U0–09A0–6	5.3 HP 230V	HD60FK658	230	13	60Hz	1740	5.3	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	150	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA358	ACH550–U0–07A5–2	5.3 HP 460V	HD60FK658	460	6.4	60Hz	1740	5.3	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	7.4	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA362	ACH550–U0–02A7–6	5.3 HP 575V	HD60FE576	575	5.4	60Hz	1725	5.3	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	6.2	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec

Table 5 — SRT Unit VFD Parameters for Remote VFD Keypad — 50HC** 14

VFD Part Number	ABB Part Number	Description	Motor Part Number	Voltage (9905)	Nom Amps (9906)	Motor Nom Freq (9907)	Nom RPM (9908)	Nom HP (9909)	Const Speed Sel (1201)	Const Speed 1 (1202)	Const Speed 2 (1203)	Const Speed 3 (1204)	Relay Out 3 (1403)	Max Amps (2003)	Min Freq (2007)	Max Freq (2008)	Switch Freq (2606)	Start Fcn (2101)	Stop Fcn (2102)	Accel/ Decel (2201)	Accel (2202)	Decel (2203)
HK30WA352	ACH550–U0–012A–2	2.4 HP 230V	HD56FE653	230	7.9	60Hz	1725	2.4	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	9.1	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA356	ACH550–U0–012A–2	2.4 HP 460V	HD56FE653	460	4	60Hz	1725	2.4	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	4.6	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA360	ACH550–U0–017A–2	2.4 HP 575V	HD56FE577	575	3.4	60Hz	1725	2.4	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	3.9	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA352	ACH550–U0–024A–2	2.9 HP 230V	HD58FE654	230	9.2	60Hz	1725	2.9	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	10.6	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA356	ACH550–U0–024A–2	2.9 HP 460V	HD58FE654	460	4.6	60Hz	1725	2.9	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	5.3	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA353	ACH550–U0–06A9–4	3.7 HP 230V	HD60FE656	230	11.2	60Hz	1725	3.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	12.9	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA357	ACH550–U0–06A9–4	3.7 HP 460V	HD60FE656	460	5.6	60Hz	1725	3.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	6.4	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA361	ACH550–U0–08A8–4	3.7 HP 575V	HD58FE577	575	4.2	60Hz	1725	3.7	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	4.8	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA354	ACH550–U0–012A–4	5.0 HP 230V	HD60FL657	230	16.7	60Hz	1745	5	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	19.2	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA358	ACH550–U0–012A–4	5.0 HP 460V	HD60FL657	460	8.4	60Hz	1745	5	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	9.7	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA362	ACH550–U0–03A9–6	5.0 HP 575V	HD60FL575	575	5.1	60Hz	1725	5	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	5.9	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA354	ACH550–U0–06A1–6	5.0 HP 230V	HD60FK657	230	14.7	60Hz	1760	5	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	16.9	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA358	ACH550–U0–09A0–6	5.0 HP 460V	HD60FK657	460	6.8	60Hz	1760	5	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	7.8	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec
HK30WA362	ACH550–U0–09A0–6	5.0 HP 575V	HD60FL576	575	5.4	60Hz	1745	5	DI 2,3	40Hz	60Hz	60Hz	16 FLT/ Alarm	6.2	0Hz	60Hz	4kHz	Auto	Ramp	Not Sel	30 sec	30 sec

COOLING

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

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.

Condenser Coil

The condenser coil is fabricated with round tube copper hairpins and plate fins of various materials and/or coatings (see Model Number Nomenclature in Appendix A to identify the materials provided in this unit). The coil may be one-row or composite-type two-row. Composite two-row coils are two single-row coils fabricated with a single return bend end tubesheet.

Condenser Coil Maintenance and Cleaning Recommendation

Routine cleaning of coil surfaces is essential to maintain proper operation of the unit. Elimination of contamination and removal of harmful residues will greatly increase the life of the coil and extend the life of the unit. The following maintenance and cleaning procedures are recommended as part of the routine maintenance activities to extend the life of the coil.

REMOVE SURFACE LOADED FIBERS

Surface loaded fibers or dirt should be removed with a vacuum cleaner. If a vacuum cleaner is not available, a soft non-metallic bristle brush may be used. In either case, the tool should be applied in the direction of the fins. Coil surfaces can be easily damaged (fin edges can be easily bent over and damage to the coating of a protected coil) if the tool is applied across the fins.

NOTE: Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibers and dirt into the coil. This will make cleaning efforts more difficult. Surface loaded fibers must be completely removed prior to using low velocity clean water rinse.

PERIODIC CLEAN WATER RINSE

A periodic clean water rinse is very beneficial for coils that are applied in coastal or industrial environments. However, it is very important that the water rinse is made with a very low velocity water stream to avoid damaging the fin edges. Monthly cleaning as described below is recommended. Rinsing coils in the opposite direction of airflow is recommended.

ROUTINE CLEANING OF COIL SURFACES

Periodic cleaning with Totaline® environmentally balanced coil cleaner is essential to extend the life of coils. This cleaner is available from Replacement Components Division as part number P902-0301 for a one gallon container, and part number P902-0305 for a 5 gallon container. It is recommended that all coils, including standard aluminum, pre-coated, copper/copper or e-coated coils be cleaned with the Totaline environmentally balanced coil cleaner as described below. Coil cleaning should be part of the unit's regularly scheduled maintenance procedures to ensure long life of the coil. Failure to clean the coils may result in reduced durability in the environment.

Avoid use of:

- coil brighteners
- acid cleaning prior to painting
- high pressure washers
- poor quality water for cleaning

Totaline environmentally balanced coil cleaner is nonflammable, hypo-allergenic, non-bacterial, and a USDA accepted biodegradable agent that will not harm the coil or surrounding components such as electrical wiring, painted metal surfaces, or insulation. Use of non-recommended coil cleaners is strongly discouraged since coil and unit durability could be affected.

One-Row Coil

Wash coil with commercial coil cleaner. It is not necessary to remove top panel.

Two-Row Coils

Clean coil as follows:

1. Turn off unit power, tag disconnect.
2. Remove top panel screws on condenser end of unit.
3. Remove condenser coil corner post. See Fig. 19. To hold top panel open, place coil corner post between top panel and center post. See Fig. 20.

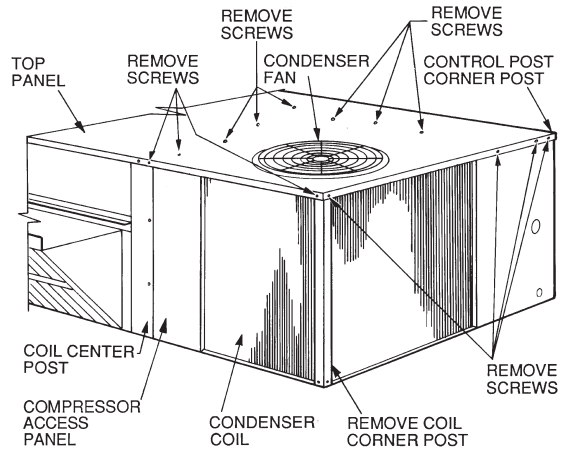


Fig. 19 — Cleaning Condenser Coil

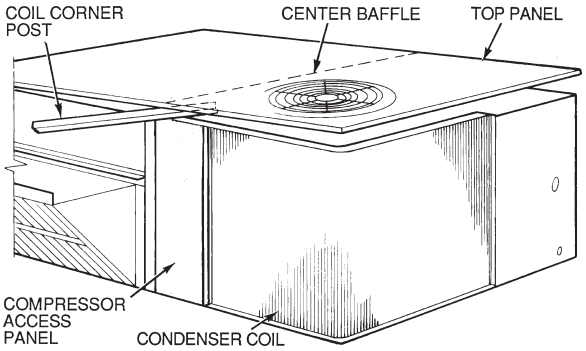


Fig. 20 — Cleaning Condenser Coil

4. Remove screws securing coil to compressor plate and compressor access panel.
5. Remove fastener holding coil sections together at return end of condenser coil. Carefully separate the outer coil section 3-in. to 4-in. from the inner coil section. See Fig. 21.
6. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.
7. Secure inner and outer coil rows together with a field-supplied fastener.
8. Reposition the outer coil section and remove the coil corner post from between the top panel and center post. Reinstall the coil corner post and replace all screws.

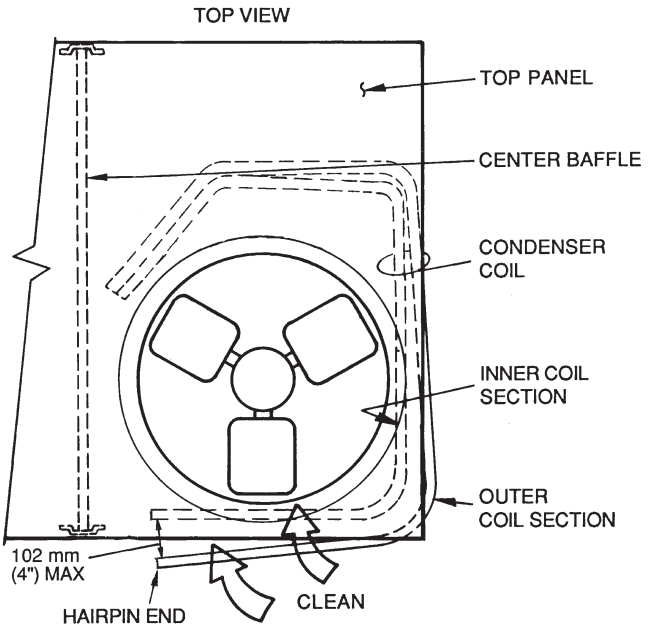


Fig. 21 — Separating Coil Sections

Totaline Environmentally Balanced Coil Cleaner Application Equipment

- $2^1/_2$ gallon garden sprayer
- Water rinse with low velocity spray nozzle

⚠CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in reduced unit performance or unit shutdown.

High velocity water from a pressure washer, garden hose, or compressed air should never be used to clean a coil. The force of the water or air jet will bend the fin edges and increase airside pressure drop.

⚠CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in accelerated corrosion of unit parts.

Harsh chemicals, household bleach or acid or basic cleaners should not be used to clean outdoor or indoor coils of any kind. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion at the fin/tube interface where dissimilar materials are in contact. If there is dirt below the surface of the coil, use the Totaline environmentally balanced coil cleaner.

Totaline Environmentally Balanced Coil Cleaner Application Instructions

1. Proper eye protection such as safety glasses is recommended during mixing and application.
2. Remove all surface loaded fibers and dirt with a vacuum cleaner as described above.
3. Thoroughly wet finned surfaces with clean water and a low velocity garden hose, being careful not to bend fins.
4. Mix Totaline environmentally balanced coil cleaner in a $2^1/_2$ gallon garden sprayer according to the instructions included with the cleaner. The optimum solution temperature is 100°F.

NOTE: Do NOT USE water in excess of 130°F, as the enzymatic activity will be destroyed.

5. Thoroughly apply Totaline environmentally balanced coil cleaner solution to all coil surfaces including finned area, tube sheets and coil headers.
6. Hold garden sprayer nozzle close to finned areas and apply cleaner with a vertical, up-and-down motion. Avoid spraying in horizontal pattern to minimize potential for fin damage.
7. Ensure cleaner thoroughly penetrates deep into finned areas. Interior and exterior finned areas must be thoroughly cleaned. Finned surfaces should remain wet with cleaning solution for 10 minutes. Ensure surfaces are not allowed to dry before rinsing. Reapply cleaner as needed to ensure 10 minute saturation is achieved.
8. Thoroughly rinse all surfaces with low velocity clean water using downward rinsing motion of water spray nozzle. Protect fins from damage from the spray nozzle.

Evaporator Coil

CLEANING THE EVAPORATOR COIL

1. Turn unit power off. Install lockout tag. Remove evaporator coil access panel.
2. If economizer or two-position damper is installed, remove economizer by disconnecting Molex plug and removing mounting screws.
3. Slide filters out of unit.
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, backflush toward return-air section to remove foreign material. Flush condensate pan after completion.
5. Reinstall economizer and filters.
6. Reconnect wiring.
7. Replace access panels.

THERMOSTATIC EXPANSION VALVE (TXV)

All 50HC units have a factory-installed nonadjustable thermostatic expansion valve (TXV). The TXV is a bi-flow, bleed port expansion valve with an external equalizer. The TXVs are specifically designed to operate with Puron® or R-22 refrigerant. Use only factory-authorized TXVs. Do not interchange Puron and R-22 TXVs.

TXV Operation

The TXV is a metering device that is used in air conditioning and heat pump systems to adjust to the changing load conditions by maintaining a preset superheat temperature at the outlet of the evaporator coil.

The volume of refrigerant metered through the valve seat is dependent upon the following:

1. Superheat temperature is sensed by cap tube sensing bulb on suction tube at outlet of evaporator coil. This temperature is converted into pressure by refrigerant in the bulb pushing downward on the diaphragm, which opens the valve using the push rods.
2. The suction pressure at the outlet of the evaporator coil is transferred through the external equalizer tube to the underside of the diaphragm.
3. The pin is spring loaded, which exerts pressure on the underside of the diaphragm. Therefore, the bulb pressure works against the spring pressure and evaporator suction pressure to open the valve. If the load increases, the temperature increases at the bulb, which increases the pressure on the top side of the diaphragm. This opens the valve and increases the flow of refrigerant. The increased refrigerant

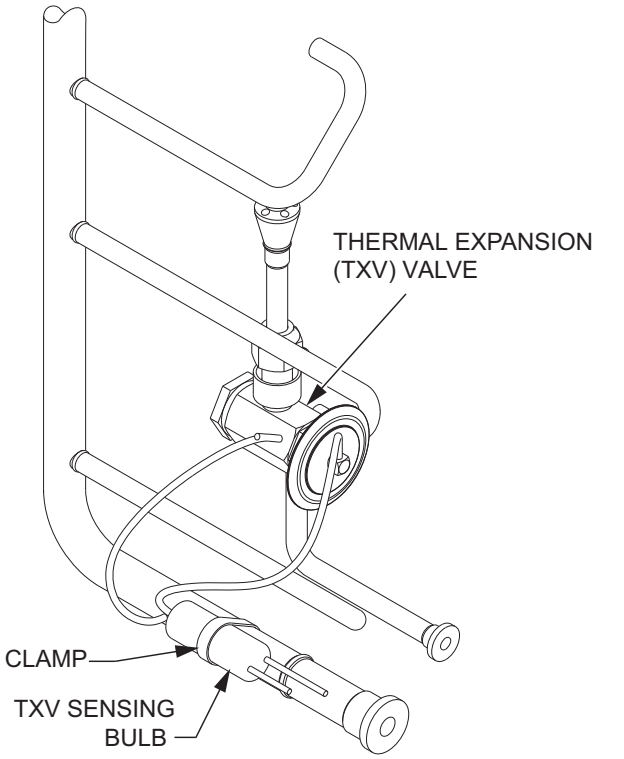
flow causes the leaving evaporator temperature to decrease. This lowers the pressure on the diaphragm and closes the pin. The refrigerant flow is effectively stabilized to the load demand with negligible change in superheat.

Replacing TXV

1. Recover refrigerant.
2. Remove TXV support clamp using a $^{5}/_{16}$-in. nut driver.
3. Remove TXV using a wrench and an additional wrench on connections to prevent damage to tubing.
4. Remove equalizer tube from suction line of coil. Use file or tubing cutter to cut brazed equalizer line approximately 2 inches above suction tube.
5. Remove bulb from vapor tube inside cabinet.
6. RInstall the new TXV using a wrench and an additional wrench on connections to prevent damage to tubing while attaching TXV to distributor.
7. Attach the equalizer tube to the suction line. If the coil has a mechanical connection, then use a wrench and an additional wrench on connections to prevent damage. If the coil has a brazed connection, use a file or a tubing cutter to remove the mechanical flare nut from the equalizer line. Then use a new coupling to braze the equalizer line to the stub (previous equalizer line) in suction line.
8. Attach TXV bulb in the same location where the original (in the sensing bulb indent) was when it was removed, using the supplied bulb clamps. See Fig. 22.
9. Route equalizer tube through suction connection opening (large hole) in fitting panel and install fitting panel in place.
10. Sweat the inlet of TXV marked “IN” to the liquid line. Avoid excessive heat which could damage the TXV valve. Use quenching cloth when applying heat anywhere on TXV.

Refrigerant System Pressure Access Ports

There are two access ports in the system: on the suction tube near the compressor and on the discharge tube near the compressor. These are brass fittings with black plastic caps. The hose connection fittings are standard $^{1}/_{4}$-in. SAE male flare couplings. The brass fittings are two-piece high flow valves, with a receptacle base brazed to the tubing and an integral spring-closed check valve core screwed into the base. See Fig. 23. This check valve is permanently assembled into this core body and cannot be serviced separately; replace the entire core body if necessary. Service tools are available from RCD that allow the replacement of the check valve core without having to recover the entire system refrigerant charge. Apply compressor refrigerant oil to the check valve core’s bottom o-ring. Install the fitting body with 96 ± 10 in.-lb (10.85 ± 1.1 Nm) of torque; do not over-tighten.



SENSING BULB INSULATION REMOVED FOR CLARITY

Fig. 22 — TXV Valve and Sensing Bulb Location

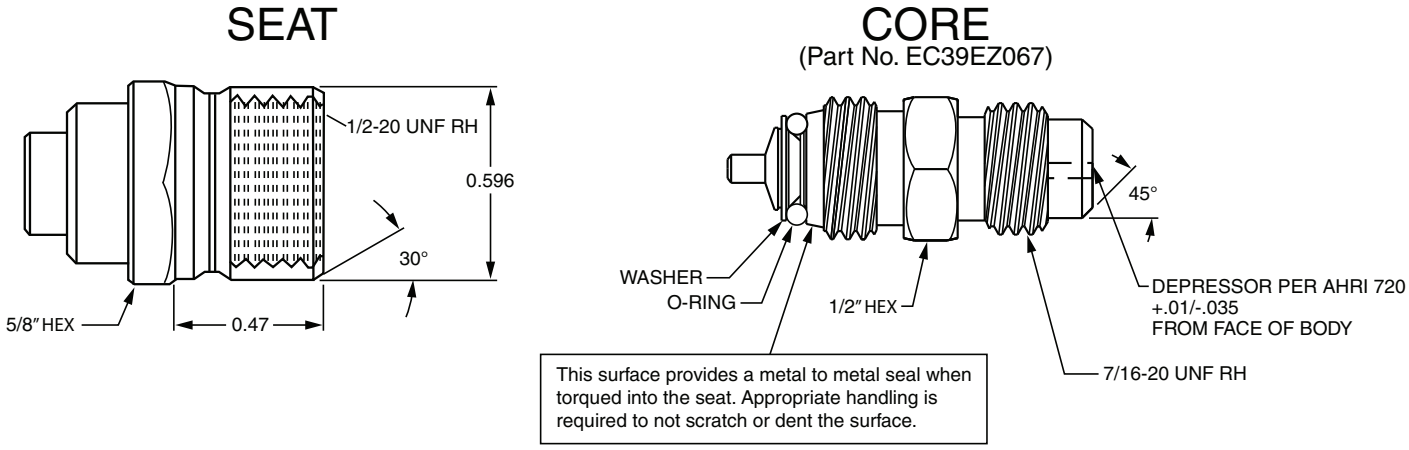


Fig. 23 — CoreMax[1] Access Port Assembly

1. CoreMax is a registered trademark of Fastest, Inc.

PURON® (R-410A) REFRIGERANT

This unit is designed for use with Puron (R-410A) refrigerant. Do not use any other refrigerant in this system.

Puron (R-410A) refrigerant is provided in pink (rose) colored cylinders. These cylinders are available with and without dip tubes; cylinders with dip tubes will have a label indicating this feature. For a cylinder with a dip tube, place the cylinder in the upright position (access valve at the top) when removing liquid refrigerant for charging. For a cylinder without a dip tube, invert the cylinder (access valve on the bottom) when removing liquid refrigerant.

Because Puron (R-410A) refrigerant is a blend, it is strongly recommended that refrigerant always be removed from the cylinder as a liquid. Admit liquid refrigerant into the system in the discharge line. If adding refrigerant into the suction line, use a commercial metering/expansion device at the gage manifold; remove liquid from the cylinder, pass it through the metering device at the gage set and then pass it into the suction line as a vapor. Do not remove Puron (R-410A) refrigerant from the cylinder as a vapor.

Refrigerant Charge

Amount of refrigerant charge is listed on the unit's nameplate. Refer to *Carrier GTAC2-5 Charging, Recovery, Recycling and Reclamation* training manual and the following procedures.

Unit panels must be in place when unit is operating during the charging procedure.

NO CHARGE

Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant.

LOW-CHARGE COOLING

Using Cooling Charging Charts, Fig. 24-32, vary refrigerant until the conditions of the appropriate chart are met. Note the charging charts are different from type normally used. Charts are based on charging the units to the correct sub-cooling for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the liquid line. Mount the temperature sensing device on the liquid line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor-air cfm must be within the normal operating range of the unit.

50HC SIZE DESIGNATION	NOMINAL TONS REFERENCE
04	3
05	4
06	5
07	6
08	7.5
09	8.5
12	10
14	12.5

EXAMPLE:

Model 50HC*A04

Outdoor Temperature . . . . . 85°F (29°C)

Suction Pressure. . . . . 140 psig (965 kPa)

Suction Temperature should be . . . . . 60°F (16°C)

USING COOLING CHARGING CHARTS

Take the outdoor ambient temperature and read the liquid pressure gage. Refer to chart to determine what liquid temperature should be. If liquid temperature is low, add refrigerant. If liquid temperature is high, carefully recover some of the charge. Recheck the liquid pressure as charge is adjusted.

COOLING CHARGING CHARTS

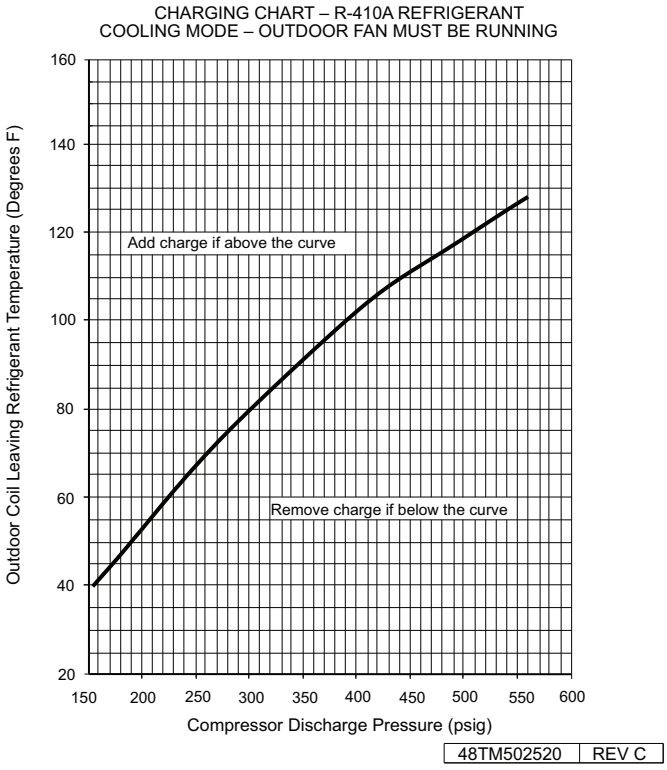


Fig. 24 — Cooling Charging Chart - 3 Ton

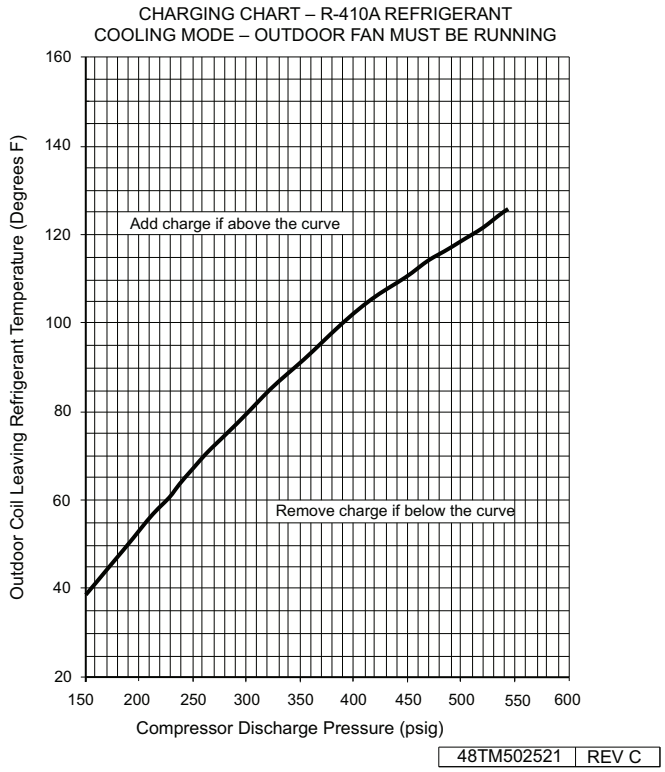
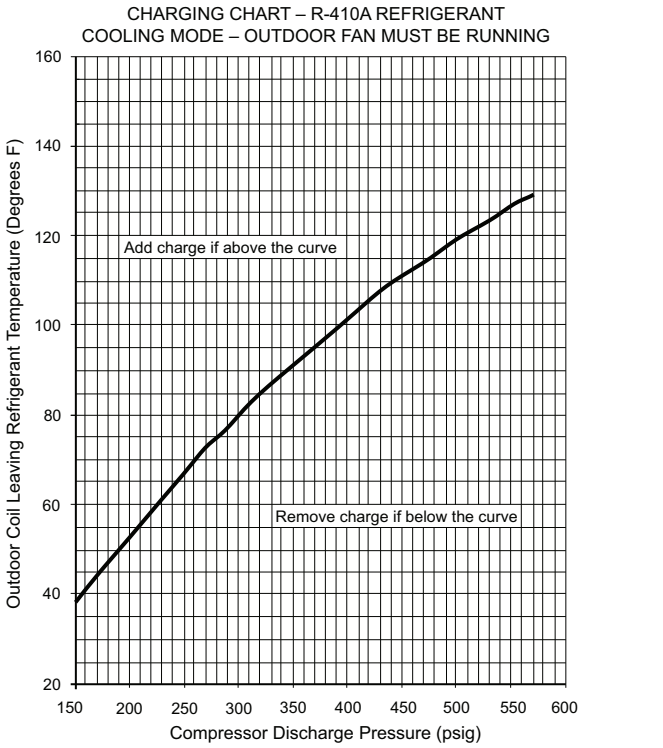
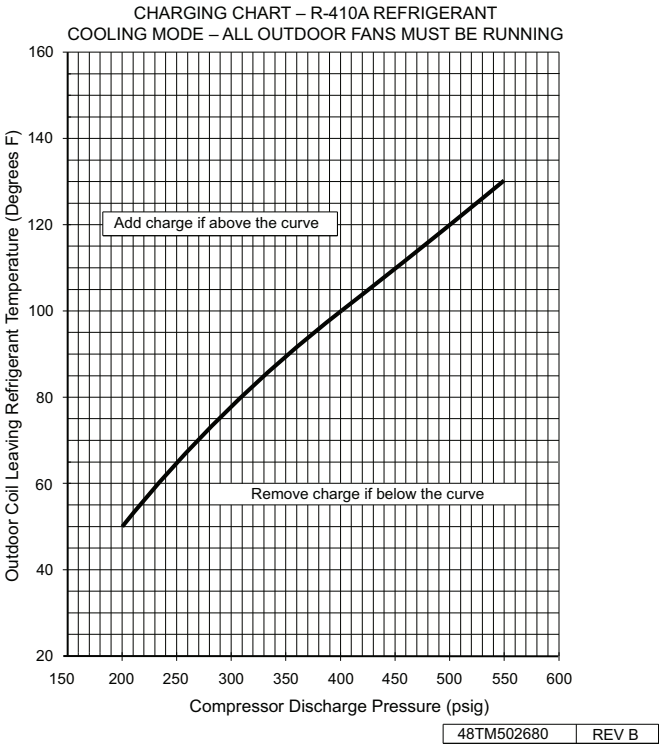


Fig. 25 — Cooling Charging Chart - 4 Ton



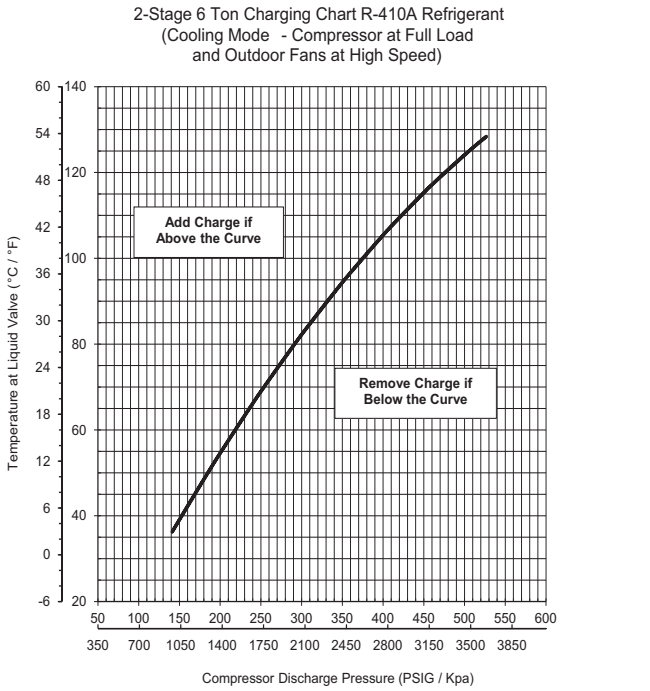
48TM502522 | REV C

Fig. 26 — Cooling Charging Chart - 5 Ton



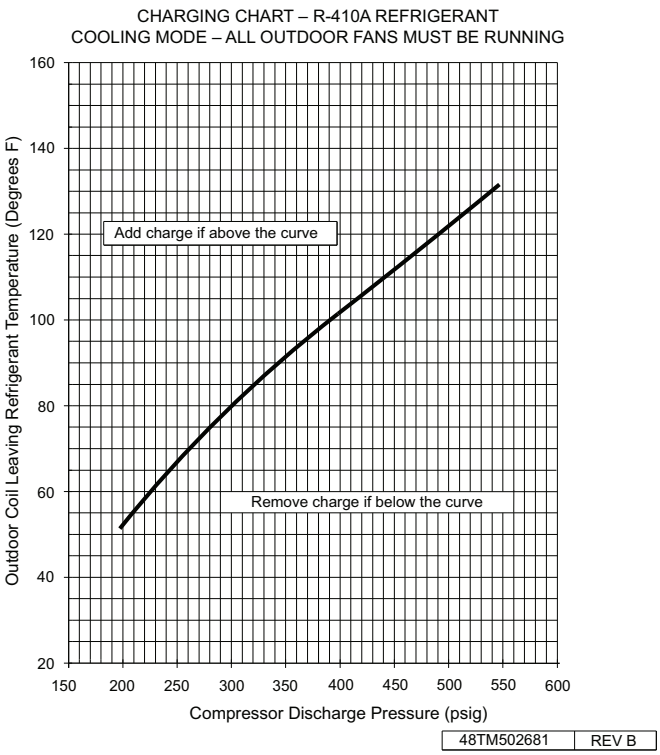
48TM502680 | REV B

Fig. 27 — Cooling Charging Chart - 6 Ton



48TM002738 | REV-

Fig. 28 — Cooling Charging Chart - 2 Stage 6 Ton



48TM502681 | REV B

Fig. 29 — Cooling Charging Chart - 7.5 Ton

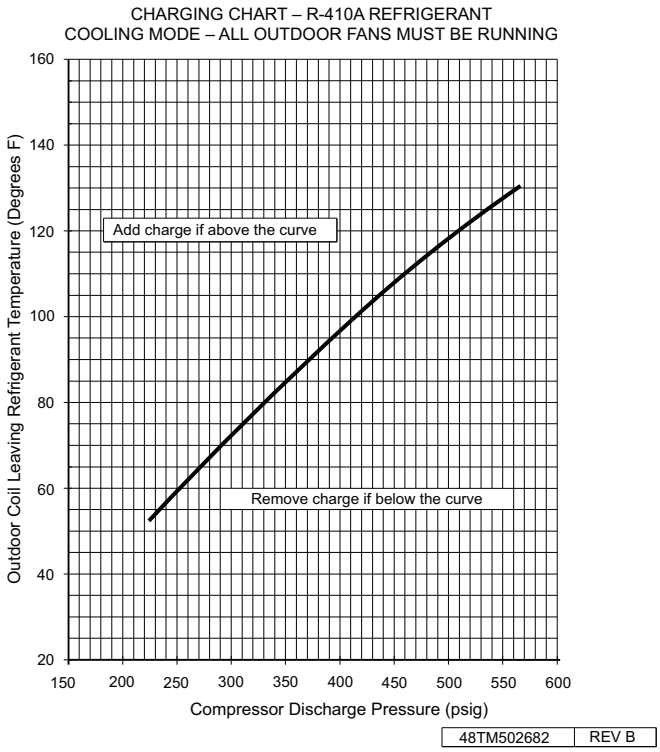


Fig. 30 — Cooling Charging Chart - 8.5 Ton

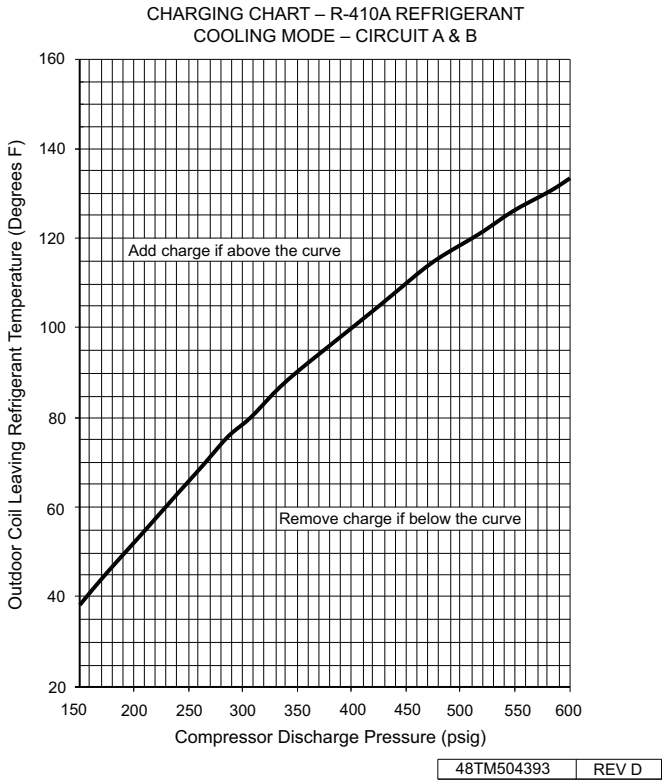


Fig. 31 — Cooling Charging Chart - 10 Ton

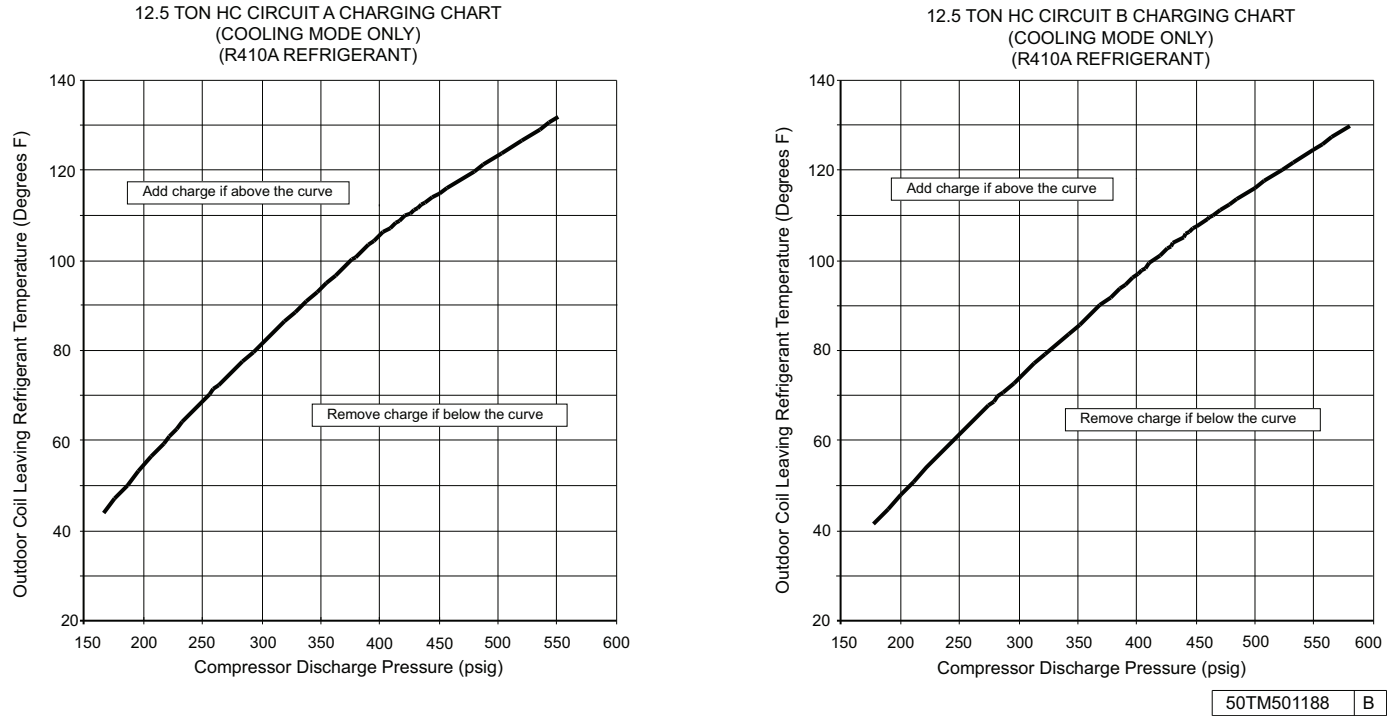


Fig. 32 — Cooling Charging Chart - 12.5 Ton - Circuit A and B

COMPRESSOR

Lubrication

The compressor is charged with the correct amount of oil at the factory.

⚠ CAUTION

UNIT DAMAGE HAZARD

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

The compressor is in a Puron® refrigerant system and uses a polyolester (POE) oil. This oil is extremely hygroscopic, meaning it absorbs water readily. POE oils can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Avoid exposure of the oil to the atmosphere.

⚠ WARNING

FIRE, EXPLOSION HAZARD

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

Never use air or gases containing oxygen for leak testing or for operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.

⚠ WARNING

FIRE, EXPLOSION HAZARD

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

Never use non-certified refrigerants in this product. Non-certified refrigerants could contain contaminates that could lead to unsafe operating conditions. Use ONLY refrigerants that conform to AHRI Standard 700.

Replacing Compressor

NOTE: Only factory-trained service technicians should remove and replace compressor units.

⚠ CAUTION

INSTALLATION SITE DAMAGE

Failure to follow this caution can result in damage to equipment location site.

Puron (R-410A) refrigerant contains polyolester (POE) oil that can damage the roof membrane. Caution should be taken to prevent POE oil from spilling onto the roof surface.

The factory also recommends that the suction and discharge lines be cut with a tubing cutter instead of using a torch to remove brazed fittings.

Compressor Rotation

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution can result in premature wear and damage to equipment.

Scroll compressors can only compress refrigerant if rotating in the right direction. Reverse rotation for extended times can result in internal damage to the compressor. Scroll compressors are sealed units and cannot be repaired on site location.

When the compressor is rotating in the wrong direction, the unit makes an elevated level of noise and does not provide cooling.

On 3-phase units with scroll compressors, it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

NOTE: If the suction pressure does not drop and the discharge pressure does not rise to normal levels, the evaporator fan is probably also rotating in the wrong direction.

4. Turn off power to the unit.
5. Reverse any two of the three unit power leads.
6. Reapply electrical power to the compressor. The suction pressure should drop and the discharge pressure should rise which is normal for scroll compressors on start-up.
7. Replace compressor if suction/discharge pressures are not within specifications for the specific compressor.

The suction and discharge pressure levels should now move to their normal start-up levels.

Filter Drier

Replace whenever refrigerant system is exposed to atmosphere. Only use factory specified liquid-line filter driers with working pressures no less than 650 psig. Do not install a suction-line filter drier in liquid line. A liquid-line filter drier designed for use with Puron refrigerant is required on every unit.

Condenser-Fan Adjustment

ALL UNITS

1. Shut off unit power supply. Install lockout tag.
2. Remove condenser-fan assembly (grille, motor, and fan).
3. Loosen fan hub setscrews.
4. Adjust fan height as shown in Fig. 33.
5. Tighten setscrews.
6. Replace condenser-fan assembly.

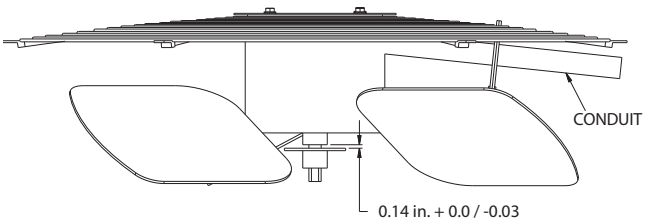


Fig. 33 — Condenser Fan Adjustment

See Fig. 34 for typical piping schematic.

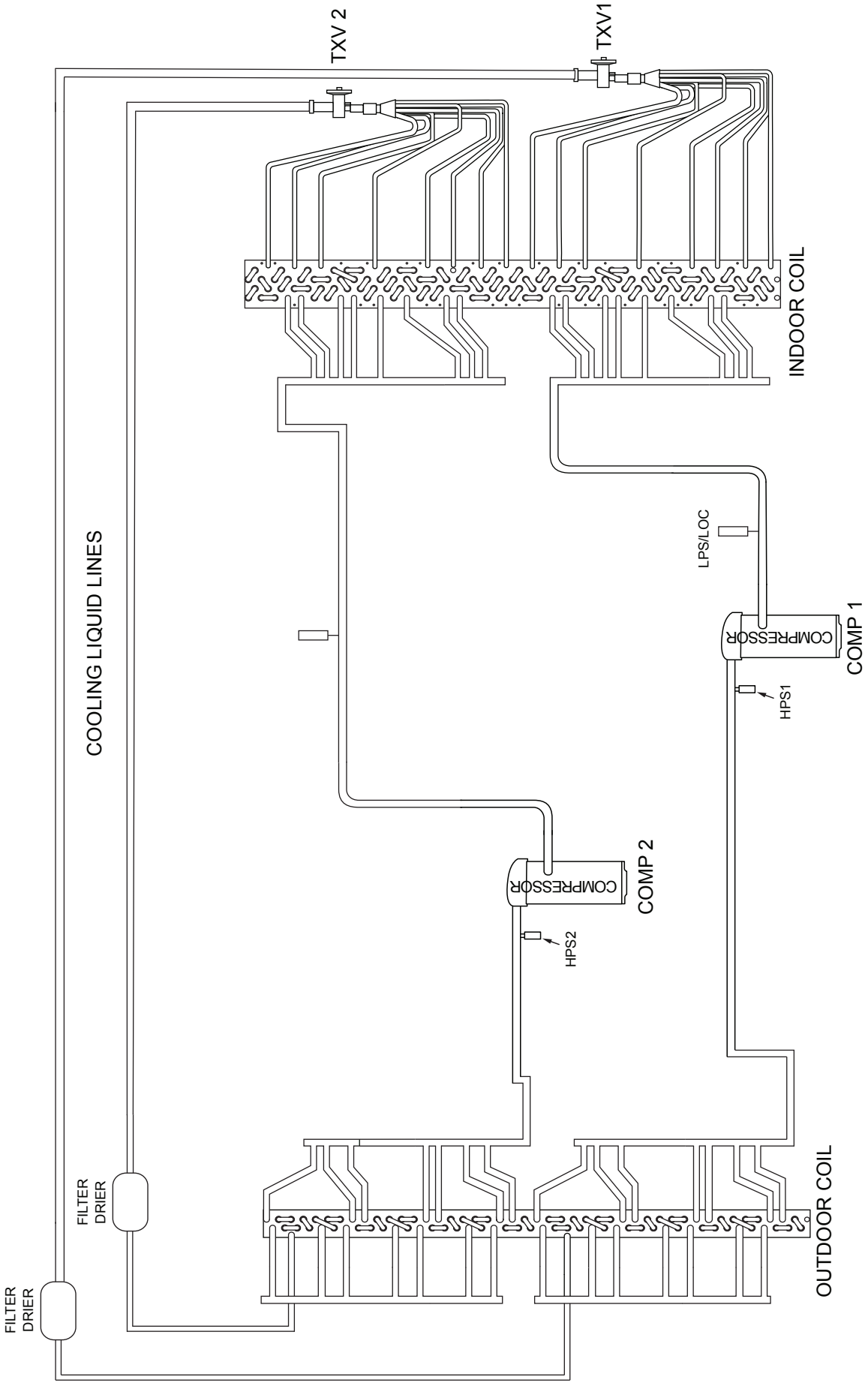


Fig. 34 — Typical Piping Schematic (Dual Circuit Unit Shown)

SIZE 11 UNITS WITH ECM CONDENSER FAN

1. Shut off unit power supply. Install lockout tag.
2. Remove grille.
3. Loosen fan hub setscrews.
4. Adjust fan height as shown in Fig. 35.
5. Tighten setscrews.
6. Replace grille.

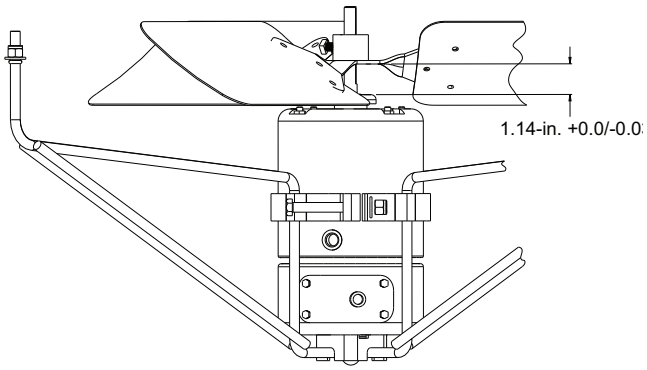


Fig. 35 — ECM Condenser Fan (Size 11)

CONVENIENCE OUTLETS

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

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

Convenience Outlets

Two types of convenience outlets are offered on 50HC models: non-powered and unit-powered. Both types provide a 125 vac ground-fault circuit-interrupt (GFCI) duplex receptacle rated at 15A behind a hinged waterproof access cover, located on the end panel of the unit. See Fig. 36.

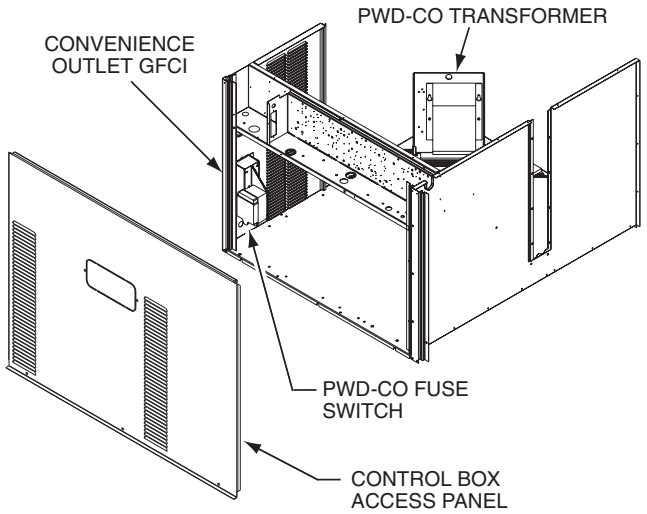


Fig. 36 — Convenience Outlet Location

Installing Weatherproof Cover

A weatherproof while-in-use cover for the factory installed convenience outlets is now required by UL standards. This cover cannot be factory-mounted due to its depth. The cover must be installed at unit installation. For shipment, the convenience outlet is covered with a blank cover plate.

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

NOTE: DISCONNECT ALL POWER TO UNIT AND CONVENIENCE OUTLET. Use approved lockout/tag-out procedures.

1. Remove the blank cover plate at the convenience outlet; discard the blank cover.
2. Loosen the two screws at the GFCI duplex outlet, until approximately $^1/_2$-in. (13 mm) under screw heads is exposed.
3. 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).
4. Mount the weatherproof cover to the backing plate as shown in Fig. 37.
5. Remove two slot fillers in the bottom of the cover to permit service tool cords to exit the cover.
6. Check cover installation for full closing and latching.

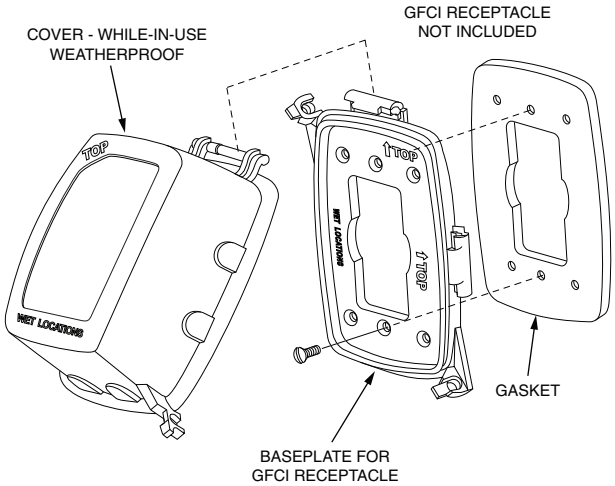


Fig. 37 — Weatherproof Cover Installation

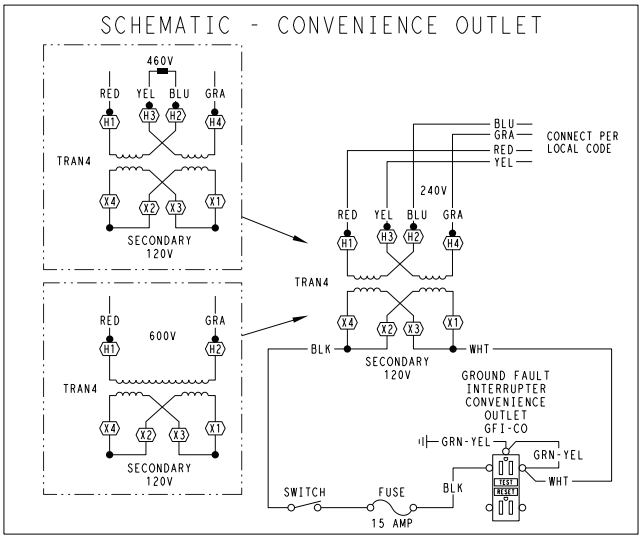
Non-Powered Type

This type requires the field installation of a general-purpose 125-v 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 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. 36.

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 a unit-mounted non-fused disconnect or Heating, Air Conditioning and Refrigeration (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. 38.



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

Fig. 38 — Powered Convenience Outlet Wiring

Duty Cycle

The unit-powered convenience outlet has a duty cycle limitation. The transformer is intended to provide power on an intermittent basis for service tools, lamps, etc; it is not intended to provide 15A loading for continuous duty loads (such as electric heaters for overnight use). Observe a 50% limit on circuit loading above 8A (i.e., limit loads exceeding 8A to 30 minutes of operation every hour).

Maintenance

Periodically test the GFCI receptacle by pressing the TEST button on the face of the receptacle. This should cause the internal circuit 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.

Fuse on Powered Type

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

USING UNIT-MOUNTED CONVENIENCE OUTLETS

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

1. Bussmann and Fusetron are trademarks of Cooper Technologies Company.

ELECTRIC HEATERS

The 50HC units can be equipped with field-installed accessory electric heaters. The heaters are modular in design, with heater frames holding open coil resistance wires strung through ceramic insulators and control contactor(s), using a combination of 24-v control side break/auto-reset or line-break/auto-reset limit switches and a pilot-circuit/manual reset limit switch to protect the unit against over-temperature situations. One or two heater modules can be used in a unit.

Heater modules are installed in the compartment below the indoor (supply) fan outlet. Access is through the indoor access panel. Heater modules slide into the compartment on tracks along the bottom of the heater opening. See Fig. 39-41.

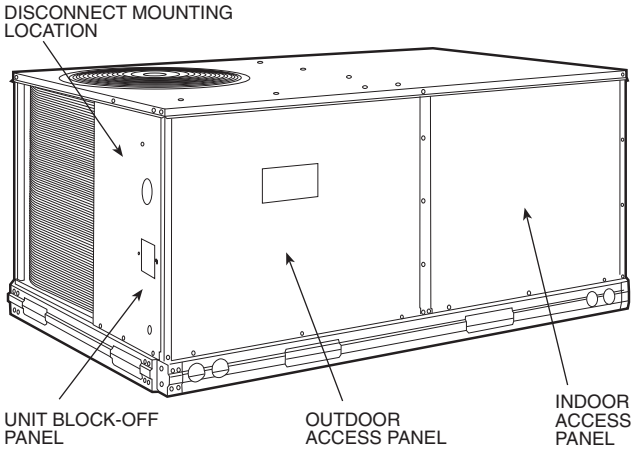


Fig. 39 — Typical Access Panel Location (3-6 Ton)

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

Unit heaters are marked with heater model numbers. However, heaters are ordered with and shipped in cartons marked with a corresponding heater sales package part number. See Table 6 for correlation between heater model number and sales package part number.

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

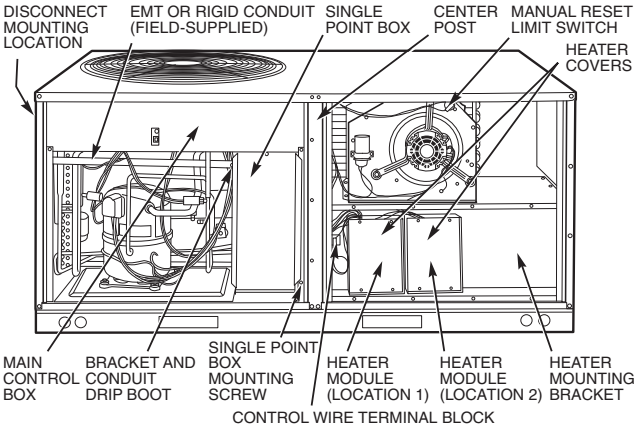


Fig. 40 — Typical Component Location

Table 6 — Heater Model Number

Bare Heater Model Number	C	R	H	E	A	T	E	R	0	0	1	A		
Heater Sales Package PNO Includes: Bare Heater Carton and Packing Materials Installation Sheet	C	R	H	E	A	T	E	R	1	0	1	A or B	0	0

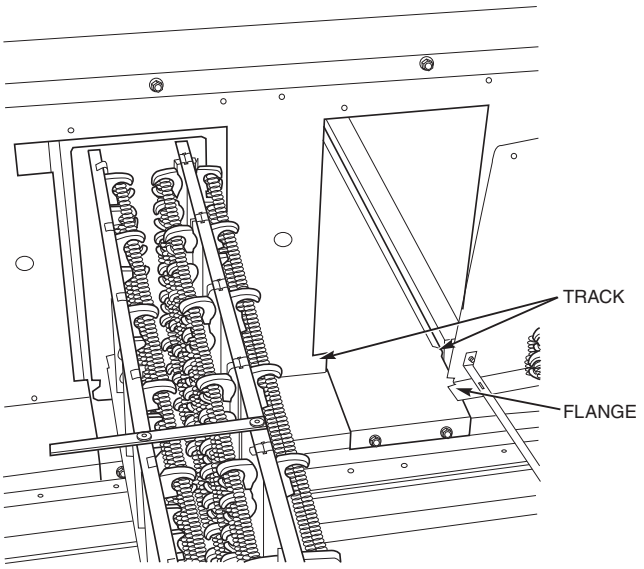


Fig. 41 — Typical Module Installation

SINGLE POINT BOXES AND SUPPLEMENTARY FUSES

When the unit MOCP device value exceeds 60A, unit-mounted supplementary fuses are required for each heater circuit. These fuses are included in accessory single point boxes, with power distribution and fuse blocks. The single point box will be installed directly under the unit control box, just to the left of the partition separating the indoor section (with electric heaters) from the outdoor section. The single point box has a hinged access cover. See Fig. 42.

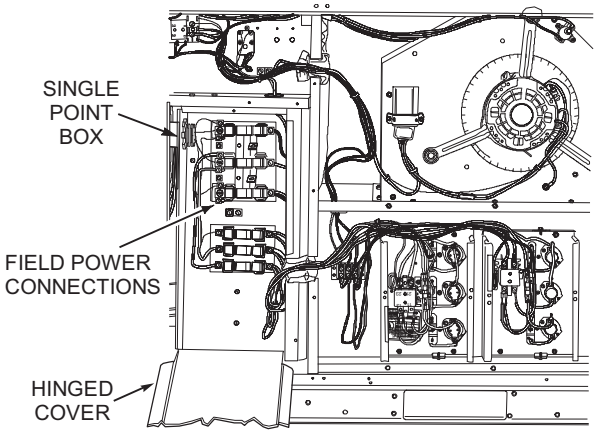


Fig. 42 — Typical Single Point Installation

On 50HC units, all fuses are 60A. Single point boxes containing fuses for 208/230-v applications use UL Class RK5 250-v fuses (Bussmann FRNR 60 or Shawmut TR 60R). Single point boxes for 460-v and 575-v applications use UL Class T 600-v fuses (Bussmann JJS 60 or Shawmut A6T 60). (Note that all heaters are qualified for use with a 60A fuse, regardless of actual heater ampacity, so only 60A fuses are necessary.)

On 07-09 size units, unit heater applications not requiring supplemental fuses require a special single point box without any fuses. Connect power supply conductors to heater conductors and field-supplied base unit power tap leads (see Completing Heater Installation section) inside the empty single point box using UL-approved connectors.

SAFETY DEVICES

Electric heater applications other than CRHEATER113B00-116B00, 128B00, and 129B00 use a combination of 24-v control side break/auto-reset or line-break/auto-reset limit switches and a pilot-circuit/manual reset limit switch to protect the unit against over-temperature situations.

CRHEATER113B00-116B00, 128B00, and 129B00 electric heater applications use a combination of 24-v control side break/auto-reset, line-break/non-resettable "one shot" limit switches and a pilot-circuit/manual reset limit switch to protect the unit against over-temperature situations.

Line-break/auto-reset limit switches, 24-v control side break/auto-reset and line-break/non-resettable "one shot" limit switches are mounted on the base plate of each heater module. See Fig. 43. These are accessed through the indoor access panel. Remove the switch by removing two screws into the base plate and extracting the existing switch.

Pilot-circuit/manual reset limit switch is located in the side plate of the indoor (supply) fan housing. See Fig. 43.

Completing Heater Installation

FIELD POWER CONNECTIONS

Tap conductors must be installed between the base unit's field power connection lugs and the single point box (with or without fuses). See Fig. 38. Refer to unit wiring schematic. Use copper wire only. For connection using the single point box without fuses, connect the field power supply conductors to the heater power leads and the field-supplied tap conductors inside the single point box. Use UL-approved pressure connectors (field-supplied) for these splice joints.

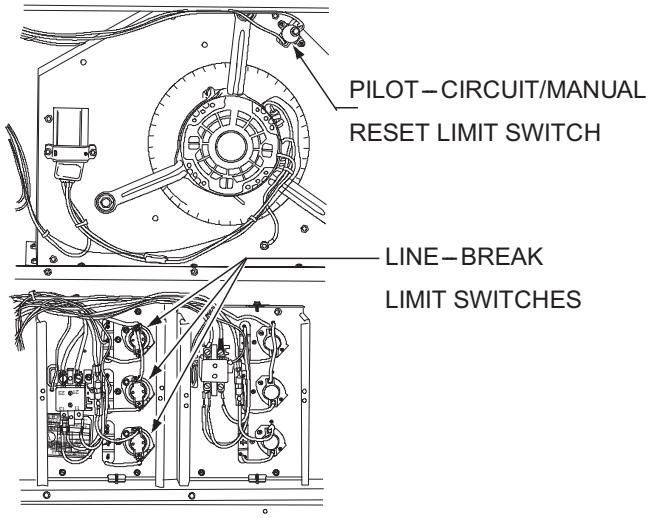


Fig. 43 — Typical Location of Heater Limit Switches (3-phase heater shown)

LOW-VOLTAGE CONTROL CONNECTIONS (ALL EXCEPT CRHEATER128B00-129B00)

Pull the low-voltage control leads from the heater module(s) — VIO and BRN (two of each if two modules are installed; identify for module no. 1) — to the 4-pole terminal board TB4 located on the heater bulkhead to the left of heater 1. Connect the VIO lead from heater to terminal TB4-1. Connect the VIO lead from heater 2 to terminal TB4-2. Connect both BRN leads to terminal TB4-3. See Fig. 44.

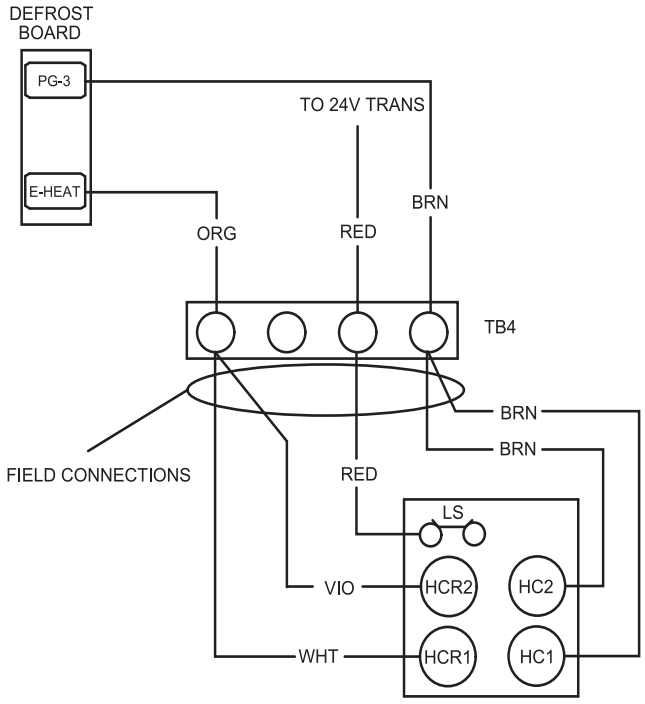


Fig. 44 — Accessory Electric Heater Control Connections (HP-2, Size 06, 575V Only)

LOW-VOLTAGE CONTROL CONNECTIONS (CRHEATER 128B00-129B00)

Pull the low-voltage control leads from the heater module(s) — ORN, VIO and BRN — to the 4-pole terminal board TB4 located on the heater bulkhead to the left of heater 1. Connect the ORN lead to terminal TB4-1. Connect the VIO lead to terminal TB4-2. Connect the BRN lead to terminal TB4-3. See Fig. 45.

The 50HC units use a various number of control wires, colors, and terminal boards depending on voltage and unit size. See Fig. 46-48 and the unit wiring diagram for proper placement.

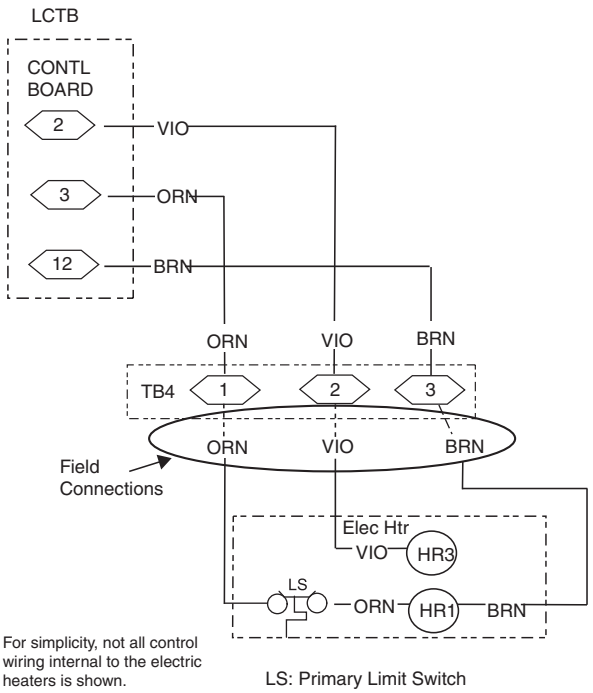


Fig. 45 — Accessory Electric Heater Control Connections (AC-1 Size 08-14, AC-2 Size 08-12) (CRHEATER128B00, 129B00 only)

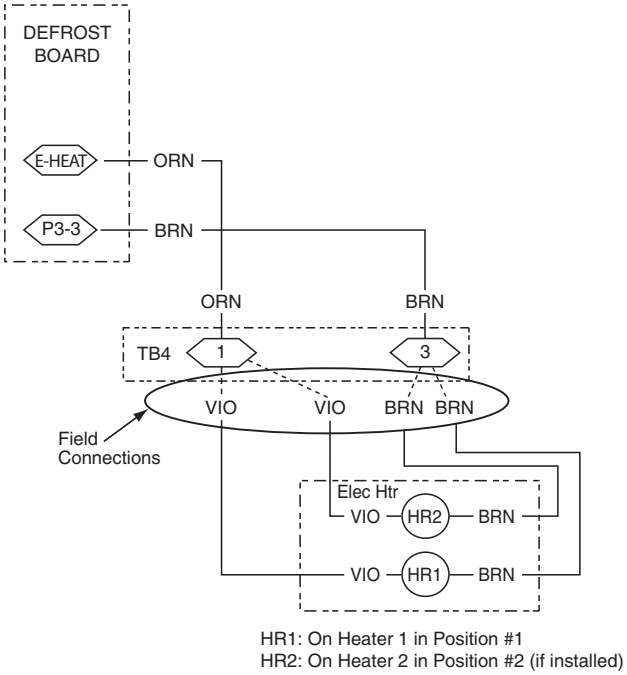


Fig. 46 — Accessory Electric Heater Control Connections (HP-1 Except Size 12 and 121, HP-2 Except Size 12)

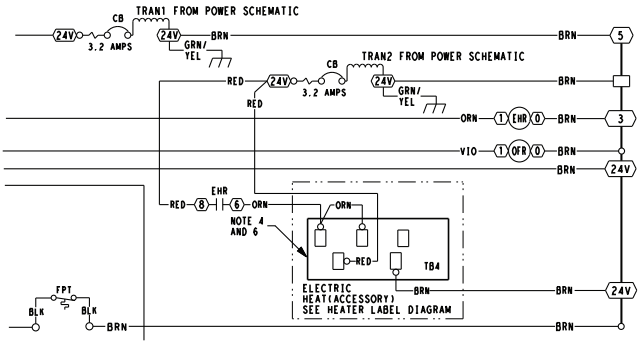


Fig. 47 — TB4 Wiring (HP Only)

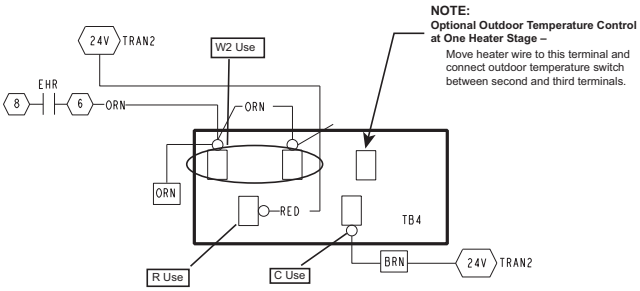


Fig. 48 — TB4 Terminal Use (HP Only)

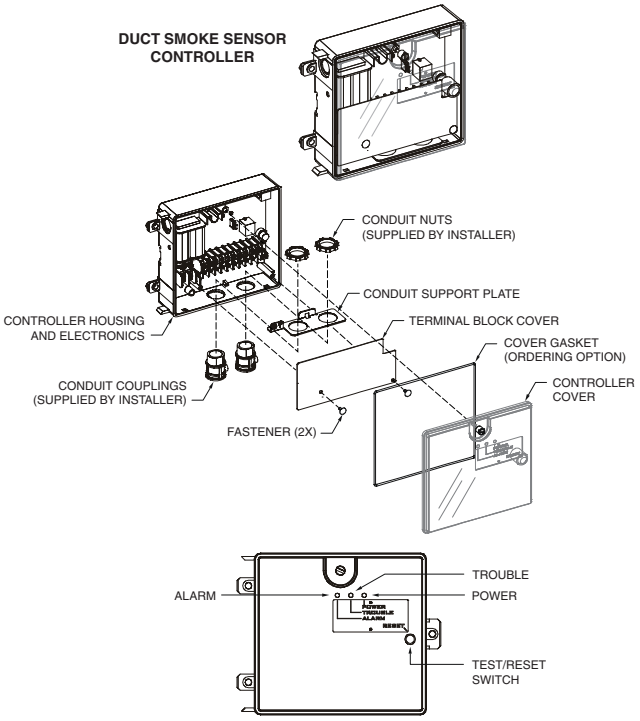


Fig. 49 — Controller Assembly

SMOKE DETECTORS

Smoke detectors are available as factory-installed options on 50HC models. Smoke detectors may be specified for supply air only, for return air without or with economizer, or in combination of supply air and return air. Return air smoke detectors are arranged for vertical return configurations only. All components necessary for operation are factory-provided and mounted. The unit is factory-configured for immediate smoke detector shutdown operation; additional wiring or modifications to unit terminal board may be necessary to complete the unit and smoke detector configuration to meet project requirements.

System

The smoke detector system consists of a four-wire controller and one or two sensors. Its primary function is to shut down the rooftop unit in order to prevent smoke from circulating throughout the building. It is not to be used as a life saving device.

Controller

The controller (see Fig. 49) includes a controller housing, a printed circuit board, and a clear plastic cover. The controller can be connected to one or two compatible duct smoke sensors. The clear plastic cover is secured to the housing with a single captive screw for easy access to the wiring terminals. The controller has three LEDs (for Power, Trouble and Alarm) and a manual test/reset button (on the cover face).

Smoke Detector Sensor

The smoke detector sensor (see Fig. 50) includes a plastic housing, a printed circuit board, a clear plastic cover, a sampling tube inlet and an exhaust tube. The sampling tube (when used) and exhaust tube are attached during installation. The sampling tube varies in length depending on the size of the rooftop unit. The clear plastic cover permits visual inspections without having to disassemble the sensor. The cover attaches to the sensor housing using four captive screws and forms an airtight chamber around the sensing electronics. Each sensor includes a harness with an RJ45 terminal for connecting to the controller. Each sensor has four LEDs (for Power, Trouble, Alarm and Dirty) and a manual test/reset button (on the left-side of the housing).

Air is introduced to the duct smoke detector sensor's sensing chamber through a sampling tube that extends into the HVAC duct and is directed back into the ventilation system through a (shorter) exhaust tube.

The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the sensor signals an alarm state and the controller automatically takes the appropriate action to shut down fans and blowers, change over air handling systems, notify the fire alarm control panel, etc.

The sensor uses a process called differential sensing to prevent gradual environmental changes from triggering false alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the sensor to signal an alarm state but dust and debris accumulated over time does not.

The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the sensor signals an alarm state and the controller automatically takes the appropriate action to shut down fans and blowers, change over air handling systems, notify the fire alarm control panel, etc.

For installations using two sensors, the duct smoke detector does not differentiate which sensor signals an alarm or trouble condition.

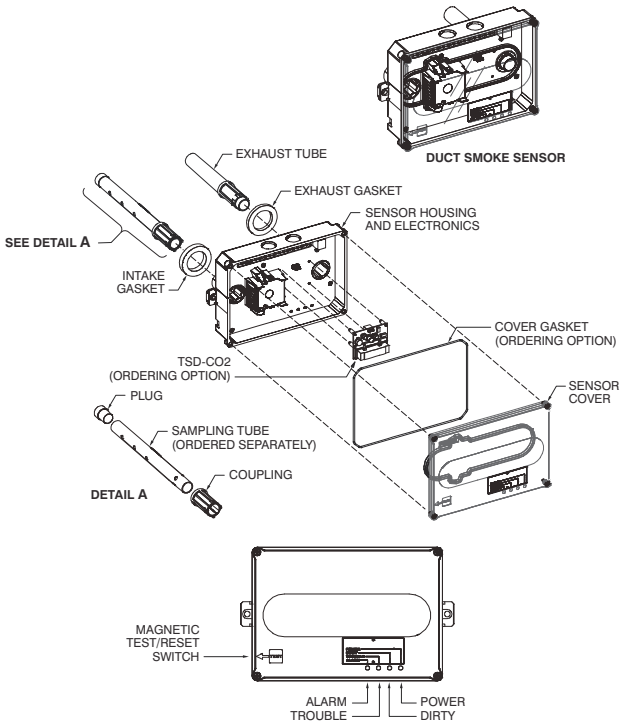


Fig. 50 — Smoke Detector Sensor

Smoke Detector Locations

SUPPLY AIR

The supply air smoke detector sensor is located to the left of the unit's indoor (supply) fan. See Fig. 51. Access is through the fan access panel. There is no sampling tube used at this location. The sampling tube inlet extends through the side plate of the fan housing (into a high pressure area). The controller is located on a bracket to the right of the return filter, accessed through the lift-off filter panel.

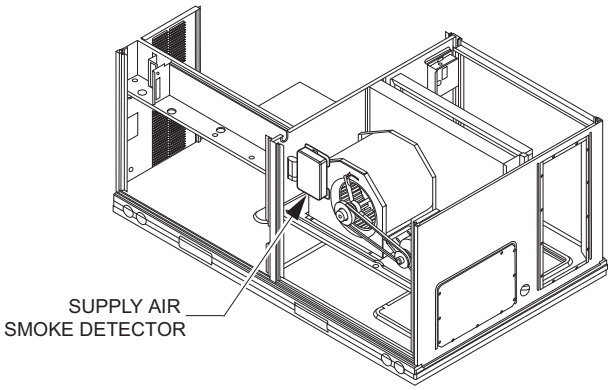


Fig. 51 — Typical Supply Air Smoke Detector Sensor Location

RETURN AIR SMOKE DETECTOR SENSOR WITHOUT ECONOMIZER

The sampling tube is located across the return air opening on the unit basepan. See Fig. 52. The holes in the sampling tube face downward, into the return air stream. The sampling tube is connected through tubing to the return air sensor that is mounted on a bracket high on the partition between return filter and controller location. The sensor is shipped in a flat-mounting location. Installation requires that this sensor be relocated to its operating location and the tubing to the sampling tube be connected. See installation steps.

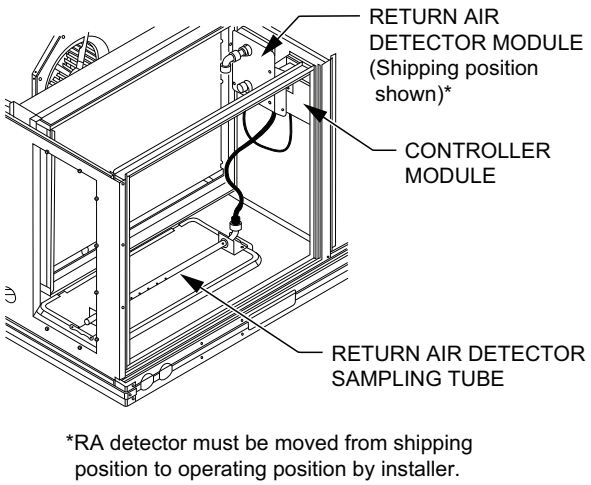


Fig. 52 — Typical Return Air Smoke Detector Location

RETURN AIR SMOKE DETECTOR SENSOR WITH ECONOMIZER

The sampling tube is inserted through the side plates of the economizer housing, placing it across the return air opening on the unit basepan. See Fig. 53. The holes in the sampling tube face downward, into the return air stream. The sampling tube is connected using tubing to the return air sensor mounted on a bracket high on the partition between return filter and controller location. The sensor is shipped in a flat-mounting location. Installation requires the sensor be relocated to its operating location and the tubing to the sampling tube be connected. See installation steps below.

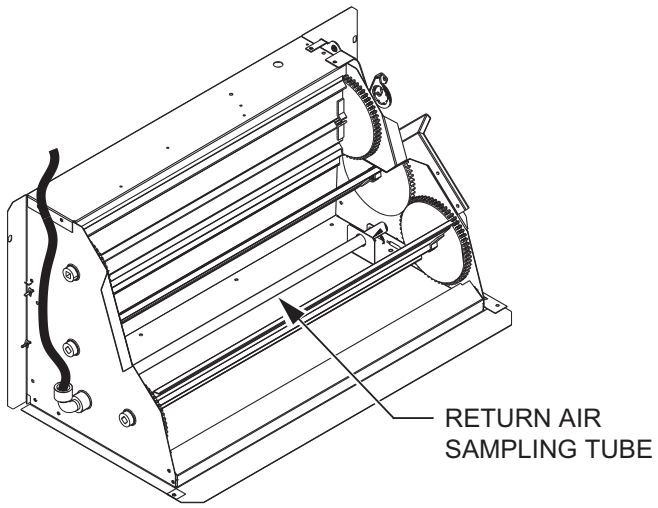


Fig. 53 — Return Air Sampling Tube Location (View reoriented to show opposite side for clarity)

Completing Installation of Return Air Smoke Detector

Use the following steps to complete the installation of the return air smoke detector.

1. Unscrew the two screws holding the return air sensor detector plate. See Fig. 54. Save the screws.
2. Remove the return air smoke sensor module and its detector plate.
3. Rotate the detector plate so the sensor is facing outwards and the sampling tube connection is on the bottom. See Fig. 55.
4. Screw the sensor and detector plate into its operating position using screws from Step 1. Ensure the sampling tube connection is on the bottom and the exhaust tube is on the top.

5. Connect the flexible tube on the sampling inlet to the sampling tube on the basepan.
6. For units with an economizer, the sampling tube is integrated into the economizer housing but connecting the flexible tubing to the sampling tube is the same.

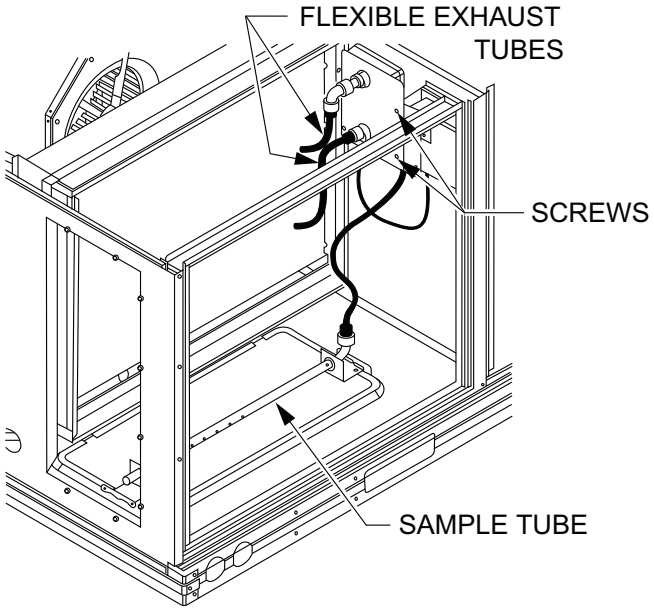


Fig. 54 — Return Air Smoke Detector Module Shipping Position

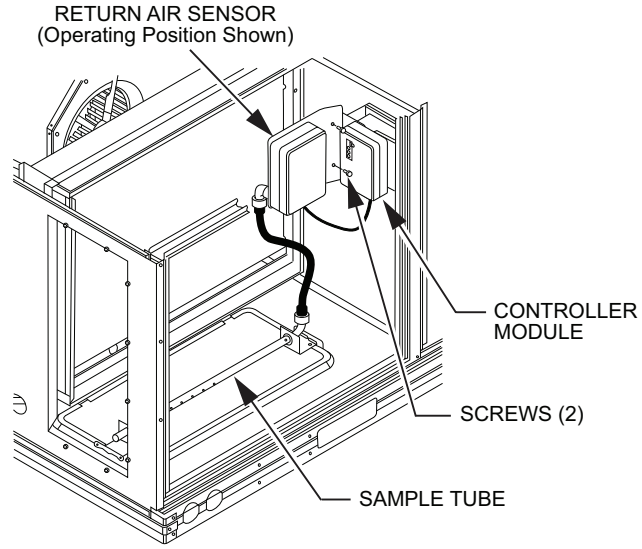


Fig. 55 — Return Air Sensor Operating Position

FIOP Smoke Detector Wiring and Response

ALL UNITS

The FIOP smoke detector is configured to automatically shut down all unit operations when a smoke condition is detected. See Fig. 56, Smoke Detector Wiring.

HIGHLIGHT A

JMP 3 is factory-cut, transferring unit control to smoke detector.

HIGHLIGHT B

Smoke detector NC contact set will open on smoke alarm condition, de-energizing the ORN conductor.

HIGHLIGHT C

24-v power signal using the ORN lead is removed at the smoke detector input on CTB; all unit operations cease immediately.

PREMIERLINK™ AND RTU-OPEN CONTROLS

Unit operating functions (fan, cooling and heating) are terminated as described above. In addition:

HIGHLIGHT D

On smoke alarm condition, the smoke detector NO Alarm contact will close, supplying 24-v power to GRA conductor.

HIGHLIGHT E

GRA lead at Smoke Alarm input on CTB provides 24-v signal to FIOP DDC control.

PREMIERLINK

This signal is conveyed to PremierLink FIOP's TB1 at terminal TB1-6 (BLU lead). This signal initiates the FSD sequence by the PremierLink control. FSD status is reported to connected CCN network.

RTU-OPEN

The 24-v signal is conveyed to RTU-OPEN-J1-10 input terminal. This signal initiates the FSD sequence by the RTU-OPEN control. FSD status is reported to connected BAS network.

USING REMOTE LOGIC

Five conductors are provided for field use (see Highlight F in Fig. 56) for additional annunciation functions.

ADDITIONAL APPLICATION DATA

Refer to *Factory-Installed Smoke Detectors for Small and Medium Rooftop Units 2 to 25 Tons* for discussions on additional control features of these smoke detectors including multiple unit coordination. See Fig. 56.

SENSOR AND CONTROLLER TESTS

Sensor Alarm Test

The sensor alarm test checks a sensor's ability to signal an alarm state. This test requires the use of a field provided SD-MAG test magnet.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
This test places the duct detector into the alarm state. Unless part of the test, disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

SENSOR ALARM TEST PROCEDURE

1. Hold the test magnet where indicated on the side of the sensor housing for seven seconds.
2. Verify that the sensor's Alarm LED turns on.
3. Reset the sensor by holding the test magnet against the sensor housing for two seconds.
4. Verify that the sensor's Alarm LED turns off.

Controller Alarm Test

The controller alarm test checks the controller's ability to initiate and indicate an alarm state.

CONTROLLER ALARM TEST PROCEDURE

1. Press the controller's test/reset switch for seven seconds.
2. Verify that the controller's Alarm LED turns on.
3. Reset the sensor by pressing the test/reset switch for two seconds.
4. Verify that the controller's Alarm LED turns off.

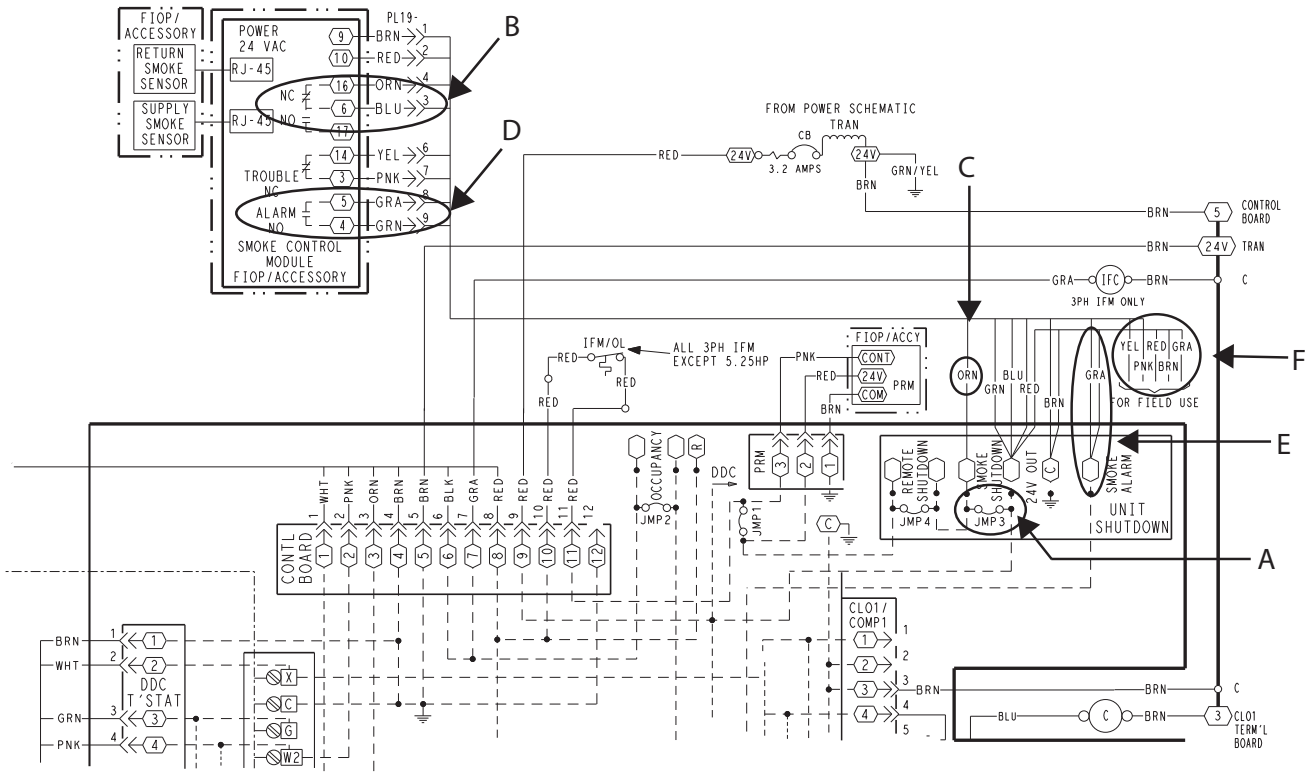


Fig. 56 — Typical Smoke Detector System Wiring

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
This test places the duct detector into the alarm state. Unless part of the test, disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

Dirty Controller Test

The dirty controller test checks the controller's ability to initiate a dirty sensor test and indicate its results.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
Pressing the controller's test/reset switch for longer than seven seconds will put the duct detector into the alarm state and activate all automatic alarm responses.

DIRTY CONTROLLER TEST PROCEDURE

1. Press the controller's test/reset switch for two seconds.
2. Verify that the controller's Trouble LED flashes.

Dirty Sensor Test

The dirty sensor test provides an indication of the sensor's ability to compensate for gradual environmental changes. A sensor that can no longer compensate for environmental changes is considered 100% dirty and requires cleaning or replacing. A field provided SD-MAG test magnet must be used to initiate a sensor dirty test. The sensor's Dirty LED indicates the results of the dirty test as shown in Table 7.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
Holding the test magnet against the sensor housing for more than seven seconds will put the duct detector into the alarm state and activate all automatic alarm responses.

Table 7 — Dirty LED Test

FLASHES	DESCRIPTION
1	0-25% dirty. (Typical of a newly installed detector)
2	25-50% dirty
3	51-75% dirty
4	76-99% dirty

DIRTY SENSOR TEST PROCEDURE

1. Hold the test magnet where indicated on the side of the sensor housing for two seconds.
2. Verify that the sensor's Dirty LED flashes.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
Changing the dirty sensor test operation will put the detector into the alarm state and activate all automatic alarm responses. Before changing dirty sensor test operation, disconnect all auxiliary equipment from the controller and notify the proper authorities if connected to a fire alarm system.

Changing the Dirty Sensor Test

By default, sensor dirty test results are indicated by:

- The sensor's Dirty LED flashing.
- The controller's Trouble LED flashing.
- The controller's supervision relay contacts toggle.

The operation of a sensor's dirty test can be changed so that the controller's supervision relay is not used to indicate test results. When two detectors are connected to a controller, sensor dirty test operation on both sensors must be configured to operate in the same manner.

TO CONFIGURE THE DIRTY SENSOR TEST OPERATION

1. Hold the test magnet where indicated on the side of the sensor housing until the sensor's Alarm LED turns on and its Dirty LED flashes twice (approximately 60 seconds).

2. Reset the sensor by removing the test magnet then holding it against the sensor housing again until the sensor's Alarm LED turns off (approximately 2 seconds).

Remote Station Test

The remote station alarm test checks a test/reset station's ability to initiate and indicate an alarm state.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
This test places the duct detector into the alarm state. Unless part of the test, disconnect all auxiliary equipment from the controller before performing the test. If the duct detector is connected to a fire alarm system, notify the proper authorities before performing the test.

SD-TRK4 Remote Alarm Test Procedure

1. Turn the key switch to the RESET/TEST position for seven seconds.
2. Verify that the test/reset station's Alarm LED turns on.
3. Reset the sensor by turning the key switch to the RESET/TEST position for two seconds.
4. Verify that the test/reset station's Alarm LED turns off.

Remote Test/Reset Station Dirty Sensor Test

The test/reset station dirty sensor test checks the test/reset station's ability to initiate a sensor dirty test and indicate the results. It must be wired to the controller as shown in Fig. 57 and configured to operate the controller's supervision relay. For more information, see "Changing sensor dirty test operation."

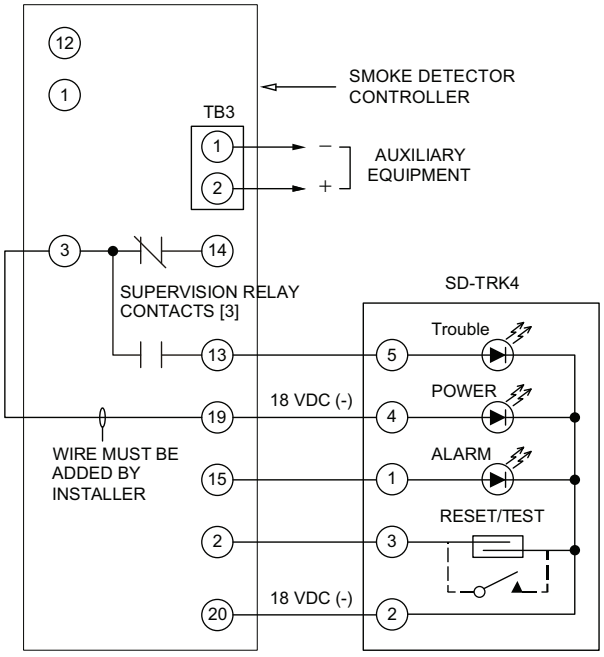


Fig. 57 — Remote Test/Reset Station Connections

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
If the test/reset station's key switch is left in the RESET/TEST position for longer than seven seconds, the detector will automatically go into the alarm state and activate all automatic alarm responses.

IMPORTANT: Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
Holding the test magnet to the target area for longer than seven seconds will put the detector into the alarm state and activate all automatic alarm responses.

Dirty Sensor Test Using an SD-TRK4

1. Turn the key switch to the RESET/TEST position for two seconds.
2. Verify that the test/reset station's Trouble LED flashes.

Detector Cleaning

CLEANING THE SMOKE DETECTOR

Clean the duct smoke sensor when the Dirty LED is flashing continuously or sooner, if conditions warrant.

IMPORTANT: OPERATIONAL TEST ALERT
Failure to follow this ALERT can result in an unnecessary evacuation of the facility.
If the smoke detector is connected to a fire alarm system, first notify the proper authorities that the detector is undergoing maintenance then disable the relevant circuit to avoid generating a false alarm.

1. Disconnect power from the duct detector then remove the sensor's cover. See Fig. 58.

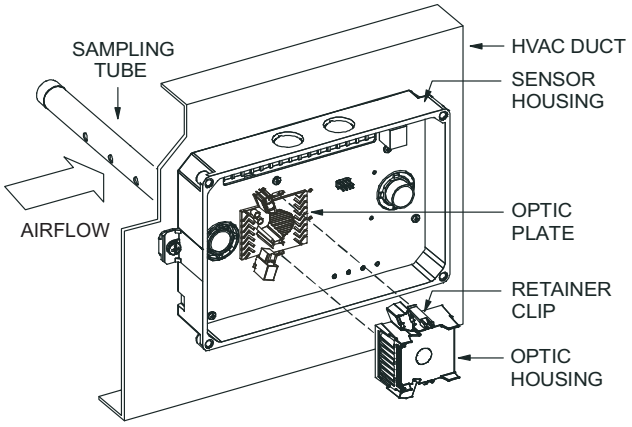


Fig. 58 — Sensor Cleaning Diagram

2. Using a vacuum cleaner, clean compressed air, or a soft bristle brush, remove loose dirt and debris from inside the sensor housing and cover. Use isopropyl alcohol and a lint-free cloth to remove dirt and other contaminants from the gasket on the sensor's cover.
3. Squeeze the retainer clips on both sides of the optic housing.
4. Lift the housing away from the printed circuit board.
5. Gently remove dirt and debris from around the optic plate and inside the optic housing.
6. Replace the optic housing and sensor cover.
7. Connect power to the duct detector then perform a sensor alarm test.

Indicators

NORMAL STATE

The smoke detector operates in the normal state in the absence of any trouble conditions and when its sensing chamber is free of smoke. In the normal state, the Power LED on both the sensor and the controller are on and all other LEDs are off.

ALARM STATE

The smoke detector enters the alarm state when the amount of smoke particulate in the sensor's sensing chamber exceeds the alarm threshold value. (See Table 8.) Upon entering the alarm state:

- The sensor's Alarm LED and the controller's Alarm LED turn on.
- The contacts on the controller's two auxiliary relays switch positions.
- The contacts on the controller's alarm initiation relay close.
- The controller's remote alarm LED output is activated (turned on).
- The controller's high impedance multiple fan shutdown control line is pulled to ground Trouble state.

The SuperDuct duct smoke detector enters the trouble state under the following conditions:

- A sensor's cover is removed and 20 minutes pass before it is properly secured.
- A sensor's environmental compensation limit is reached (100% dirty).
- A wiring fault between a sensor and the controller is detected.

An internal sensor fault is detected upon entering the trouble state:

- The contacts on the controller's supervisory relay switch positions. (See Fig. 59.)
- If a sensor trouble, the sensor's Trouble LED the controller's Trouble LED turn on.
- If 100% dirty, the sensor's Dirty LED turns on and the controller's Trouble LED flashes continuously.
- If a wiring fault between a sensor and the controller, the controller's Trouble LED turns on but not the sensor's.

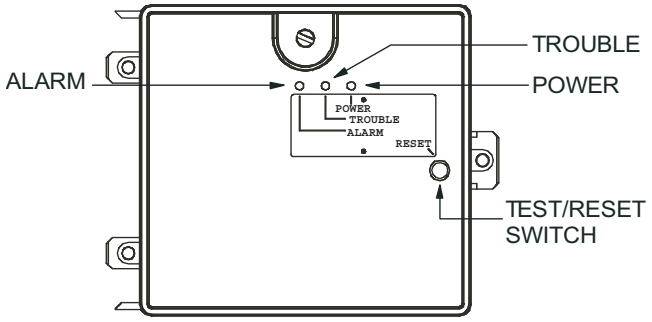


Fig. 59 — Controller Assembly

NOTE: All troubles are latched by the duct smoke detector. The trouble condition must be cleared and then the duct smoke detector must be reset in order to restore it to the normal state.

RESETTING ALARM AND TROUBLE CONDITION TRIPS

Manual reset is required to restore smoke detector systems to Normal operation. For installations using two sensors, the duct smoke detector does not differentiate which sensor signals an alarm or trouble condition. Check each sensor for Alarm or Trouble status (indicated by LED). Clear the condition that has generated the trip at this sensor. Then reset the sensor by pressing and holding the reset button (on the side) for 2 seconds. Verify that the sensor's Alarm and Trouble LEDs are now off. At the controller, clear its Alarm or Trouble state by pressing and holding the manual reset button (on the front cover) for 2 seconds. Verify that the controller's Alarm and Trouble LEDs are now off. Replace all panels.

Troubleshooting

CONTROLLER'S TROUBLE LED IS ON

1. Check the Trouble LED on each sensor connected to the controller. If a sensor's Trouble LED is on, determine the cause and make the necessary repairs.
2. Check the wiring between the sensor and the controller. If wiring is loose or missing, repair or replace as required.

CONTROLLER'S TROUBLE LED IS FLASHING

1. One or both of the sensors is 100% dirty.
2. Determine which Dirty LED is flashing then clean that sensor assembly as described in the detector cleaning section.

SENSOR'S TROUBLE LED IS ON

1. Check the sensor's Dirty LED. If it is flashing, the sensor is dirty and must be cleaned.
2. Check the sensor's cover. If it is loose or missing, secure the cover to the sensor housing.
3. Replace sensor assembly.

SENSOR'S POWER LED IS OFF

1. Check the controller's Power LED. If it is off, determine why the controller does not have power and make the necessary repairs.
2. Check the wiring between the sensor and the controller. If wiring is loose or missing, repair or replace as required.

CONTROLLER'S POWER LED IS OFF

1. Make sure the circuit supplying power to the controller is operational. If not, make sure JP2 and JP3 are set correctly on the controller before applying power.
2. Verify that power is applied to the controller's supply input terminals. If power is not present, replace or repair wiring as required.

REMOTE TEST/RESET STATION'S TROUBLE LED DOES NOT FLASH WHEN PERFORMING A DIRTY TEST, BUT THE CONTROLLER'S TROUBLE LED DOES

1. Verify that the remote test/station is wired as shown in Fig. 57. Repair or replace loose or missing wiring.
2. Configure the sensor dirty test to activate the controller's supervision relay. See "Changing sensor dirty test operation."

SENSOR'S TROUBLE LED IS ON, BUT THE CONTROLLER'S TROUBLE LED IS OFF

Remove JP1 on the controller.

PROTECTIVE DEVICES

Compressor Protection

OVERCURRENT

The compressor has internal line-break motor protection.

OVERTEMPERATURE

The compressor has an internal protector to protect it against excessively high discharge gas temperatures.

HIGH PRESSURE SWITCH

The system is provided with a high pressure switch mounted on the discharge line. The switch is stem-mounted and brazed into the discharge tube. Trip setting is 630 psig ± 10 psig (4344 ± 69 kPa) when hot. Reset is automatic at 505 psig (3482 kPa).

LOW PRESSURE SWITCH

The system is protected against a loss of charge and low evaporator coil loading condition by a low pressure switch located on

the suction line near the compressor. The switch is stem-mounted. Trip setting is 54 psig ± 5 psig (372 ± 34 kPa). Reset is automatic at 117 ± 5 psig (807 ± 34 kPa).

EVAPORATOR FREEZE PROTECTION

The system is protected against evaporator coil frosting and low temperature conditions by a temperature switch mounted on the evaporator coil hairpin. Trip setting is 30°F ± 5°F (-1°C ± 3°C). Reset is automatic at 45°F (7°C).

SUPPLY (INDOOR) FAN MOTOR PROTECTION

Disconnect and lockout power when servicing fan motor.

The standard supply fan motor is equipped with internal over-current and over-temperature protection. Protection devices reset automatically.

The high static option supply fan motor is equipped with a pilot-circuit Thermix combination over-temperature/over-current protection device. This device resets automatically. Do not bypass this switch to correct trouble. Determine the cause and correct it.

Table 8 — Detector Indicators

CONTROL OR INDICATOR	DESCRIPTION
Magnetic test/ reset switch	Resets the sensor when it is in the alarm or trouble state. Activates or tests the sensor when it is in the normal state.
Alarm LED	Indicates the sensor is in the alarm state.
Trouble LED	Indicates the sensor is in the trouble state.
Dirty LED	Indicates the amount of environmental compensation used by the sensor (flashing continuously = 100%)
Power LED	Indicates the sensor is energized.

CONDENSER FAN MOTOR PROTECTION

The condenser fan motor is internally protected against over-temperature.

Relief Device

A soft solder joint at the suction service access port provides pressure relief under abnormal temperature and pressure conditions (i.e., fire in building). Protect this joint during brazing operations near this joint.

Control Circuit, 24-V

The control circuit is protected against overcurrent conditions by a circuit breaker mounted on control transformer TRAN. Reset is manual.

PremierLink™ Control

For details on operating units equipped with the factory-installed PremierLink controller option, refer to the *PremierLink Retrofit Rooftop Controller Version 3.x Installation, Start-Up, and Configuration Instructions* manual.

RTU Open Control System

For details on operating units equipped with the factory-installed RTU Open controller, refer to the *"Factory-Installed RTU Open Multi-Protocol Controller Control, Start-Up, Operation and Troubleshooting"* manual.

ECONOMIZER SYSTEMS

The unit may be equipped with a factory-installed or accessory (field-installed) economizer system. Three types are available: with a logic control system (EconoMi$er IV and EconoMi$er X) and without a control system (EconoMi$er2). See Fig. 60-62 for component locations on each type. See Fig. 63-66 for economizer section wiring diagrams. The W7212 controller is used for EconoMi$er IV and the W7220 controller is used for EconoMi$er X. See Table 9 for EconoMi$er IV input and output logic.

All three economizers use direct-drive damper actuators.

IMPORTANT: Any economizer that meets the economizer requirements as laid out in California's Title 24 mandatory section 120.2 (fault detection and diagnostics) and/or prescriptive section 140.4 (life-cycle tests, damper leakage, 5 year warranty, sensor accuracy, etc), will have a label on the economizer. Any economizer without this label does not meet California's Title 24. The five year limited parts warranty referred to in section 140.4 only applies to factory installed economizers. Please refer to your economizer on your unit.

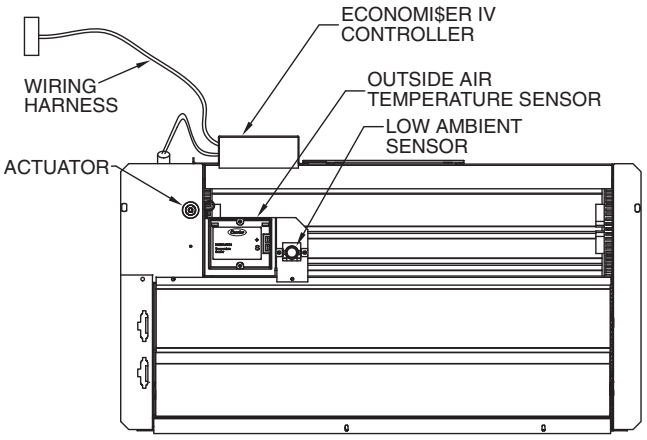


Fig. 60 — EconoMi$er IV Component Locations

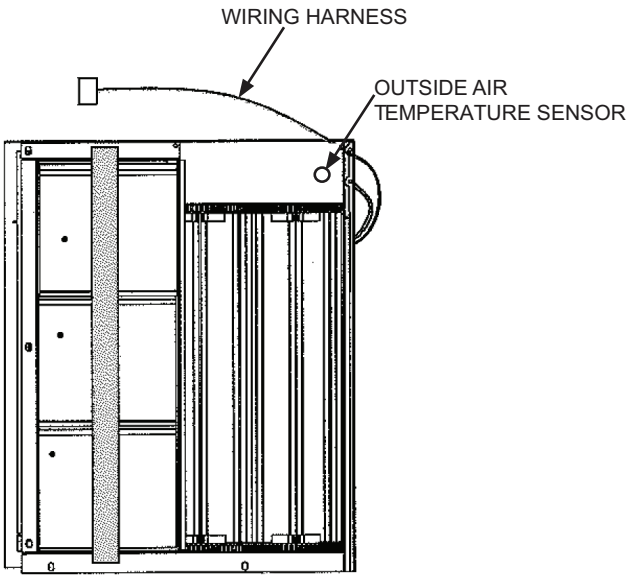


Fig. 61 — EconoMi$er X Component Locations

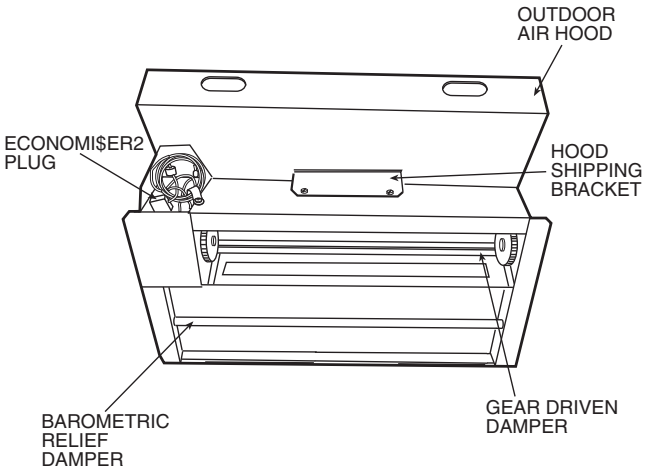


Fig. 62 — EconoMi$er2 Component Locations

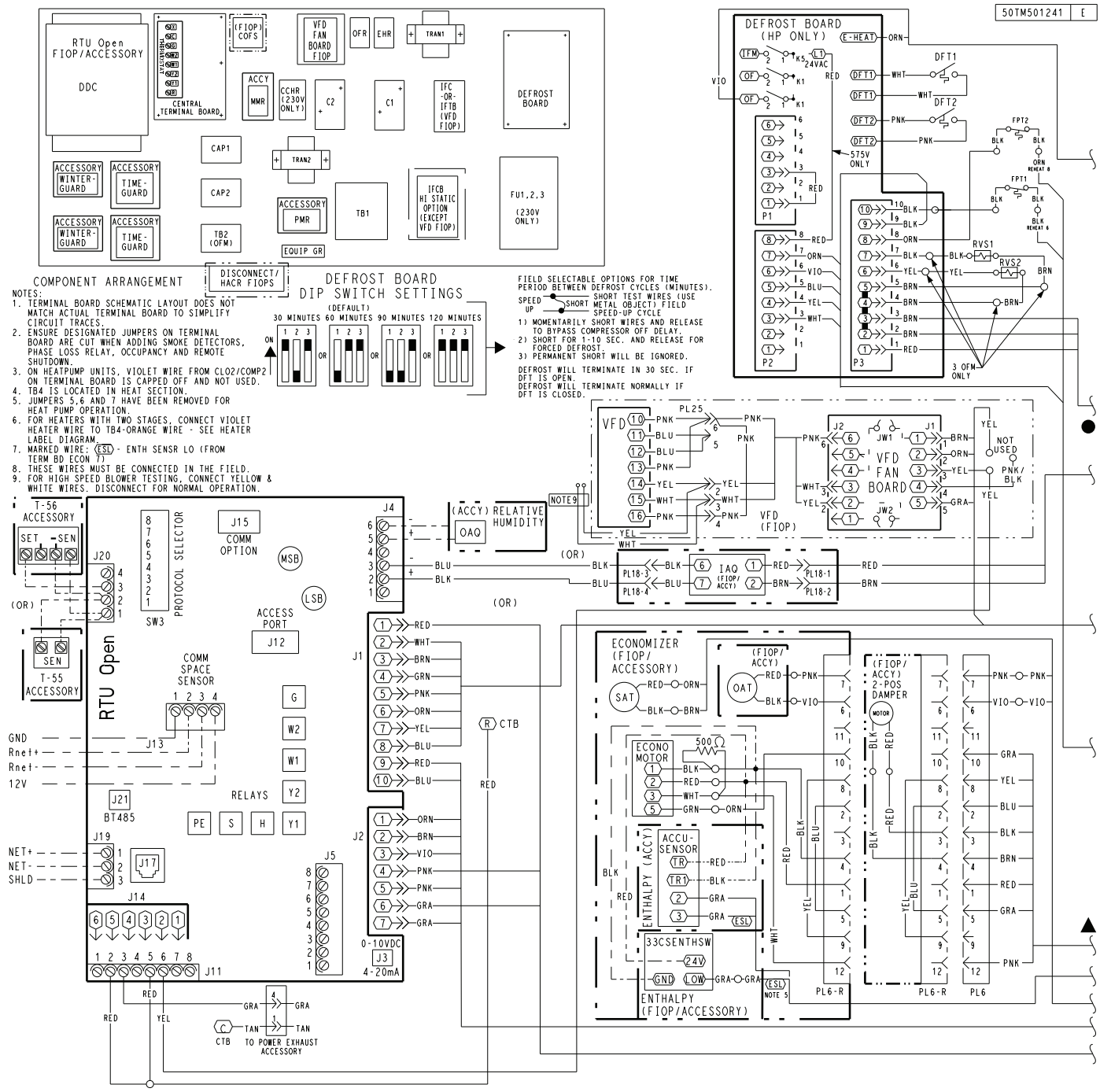


Fig. 63 — RTU Open Overlay for Economizer Wiring

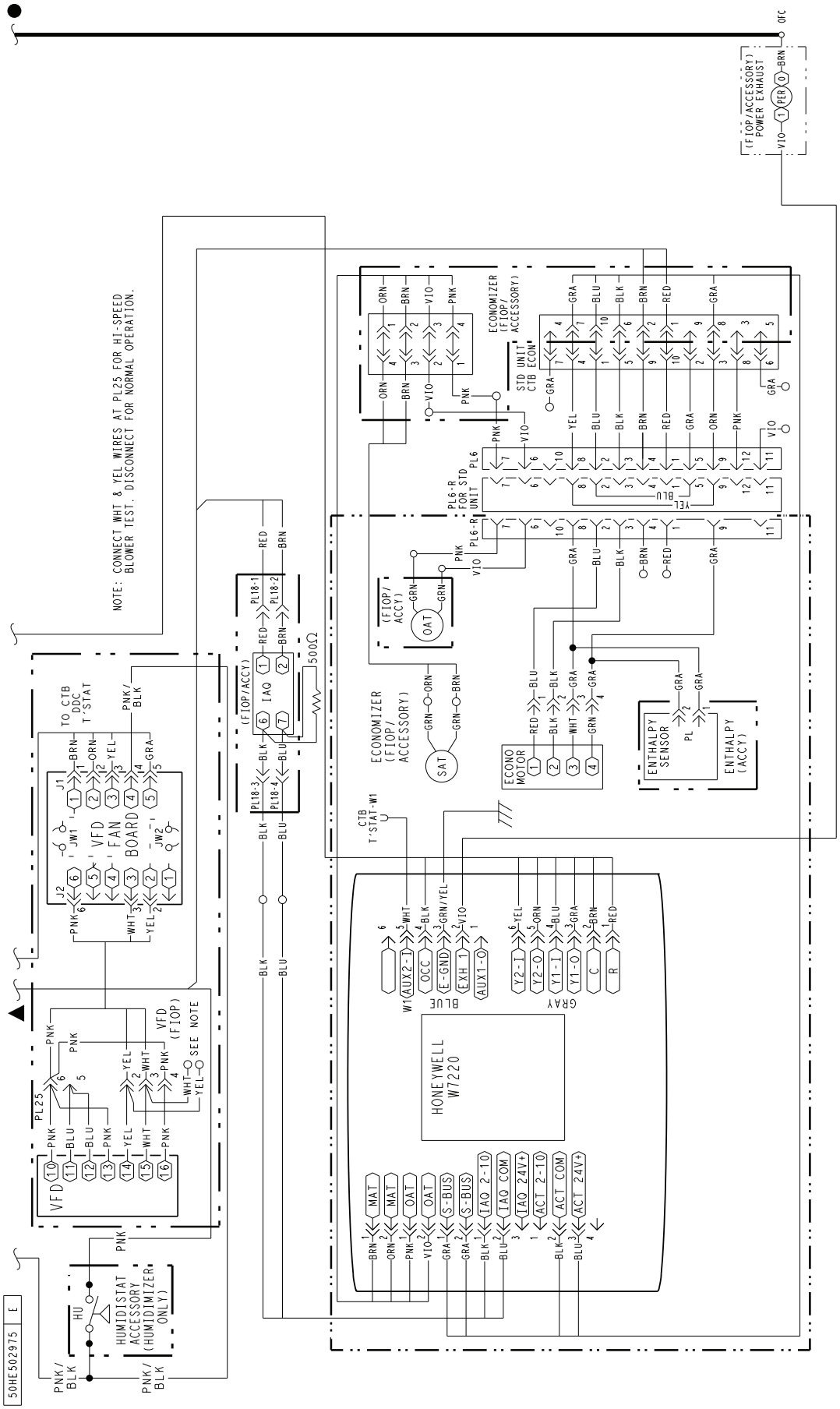
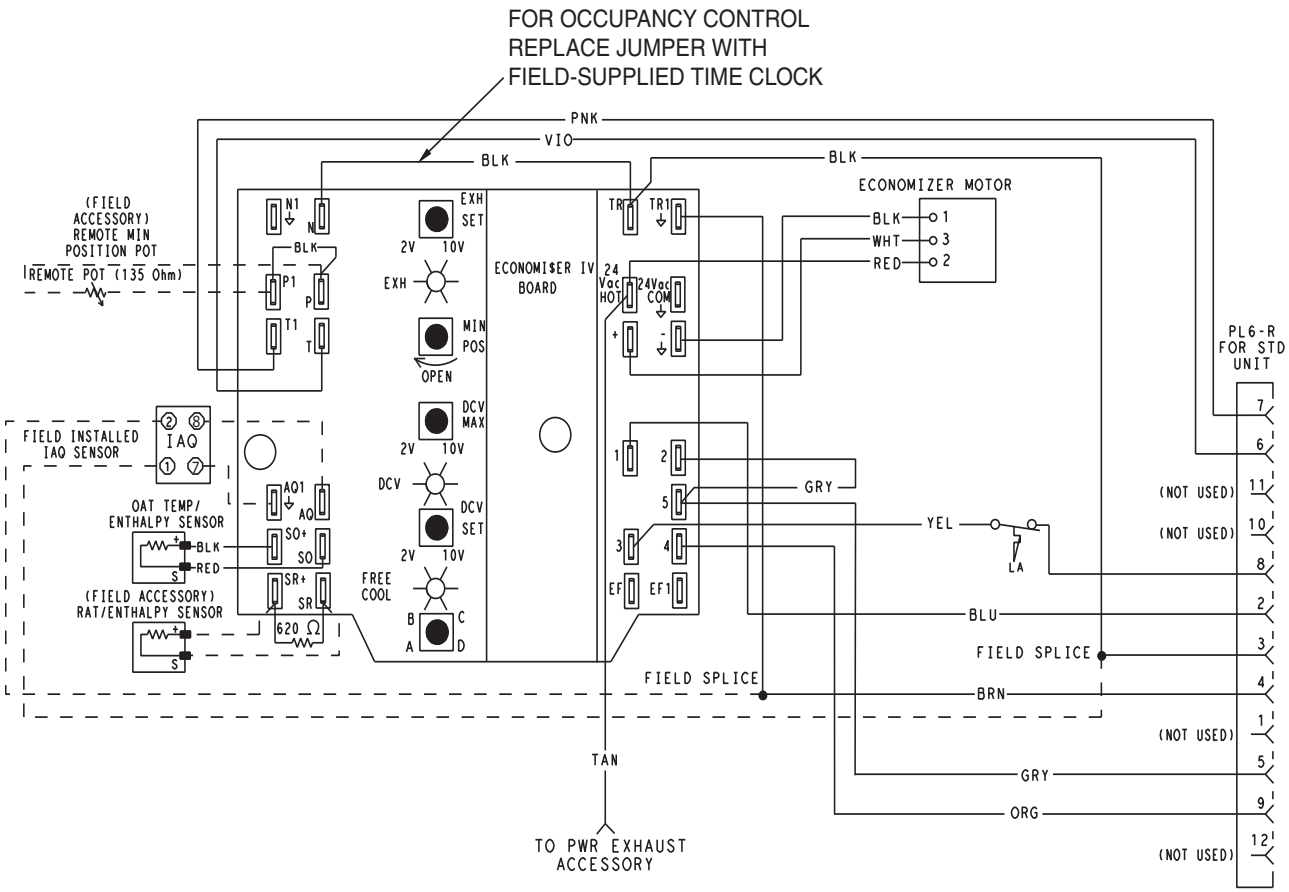


Fig. 64 — VFD Overlay for W2770 Controller Wiring



LEGEND

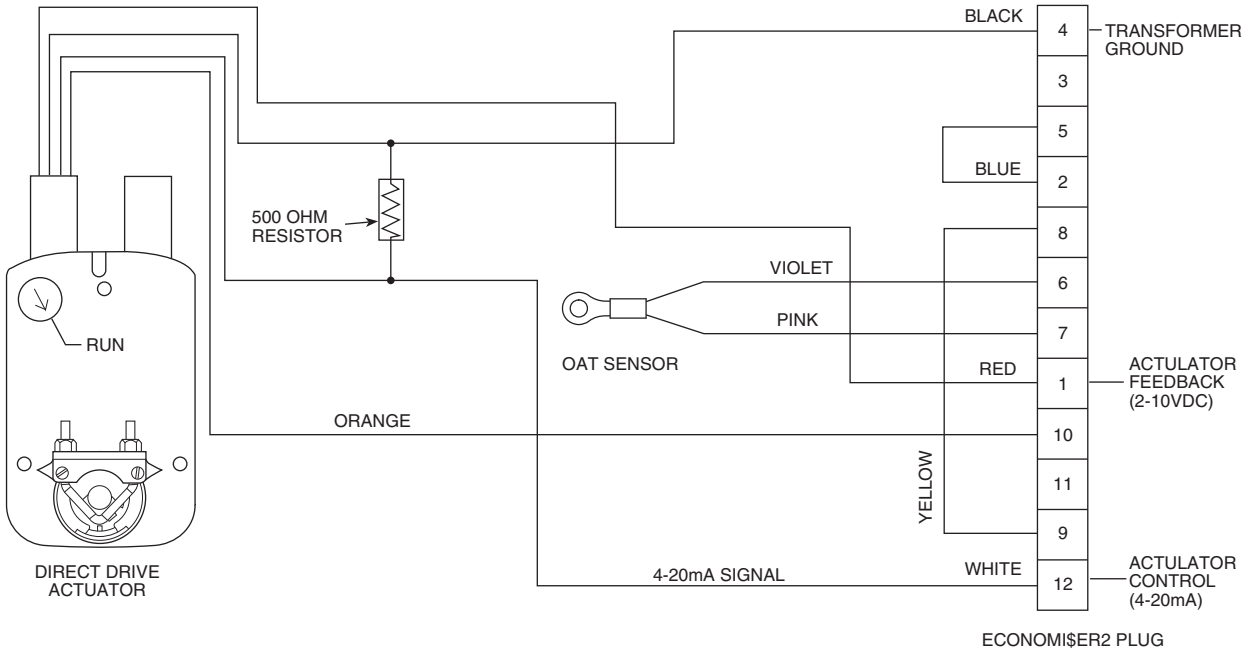
DCV — Demand Controlled Ventilation
IAQ — Indoor Air Quality
LA — Low Ambient Lockout Device
OAT — Outdoor-Air Temperature
POT — Potentiometer
RAT — Return-Air Temperature

Potentiometer Defaults Settings:

Power Exhaust	Middle
Minimum Pos.	Fully Closed
DCV Max.	Middle
DCV Set	Middle
Enthalpy	C Setting

NOTES:
1. 620 ohm, 1 watt 5% resistor should be removed only when using differential enthalpy or dry bulb.
2. If a separate field-supplied 24-v transformer is used for the IAQ sensor power supply, it cannot have the secondary of the transformer grounded.
3. For field-installed remote minimum position POT, remove black wire jumper between P and P1 and set control minimum position POT to the minimum position.

Fig. 65 — EconoMi$er IV Wiring



NOTES:
1. Switch on actuator must be in run position for economizer to operate.
2. PremierLink™ control requires that the standard 50HJ540569 outside-air sensor be replaced by either the CROASENR001A00 dry bulb sensor or HH57A077 enthalpy sensor.
3. 50HJ540573 actuator consists of the 50HJ540567 actuator and a harness with 500-ohm resistor.

Fig. 66 — EconoMi$er2 with 4 to 20 mA Control Wiring

Table 9 — EconoMi$er IV Input/Output Logic

INPUTS					OUTPUTS			
Demand Controlled Ventilation (DCV)	Enthalpy*		Y1	Y2	Compressor		N Terminal	
	Outdoor	Return			Stage 1	Stage 2	Occupied	Unoccupied
Below set (DCV LED Off)	High (Free Cooling LED Off)	Low	On	On	On	On	Minimum position	Closed
			On	Off	On	Off		
			Off	Off	Off	Off		
	Low (Free Cooling LED On)	High	On	On	On	Off	Modulating** (between min. position and full-open)	Modulating** (between closed and full-open)
			On	Off	Off	Off		
			Off	Off	Off	Off	Minimum position	Closed
Above set (DCV LED On)	High (Free Cooling LED Off)	Low	On	On	On	On	Modulating†† (between min. position and DCV maximum)	Modulating†† (between closed and DCV maximum)
			On	Off	On	Off		
			Off	Off	Off	Off		
	Low (Free Cooling LED On)	High	On	On	On	Off	Modulating***	Modulating†††
			On	Off	Off	Off		
			Off	Off	Off	Off		

* For single enthalpy control, the module compares outdoor enthalpy to the ABCD set point.
† Power at N terminal determines Occupied/Unoccupied setting: 24 vac (Occupied), no power (Unoccupied).
** Modulation is based on the supply-air sensor signal.
†† Modulation is based on the DCV signal.
*** Modulation is based on the greater of DCV and supply-air sensor signals, between minimum position and either maximum position (DCV) or fully open (supply-air signal).
††† Modulation is based on the greater of DCV and supply-air sensor signals, between closed and either maximum position (DCV) or fully open (supply-air signal).

EconoMi$er® IV Standard Sensors

A functional view of the EconoMi$er is shown in Fig. 67. Typical settings, sensor ranges, and jumper positions are also shown. An EconoMi$er IV simulator program is available to help with EconoMi$er IV training and troubleshooting.

OUTDOOR AIR TEMPERATURE (OAT) SENSOR

The outdoor air temperature sensor (HH57AC074) is a 10 to 20 mA device used to measure the outdoor-air temperature. The outdoor-air temperature is used to determine when the EconoMi$er IV can be used for free cooling. The sensor is factory-installed on the EconoMi$er IV in the outdoor airstream. See Fig. 68. The operating range of temperature measurement is 40°F to 100°F (4°C to 38°C).

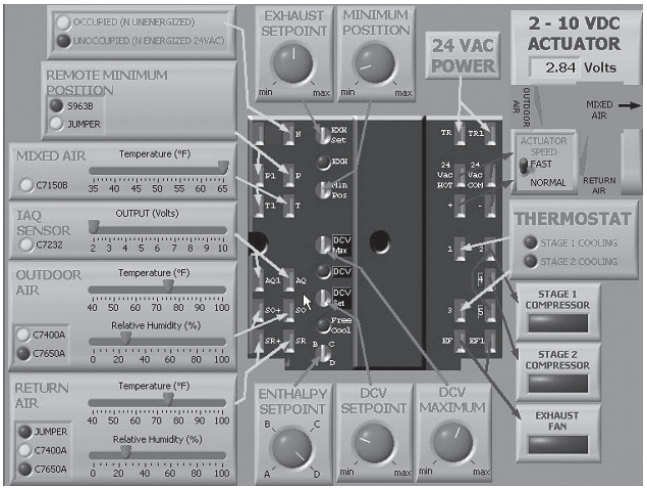


Fig. 67 — EconoMi$er IV Functional View

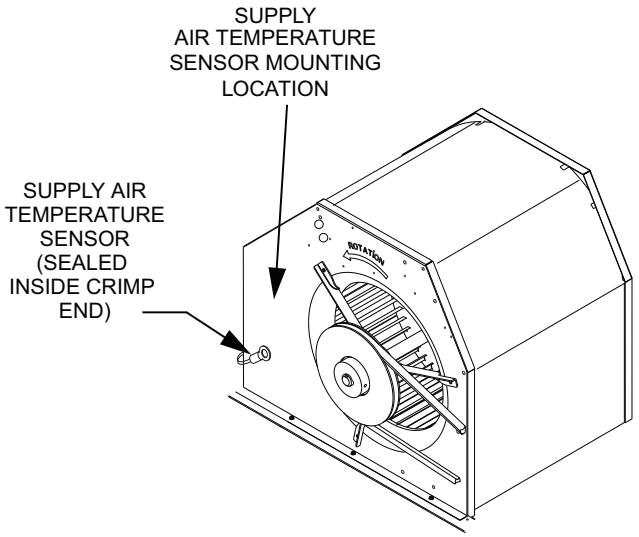


Fig. 68 — Supply Air Sensor Location

SUPPLY AIR TEMPERATURE (SAT) SENSOR

The supply air temperature sensor is a 3 K thermistor located at the inlet of the indoor fan. See Fig. 68. This sensor is factory installed. The operating range of temperature measurement is 0°F to 158°F (-18°C to 70°C). See Table 66 for sensor temperature/resistance values.

The temperature sensor looks like an eyelet terminal with wires running to it. The sensor is located in the "crimp end" and is sealed from moisture.

OUTDOOR AIR LOCKOUT SENSOR

The EconoMi$er IV is equipped with an ambient temperature lockout switch located in the outdoor airstream which is used to lock out the compressors below a 42°F (6°C) ambient temperature. See Fig. 60.

EconoMi$er IV Control Modes

IMPORTANT: The optional EconoMi$er2 does not include a controller. The EconoMi$er2 is operated by a 4 to 20 mA signal from an existing field-supplied controller. See Fig. 62 for wiring information.

Determine the EconoMi$er IV control mode before set up of the control. Some modes of operation may require different sensors. The EconoMi$er IV is supplied from the factory with a supply-air temperature sensor and an outdoor-air temperature sensor. This allows for operation of the EconoMi$er IV with outdoor air dry bulb changeover control. Additional accessories can be added to allow for different types of changeover control and operation of the EconoMi$er IV and unit.

OUTDOOR DRY BULB CHANGEOVER

The standard controller is shipped from the factory configured for outdoor dry bulb changeover control. The outdoor air and supply air temperature sensors are included as standard. For this control mode, the outdoor temperature is compared to an adjustable set point selected on the control. If the outdoor-air temperature is above the set point, the EconoMi$er IV will adjust the outside air dampers to minimum position. If the outdoor-air temperature is below the set point, the position of the outside air dampers will be controlled to provided free cooling using outdoor air. When in this mode, the LED next to the free cooling set point potentiometer will be on. The changeover temperature set point is controlled by the free cooling set point potentiometer located on the control. See Fig. 69. The scale on the potentiometer is A, B, C, and D. See Fig. 70 for the corresponding temperature changeover values and Fig. 71 for damper leakage.

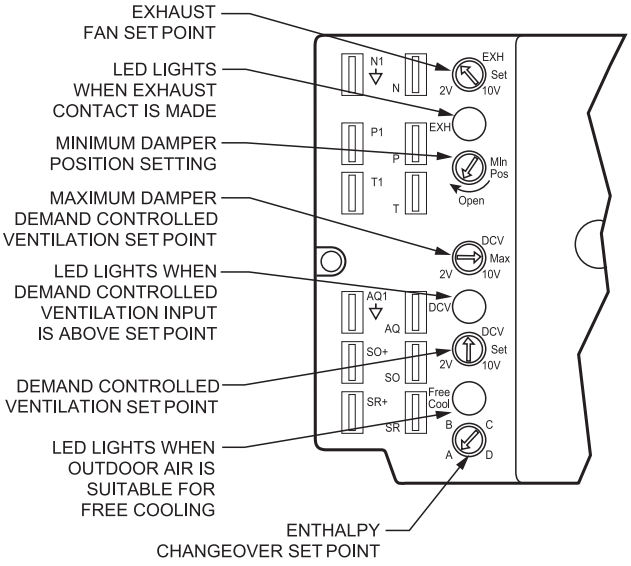


Fig. 69 — EconoMi$er IV Controller Potentiometer and LED Locations

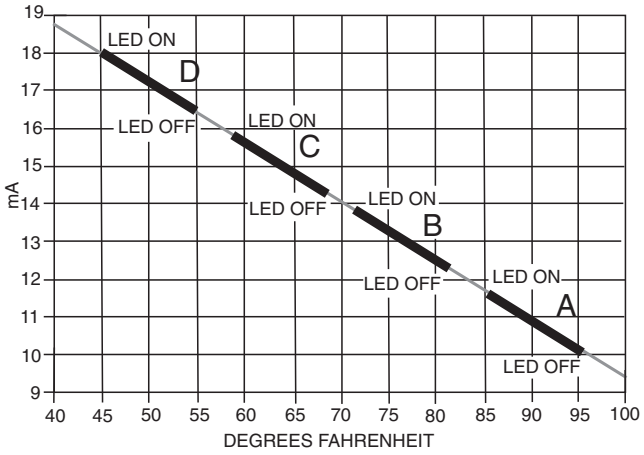


Fig. 70 — Outside Air Temperature Changeover Set Points

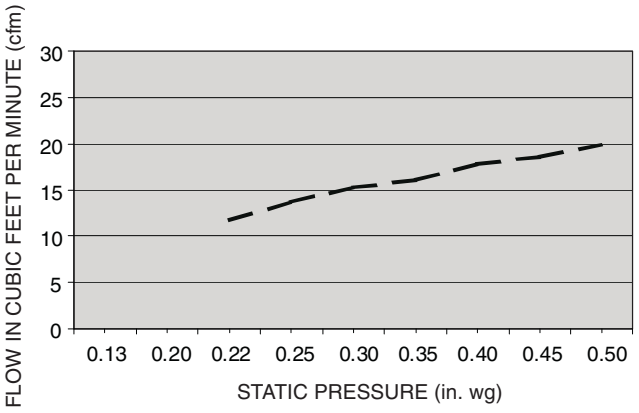


Fig. 71 — Outdoor-Air Damper Leakage

DIFFERENTIAL DRY BULB CONTROL

For differential dry bulb control the standard outdoor dry bulb sensor is used in conjunction with an additional accessory dry bulb sensor (P/N: CRTEMPSN002A00). The accessory sensor must be mounted in the return airstream. See Fig. 72. Wiring is provided in the EconoMi$er IV wiring harness.

In this mode of operation, the outdoor-air temperature is compared to the return-air temperature and the lower temperature airstream is used for cooling. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting. See Fig. 69.

OUTDOOR ENTHALPY CHANGEOVER

For enthalpy control, accessory enthalpy sensor (P/N: HH57AC078) is required. Replace the standard outdoor dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. See Fig. 73. When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. The set points are A, B, C, and D. See Fig. 74. The factory-installed 620-ohm jumper must be in place across terminals S_R and SR+ on the EconoMi$er IV controller.

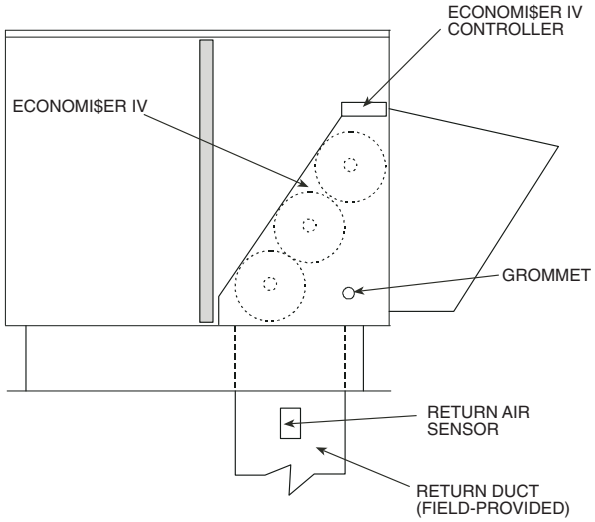


Fig. 72 — Return Air Temperature or Enthalpy Sensor Mounting Location

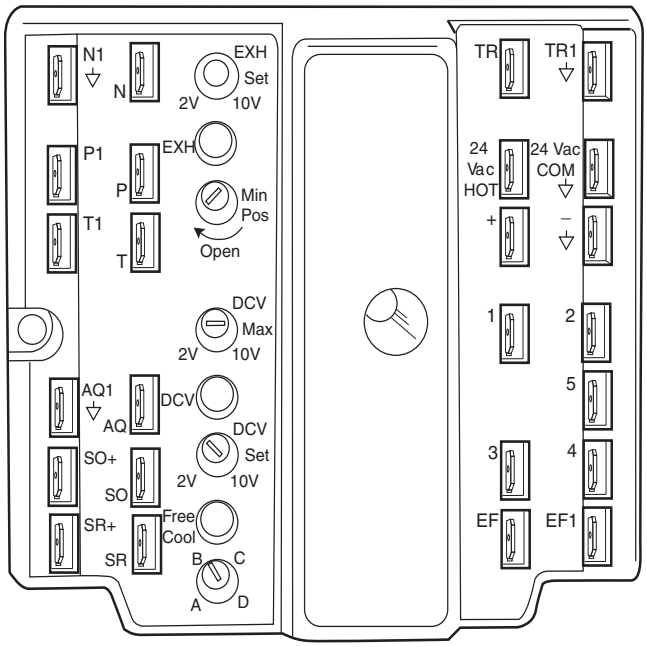


Fig. 73 — EconoMi$er IV Control

DIFFERENTIAL ENTHALPY CONTROL

For differential enthalpy control, the EconoMi$er IV controller uses two enthalpy sensors (HH57AC078 and CRENTDIF004A00), one in the outside air and one in the return air duct. The EconoMi$er IV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$er IV use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air, the EconoMi$er IV opens to bring in outdoor air for free cooling.

Replace the standard outside air dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. See Fig. 73. Mount the return air enthalpy sensor in the return air duct. See Fig. 72. Wiring is provided in the EconoMi$er IV wiring harness. See Fig. 65. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.

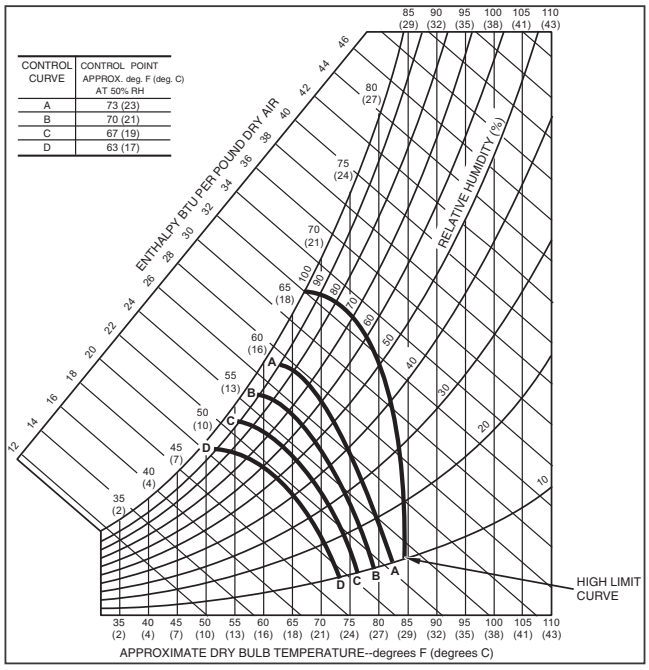


Fig. 74 — Enthalpy Changeover Set Points

INDOOR AIR QUALITY (IAQ) SENSOR INPUT

The IAQ input can be used for demand control ventilation control based on the level of CO_2 measured in the space or return air duct.

Mount the accessory IAQ sensor according to manufacturer specifications. The IAQ sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the DCV potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. See Fig. 75.

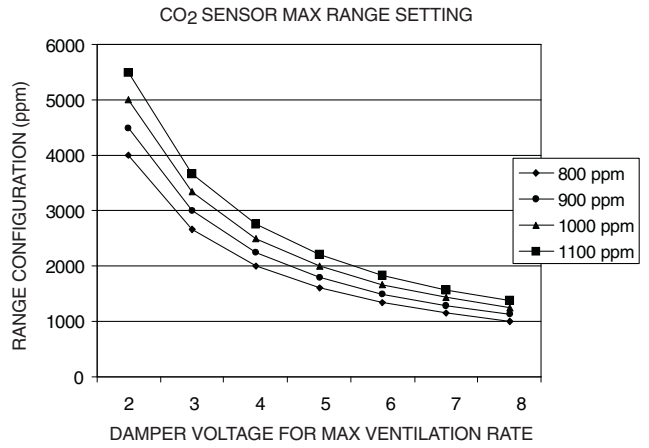


Fig. 75 — CO_2 Sensor Maximum Range Settings

If a separate field-supplied transformer is used to power the IAQ sensor, the sensor must not be grounded or the EconoMi$er IV control board will be damaged.

When using demand ventilation, the minimum damper position represents the minimum ventilation position for VOC (volatile organic compounds) ventilation requirements. The maximum demand ventilation position is used for fully occupied ventilation.

When demand ventilation control is not being used, the minimum position potentiometer should be used to set the occupied ventilation position. The maximum demand ventilation position should be turned fully clockwise.

EXHAUST SET POINT ADJUSTMENT

The exhaust set point will determine when the exhaust fan runs based on damper position (if accessory power exhaust is installed). The set point is modified with the Exhaust Fan set point (EXH SET) potentiometer. See Fig. 69. The set point represents the damper position above which the exhaust fans will be turned on. When there is a call for exhaust, the EconoMi$er IV controller provides a 45 ± 15 second delay before exhaust fan activation to allow the dampers to open. This delay allows the damper to reach the appropriate position to avoid unnecessary fan overload.

MINIMUM POSITION CONTROL

There is a minimum damper position potentiometer on the EconoMi$er IV controller. See Fig. 69. The minimum damper position maintains the minimum airflow into the building during the occupied period.

When using demand ventilation, the minimum damper position represents the minimum ventilation position for Volatile Organic Compound (VOC) ventilation requirements. The maximum demand ventilation position is used for fully occupied ventilation.

When demand ventilation control is not being used, the minimum position potentiometer should be used to set the occupied ventilation position. The maximum demand ventilation position should be turned fully clockwise.

Adjust the minimum position potentiometer to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10°F temperature difference between the outdoor and return-air temperatures.

To determine the minimum position setting, perform the following procedure:

1. Calculate the appropriate mixed air temperature using the following formula:

$$\left(T_O \times \frac{OA}{100}\right) + \left(T_R \times \frac{RA}{100}\right) = T_M$$

T_O = Outdoor-Air Temperature

OA = Percent of Outdoor Air

T_R = Return-Air Temperature

RA = Percent of Return Air

T_M = Mixed-Air Temperature

As an example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60°F, and return-air temperature is 75°F.

(60 x 0.10) + (75 x 0.90) = 73.5°F

2. Disconnect the supply air sensor from terminals T and T1.
3. Ensure that the factory-installed jumper is in place across terminals P and P1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 69 and that the minimum position potentiometer is turned fully clockwise.
4. Connect 24 vac across terminals TR and TR1.
5. Carefully adjust the minimum position potentiometer until the measured mixed air temperature matches the calculated value.
6. Reconnect the supply air sensor to terminals T and T1.

Remote control of the EconoMi$er IV damper is desirable when requiring additional temporary ventilation. If a field-supplied remote potentiometer (Honeywell P/N: S963B1128) is wired to the EconoMi$er IV controller, the minimum position of the damper can be controlled from a remote location.

To control the minimum damper position remotely, remove the factory-installed jumper on the P and P1 terminals on the EconoMi$er IV controller. Wire the field-supplied potentiometer

to the P and P1 terminals on the EconoMi$er IV controller. (See Fig. 74.)

DAMPER MOVEMENT

Damper movement from full open to full closed (or vice versa) takes $2^1/_2$ minutes.

THERMOSTATS

The EconoMi$er IV control works with conventional thermostats that have a Y1 (cool stage 1), Y2 (cool stage 2), W1 (heat stage 1), W2 (heat stage 2), and G (fan). The EconoMi$er IV control does not support space temperature sensors. Connections are made at the thermostat terminal connection board located in the main control box.

OCCUPANCY CONTROL

The factory default configuration for the EconoMi$er IV control is occupied mode. Occupied status is provided by the black jumper from terminal TR to terminal N. When unoccupied mode is desired, install a field-supplied timeclock function in place of the jumper between TR and N. When the timeclock contacts are closed, the EconoMi$er IV control will be in occupied mode. When the timeclock contacts are open (removing the 24-v signal from terminal N), the EconoMi$er IV will be in unoccupied mode.

DEMAND CONTROLLED VENTILATION (DCV)

When using the EconoMi$er IV for demand controlled ventilation, there are some equipment selection criteria which should be considered. When selecting the heat capacity and cool capacity of the equipment, the maximum ventilation rate must be evaluated for design conditions. The maximum damper position must be calculated to provide the desired fresh air.

Typically the maximum ventilation rate will be about 5 to 10% more than the typical cfm required per person, using normal outside air design criteria.

A proportional anticipatory strategy should be taken with the following conditions: a zone with a large area, varied occupancy, and equipment that cannot exceed the required ventilation rate at design conditions. Exceeding the required ventilation rate means the equipment can condition air at a maximum ventilation rate that is greater than the required ventilation rate for maximum occupancy. A proportional-anticipatory strategy will cause the fresh air supplied to increase as the room CO_2 level increases even though the CO_2 set point has not been reached. By the time the CO_2 level reaches the set point, the damper will be at maximum ventilation and should maintain the set point.

In order to have the CO_2 sensor control the economizer damper in this manner, first determine the damper voltage output for minimum or base ventilation. Base ventilation is the ventilation required to remove contaminants during unoccupied periods. The following equation may be used to determine the percent of outside air entering the building for a given damper position. For best results, there should be at least a 10°F difference in outside and return-air temperatures.

$$(T_O \times \frac{OA}{100}) + (T_R \times \frac{RA}{100}) = T_M$$

T_O = Outdoor-Air Temperature

OA = Percent of Outdoor Air

T_R = Return-Air Temperature

RA = Percent of Return Air

T_M = Mixed-Air Temperature

Once base ventilation has been determined, set the minimum damper position potentiometer to the correct position.

The same equation can be used to determine the occupied or maximum ventilation rate to the building. For example, an output of 3.6 volts to the actuator provides a base ventilation rate of 5% and an output of 6.7 volts provides the maximum ventilation rate of 20% (or base plus 15 cfm per person). Use Fig. 75 to determine the maximum setting of the CO_2 sensor. For example, an 1100 ppm set point relates to a 15 cfm per person design. Use the 1100 ppm curve on Fig. 75 to find the point when the CO_2 sensor output will be 6.7 volts. Line up the point on the graph with the left side of the chart to determine that the range configuration for the CO_2 sensor should be 1800 ppm. The EconoMi$er IV controller will output the 6.7 volts from the CO_2 sensor to the actuator when the CO_2 concentration in the space is at 1100 ppm. The DCV set point may be left at 2 volts since the CO_2 sensor voltage will be ignored by the EconoMi$er IV controller until it rises above the 3.6 volt setting of the minimum position potentiometer.

Once the fully occupied damper position has been determined, set the maximum damper demand control ventilation potentiometer to this position. Do not set to the maximum position as this can result in over-ventilation to the space and potential high humidity levels.

CO_2 SENSOR CONFIGURATION

The CO_2 sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. See Table 10.

Use setting 1 or 2 for Carrier equipment. See Table 10.

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.

Table 10 — EconoMi$er IV Sensor Usage

APPLICATION	ECONOMI$ER IV WITH OUTDOOR AIR DRY BULB SENSOR
	Accessories Required
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.
Differential Dry Bulb	CRTEMPSN002A00*
Single Enthalpy	HH57AC078
Differential Enthalpy	HH57AC078 and CRENTDIF004A00*
CO_2 for DCV Control using a Wall-Mounted CO_2 Sensor	33ZCSENCO2
CO_2 for DCV Control using a Duct-Mounted CO_2 Sensor	33ZCSENCO2† and 33ZCASPCO2** OR CRCBDIOX005A00††

* CRENTDIF004A00 and CRTEMPSN002A00 accessories are used on many different base units. As such, these kits may contain parts that will not be needed for installation.
† 33ZCSENCO2 is an accessory CO_2 sensor.
** 33ZCASPCO2 is an accessory aspirator box required for duct-mounted applications.
†† CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.

3. Use the Up/Down button to select the preset number. See Table 10.
4. Press Enter to lock in the selection.
5. Press Mode to exit and resume normal operation.

The custom settings of the CO_2 sensor can be changed anytime after the sensor is energized. Follow the steps below to change the non-standard settings:

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to toggle to the NONSTD menu and press Enter.
4. Use the Up/Down button to toggle through each of the nine variables, starting with Altitude, until the desired setting is reached.
5. Press Mode to move through the variables.
6. Press Enter to lock in the selection, then press Mode to continue to the next variable.

DEHUMIDIFICATION OF FRESH AIR WITH DCV (DEMAND CONTROLLED VENTILATION) CONTROL

If normal rooftop heating and cooling operation is not adequate for the outdoor humidity level, an energy recovery unit and/or a dehumidification option should be considered.

EconoMi$er IV Preparation

This procedure is used to prepare the EconoMi$er IV for troubleshooting. No troubleshooting or testing is done by performing the following procedure.

NOTE: This procedure requires a 9-v battery, 1.2 kilo-ohm resistor, and a 5.6 kilo-ohm resistor which are not supplied with the EconoMi$er IV.

IMPORTANT: Be sure to record the positions of all potentiometers before starting troubleshooting.

1. Disconnect power at TR and TR1. All LEDs should be off. Exhaust fan contacts should be open.
2. Disconnect device at P and P1.
3. Jumper P to P1.
4. Disconnect wires at T and T1. Place 5.6 kilo-ohm resistor across T and T1.
5. Jumper TR to 1.
6. Jumper TR to N.
7. If connected, remove sensor from terminals SO and +. Connect 1.2 kilo-ohm 4074EJM checkout resistor across terminals SO and +.
8. Put 620-ohm resistor across terminals SR and +.
9. Set minimum position, DCV set point, and exhaust potentiometers fully CCW (counterclockwise).
10. Set DCV maximum position potentiometer fully CW (clockwise).
11. Set enthalpy potentiometer to D.
12. Apply power (24 vac) to terminals TR and TR1.

Differential Enthalpy

To check differential enthalpy:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Place 620-ohm resistor across SO and +.
3. Place 1.2 kilo-ohm resistor across SR and +. The Free Cool LED should be lit.
4. Remove 620-ohm resistor across SO and +. The Free Cool LED should turn off.
5. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

Single Enthalpy

To check single enthalpy:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Set the enthalpy potentiometer to A (fully CCW). The Free Cool LED should be lit.
3. Set the enthalpy potentiometer to D (fully CW). The Free Cool LED should turn off.
4. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

DCV (Demand Controlled Ventilation) and Power Exhaust

To check DCV and Power Exhaust:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Ensure terminals AQ and AQ1 are open. The LED for both DCV and Exhaust should be off. The actuator should be fully closed.
3. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The LED for both DCV and Exhaust should turn on. The actuator should drive to between 90 and 95% open.
4. Turn the Exhaust potentiometer CW until the Exhaust LED turns off. The LED should turn off when the potentiometer is approximately 90%. The actuator should remain in position.
5. Turn the DCV set point potentiometer CW until the DCV LED turns off. The DCV LED should turn off when the potentiometer is approximately 9-v. The actuator should drive fully closed.
6. Turn the DCV and Exhaust potentiometers CCW until the Exhaust LED turns on. The exhaust contacts will close 30 to 120 seconds after the Exhaust LED turns on.
7. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

DCV Minimum and Maximum Position

To check the DCV minimum and maximum position:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The DCV LED should turn on. The actuator should drive to between 90 and 95% open.
3. Turn the DCV Maximum Position potentiometer to mid-point. The actuator should drive to between 20 and 80% open.
4. Turn the DCV Maximum Position potentiometer to fully CCW. The actuator should drive fully closed.
5. Turn the Minimum Position potentiometer to mid-point. The actuator should drive to between 20 and 80% open.
6. Turn the Minimum Position Potentiometer fully CW. The actuator should drive fully open.
7. Remove the jumper from TR and N. The actuator should drive fully closed.
8. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

Supply-Air Sensor Input

To check supply-air sensor input:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Set the Enthalpy potentiometer to A. The Free Cool LED turns on. The actuator should drive to between 20 and 80% open.
3. Remove the 5.6 kilo-ohm resistor and jumper T to T1. The actuator should drive fully open.
4. Remove the jumper across T and T1. The actuator should drive fully closed.
5. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

EconoMi$er IV Troubleshooting Completion

This procedure is used to return the EconoMi$er IV to operation. No troubleshooting or testing is done by performing the following procedure.

1. Disconnect power at TR and TR1.
2. Set enthalpy potentiometer to previous setting.
3. Set DCV maximum position potentiometer to previous setting.

4. Set minimum position, DCV set point, and exhaust potentiometers to previous settings.
5. Remove 620-ohm resistor from terminals SR and +.
6. Remove 1.2 kilo-ohm checkout resistor from terminals SO and +. If used, reconnect sensor from terminals SO and +.
7. Remove jumper from TR to N.
8. Remove jumper from TR to 1.
9. Remove 5.6 kilo-ohm resistor from T and T1. Reconnect wires at T and T1.
10. Remove jumper from P to P1. Reconnect device at P and P1.
11. Apply power (24 vac) to terminals TR and TR1.

EconoMi$er® X (Factory Option)

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. 76). The W7220 can be configured with optional sensors.

Fig. 76 — W7220 Economizer Module

The W7220 economizer module can be used as a stand-alone economizer module wired directly to a commercial set-back 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 CO_2 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°F to 150°F (-40°C to 66°C)

Temperature accuracy: 0°F/+2°F

Temperature and Humidity, C7400S1000 (optional)

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

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

Temperature accuracy: 0°F/+2°F (-18°C/-17°C)

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 (see page 42 for wiring details).

24 vac power supply

20 to 30 vac 50/60Hz; 100 VA Class 2 transformer.

OUTPUTS

Actuator Signal

2 to 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°F to 150°F (-40°C to 65°C).

Exception of display operation down to -4°F (-20°C) with full recovery at -4°F (-20°C) from exposure to -40°F (-40°C)

Storage Temperature

-40°F to 150°F (-40°C to 65°C)

Shipping Temperature

-40°F to 150°F (-40°C to 65°C)

Relative Humidity

5% to 95% RH non-condensing

ECONOMIZER MODULE WIRING DETAILS

Use Fig. 77 and Tables 11 and 12 to locate the wiring terminals for the Economizer module.

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

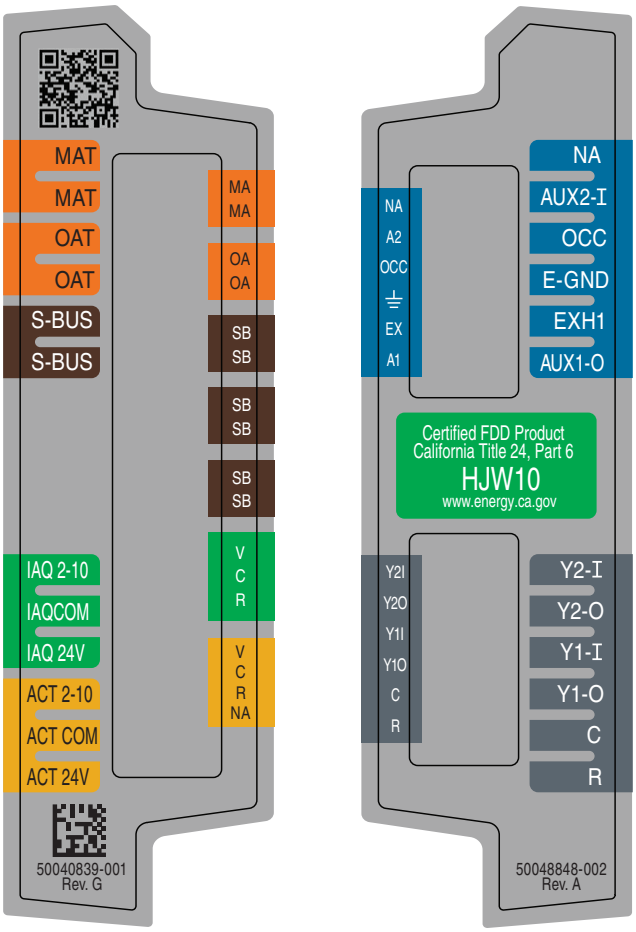


Fig. 77 — W7220 Wiring Terminals

Table 11 — 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

*Sylk is a trademark of Honeywell International Inc.

Table 12 — 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. 78 and Table 13 to locate the wiring terminals for each S-Bus and enthalpy control sensor.

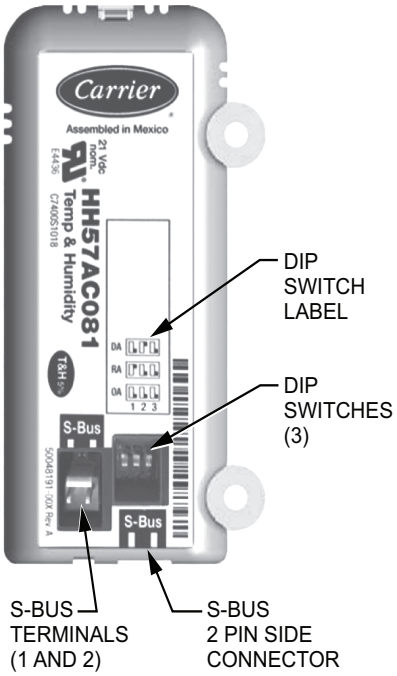


Fig. 78 — S-Bus Sensor DIP Switches

Table 13 — 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. 78 and Table 14 to set the DIP switches for the desired use of the sensor.

Table 14 — 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 an 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. 79 for CO_2 sensor wiring.

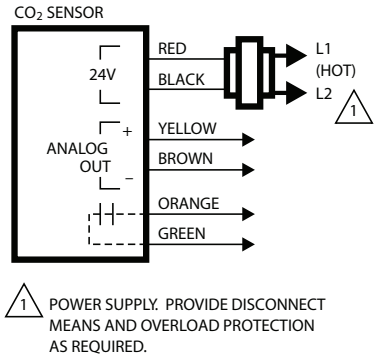


Fig. 79 — CO_2 Sensor Wiring

INTERFACE OVERVIEW

This section describes how to use the EconoMi$er® 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

Use the four navigation buttons (see Fig. 80) 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.
- Press the ⓘ (Menu Up/Exit) button to exit a menu's item and return to the list of menus.

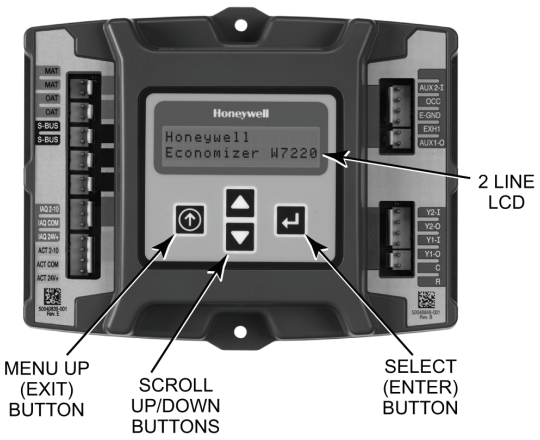


Fig. 80 — W7220 Controller Navigation Buttons

To 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 or decrement.

1. Press the ↵ (Enter) button to accept the displayed value and store it in nonvolatile RAM. “CHANGE STORED” displays.
2. Press the ↵ (Enter) button to return to the current menu parameter.
3. Press the ⓘ (Menu Up/Exit) button to return to the previous menu.

Menu Structure

Table 15 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

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 set up 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 15 — W7220 Menu Structure*

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT†	EXPANDED PARAMETER NAME Notes
STATUS	ECON 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 first 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 or 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 (or _ _ . _ °C)	-40°F to 150°F (-40°C to 66°C)	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 (or _ _ . _ °C)	-40°F to 150°F (-40°C to 66°C)	DISCHARGE AIR TEMPERATURE, after Heating section Displays when Discharge Air Sylk Bus 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 (or _ _ . _ °C)	-40°F to 140°F (-40°C to 60°C)	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 Sylk Bus sensor. Displays _ _% if not connected short, or out of range.
	RA TEMP	_ _ . _ °F (or _ _ . _ °C)	0°F to 140°F (-18°C to 60°C)	RETURN AIR TEMPERATURE Displays measured value of return air temperature from RAT Sylk Bus 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 Sylk Bus 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. May be adjusted in Advanced menu by Zero offset and Span.
	DCV STATUS	N/A	ON/OFF	DEMAND CONTROLLED VENTILATION STATUS Displays ON if above set point and OFF if below set point, 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 actuator
	ACT COUNT	N/A	1 to 65,535	Displays number of times actuator has cycled. 1 cycle equals 180 degrees 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 Displays ON when damper position reaches programmed percentage set point. Output of EXH1 terminal: ON = relay closed OFF = relay open

Table 15 — W7220 Menu Structure* (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT†	EXPANDED PARAMETER NAME Notes
STATUS (cont)	EXH2 OUT	OFF	ON/OFF	EXHAUST STAGE 2 RELAY OUTPUT Output of AUX1 O terminal Displays ON when damper position reaches programmed percentage set point. ON = 24 vac output OFF = No output Displays only if AUX1 O = EXH2
	ERV	OFF	ON/OFF	ENERGY RECOVERY VENTILATOR Output of AUX1 O terminal; displays only if AUX1 O = ERV ON = 24 vac output OFF = No Output
	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 IN)	N/A	ON/OFF	HEAT DEMAND STATUS Displays status of heat demand on a 2-speed fan unit.
SETPOINTS	MAT SET	53°F (12°C)	38°F to 70°F (3°C to 21°C); increment by 1 degree	SUPPLY AIR SETPOINT The economizer will modulate the OA damper to maintain the mixed air temperature at the set point
	LOW T LOCK	32°F (0°C)	-45°F to 80°F (-43°C to 27°C); increment by 1 degree	COMPRESSOR LOW TEMPERATURE LOCKOUT Set point determines outdoor temperature when the mechanical cooling cannot be turned on. Commonly referred to as the Compressor lockout. At or below the set point, the Y1-O and Y2-O will not be energized on the controller.
	DRYBLB SET	63°F (17°C)	48°F to 80°F (9°C to 27°C); increment by 1 degree	OA DRY BULB TEMPERATURE CHANGEOVER SETPOINT *Dry bulb set point will only appear if using dry bulb changeover.* Set point 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 ES curve will only appear if using enthalpy changeover. Enthalpy boundary “curves” for economizing using single enthalpy. See page 53 for description of enthalpy curves.
	DCV SET	1100ppm	500 to 2000 ppm; increment by 100	DEMAND CONTROLLED VENTILATION Displays only if CO_2 sensor is connected. Set point for Demand Controlled Ventilation of space. Above the set point, the OA dampers will modulate open to bring in additional OA to maintain a space ppm level below the set point.
	MIN POS	2.8 V	2 to 10 vdc	VENTILATION MINIMUM POSITION Displays ONLY if a CO_2 sensor is NOT connected. With 2-speed fan units, MIN POS L (low speed fan) and MIN POS H (high speed fan) settings are required. Default for MIN POS L is 3.2V and MIN POS H is 2.8V.
	VENTMAX	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) set point. VENTMAX is the same setting as MIN POS would be if unit did not have CO_2 sensor.
			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, VENTMAX L (low speed fan) and VENTMAX H (high speed fan) settings are required. Default for VENTMAX L is 3.2V and VENTMAX H is 2.8V
	VENTMIN	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 Va (ventilation min cfm) set point. This is the ventilation for less than maximum occupancy of the space.
			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 VENTMIN H (high speed fan) settings are required. Default for VENTMIN L is 2.5V and VENTMIN H is 2.25V
	ERV OAT SP††	32°F (0°C)	0°F to 50°F (-18°C to 10°C); increment by 1 degree	ENERGY RECOVERY VENTILATOR UNIT OUTDOOR AIR TEMPERATURE SETPOINT Only when AUX1 O = ERV

Table 15 — W7220 Menu Structure* (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT†	EXPANDED PARAMETER NAME Notes
SETPOINTS (cont)	EXH1 SET	50%	0 to 100%; increment by 1	EXHAUST FAN STAGE 1 SETPOINT Set point 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	75%	0 to 100%; increment by 1	EXHAUST FAN STAGE 2 SETPOINT Set point 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%
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	CONV or HP	CONV = conventional; HP O/B = Enable Heat Pump mode. Use AUX2 I for Heat Pump input from thermostat or controller.
	AUX2 IN	W	Shutdown (SD) Heat (W1) 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. 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. The controller does not control the fan, but positions the OA and RA dampers to heating or cooling mode. NOTE: 2-speed fan option also needs Heat (W1) programmed in AUX 2 In.
	FAN CFM	5000 cfm	100 to 15000 cfm; increment by 100	UNIT DESIGN AIRFLOW (CFM) Enter only if using DCVCAL ENA = AUTO This is the capacity of the RTU. 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 24 vac out 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.
ADVANCED SETUP	MA LO SET	45°F (7°C)	35°F to 65°F (2°C to 18°C); Increment by 1 degree	SUPPLY AIR TEMPERATURE LOW LIMIT Temperature to activate Freeze Protection (close damper or modulate to MIN POS if temp falls below set 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 50	CO_2 ppm span to match CO_2 sensor; e.g.: 500-1500 sensor output would be 500 CO_2 zero and 1000 CO_2 span.
	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 second stage of cooling when economizer is first stage call and mechanical cooling is second stage call. 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)	NONE 35°F to 65°F (2°C to 18°C); Increment by 5°F	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.

Table 15 — W7220 Menu Structure* (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT†	EXPANDED PARAMETER NAME Notes
ADVANCED SETUP (cont)	DA HI ALM	80°F (27°C)	NONE 70°F to 180°F (21°C to 82°C); Increment by 5°F	Used for alarm for when the DA air temperature is too high. Sets 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 (RA, OA, MA, CO_2) sensors. This operation is not operable with a 2-speed fan unit.
	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 SECOND 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 16.
	DAMPER OPEN	N/A	N/A	Position damper to the full open position. Exhaust fan contacts enable during the DAMPER OPEN test. Make sure to 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 — no 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 1 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.

Table 15 — W7220 Menu Structure* (cont)

MENU	PARAMETER	PARAMETER DEFAULT VALUE	PARAMETER RANGE AND INCREMENT†	EXPANDED PARAMETER NAME Notes
ALARMS (cont)	FREEZE ALARM	N/A	N/A	Check if outdoor temperature is below the LOW Temp Lockout on set point menu. Check if Mixed air temperature on STATUS menu is below the Lo Set point on Advanced menu. When conditions are back in normal range, the alarm will go away.
	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, this alarm will display when the W7220 is completing a calibration on the dampers. Wait until the calibration is completed and the alarm will go away. Must have OA, MA and RA sensors for DCV calibration; set up is 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-O is set to SYS and there is any alarm (e.g., failed sensors, etc.), the AUX1-O 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

* Table 15 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.

† When values are displayed, pressing and holding the ▲ or ▼ button causes the display to automatically increment.

** N/A = Not Applicable.

†† 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 set point in the set point menu.

*** After 10 minutes without a command or mode change, the controller will change to normal operation.

NOTES:

1. 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 OCCUPANCY jumper 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.
2. 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.
3. SETPOINTS —> DRYBLB SET — This point is not displayed if a Return Air (differential) temperature sensor or an Outdoor Air enthalpy sensor is connected.
4. SYSTEM SETUP parameters must be configured as noted for 2-Speed unit operation:
   EQUIPMENT = CONV
   AUX2 I = W
   FAN SPEED = 2SPEED

For damper minimum position settings and checkout menu readings, see Table 16. For dry bulb operation with a 1-speed fan, with or without DCV, see Tables 17 and 18. For enthalpy operation with a 1-speed fan, with or without DCV, see Tables 19 and 20. For dry bulb operation with a 2-speed indoor fan, with or without DCV, see Tables 21 and 22. For enthalpy operation with a 2-speed indoor fan, with or without DCV, see Tables 23 and 24.

Table 16 — 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 17 — Dry Bulb Operation without 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	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	24-v/On	0-v/Off	MIN POS	Closed
		On	On	High	24-v/On	24-v/On	MIN POS	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	0-v/Off	0-v/Off	MIN POS to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/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 Y-I and Y2-I have not been satisfied.

Table 18 — 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	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off*	VENTMIN to Full-Open	Closed to Full-Open
Above CO_2 set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN to VENTMAX	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN to VENTMAX	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN to VENTMAX	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN to VENTMAX	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/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 Y-I and Y2-I have not been satisfied.

Table 19 — Enthalpy Operation without 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	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	24-v/On	0-v/Off	MIN POS	Closed
		On	On	High	24-v/On	24-v/On	MIN POS	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	MIN POS	Closed
		On	Off	High	0-v/Off	0-v/Off	MIN POS to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/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 Y-I and Y2-I have not been satisfied.

Table 20 — 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	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	24-v/On	0-v/Off†	VENTMIN to Full-Open	Closed to Full-Open
Above CO_2 set	No	Off	Off	High	0-v/Off	0-v/Off	VENTMIN to VENTMAX	Closed
		On	Off	High	24-v/On	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	On	High	24-v/On	24-v/On	VENTMIN H to VENTMAX	Closed
	Yes	Off	Off	High	0-v/Off	0-v/Off	VENTMIN L to VENTMAX	Closed
		On	Off	High	0-v/Off	0-v/Off	VENTMIN to Full-Open	Closed to Full-Open
		On	On	High	DELAY* 24-v/On	0-v/Off†	VENTMIN to Full-Open	Closed to Full-Open

*With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high speed fan to try to satisfy the call for second stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.
†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 Y-I and Y2-I have not been satisfied.

Table 21 — Dry Bulb Operation without 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	0-v/Off	0-v/Off	MIN POS L	Closed
		On	Off	Low	24-v/On	0-v/Off	MIN POS L	Closed
		On	On	High	24-v/On	24-v/On	MIN POS H	Closed
NONE	Yes	Off	Off	Low	0-v/Off	0-v/Off	MIN POS L	Closed
		On	Off	Low	0-v/Off	0-v/Off	MIN POS L to Full-Open	Closed to Full-Open
		On	On	High	DELAY* 24-v/On	0-v/Off†	MIN POS H to Full-Open	Closed to Full-Open

*With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high speed fan to try to satisfy the call for second stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.
†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 Y-I and Y2-I have not been satisfied.

Table 22 — 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	DELAY* 24v/On	0v/Off†	VENTMIN to Full-Open	Closed to Full-Open

*With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high speed fan to try to satisfy the call for second stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.
†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 23 — Enthalpy Operation without 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	DELAY* 24v/On	0v/Off†	MIN POS to Full Open	Closed to Full-Open

*With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high speed fan to try to satisfy the call for second stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.
†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 24 — 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	DELAY* 24v/On	0v/Off*	VENTMIN to Full-Open	Closed to Full-Open

*With 2SP FAN DELAY (Advanced Setup Menu) when in the economizing mode there is a delay for the high speed fan to try to satisfy the call for second stage cooling by turning on the fan to high and opening the OA damper 100% before the first stage mechanical cooling is enabled.
†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.

ENTHALPY SETTINGS

When the OA temperature, enthalpy and dew point are below the respective set points, the Outdoor Air can be used for economizing. Figure 81 shows the new single enthalpy boundaries in the W7220. There are 5 boundaries (set points ES1 through ES5), which are defined by dry bulb temperature, enthalpy and dew point.

Refer to Table 26 for ENTH CURVE set point 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.

Figure 81 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.

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 25.

Table 25 — 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.

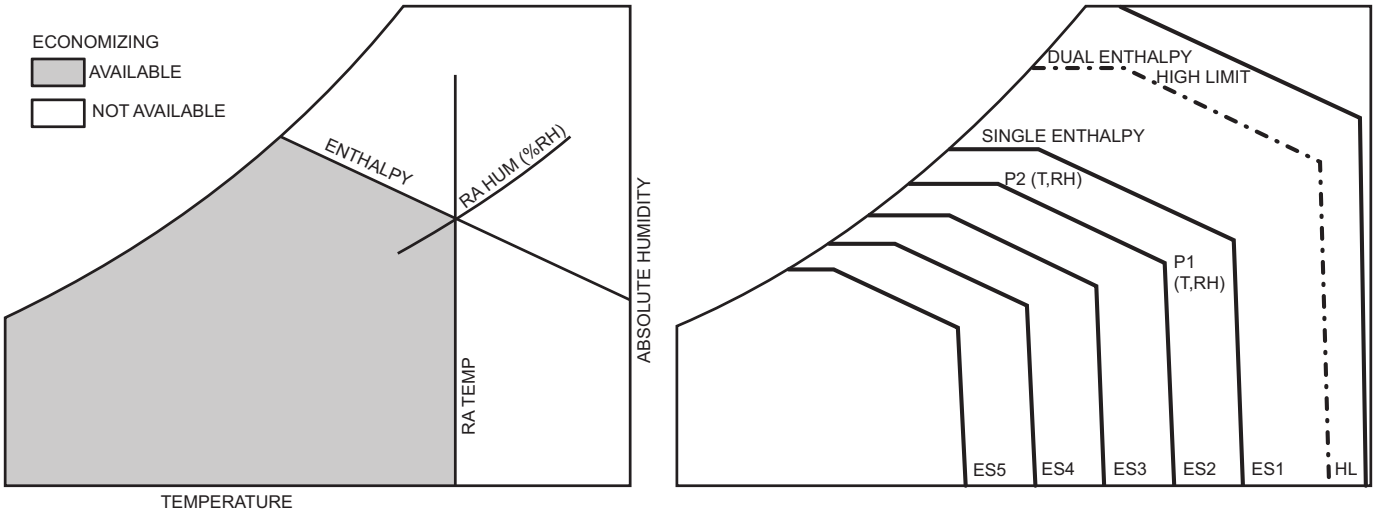


Fig. 81 — Single Enthalpy Curve Boundaries

Table 26 — 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

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 43.

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 set points 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 15) 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 43.

Checkout Tests

Use the Checkout menu (see page 48) 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 43.

To perform a Checkout test:

1. Scroll to the desired test in the Checkout menu using the ▲ and ▼ buttons.
2. Press the ↵ (Enter) button to select the item. RUN? appears.
3. Press the ↵ (Enter) button to start the test. The unit pauses and then displays IN PROGRESS. When the test is complete, DONE appears.
4. 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.

⚠CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

Be sure to allow enough time for compressor start-up and shutdown between checkout tests so that you do not short-cycle the compressors.

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 ↵ (Enter) button. ERASE? displays.
3. Press the ↵ (Enter) button. ALARM ERASED displays.
4. Press the ↑ (Menu up/Exit) button to complete the action and return to the previous menu.

If the alarm still exists after clearing it, it is redisplayed within 5 seconds.

PRE-START-UP/START-UP

⚠ WARNING

PERSONAL INJURY HAZARD

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

1. Follow recognized safety practices and wear approved Personal Protective Equipment (PPE), including safety glasses and gloves when checking or servicing refrigerant system.
2. Do not use a torch to remove any component. System contains oil and refrigerant under pressure. To remove a component, wear PPE and proceed as follows:
   d. Shut off all electrical power to unit. Apply applicable lockout/tag-out procedures.
   e. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
   f. Do not use a torch. Cut component connection tubing with tubing cutter and remove component from unit.
   g. Carefully un-sweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.
3. Do not operate compressor or provide any electric power to unit unless compressor terminal cover is in place and secured.
4. Do not remove compressor terminal cover until all electrical power is disconnected and approved lockout/tag-out procedures are in place.
5. Relieve all pressure from system before touching or disturbing anything inside terminal box whenever refrigerant leak is suspected around compressor terminals.
6. Never attempt to repair a soldered connection while refrigerant system is under pressure.

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

The unit must be electrically grounded in accordance with local codes and NEC ANSI/NFPA 70 (American National Standards Institute/National Fire Protection Association).

Proceed as follows to inspect and prepare the unit for initial start-up:

1. Remove all access panels.
2. Read and follow instructions on all WARNING, CAUTION, and INFORMATION labels attached to, or shipped with, unit.
3. Make the following inspections:
   a. Inspect for shipping and handling damages such as broken lines, loose parts, or disconnected wires, etc.
   b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil generally indicates a refrigerant leak. Leak-test all refrigerant tubing connections using electronic leak detector, halide torch, or liquid-soap solution.
   c. Inspect all field-wiring and factory-wiring connections. Be sure that connections are completed and tight. Be sure that wires are not in contact with refrigerant tubing or sharp edges.
   d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
4. Verify the following conditions:
   a. Make sure that condenser-fan blade are correctly positioned in fan orifice. See Condenser Fan Adjustment section for more details.
   b. Make sure that air filter(s) is in place.
   c. Make sure that condensate drain trap is filled with water to ensure proper drainage.
   d. Make sure that all tools and miscellaneous loose parts have been removed.

START-UP, GENERAL

Unit Preparation

Make sure that unit has been installed in accordance with installation instructions and applicable codes.

IMPORTANT: Follow the base unit's start-up sequence as described in the unit's installation instructions.

In addition to the base unit start-up, there are a few steps needed to properly start-up the controls. RTU-OPEN's Service Test function should be used to assist in the base unit start-up and also allows verification of output operation. Controller configuration is also part of start-up. This is especially important when field accessories have been added to the unit. The factory pre-configures options installed at the factory. There may also be additional installation steps or inspection required during the start-up process.

Additional Installation/Inspection

Inspect the field-installed accessories for proper installation, making note of which ones do or do not require configuration changes. Inspect the RTU-OPEN's Alarms for initial insight to any potential issues. Refer to the *Controls, Start-up, Operation and Troubleshooting Instructions* manual. Inspect the SAT sensor for relocation as intended during installation. Inspect special wiring as directed below.

Return-Air Filters

Ensure correct filters are installed in unit (see Appendix B — Physical Data). Do not operate unit without return-air filters.

Outdoor-Air Inlet Screens

Outdoor-air inlet screen must be in place before operating unit.

Compressor Mounting

Compressors are internally spring mounted. Do not loosen or remove compressor hold down bolts.

Internal Wiring

Check all electrical connections in unit control boxes. Tighten as required.

Refrigerant Service Ports

Each unit system has two 1/4-in. SAE flare (with check valves) service ports: one on the suction line, and one on the compressor discharge line. Be sure that caps on the ports are tight.

Compressor Rotation

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution can result in premature wear and damage to equipment.

Scroll compressors can only compress refrigerant if rotating in the right direction. Reverse rotation for extended times can result in internal damage to the compressor. Scroll compressors are sealed units and cannot be repaired on site location.

On 3-phase units with scroll compressors, it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

If the suction pressure does not drop and the discharge pressure does not rise to normal levels:

4. Note that the evaporator fan is probably also rotating in the wrong direction.
5. Turn off power to the unit and install lockout tag.
6. Reverse any two of the unit power leads.
7. Re-energize to the compressor. Check pressures.

The suction and discharge pressure levels should now move to their normal start-up levels.

NOTE: When the compressor is rotating in the wrong direction, the unit will make an elevated level of noise and will not provide cooling.

Cooling

Set space thermostat to OFF position. To start unit, turn on main power supply. Set system selector switch at COOL position and fan switch at AUTO. position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check unit charge. Refer to Refrigerant Charge section on page 15.

Reset thermostat at a position above room temperature. Compressor will shut off. Evaporator fan will shut off after a 30 second delay.

To shut off unit, set system selector switch at OFF position. Resetting thermostat at a position above room temperature shuts unit off temporarily until space temperature exceeds thermostat setting.

Heating

To start unit, turn on main power supply. Set system selector switch to the HEAT position and set thermostat at a setting above room temperature. Set fan to AUTO position.

First stage of thermostat energizes the first stage of the electric heaters. Second stage of thermostat energizes the second stage of electric heaters (if installed). Check heating effects at air supply grille(s).

If electric heaters do not energize, reset limit switch (located on supply-fan scroll) by pressing button located between terminals on the switch.

To shut unit off, set system selector switch to the OFF position. Resetting thermostat at a position below room temperature temporarily shuts unit off until space temperature falls below thermostat setting.

Ventilation (Continuous Fan)

Set fan and system selector switches at ON and OFF positions, respectively. Evaporator fan operates continuously to provide constant air circulation. When the evaporator-fan selector switch is turned to the OFF position, there is a 30 second delay before the fan turns off.

START-UP, PREMIERLINK CONTROLS

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

The unit must be electrically grounded in accordance with local codes and NEC ANSI/NFPA 70 (American National Standards Institute/National Fire Protection Association).

Use the Carrier network communication software to start up and configure the PremierLink controller.

Changes can be made using the ComfortWORKS® software, ComfortVIEW™ software, Network Service Tool, System Pilot™ device, or Touch Pilot™ device. The System Pilot and Touch Pilot are portable interface devices that allow the user to change system set-up and set points from a zone sensor or terminal control module. During start-up, the Carrier software can also be used to verify communication with PremierLink controller.

NOTE: All set-up and set point configurations are factory set and field adjustable.

For specific operating instructions, refer to the literature provided with user interface software.

IMPORTANT: SET-UP INSTRUCTIONS

All set-up and set point configurations are factory set and field-adjustable.

Refer to *PremierLink™ Installation, Start-Up and Configuration Instructions* for specific operating instructions for the controller. Have a copy of this manual available at unit start-up.

Perform System Check-Out

1. Check correctness and tightness of all power and communication connections.
2. At the unit, check fan and system controls for proper operation.
3. At the unit, check electrical system and connections of any optional electric reheat coil.
4. Check to be sure the area around the unit is clear of construction dirt and debris.
5. Check that final filters are installed in the unit. Dust and debris can adversely affect system operation.
6. Verify that the PremierLink controls are properly connected to the CCN bus.

START-UP, RTU-OPEN CONTROLS

IMPORTANT: SET-UP INSTRUCTIONS

Installation, wiring and troubleshooting information for the RTU-OPEN Controller.: “Controls, Start-up, Operation and Troubleshooting Instructions,” “RTU-Open Installation and Start-up Guide” and “RTU-Open Integration Guide”. Have a copy of these manuals available at unit start-up.

FASTENER TORQUE VALUES

Table 27 — Torque Values

LOCATION	TORQUE VALUE
Supply fan motor mounting	120 in.-lb (13.6 Nm) ±12 in.-lb (1.4Nm)
Supply fan motor adjustment plate	120 in.-lb (13.6 Nm) ±12 in.-lb (1.4Nm)
Motor pulley setscrew	72 in.-lb (8.1 Nm) ± 5 in.-lb (0.6 Nm)
Fan pulley setscrew	72 in.-lb (8.1 Nm) ± 5 in.-lb (0.6 Nm)
Blower wheel hub setscrew	72 in.-lb (8.1 Nm) ± 5 in.-lb (0.6 Nm)
Bearing locking collar setscrew	50 in.-lb (6.2 Nm) - 60 in.-lb (6.8 Nm)
Compressor mounting bolts	65 in.-lb (7.3 Nm) - 75 in.-lb (8.5Nm)
Condenser fan motor mounting bolts	20 in.-lb (2.3 Nm) ± 2 in.-lb 0.2 Nm)
Condenser fan hub setscrew	84 in.-lb (9.5 Nm) ± 12 in.-lb (1.4 Nm)

APPENDIX A — MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
5	0	H	C	–	D	0	8	A	3	A	5	–	0	A	0	A	0

Product Type
50 – Elect Heat Pkg. Rooftop

Model Series – WeatherMaster
HC – High Efficiency

Electric Heater Option
– – Standard (No Electric Heat)
A – Low Electric Heat
B – Medium Electric Heat
C – High Electric Heat

Refrigerant System Options
A – Single stage cooling models
B – Single stage cooling w/Humidi-MiZer
D – 2 stage Cooling
E – 2 stage cooling w/Humidi-MiZer
F – Single stage cool w/MotorMaster low amb cntl
G – 2 stage cool w/Motormaster low amb cntl

Nominal Cooling Capacity (Tons)
04 – 3 ton
05 – 4 ton
06 – 5 ton
07 – 6 ton
08 – 7.5 ton
09 – 8.5 ton
11 – 10 ton (12.0 EER)
12 – 10 ton (11.7 EER)
14 – 12.5 ton

Sensor Options
A – None
B – RA Smoke Detector
C – SA Smoke Detector
D – RA + SA Smoke Detector
E – CO_2 Sensor
F – RA Smoke Detector + CO_2
G – SA Smoke Detector + CO_2
H – RA + SA Smoke Detector + CO_2

Indoor Fan Options 3, 4, 5 Ton Models Only*
0 – Electric (Direct) Drive X13 motor
2 – Medium Static Option – Belt Drive
3 – High Static Option – Belt Drive

Indoor Fan Options 6–12.5 Ton Models Only
1 – Standard Static Option – Belt Drive
2 – Medium Static Option – Belt Drive
3 – High Static Option – Belt Drive
C – High Static Option w/Hi–Effy Motor – Belt Drive (14 size only)

Coil Options (RTPF) (Outdoor–Indoor–Hail Guard)
A – Al/Cu – Al/Cu
B – Pre–coat 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 – Pre–Coat Al/Cu – Al/Cu – Louvered Hail Guard
P – E–Coat Al/Cu – Al/Cu Louvered Hail Guard
Q – E–Coat Al/Cu – E–coat Al/Cu – Louvered Hail Guard
R – Cu/Cu – Al/Cu – Louvered Hail Guard
S – Cu/Cu – Cu/Cu – Louvered Hail Guard

Voltage
1 – 575/3/60
3 – 208-230/1/60
5 – 208-230/3/60
6 – 460/3/60

Design Revision
– Factory Design Revision

Base Unit Controls
0 – Base Electromechanical Controls. Can be used with W7212 EconoMi$er IV (Non-Fault Detection and Diagnostic)
1 – PremierLink Controller
2 – RTU Open Multi-Protocol Controller
6 – Electromechanical Controls. Can be used with W7220 EconoMi$er X (Non-Fault Detection and Diagnostic)
D – ComfortLink Controls

Intake / Exhaust Options
A – None
B – Temperature Economizer w/Barometric Relief
F – Enthalpy Economizer w/Barometric Relief
K – 2 position Damper
U – Temp Ultra Low Leak Economizer w/Baro Relief
W – Enthalpy Ultra Low Leak Econo w/Baro Relief

Service Options
0 – None
1 – Un-powered Convenience Outlet
2 – Powered Convenience Outlet
3 – Hinged Panels
4 – Hinged Panels, un-powered C.O.
5 – Hinged Panels, powered C.O.
C – Foil faced insulation

Electrical Options
A – None
B – HACR breaker
C – Non-fused disconnect
D – Thru the base connections
F – Non-fused disconnect & thru the base
G – 2-speed indoor fan (VFD) controller
J – 2-spd contr (VFD) & non-fused disc.
K – 2-spd contr (VFD) & thru the base
M – 2-spd cont (VFD) non-fused disc. & thru the base connections

Packaging
0 – Standard
1 – LTL

NOTE: On single phase (-3voltage code) models, the following are not available as a factory-installed option:
– Humidi-MiZer
– Coated Coils or CU Fin Coils
– Louvered Hail Guards
– Economizer or 2 Position Damper
– Powered 115 Volt Convenience Outlet

* See Price Page details for specific Humidi-MiZer models.

Not all possible options can be displayed above – see price pages or contact your Carrier Expert for more details

Fig. A — Model Number Nomenclature

APPENDIX B — PHYSICAL DATA

Table A — PHYSICAL DATA (Cooling) 3-5 Tons

		50HC*A04	50HC*B04	50HC*A05	50HC*B05	50HC*A06	50HC*B06
Refrigeration System							
	# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll
	Puron® refrigerant (R-410A) charge (lb-oz)	9 - 0	—	12 - 8	—	13 - 3	—
	Humidi-MiZer Puron® refrigerant (R-410A) charge (lb-oz)	—	11 - 0	—	19 - 12	—	20 - 0
	oil A/B (oz)	25	25	42	42	42	42
	Metering Device	TXV	TXV	TXV	TXV	TXV	TXV
	Humidi-MiZer Metering Device	none	none	none	none	none	none
	High-press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505
	Low-press. Trip / Reset (psig)	54 / 117	—	54 / 117	—	54 / 117	—
	Loss of charge Trip/Reset (psig)	—	27 / 44	—	27 / 44	—	27 / 44
Evaporator Coil							
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	3 / 15	3 / 15	3 / 15	3 / 15	4 / 15	4 / 15
	Total Face Area (ft^2)	5.5	5.5	7.3	7.3	7.3	7.3
	Condensate Drain Conn. Size	3/4-in.	3/4-in.	3/4-in.	3/4-in.	3/4-in.	3/4-in.
Humidi-MiZer® Coil							
	Material	—	Cu / Al	—	Cu / Al	—	Cu / Al
	Coil Type	—	3/8-in. RTPF	—	3/8-in. RTPF	—	3/8-in. RTPF
	Rows / FPI	—	1 / 17	—	2 / 17	—	2 / 17
	Total Face Area (ft^2)	—	3.9	—	5.2	—	5.2
Evap. Fan and Motor							
	Motor Qty / Drive Type	1 / Direct	1 / Belt	1 / Direct	1 / Belt	1 / Direct	1 / Belt
	Max BHP	1	1.2	1	1.2	1	1.2
STANDARD STATIC 1 PHASE	RPM Range	600-1200	560-854	600-1200	560-854	600-1200	770-1175
	Motor Frame Size	48	48	48	48	48	48
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	10 x 10	10 x 10	10 x 10	10 x 10	10 x 10	10 x 10
	Motor Qty / Drive Type	—	1 / Belt	—	1 / Belt	—	1 / Belt
	Max BHP	—	1.2	—	1.2	—	1.5
MEDIUM STATIC 1 PHASE	RPM Range	—	770-1175	—	770-1175	—	1035-1466
	Motor Frame Size	—	48	—	48	—	56
	Fan Qty / Type	—	1 / Centrifugal	—	1 / Centrifugal	—	1 / Centrifugal
	Fan Diameter (in.)	—	10 x 10	—	10 x 10	—	10 x 10
	Motor Qty / Drive Type	1 / Direct	1 / Belt	1 / Direct	1 / Belt	1 / Direct	1 / Belt
	Max BHP	1	1.7	1	1.7	1	1.7
STANDARD STATIC 3 PHASE	RPM Range	600-1200	560-854	600-1200	560-854	600-1200	770-1175
	Motor Frame Size	48	48	48	48	48	48
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	10 x 10	10 x 10	10 x 10	10 x 10	11 x 10	10 x 10
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.7	1.7	1.7	1.7	2.4	2.4
MEDIUM STATIC 3 PHASE	RPM Range	770-1175	770-1175	920-1303	770-1175	1035-1466	1035-1466
	Motor Frame Size	48	48	56	48	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	10 x 10	10 x 10	10 x 10	10 x 10	10 x 10	10 x 10
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.4	2.4	2.9	2.9	2.9	2.9
HIGH STATIC 3 PHASE	RPM Range	1035-1466	1035-1466	1208-1550	1208-1550	1303-1550	1303-1550
	Motor Frame Size	56	56	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	10 x 10	10 x 10	10 x 10	10 x 10	10 x 10	10 x 10
Cond. coil							
	Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	2 / 17	2 / 17	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft^2)	12.7	12.7	21.3	21.3	21.3	21.3

APPENDIX B — PHYSICAL DATA

Table A — PHYSICAL DATA (Cooling) 3-5 Tons (cont)

	50HC*A04	50HC*B04	50HC*A05	50HC*B05	50HC*A06	50HC*B06
Cond. fan / motor						
Qty / Motor Drive Type	1 / direct	1 / direct	1 / direct	1 / direct	1 / direct	1 / direct
Motor HP / RPM	1/8 / 825	1/8 / 825	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
Fan diameter (in.)	22	22	22	22	22	22
Filters						
RA Filter qty / Size (in.)	2 / 16 x 25 x 2	2 / 16 x 25 x 2	4 / 16 x 16 x 2	4 / 16 x 16 x 2	4 / 16 x 16 x 2	4 / 16 x 16 x 2
OA inlet screen qty / Size (in.)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1

APPENDIX B — PHYSICAL DATA

Table B — PHYSICAL DATA (Cooling) 6 Tons

		50HC*A07	50HC*B07	50HC*D07	50HC*E07
Refrigeration System					
	# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / 2-Stage Scroll	1 / 1 /2-Stage Scroll
	Puron® refrigerant (R-410A) charge (lb-oz)	14 - 0	—	14 - 0	—
	Humidi-MiZer Puron® refrigerant (R-410A) charge (lb-oz)	—	22 - 8	—	22 - 8
	oil A/B (oz)	56	56	56	56
	Metering Device	TXV	TXV	TXV	TXV
	Humidi-MiZer Metering Device	none	none	none	none
	High-press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
	Low-press. Trip / Reset (psig)	54 / 117	—	54 / 117	—
	Loss of charge Trip/Reset (psig)	—	27 / 44	—	27 / 44
Evaporator Coil					
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	3 / 15	3 / 15	3 / 15	3 / 15
	Total Face Area (ft^2)	8.9	8.9	8.9	8.9
	Condensate Drain Conn. Size	3/4-in.	3/4-in.	3/4-in.	3/4-in.
Humidi-MiZer® Coil					
	Material	—	Cu / Al	—	Cu / Al
	Coil Type	—	3/8-in. RTPF	—	3/8-in. RTPF
	Rows / FPI	—	2 / 17	—	2 / 17
	Total Face Area (ft^2)	—	5.2	—	5.2
Evap. Fan and Motor					
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.7	1.7	1.7	1.7
STANDARD STATIC 3 PHASE	RPM Range	489-747	489-747	489-747	489-747
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.9	2.9	2.9	2.9
MEDIUM STATIC 3 PHASE	RPM Range	733-949	733-949	733-949	733-949
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	4.7	4.7	4.7	4.7
HIGH STATIC 3 PHASE	RPM Range	909-1102	909-1102	909-1102	909-1102
	Motor Frame Size	14	14	14	14
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
Cond. coil					
	Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft^2)	20.5	20.5	20.5	20.5
Cond. fan / motor					
	Qty / Motor Drive Type	2 / direct	2 / direct	2 / direct	2 / direct
	Motor HP / RPM	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
	Fan diameter (in.)	22	22	22	22
Filters					
	RA Filter qty / Size (in.)	4 / 16 x 20 x 2	4 / 16 x 20 x 2	4 / 16 x 20 x 2	4 / 16 x 20 x 2
	OA inlet screen qty / Size (in.)	1 / 20 x 36 x 1	1 / 20 x 36 x 1	1 / 20 x 36 x 1	1 / 20 x 36 x 1

APPENDIX B — PHYSICAL DATAPHYSICAL DATA

Table C — PHYSICAL DATA (Cooling) 7.5-8.5 Tons

		50HC*D08	50HC*E08	50HC*D09	50HC*E09
Refrigeration System					
	# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
	RTPF models R-410A charge A/B (lbs - oz)	9 - 10 / 9 - 10	—	9 -14 / 9 - 14	—
	Alternate (Humidimizer) R-410A charge A/B (lbs - oz)	—	17 - 0 / 17 - 0	—	15 - 2 / 15 - 0
	oil A/B (oz)	42 / 42	42 / 42	42 / 42	42 / 42
	Metering device	TXV	TXV	TXV	TXV
	Alternate (Humidimizer) Metering device	none	none	none	none
	High-press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
	Low-press. Trip / Reset (psig)	54 / 117	—	54 / 117	—
	Loss of charge Trip / Reset (psig)	—	27 / 44	—	27 / 44
Evaporator Coil					
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	4 / 15	4 / 15	4 / 15	4 / 15
	Total Face Area (ft²)	11.1	11.1	11.1	11.1
	Condensate Drain Conn. Size	3/4-in.	3/4-in.	3/4-in.	3/4-in.
Humidi-MiZer® Coil					
	Material	—	Cu / Al	—	Cu / Al
	Coil Type	—	3/8-in. RTPF	—	3/8-in. RTPF
	Rows / FPI	—	2 / 17	—	2 / 17
	Total Face Area (ft²)	—	6.3	—	8.4
Evap. Fan and Motor					
STANDARD STATIC 3 PHASE	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.7	1.7	1.7	1.7
	RPM Range	518-733	518-733	518-733	518-733
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
MEDIUM STATIC 3 PHASE	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.4	2.4	2.4	2.4
	RPM Range	690-936	690-936	690-936	690-936
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
HIGH STATIC 3 PHASE	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	3.7	3.7	3.7	3.7
	RPM Range	838-1084	838-1084	838-1084	838-1084
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15
Cond. coil					
	Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft²)	25.1	25.1	25.1	25.1
Cond. fan / motor					
	Qty / Motor Drive Type	2 / direct	2 / direct	2 / direct	2 / direct
	Motor HP / RPM	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
	Fan diameter (in.)	22	22	22	22
Filters					
	RA Filter qty / Size (in.)	4 / 20 x 20 x 2	4 / 20 x 20 x 2	4 / 20 x 20 x 2	4 / 20 x 20 x 2
	OA inlet screen qty / Size (in.)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1

APPENDIX B — PHYSICAL DATA

Table D — PHYSICAL DATA (Cooling) 10-12.5 Tons

		50HC*D11	50HC*E11	50HC*D12	50HC*E12	50HC*D14	50HC*E14
Refrigeration System							
	# Circuits / # Comp. / Type	2/2/Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
	RTPF models R-410A charge A/B (lbs - oz)	12-10/ 13-0	18-0/18-0	12-11/ 12-5	—	16-7 / 15-5	—
	Alternate (Humidimizer) R-410A charge A/B (lbs - oz)	—	—	—	—	—	—
	oil A/B (oz)	—	—	—	18 - 3 / 17 - 3	—	29 - 8 / 21 - 0
	Metering device	42 / 42	42 / 42	42 / 42	42 / 42	56/56	56/56
	Alternate (Humidimizer) Metering device	TXV	TXV	TXV	TXV	TXV	TXV
	High-press. Trip / Reset (psig)	none	none	none	none	none	none
	Low-press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505
	Loss of charge Trip / Reset (psig)	27/44	—	54 / 117	—	54 / 117	—
Evaporator Coil							
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15
	Total Face Area (ft^2)	11.1	11.1	11.1	11.1	17.5	17.5
	Condensate Drain Conn. Size	3/4-in.	3/4-in.	3/4-in.	3/4-in.	3/4-in.	3/4-in.
Humidi-MiZer® Coil							
	Material	—	Cu/Al	—	Cu/Al	—	Cu / Al
	Coil Type	—	3/8-in. RTPF	—	3/8-in. RTPF	—	3/8-in. RTPF
	Rows / FPI	—	2/17	—	2/17	—	1 / 17
	Total Face Area (ft^2)	—	8.6	—	8.6	—	13.8
Evap. Fan and Motor							
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.4	2.4	2.4	2.4	2.9	2.9
STANDARD STATIC 3 PHASE	RPM Range	591-838	591-838	591-838	591-838	440-609	440-609
	Motor Frame Size	56	56	56	56	56Y	56Y
	Fan Qty / Type	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15	18 x 18	18 x 18
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	3.7	3.7	3.7	3.7	3.7	3.7
MEDIUM STATIC 3 PHASE	RPM Range	838-1084	838-1084	838-1084	838-1084	609-778	609-778
	Motor Frame Size	56HZ	56HZ	56HZ	56HZ	56HZ	56HZ
	Fan Qty / Type	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15	18 x 18	18 x 18
	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt	—	—
	Max BHP	4.9	4.9	4.9	4.9	—	—
HIGH STATIC 3 PHASE	RPM Range	1022-1240	1022-1240	1022-1240	1022-1240	—	—
	Motor Frame Size	145TY	145TY	145TY	145TY	—	—
	Fan Qty / Type	1/Centrifugal	1/Centrifugal	1/Centrifugal	1/Centrifugal	—	—
	Fan Diameter (in.)	15 x 15	15 x 15	15 x 15	15 x 15	—	—
	Motor Qty / Drive Type	—	—	—	—	1 / Belt	1 / Belt
	Max BHP (208/230/460/575v)	—	—	—	—	6.5 / 6.9 / 7.0 / 8.3	6.5 / 6.9 / 7.0 / 8.3
HIGH STATIC HIGH EFFICIENCY 3 PHASE	RPM Range	—	—	—	—	776-955	776-955
	Motor Frame Size	—	—	—	—	S184T	S184T
	Fan Qty / Type	—	—	—	—	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in.)	—	—	—	—	18 x 18	18 x 18
Cond. coil							
	Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil Type	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF	3/8-in. RTPF
	Rows / FPI	3 / 17	3 / 17	3 / 17	3 / 17	2/17	2/17
	Total Face Area (ft^2)	25.1	25.1	25.1	25.1	(2) 23.1	(2) 23.1
Cond. fan / motor							
	Qty / Motor Drive Type	1/direct-ECM	1 / direct	1 / direct	1 / direct	3 / direct	3 / direct
	Motor HP / RPM	1/1050	1 / 1175	1 / 1175	1 / 1175	1/4 / 1100	1/4 / 1100
	Fan diameter (in.)	30	30	30	30	22	22
Filters							
	RA Filter qty / Size (in.)	4 / 20x20x2	4 / 20x20x2	4 / 20x20x2	4 / 20x20x2	6 / 18x24x2	6 / 18x24x2
	OA inlet screen qty / Size (in.)	1 / 20x24x1	1 / 20x24x1	1 / 20x24x1	1 / 20x24x1	V 2 / 24x27x1 H 1 / 30x39x1	V 2 / 24x27x1 H 1 / 30x39x1

APPENDIX C — FAN PERFORMANCE

Table E — 50HC Size 04 Single Phase Humidi-MiZer 3-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	574	0.13	707	0.23	817	0.34	913	0.47	999	0.61
975	597	0.15	727	0.25	835	0.37	929	0.50	1015	0.64
1050	621	0.18	747	0.28	853	0.40	946	0.53	1030	0.68
1125	646	0.20	768	0.31	872	0.43	964	0.57	1047	0.72
1200	671	0.23	790	0.34	892	0.47	982	0.61	1064	0.76
1275	696	0.26	812	0.38	912	0.51	1001	0.65	1082	0.81
1350	723	0.30	835	0.42	933	0.55	1020	0.70	1100	0.86
1425	749	0.34	859	0.46	955	0.60	1040	0.75	1119	0.91
1500	776	0.38	883	0.51	977	0.65	1061	0.80	1138	0.97

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1078	0.77	1151	0.93	**1220**	**1.11**	—	—	—	—
975	1093	0.80	1165	0.97	**1233**	**1.15**	—	—	—	—
1050	1108	0.84	**1180**	**1.01**	**1247**	**1.19**	—	—	—	—
1125	1123	0.88	**1195**	**1.05**	—	—	—	—	—	—
1200	1140	0.92	**1210**	**1.10**	—	—	—	—	—	—
1275	1157	0.97	**1226**	**1.15**	—	—	—	—	—	—
1350	1174	1.02	**1243**	**1.20**	—	—	—	—	—	—
1425	**1192**	**1.08**	—	—	—	—	—	—	—	—
1500	**1210**	**1.14**	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 560-854 RPM, 1.2 BHP max
Medium static 770-1175 RPM, 1.2 BHP max

Table F — 50HC Size 04 Single Phase Humidi-MiZer 3-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	594	0.15	740	0.25	867	0.37	981	0.52	1084	0.68
975	618	0.17	758	0.28	881	0.40	991	0.55	1092	0.71
1050	642	0.19	777	0.30	896	0.43	1003	0.58	1102	0.75
1125	668	0.22	797	0.34	912	0.47	1017	0.62	1113	0.79
1200	695	0.25	818	0.37	930	0.51	1032	0.66	1126	0.83
1275	722	0.29	841	0.41	949	0.55	1048	0.71	1140	0.88
1350	750	0.33	864	0.46	968	0.60	1065	0.76	1155	0.93
1425	778	0.37	888	0.50	989	0.65	1083	0.81	1171	0.99
1500	807	0.42	913	0.56	1011	0.71	1103	0.87	**1188**	**1.05**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	**1180**	**0.86**	**1269**	**1.05**	—	—	—	—	—	—
975	**1186**	**0.89**	**1275**	**1.08**	—	—	—	—	—	—
1050	**1194**	**0.92**	**1281**	**1.12**	—	—	—	—	—	—
1125	**1204**	**0.97**	**1289**	**1.16**	—	—	—	—	—	—
1200	**1215**	**1.01**	—	—	—	—	—	—	—	—
1275	**1227**	**1.06**	—	—	—	—	—	—	—	—
1350	**1240**	**1.12**	—	—	—	—	—	—	—	—
1425	**1254**	**1.18**	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 560-854 RPM, 1.2 BHP max
Medium static 770-1175 RPM, 1.2 BHP max

APPENDIX C — FAN PERFORMANCE

Table G — 50HC Size 04 3-Phase Humidi-MiZer 3-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	574	0.13	707	0.23	817	0.34	913	0.47	999	0.61
975	597	0.15	727	0.25	835	0.37	929	0.50	1015	0.64
1050	621	0.18	747	0.28	853	0.40	946	0.53	1030	0.68
1125	646	0.20	768	0.31	872	0.43	964	0.57	1047	0.72
1200	671	0.23	790	0.34	892	0.47	982	0.61	1064	0.76
1275	696	0.26	812	0.38	912	0.51	1001	0.65	1082	0.81
1350	723	0.30	835	0.42	933	0.55	1020	0.70	1100	0.86
1425	749	0.34	859	0.46	955	0.60	1040	0.75	1119	0.91
1500	776	0.38	883	0.51	977	0.65	1061	0.80	1138	0.97

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1078	0.77	1151	0.93	1220	1.11	1284	1.30	1346	1.49
975	1093	0.80	1165	0.97	1233	1.15	1297	1.33	1358	1.53
1050	1108	0.84	1180	1.01	1247	1.19	1311	1.38	1371	1.58
1125	1123	0.88	1195	1.05	1261	1.23	1325	1.42	1385	1.62
1200	1140	0.92	1210	1.10	1276	1.28	1339	1.47	1399	1.68
1275	1157	0.97	1226	1.15	1292	1.33	1354	1.53	1414	1.73
1350	1174	1.02	1243	1.20	1308	1.39	1370	1.59	1429	1.80
1425	1192	1.08	1260	1.26	1325	1.45	1386	1.65	1444	1.86
1500	1210	1.14	1278	1.33	1342	1.52	1403	1.72	1461	1.93

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 560-854 RPM, 1.7 BHP max
Medium static 770-1175 RPM, 1.7 BHP max
High static 1035-1466 RPM, 2.4 BHP max

Table H — 50HC Size 04 3-Phase Humidi-MiZer 3-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	594	0.15	740	0.25	867	0.37	981	0.52	1084	0.68
975	618	0.17	758	0.28	881	0.40	991	0.55	1092	0.71
1050	642	0.19	777	0.30	896	0.43	1003	0.58	1102	0.75
1125	668	0.22	797	0.34	912	0.47	1017	0.62	1113	0.79
1200	695	0.25	818	0.37	930	0.51	1032	0.66	1126	0.83
1275	722	0.29	841	0.41	949	0.55	1048	0.71	1140	0.88
1350	750	0.33	864	0.46	968	0.60	1065	0.76	1155	0.93
1425	778	0.37	888	0.50	989	0.65	1083	0.81	1171	0.99
1500	807	0.42	913	0.56	1011	0.71	1103	0.87	1188	1.05

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1180	0.86	1269	1.05	1354	1.25	1434	1.47	**1511**	**1.70**
975	1186	0.89	1275	1.08	1358	1.29	1437	1.51	**1513**	**1.74**
1050	1194	0.92	1281	1.12	1363	1.32	1441	1.54	**1516**	**1.78**
1125	1204	0.97	1289	1.16	1370	1.37	1447	1.59	**1520**	**1.82**
1200	1215	1.01	1298	1.21	1378	1.42	1454	1.64	**1526**	**1.87**
1275	1227	1.06	1309	1.26	1387	1.47	1462	1.69	**1533**	**1.92**
1350	1240	1.12	1321	1.32	1397	1.53	**1471**	**1.75**	**1541**	**1.99**
1425	1254	1.18	1333	1.38	1409	1.59	**1481**	**1.82**	—	—
1500	1270	1.24	1347	1.45	1421	1.66	**1492**	**1.89**	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 560-854 RPM, 1.7 BHP max
Medium static 770-1175 RPM, 1.7 BHP max
High static 1035-1466 RPM, 2.4 BHP max

APPENDIX C — FAN PERFORMANCE

Table I — 50HC Size 04 3-Phase Non-Humidi-MiZer 3-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	**574**	**0.13**	**707**	**0.23**	817	0.34	913	0.47	999	0.61
975	**597**	**0.15**	**727**	**0.25**	835	0.37	929	0.50	1015	0.64
1050	**621**	**0.18**	**747**	**0.28**	853	0.40	946	0.53	1030	0.68
1125	**646**	**0.20**	**768**	**0.31**	872	0.43	964	0.57	1047	0.72
1200	**671**	**0.23**	790	0.34	892	0.47	982	0.61	1064	0.76
1275	**696**	**0.26**	812	0.38	912	0.51	1001	0.65	1082	0.81
1350	**723**	**0.30**	835	0.42	933	0.55	1020	0.70	1100	0.86
1425	**749**	**0.34**	859	0.46	955	0.60	1040	0.75	1119	0.91
1500	776	0.38	883	0.51	977	0.65	1061	0.80	1138	0.97

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1078	0.77	1151	0.93	1220	1.11	1284	1.30	1346	1.49
975	1093	0.80	1165	0.97	1233	1.15	1297	1.33	1358	1.53
1050	1108	0.84	1180	1.01	1247	1.19	1311	1.38	1371	1.58
1125	1123	0.88	1195	1.05	1261	1.23	1325	1.42	1385	1.62
1200	1140	0.92	1210	1.10	1276	1.28	1339	1.47	1399	1.68
1275	1157	0.97	1226	1.15	1292	1.33	1354	1.53	1414	1.73
1350	1174	1.02	1243	1.20	1308	1.39	1370	1.59	1429	1.80
1425	1192	1.08	1260	1.26	1325	1.45	1386	1.65	1444	1.86
1500	1210	1.14	1278	1.33	1342	1.52	1403	1.72	1461	1.93

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Medium static 770-1175 RPM, 1.7 BHP max
High static 1035-1466 RPM, 2.4 BHP max

Table J — 50HC Size 04 3-Phase Non-Humidi-MiZer 3-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	**594**	**0.15**	**740**	**0.25**	867	0.37	981	0.52	1084	0.68
975	**618**	**0.17**	**758**	**0.28**	881	0.40	991	0.55	1092	0.71
1050	**642**	**0.19**	777	0.30	896	0.43	1003	0.58	1102	0.75
1125	**668**	**0.22**	797	0.34	912	0.47	1017	0.62	1113	0.79
1200	**695**	**0.25**	818	0.37	930	0.51	1032	0.66	1126	0.83
1275	**722**	**0.29**	841	0.41	949	0.55	1048	0.71	1140	0.88
1350	**750**	**0.33**	864	0.46	968	0.60	1065	0.76	1155	0.93
1425	778	0.37	888	0.50	989	0.65	1083	0.81	1171	0.99
1500	807	0.42	913	0.56	1011	0.71	1103	0.87	1188	1.05

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1180	0.86	1269	1.05	1354	1.25	1434	1.47	**1511**	**1.70**
975	1186	0.89	1275	1.08	1358	1.29	1437	1.51	**1513**	**1.74**
1050	1194	0.92	1281	1.12	1363	1.32	1441	1.54	**1516**	**1.78**
1125	1204	0.97	1289	1.16	1370	1.37	1447	1.59	**1520**	**1.82**
1200	1215	1.01	1298	1.21	1378	1.42	1454	1.64	**1526**	**1.87**
1275	1227	1.06	1309	1.26	1387	1.47	1462	1.69	**1533**	**1.92**
1350	1240	1.12	1321	1.32	1397	1.53	**1471**	**1.75**	**1541**	**1.99**
1425	1254	1.18	1333	1.38	1409	1.59	**1481**	**1.82**	—	—
1500	1270	1.24	1347	1.45	1421	1.66	**1492**	**1.89**	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Medium static 770-1175 RPM, 1.7 BHP max
High static 1035-1466 RPM, 2.4 BHP max

APPENDIX C — FAN PERFORMANCE

Table K — 50HC Size 05 Single Phase Humidi-MiZer 4-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	671	0.23	790	0.34	892	0.47	982	0.61	1064	0.76
1300	705	0.28	820	0.39	919	0.52	1007	0.67	1088	0.82
1400	740	0.33	851	0.45	947	0.58	1034	0.73	1113	0.89
1500	776	0.38	883	0.51	977	0.65	1061	0.80	1138	0.97
1600	813	0.45	916	0.58	1007	0.73	1089	0.89	1165	1.05
1700	851	0.52	949	0.66	1038	0.81	1118	0.97	**1192**	**1.15**
1800	888	0.60	984	0.75	1069	0.90	1148	1.07	—	—
1900	927	0.69	1019	0.84	1102	1.00	**1179**	**1.18**	—	—
2000	965	0.78	1054	0.94	1135	1.11	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1140	0.92	**1210**	**1.10**	—	—	—	—	—	—
1300	1162	0.99	**1232**	**1.16**	—	—	—	—	—	—
1400	**1186**	**1.06**	—	—	—	—	—	—	—	—
1500	**1210**	**1.14**	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 560-854 RPM, 1.2 BHP max
Medium static 770-1175 RPM, 1.2 BHP max

Table L — 50HC Size 05 Single Phase Humidi-MiZer 4-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	695	0.25	818	0.37	930	0.51	1032	0.66	1126	0.83
1300	731	0.30	849	0.43	955	0.57	1053	0.72	1145	0.89
1400	769	0.36	880	0.49	982	0.63	1077	0.79	1166	0.97
1500	807	0.42	913	0.56	1011	0.71	1103	0.87	**1188**	**1.05**
1600	847	0.49	948	0.63	1042	0.79	1130	0.96	**1213**	**1.14**
1700	887	0.57	983	0.72	1073	0.88	1158	1.06	—	—
1800	928	0.66	1020	0.82	1106	0.98	**1188**	**1.16**	—	—
1900	969	0.76	1057	0.92	1140	1.09	—	—	—	—
2000	1010	0.87	1095	1.04	1175	1.21	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	**1215**	**1.01**	**1298**	**1.21**	—	—	—	—	—	—
1300	**1231**	**1.08**	—	—	—	—	—	—	—	—
1400	**1249**	**1.16**	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 560-854 RPM, 1.2 BHP max
Medium static 770-1175 RPM, 1.2 BHP max

APPENDIX C — FAN PERFORMANCE

Table M — 50HC Size 05 3-Phase Humidi-MiZer 4-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	671	0.23	790	0.34	892	0.47	982	0.61	1064	0.76
1300	705	0.28	820	0.39	919	0.52	1007	0.67	1088	0.82
1400	740	0.33	851	0.45	947	0.58	1034	0.73	1113	0.89
1500	776	0.38	883	0.51	977	0.65	1061	0.80	1138	0.97
1600	813	0.45	916	0.58	1007	0.73	1089	0.89	1165	1.05
1700	851	0.52	949	0.66	1038	0.81	1118	0.97	1192	1.15
1800	888	0.60	984	0.75	1069	0.90	1148	1.07	1221	1.25
1900	927	0.69	1019	0.84	1102	1.00	1179	1.18	1250	1.36
2000	965	0.78	1054	0.94	1135	1.11	1210	1.29	1280	1.48

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1140	0.92	1210	1.10	1276	1.28	1339	1.47	1399	1.68
1300	1162	0.99	1232	1.16	1297	1.35	1360	1.55	1419	1.75
1400	1186	1.06	1254	1.24	1319	1.43	1381	1.63	1439	1.84
1500	1210	1.14	1278	1.33	1342	1.52	1403	1.72	1461	1.93
1600	1236	1.23	1302	1.42	1365	1.62	1425	1.82	1483	2.04
1700	1262	1.33	1328	1.52	1390	1.72	1449	1.93	1505	2.15
1800	1289	1.44	1354	1.63	1415	1.84	1473	2.05	1529	2.27
1900	1317	1.55	1380	1.75	1441	1.96	1498	2.18	—	—
2000	1345	1.68	1408	1.88	1467	2.10	1524	2.32	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 560-854 RPM, 1.7 BHP max
Medium static 770-1175 RPM, 1.7 BHP max
High static 1208-1550 RPM, 2.9 BHP max

Table N — 50HC Size 05 3-Phase Humidi-MiZer 4-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	695	0.25	818	0.37	930	0.51	1032	0.66	1126	0.83
1300	731	0.30	849	0.43	955	0.57	1053	0.72	1145	0.89
1400	769	0.36	880	0.49	982	0.63	1077	0.79	1166	0.97
1500	807	0.42	913	0.56	1011	0.71	1103	0.87	1188	1.05
1600	847	0.49	948	0.63	1042	0.79	1130	0.96	1213	1.14
1700	887	0.57	983	0.72	1073	0.88	1158	1.06	1239	1.24
1800	928	0.66	1020	0.82	1106	0.98	1188	1.16	1266	1.35
1900	969	0.76	1057	0.92	1140	1.09	1219	1.28	1295	1.48
2000	1010	0.87	1095	1.04	1175	1.21	1251	1.41	1325	1.61

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1215	1.01	1298	1.21	1378	1.42	1454	1.64	1526	1.87
1300	1231	1.08	1313	1.28	1390	1.49	1465	1.71	1536	1.94
1400	1249	1.16	1329	1.36	1405	1.57	1478	1.79	1547	2.03
1500	1270	1.24	1347	1.45	1421	1.66	1492	1.89	—	—
1600	1292	1.34	1367	1.54	1440	1.76	1509	1.99	—	—
1700	1315	1.44	1389	1.65	1459	1.88	1527	2.11	—	—
1800	1341	1.56	1412	1.77	1481	2.00	1547	2.23	—	—
1900	1367	1.68	1437	1.90	1504	2.13	—	—	—	—
2000	1395	1.82	1463	2.04	1528	2.28	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 560-854 RPM, 1.7 BHP max
Medium static 770-1175 RPM, 1.7 BHP max
High static 1208-1550 RPM, 2.9 BHP max

APPENDIX C — FAN PERFORMANCE

Table O — 50HC Size 05 3-Phase Non-Humidi-MiZer 4-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	**671**	**0.23**	**790**	**0.34**	**892**	**0.47**	982	0.61	1064	0.76
1300	**705**	**0.28**	**820**	**0.39**	**919**	**0.52**	1007	0.67	1088	0.82
1400	**740**	**0.33**	**851**	**0.45**	947	0.58	1034	0.73	1113	0.89
1500	**776**	**0.38**	**883**	**0.51**	977	0.65	1061	0.80	1138	0.97
1600	**813**	**0.45**	**916**	**0.58**	1007	0.73	1089	0.89	1165	1.05
1700	**851**	**0.52**	949	0.66	1038	0.81	1118	0.97	1192	1.15
1800	**888**	**0.60**	984	0.75	1069	0.90	1148	1.07	1221	1.25
1900	927	0.69	1019	0.84	1102	1.00	1179	1.18	1250	1.36
2000	965	0.78	1054	0.94	1135	1.11	1210	1.29	1280	1.48

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1140	0.92	1210	1.10	1276	1.28	1339	1.47	1399	1.68
1300	1162	0.99	1232	1.16	1297	1.35	1360	1.55	1419	1.75
1400	1186	1.06	1254	1.24	1319	1.43	1381	1.63	1439	1.84
1500	1210	1.14	1278	1.33	1342	1.52	1403	1.72	1461	1.93
1600	1236	1.23	1302	1.42	1365	1.62	1425	1.82	1483	2.04
1700	1262	1.33	1328	1.52	1390	1.72	1449	1.93	1505	2.15
1800	1289	1.44	1354	1.63	1415	1.84	1473	2.05	1529	2.27
1900	1317	1.55	1380	1.75	1441	1.96	1498	2.18	—	—
2000	1345	1.68	1408	1.88	1467	2.10	1524	2.32	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Medium static 920-1303 RPM, 1.7 BHP max
High static 1208-1550 RPM, 2.9 BHP max

Table P — 50HC Size 05 3-Phase Non-Humidi-MiZer 4-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	**695**	**0.25**	**818**	**0.37**	930	0.51	1032	0.66	1126	0.83
1300	**731**	**0.30**	**849**	**0.43**	955	0.57	1053	0.72	1145	0.89
1400	**769**	**0.36**	**880**	**0.49**	982	0.63	1077	0.79	1166	0.97
1500	**807**	**0.42**	**913**	**0.56**	1011	0.71	1103	0.87	1188	1.05
1600	**847**	**0.49**	948	0.63	1042	0.79	1130	0.96	1213	1.14
1700	**887**	**0.57**	983	0.72	1073	0.88	1158	1.06	1239	1.24
1800	928	0.66	1020	0.82	1106	0.98	1188	1.16	1266	1.35
1900	969	0.76	1057	0.92	1140	1.09	1219	1.28	1295	1.48
2000	1010	0.87	1095	1.04	1175	1.21	1251	1.41	1325	1.61

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1215	1.01	1298	1.21	1378	1.42	1454	1.64	1526	1.87
1300	1231	1.08	1313	1.28	1390	1.49	1465	1.71	1536	1.94
1400	1249	1.16	1329	1.36	1405	1.57	1478	1.79	1547	2.03
1500	1270	1.24	1347	1.45	1421	1.66	1492	1.89	—	—
1600	1292	1.34	1367	1.54	1440	1.76	1509	1.99	—	—
1700	1315	1.44	1389	1.65	1459	1.88	1527	2.11	—	—
1800	1341	1.56	1412	1.77	1481	2.00	1547	2.23	—	—
1900	1367	1.68	1437	1.90	1504	2.13	—	—	—	—
2000	1395	1.82	1463	2.04	1528	2.28	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Medium static 920-1303 RPM, 1.7 BHP max
High static 1208-1550 RPM, 2.9 BHP max

APPENDIX C — FAN PERFORMANCE

Table Q — 50HC Size 06 Single Phase Humidi-MiZer 5-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	725	0.33	840	0.46	937	0.60	1023	0.75	1101	0.90
1625	765	0.40	876	0.54	970	0.68	1054	0.84	1131	1.00
1750	806	0.48	912	0.63	1004	0.78	1087	0.94	1162	1.11
1875	847	0.57	950	0.72	1039	0.88	1120	1.05	1194	1.23
2000	889	0.66	988	0.83	1075	1.00	1154	1.18	1226	1.36
2125	931	0.78	1027	0.95	1112	1.13	1189	1.31	1260	1.50
2250	974	0.90	1067	1.08	1149	1.27	1224	1.46	—	—
2375	1018	1.03	1107	1.23	1187	1.43	—	—	—	—
2500	1061	1.19	1148	1.39	—	—	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1172	1.06	1239	1.23	1302	1.40	—	—	—	—
1625	1201	1.16	1267	1.34	1329	1.52	—	—	—	—
1750	1231	1.28	1296	1.46	—	—	—	—	—	—
1875	1262	1.41	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—
2125	—	—	—	—	—	—	—	—	—	—
2250	—	—	—	—	—	—	—	—	—	—
2375	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 770-1175 RPM, 1.2 BHP max
Medium static 1035-1466 RPM, 1.5 BHP max

Table R — 50HC Size 06 Single Phase Humidi-MiZer 5-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	794	0.41	902	0.55	993	0.69	1074	0.85	1147	1.00
1625	840	0.49	945	0.64	1034	0.80	1113	0.96	1185	1.13
1750	888	0.59	988	0.75	1075	0.92	1153	1.09	1223	1.26
1875	936	0.70	1033	0.87	1117	1.05	1193	1.23	1263	1.41
2000	984	0.82	1078	1.00	1160	1.19	1235	1.39	—	—
2125	1033	0.96	1124	1.15	1204	1.35	—	—	—	—
2250	1083	1.11	1170	1.32	1248	1.53	—	—	—	—
2375	1133	1.28	1217	1.50	—	—	—	—	—	—
2500	1183	1.47	—	—	—	—	—	—	—	—

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1214	1.16	1277	1.33	1336	1.50	—	—	—	—
1625	1251	1.30	1313	1.47	—	—	—	—	—	—
1750	1289	1.44	—	—	—	—	—	—	—	—
1875	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—
2125	—	—	—	—	—	—	—	—	—	—
2250	—	—	—	—	—	—	—	—	—	—
2375	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 770-1175 RPM, 1.2 BHP max
Medium static 1035-1466 RPM, 1.5 BHP max

APPENDIX C — FAN PERFORMANCE

Table S — 50HC Size 06 3-Phase Humidi-MiZer 5-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	725	0.33	840	0.46	937	0.60	1023	0.75	1101	0.90
1625	765	0.40	876	0.54	970	0.68	1054	0.84	1131	1.00
1750	806	0.48	912	0.63	1004	0.78	1087	0.94	1162	1.11
1875	847	0.57	950	0.72	1039	0.88	1120	1.05	1194	1.23
2000	889	0.66	988	0.83	1075	1.00	1154	1.18	1226	1.36
2125	931	0.78	1027	0.95	1112	1.13	1189	1.31	1260	1.50
2250	974	0.90	1067	1.08	1149	1.27	1224	1.46	1294	1.66
2375	1018	1.03	1107	1.23	1187	1.43	1261	1.63	1329	1.84
2500	1061	1.19	1148	1.39	1226	1.59	1297	1.81	1364	2.02

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1172	1.06	1239	1.23	1302	1.40	1361	1.58	1418	1.77
1625	1201	1.16	1267	1.34	1329	1.52	1388	1.71	1444	1.90
1750	1231	1.28	1296	1.46	1358	1.65	1416	1.84	1472	2.04
1875	1262	1.41	1326	1.60	1387	1.79	1445	1.99	1499	2.20
2000	1294	1.55	1357	1.74	1417	1.95	1474	2.15	1528	2.36
2125	1326	1.70	1388	1.90	1447	2.11	1504	2.33	—	—
2250	1359	1.87	1420	2.08	1479	2.29	1534	2.51	—	—
2375	1393	2.05	1453	2.27	1511	2.49	—	—	—	—
2500	1427	2.24	1487	2.47	1543	2.70	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 770-1175 RPM, 1.7 BHP max
Medium static 1035-1466 RPM, 2.4 BHP max
High static 1303-1550 RPM, 2.9 BHP max

Table T — 50HC Size 06 3-Phase Humidi-MiZer 5-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	794	0.41	902	0.55	993	0.69	1074	0.85	1147	1.00
1625	840	0.49	945	0.64	1034	0.80	1113	0.96	1185	1.13
1750	888	0.59	988	0.75	1075	0.92	1153	1.09	1223	1.26
1875	936	0.70	1033	0.87	1117	1.05	1193	1.23	1263	1.41
2000	984	0.82	1078	1.00	1160	1.19	1235	1.39	1303	1.58
2125	1033	0.96	1124	1.15	1204	1.35	1277	1.56	1343	1.76
2250	1083	1.11	1170	1.32	1248	1.53	1319	1.74	1385	1.96
2375	1133	1.28	1217	1.50	1293	1.72	1363	1.95	1427	2.17
2500	1183	1.47	1265	1.70	1339	1.93	1406	2.17	1470	2.41

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1214	1.16	1277	1.33	1336	1.50	1392	1.67	1445	1.85
1625	1251	1.30	1313	1.47	1371	1.65	1427	1.83	1479	2.02
1750	1289	1.44	1350	1.63	1407	1.81	1462	2.01	1514	2.20
1875	1327	1.60	1387	1.80	1444	1.99	1498	2.19	1550	2.40
2000	1366	1.78	1426	1.98	1482	2.19	1535	2.40	—	—
2125	1406	1.97	1464	2.18	1520	2.40	—	—	—	—
2250	1446	2.18	1504	2.40	—	—	—	—	—	—
2375	1487	2.40	1544	2.63	—	—	—	—	—	—
2500	1529	2.64	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 770-1175 RPM, 1.7 BHP max
Medium static 1035-1466 RPM, 2.4 BHP max
High static 1303-1550 RPM, 2.9 BHP max

APPENDIX C — FAN PERFORMANCE

Table U — 50HC Size 06 3-Phase Non-Humidi-MiZer 5-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	**725**	**0.33**	**840**	**0.46**	937	0.60	1023	0.75	1101	0.90
1625	**765**	**0.40**	**876**	**0.54**	970	0.68	1054	0.84	1131	1.00
1750	**806**	**0.48**	**912**	**0.63**	1004	0.78	1087	0.94	1162	1.11
1875	**847**	**0.57**	**950**	**0.72**	1039	0.88	1120	1.05	1194	1.23
2000	**889**	**0.66**	**988**	**0.83**	1075	1.00	1154	1.18	1226	1.36
2125	**931**	**0.78**	**1027**	**0.95**	1112	1.13	1189	1.31	1260	1.50
2250	**974**	**0.90**	1067	1.08	1149	1.27	1224	1.46	1294	1.66
2375	**1018**	**1.03**	1107	1.23	1187	1.43	1261	1.63	1329	1.84
2500	1061	1.19	1148	1.39	1226	1.59	1297	1.81	1364	2.02

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1172	1.06	1239	1.23	1302	1.40	1361	1.58	1418	1.77
1625	1201	1.16	1267	1.34	1329	1.52	1388	1.71	1444	1.90
1750	1231	1.28	1296	1.46	1358	1.65	1416	1.84	1472	2.04
1875	1262	1.41	1326	1.60	1387	1.79	1445	1.99	1499	2.20
2000	1294	1.55	1357	1.74	1417	1.95	1474	2.15	1528	2.36
2125	1326	1.70	1388	1.90	1447	2.11	1504	2.33	—	—
2250	1359	1.87	1420	2.08	1479	2.29	1534	2.51	—	—
2375	1393	2.05	1453	2.27	1511	2.49	—	—	—	—
2500	1427	2.24	1487	2.47	1543	2.70	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Medium static 1035-1466 RPM, 2.4 BHP max
High static 1303-1550 RPM, 2.9 BHP max

Table V — 50HC Size 06 3-Phase Non-Humidi-MiZer 5-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	**794**	**0.41**	**902**	**0.55**	**993**	**0.69**	1074	0.85	1147	1.00
1625	**840**	**0.49**	**945**	**0.64**	**1034**	**0.80**	1113	0.96	1185	1.13
1750	**888**	**0.59**	**988**	**0.75**	1075	0.92	1153	1.09	1223	1.26
1875	**936**	**0.70**	**1033**	**0.87**	1117	1.05	1193	1.23	1263	1.41
2000	**984**	**0.82**	1078	1.00	1160	1.19	1235	1.39	1303	1.58
2125	**1033**	**0.96**	1124	1.15	1204	1.35	1277	1.56	1343	1.76
2250	1083	1.11	1170	1.32	1248	1.53	1319	1.74	1385	1.96
2375	1133	1.28	1217	1.50	1293	1.72	1363	1.95	1427	2.17
2500	1183	1.47	1265	1.70	1339	1.93	1406	2.17	1470	2.41

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1214	1.16	1277	1.33	1336	1.50	1392	1.67	1445	1.85
1625	1251	1.30	1313	1.47	1371	1.65	1427	1.83	1479	2.02
1750	1289	1.44	1350	1.63	1407	1.81	1462	2.01	1514	2.20
1875	1327	1.60	1387	1.80	1444	1.99	1498	2.19	1550	2.40
2000	1366	1.78	1426	1.98	1482	2.19	1535	2.40	—	—
2125	1406	1.97	1464	2.18	1520	2.40	—	—	—	—
2250	1446	2.18	1504	2.40	—	—	—	—	—	—
2375	1487	2.40	1544	2.63	—	—	—	—	—	—
2500	1529	2.64	—	—	—	—	—	—	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Medium static 1035-1466 RPM, 2.4 BHP max
High static 1303-1550 RPM, 2.9 BHP max

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Table W — 50HC Size 07 3-Phase Non-Humidi-MiZer 6-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	415	0.28	510	0.46	588	0.65	655	0.85	715	1.08
1950	431	0.32	525	0.51	601	0.71	668	0.93	727	1.16
2100	448	0.38	540	0.57	615	0.78	681	1.01	740	1.25
2250	465	0.43	555	0.64	629	0.86	694	1.10	753	1.34
2400	483	0.49	571	0.71	644	0.94	708	1.19	766	1.45
2550	501	0.56	587	0.79	659	1.04	722	1.29	779	1.56
2700	519	0.64	603	0.88	674	1.14	737	1.40	793	1.68
2850	538	0.72	620	0.98	689	1.24	751	1.52	807	1.80
3000	557	0.82	637	1.08	705	1.36	766	1.64	822	1.94

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	770	1.31	821	1.56	868	1.82	913	2.09	955	2.36
1950	782	1.40	832	1.66	879	1.92	924	2.20	966	2.49
2100	794	1.50	844	1.76	891	2.03	935	2.32	977	2.61
2250	806	1.60	856	1.87	903	2.15	947	2.45	988	2.75
2400	819	1.71	868	1.99	915	2.28	958	2.58	1000	2.89
2550	832	1.83	881	2.12	927	2.42	971	2.73	1012	3.05
2700	845	1.96	894	2.26	940	2.57	983	2.88	1024	3.21
2850	859	2.10	907	2.41	953	2.72	995	3.05	1036	3.38
3000	873	2.24	921	2.56	966	2.89	1008	3.22	1049	3.56

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 489-747 RPM, 1.7 BHP max
Medium static 733-949 RPM, 2.9 BHP max
High static 909-1102 RPM, 4.7 BHP max

Table X — 50HC Size 07 3-Phase Non-Humidi-MiZer 6-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	446	0.33	534	0.50	609	0.70	676	0.91	736	1.14
1950	467	0.39	552	0.57	625	0.77	690	0.99	750	1.23
2100	489	0.45	571	0.64	642	0.86	706	1.08	764	1.33
2250	511	0.53	591	0.73	660	0.95	722	1.19	779	1.44
2400	534	0.61	611	0.82	678	1.05	739	1.30	795	1.56
2550	558	0.71	631	0.93	697	1.17	756	1.42	811	1.69
2700	581	0.81	652	1.04	716	1.29	774	1.55	828	1.83
2850	605	0.93	674	1.17	736	1.43	792	1.70	845	1.98
3000	630	1.06	696	1.31	756	1.58	811	1.86	863	2.15

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	791	1.39	843	1.65	892	1.93	938	2.22	981	2.53
1950	804	1.49	855	1.76	903	2.04	949	2.34	992	2.65
2100	818	1.59	868	1.87	915	2.16	961	2.46	1003	2.78
2250	832	1.71	882	1.99	928	2.29	973	2.59	1015	2.92
2400	847	1.83	896	2.12	942	2.43	986	2.74	1028	3.07
2550	862	1.97	910	2.27	956	2.58	999	2.90	1041	3.23
2700	878	2.12	926	2.42	971	2.74	1013	3.07	1055	3.41
2850	895	2.28	941	2.59	986	2.92	1028	3.25	1069	3.60
3000	912	2.46	958	2.78	1001	3.11	1043	3.45	1083	3.80

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 489-747 RPM, 1.7 BHP max
Medium static 733-949 RPM, 2.9 BHP max
High static 909-1102 RPM, 4.7 BHP max

APPENDIX C — FAN PERFORMANCE

Table Y — 50HC Size 08 3-Phase Non-Humidi-MiZer 7.5-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	433	0.29	518	0.41	596	0.54	667	0.67	733	0.81
2438	454	0.35	535	0.48	609	0.61	677	0.75	741	0.90
2625	477	0.42	553	0.55	624	0.69	689	0.84	751	1.00
2813	500	0.49	572	0.64	640	0.78	703	0.94	763	1.10
3000	523	0.58	592	0.73	657	0.88	718	1.05	775	1.22
3188	547	0.68	613	0.83	675	1.00	733	1.17	789	1.34
3375	571	0.78	634	0.95	694	1.12	750	1.30	804	1.48
3563	596	0.90	656	1.07	713	1.25	768	1.44	820	1.63
3750	621	1.03	679	1.21	734	1.40	786	1.59	837	1.79

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	795	0.96	854	1.11	910	1.27	963	1.43	1014	1.60
2438	802	1.05	859	1.21	913	1.38	966	1.55	1016	1.72
2625	810	1.16	865	1.32	919	1.49	970	1.67	1019	1.85
2813	819	1.27	874	1.44	925	1.62	975	1.80	1023	1.99
3000	830	1.39	883	1.57	934	1.76	982	1.95	1029	2.14
3188	843	1.53	894	1.71	943	1.90	990	2.10	1036	2.30
3375	856	1.67	905	1.86	953	2.06	1000	2.27	1045	2.48
3563	870	1.83	918	2.03	965	2.23	1010	2.44	1054	2.66
3750	885	1.99	932	2.20	978	2.42	1022	2.64	1065	2.86

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 518-733 RPM, 1.7 BHP max
Medium static 690-936 RPM, 2.4 BHP max
High static 838-1084 RPM, 3.7 BHP max

Table Z — 50HC Size 08 3-Phase Non-Humidi-MiZer 7.5-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	482	0.36	577	0.51	659	0.66	732	0.82	799	0.98
2438	505	0.43	597	0.59	676	0.75	748	0.92	813	1.09
2625	529	0.51	617	0.68	694	0.85	764	1.03	827	1.22
2813	554	0.60	638	0.78	713	0.97	781	1.16	843	1.35
3000	579	0.70	660	0.89	732	1.09	799	1.29	860	1.50
3188	604	0.81	683	1.02	753	1.23	817	1.44	877	1.65
3375	630	0.94	706	1.15	774	1.37	836	1.60	895	1.82
3563	657	1.08	729	1.31	795	1.54	856	1.77	913	2.01
3750	683	1.23	753	1.47	817	1.71	877	1.96	933	2.21

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	860	1.14	917	1.31	971	1.48	1022	1.66	1071	1.84
2438	873	1.27	929	1.45	983	1.63	1033	1.81	1081	2.00
2625	887	1.40	942	1.59	995	1.78	1045	1.98	**1092**	**2.18**
2813	901	1.55	956	1.75	1008	1.95	1057	2.15	**1104**	**2.36**
3000	917	1.70	970	1.91	1021	2.13	1070	2.34	**1117**	**2.56**
3188	933	1.87	986	2.09	1036	2.32	1084	2.54	**1130**	**2.77**
3375	950	2.05	1002	2.29	1051	2.52	**1098**	**2.76**	**1144**	**3.00**
3563	967	2.25	1018	2.49	1067	2.74	**1113**	**2.99**	**1158**	**3.24**
3750	985	2.46	1035	2.71	1083	2.97	**1129**	**3.23**	**1173**	**3.49**

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 518-733 RPM, 1.7 BHP max
Medium static 690-936 RPM, 2.4 BHP max
High static 838-1084 RPM, 3.7 BHP max

APPENDIX C — FAN PERFORMANCE

Table AA — 50HC Size 09 3-Phase Non-Humidi-MiZer 8.5-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	468	0.39	546	0.52	618	0.66	684	0.80	747	0.96
2750	492	0.47	566	0.61	634	0.75	698	0.91	759	1.07
3000	523	0.58	592	0.73	657	0.88	718	1.05	775	1.22
3200	549	0.68	614	0.84	676	1.00	735	1.17	790	1.35
3400	575	0.80	637	0.96	696	1.14	752	1.31	806	1.50
3600	601	0.93	661	1.10	717	1.28	771	1.47	823	1.66
3850	635	1.11	691	1.29	745	1.48	796	1.68	846	1.88
4050	662	1.27	716	1.46	767	1.66	817	1.87	865	2.08
4250	689	1.45	741	1.65	790	1.86	838	2.07	885	2.29

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	806	1.11	863	1.28	916	1.45	968	1.62	1018	1.80
2750	816	1.23	871	1.40	923	1.58	973	1.76	1022	1.94
3000	830	1.39	883	1.57	934	1.76	982	1.95	1029	2.14
3200	843	1.53	894	1.72	944	1.91	991	2.11	1037	2.31
3400	858	1.69	907	1.88	955	2.09	1001	2.29	1046	2.50
3600	873	1.86	921	2.06	967	2.27	1012	2.48	1056	2.70
3850	894	2.09	940	2.30	985	2.52	1028	2.74	1071	2.97
4050	911	2.29	956	2.51	1000	2.74	1042	2.97	1083	3.20
4250	930	2.51	973	2.74	1015	2.97	1057	3.21	**1097**	**3.45**

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 518-733 RPM, 1.7 BHP max
Medium static 690-936 RPM, 2.4 BHP max
High static 838-1084 RPM, 3.7 BHP max

Table AB — 50HC Size 09 3-Phase Non-Humidi-MiZer 8.5-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	495	0.43	570	0.56	634	0.70	693	0.83	746	0.96
2750	522	0.52	593	0.66	656	0.80	712	0.94	764	1.09
3000	556	0.65	623	0.80	684	0.95	738	1.11	789	1.26
3200	583	0.76	648	0.93	707	1.09	760	1.26	809	1.42
3400	611	0.89	674	1.07	730	1.24	782	1.42	831	1.59
3600	639	1.04	700	1.22	754	1.41	805	1.59	852	1.78
3850	675	1.24	733	1.44	785	1.64	834	1.83	880	2.03
4050	704	1.42	760	1.63	811	1.84	858	2.05	903	2.25
4250	733	1.62	787	1.84	836	2.06	883	2.28	926	2.49

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	795	1.09	841	1.23	885	1.36	926	1.50	965	1.64
2750	813	1.23	858	1.37	901	1.52	942	1.66	981	1.81
3000	836	1.42	881	1.57	923	1.73	963	1.89	1001	2.05
3200	856	1.58	899	1.75	941	1.92	980	2.08	1018	2.25
3400	876	1.76	919	1.94	960	2.12	998	2.29	1036	2.47
3600	897	1.96	939	2.14	979	2.33	1017	2.52	1054	2.70
3850	923	2.23	964	2.42	1004	2.62	1041	2.82	1077	3.02
4050	945	2.46	986	2.67	1024	2.88	1061	3.08	**1097**	**3.29**
4250	968	2.71	1007	2.93	1045	3.15	1081	3.36	**1117**	**3.58**

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 518-733 RPM, 1.7 BHP max
Medium static 690-936 RPM, 2.4 BHP max
High static 838-1084 RPM, 3.7 BHP max

APPENDIX C — FAN PERFORMANCE

Table AC — 50HC Size 11 3-Phase Non-Humidi-MiZer 10-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	523	0.58	592	0.73	657	0.88	718	1.05	775	1.22
3250	555	0.71	620	0.87	681	1.04	739	1.21	794	1.39
3500	588	0.86	649	1.03	707	1.21	762	1.39	815	1.58
3750	621	1.03	679	1.21	734	1.40	786	1.59	837	1.79
4000	655	1.23	709	1.42	761	1.61	812	1.82	860	2.03
4250	689	1.45	741	1.65	790	1.86	838	2.07	885	2.29
4500	723	1.69	773	1.90	820	2.12	866	2.35	910	2.57
4750	758	1.96	805	2.19	850	2.42	894	2.65	937	2.89
5000	793	2.26	838	2.50	881	2.74	923	2.98	965	3.23

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	830	1.39	883	1.57	934	1.76	982	1.95	1029	2.14
3250	847	1.57	897	1.76	946	1.96	993	2.16	1039	2.36
3500	865	1.77	914	1.97	961	2.18	1007	2.38	1051	2.60
3750	885	1.99	932	2.20	978	2.42	1022	2.64	1065	2.86
4000	907	2.24	952	2.46	996	2.68	1038	2.91	1080	3.14
4250	930	2.51	973	2.74	1015	2.97	1057	3.21	1097	3.45
4500	954	2.81	996	3.05	1037	3.29	1076	3.54	1115	3.79
4750	979	3.13	1019	3.38	1059	3.63	1097	3.89	1135	4.15
5000	1005	3.49	1044	3.74	1082	4.01	1119	4.27	1156	4.55

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 591-838 RPM, 2.4 BHP max
Medium static 838-1084 RPM, 3.7 BHP max
High static 1022-1240 RPM, 4.9 BHP max

Table AD — 50HC Size 11 3-Phase Non-Humidi-MiZer 10-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	556	0.65	623	0.80	684	0.95	738	1.11	789	1.26
3250	590	0.79	655	0.96	713	1.13	766	1.29	815	1.46
3500	625	0.96	687	1.14	742	1.32	794	1.50	841	1.68
3750	661	1.16	719	1.35	773	1.54	822	1.73	869	1.93
4000	697	1.37	753	1.58	804	1.79	852	1.99	897	2.20
4250	733	1.62	787	1.84	836	2.06	883	2.28	926	2.49
4500	770	1.89	821	2.13	869	2.36	914	2.59	956	2.82
4750	807	2.20	856	2.45	902	2.69	945	2.94	986	3.18
5000	844	2.54	891	2.80	936	3.06	978	3.31	1018	3.57

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	836	1.42	881	1.57	923	1.73	963	1.89	1001	2.05
3250	861	1.63	904	1.79	945	1.96	985	2.13	1023	2.30
3500	886	1.86	929	2.04	969	2.22	1008	2.40	1045	2.58
3750	912	2.12	954	2.31	994	2.50	1031	2.70	1068	2.89
4000	940	2.40	980	2.61	1019	2.81	1056	3.02	1092	3.22
4250	968	2.71	1007	2.93	1045	3.15	1081	3.36	1117	3.58
4500	996	3.05	1035	3.28	1072	3.51	1108	3.74	1142	3.97
4750	1026	3.42	1063	3.66	1100	3.91	1135	4.15	1168	4.39
5000	1056	3.82	1093	4.08	1128	4.34	1162	4.59	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 591-838 RPM, 2.4 BHP max
Medium static 838-1084 RPM, 3.7 BHP max
High static 1022-1240 RPM, 4.9 BHP max

APPENDIX C — FAN PERFORMANCE

Table AE — 50HC Size 12 3-Phase Non-Humidi-MiZer 10-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	523	0.58	592	0.73	657	0.88	718	1.05	775	1.22
3250	555	0.71	620	0.87	681	1.04	739	1.21	794	1.39
3500	588	0.86	649	1.03	707	1.21	762	1.39	815	1.58
3750	621	1.03	679	1.21	734	1.40	786	1.59	837	1.79
4000	655	1.23	709	1.42	761	1.61	812	1.82	860	2.03
4250	689	1.45	741	1.65	790	1.86	838	2.07	885	2.29
4500	723	1.69	773	1.90	820	2.12	866	2.35	910	2.57
4750	758	1.96	805	2.19	850	2.42	894	2.65	937	2.89
5000	793	2.26	838	2.50	881	2.74	923	2.98	965	3.23

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	830	1.39	883	1.57	934	1.76	982	1.95	1029	2.14
3250	847	1.57	897	1.76	946	1.96	993	2.16	1039	2.36
3500	865	1.77	914	1.97	961	2.18	1007	2.38	1051	2.60
3750	885	1.99	932	2.20	978	2.42	1022	2.64	1065	2.86
4000	907	2.24	952	2.46	996	2.68	1038	2.91	1080	3.14
4250	930	2.51	973	2.74	1015	2.97	1057	3.21	1097	3.45
4500	954	2.81	996	3.05	1037	3.29	1076	3.54	1115	3.79
4750	979	3.13	1019	3.38	1059	3.63	1097	3.89	1135	4.15
5000	1005	3.49	1044	3.74	1082	4.01	1119	4.27	1156	4.55

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 591-838 RPM, 2.4 BHP max
Medium static 838-1084 RPM, 3.7 BHP max
High static 1022-1240 RPM, 4.9 BHP max

Table AF — 50HC Size 12 3-Phase Non-Humidi-MiZer 10-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	556	0.65	623	0.80	684	0.95	738	1.11	789	1.26
3250	590	0.79	655	0.96	713	1.13	766	1.29	815	1.46
3500	625	0.96	687	1.14	742	1.32	794	1.50	841	1.68
3750	661	1.16	719	1.35	773	1.54	822	1.73	869	1.93
4000	697	1.37	753	1.58	804	1.79	852	1.99	897	2.20
4250	733	1.62	787	1.84	836	2.06	883	2.28	926	2.49
4500	770	1.89	821	2.13	869	2.36	914	2.59	956	2.82
4750	807	2.20	856	2.45	902	2.69	945	2.94	986	3.18
5000	844	2.54	891	2.80	936	3.06	978	3.31	1018	3.57

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	836	1.42	881	1.57	923	1.73	963	1.89	1001	2.05
3250	861	1.63	904	1.79	945	1.96	985	2.13	1023	2.30
3500	886	1.86	929	2.04	969	2.22	1008	2.40	1045	2.58
3750	912	2.12	954	2.31	994	2.50	1031	2.70	1068	2.89
4000	940	2.40	980	2.61	1019	2.81	1056	3.02	1092	3.22
4250	968	2.71	1007	2.93	1045	3.15	1081	3.36	1117	3.58
4500	996	3.05	1035	3.28	1072	3.51	1108	3.74	1142	3.97
4750	1026	3.42	1063	3.66	1100	3.91	1135	4.15	1168	4.39
5000	1056	3.82	1093	4.08	1128	4.34	1162	4.59	—	—

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 591-838 RPM, 2.4 BHP max
Medium static 838-1084 RPM, 3.7 BHP max
High static 1022-1240 RPM, 4.9 BHP max

APPENDIX C — FAN PERFORMANCE

Table AG — 50HC Size 14 3-Phase Non-Humidi-MiZer 12.5-Ton Horizontal Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3438	379	0.48	455	0.69	526	0.94	593	1.23	655	1.54
3750	399	0.59	469	0.80	536	1.06	600	1.35	660	1.67
4063	420	0.71	486	0.93	549	1.19	609	1.49	667	1.81
4375	442	0.84	503	1.08	562	1.35	620	1.65	675	1.97
4688	464	1.00	522	1.25	578	1.52	632	1.83	685	2.16
5000	486	1.17	541	1.44	594	1.72	646	2.03	696	2.37
5313	509	1.37	561	1.64	612	1.94	661	2.26	708	2.60
5625	532	1.58	582	1.87	630	2.18	677	2.51	722	2.86
5938	555	1.82	603	2.13	649	2.45	694	2.78	737	3.14
6250	578	2.09	625	2.41	669	2.74	711	3.09	753	3.45

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3438	713	1.89	766	2.25	816	2.64	863	3.04	907	3.46
3750	717	2.02	770	2.39	820	2.79	867	3.20	911	3.63
4063	722	2.17	774	2.55	824	2.95	870	3.37	914	3.81
4375	728	2.33	779	2.72	828	3.13	874	3.56	918	4.00
4688	736	2.52	785	2.91	832	3.32	878	3.76	922	4.21
5000	745	2.73	792	3.12	838	3.54	883	3.98	926	4.44
5313	755	2.97	801	3.36	846	3.78	889	4.23	931	4.69
5625	767	3.23	811	3.63	854	4.05	896	4.50	937	4.97
5938	780	3.52	822	3.92	864	4.35	904	4.80	944	5.27
6250	794	3.84	835	4.25	875	4.68	914	5.13	952	5.61

NOTE: For more information, see General Fan Performance Notes on page 83.

Standard static 440-609 RPM, 2.9 BHP max
Medium static 609-778 RPM, 3.7 BHP max
High static 776-955 RPM
Voltage 208v / 230v / 460v / 575v
Max BHP 6.5 / 6.9 / 7.0 / 8.3

APPENDIX C — FAN PERFORMANCE

Table AH — 50HC Size 14 3-Phase Non-Humidi-MiZer 12.5-Ton Vertical Supply

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3438	383	0.46	458	0.66	530	0.91	601	1.20	668	1.53
3750	402	0.56	474	0.77	540	1.01	605	1.30	670	1.64
4063	422	0.67	491	0.90	552	1.14	613	1.43	674	1.76
4375	443	0.79	508	1.04	567	1.29	623	1.58	680	1.90
4688	464	0.93	527	1.19	583	1.46	636	1.75	689	2.07
5000	486	1.10	546	1.37	600	1.65	651	1.95	700	2.27
5313	509	1.28	565	1.56	618	1.86	666	2.17	713	2.49
5625	533	1.48	585	1.77	636	2.09	683	2.41	728	2.74
5938	557	1.71	605	2.01	655	2.34	701	2.67	744	3.02
6250	581	1.97	626	2.26	673	2.61	718	2.96	760	3.32

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3438	729	1.88	783	2.25	833	2.62	879	2.99	921	3.37
3750	731	2.00	787	2.39	838	2.78	885	3.18	929	3.59
4063	733	2.13	789	2.52	841	2.94	890	3.36	935	3.79
4375	736	2.27	791	2.67	843	3.10	892	3.54	938	3.99
4688	741	2.43	794	2.83	845	3.26	894	3.72	941	4.19
5000	749	2.63	799	3.02	848	3.45	896	3.90	942	4.39
5313	760	2.85	806	3.23	853	3.66	899	4.11	944	4.60
5625	772	3.10	816	3.48	860	3.90	904	4.35	947	4.83
5938	786	3.38	827	3.76	869	4.18	911	4.62	952	5.09
6250	801	3.69	841	4.07	880	4.49	920	4.93	**959**	**5.40**

NOTE: For more information, see General Fan Performance Notes on page 83.
Boldface indicates field-supplied drive is required.

Standard static 440-609 RPM, 2.9 BHP max
Medium static 609-778 RPM, 3.7 BHP max
High static 776-955 RPM
Voltage 208v / 230v / 460v / 575v
Max BHP 6.5 / 6.9 / 7.0 / 8.3

APPENDIX C — FAN PERFORMANCE
X13 MULTI-SPEED/TORQUE MOTOR

Table AI — 50HC*A04 Horizontal Unit - Direct Drive

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	900	0.47	0.21
	975	0.38	0.20
	1050	0.29	0.19
	1125	0.21	0.18
	1200	0.13	0.18
	1275	0.06	0.20
	1350	—	—
	1425	—	—
	1500	—	—
2	900	0.65	0.27
	975	0.54	0.26
	1050	0.44	0.25
	1125	0.33	0.24
	1200	0.23	0.23
	1275	0.13	0.21
	1350	0.02	0.20
	1425	—	—
	1500	—	—
3	900	0.96	0.38
	975	0.84	0.37
	1050	0.73	0.36
	1125	0.61	0.34
	1200	0.50	0.33
	1275	0.38	0.31
	1350	0.26	0.30
	1425	0.15	0.28
	1500	0.04	0.26
4	900	1.17	0.46
	975	1.08	0.46
	1050	0.98	0.46
	1125	0.87	0.45
	1200	0.75	0.44
	1275	0.63	0.42
	1350	0.51	0.40
	1425	0.39	0.39
	1500	0.27	0.37
5	900	1.35	0.52
	975	1.30	0.54
	1050	1.26	0.57
	1125	1.21	0.59
	1200	1.16	0.62
	1275	1.12	0.64
	1350	1.07	0.67
	1425	1.02	0.70
	1500	0.97	0.73

Table AJ — 50HC*A04 Vertical Unit - Direct Drive

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	900	0.36	0.16
	975	0.27	0.16
	1050	0.18	0.15
	1125	0.10	0.15
	1200	0.04	0.16
	1275	—	—
	1350	—	—
	1425	—	—
	1500	—	—
2	900	0.51	0.21
	975	0.40	0.20
	1050	0.30	0.19
	1125	0.21	0.18
	1200	0.11	0.17
	1275	0.02	0.16
	1350	—	—
	1425	—	—
	1500	—	—
3	900	0.84	0.33
	975	0.72	0.32
	1050	0.60	0.31
	1125	0.49	0.29
	1200	0.38	0.28
	1275	0.28	0.26
	1350	0.17	0.25
	1425	0.07	0.24
	1500	—	—
4	900	1.06	0.41
	975	0.96	0.41
	1050	0.86	0.41
	1125	0.74	0.40
	1200	0.63	0.38
	1275	0.50	0.37
	1350	0.38	0.35
	1425	0.26	0.34
	1500	0.15	0.32
5	900	1.24	0.51
	975	1.19	0.52
	1050	1.14	0.54
	1125	1.08	0.57
	1200	1.03	0.59
	1275	0.98	0.61
	1350	0.93	0.64
	1425	0.88	0.67
	1500	0.82	0.69

APPENDIX C — FAN PERFORMANCE
X13 MULTI-SPEED/TORQUE MOTOR

Table AK — 50HC*A05 Horizontal Unit - Direct Drive

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1200	0.62	0.34
	1300	0.48	0.32
	1400	0.35	0.30
	1500	0.23	0.28
	1600	0.12	0.28
	1700	0.02	0.27
	1800	—	—
	1900	—	—
	2000	—	—
2	1200	0.74	0.39
	1300	0.60	0.37
	1400	0.46	0.35
	1500	0.32	0.32
	1600	0.19	0.30
	1700	0.07	0.27
	1800	—	—
	1900	—	—
	2000	—	—
3	1200	1.20	0.59
	1300	1.12	0.60
	1400	1.01	0.61
	1500	0.89	0.62
	1600	0.76	0.59
	1700	0.61	0.56
	1800	0.47	0.53
	1900	0.32	0.50
	2000	0.18	0.47
4	1200	1.24	0.60
	1300	1.18	0.63
	1400	1.11	0.65
	1500	1.03	0.69
	1600	0.93	0.69
	1700	0.82	0.69
	1800	0.70	0.69
	1900	0.56	0.66
	2000	0.41	0.63
5	1200	1.25	0.61
	1300	1.20	0.65
	1400	1.11	0.68
	1500	1.03	0.68
	1600	1.05	0.76
	1700	1.01	0.76
	1800	0.96	0.84
	1900	0.91	0.89
	2000	0.87	0.93

Table AL — 50HC*A05 Vertical Unit - Direct Drive

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1200	0.57	0.31
	1300	0.44	0.29
	1400	0.30	0.27
	1500	0.16	0.25
	1600	0.03	0.25
	1700	—	—
	1800	—	—
	1900	—	—
	2000	—	—
2	1200	0.68	0.35
	1300	0.54	0.33
	1400	0.40	0.31
	1500	0.24	0.28
	1600	0.10	0.26
	1700	—	—
	1800	—	—
	1900	—	—
	2000	—	—
3	1200	1.15	0.54
	1300	1.09	0.54
	1400	1.02	0.55
	1500	0.93	0.58
	1600	0.82	0.57
	1700	0.69	0.55
	1800	0.54	0.52
	1900	0.38	0.50
	2000	0.21	0.47
4	1200	1.16	0.56
	1300	1.12	0.59
	1400	1.07	0.61
	1500	1.00	0.65
	1600	0.92	0.65
	1700	0.80	0.66
	1800	0.67	0.65
	1900	0.51	0.62
	2000	0.34	0.59
5	1200	1.16	0.59
	1300	1.11	0.63
	1400	1.00	0.67
	1500	0.88	0.67
	1600	0.96	0.75
	1700	0.91	0.75
	1800	0.86	0.83
	1900	0.80	0.87
	2000	0.74	0.91

APPENDIX C — FAN PERFORMANCE
X13 MULTI-SPEED/TORQUE MOTOR

Table AM — 50HC*A06 Horizontal Unit - Direct Drive

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1500	0.63	0.49
	1625	0.45	0.46
	1750	0.27	0.43
	1875	0.10	0.39
	2000	—	—
	2125	—	—
	2250	—	—
	2375	—	—
	2500	—	—
2	1500	0.88	0.61
	1625	0.69	0.58
	1750	0.49	0.55
	1875	0.30	0.51
	2000	0.12	0.48
	2125	—	—
	2250	—	—
	2375	—	—
	2500	—	—
3	1500	1.37	0.89
	1625	1.20	0.87
	1750	1.02	0.86
	1875	0.81	0.83
	2000	0.60	0.79
	2125	0.39	0.75
	2250	0.21	0.71
	2375	0.07	0.67
	2500	—	—
4	1500	1.48	0.95
	1625	1.35	0.95
	1750	1.20	0.99
	1875	1.03	0.99
	2000	0.83	0.96
	2125	0.63	0.93
	2250	0.42	0.89
	2375	0.22	0.84
	2500	0.05	0.78
5	1500	1.52	0.97
	1625	1.42	1.01
	1750	1.20	1.05
	1875	1.03	1.09
	2000	1.00	1.09
	2125	0.82	1.06
	2250	0.62	1.02
	2375	0.40	0.98
	2500	0.16	0.93

To convert BHP to watts, use 84% motor efficiency.

Table AN — 50HC*A06 Vertical Unit - Direct Drive

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1500	0.50	0.44
	1625	0.32	0.42
	1750	0.14	0.39
	1875	—	—
	2000	—	—
	2125	—	—
	2250	—	—
	2375	—	—
	2500	—	—
2	1500	0.72	0.56
	1625	0.53	0.53
	1750	0.34	0.50
	1875	0.18	0.48
	2000	—	—
	2125	—	—
	2250	—	—
	2375	—	—
	2500	—	—
3	1500	1.20	0.84
	1625	1.02	0.82
	1750	0.82	0.82
	1875	0.61	0.79
	2000	0.40	0.75
	2125	0.20	0.71
	2250	0.04	0.67
	2375	—	—
	2500	—	—
4	1500	1.31	0.92
	1625	1.17	0.92
	1750	0.99	0.95
	1875	0.80	0.94
	2000	0.59	0.90
	2125	0.37	0.86
	2250	0.17	0.83
	2375	0.00	0.79
	2500	—	—
5	1500	1.36	0.94
	1625	1.24	0.99
	1750	0.99	1.02
	1875	0.80	1.05
	2000	0.74	1.03
	2125	0.53	0.99
	2250	0.31	0.94
	2375	0.08	0.90
	2500	—	0.86

To convert BHP to watts, use 84% motor efficiency.

APPENDIX C — FAN PERFORMANCE
X13 MULTI-SPEED/TORQUE MOTOR

Table AO — Pulley Adjustment (Fan RPM at motor pulley settings)

UNIT		MOTOR/DRIVE COMBO	MOTOR PULLEY TURNS OPEN										
			0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
04	1 PHASE	Standard Static	854	825	795	766	736	707	678	648	619	589	560
		Medium Static	1175	1135	1094	1054	1013	973	932	892	851	811	770
05		Standard Static	854	825	795	766	736	707	678	648	619	589	560
		Medium Static	1175	1135	1094	1054	1013	973	932	892	851	811	770
06		Standard Static	1175	1135	1094	1054	1013	973	932	892	851	811	770
		Medium Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
04	3 PHASE	Standard Static*	854	825	795	766	736	707	678	648	619	589	560
		Medium Static	1175	1135	1094	1054	1013	973	932	892	851	811	770
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
05		Standard Static*	854	825	795	766	736	707	678	648	619	589	560
		Medium Static*	1175	1135	1094	1054	1013	973	932	892	851	811	770
		Medium Static	1303	1265	1226	1188	1150	1112	1073	1035	997	958	920
		High Static	1550	1516	1482	1447	1413	1379	1345	1311	1276	1242	1208
06		Standard Static*	1175	1135	1094	1054	1013	973	932	892	851	811	770
		Medium Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
		High Static	1550	1525	1501	1476	1451	1427	1402	1377	1352	1328	1303
07		Standard Static	747	721	695	670	644	618	592	566	541	515	489
		Medium Static	949	927	906	884	863	841	819	798	776	755	733
		High Static	1102	1083	1063	1044	1025	1006	986	967	948	928	909
08		Standard Static	733	712	690	669	647	626	604	583	561	540	518
		Medium Static	936	911	887	862	838	813	788	764	739	715	690
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838
09		Standard Static	733	712	690	669	647	626	604	583	561	540	518
		Medium Static	936	911	887	862	838	813	788	764	739	715	690
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838
11		Standard Static	838	813	789	764	739	715	690	665	640	616	591
		Medium Static	1084	1059	1035	1010	986	961	936	912	887	863	838
		High Static	1240	1218	1196	1175	1153	1131	1109	1087	1066	1044	1022
12		Standard Static	838	813	789	764	739	715	690	665	640	616	591
		Medium Static	1084	1059	1035	1010	986	961	936	912	887	863	838
		High Static	1240	1218	1196	1175	1153	1131	1109	1087	1066	1044	1022
14		Standard Static	609	592	575	558	541	525	508	491	474	457	440
		Medium Static	778	761	744	727	710	694	677	660	643	626	609
		High Static	955	937	919	901	883	866	848	830	812	794	776

— Factory settings

* Humidi-MiZer models only

General Fan Performance Notes:

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories can add static pressure losses.
4. The Fan Performance tables offer motor/drive recommendations. In cases when two motor/drive combinations would work, Carrier recommends the lower horsepower option.

APPENDIX D — WIRING DIAGRAMS

Table AP — Wiring Diagrams

50HC*A04-D14 UNITS					
		STANDARD		HUMIDI-MIZER	
SIZE	VOLTAGE	CONTROL	POWER	CONTROL	POWER
A04-A06	230-1-60	48TM502410-H (page 85)	48TM502523-G (page 93)	48TM503087-K (page 105)	48TM503090-I (page 111)
	208/230-3-60 460-3-60		48TM502524-I (page 94)		48TM503097-K (page 112)
	575-3-60				48TM503131-L (page 113)
A07	208/230-3-60 460-3-60	48TM500928-T (page 86)	48TM500737-U (page 95)	48TM503176-K (page 106)	48TM503179-F (page 114)
	575-3-60				48TM503300-K (page 115)
D07	208/230-3-60 460-3-60	48TM002690 (page 87)	48TM002723-A (page 96)	48TM002693 (page 88)	48TM002727 (page 97)
	575-3-60				48TM002728-A (page 98)
D08-D09	208/230-3-60 460-3-60	48TM501323-R (page 89)	48TM501324-Q (page 99)	48TM503246-M (page 107)	48TM503247-E (page 116)
	575-3-60				48TM503248-G (page 117)
D11	208/230-3-60	48TM504180-K (page 90)	48TM504183-H (page 100)	48TM504728-E (page 108)	48TM504183-H (page 118)
	460-3-60 575-3-60		48TM504551-D (page 101)		48TM504551-D (page 119)
D12	208/230-3-60 460-3-60 575-3-60	48TM501247-S (page 91)	48TM501248-O (page 102)	48TM503249-M (page 109)	48TM503250-F (page 120)
D14	208/230-3-60	50TM501064-K (page 92)	50TM501159-F (page 103)	50TM501503-I (page 110)	50TM501506-G (page 121)
	460-3-60		50TM501160-E (page 104)		50TM501505-G (page 122)
	575-3-60				50TM501511-G (page 123)
A04-A06	PremierLink controller	48TM500983-M (page 124)			
A07-D14	PremierLink controller	48TM504587-A (page 126)			
A04-A06	RTU-Open controller	48TM502741-E (page 125)			
A07-D14	RTU-Open controller	48TM503310-E (page 127)			

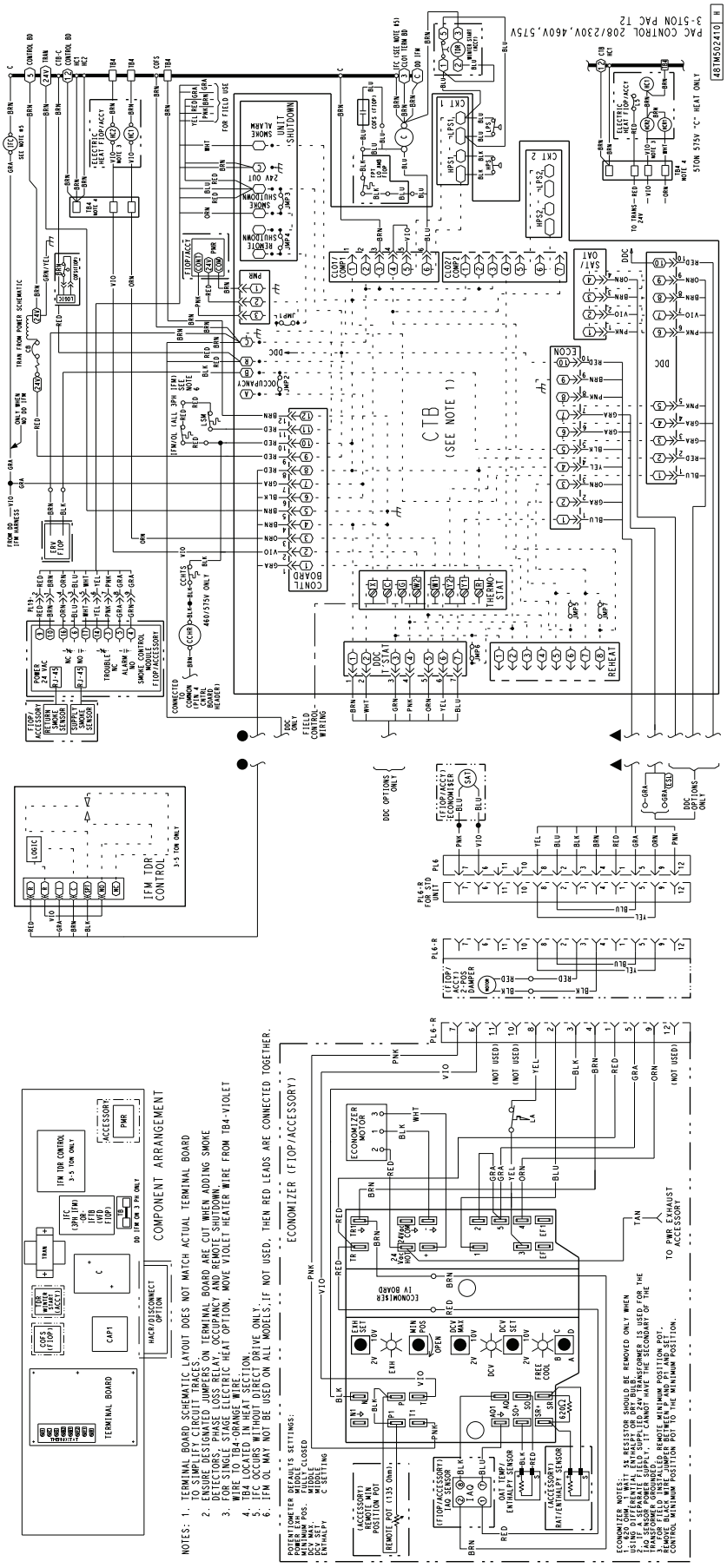


Fig. B — 50HC*A04-A06 PAC Control Diagram — 208-1-60; 208/230-3-60; 460/575-3-60

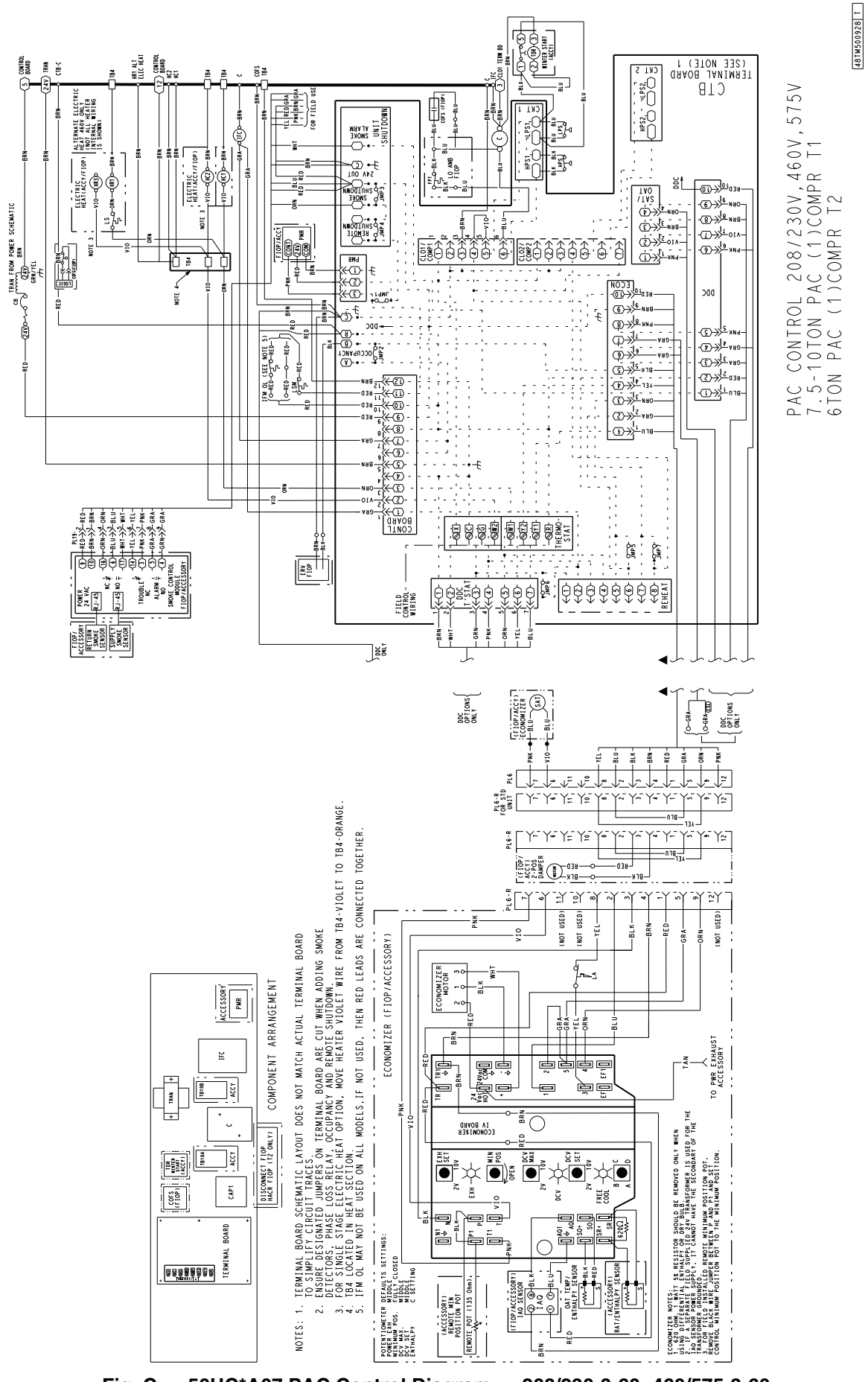


Fig. C — 50HC*A07 PAC Control Diagram — 208/230-3-60; 460/575-3-60

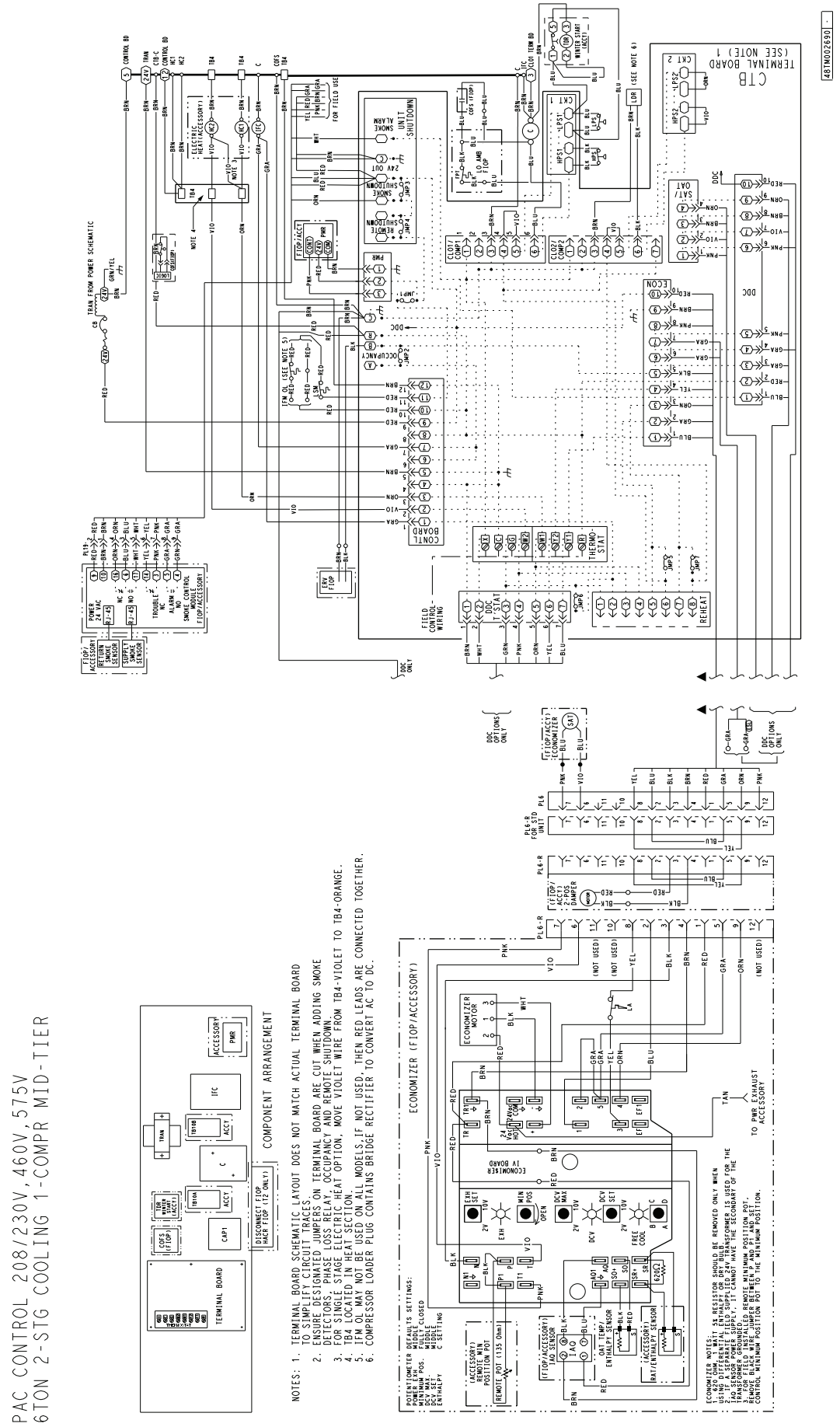


Fig. D — 50HC*D07 PAC Control Diagram — 208/230-3-60; 460/575-3-60 (6 Ton 2 Stage Cooling)

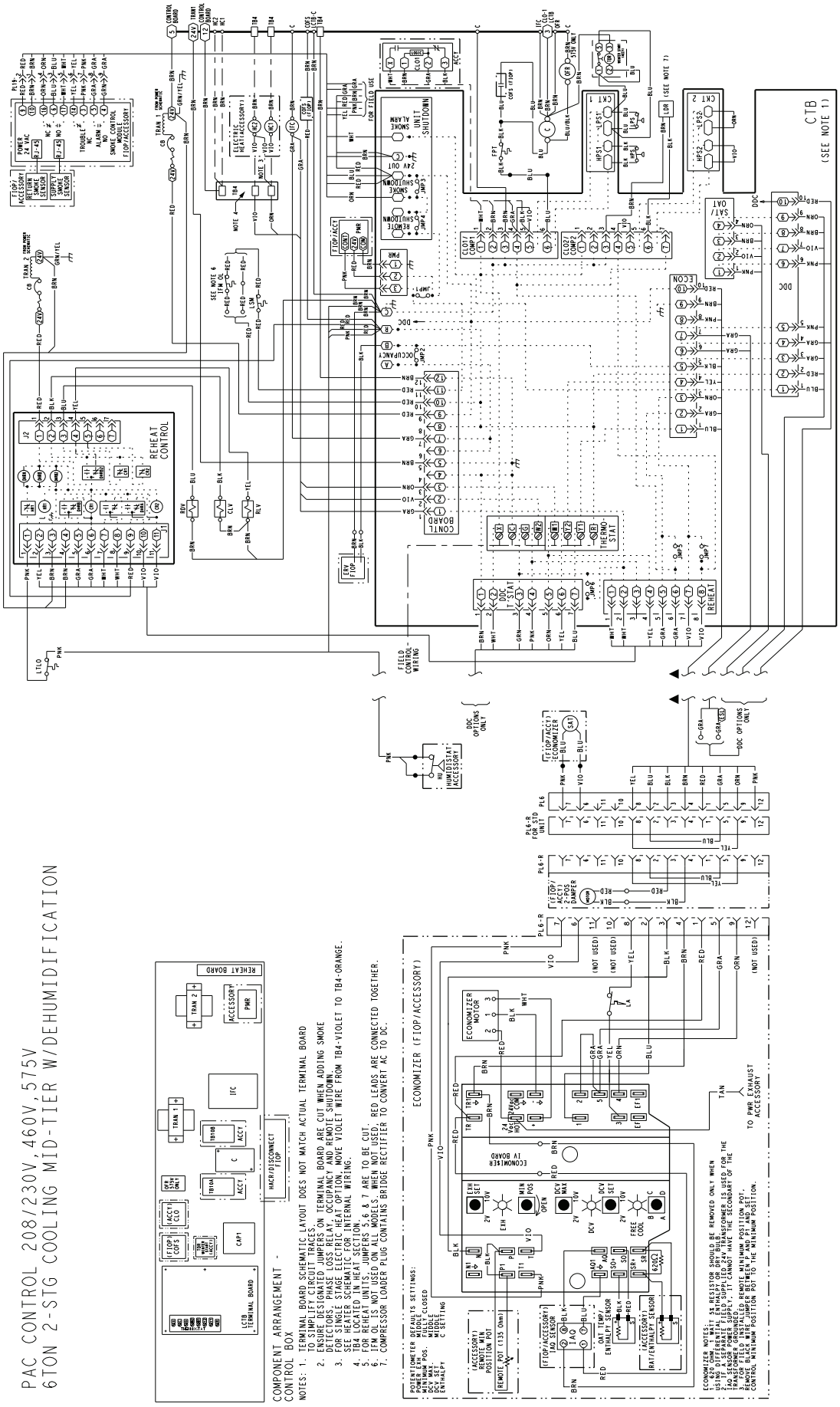


Fig. E — 50HC*D07 PAC Control Diagram — 208/230-3-60; 460/575-3-60 (6 Ton 2 Stage with Dehumidification)

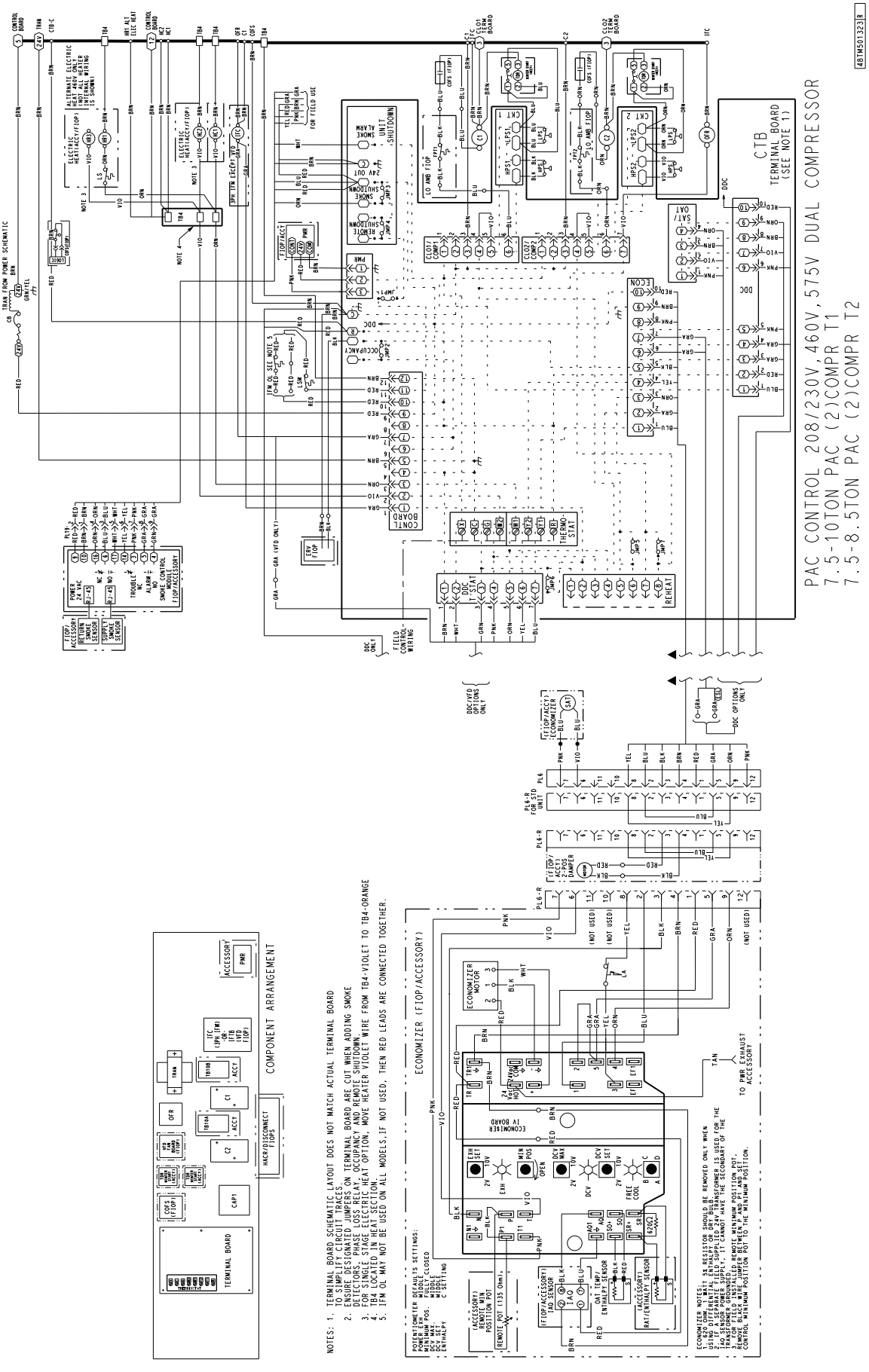


Fig. F — 50HC*D08-D09 PAC Control Diagram — 208/230-3-60; 460/575-3-60

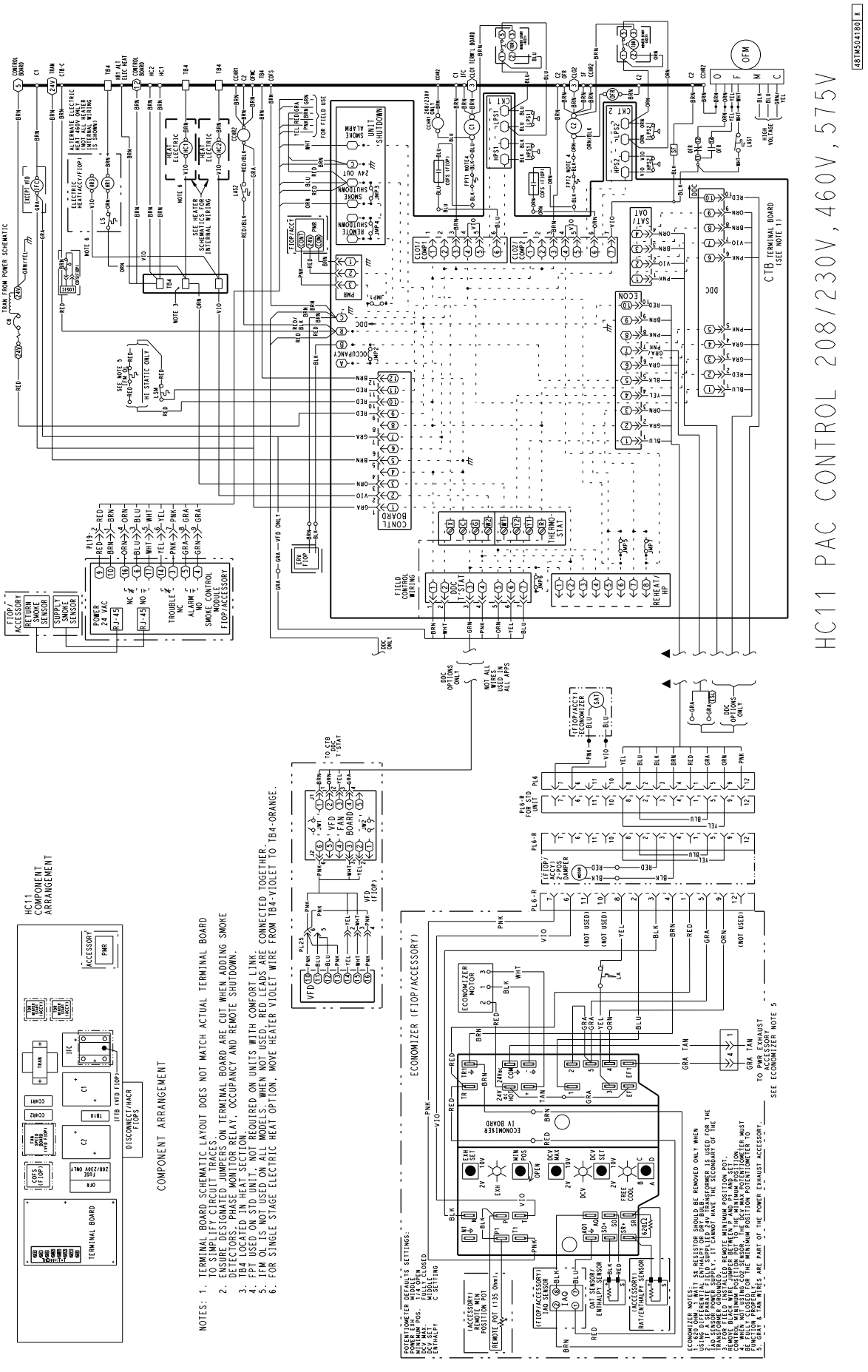


Fig. G — 50HC*D11 PAC Control Diagram — 208/230-3-60, 460-3-60, 575-3-60

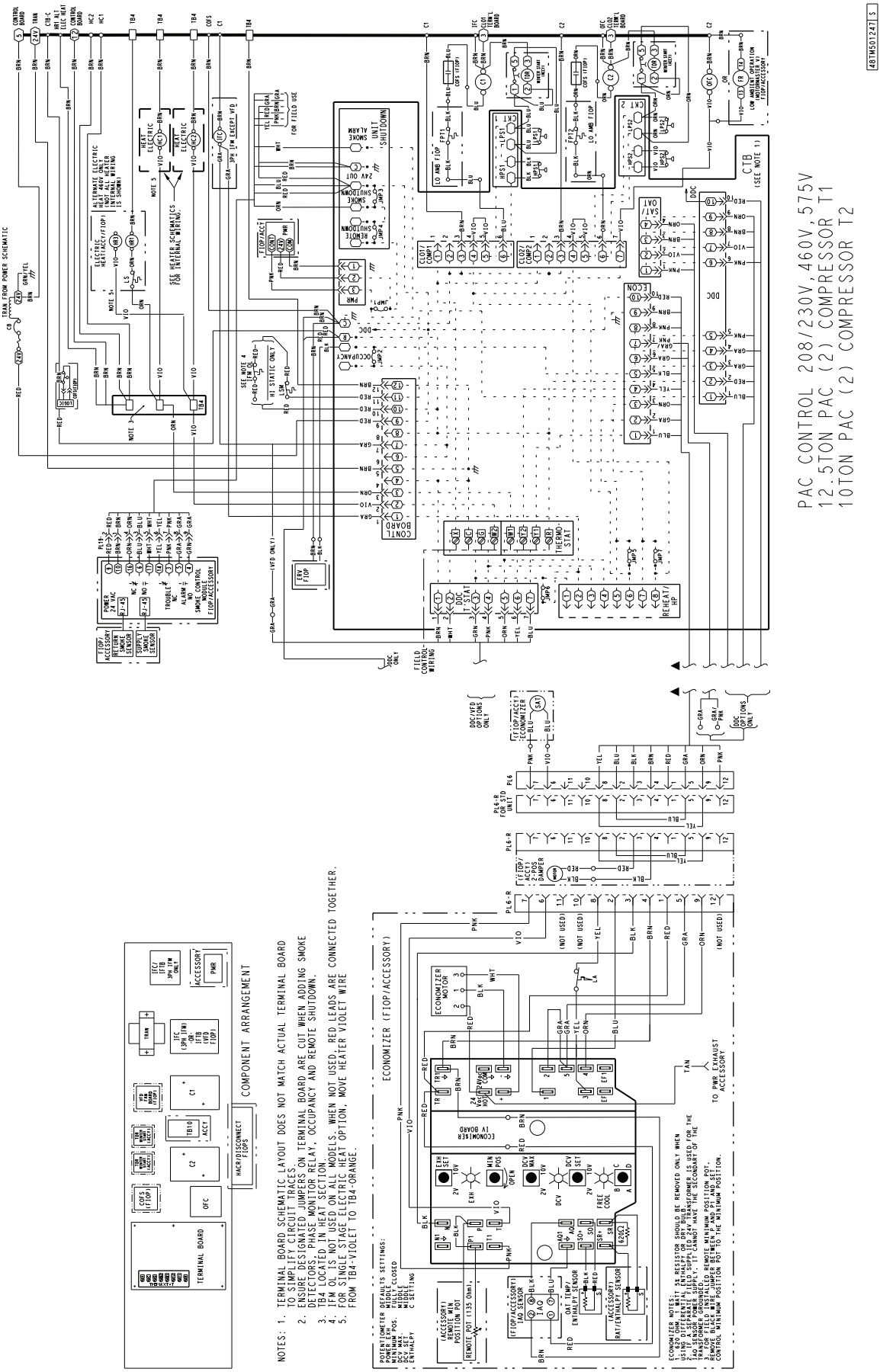


Fig. H — 50HC*D12 PAC Control Diagram — 208/230-3-60; 460/575-3-60

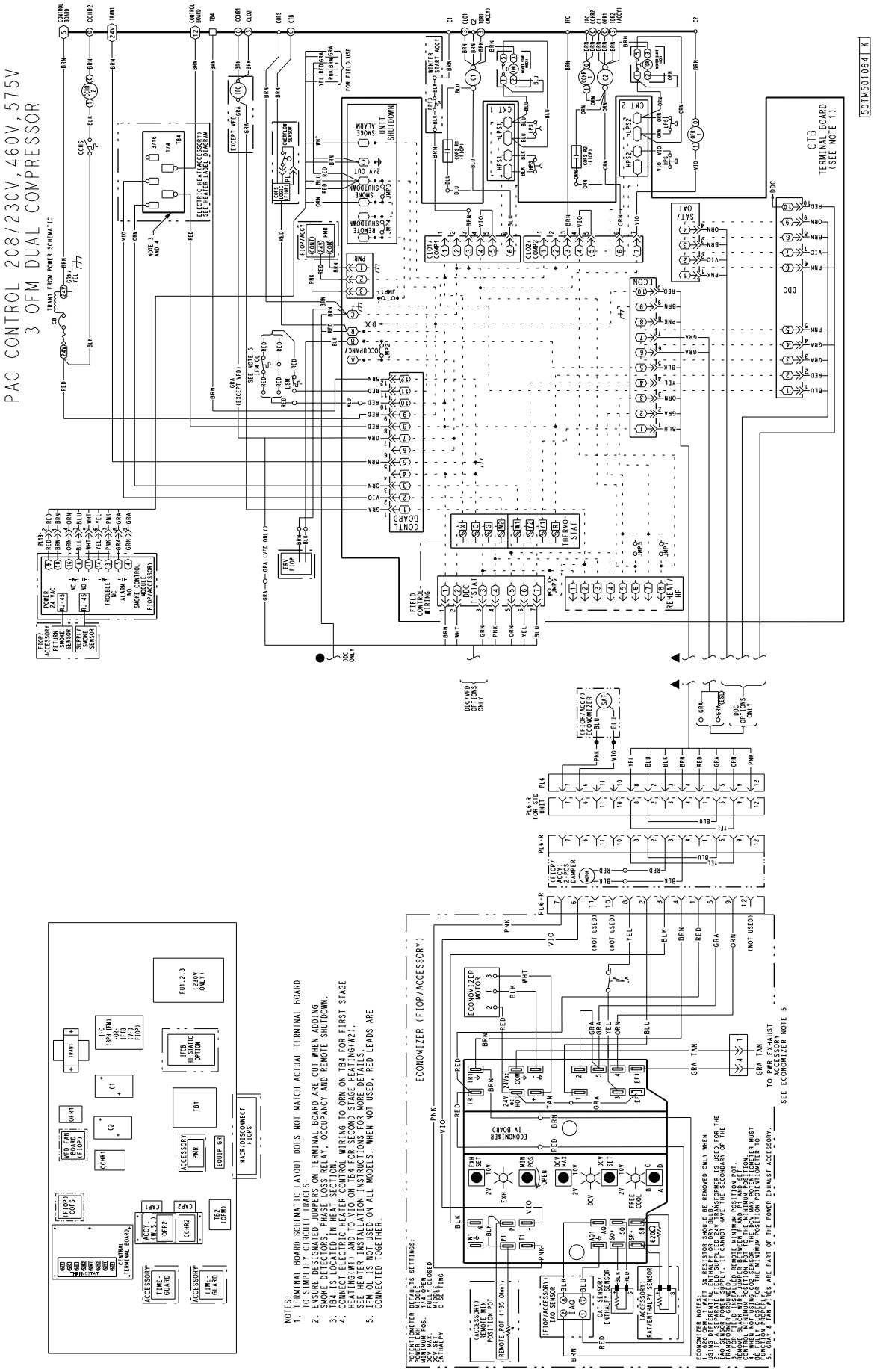
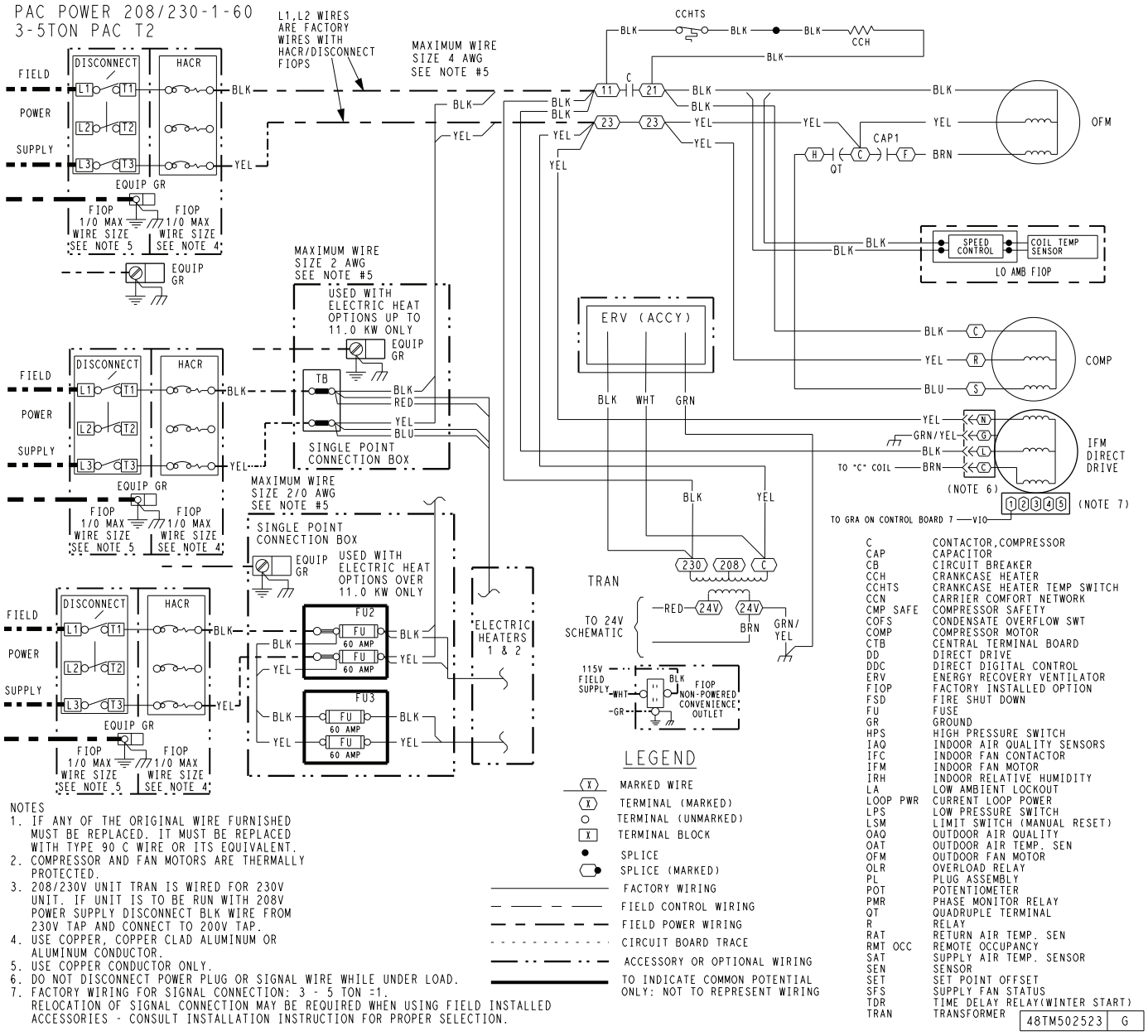


Fig. I — 50HC*D14 PAC Control Diagram — 208/230-3-60, 460-3-60, 575-3-60



NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED.
3. 208/230V UNIT TRAN IS WIRED FOR 230V UNIT. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTOR.
5. USE COPPER CONDUCTOR ONLY.
6. DO NOT DISCONNECT POWER PLUG OR SIGNAL WIRE WHILE UNDER LOAD.
7. FACTORY WIRING FOR SIGNAL CONNECTION: 3 - 5 TON =1. RELOCATION OF SIGNAL CONNECTION MAY BE REQUIRED WHEN USING FIELD INSTALLED ACCESSORIES - CONSULT INSTALLATION INSTRUCTION FOR PROPER SELECTION.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHTS	CRANKCASE HEATER TEMP SWITCH
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DD	DIRECT DRIVE
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OLR	OVERLOAD RELAY
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY(WINTER START)
TRAN	TRANSFORMER

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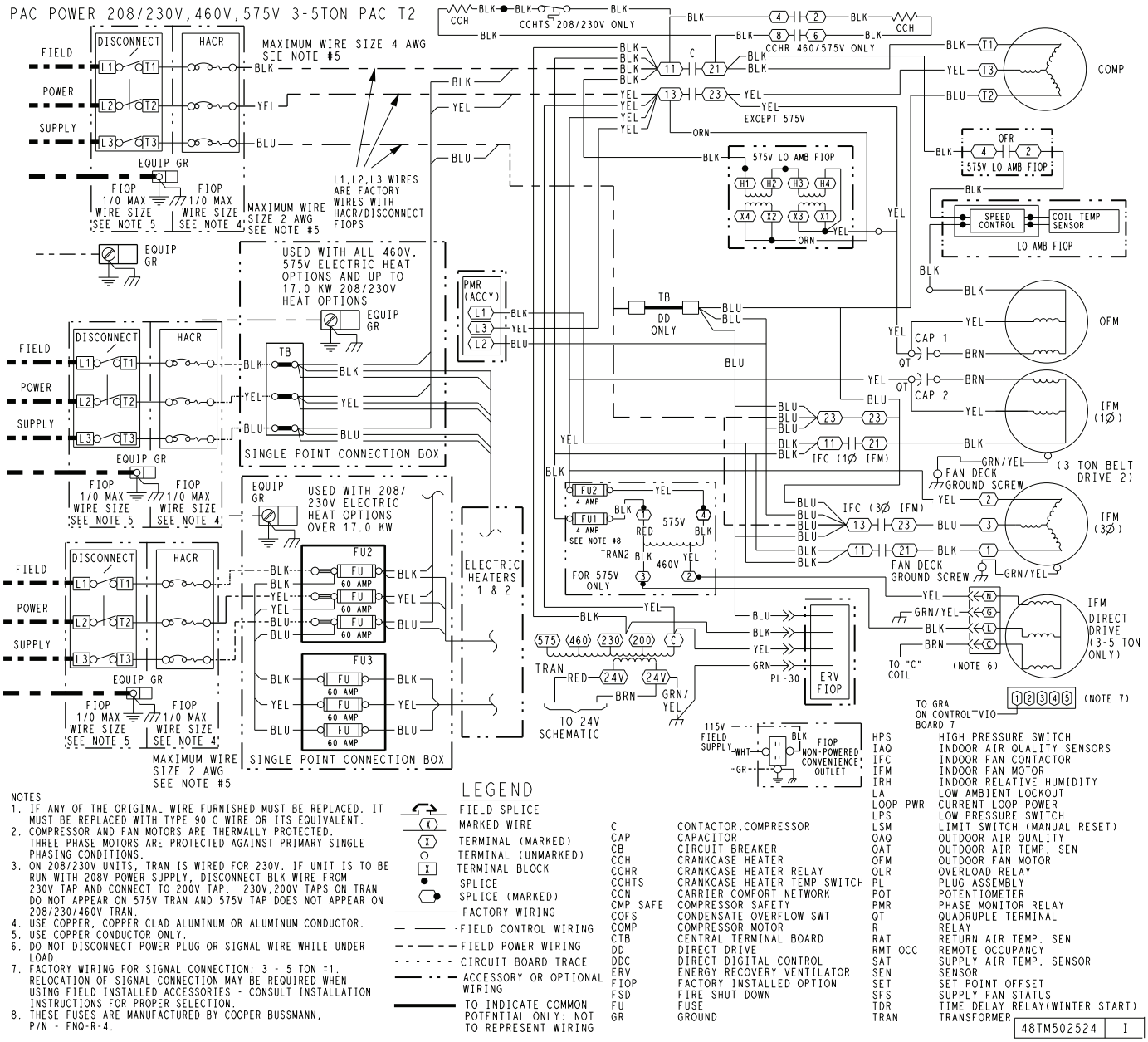
Fig. J — 50HC*A04-A06 PAC Power Diagram — 208/230-1-60



NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTOR.
5. USE COPPER CONDUCTOR ONLY.
6. DO NOT DISCONNECT POWER PLUG OR SIGNAL WIRE WHILE UNDER LOAD.
7. FACTORY WIRING FOR SIGNAL CONNECTION: 3 - 5 TON =1. RELOCATION OF SIGNAL CONNECTION MAY BE REQUIRED WHEN USING FIELD INSTALLED ACCESSORIES - CONSULT INSTALLATION INSTRUCTIONS FOR PROPER SELECTION.
8. THESE FUSES ARE MANUFACTURED BY COOPER BUSSMANN, P/N - FNQ-R-4.

LEGEND

	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	SPLICE
	SPLICE (MARKED)
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR OPTIONAL WIRING
	TO INDICATE COMMON POTENTIAL ONLY; NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCHTS	CRANKCASE HEATER TEMP SWITCH
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DD	DIRECT DRIVE
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND

HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OLR	OVERLOAD RELAY
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY(WINTER START)
TRAN	TRANSFORMER

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Fig. K — 50HC*A04-A06 PAC Power Diagram — 208/230-3-60; 460-3-60; 575-3-60

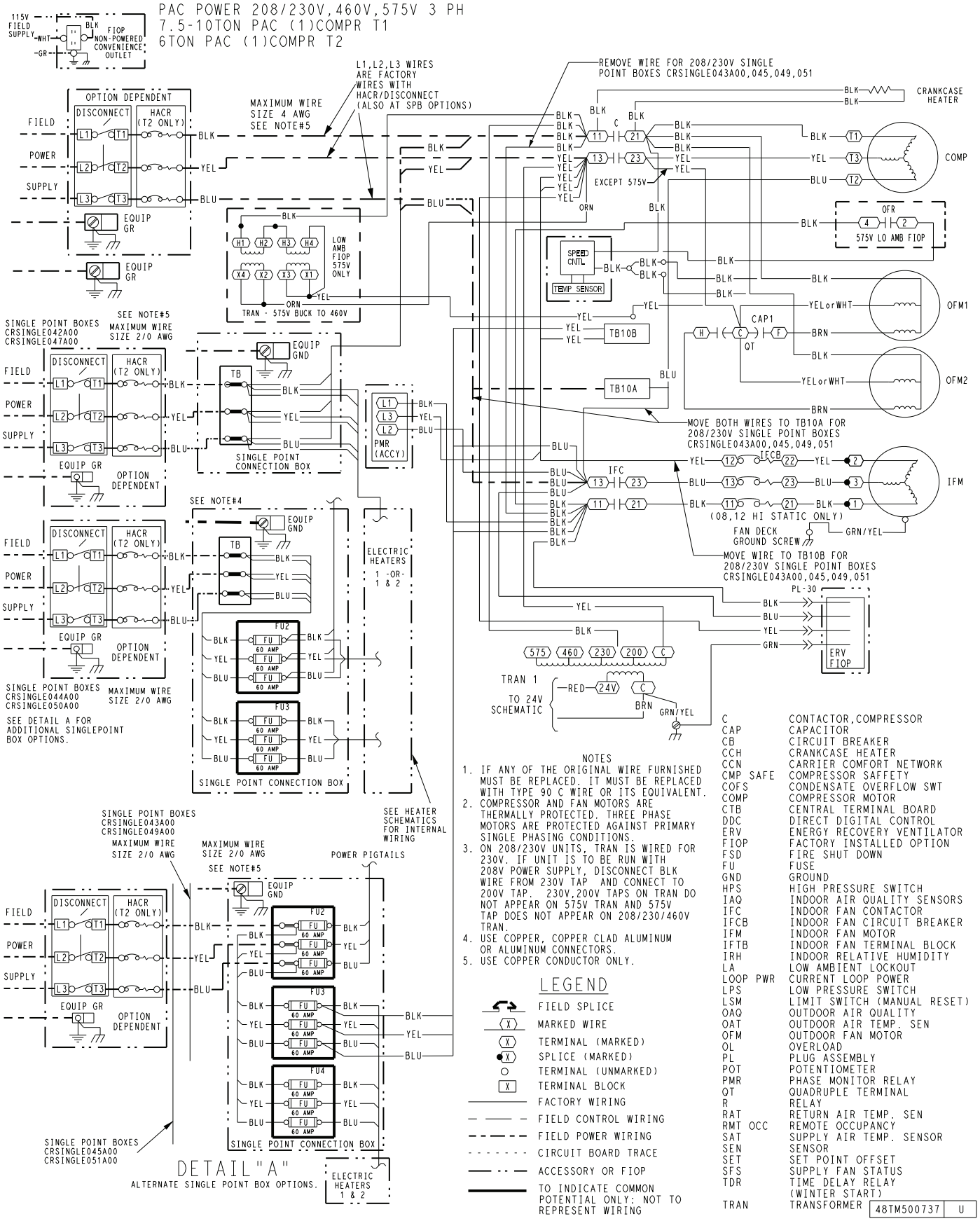


Fig. L — 50HC*A07 PAC Power Diagram — 208/230-3-60, 460-3-60, 575-3-60

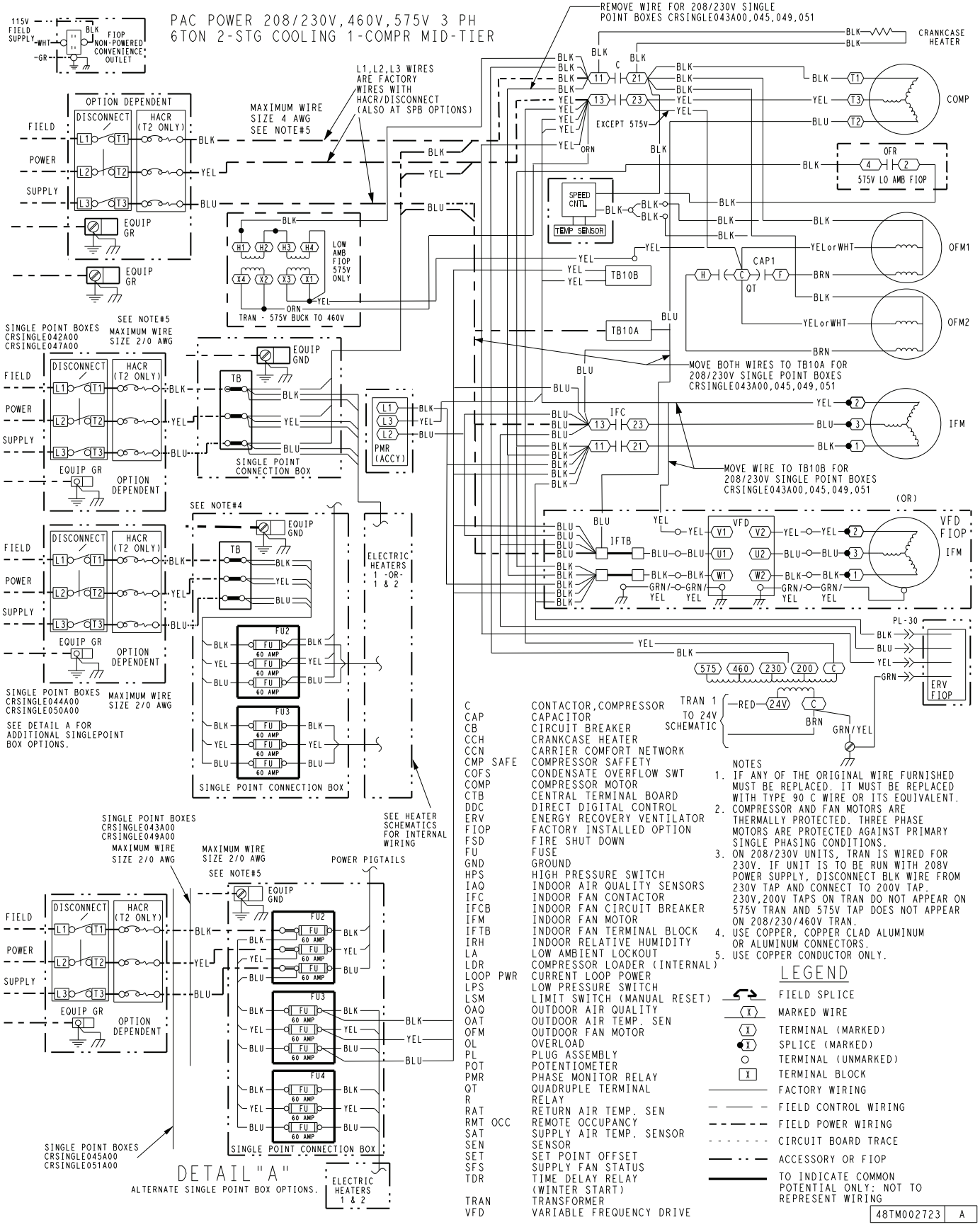
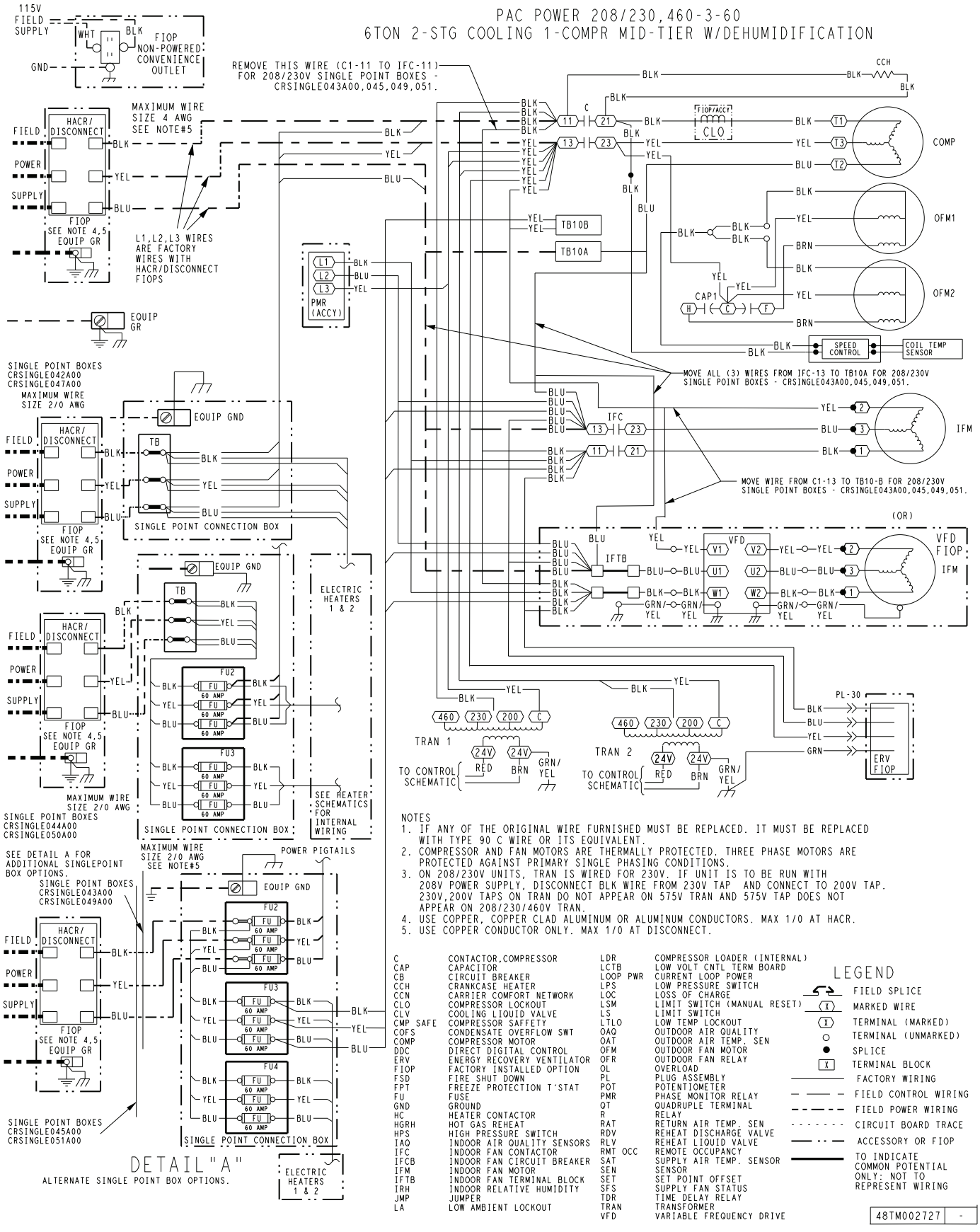


Fig. M — 50HC*D07 PAC Power Diagram — 208/230-3-60, 460-3-60 (6 Ton 2 Stage with Cooling)

APPENDIX D — WIRING DIAGRAMS



NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 AT HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 AT DISCONNECT.

C	CONTACTOR,COMPRESSOR	LDR	COMPRESSOR LOADER (INTERNAL)
CAP	CAPACITOR	LCTB	LOW VOLT CNTL TERM BOARD
CB	CIRCUIT BREAKER	LOOP PWR	CURRENT LOOP POWER
CCH	CRANKCASE HEATER	LPS	LOW PRESSURE SWITCH
CCN	CARRIER COMFORT NETWORK	LOC	LOSS OF CHARGE
CLO	COMPRESSOR LOCKOUT	LSM	LIMIT SWITCH (MANUAL RESET)
CLV	COOLING LIQUID VALVE	LS	LIMIT SWITCH
CMP SAFE	COMPRESSOR SAFFETY	LTLO	LOW TEMP LOCKOUT
COFS	CONDENSATE OVERFLOW SWT	OAQ	OUTDOOR AIR QUALITY
COMP	COMPRESSOR MOTOR	OAT	OUTDOOR AIR TEMP. SEN
DDC	DIRECT DIGITAL CONTROL	OFM	OUTDOOR FAN MOTOR
ERV	ENERGY RECOVERY VENTILATOR	OFR	OUTDOOR FAN RELAY
FIOP	FACTORY INSTALLED OPTION	OL	OVERLOAD
FSD	FIRE SHUT DOWN	PL	PLUG ASSEMBLY
FPT	FREEZE PROTECTION T'STAT	POT	POTENTIOMETER
FU	FUSE	PMR	PHASE MONITOR RELAY
GND	GROUND	QT	QUADRUPLE TERMINAL
HC	HEATER CONTACTOR	R	RELAY
HGRH	HOT GAS REHEAT	RAT	RETURN AIR TEMP. SEN
HPS	HIGH PRESSURE SWITCH	RDV	REHEAT DISCHARGE VALVE
IAQ	INDOOR AIR QUALITY SENSORS	RLV	REHEAT LIQUID VALVE
IFC	INDOOR FAN CONTACTOR	RMT OCC	REMOTE OCCUPANCY
IFCB	INDOOR FAN CIRCUIT BREAKER	SAT	SUPPLY AIR TEMP. SENSOR
IFM	INDOOR FAN MOTOR	SEN	SENSOR
IFTB	INDOOR FAN TERMINAL BLOCK	SET	SET POINT OFFSET
IRH	INDOOR RELATIVE HUMIDITY	SFS	SUPPLY FAN STATUS
JMP	JUMPER	TDR	TIME DELAY RELAY
LA	LOW AMBIENT LOCKOUT	TRAN	TRANSFORMER
		VFD	VARIABLE FREQUENCY DRIVE

LEGEND
- FIELD Ssplice
- (X) MARKED WIRE
- (X) TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- SPLICE
- [X] TERMINAL BLOCK
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR FIOP
- TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

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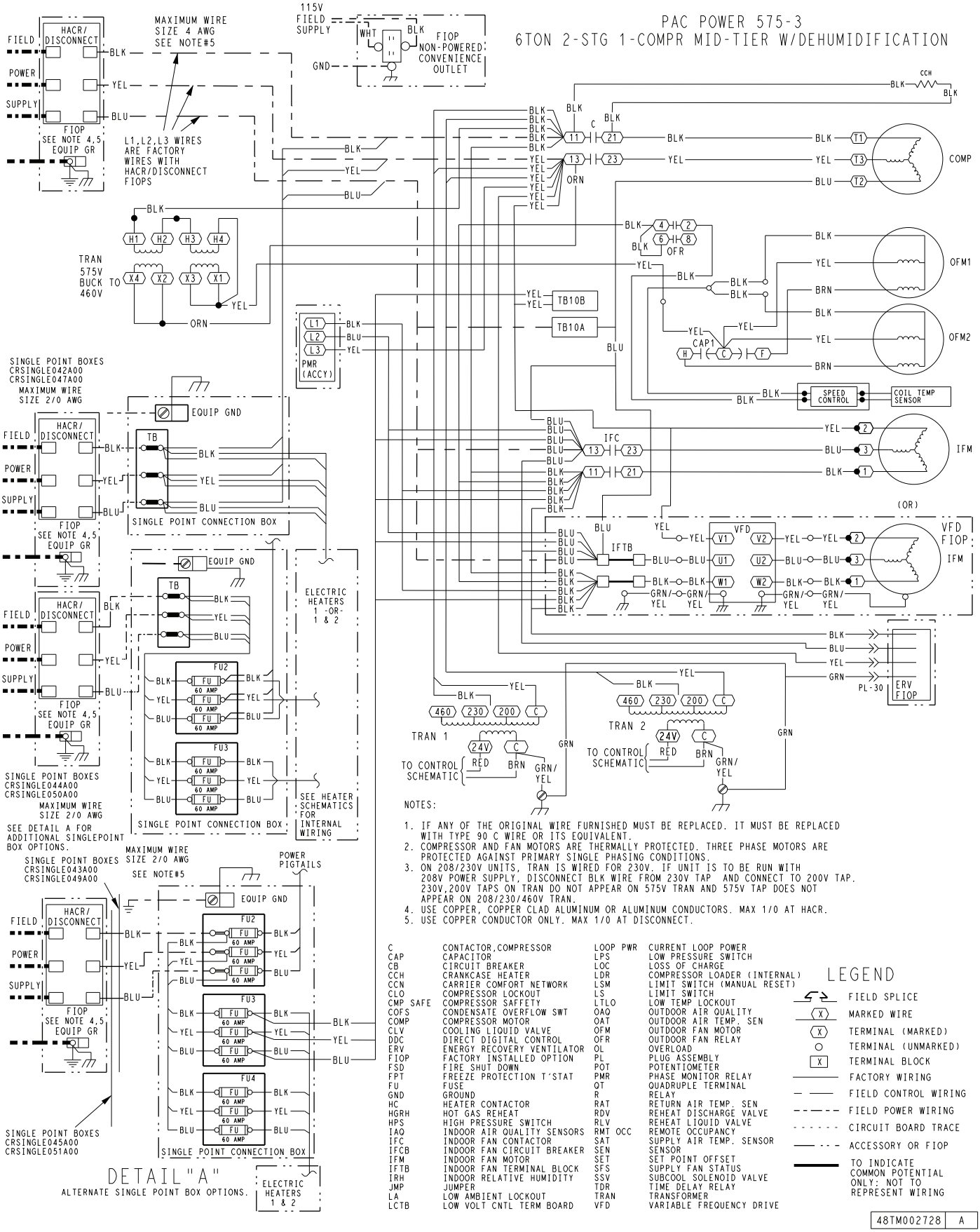
Fig. N — 50HC*D07 PAC Power Diagram — 208/230-3-60, 460-3-60 (6 Ton 2 Stage with Dehumidification)

APPENDIX D — WIRING DIAGRAMS



NOTES:

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 AT HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 AT DISCONNECT.

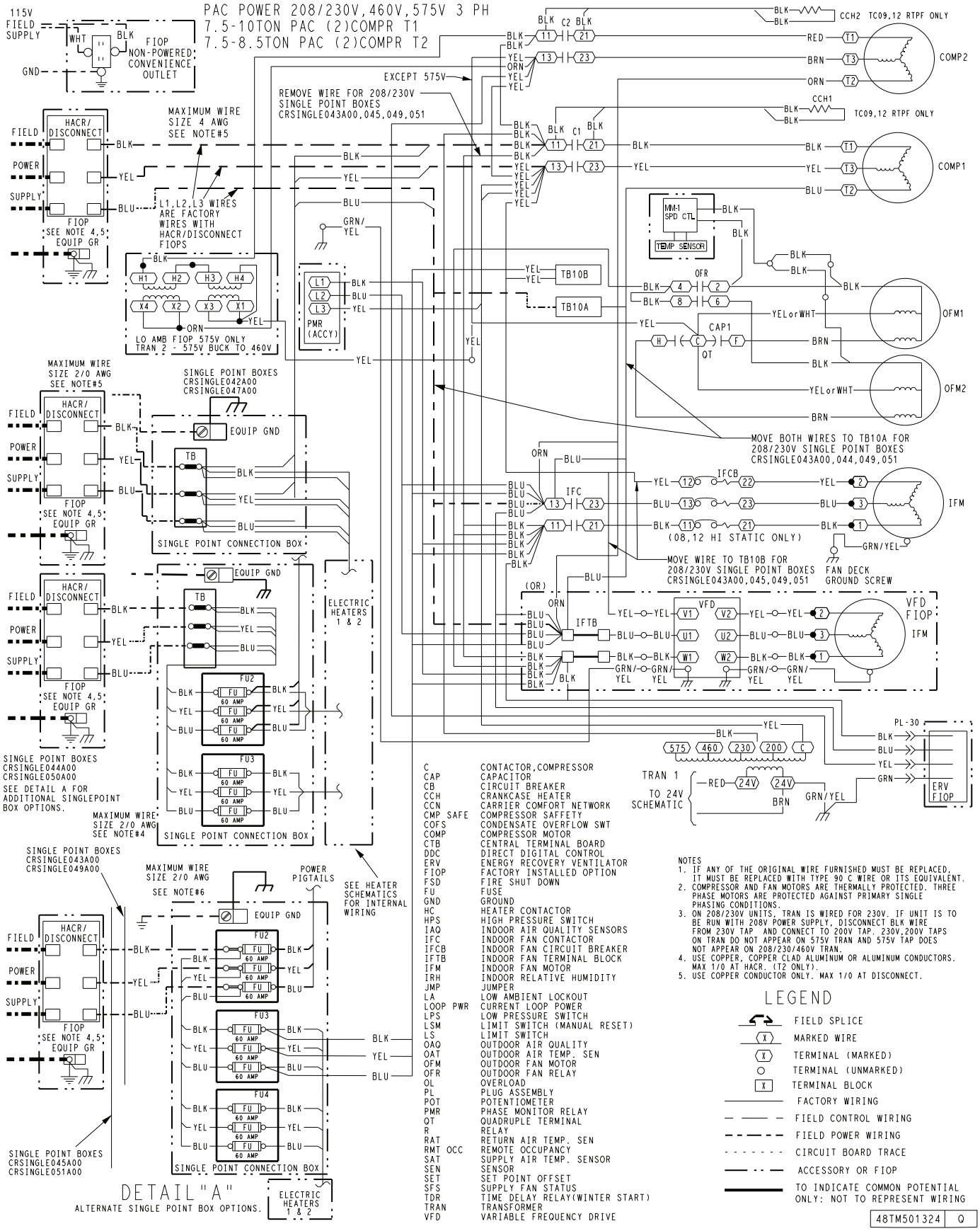
C	CONTACTOR,COMPRESSOR	LOOP PWR	CURRENT LOOP POWER
CAP	CAPACITOR	LPS	LOW PRESSURE SWITCH
CB	CIRCUIT BREAKER	LOC	LOSS OF CHARGE
CCH	CRANKCASE HEATER	LDR	COMPRESSOR LOADER (INTERNAL)
CCN	CARRIER COMFORT NETWORK	LSM	LIMIT SWITCH (MANUAL RESET)
CLO	COMPRESSOR LOCKOUT	LS	LIMIT SWITCH
CMP SAFE	COMPRESSOR SAFFETY	LTLO	LOW TEMP LOCKOUT
COFS	CONDENSATE OVERFLOW SWT	OAQ	OUTDOOR AIR QUALITY
COMP	COMPRESSOR MOTOR	OAT	OUTDOOR AIR TEMP. SEN
CLV	COOLING LIQUID VALVE	OFM	OUTDOOR FAN MOTOR
DDC	DIRECT DIGITAL CONTROL	OFR	OUTDOOR FAN RELAY
ERV	ENERGY RECOVERY VENTILATOR	OL	OVERLOAD
FIOP	FACTORY INSTALLED OPTION	PL	PLUG ASSEMBLY
FSD	FIRE SHUT DOWN	POT	POTENTIOMETER
FPT	FREEZE PROTECTION T'STAT	PMR	PHASE MONITOR RELAY
FU	FUSE	QT	QUADRUPLE TERMINAL
GND	GROUND	R	RELAY
HC	HEATER CONTACTOR	RAT	RETURN AIR TEMP. SEN
HGRH	HOT GAS REHEAT	RDV	REHEAT DISCHARGE VALVE
HPS	HIGH PRESSURE SWITCH	RLV	REHEAT LIQUID VALVE
IAQ	INDOOR AIR QUALITY SENSORS	RMT OCC	REMOTE OCCUPANCY
IFC	INDOOR FAN CONTACTOR	SAT	SUPPLY AIR TEMP. SENSOR
IFCB	INDOOR FAN CIRCUIT BREAKER	SEN	SENSOR
IFM	INDOOR FAN MOTOR	SET	SET POINT OFFSET
IFTB	INDOOR FAN TERMINAL BLOCK	SFS	SUPPLY FAN STATUS
IRH	INDOOR RELATIVE HUMIDITY	SSV	SUBCOOL SOLENOID VALVE
JMP	JUMPER	TDR	TIME DELAY RELAY
LA	LOW AMBIENT LOCKOUT	TRAN	TRANSFORMER
LCTB	LOW VOLT CNTL TERM BOARD	VFD	VARIABLE FREQUENCY DRIVE

LEGEND

- FIELD SPLICE
- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- TERMINAL BLOCK
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR FIOP
- TO INDICATE COMMON POTENTIAL ONLY; NOT TO REPRESENT WIRING

48TM002728 | A

Fig. O — 50HC*D07 PAC Power Diagram — 575-3-60 (6 Ton 2 Stage with Dehumidification)



C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HC	HEATER CONTACTOR
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
LS	LIMIT SWITCH
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY(WINTER START)
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 AT HACR. (T2 ONLY).
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 AT DISCONNECT.

LEGEND

	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR FIOP
	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

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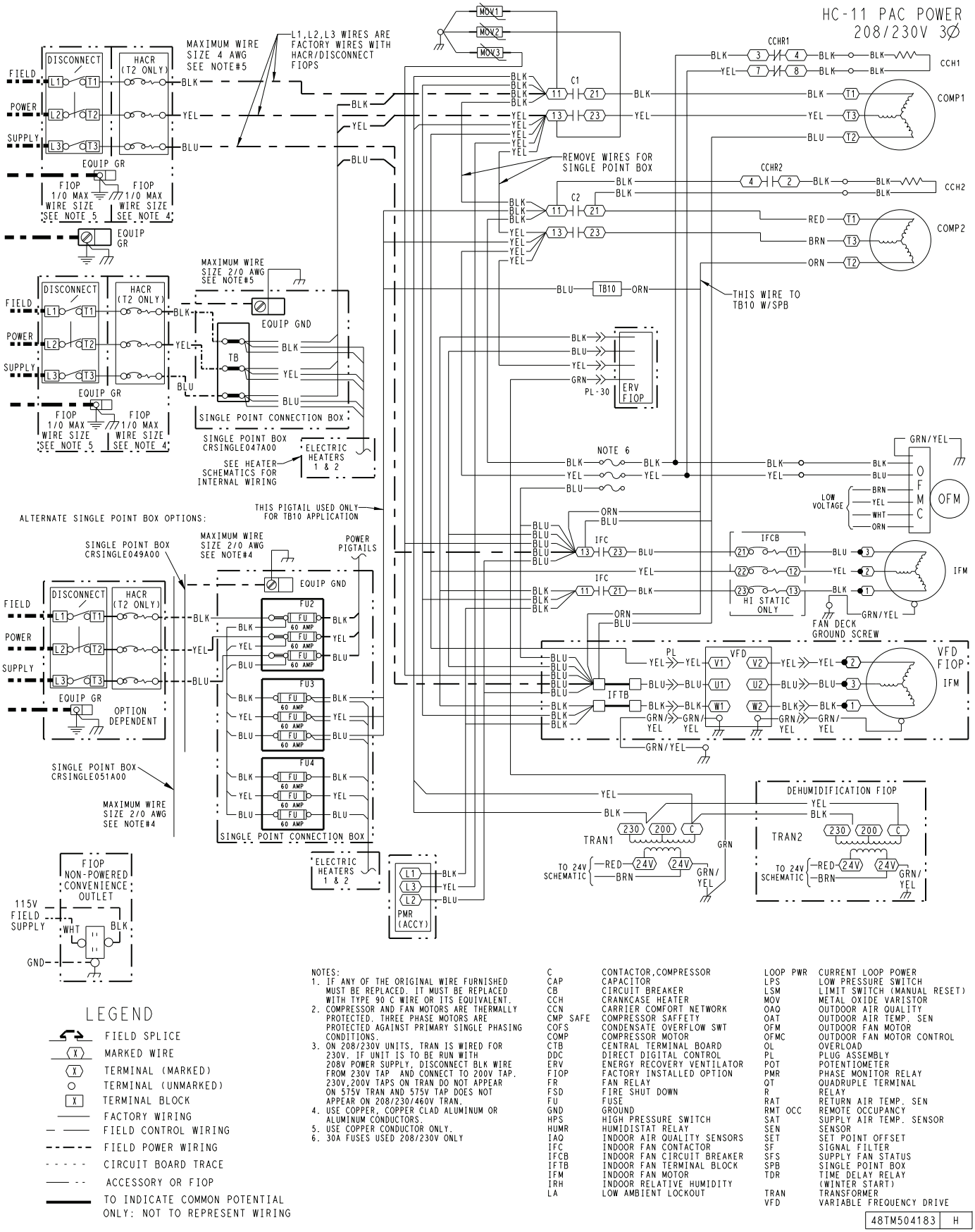
Fig. P — 50HC*D08-D09 PAC Power Diagram — 208/230-3-60, 460-3-60, 575-3-60



NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.
6. 30A FUSES USED 208/230V ONLY

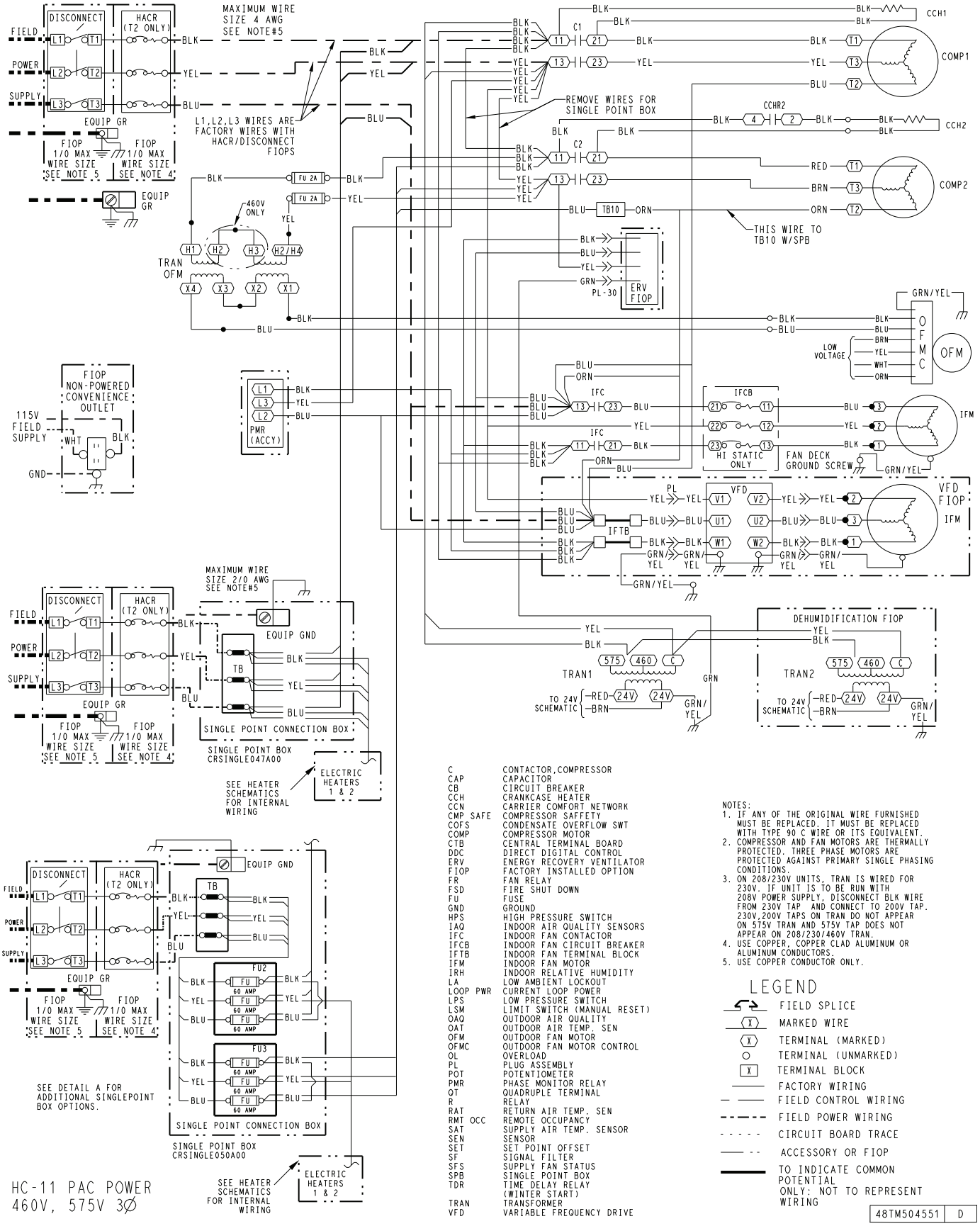
LEGEND

	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR FIOP
	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FR	FAN RELAY
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HPS	HIGH PRESSURE SWITCH
HUMR	HUMIDISTAT RELAY
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
MOV	METAL OXIDE VARISTOR
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROL
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SF	SIGNAL FILTER
SFS	SUPPLY FAN STATUS
SPB	SINGLE POINT BOX
TDR	TIME DELAY RELAY (WINTER START)
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

48TM504183 | H

Fig. Q — 50HC*D11 PAC Power Diagram 208/230-3-60



C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FR	FAN RELAY
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROL
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SF	SIGNAL FILTER
SFS	SUPPLY FAN STATUS
SPB	SINGLE POINT BOX
TDR	TIME DELAY RELAY (WINTER START)
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

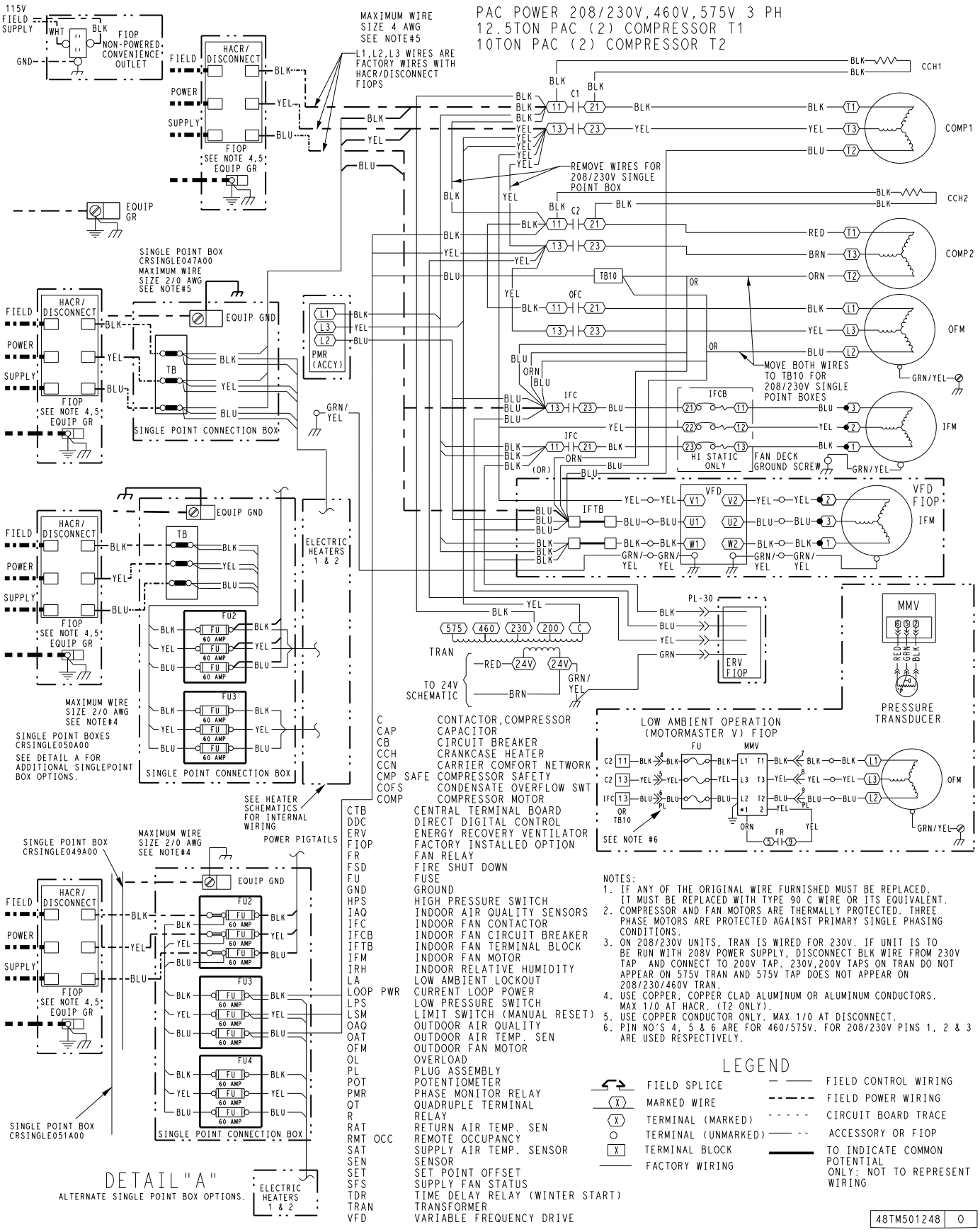
NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.

LEGEND

	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR FIOP
	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

48TM504551 | D

Fig. R — 50HC*D11 PAC Power Diagram 460-3-60, 575-3-60



C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FR	FAN RELAY
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY (WINTER START)
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

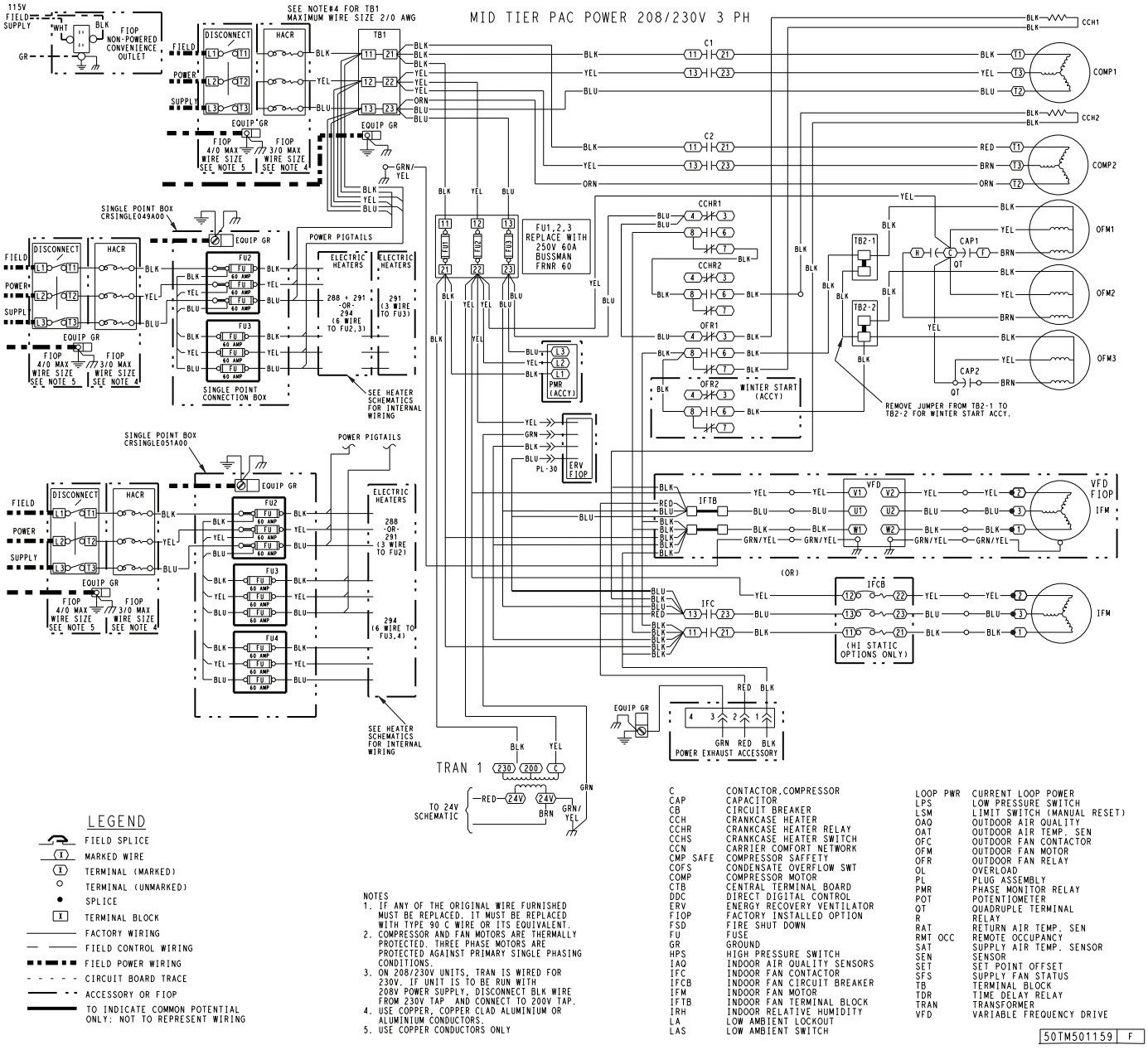
NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 AT HACR. (T2 ONLY).
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 AT DISCONNECT.
6. PIN NO'S 4, 5 & 6 ARE FOR 460/575V. FOR 208/230V PINS 1, 2 & 3 ARE USED RESPECTIVELY.

LEGEND

FIELD SPLICE	FIELD CONTROL WIRING
MARKED WIRE	FIELD POWER WIRING
TERMINAL (MARKED)	CIRCUIT BOARD TRACE
TERMINAL (UNMARKED)	ACCESSORY OR FIOP
TERMINAL BLOCK	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING
FACTORY WIRING	

48TM501248 | O

Fig. S — 50HC*D12 PAC Power Diagram — 208/230-3-60, 460-3-60, 575-3-60



LEGEND

- FIELD SPLICE
- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- SPLICE
- TERMINAL BLOCK
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR FIOP
- TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

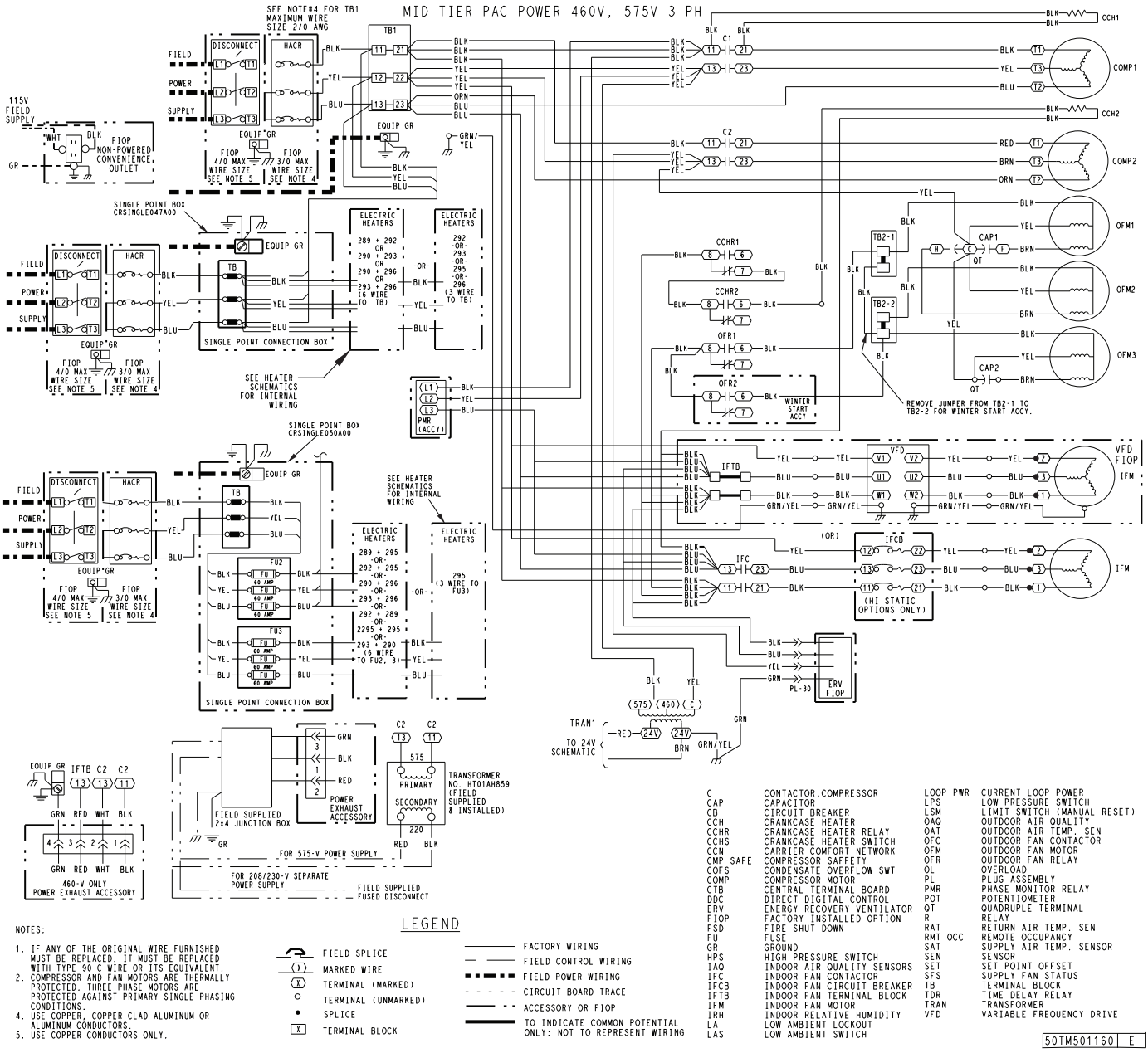
NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP.
4. USE COPPER, COPPER CLAD ALUMINIUM OR ALUMINIUM CONDUCTORS.
5. USE COPPER CONDUCTORS ONLY

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCHS	CRANKCASE HEATER SWITCH
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IFTB	INDOOR FAN TERMINAL BLOCK
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LAS	LOW AMBIENT SWITCH

LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFC	OUTDOOR FAN CONTACTOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
PMR	PHASE MONITOR RELAY
POT	POTENTIOMETER
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TB	TERMINAL BLOCK
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

50TM501159 F

Fig. T — 50HC*D14 PAC Power Diagram — 208/230-3-60



NOTES:

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTORS ONLY.

LEGEND

FIELD SPLICE	FACTORY WIRING
MARKED WIRE	FIELD CONTROL WIRING
TERMINAL (MARKED)	FIELD POWER WIRING
TERMINAL (UNMARKED)	CIRCUIT BOARD TRACE
SPLICE	ACCESSORY OR FIOP
TERMINAL BLOCK	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR	LOOP PWR	CURRENT LOOP POWER
CAP	CAPACITOR	LPS	LOW PRESSURE SWITCH
CB	CIRCUIT BREAKER	LSM	LIMIT SWITCH (MANUAL RESET)
CCH	CRANKCASE HEATER	OAQ	OUTDOOR AIR QUALITY
CCHR	CRANKCASE HEATER RELAY	OAT	OUTDOOR AIR TEMP. SEN
CCHS	CRANKCASE HEATER SWITCH	OFC	OUTDOOR FAN CONTACTOR
CCN	CARRIER COMFORT NETWORK	OFM	OUTDOOR FAN MOTOR
CMP SAFE	COMPRESSOR SAFFETY	OFR	OUTDOOR FAN RELAY
COFS	CONDENSATE OVERFLOW SWT	OL	OVERLOAD
COMP	COMPRESSOR MOTOR	PL	PLUG ASSEMBLY
CTB	CENTRAL TERMINAL BOARD	PMR	PHASE MONITOR RELAY
DDC	DIRECT DIGITAL CONTROL	POT	POTENTIOMETER
ERV	ENERGY RECOVERY VENTILATOR	QT	QUADRUPLE TERMINAL
FIOP	FACTORY INSTALLED OPTION	R	RELAY
FSD	FIRE SHUT DOWN	RAT	RETURN AIR TEMP. SEN
FU	FUSE	RMT OCC	REMOTE OCCUPANCY
GR	GROUND	SAT	SUPPLY AIR TEMP. SENSOR
HPS	HIGH PRESSURE SWITCH	SEN	SENSOR
IAQ	INDOOR AIR QUALITY SENSORS	SET	SET POINT OFFSET
IFC	INDOOR FAN CONTACTOR	SFS	SUPPLY FAN STATUS
IFCB	INDOOR FAN CIRCUIT BREAKER	TB	TERMINAL BLOCK
IFTB	INDOOR FAN TERMINAL BLOCK	TDR	TIME DELAY RELAY
IFM	INDOOR FAN MOTOR	TRAN	TRANSFORMER
IRH	INDOOR RELATIVE HUMIDITY	VFD	VARIABLE FREQUENCY DRIVE
LA	LOW AMBIENT LOCKOUT		
LAS	LOW AMBIENT SWITCH		

50TM501160 E

Fig. U — 50HC*D14 PAC Power Diagram — 460-3-60, 575-3-60

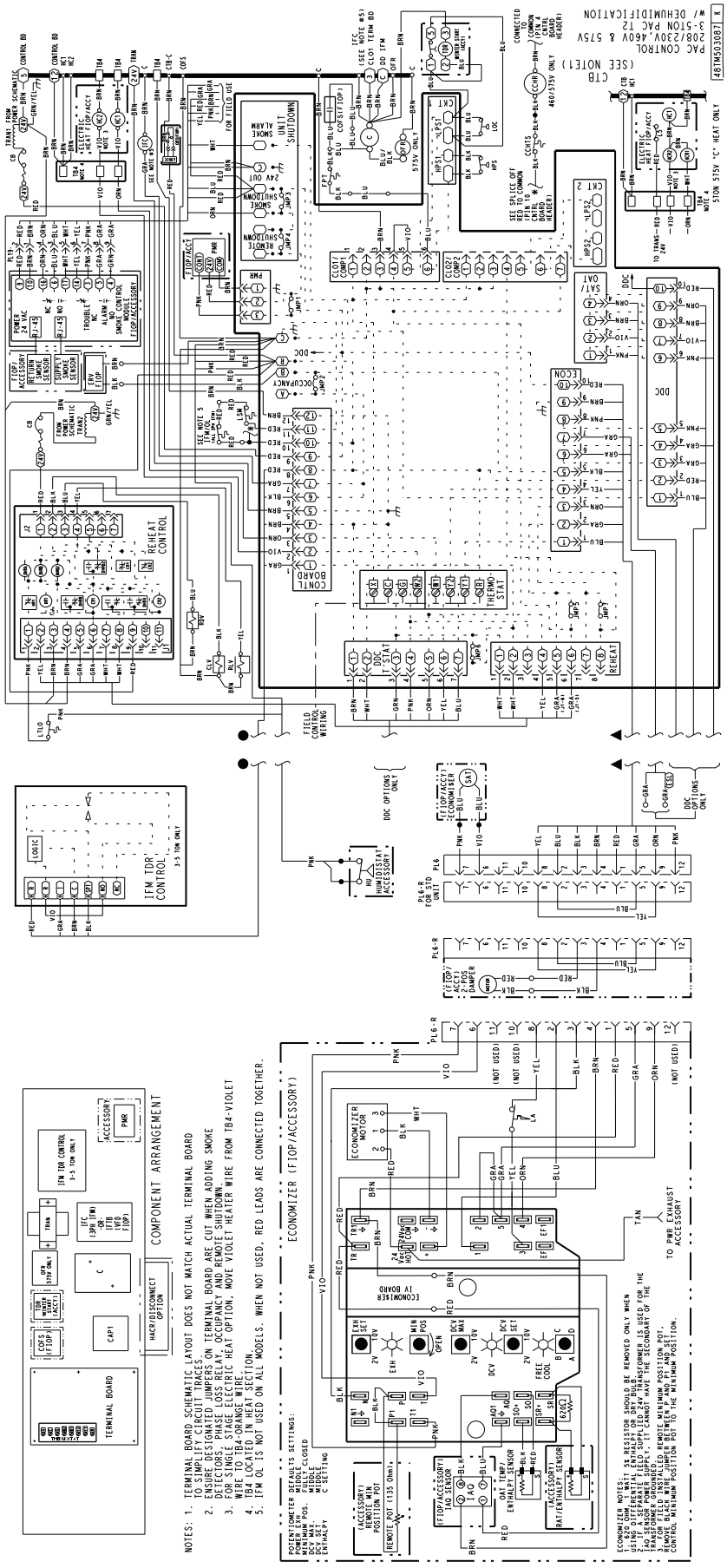


Fig. V — 50HC*A04-A06 PAC Control Diagram — 230-1-60; 230/460/575-3-60 with Humidi-MiZer® System

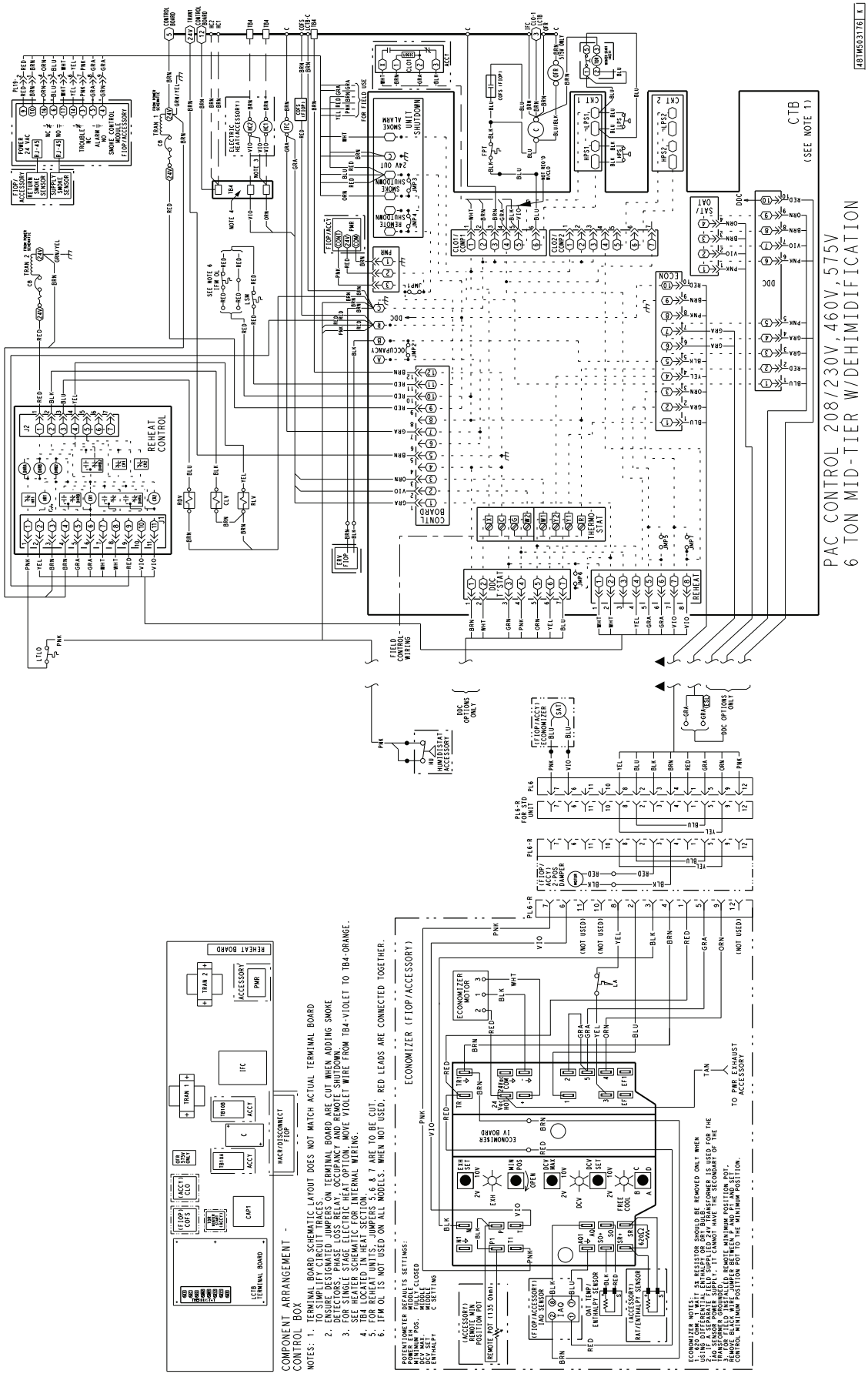


Fig. W — 50HC*A07 PAC Control Diagram — 208/230-1-60; 230/460/575-3-60 with Humidi-MiZer® System

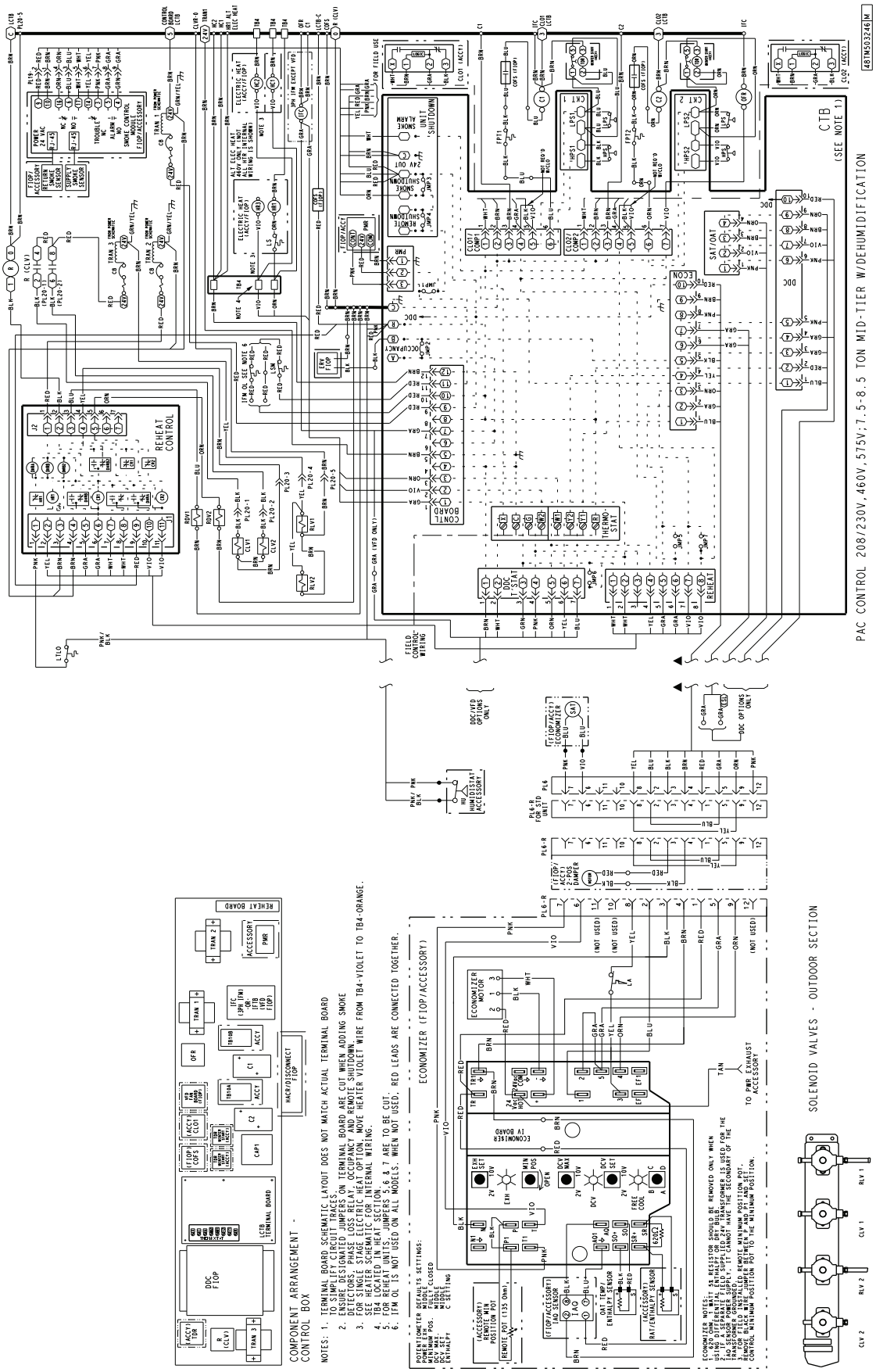


Fig. X — 50HC*D08-D09 PAC Control Diagram — 208/230-3-60, 460-3-60, 575-3-60 with Humidi-MiZer® System

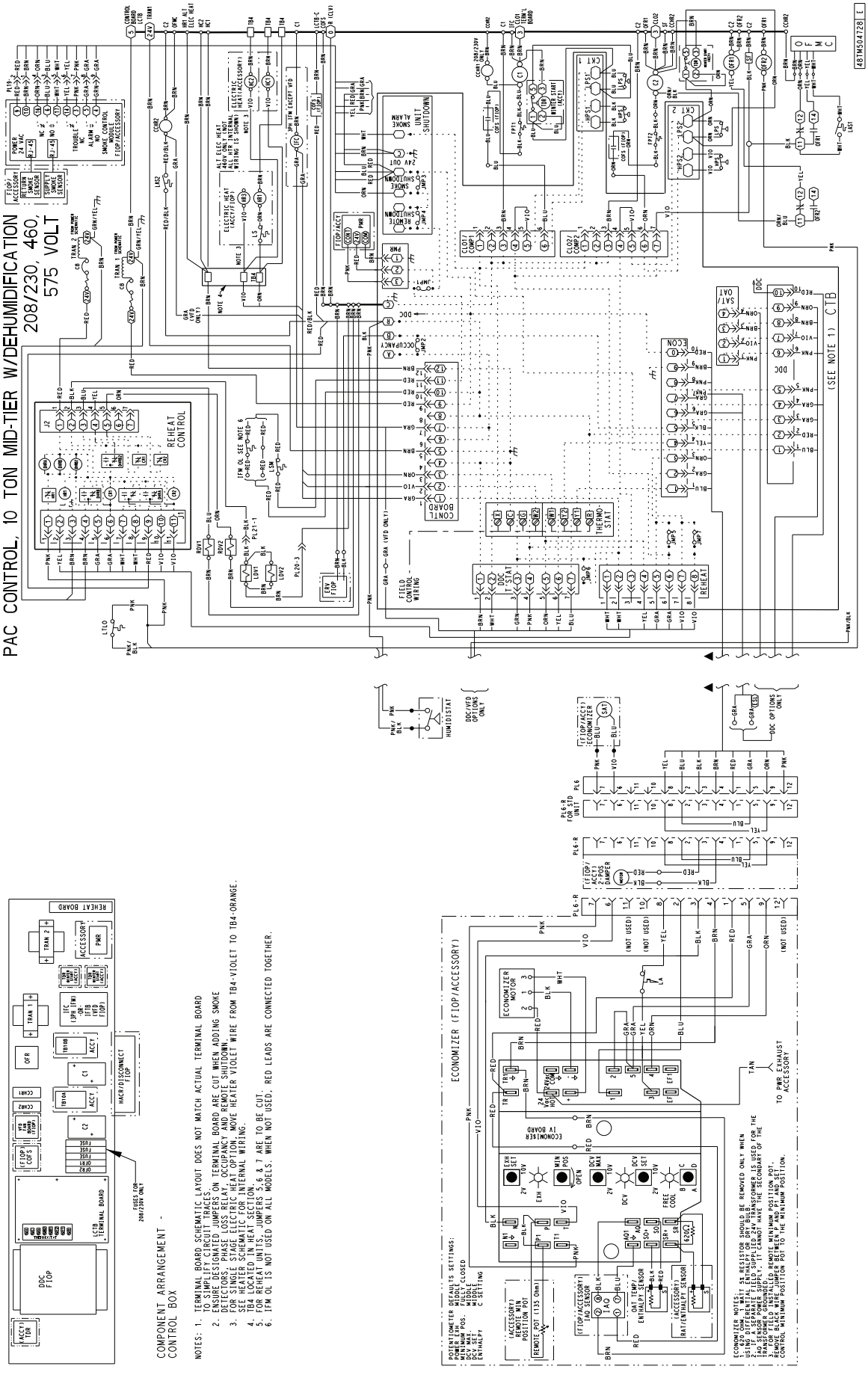


Fig. Y — 50HC*D11 PAC Control Diagram — 208/230-1-60; 230/460/575-3-60 with Humidi-MiZer® System

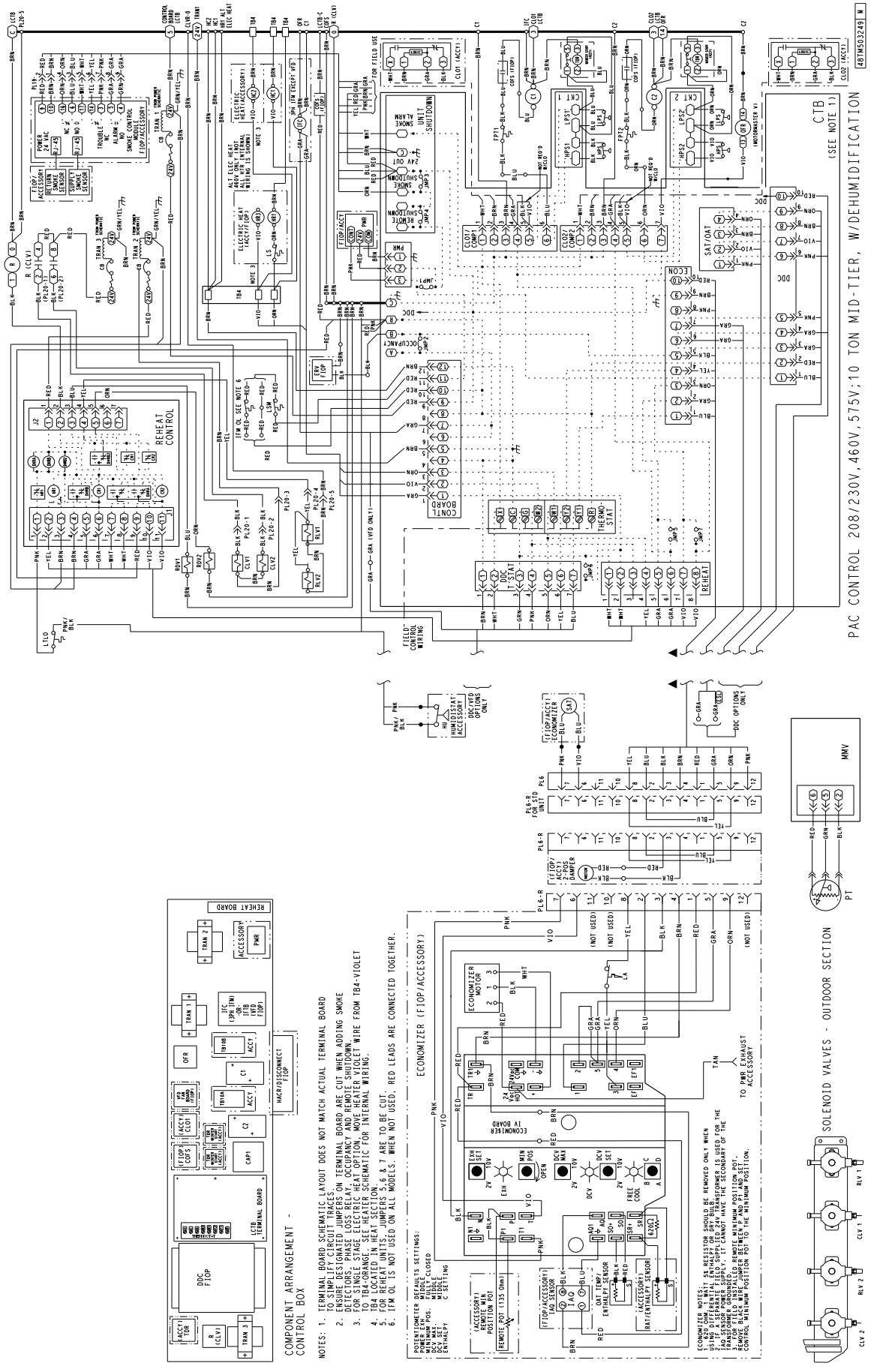


Fig. Z — 50HC*D12 PAC Control Diagram — 230/460/575-3-60 with Humidi-MiZer® System

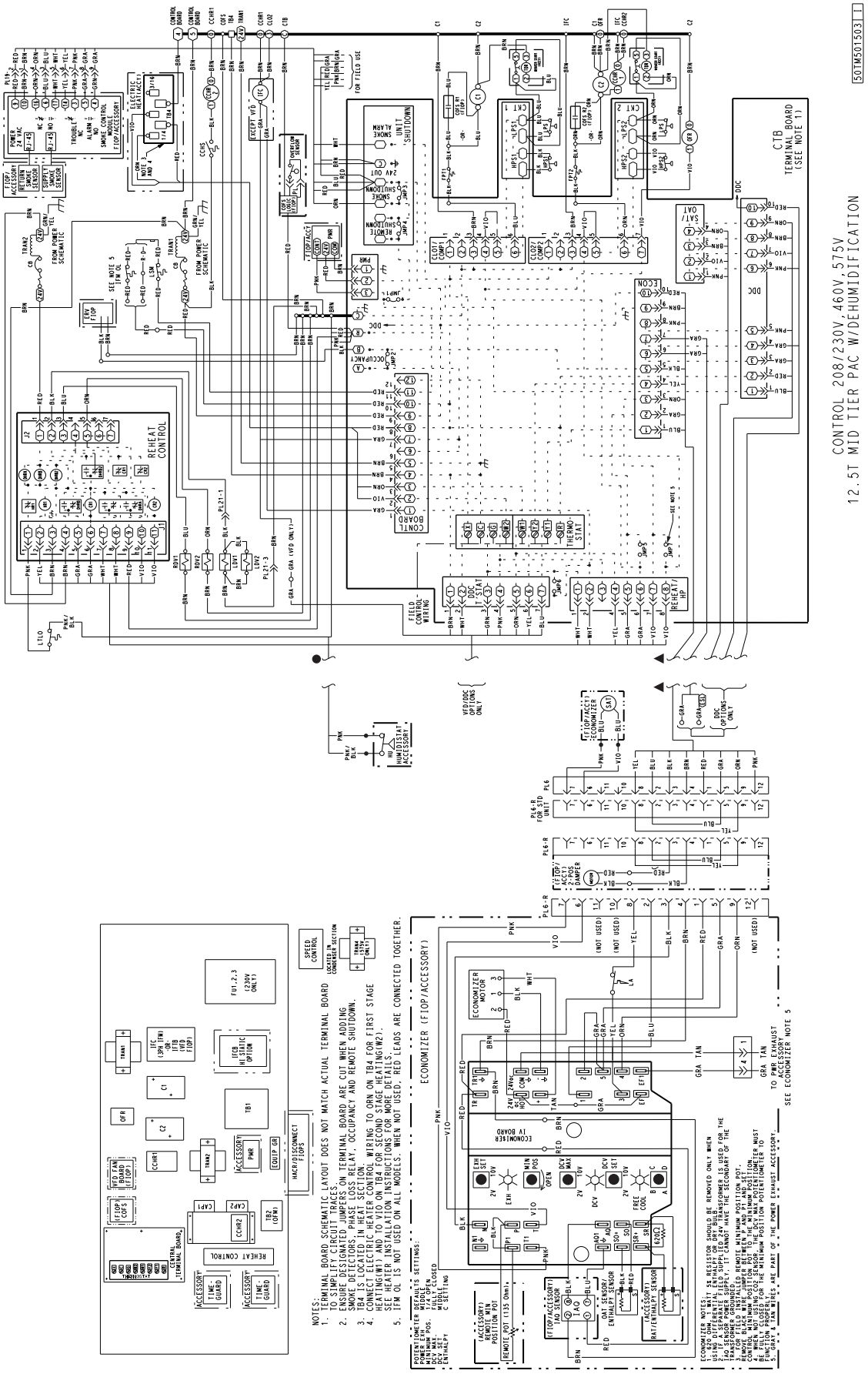


Fig. AA — 50HC*D14 PAC Control Diagram — 230/460/575-3-60 with Humidi-MiZer® System

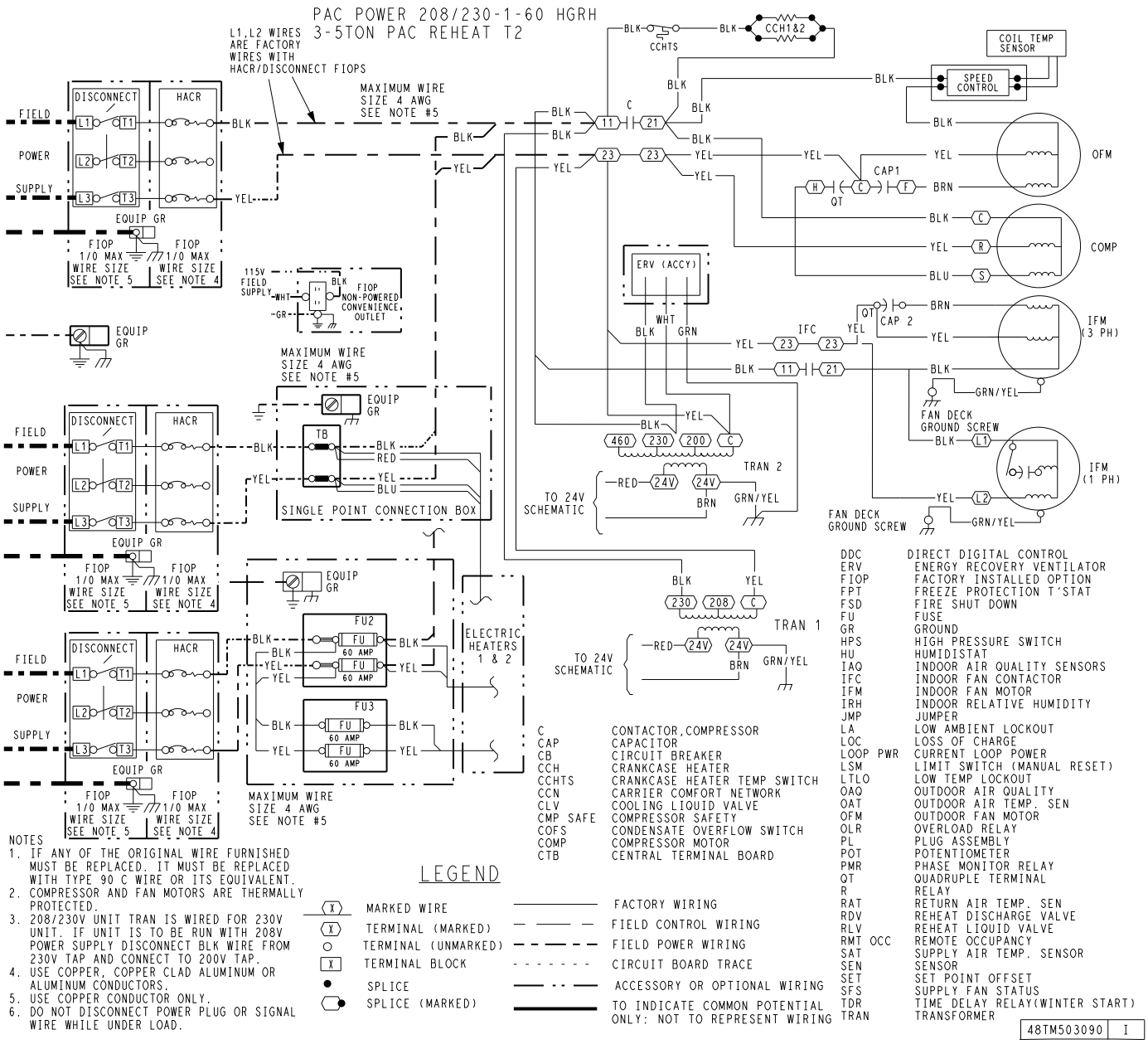
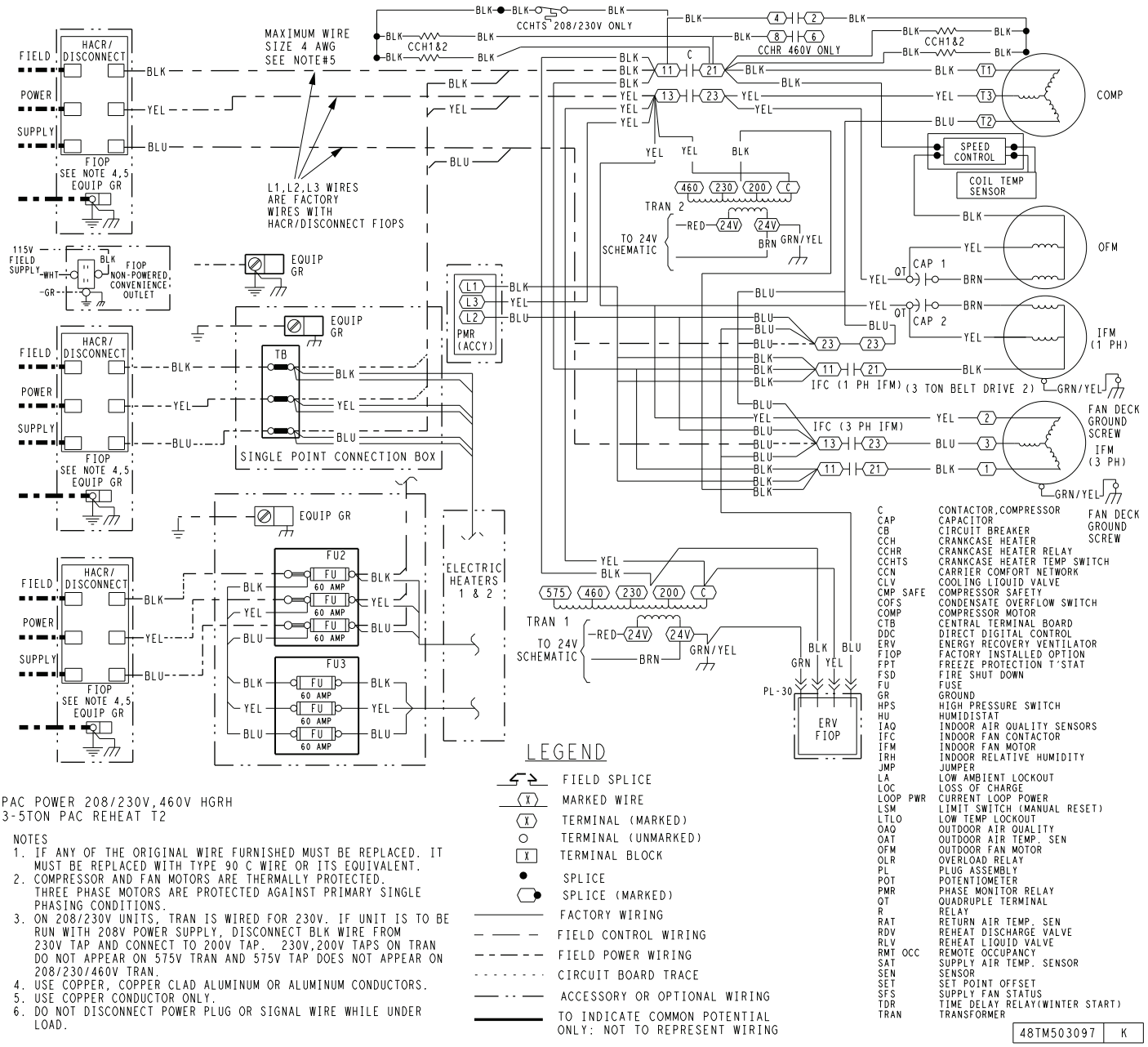


Fig. AB — 50HC*A04-A06 PAC Power Diagram — 208/230-1-60 with Humidi-MiZer® System



PAC POWER 208/230V,460V HGRH
3-5TON PAC REHEAT T2

NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.
6. DO NOT DISCONNECT POWER PLUG OR SIGNAL WIRE WHILE UNDER LOAD.

LEGEND

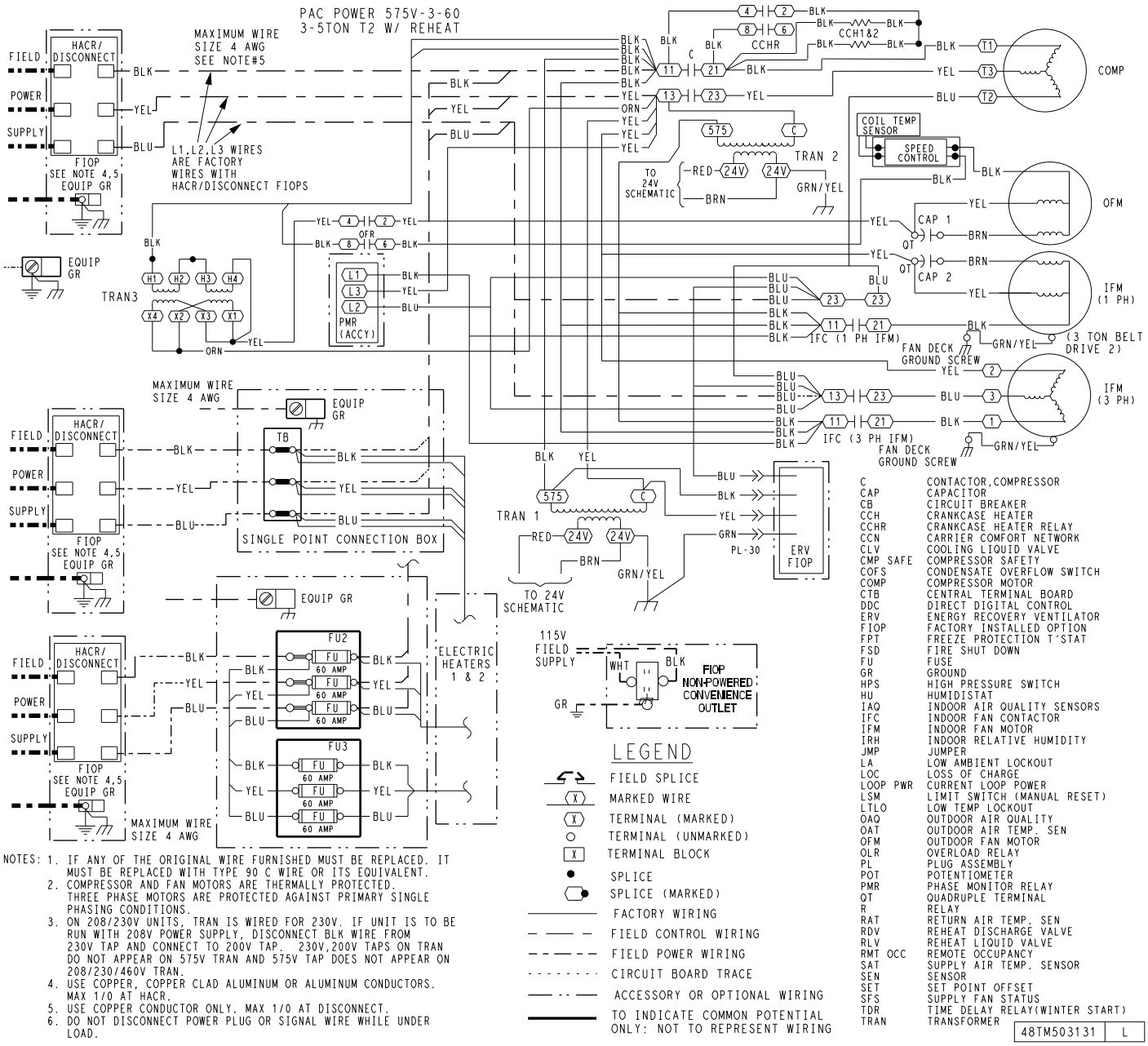
	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	SPLICE
	SPLICE (MARKED)
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR OPTIONAL WIRING
	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCHTS	CRANKCASE HEATER TEMP SWITCH
CCN	CARRIER COMFORT NETWORK
CLV	COOLING LIQUID VALVE
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWITCH
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FPT	FREEZE PROTECTION T'STAT
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
HU	HUMIDISTAT
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LOC	LOSS OF CHARGE
LOOP PWR	CURRENT LOOP POWER
LSM	LIMIT SWITCH (MANUAL RESET)
LTLO	LOW TEMP LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OLR	OVERLOAD RELAY
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RLV	REHEAT LIQUID VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY(WINTER START)
TRAN	TRANSFORMER

48TM503097 | K

Fig. AC — 50HC*A04-A06 PAC Power Diagram — 208/230/460-3-60 with Humidi-MiZer® System

APPENDIX D — WIRING DIAGRAMS



NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 AT HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 AT DISCONNECT.
6. DO NOT DISCONNECT POWER PLUG OR SIGNAL WIRE WHILE UNDER LOAD.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCN	CARRIER COMFORT NETWORK
CLV	COOLING LIQUID VALVE
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWITCH
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FPT	FREEZE PROTECTION T'STAT
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
HU	HUMIDISTAT
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LOC	LOSS OF CHARGE
LOOP PWR	CURRENT LOOP POWER
LSM	LIMIT SWITCH (MANUAL RESET)
LTLO	LOW TEMP LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OLR	OVERLOAD RELAY
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RLV	REHEAT LIQUID VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY(WINTER START)
TRAN	TRANSFORMER

48TM503131 | L

Fig. AD — 50HC*A04-A06 PAC Power Diagram — 575-3-60 with Humidi-MiZer® System

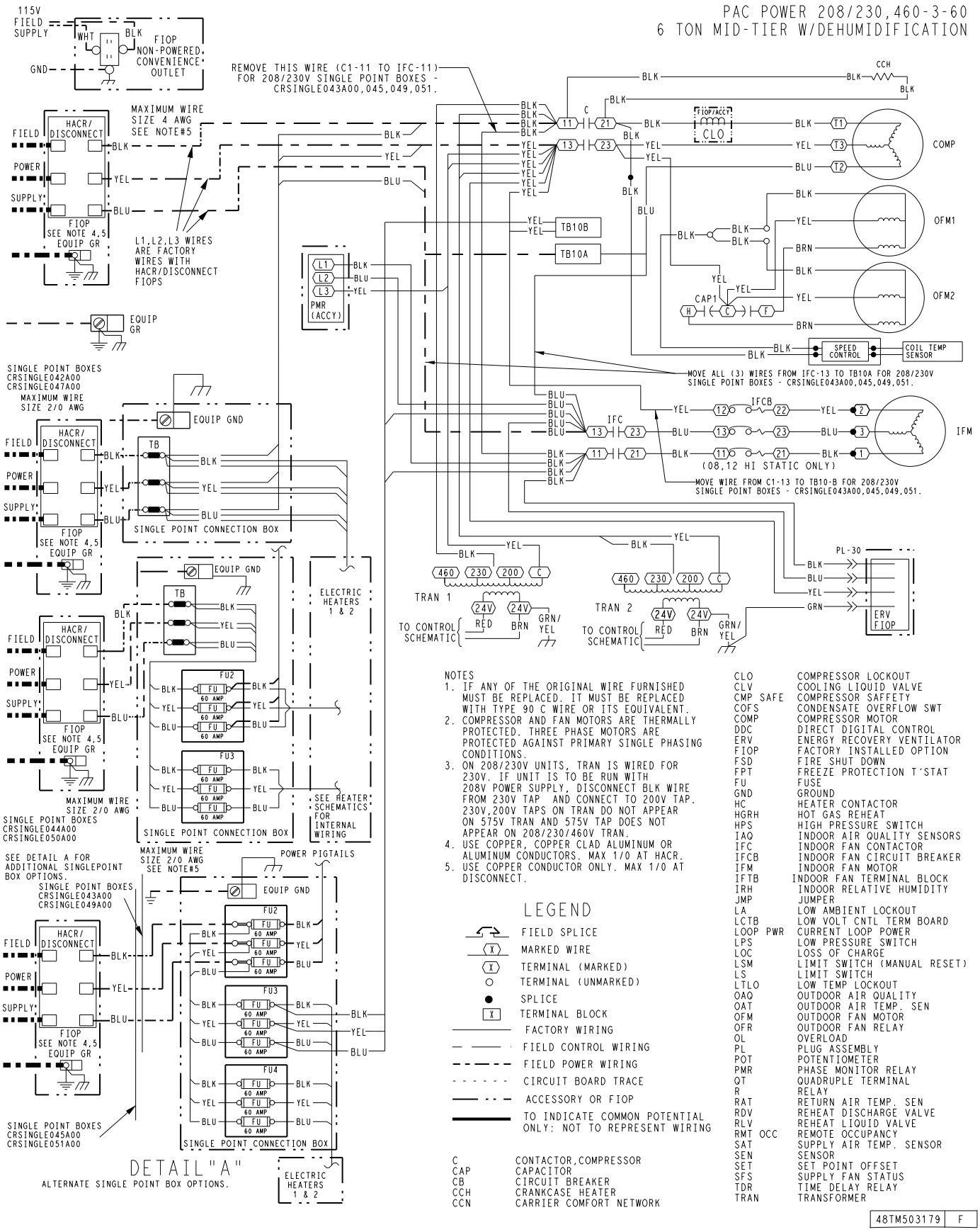
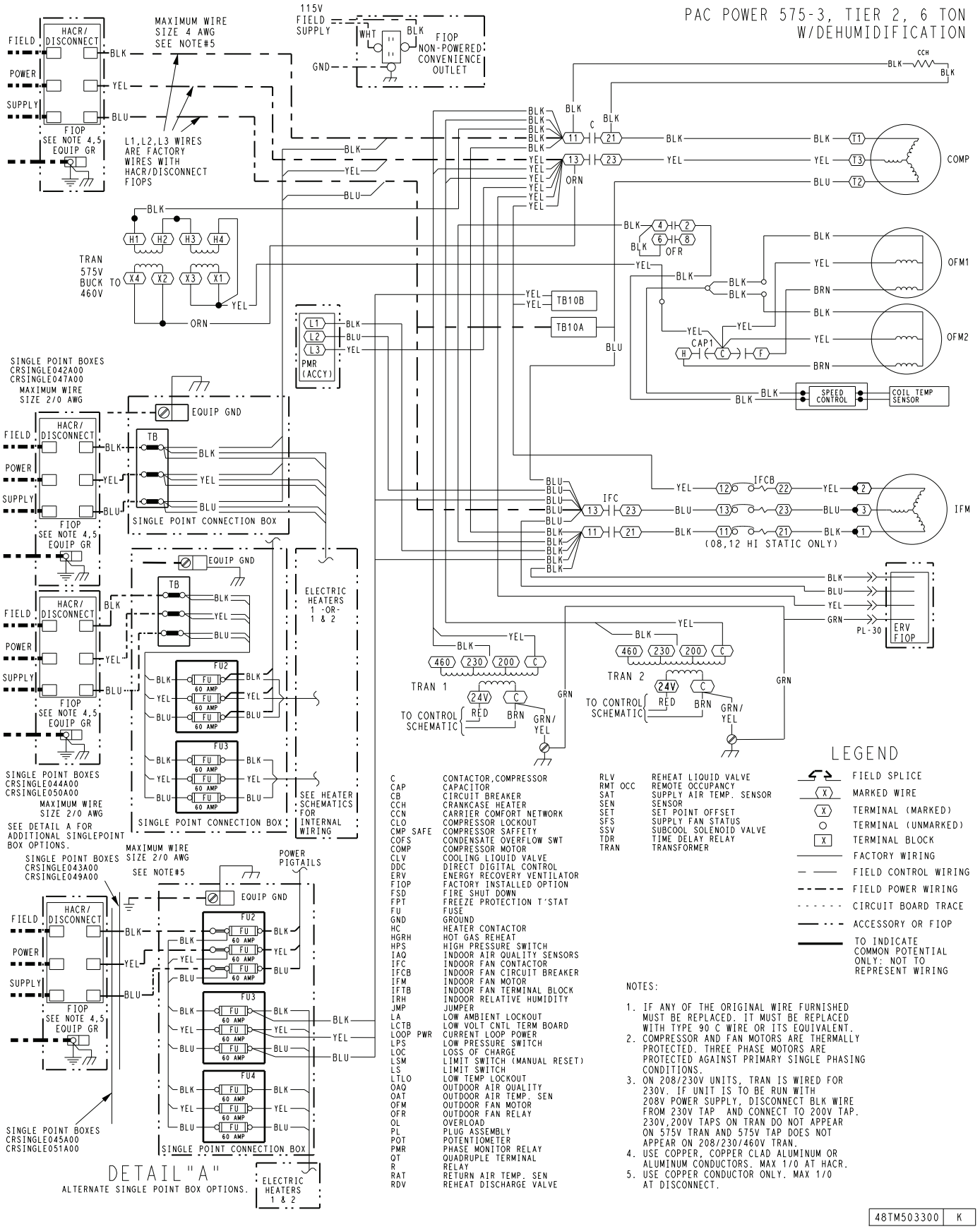


Fig. AE — 50HC*A07 PAC Power Diagram — 208/230/460-3-60 with Humidi-MiZer® System



C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CLO	COMPRESSOR LOCKOUT
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CLV	COOLING LIQUID VALVE
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FSD	FIRE SHUT DOWN
FPT	FREEZE PROTECTION T'STAT
FU	FUSE
GND	GROUND
HC	HEATER CONTACTOR
HGRH	HOT GAS REHEAT
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IFTB	INDOOR FAN TERMINAL BLOCK
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LCTB	LOW VOLT CNTL TERM BOARD
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LOC	LOSS OF CHARGE
LSM	LIMIT SWITCH (MANUAL RESET)
LS	LIMIT SWITCH
LTLO	LOW TEMP LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RLV	REHEAT LIQUID VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
SSV	SUBCOOL SOLENOID VALVE
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER

LEGEND

- FIELD SPLICE
- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- TERMINAL BLOCK
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR FIOP
- TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

NOTES:

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 AT HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 AT DISCONNECT.

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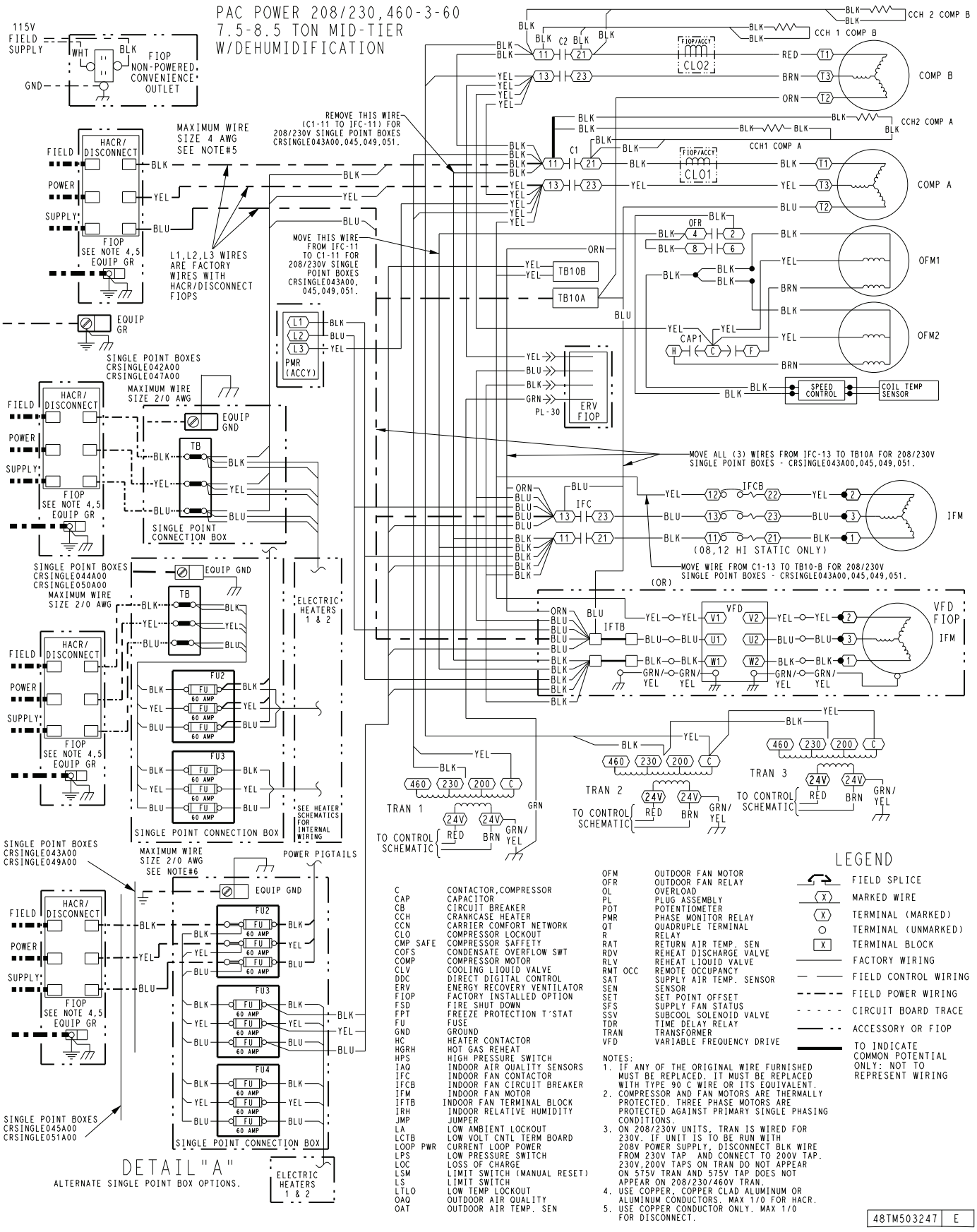
Fig. AF — 50HC*A07 PAC Power Diagram — 575-3-60 with Humidi-MiZer® System



C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CLO	COMPRESSOR LOCKOUT
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CLV	COOLING LIQUID VALVE
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FSD	FIRE SHUT DOWN
FPT	FREEZE PROTECTION T'STAT
FU	FUSE
GND	GROUND
HC	HEATER CONTACTOR
HGRH	HOT GAS REHEAT
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IFTB	INDOOR FAN TERMINAL BLOCK
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LCTB	LOW VOLT CNTL TERM BOARD
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LOC	LOSS OF CHARGE
LSM	LIMIT SWITCH (MANUAL RESET)
LS	LIMIT SWITCH
LTLO	LOW TEMP LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PWR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RLV	REHEAT LIQUID VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
SSV	SUBCOOL SOLENOID VALVE
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

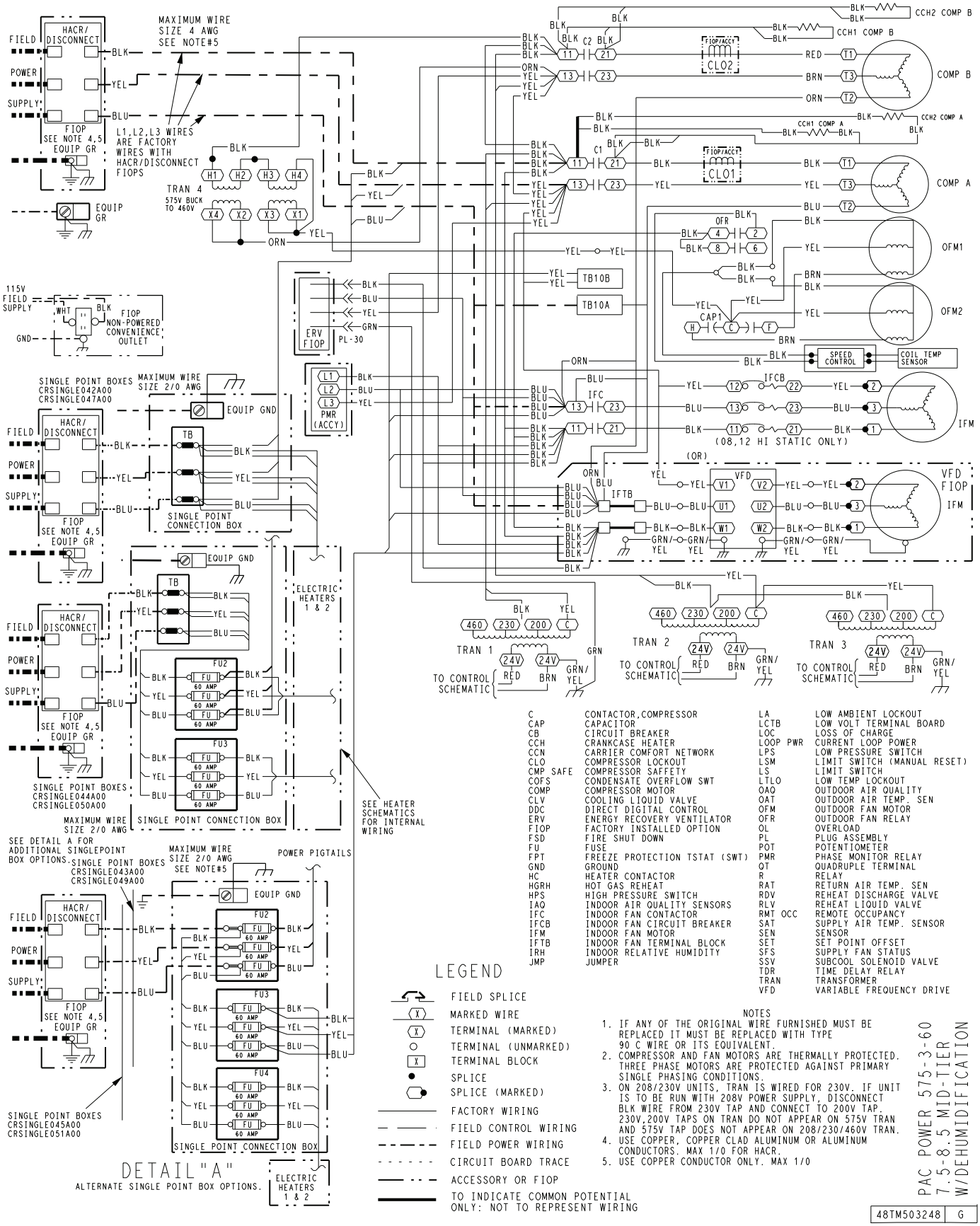
NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 FOR HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 FOR DISCONNECT.

LEGEND

	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR FIOP
	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

48TM503247 | E

Fig. AG — 50HC*D08-D09 PAC Power Diagram — 208/230/460-3-60 with Humidi-MiZer® System



C	CONTACTOR,COMPRESSOR	LA	LOW AMBIENT LOCKOUT
CAP	CAPACITOR	LCTB	LOW VOLT TERMINAL BOARD
CB	CIRCUIT BREAKER	LOC	LOSS OF CHARGE
CCH	CRANKCASE HEATER	LOOP PWR	CURRENT LOOP POWER
CCN	CARRIER COMFORT NETWORK	LPS	LOW PRESSURE SWITCH
CLO	COMPRESSOR LOCKOUT	LSM	LIMIT SWITCH (MANUAL RESET)
CMP SAFE	COMPRESSOR SAFFETY	LS	LIMIT SWITCH
COFS	CONDENSATE OVERFLOW SWT	LTLO	LOW TEMP LOCKOUT
COMP	COMPRESSOR MOTOR	OAQ	OUTDOOR AIR QUALITY
CLV	COOLING LIQUID VALVE	OAT	OUTDOOR AIR TEMP. SEN
DDC	DIRECT DIGITAL CONTROL	OFM	OUTDOOR FAN MOTOR
ERV	ENERGY RECOVERY VENTILATOR	OFR	OUTDOOR FAN RELAY
FIOP	FACTORY INSTALLED OPTION	OL	OVERLOAD
FSD	FIRE SHUT DOWN	PL	PLUG ASSEMBLY
FU	FUSE	POT	POTENTIOMETER
FPT	FREEZE PROTECTION TSTAT (SWT)	PMR	PHASE MONITOR RELAY
GND	GROUND	QT	QUADRUPLE TERMINAL
HC	HEATER CONTACTOR	R	RELAY
HGRH	HOT GAS REHEAT	RAT	RETURN AIR TEMP. SEN
HPS	HIGH PRESSURE SWITCH	RDV	REHEAT DISCHARGE VALVE
IAQ	INDOOR AIR QUALITY SENSORS	RLV	REHEAT LIQUID VALVE
IFC	INDOOR FAN CONTACTOR	RMT OCC	REMOTE OCCUPANCY
IFCB	INDOOR FAN CIRCUIT BREAKER	SAT	SUPPLY AIR TEMP. SENSOR
IFM	INDOOR FAN MOTOR	SEN	SENSOR
IFTB	INDOOR FAN TERMINAL BLOCK	SET	SET POINT OFFSET
IRH	INDOOR RELATIVE HUMIDITY	SFS	SUPPLY FAN STATUS
JMP	JUMPER	SSV	SUBCOOL SOLENOID VALVE
		TDR	TIME DELAY RELAY
		TRAN	TRANSFORMER
		VFD	VARIABLE FREQUENCY DRIVE

LEGEND

- FIELD SPLICE
- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- TERMINAL BLOCK
- SPLICE
- SPLICE (MARKED)
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR FIOP
- TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

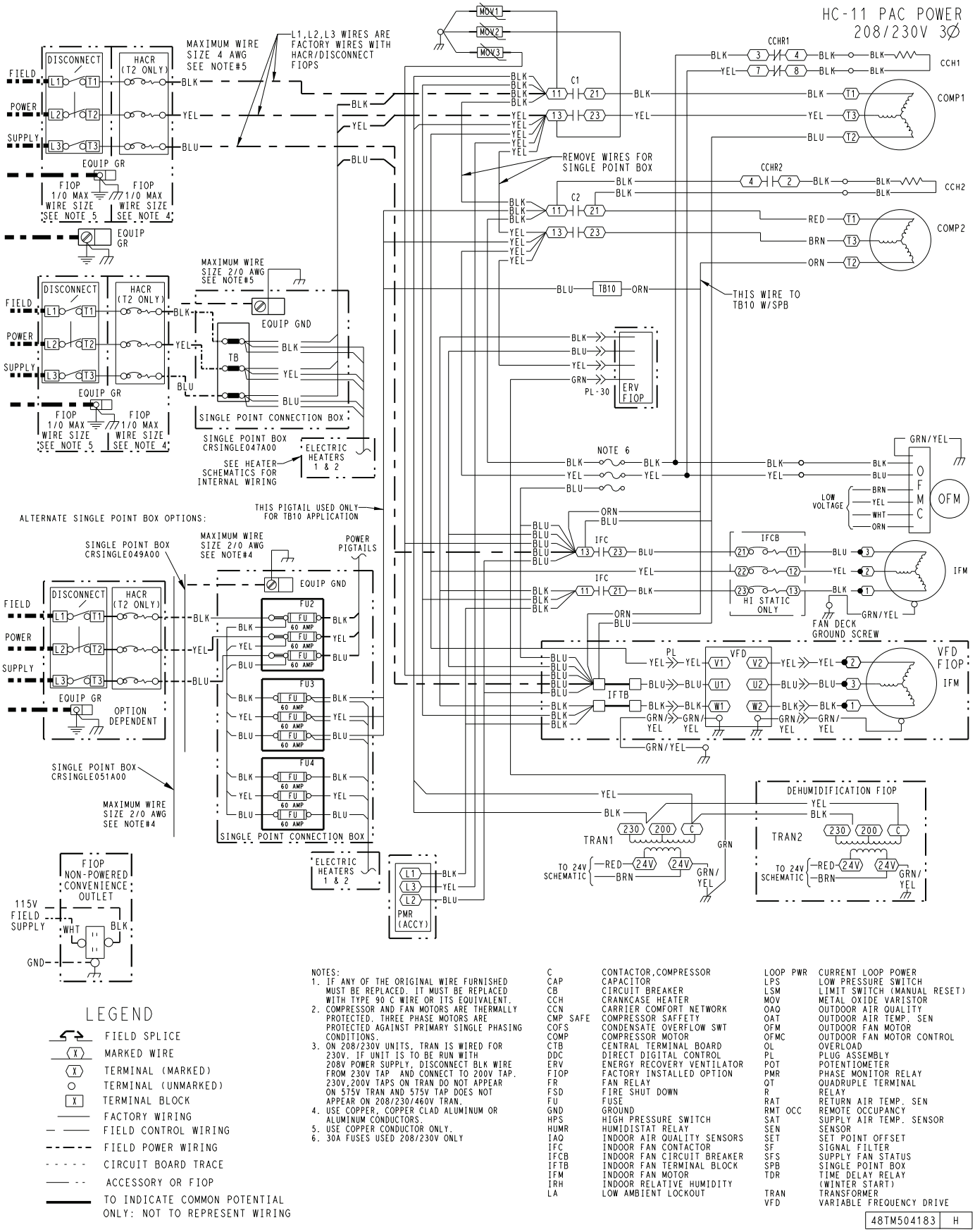
NOTES

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 FOR HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0

PAC POWER 575-3-60 7.5-8.5 MID-TIER W/DEHUMIDIFICATION

48TM503248 | G

Fig. AH — 50HC*D08-D09 PAC Power Diagram — 575-3-60 with Humidi-MiZer® System



NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.
6. 30A FUSES USED 208/230V ONLY

LEGEND

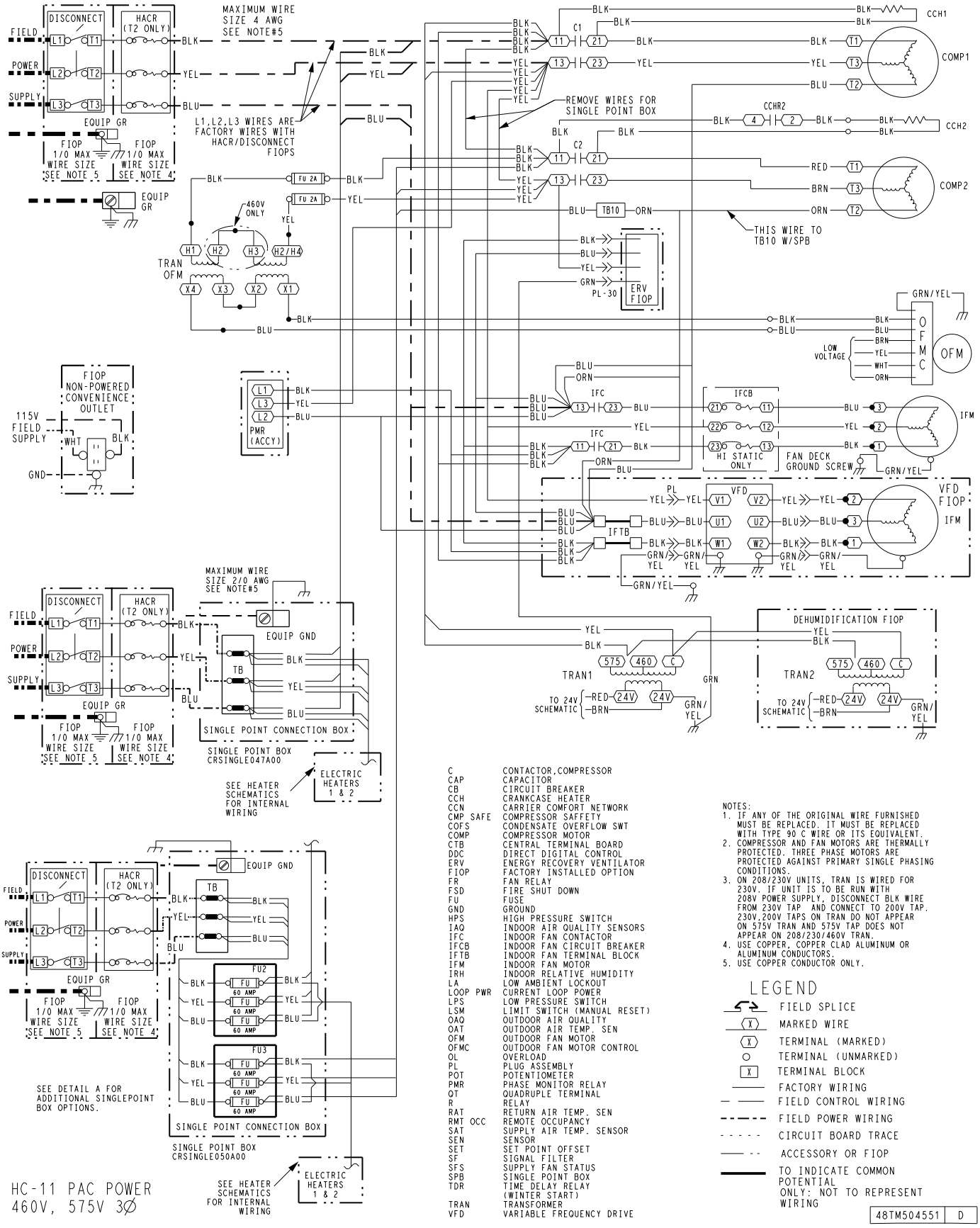
	FIELD SPLICE
X	MARKED WIRE
X	TERMINAL (MARKED)
	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
	FACTORY WIRING
	FIELD CONTROL WIRING
	FIELD POWER WIRING
	CIRCUIT BOARD TRACE
	ACCESSORY OR FIOP
	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FR	FAN RELAY
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HPS	HIGH PRESSURE SWITCH
HUMR	HUMIDISTAT RELAY
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT

LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
MOV	METAL OXIDE VARISTOR
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROL
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SF	SIGNAL FILTER
SFS	SUPPLY FAN STATUS
SPB	SINGLE POINT BOX
TDR	TIME DELAY RELAY (WINTER START)
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

48TM504183 | H

Fig. AI — 50HC*D11 PAC Power Diagram — 208/230-3-60 with Humidi-MiZer® System



C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FR	FAN RELAY
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFMC	OUTDOOR FAN MOTOR CONTROL
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SF	SIGNAL FILTER
SFS	SUPPLY FAN STATUS
SPB	SINGLE POINT BOX
TDR	TIME DELAY RELAY (WINTER START)
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

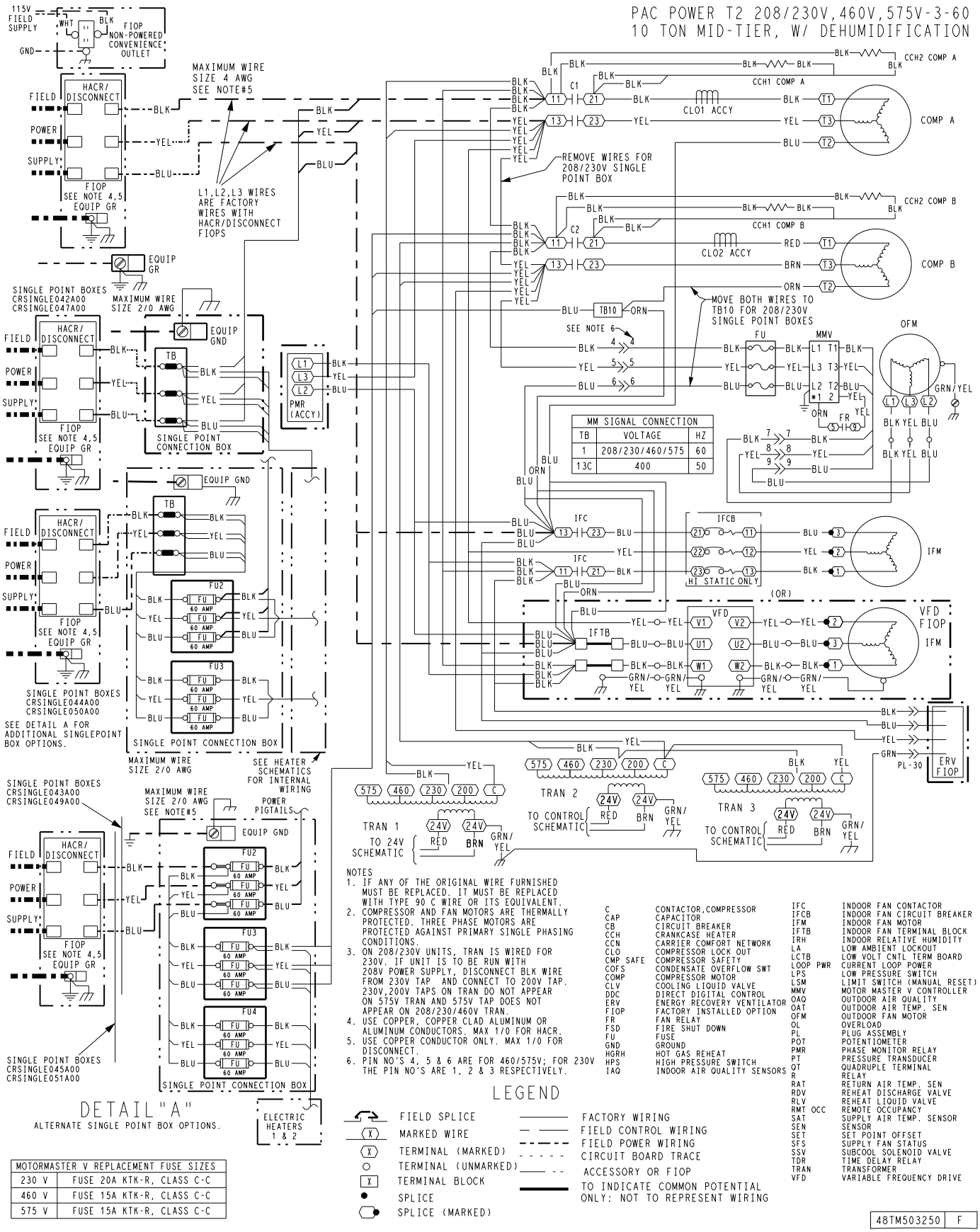
NOTES:
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.

LEGEND

	FIELD SPLICE
(X)	MARKED WIRE
(X)	TERMINAL (MARKED)
○	TERMINAL (UNMARKED)
[X]	TERMINAL BLOCK
———	FACTORY WIRING
— — —	FIELD CONTROL WIRING
- - - -	FIELD POWER WIRING
- - - - -	CIRCUIT BOARD TRACE
—— --	ACCESSORY OR FIOP
———	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

48TM504551 | D

Fig. AJ — 50HC*D11 PAC Power Diagram — 460-3-60, 575-3-60 with Humidi-MiZer® System



NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS. MAX 1/0 FOR HACR.
5. USE COPPER CONDUCTOR ONLY. MAX 1/0 FOR DISCONNECT.
6. PIN NO'S 4, 5 & 6 ARE FOR 460/575V; FOR 230V THE PIN NO'S ARE 1, 2 & 3 RESPECTIVELY.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CLO	COMPRESSOR LOCK OUT
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CLV	COOLING LIQUID VALVE
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FR	FAN RELAY
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HGRH	HOT GAS REHEAT
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IFTB	INDOOR FAN TERMINAL BLOCK
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LCTB	LOW VOLT CNTL TERM BOARD
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
MMV	MOTOR MASTER V CONTROLLER
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
PT	PRESSURE TRANSDUCER
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RLV	REHEAT LIQUID VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
SSV	SUBCOOL SOLENOID VALVE
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

LEGEND

FIELD SPLICE	FACTORY WIRING
MARKED WIRE	FIELD CONTROL WIRING
TERMINAL (MARKED)	FIELD POWER WIRING
TERMINAL (UNMARKED)	CIRCUIT BOARD TRACE
TERMINAL BLOCK	ACCESSORY OR FIOP
SPLICE	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING
SPLICE (MARKED)	

MOTORMASTER V REPLACEMENT FUSE SIZES	
230 V	FUSE 20A KTK-R, CLASS C-C
460 V	FUSE 15A KTK-R, CLASS C-C
575 V	FUSE 15A KTK-R, CLASS C-C

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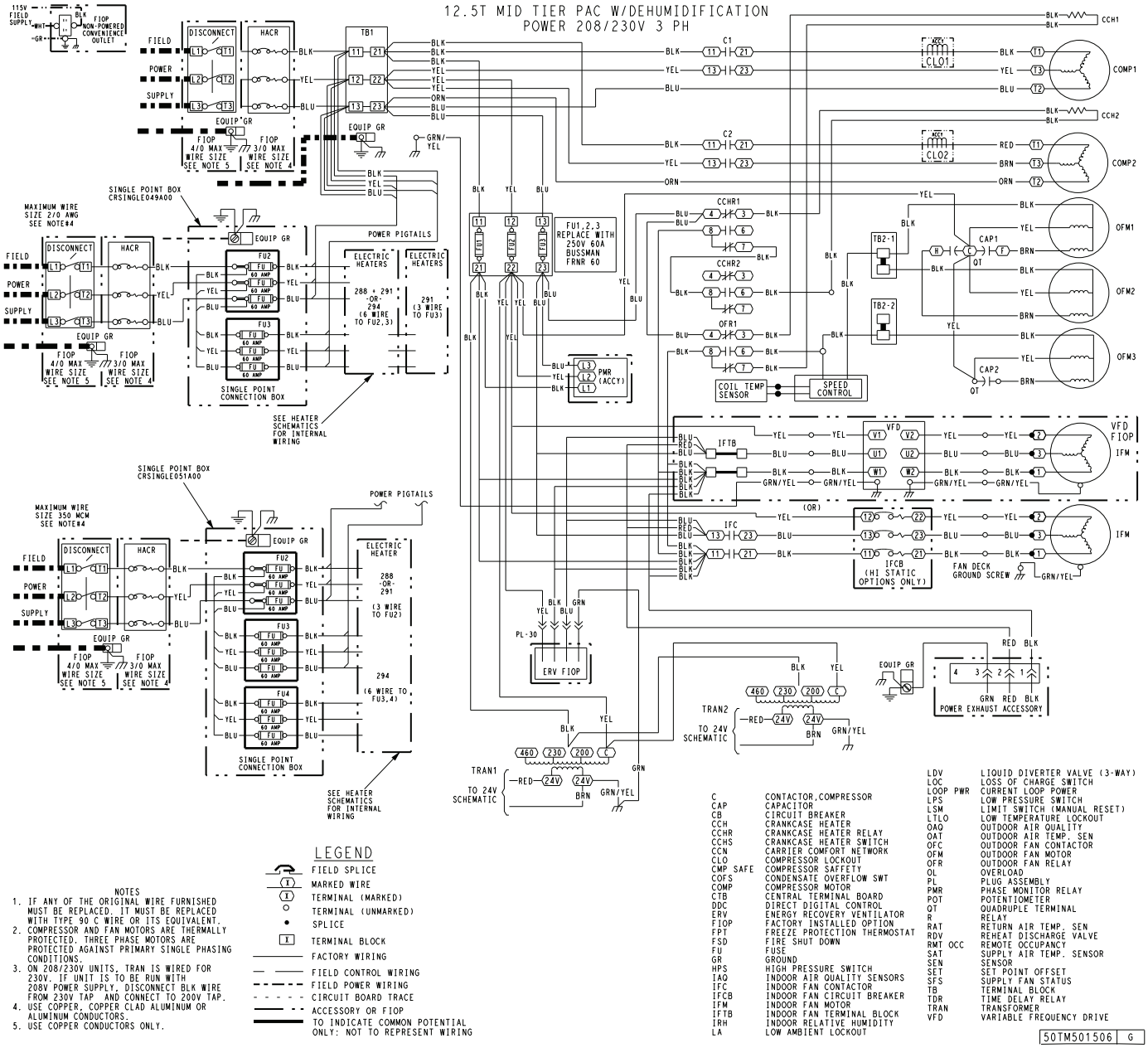
Fig. AK — 50HC*D12 PAC Power Diagram — 208/230-3-60, 460-3-60, 575-3-60 with Humidi-MiZer® System

APPENDIX D — WIRING DIAGRAMS



NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTORS ONLY.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCHS	CRANKCASE HEATER SWITCH
CCN	CARRIER COMFORT NETWORK
CLO	COMPRESSOR LOCKOUT
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FPT	FREEZE PROTECTION THERMOSTAT
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IFTB	INDOOR FAN TERMINAL BLOCK
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LDV	LIQUID DIVERTER VALVE (3-WAY)
LOC	LOSS OF CHARGE SWITCH
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
LTLO	LOW TEMPERATURE LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFC	OUTDOOR FAN CONTACTOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
PMR	PHASE MONITOR RELAY
POT	POTENTIOMETER
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TB	TERMINAL BLOCK
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

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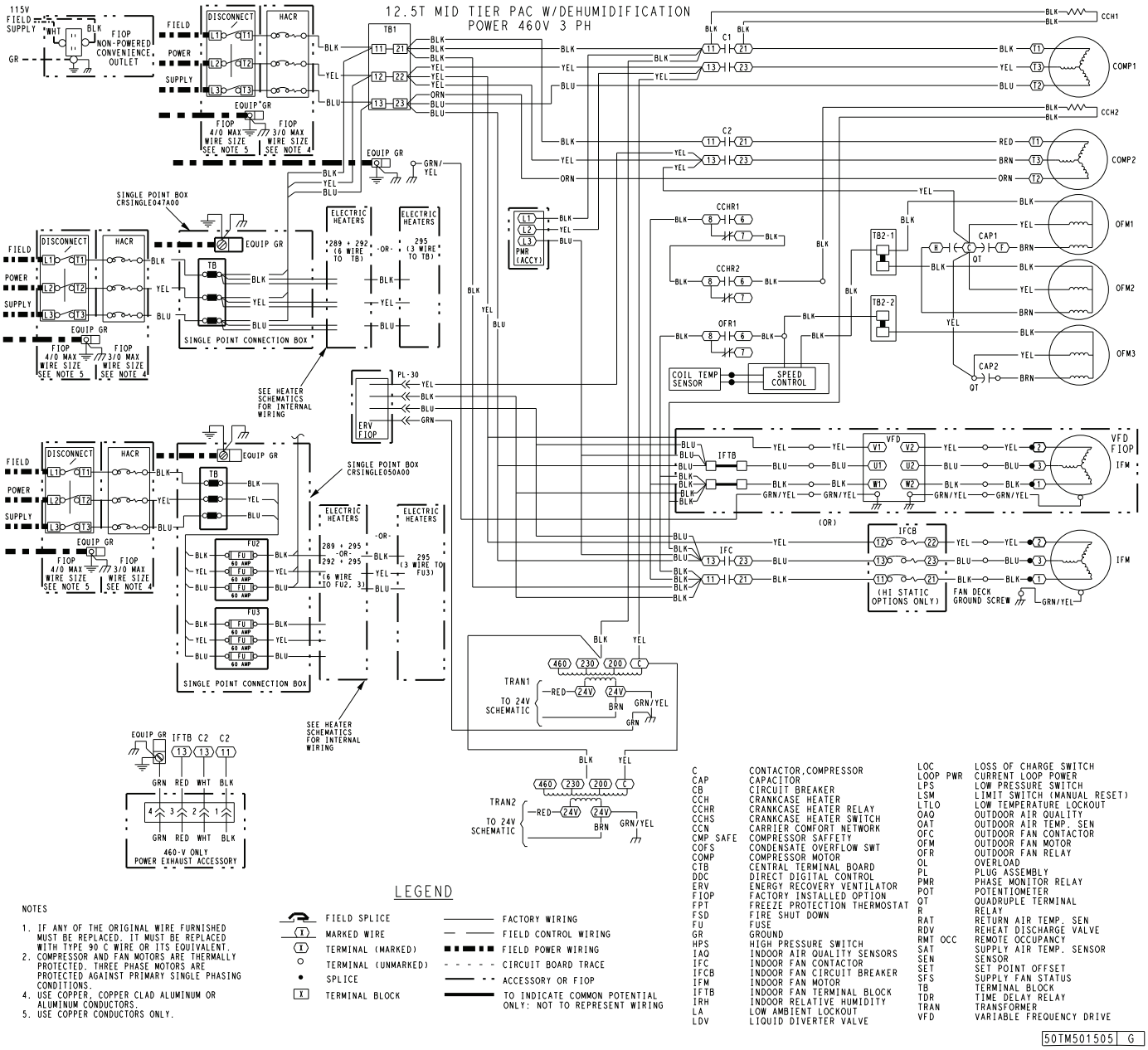
Fig. AL — 50HC*D14 PAC Power Diagram — 208/230-3-60 with Humidi-MiZer® System

APPENDIX D — WIRING DIAGRAMS



LEGEND

FIELD SPLICE	FACTORY WIRING
MARKED WIRE	FIELD CONTROL WIRING
TERMINAL (MARKED)	FIELD POWER WIRING
TERMINAL (UNMARKED)	CIRCUIT BOARD TRACE
SPLICE	ACCESSORY OR FIOP
TERMINAL BLOCK	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

NOTES

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTORS ONLY.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCHS	CRANKCASE HEATER SWITCH
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FPT	FREEZE PROTECTION THERMOSTAT
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IFTB	INDOOR FAN TERMINAL BLOCK
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LDV	LIQUID DIVERTER VALVE
LOC	LOSS OF CHARGE SWITCH
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
LTLO	LOW TEMPERATURE LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFC	OUTDOOR FAN CONTACTOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
PWR	PHASE MONITOR RELAY
POT	POTENTIOMETER
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TB	TERMINAL BLOCK
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

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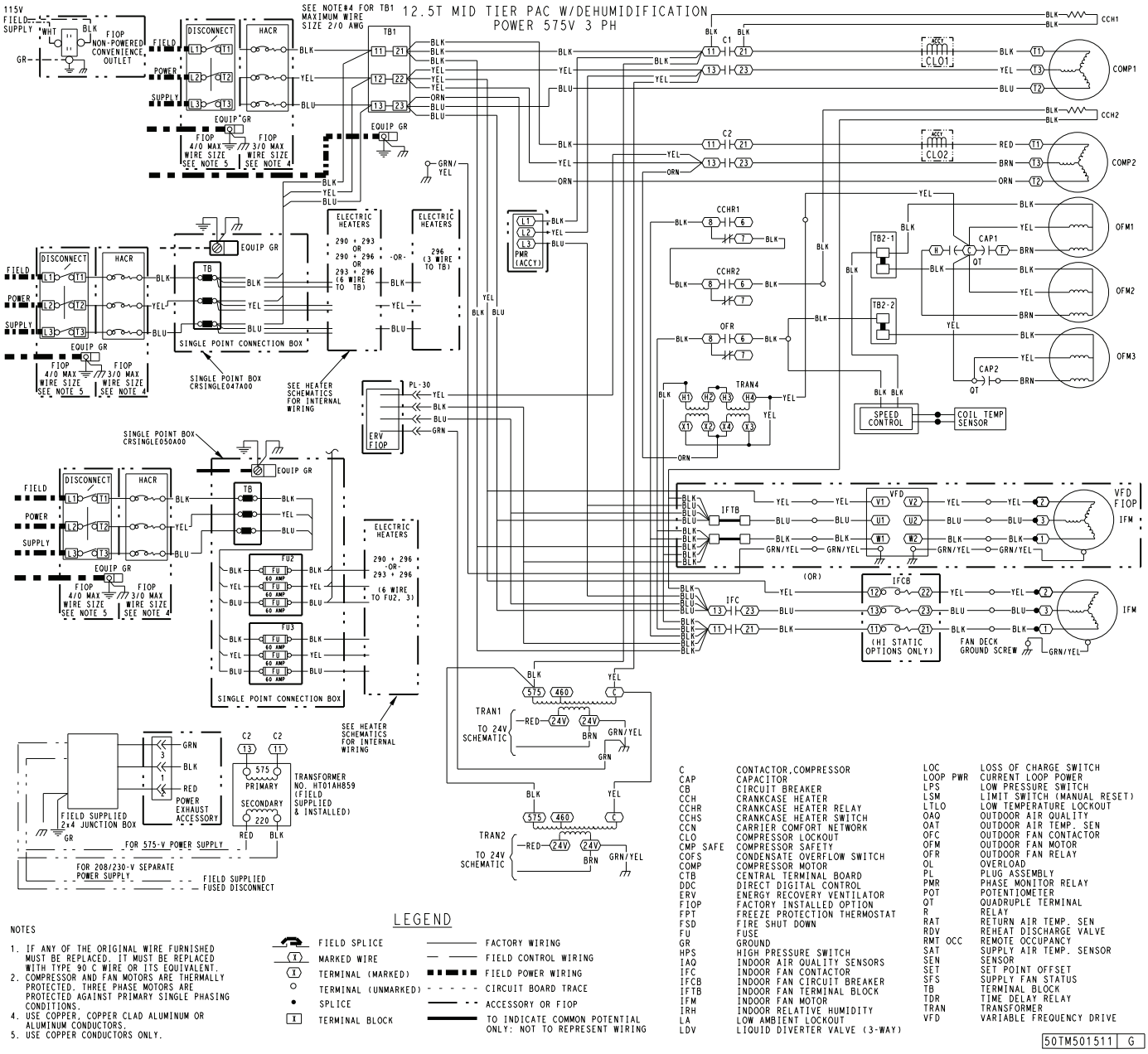
Fig. AM — 50HC*D14 PAC Power Diagram — 460-3-60 with Humidi-MiZer® System



NOTES

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
4. USE COPPER, COPPER CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
5. USE COPPER CONDUCTORS ONLY.

LEGEND

FIELD SPLICE	FACTORY WIRING
MARKED WIRE	FIELD CONTROL WIRING
TERMINAL (MARKED)	FIELD POWER WIRING
TERMINAL (UNMARKED)	CIRCUIT BOARD TRACE
SPLICE	ACCESSORY OR FIOP
TERMINAL BLOCK	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER RELAY
CCHS	CRANKCASE HEATER SWITCH
CCN	CARRIER COMFORT NETWORK
CLO	COMPRESSOR LOCKOUT
CMP SAFE	COMPRESSOR SAFETY
COFS	CONDENSATE OVERFLOW SWITCH
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DDC	DIRECT DIGITAL CONTROL
ERV	ENERGY RECOVERY VENTILATOR
FIOP	FACTORY INSTALLED OPTION
FPT	FREEZE PROTECTION THERMOSTAT
FSD	FIRE SHUT DOWN
FU	FUSE
GR	GROUND
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFTB	INDOOR FAN TERMINAL BLOCK
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LDV	LIQUID DIVERTER VALVE (3-WAY)
LOC	LOSS OF CHARGE SWITCH
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
LTLO	LOW TEMPERATURE LOCKOUT
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFC	OUTDOOR FAN CONTACTOR
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
PMR	PHASE MONITOR RELAY
POT	POTENTIOMETER
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RDV	REHEAT DISCHARGE VALVE
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TB	TERMINAL BLOCK
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE

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Fig. AN — 50HC*D14 PAC Power Diagram — 575-3-60 with Humidi-MiZer® System

APPENDIX D — WIRING DIAGRAMS

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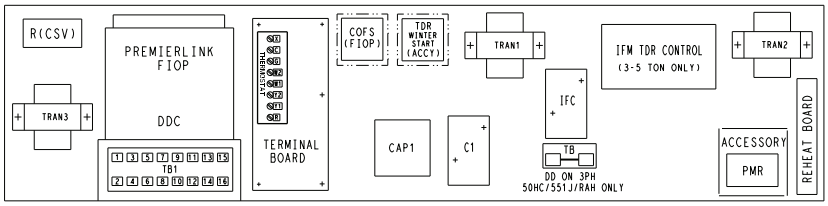

COMPONENT ARRANGEMENT - (2) COMPRESSOR SHOWN

NOTES:
1. TERMINAL BOARD SCHEMATIC LAYOUT DOES NOT MATCH ACTUAL TERMINAL BOARD TO SIMPLIFY CIRCUIT TRACES.
2. ENSURE DESIGNATED JUMPERS ON TERMINAL BOARD ARE CUT WHEN ADDING SMOKE DETECTORS, PHASE LOSS RELAY, OCCUPANCY AND REMOTE SHUTDOWN.
3. FOR SINGLE STAGE ELECTRIC HEAT OPTION, MOVE VIOLET HEATER WIRE FROM TB4-VIOLET WIRE TO TB4-ORANGE WIRE.
4. TB4 IS LOCATED IN HEAT SECTION.
5. IFC OCCURS WITHOUT DIRECT DRIVE ONLY.
6. MARKED WIRE: (ESL)- ENTH SENSR LO (FROM TERM BD ECON 7)

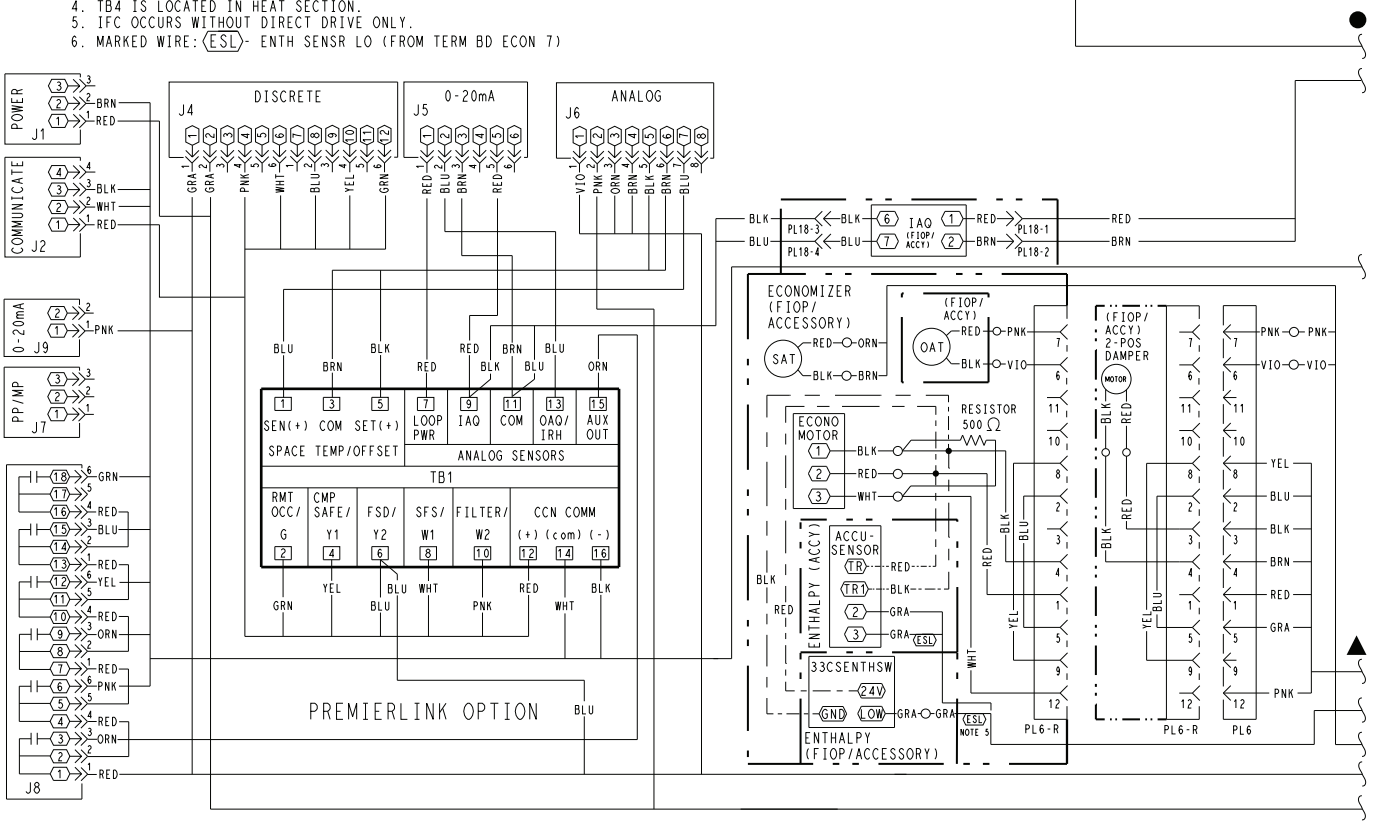

Fig. AO — PremierLink™ System A04-A06 Wiring Diagram

APPENDIX D — WIRING DIAGRAMS

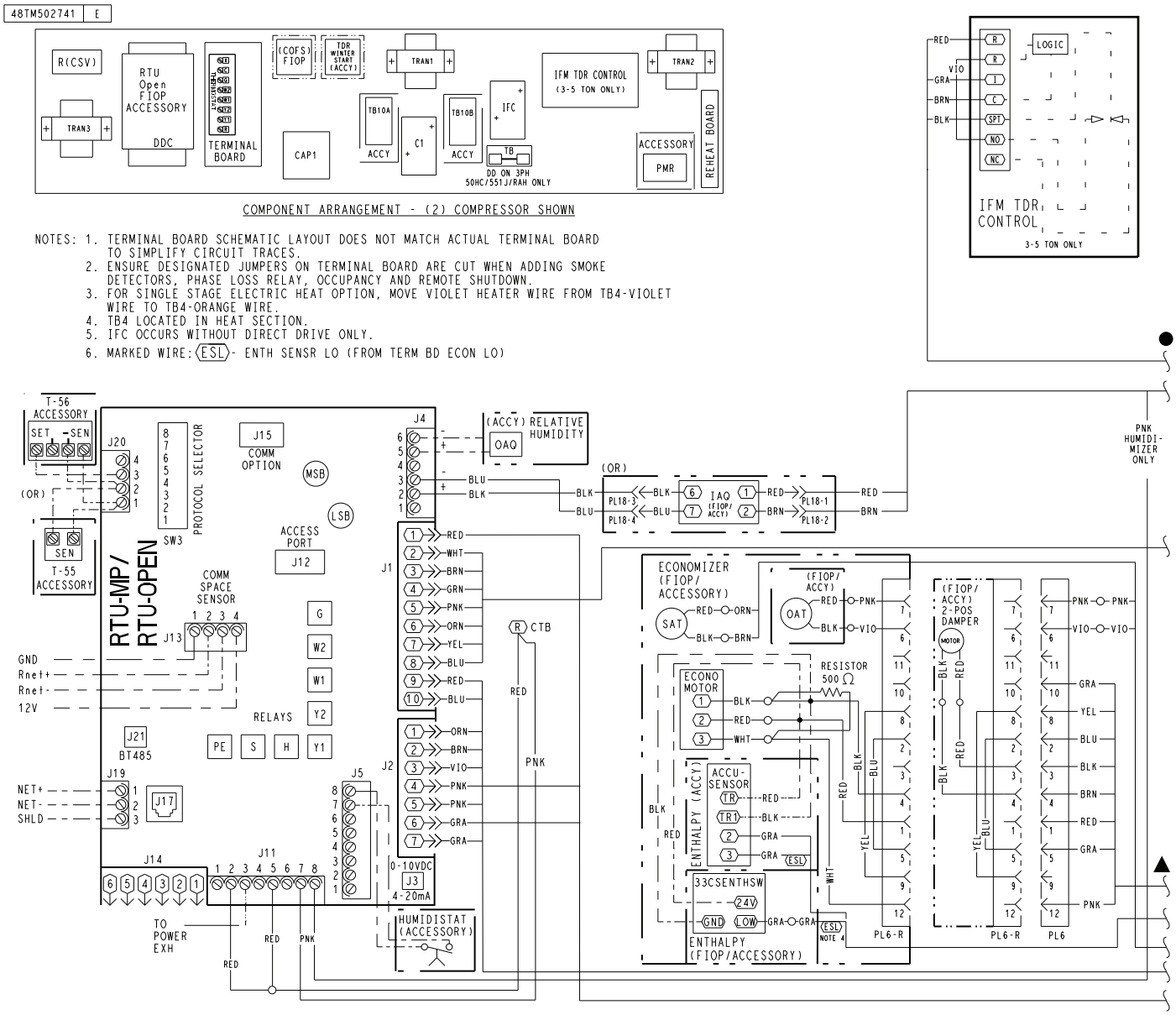

Fig. AP — RTU Open System Control A04-A06 Wiring Diagram

APPENDIX D — WIRING DIAGRAMS

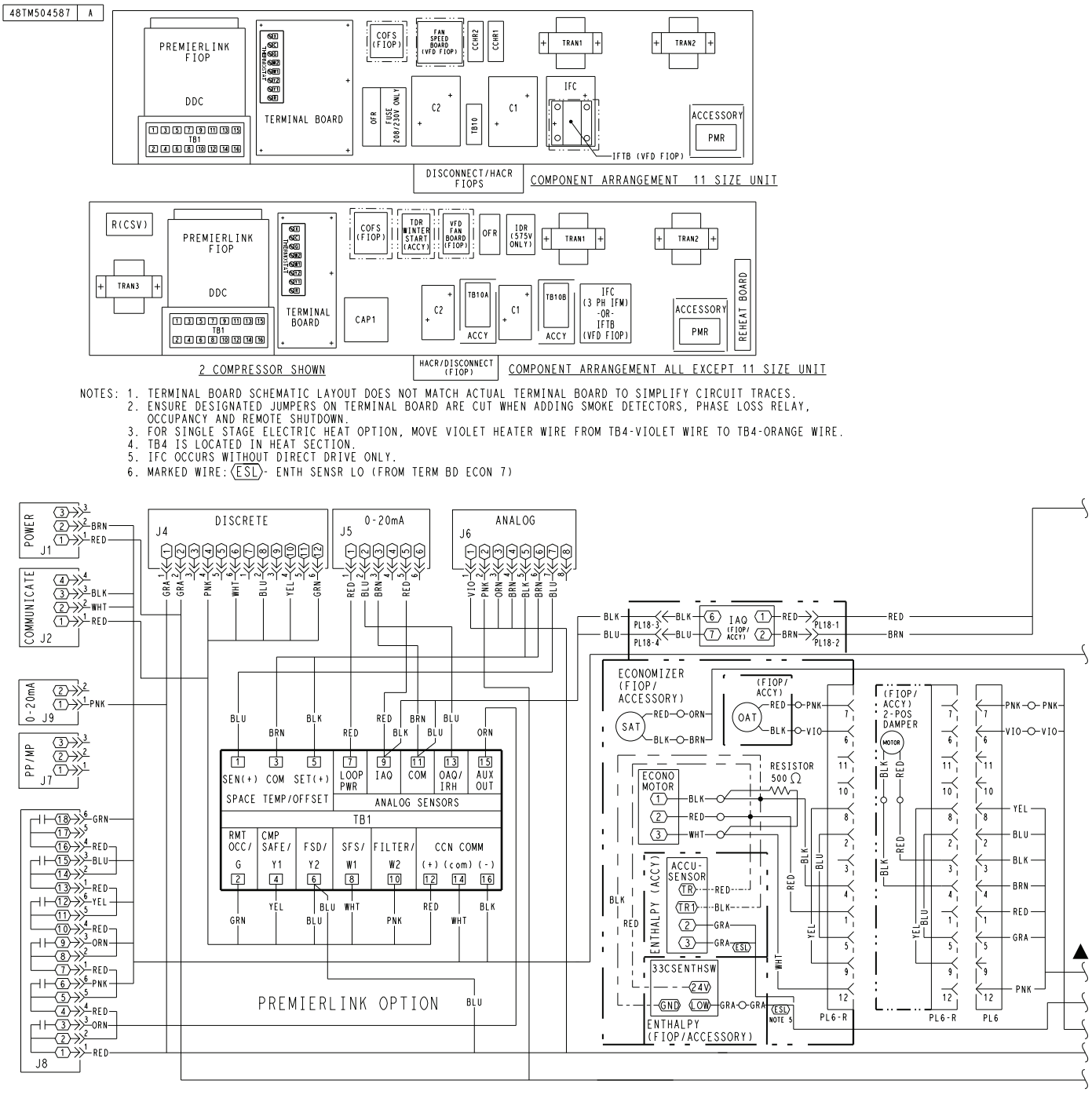

Fig. AQ — PremierLink™ System A07 - D14 Wiring Diagram

APPENDIX D — WIRING DIAGRAMS

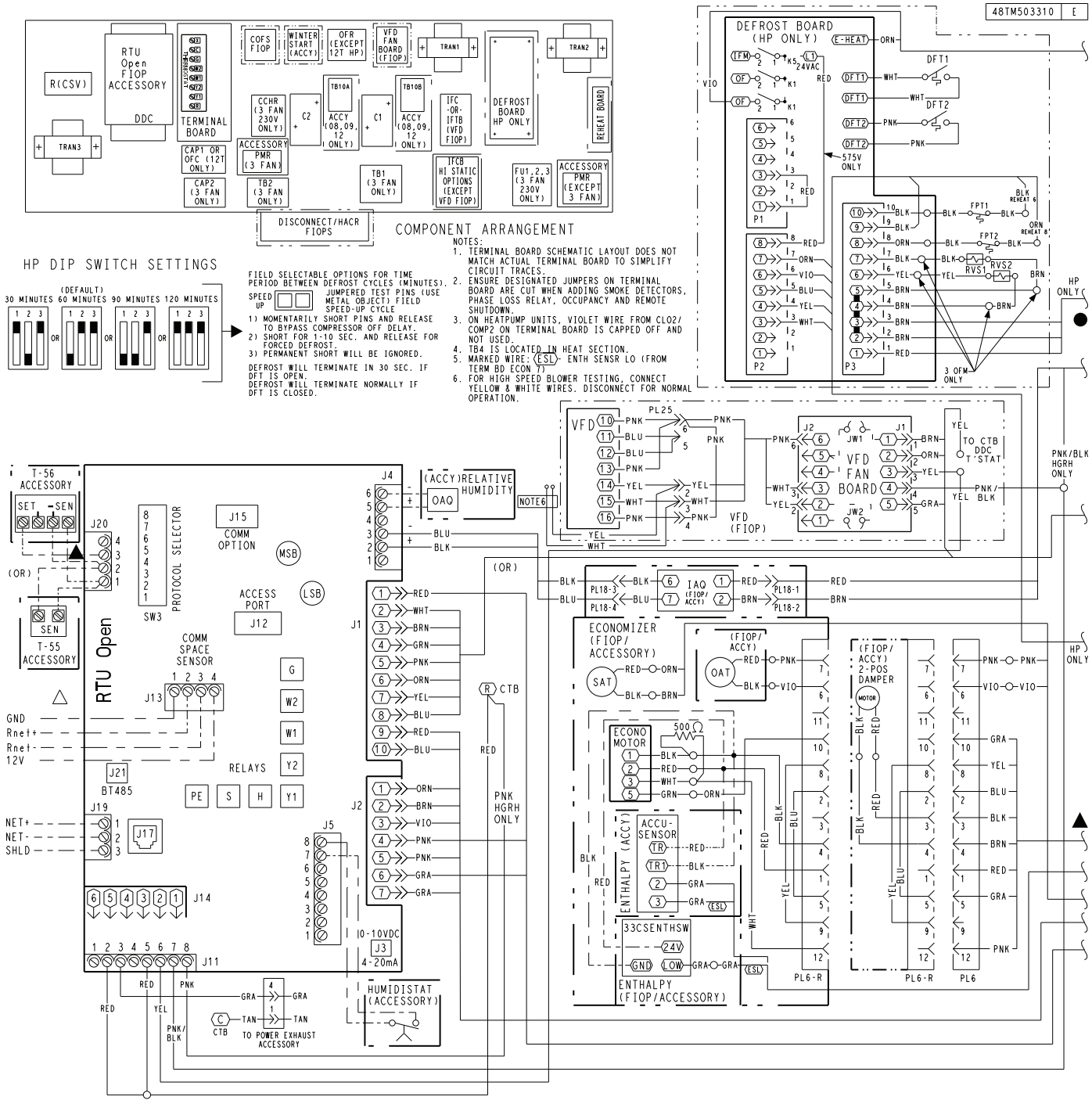

Fig. AR — RTU Open A07-D14 Wiring Diagram

APPENDIX E — MOTORMASTER® SENSOR LOCATIONS

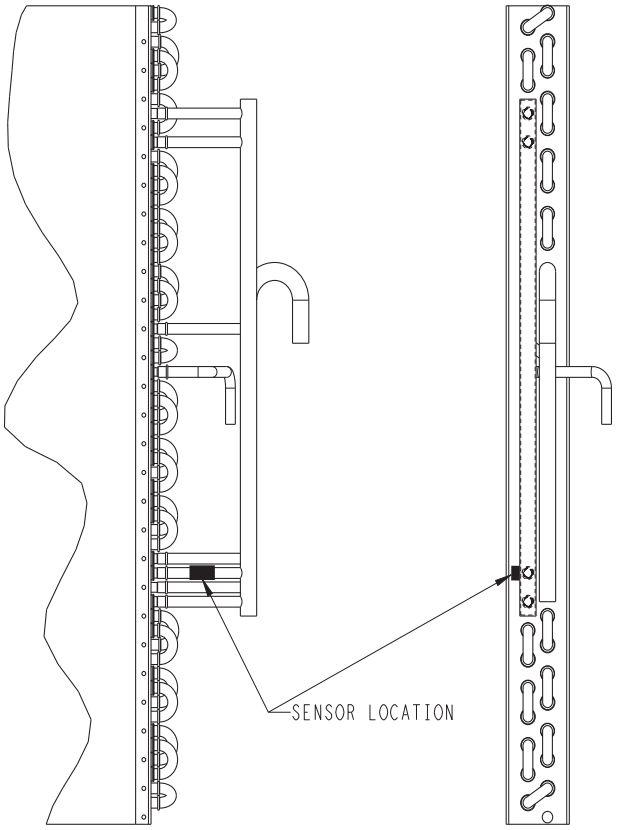

Fig. AS — 50HC*A04 Outdoor Circuiting

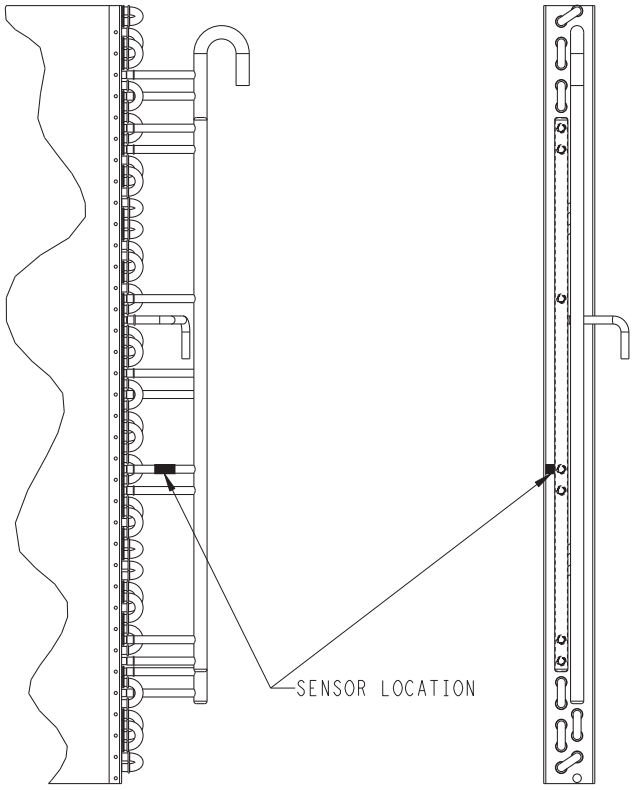

Fig. AU — 50HC*A07 and 50HC*D07 Outdoor Circuiting

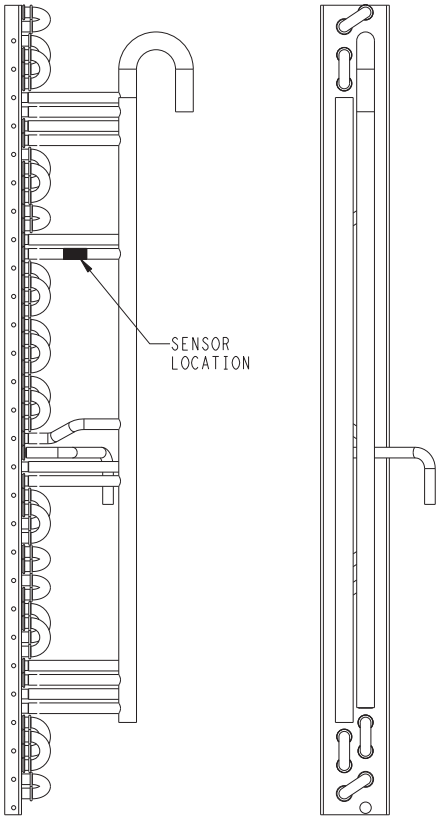

Fig. AT — 50HC*A05/06 Outdoor Circuiting

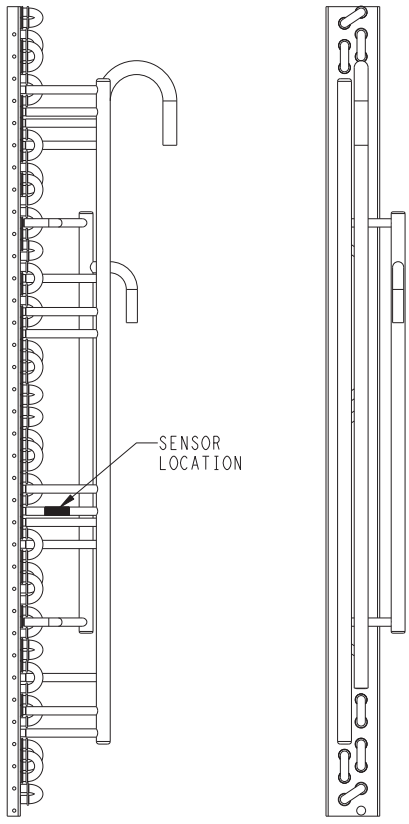

Fig. AV — 50HC*A08 Outdoor Circuiting

APPENDIX E — MOTORMASTER® SENSOR LOCATIONS

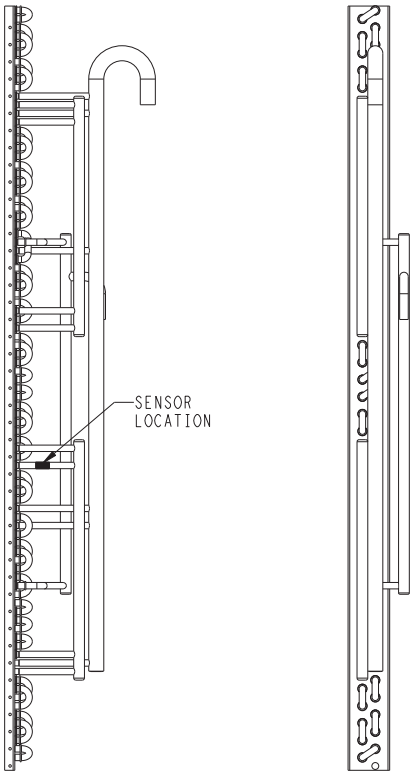

Fig. AW — 50HC*A09 Outdoor Circuiting

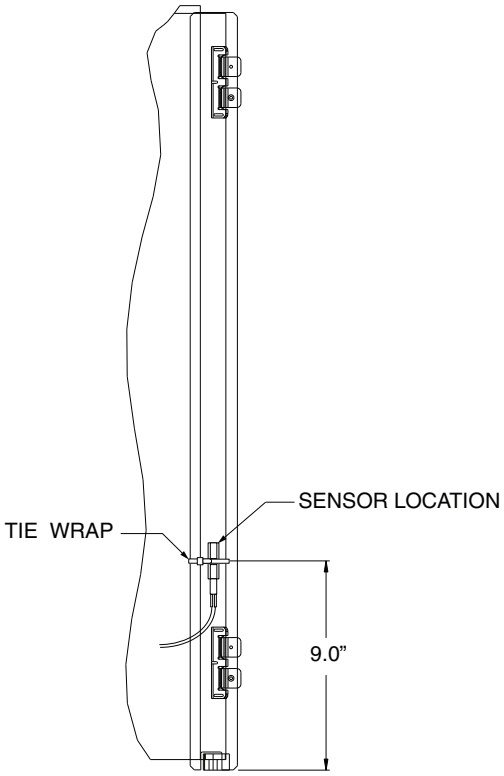

Fig. AY — 50HC*D08 Motormaster® Sensor Location — Novation® Coils (MCHX)

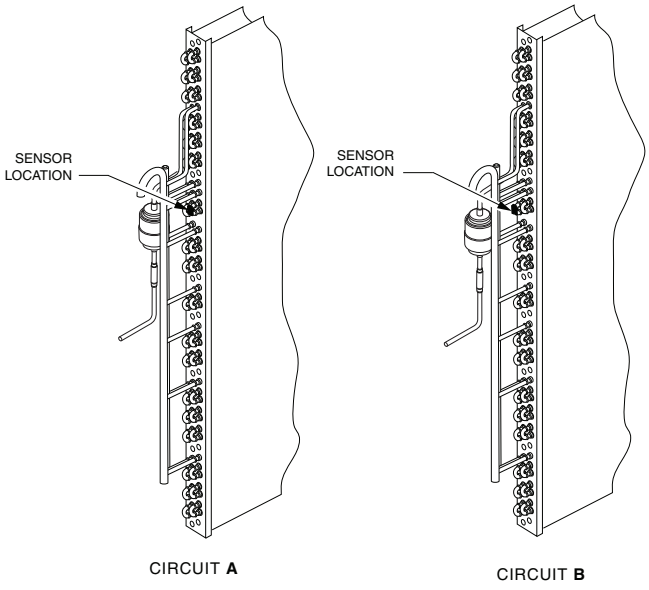

Fig. AX — 50HC*D14 Outdoor Circuiting (Circuit A and Circuit B)

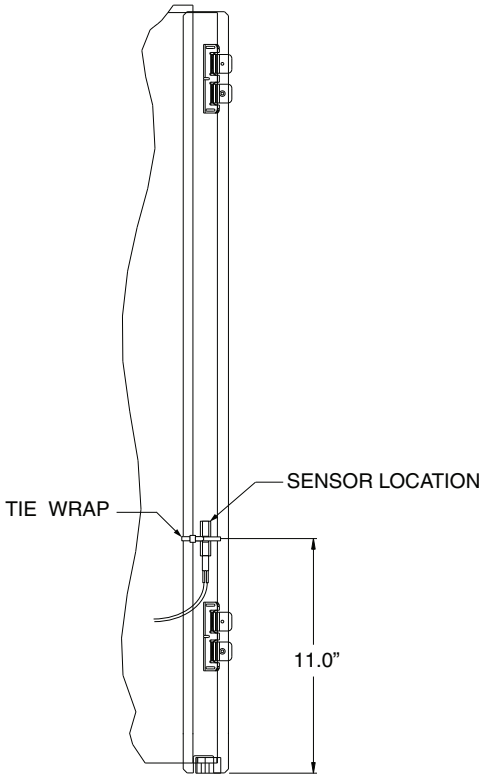

Fig. AZ — 50HC*D12 Motormaster Sensor Location — Novation Coils (MCHX)

UNIT START-UP CHECKLIST
(Remove and use for Job File)

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

I. PRELIMINARY INFORMATION:

MODEL NO. _____

JOB NAME _____

SERIAL NO. _____

ADDRESS _____

START-UP DATE _____

TECHNICIAN _____

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 that condensate connection is installed per instructions (Y/N) _____
Verify that all electrical connections and terminals are tight (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) _____

III. START-UP

ELECTRICAL

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

TEMPERATURES

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

PRESSURES

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) _____

IV. HUMIDI-MIZER® START-UP

NOTE: Units equipped with either SystemVu™ or RTU Open controls have Service Test menus or modes that can assist with the Humidi-MiZer System Start-Up function and provide the means to make the observations listed for this 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) _____
   (Jumper 32L Motormaster® temperature sensor during this check. Remove jumper when complete.)
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°F to 55°F range (Y/N) _____
D. LSV solenoid energized (valve closes) (Y/N) _____

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

OBSERVE

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

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

REPEAT PROCESS FOR 2 COMPRESSOR SYSTEMS.

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.
Catalog No. 04-53500188-01 Printed in U.S.A. Form 50HC-4-14-02SM Rev. A Pg CL-2 4-19 Replaces: 50HC-4-14-01SM