50HCQ*04−12
Single Package Heat Pump/Electric Heat
Nominal 3 to 10 Tons
With Puron (R−410A) Refrigerant

Carrier
turn to the experts

Service and Maintenance Instructions

TABLE OF 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 only the basic maintenance functions such as replacing filters. Trained service personnel should perform all other service and maintenance operations.

When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that can apply. Follow all safety codes. Wear approved safety glasses and leather work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

Recognize safety information. This is the safety ALERT symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be aware of the potential for physical injury hazards.

Understand the signal words **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-ALERT symbol. **DANGER** indicates a hazardous situation which, if not avoided, **will** result in death or severe personal injury. **WARNING** indicates a hazardous situation which, if not avoided, **could** result in death or personal injury. **CAUTION** indicates a hazardous situation which, if not avoided, **could** result in minor to moderate injury or product and property damage. ***NOTICE*** is used to address practices not related to physical injury. **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, LOCK-OUT/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 can use multiple disconnects. Check convenience outlet for power status before opening unit for service. Locate the disconnect switch and lock it in the open position it. LOCK-OUT/TAGOUT this switch to notify others.

⚠ 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.

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

⚠ 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.

NOTICE

OPERATIONAL TEST ALERT

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.

UNIT ARRANGEMENT AND ACCESS

General

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

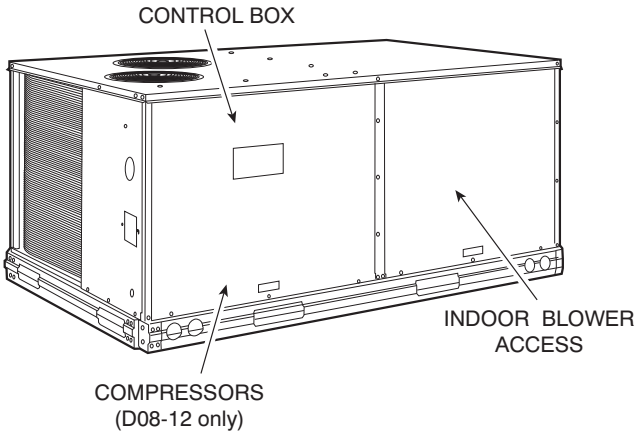

Fig. 1 - Typical Access Panel Location (Front)

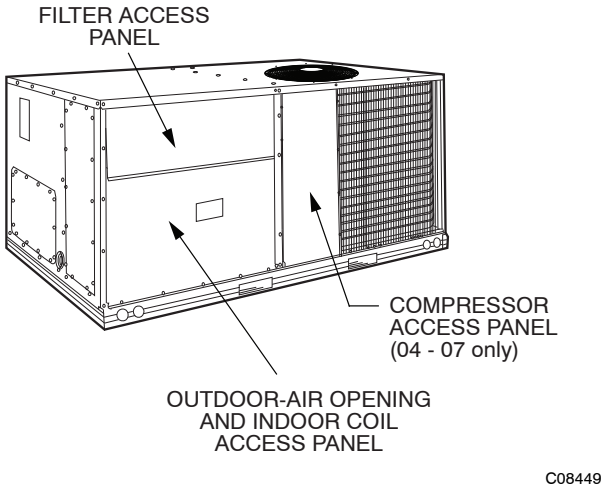

Fig. 2 - Typical Access Panel Locations (Rear)

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):

- Replace return air filter
- Clean outdoor hood inlet filters
- Check belt tension
- Check belt condition
- Inspect pulley alignment
- Check fan shaft bearing locking collar tightness
- Check outdoor coil cleanliness
- Check condensate drain

Seasonal Maintenance

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

Air Conditioning/Heat Pump:

- 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, it will also have a an inlet air screen.

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

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 build-up on components can cause premature wear on components resulting in component failure.

Return Air Filters are disposable fiberglass filters. Access to the filters is through the lift-out filter access panel located on the rear side of the unit, above the indoor coil access panel. See Fig. 2.

Removing the Return Air 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 remove filters from the filter rack.
4. Replace filters as required with similar replacement filters of same size.

Re-installing 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.

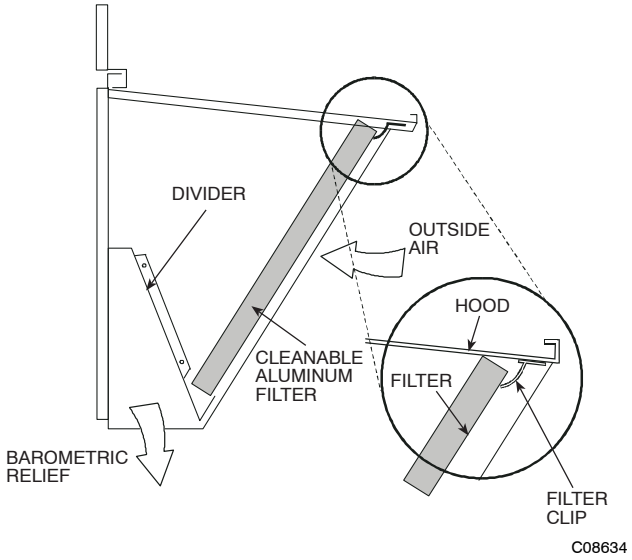

Fig. 3 - Filter Installation

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

Manual Outside Air Hood Screen

The Manual Outside Air Hood Screen is secured by three screws and a retainer angle across the top edge of the hood. See Fig. 4.

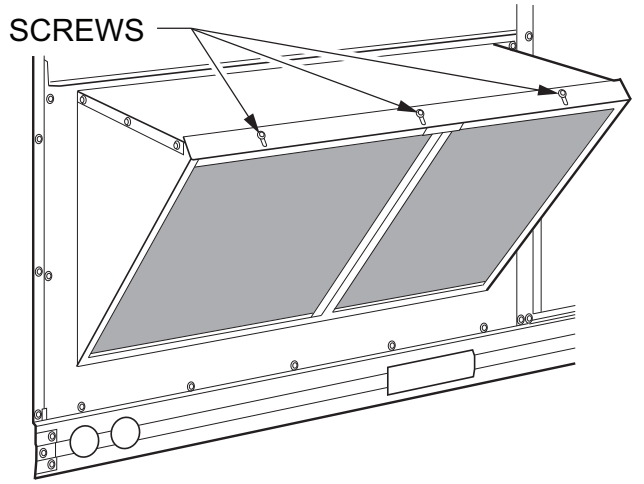

Fig. 4 - Screens Installed on Outdoor-Air Hood (Sizes A07, D08-09s Shown)

Remove the screen by loosening the three screws in the top retainer and move the retainer up until the filter can be removed.

Re-install the Manual Outside Air Hood Screen by placing the screen frame in its track, rotating the retainer back down. Tighten all screws.

SUPPLY FAN (BLOWER) SECTION

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on the fan system, disconnect all electrical power to the unit and apply approved Lock-out/Tagout procedures to the unit disconnect switch. Do not reach into the fan section with power applied to unit.

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 (50HCQ Direct-Drive Fan Assembly) and Fig. 6 (ECM Motor Connectors).

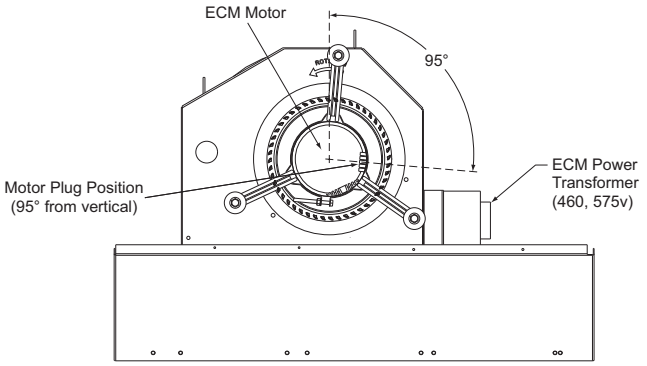

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Fig. 5 - 50HCQ Direct-Drive Supply Fan Assembly

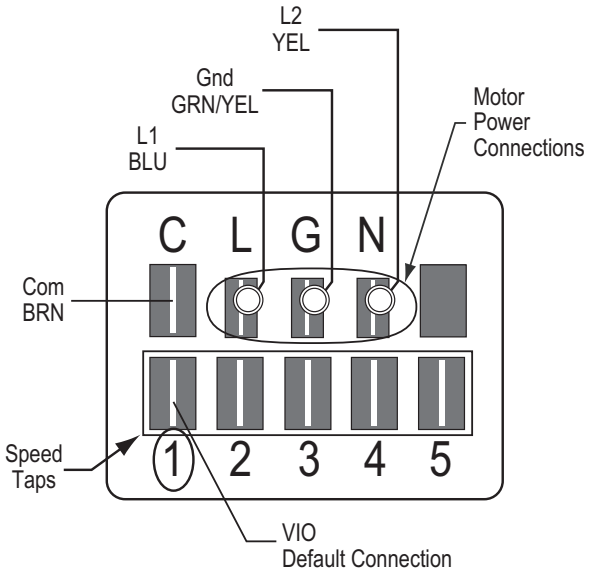

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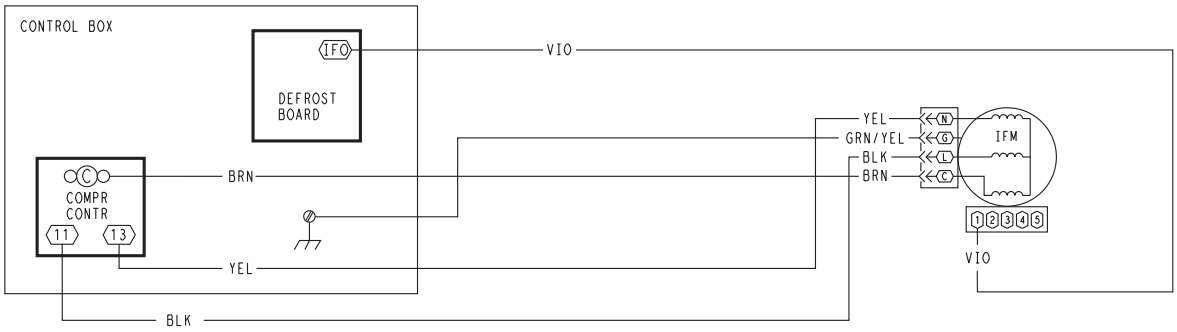
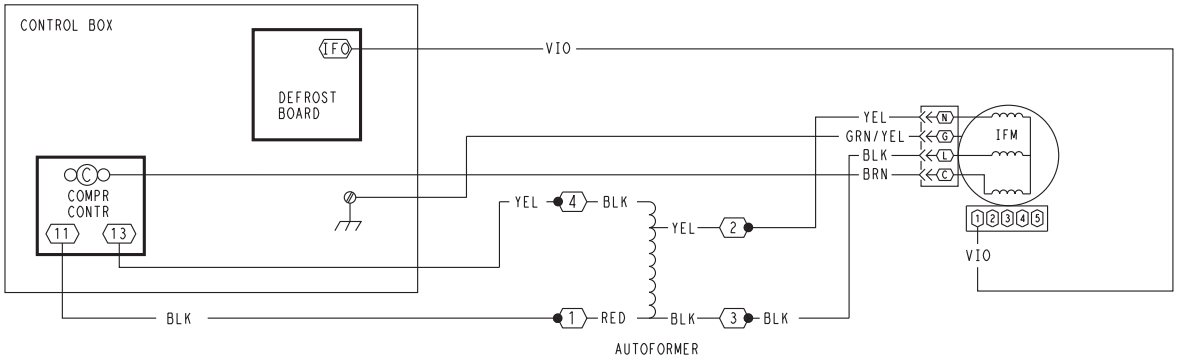
Fig. 6 - ECM Motor Connectors



208/230, 460V Units



575V Units

C09263

Fig. 7 - ECM Unit Wiring

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.

208/230V units use a 230V motor, 460V units use a 460V motor and 575V units use a 460V motor with an autotransformer. Motor power voltage is connected to motor terminals L and N (see Fig. 6 and Fig. 7); 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 24V control signal to one of the five motor communications terminals. When the 24V 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 – 50HCQ Motor Tap Programing (percent of full-load torque)

Unit Size	Tap 1	Tap 2	Tap 3	Tap 4	Tap 5
04	29	33	41	48	100
05	46	49	57	67	100
06	49	55	79	90	100

Factory Default: Tap 1 (VIO)

Selecting another speed:

1. Disconnect main power to the unit. Apply lockout/tagout 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 — 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).

Table 2 – Motor Test Volts

Unit Voltage	Motor Voltage	Min–Max Volts
208/230	230	187–253
460	460	414–506
575	460	414–506

5. Using a jumper wire from unit control terminals R to G, engage motor operation. Check for 24v output at the defrost board terminal IFO.
6. Check for proper control signal voltages of 22V to 28V at motor signal leads VIO and BRN.
7. Disconnect unit main power. Apply lockout/tagout 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.

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-lbs (6.8 Nm).
7. Center the fan wheel in the fan housing. Tighten the fan wheel hub setscrew and torque to 120 in-lbs (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-lbs (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. 8.

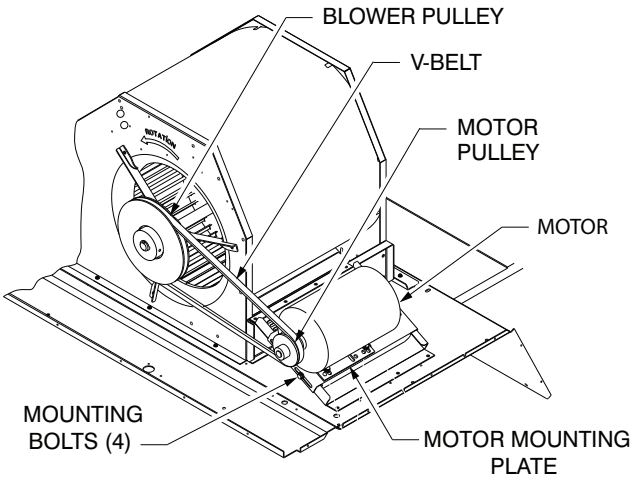


Fig. 8 - Typical Belt Drive Motor Mounting

Variable Frequency Drive (VFD)

For units equipped with a VFD factory installed option (FIOP), refer to the following supplement: *"Variable Frequency Drive (VFD) Installation, Setup and Troubleshooting."*

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-lbs at a $^{5}/_{8}$-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. 9.

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 65-70 in-lb (7.4 to 7.9 Nm).

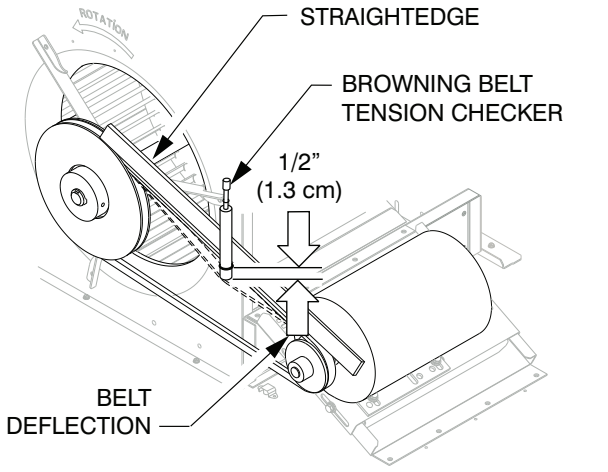


Fig. 9 - Checking Blower Motor Belt Tension

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. 8.

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

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.

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. 10.

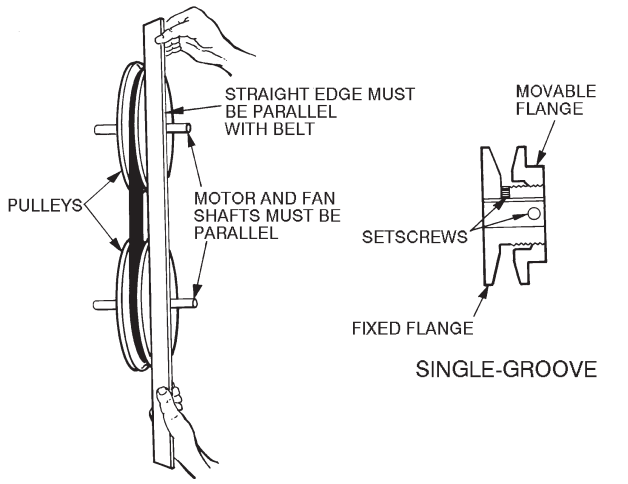


Fig. 10 - Supply-Fan Pulley Adjustment

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/tagout procedures.
2. Loosen belt by loosening fan motor mounting nuts. See Fig. 8.
3. Loosen movable pulley flange setscrew. See Fig. 10.
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 65-70 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 65-70 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 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 55-60 in-lb (6.2-6.8 Nm). See Fig. 11. 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.

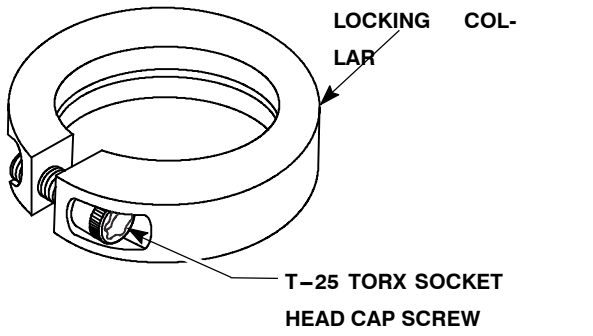


Fig. 11 - Tightening Locking Collar

Motor

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 and torque to 120 ± 12 in-lbs (14 ± 1.4 Nm).

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). 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 was provided on the original factory pulley.

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 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.

HEAT PUMP REFRIGERATION SYSTEM

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

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

This system uses Puron® (R410A) refrigerant that operates at higher pressures than standard R-22 systems and other refrigerants. No other refrigerant can be used in this system. Gauge set, hoses, and recovery system must be designed to handle Puron refrigerant. If unsure about equipment, consult the equipment manufacturer.

Outdoor Coil

The 50HCQ outdoor coil is fabricated with round tube copper hairpins and plate fins of various materials and/or coatings (see "Appendix I - Model Number Significance" to identify the materials provided in this unit). All unit sizes use composite-type two-row coils. Composite two-row coils are two single-row coils fabricated with a single return bend end tubesheet.

Indoor Coil

The indoor coil is traditional round-tube, plate-fin technology. Tube and fin construction is of various optional materials and coatings (see Model Number Format). Coils are multiple-row.

Recommended Outdoor Coil Maintenance and Cleaning

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 can 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 the coating of a protected coil) when 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 and dirt 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 very low velocity water stream to avoid damaging the fin edges. Monthly cleaning as described below is recommended.

⚠ CAUTION

PERSONAL INJURY AND UNIT DAMAGE HAZARD

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

Only approved cleaning is recommended.

Routine Cleaning of Indoor Coil Surfaces:

Periodic cleaning with Totaline® Environmentally Sound Coil Cleaner is essential in extending the life of coils. This cleaner is available from Carrier Replacement Components Division (p/n P902-0301 for one gallon [3.8L] container, and p/n P902-0305 for a 5 gallon [19L] container). It is recommended that all coils (including standard aluminum, pre-coated, copper/copper or E-coated coils) be cleaned with the Totaline Environmentally Sound Coil Cleaner as described below. Coil cleaning should be part of the unit's regularly scheduled maintenance procedures ensuring the long life of the coil. Failure to clean the coils can result in reduced durability in the environment.

Avoid the use of:

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

Totaline Environmentally Sound Coil Cleaner is non-flammable, hypoallergenic, 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 because coil and unit durability can be affected.

Clean coil as follows:

1. Turn off unit power. Use lockout/tagout procedures on unit power switch.
2. Remove top panel screws on outdoor coil end of unit.
3. Remove coil corner post. See Fig. 12. To hold top panel open, place coil corner post between top panel and center post. See Fig. 13.

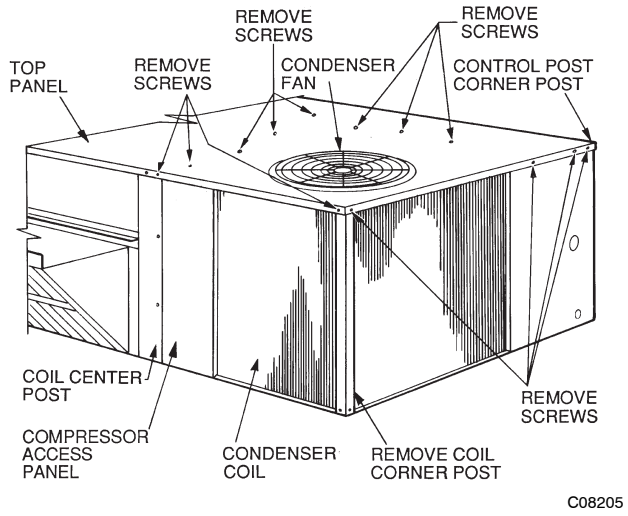


Fig. 12 - Cleaning Condenser Coil (Size 04-06 shown)

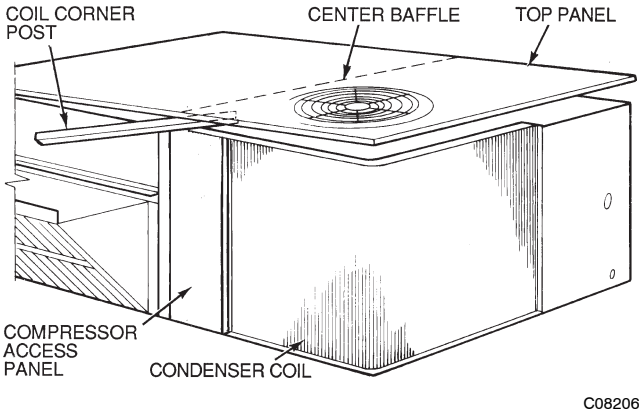


Fig. 13 - Propping Up Top Panel

4. For Sizes 04-06: Remove screws securing coil to compressor plate and compressor access panel.
5. For Sizes 07-12: Remove fastener holding coil sections together at return end of condenser coil. Carefully separate the outdoor coil section 3 to 4 in. (7.6-10 cm) from the inner coil section. See Fig. 14.
6. Clean the outer surfaces with a stiff brush in the normal manner. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris.
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.

Totaline Environmentally Sound Coil Cleaner Application Equipment:

- 2.5 gal (9.5L) garden sprayer
- Water rinse with low velocity spray nozzle

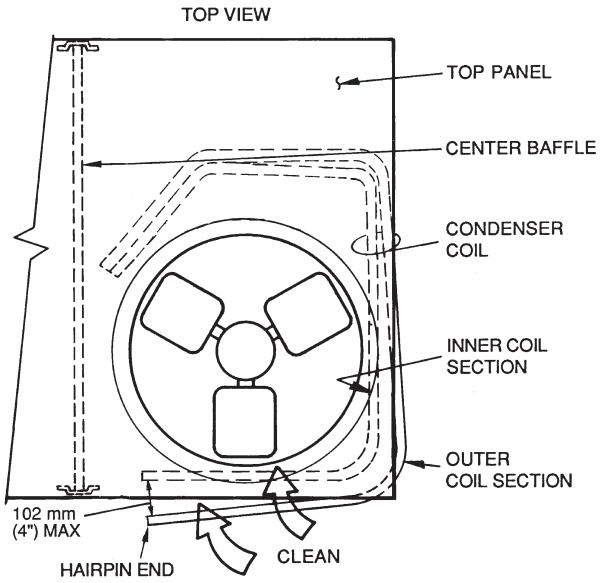


Fig. 14 - Separating Coil Sections

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution can result in corrosion and damage to the unit.

Harsh chemicals, household bleach, 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 Sound Coil Cleaner as described below.

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution can result in reduced unit performance.

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.

Totaline Environmentally Sound Coil Cleaner Application Instructions:

1. Proper protection equipment, such as approved safety glasses and gloves, is recommended during mixing and application of Totaline Environmentally Sound Coil Cleaner.
2. Remove all surface loaded fibers and debris using a vacuum cleaner or a soft non-metallic bristle brush as described above.
3. Thoroughly wet all finned surfaces with clean water using a low velocity garden hose being careful not to bend fins.

4. Mix Totaline Environmentally Sound Coil Cleaner in a 2.5 gal (9.5L) garden spryer according to the instructions included with the cleaner. The optimum solution temperature is 100°F (38°C).

NOTE: Do NOT USE water in excess of 130°F (54°C), as the enzymatic activity will be destroyed.

5. Thoroughly apply Totaline Environmentally Sound 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.
8. Interior and exterior finned areas must be thoroughly cleaned.
9. Finned surfaces should remain wet with cleaning solution for 10 minutes.
10. Ensure surfaces are not allowed to dry before rinsing. Reapply cleaner as needed to ensure 10-minute saturation is achieved.
11. 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.

Indoor Coil

Cleaning the Indoor Coil:

1. Turn unit power off. Use proper lockout/tagout procedures.
2. Remove indoor coil access panel.
3. If economizer or two-position damper is installed, remove economizer by disconnecting the Molex® plug and removing mounting screws.
4. Slide filters out of unit.
5. 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, back-flush toward return-air section to remove foreign material. Flush condensate pan after completion.
6. Reinstall economizer and filters.
7. Reconnect wiring.
8. Replace access panels.

Refrigeration System Components:

Each heat pump refrigeration system includes a compressor, accumulator, reversing valve, dual-function outdoor coil with vapor header check valve, cooling liquid line with a filter drier and a check valve, dual-function indoor coil with a vapor header check valve, and heating liquid line with check a valve and a strainer. Unit sizes A04-07 have a single compressor-circuit; unit sizes D08 through D12 have two compressor-circuits. See Fig. 15 for typical unit piping schematic (unit size D09 (4-row indoor coil) with two compressor-circuits is shown).

Dual-function outdoor and indoor coils are designed to provide parallel coil circuits during evaporator-function operation and converging coil circuits during the condenser-function operation.

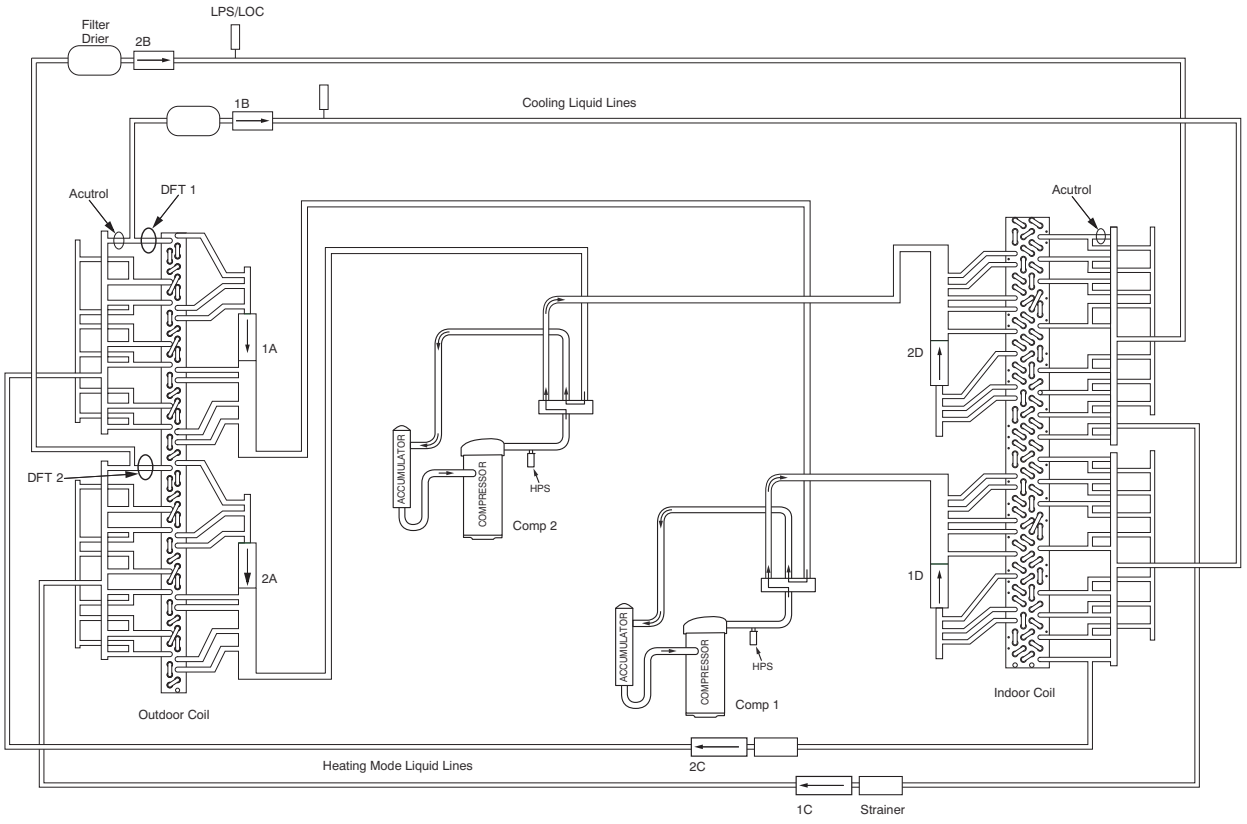


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Fig. 15 - Typical Unit Piping Schematic (with TXV valves on Indoor Coils)

Reversing Valve and Check Valve Position

See Fig. 15 on page 11.

Table 3 – Cooling Mode (each circuit)

Component	Status/Position
Reversing Valve	Energized
Check Valve A	Closed
Check Valve B	Open
Check Valve C	Closed
Check Valve D	Open

Table 4 – Heating Mode (each circuit)

Component	Status/Position
Reversing Valve	De–energized
Check Valve A	Open
Check Valve B	Closed
Check Valve C	Open
Check Valve D	Closed

Table 5 – Defrost Mode

A04–A07 and D08–D12/Circuit 2:

Component	Status/Position
Defrost Thermostat	Closed
Outdoor Fan(s)	Off
Reversing Valve	Energized
Check Valve A	Closed
Check Valve B	Open
Check Valve C	Closed
Check Valve D	Open

Troubleshooting Refrigerant Pressure Problems and Check Valves

Refer to Fig. 15, above, and the Cooling Mode and Heating Mode tables (Tables 3 and 4) above.

Refrigerant System Pressure Access Ports

There are two access ports in each circuit - on the suction tube and the discharge tube near the compressor. These are brass fittings with black plastic caps. The hose connection fittings are standard 1/4 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. 16. 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 and torque to 96±10 in-lbs (10.9 ± 1 Nm). Do not exceed 106 in-lbs (11.9 Nm) when tightening.

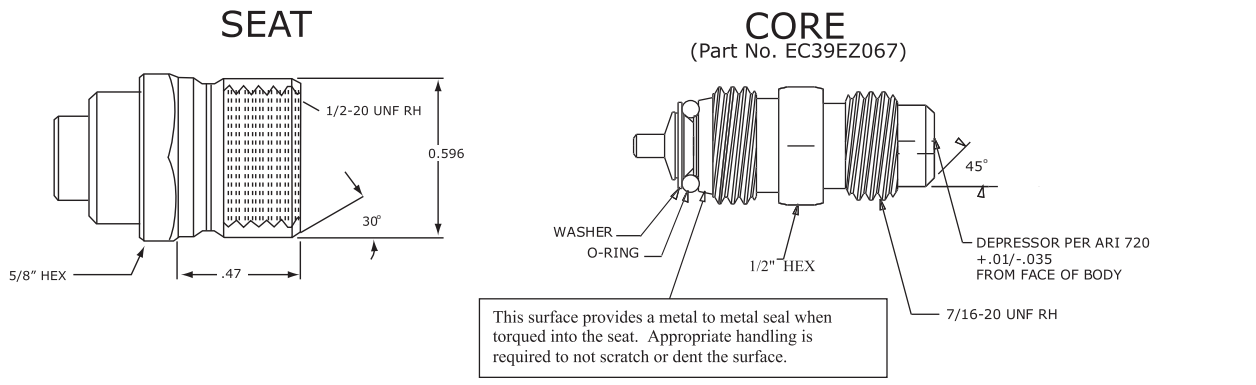

Fig. 16 - CoreMax Access Port Assembly

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. Add liquid refrigerant into the system in the discharge line. If adding refrigerant into the suction line, use a commercial metering/expansion device at the gauge manifold; remove liquid from the cylinder, pass it through the metering device at the gauge 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

The amount of refrigerant charge is listed on the unit's nameplate. Refer to Carrier Publication, "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. If unit is equipped with a head pressure control device, bypass it to ensure full fan operation during charging.

Charge checking and adjustments must be made while the system is operating in Cooling only.

No Charge:

Use standard evacuation techniques for Puron (R-410A) refrigerant.. After evacuating system, weigh the specified amount of refrigerant.

THERMOSTATIC EXPANSION VALVE (TXV)

All 50TCQ's have a factory installed nonadjustable thermostatic expansion valve (TXV). The TXV will be a bi-flow, bleed port expansion valve with an external equalizer. TXVs are specifically designed to operate with Puron® refrigerant, use only factory authorized TXVs. See Fig. 15 for a typical piping schematic.

TXV Operation

The TXV is a metering device that is used in air conditioning and heat pump systems to adjust to 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 (see Fig. 17):

1. Superheat temperature is sensed by the cap tube sensing bulb on the suction tube at outlet of the 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. As long as this bulb and cap tube contain any liquid refrigerant, this temperature is converted into suction pressure pushing downward on the diaphragm, which tends to open the TXV valve through 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 needle valve on the pin carrier is spring loaded, exerting pressure on the underside of the diaphragm. Therefore, the bulb pressure equals evaporator pressure (at outlet of coil) plus spring pressure. If the load increases, the temperature increases at the bulb, which increases the pressure on the top side of the diaphragm, pushing the carrier away from the seat, opening the valve and increasing the flow of refrigerant. The increased refrigerant flow causes increased leaving evaporator pressure which is transferred through the equalizer tube to the underside of the diaphragm. This causes pin carrier spring pressure to close the TXV valve. The refrigerant flow is effectively stabilized to the load demand with a negligible change in superheat.

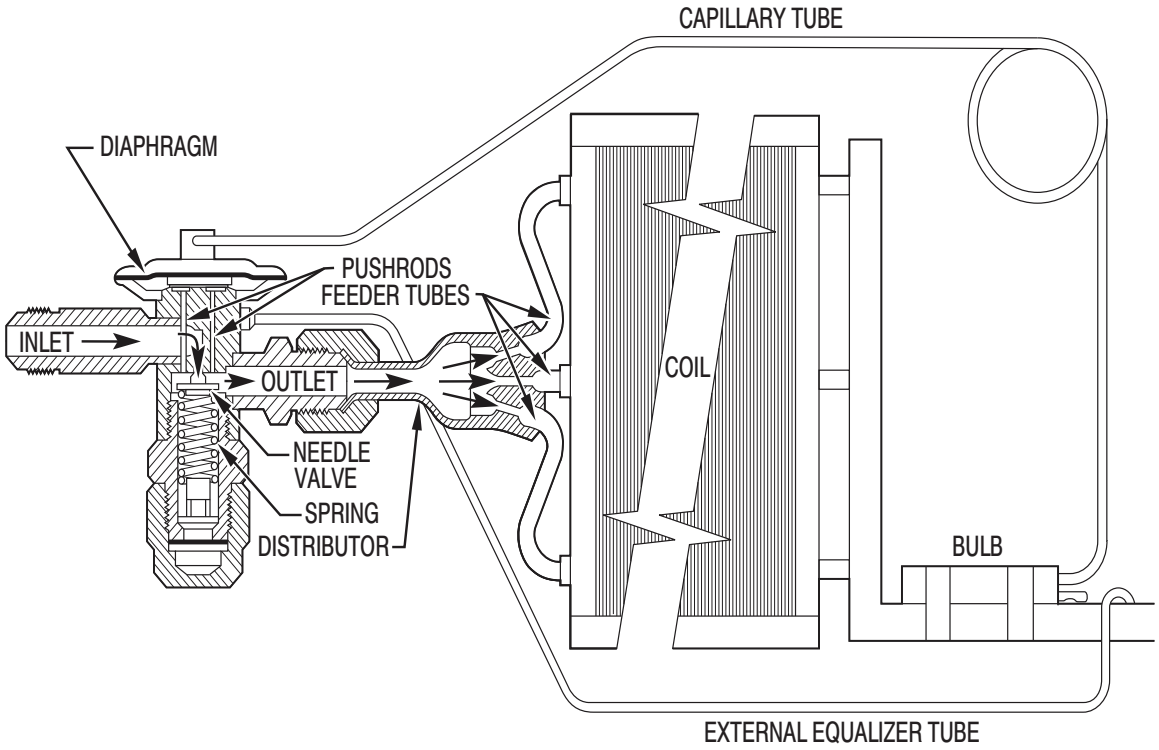

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Fig. 17 - Thermostatic Expansion Valve (TXV) Operation

Replacing TXV

⚠ CAUTION

PERSONAL INJURY HAZARD

Failure to follow this caution can result in injury to personnel and damage to components.

Always wear approved safety glasses, work gloves and other recommended Personal Protective Equipment (PPE) when working with refrigerants.

1. Recover refrigerant.
2. Remove TXV support clamp using a 5/l6-in. nut driver.
3. Remove TXV using a backup 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. Install the new TXV and avoid damaging the tubing or the valve when attaching the TXV to the distributor.
7. Attach equalizer tube to suction line. If coil has mechanical connection, then use wrench and back up wrench to attach. If coil has brazed connection, use file or tubing cutters to remove mechanical flare nut from equalizer line. Then use coupling to braze the equalizer line to stub (previous equalizer line) in suction line.
8. Attach TXV bulb in the same location as original (in the sensing bulb indent), wrap bulb in protective insulation and secure using the supplied bulb clamp. See Fig. 18.
9. Route equalizer tube through suction connection opening (large hole) in fitting panel and install fitting panel in place.
10. Sweat inlet of TXV marked “IN” to liquid line. Avoid excessive heat which could damage valve.

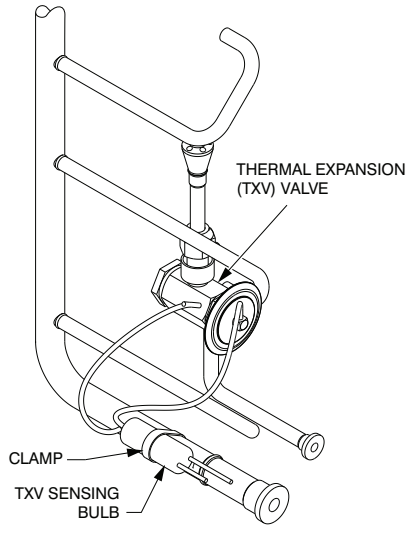

Fig. 18 - TXV Valve and Sensing Bulb

COOLING CHARGING CHARTS

How To Use Cooling Charging Charts:

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

SIZE DESIGNATION	NOMINAL TONS REFERENCE
A04	3
A05	4
A06	5
A07	6
D08	7.5
D09	8.5
D12	10

EXAMPLE:

Model 50TCQ*D14

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

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

Suction Temperature . . . . . 55° F (13°C)

Refer to Fig. 19 through Fig. 26 for Cooling Charging Charts.

Compressors

Lubrication:

Compressors are charged with the correct amount of oil at the factory.

CAUTION

UNIT DAMAGE HAZARD

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

The compressor is in a Puron (R-410A) 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 POE oil to the atmosphere. This exposure to the atmosphere can cause contaminants that are harmful to R-410A components to form. Keep POE oil containers closed until ready for use.

COOLING CHARGING CHARTS

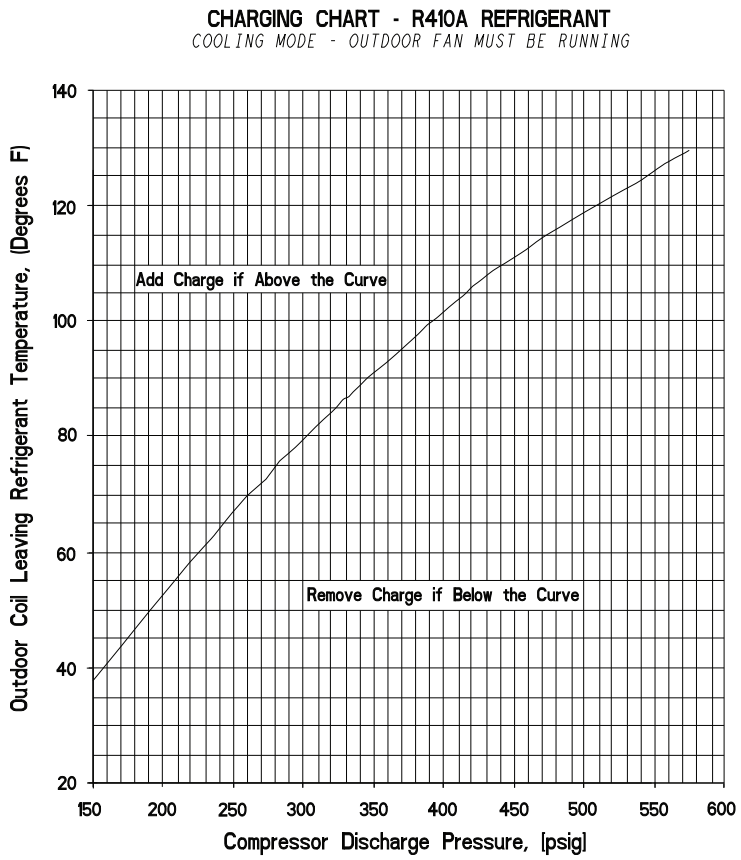

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Fig. 19 - Cooling Charging Charts- 50HCQA04

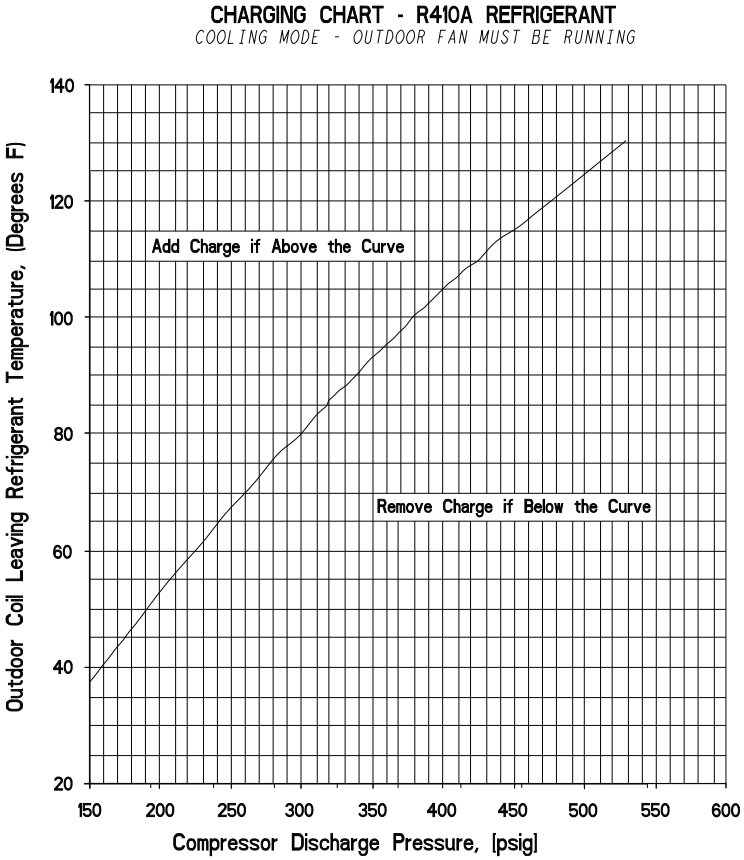

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Fig. 20 - Cooling Charging Charts - 50HCQA05

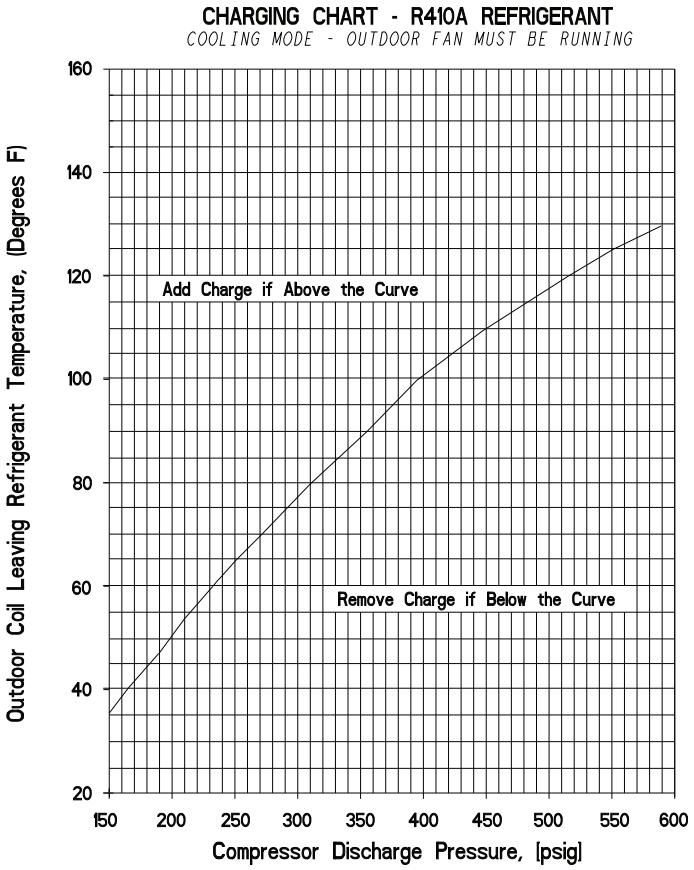

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Fig. 21 - Cooling Charging Charts - 50HCQA06

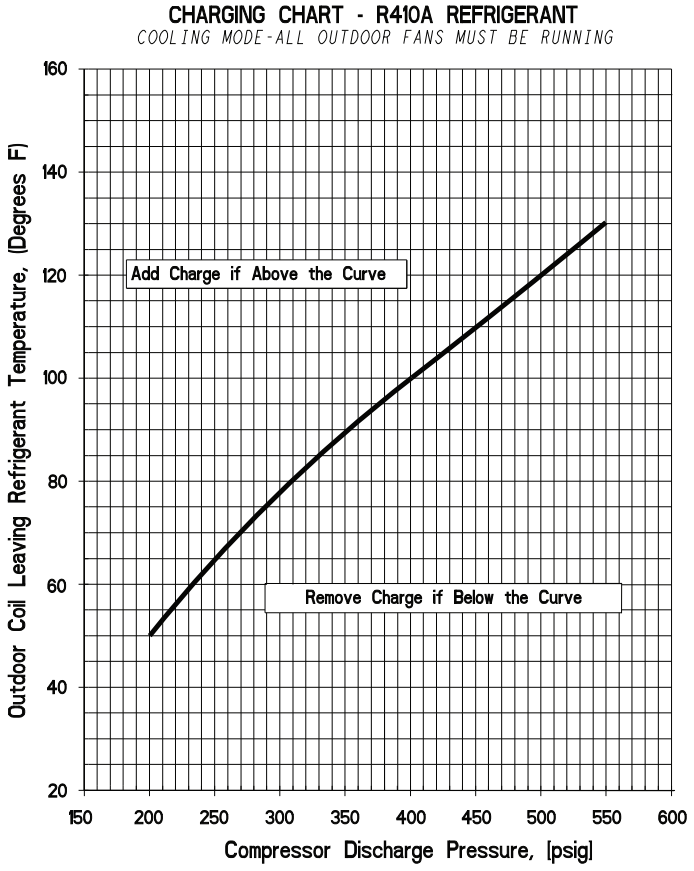

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Fig. 22 - Cooling Charging Charts - 50HCQA07

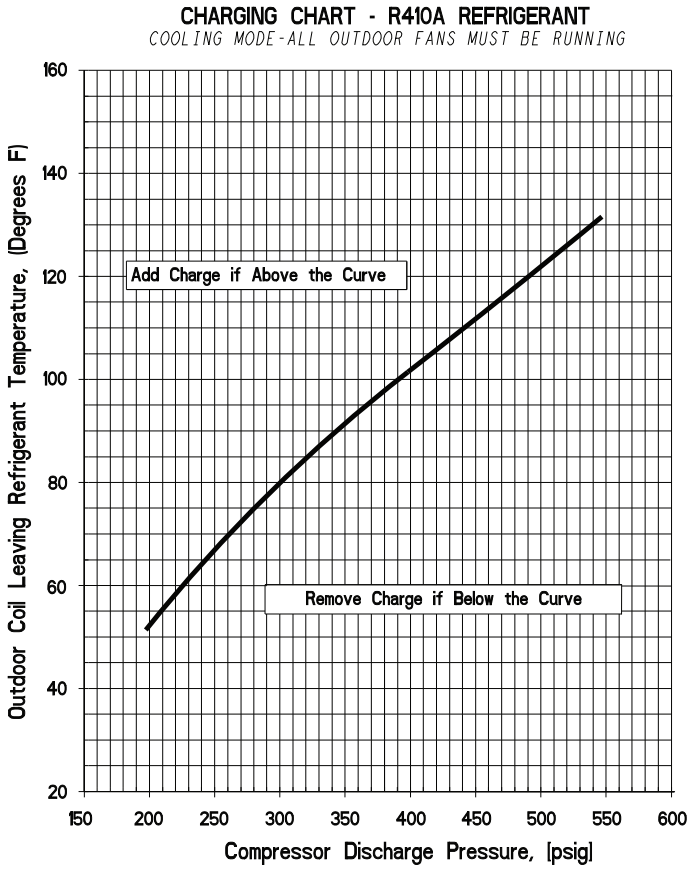

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Fig. 23 - Cooling Charging Charts - 50HCQD08

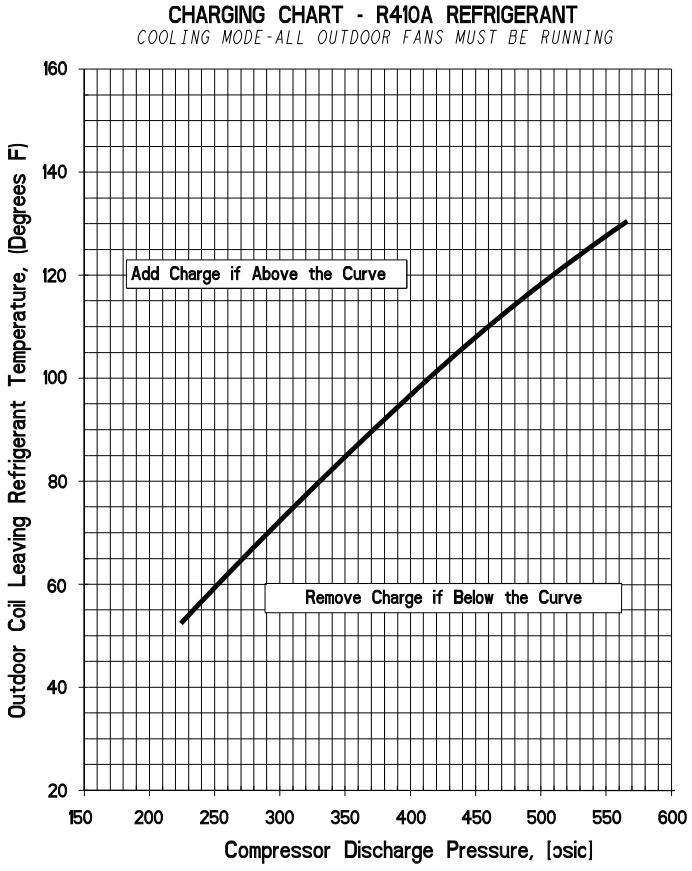

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Fig. 24 - Cooling Charging Charts - 50HCQD09

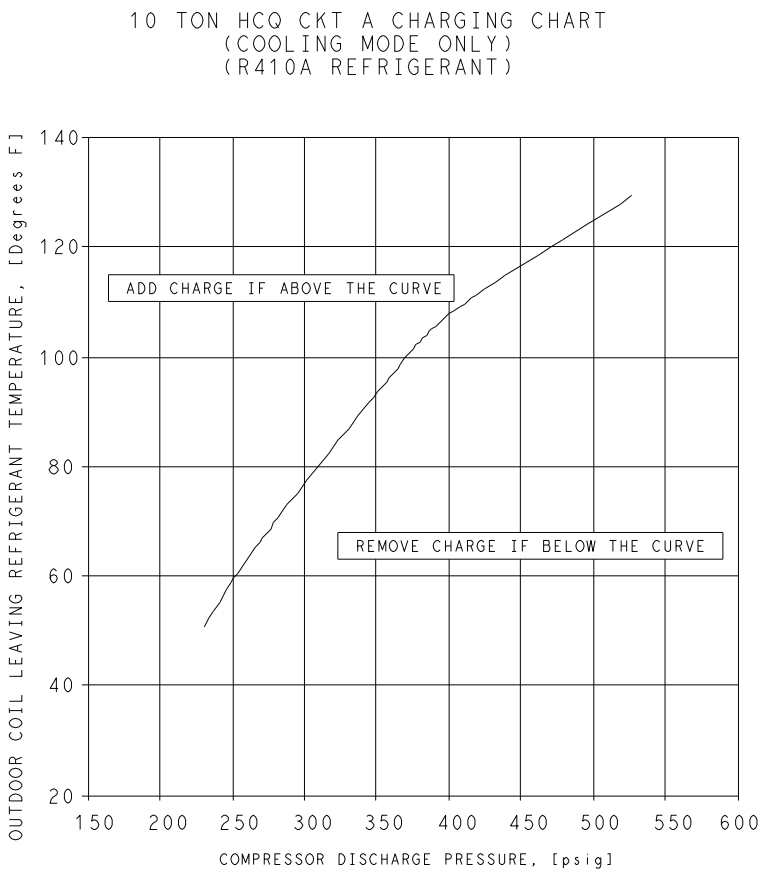

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Fig. 25 - Cooling Charging Charts - 50HCQD12 Circuit A

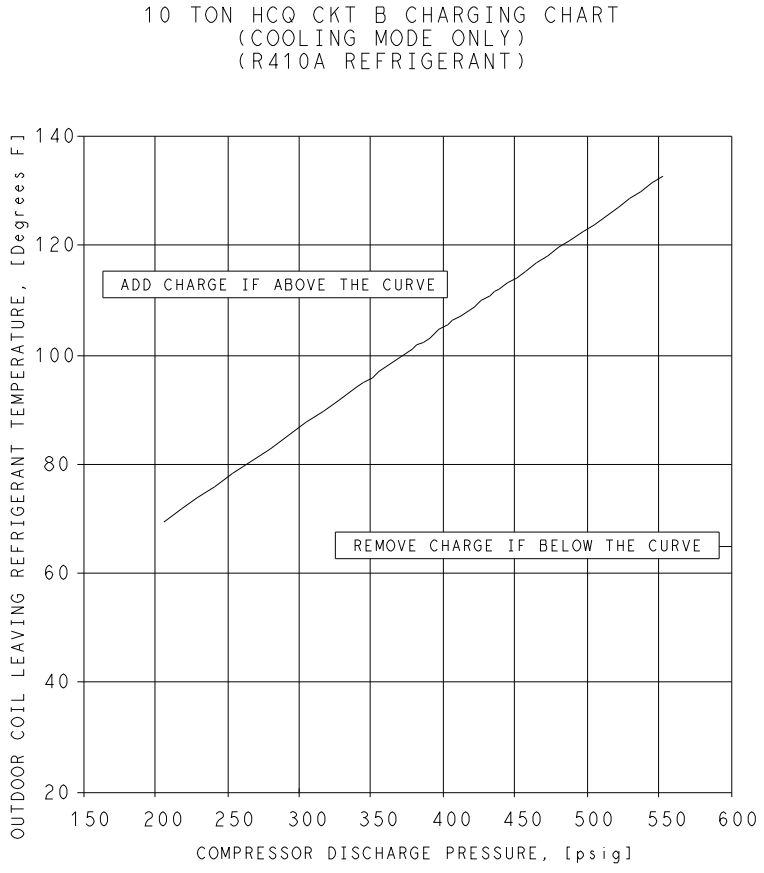

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Fig. 26 - Cooling Charging Charts - 50HCQD12 Circuit B

Replacing Compressor

⚠ 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.

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.

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

Compressors using Puron refrigerant contain a polyolester (POE) oil. This oil has a high affinity for moisture. Do not remove the compressor's tube plugs until ready to insert the unit suction and discharge tube ends.

Compressor Rotation:

CAUTION

EQUIPMENT DAMAGE

Failure to follow this caution can result in equipment damage.

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.

NOTE: 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 gauges 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:

4. Note that the evaporator fan is probably also rotating in the wrong direction.
5. Turn off power to the unit.
6. Reverse any two of the three unit power leads.
7. Reapply electrical power to the compressor.
8. The suction pressure should drop and the discharge pressure should rise which is normal for scroll compressors on start-up.
9. Replace compressor if suction/discharge pressures are not within specifications for the specific compressor.

Filter Drier

Replace the Filter Drier whenever refrigerant system is exposed to atmosphere. Only use factory specified liquid-line filter driers with working pressures no less than 650 psig (4482 kPa).

CAUTION

EQUIPMENT DAMAGE

Failure to follow this caution can result in equipment damage.

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.

Outdoor Fan Location

See Fig. 27.

1. Shut off unit power supply. Apply lockout/tagout procedures.
2. Remove condenser-fan assembly (grille, motor, and fan).
3. Loosen fan hub setscrews.
4. Adjust fan height as shown in Fig. 27.
5. Tighten setscrews to 84 in-lbs (9.5 Nm).
6. Replace condenser-fan assembly.

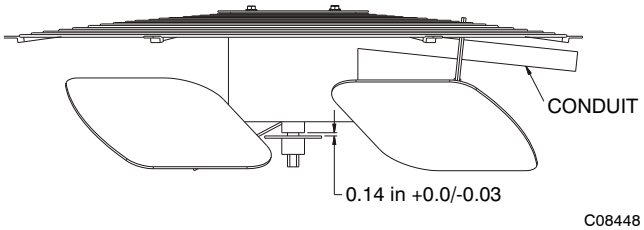


Fig. 27 - Outdoor Fan Adjustment

Troubleshooting Cooling System

Refer to Table 6, on the following page, for additional troubleshooting topics.

Table 6 – Heating and Cooling Troubleshooting

PROBLEM	CAUSE	REMEDY
Compressor and Outdoor Fan Will Not Start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker. Determine root cause.
	Defective thermostat, contactor, transformer, control relay, or capacitor.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
	High pressure switch tripped.	See problem ''Excessive head pressure.''
	Low pressure switch tripped.	Check system for leaks. Repair as necessary.
	Freeze-up protection thermostat tripped.	See problem ''Suction pressure too low.''
Compressor Will Not Start But Outdoor Fan Runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor or allow enough time for internal overload to cool and reset.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace compressor.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor Cycles (Other Than Normally Satisfying Thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked outdoor coil or dirty air filter.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty outdoor-fan (cooling) or indoor-fan (heating) motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor Operates Continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low (cooling).	Reset thermostat.
	Low refrigerant charge.	Locate leak; repair and recharge.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Outdoor coil dirty or restricted.	Clean coil or remove restriction.
Compressor Makes Excessive Noise.	Compressor rotating in the wrong direction.	Reverse the 3-phase power leads as described in Start-Up.
Excessive Head Pressure.	Dirty outside air or return air filter (heating).	Replace filter.
	Dirty outdoor coil (cooling).	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condensing air restricted or air short-cycling.	Determine cause and correct.
Head Pressure Too Low.	Low refrigerant charge.	Check for leaks; repair and recharge.
	Compressor scroll plates defective.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive Suction Pressure.	High heat load.	Check for source and eliminate.
	Compressor scroll plates defective.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction Pressure Too Low.	Dirty air filter (cooling).	Replace filter.
	Dirty or heavily iced outdoor coil (heating).	Clean outdoor coil. Check defrost cycle operation.
	Low refrigerant charge.	Check for leaks; repair and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient indoor airflow (cooling mode).	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Field-installed filter drier restricted.	Replace.
	Outdoor ambient below 25°F (cooling).	Install low-ambient kit.
	Outdoor fan motor(s) not operating (heating).	Check fan motor operation.

CONVENIENCE OUTLETS

⚠ WARNING

ELECTRICAL OPERATION HAZARD

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

Units with convenience outlet circuits can use multiple disconnects. Check convenience outlet for power status before opening unit for service. Locate its disconnect switch, if appropriate, and open it. Apply lockout/tagout to this switch, if necessary.

Convenience Outlets: Two types of convenience outlets are offered on 50HCQ models: Non-powered and unit-powered. Both types provide a 125VAC/15A Ground-Fault Circuit Interrupter (GFCI) duplex receptacle behind a hinged waterproof access cover, located on the end panel of the unit. See Fig. 28.

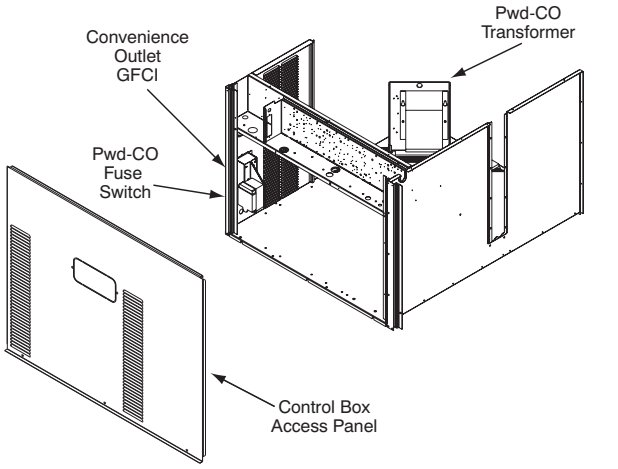


Fig. 28 - Convenience Outlet Location

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 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/tagout 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 are 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. 29.
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.

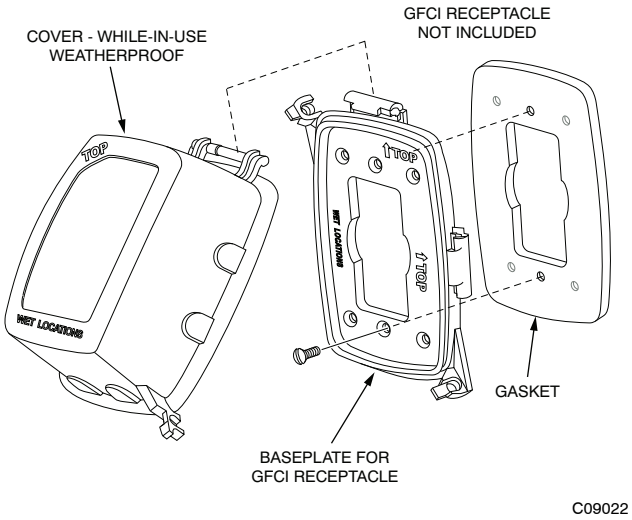


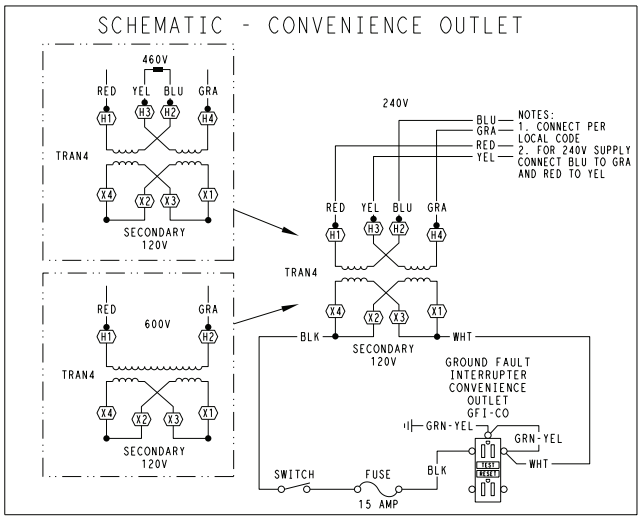
Fig. 29 - Weatherproof Cover Installation

Non-powered type — This type requires the field installation of a general-purpose 125VAC/15AC 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 125VAC 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 115VAC 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. 28.

The primary leads to the convenience outlet transformer are not factory-connected. Selection of primary power source is a customer-option. If local codes permit, the transformer primary leads can be connected at the line-side terminals on the unit-mounted non-fused disconnect or HACR breaker switch. This will provide service power to the unit when the unit disconnect switch or HACR switch is open. Other connection methods will result in the convenience outlet circuit being de-energized when the unit disconnect or HACR switch is open. See Fig. 30.

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 15 amps loading for continuous duty loads (such as electric heaters for overnight use). Observe a 50% limit on circuit loading above 8 amps (i.e., limit loads exceeding 8 amps to 30 minutes of operation every hour).



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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. 30 - Powered Convenience Outlet Wiring

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.

The Fuse on the powered type — The factory fuse is a Cooper Bussmann® Fusetron® 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 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.

HEAT PUMP CONTROLS

Central Terminal Board

The Central Terminal Board (CTB) is a large printed circuit board that is located in the center of the unit control box. This printed circuit board contains multiple termination strips and connectors to simplify factory control box wiring and field control connections. Terminals are clearly marked on the board surface. See Fig 31.

The CTB contains no software and no logic. But it does include seven configuration jumpers that are cut to configure the board to read external optional and accessory controls, including that the unit is a heat pump.

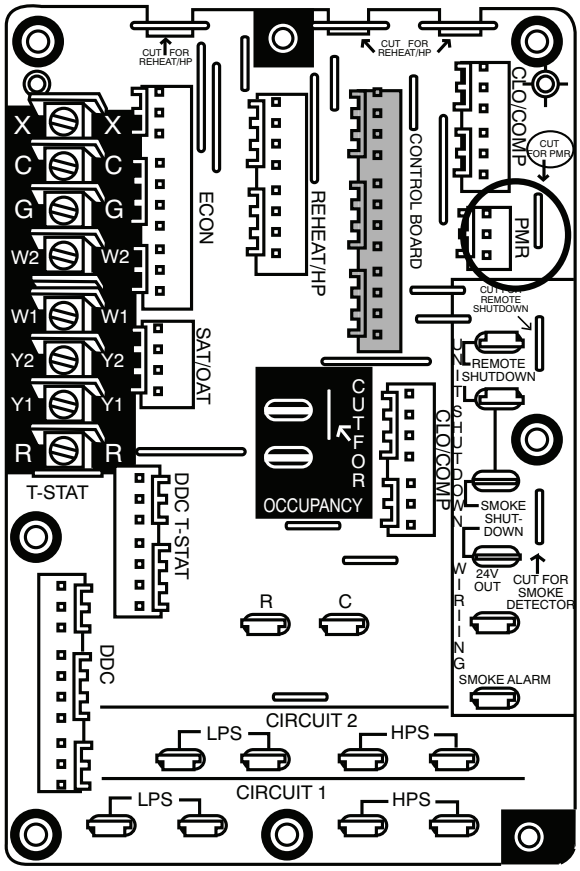

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Fig. 31 - Central Terminal Board (CTB)

Table 7 – Jumper Configuration

Jumper	Control Function	Note
JMP1	Phase Monitor	
JMP2	Occupancy Control	
JMP3	Smoke Detector Shutdown	
JMP4	Remote Shutdown	
JMP5	Heat Pump / Reheat	50HCQ default: Cut
JMP6	Heat Pump / Reheat	50HCQ default: Cut
JMP7	Heat Pump / Reheat	50HCQ default: Cut

Jumpers JMP5, JMP6 and JMP7 are located in notches across the top of the CTB. See Fig. 31. These jumpers are factory cut on all heat pump units. Visually check these jumpers to confirm that they have been cut.

PROTECTIVE CONTROLS

Compressor Protection

Over-current

The compressor has internal line-break motor protection.

Over-temperature:

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).

Loss of Charge Switch:

The system is protected against a loss of charge and low evaporator coil loading condition by a loss of charge switch located on the liquid line and a freeze protection thermostat on the indoor coil. The switch is stem-mounted. Loss of Charge Switch trip setting is 27 psig ± 3 psig (186 ± 21 kPa). Reset is automatic at 44 ± 3 psig (303 ± 21 kPa).

Freeze Protection Thermostat trip setting is 30°F ± 5°F (-1°C ± 3°C). Reset is automatic at 45°F ± 5°F (7°C ±3°C).

Supply (Indoor) Fan Motor Protection:

Disconnect all electrical power and apply appropriate Lock-out/Tagout procedures when servicing the fan motor.

Motors are equipped with an over-temperature device (Thermik), internal line break, external circuit breaker or electronic controlled circuits for overload protection. All protection schemes are automatically reset except for units having the 2-speed indoor fan option (VFD) or external circuit breakers. These two protection schemes are classified as manual reset. The type of device depends on several factors including motor size, voltage and other options in the unit (i.e. VFD).

The Thermik device is a snap-action over-temperature protection device that is imbedded in the motor windings. It is also a pilot-circuit device that is wired into the unit's 24V control circuit. When this device reaches its trip set point, it opens the 24V control circuit and causes all unit operation to stop. This device resets automatically when the motor windings cool. Do not bypass this device to correct trouble. Determine the cause of the problem and correct it.

The External motor overload device is a specially-calibrated circuit breaker that is UL recognized as a motor overload controller. It is an over-current device. When the motor current exceeds the circuit breaker set point, the device opens all motor power leads and the motor shuts down. Reset requires a manual reset at the overload switch. This device (designated IFCB) is located on the side of the supply fan housing, behind the fan access panel.

Troubleshooting supply fan motor overload trips — The supply fan used in the 50HCQ units is a forward-curved centrifugal wheel. At a constant wheel speed, this wheel has a characteristic that causes the fan shaft load to DECREASE when the static pressure in the unit-duct system increases and to INCREASE when the static pressure in the unit-duct system decreases (and fan airflow rate increases). Motor overload conditions typically develop when the unit is operated with an access panel removed, with unfinished duct work, in an economizer-open mode, or a leak develops in the duct system that allows a bypass back to unit return opening.

Outdoor Fan Motor Protection:

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

Control Circuit, 24V

The control circuit is protected against over-current conditions by a circuit breaker mounted on control transformer TRAN. The Control Circuit is reset manually.

COMMERCIAL DEFROST CONTROL

The Commercial Defrost Control Board (DFB) coordinates thermostat demands for supply fan control, 1 or 2 stage cooling, 2 stage heating, emergency heating and defrost control with unit operating sequences. The DFB also provides an indoor fan off delay feature (user selectable). See Fig. 32 for board arrangement.

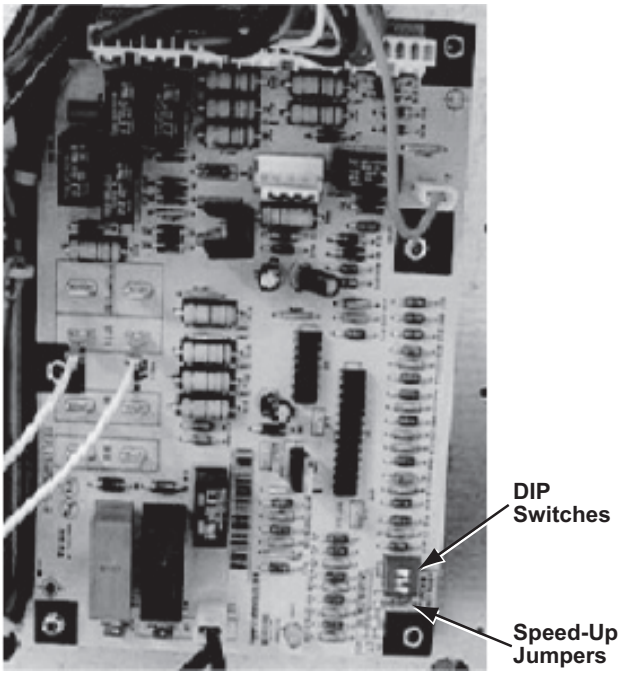

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Fig. 32 - Defrost Control Board Arrangement

The DFB is located in the 50HCQ's main control box (see Fig. 33). All connections are factory-made through harnesses to the unit's CTB, to IFC (belt-drive motor) or to ECM (direct-drive motor), reversing valve solenoids and to defrost thermostats. Refer to Table 8 for details of DFB Inputs and Outputs. Detailed unit operating sequences are provided in the Operating Sequences section starting on page 72.

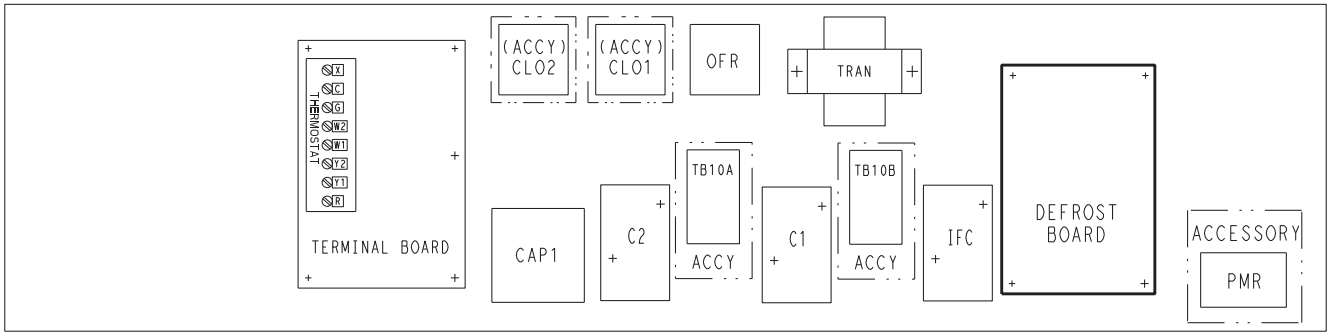

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Fig. 33 - Defrost Control Board Location

Table 8 – 50HCQ Defrost Board I/O and Jumper Configurations

Inputs

Point Name	Type of I/O	Connection Pin Number	Unit Connection	Note
G Fan	DI, 24Vac	P2–3	LCTB–G	
Y1 Cool 1	DI, 24Vac	P2–5	LCTB–Y1	
Y2 Cool 2	DI, 24Vac	P2–4	LCTB–Y2	
W1 Heat 1	DI, 24Vac	P2–7	LCTB–W1	
W2 Heat 2	DI, 24Vac	P2–6	LCTB–W2	
R Power	24Vac	P3–1	CONTL BRD–8	
C Common	24Vac	P3–2	CONTL BRD–4	
DFT1	DI, 24Vac	DFT–1 to DFT–1		
DFT 2	DI, 24Vac	DFT–2 to DFT–2		

Outputs

Point Name	Type of I/O	Connection Pin Number	Unit Connection	Note
IFO Fan On	DO, 24Vac	P3–9	REHEAT–2	
OF OD Fan On	DO, 24Vac	OF	OFR	
RVS1	DO, 24Vac	P3–7 to P3–5		Energize in COOL
RVS2	DO, 24Vac	P3–6 to P3–4		Energize in COOL
COMP 1	DO, 24Vac	P3–10	FPT – REHEAT–6	
COMP 2	DO, 24Vac	P3–8	REHEAT–8	
HEAT 2	DO, 24Vac	E–HEAT	HC–1 (TB4–1)	
COM	24Vac	P3–3	HC–1 (TB4–3)	

Configuration

Point Name	Type of I/O	Connection Pin Number	Unit Connection	Note
Select Jumper	24Vac	P1–1		
2 Compressor	24Vac	P1–3		Use for 50HCQD

Speed-Up Configuration

Point Name	Type of I/O	Connection Pin Number	Unit Connection	Note
Speed–Up Jumper		JMP17		
Speed–Up Jumper		JMP18		

Jumper for 1-3 seconds: Factory Test, defrost runs for 9 seconds
Jumper for 5-20 seconds: Forced Defrost, defrost runs for 30 seconds if DFT2 is open

Reversing valve control — The DFB has two outputs for unit reversing valve control. Operation of the reversing valves is based on internal logic; this application does not use an “O” or “B” signal to determine reversing valve position. Reversing valves are energized during the cooling stages and the defrost cycle and de-energized during heating cycles. Once energized at the start of a cooling stage, the reversing valve will remain energized until the next heating cycle demand is received. Once de-energized at the start of a Heating cycle, the reversing valves will remain de-energized until the next cooling stage is initiated.

Compressor control — The DFB receives inputs indicating Stage 1 Cooling, Stage 2 Cooling (sizes 08 - 12) and Stage 1 Heating from the space thermostat or unit control system (PremierLink® or RTU-OPEN); it generates commands to start compressors with or without reversing valve operation to produce Stage 1 Cooling (one compressor), Stage 2 Cooling (both compressors run) or Stage 1 Heating (both compressors run on 8-12 systems. The 04-07 systems have only one compressor).

Auxiliary (Electric) Heat control — The 50HCQ unit can be equipped with one or two auxiliary electric heaters, to provide a second stage of heating. The DFB will energize this Heating System for a Stage 2 Heating Command (heaters operate concurrently with compressor(s) in the Stage 1 Heating cycle), for an Emergency Heating sequence (compressors are off and only the electric heaters are energized) and also during the Defrost cycle (to eliminate a "cold blow" condition in the space).

Defrost — The defrost control mode is a time/temperature sequence. There are two time components: The continuous run period and the test/defrost cycle period. The temperature component is provided by Defrost Thermostat 1 and 2 (DFT1 and DFT2 (A08-D09 only) mounted on the outdoor coil.

The continuous run period is a fixed time period between the end of the last defrost cycle (or start of the current Heating cycle) during which no defrost will be permitted. This period can be set at 30, 60, 90 or 120 minutes by changing the positions of DIP switches SW1 and SW2 (see Fig. 34 and Table 9). The default run periods are 60 minutes for unit sizes 04-06, 30 minutes for unit size 07, 90 minutes for unit sizes 08-09 and 60 minutes for unit size 12.

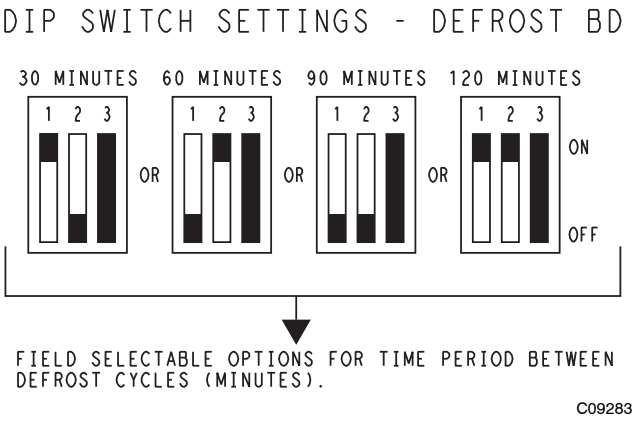

Fig. 34 - DIP Switch Settings — Defrost Board

At the end of the continuous run period, the defrost control will test for a need to defrost. On unit sizes 04-07 (single compressor designs), DFT1 controls the start and termination of the defrost cycle. If DFT1 is still open, the defrost test/run window is closed and the control repeats the continuous run period. If DFT1 is closed, the defrost cycle is initiated. The defrost period will end when DFT1 opens (indicating the outdoor coil has been cleared of frost and ice) or a 10 minute elapsed period expires, whichever comes first.

On unit sizes 08 and 12 (two circuit designs), DFT2 (located on the bottom circuit of the outdoor coil on the 08-09 size and the outdoor coil with two bends on the 12 size) controls the start and termination of the defrost cycle. If DFT2 is still open, the defrost test/run window is closed and the control repeats the continuous run period. If DFT2 is closed, the defrost cycle is initiated in Circuit 2. The defrost period will end when DFT2 opens (indicating the outdoor coil has been cleared of frost and ice) or a 10 minute elapsed period expires, whichever comes first.

On sizes 08-12, Circuit 1's defrost thermostat DFT1 (located on the upper circuit of the outdoor coil on 08-09 size and the outdoor coil with one bend on the -12 size.) cannot initiate a unit defrost cycle; only DFT2 can do this. But once Circuit 2 is in defrost, the DFB will monitor the status of DFT1. If DFT1 closes during a Circuit 2 defrost cycle, Circuit 1 will also enter a defrost cycle. Circuit 1's defrost cycle will end when DFT1 opens (indicating the upper portion of the outdoor coil is cleared of frost and ice) or the Circuit 2 defrost cycle is terminated.

At the end of the unit defrost cycle, the unit will be returned to Heating cycle for a full continuous run period.

If the space heating load is satisfied and compressor operation is terminated, the defrost control will remember where the run period was interrupted. On restart in Heating, the defrost control will resume unit operation at the point in the run period where it was last operating.

Defrost Thermostats — These are temperature switches that monitor the surface temperature of the outdoor coil circuits. These switches are mounted on the liquid tube exiting the outdoor coil heating circuits. These switches close on temperature drop at 30°F (-1°C) and reset open on temperature rise at 80°F (27°C).

Indoor Fan Off Delay — The DFB can provide a 60 sec delay on Indoor Fan Off if the thermostat's fan selector switch is set on AUTO control. DIP Switch SW3 on the DFB selects use of the fan off time delay feature. Setting SW3 in the OPEN position turns the Fan Off Delay feature on; setting SW3 in the CLOSED position disables this feature. The delay period begins when Y1 demand or W1 demand by the space thermostat is removed.

Defrost Speedup Functions — The DFB permits the servicer to speed-up the defrost cycle. There are two speed-up sequences: relative speed-up and an immediate forced defrost. Speed-up sequences are initiated by shorting jumper wires JMP17 and JMP18 together (see Fig. 32); use a flat-blade screwdriver.

Shorting the jumpers for a period of 1 to 3 seconds reduces the defrost timer periods by a factor of 0.1 sec/minute. (For example, the 90 minute run period is reduced to 9 seconds) The DFB will step the unit through a Heating cycle and a Defrost cycle using these reduced time periods. This mode ends after the Defrost cycle.

Table 9 – Dip Switch Position

Switch No.	1	2		1	2		1	2		1	2		3	
1			1		■	1	■		1	■	■	1		On
0	■	■	0	■		0		■	0			0	■	Off
	90 minutes			60 minutes			30 minutes			120 minutes			Fan Delay	

Shorting the jumpers for a period of 5 to 20 secs bypasses the remaining continuous run period and places the unit in a Forced Defrost mode. If the controlling DFT is closed when this mode is initiated, the unit will complete a normal defrost period that will terminate when the controlling DFT opens or the 10 minute defrost cycle limit is reached. If the controlling DFT is open when this mode is initiated, the Defrost cycle will run for 30 secs. Both modes end at the end of the Defrost cycle.

ELECTRIC HEATERS

50HCQ 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, line-break limit switches and a control contactor. One or two heater modules can be used in a unit.

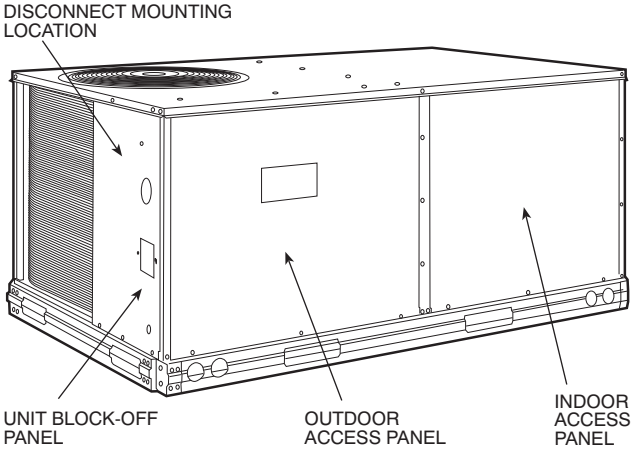

Fig. 35 - Typical Access Panel Location (3-6 Ton)

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. 35, Fig. 36 and Fig. 37.

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 re approved heaters.

Unit heaters are marked with Heater Model Numbers. However, heaters are ordered as and shipped in cartons marked with a corresponding heater Sales Package part number. See Table 10 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).

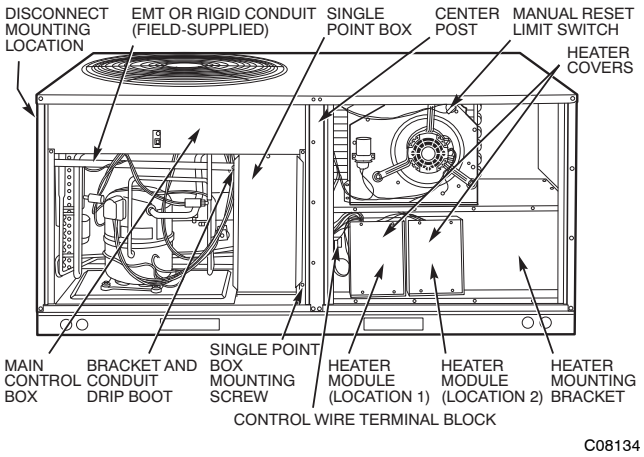

Fig. 36 - Typical Component Location

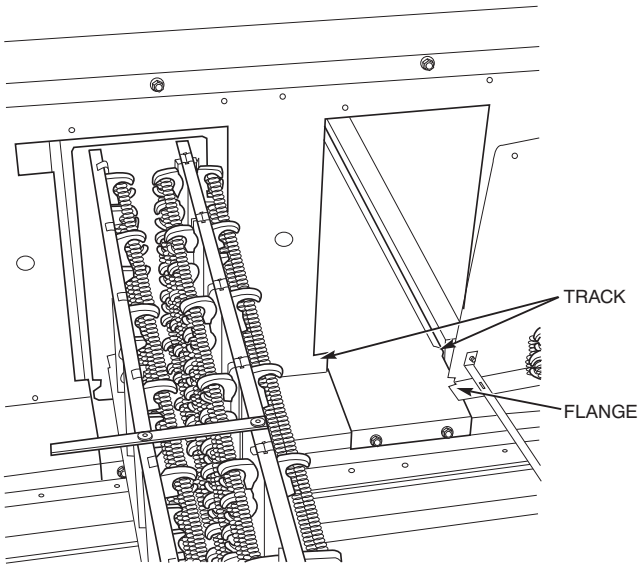

Fig. 37 - Typical Module Installation

Table 10 – Heater Model Number

Bare Heater Model Number	C	R	H	E	A	T	E	R	0	0	1	A	0	0
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	0	0

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. 38.

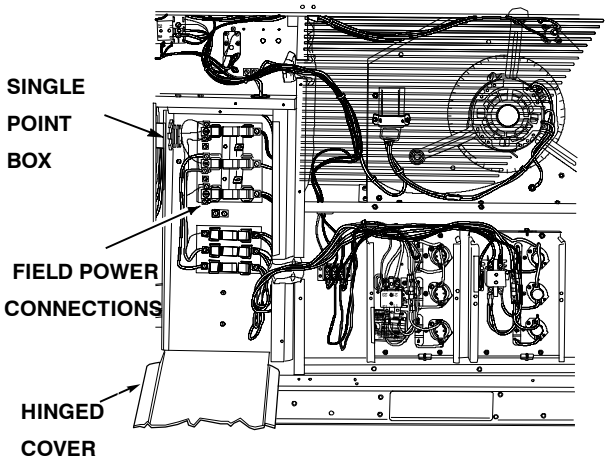

Fig. 38 - Typical Single Point Installation

On 50HCQ units, all fuses are 60A. Single point boxes containing fuses for 208/230V applications use UL Class RK5 250V fuses (Bussmann FRNR 60 or Shawmut TR 60R). Single point boxes for 460V and 575V applications use UL Class T 600V 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 text below re: "Completing Heater Installation") inside the empty Single Point Box using UL-approved connectors.

Safety Devices — Electric heater applications use a combination of line-break/auto-reset limit switches and a pilot-circuit/manual reset limit switch to protect the unit against over-temperature situations.

Line-break/auto-reset limit switches are mounted on the base plate of each heater module. See Fig. 39. 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. 36 and Fig 39.

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.

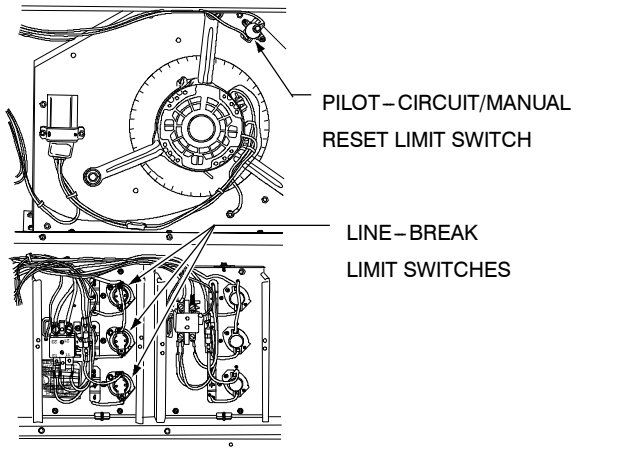

Fig. 39 - Typical Location of Heater Limit Switches (3-phase heater shown)

Low-Voltage Control Connections — Pull the low-voltage control leads from the heater module(s). The 50HCQ units use a various number of control wires, colors and terminal boards depending on voltage and unit size. See Fig. 40 through Fig. 43 and the unit wiring diagram for proper placement.

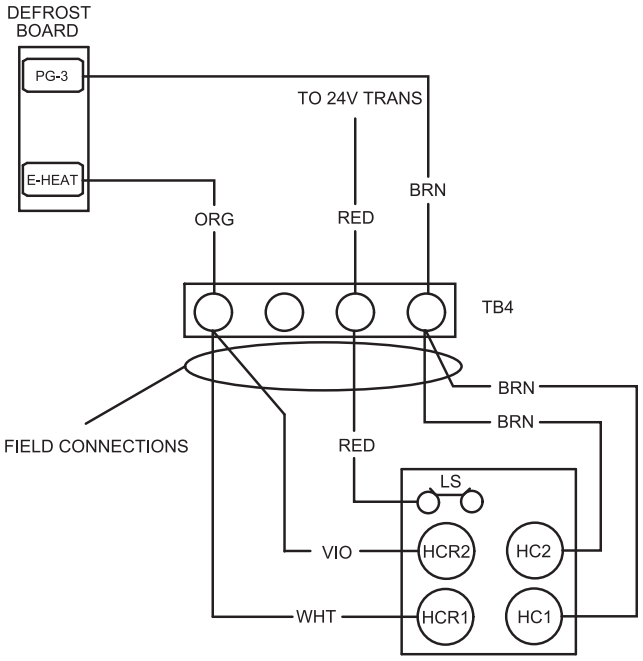

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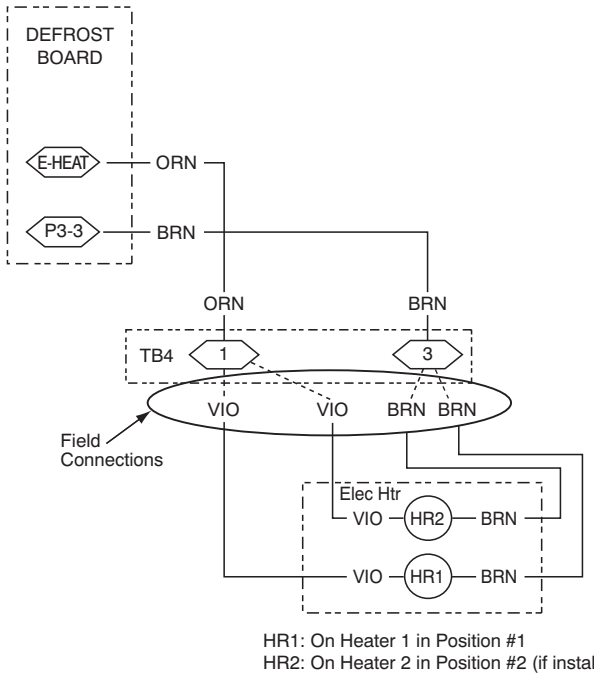
Fig. 40 - Accessory Electric Heater Control Connections (HP-2, Size 06, 575V Only)



HR1: On Heater 1 in Position #1
HR2: On Heater 2 in Position #2 (if installed)

C09013

Fig. 41 - Accessory Electric Heater Control Connections (HP-1 Except Size 12 and 121, HP-2 Except Size 12)

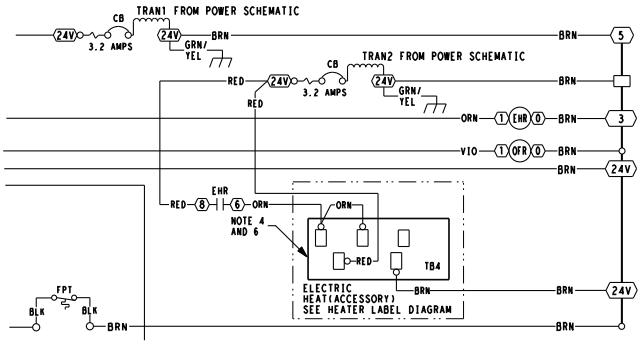


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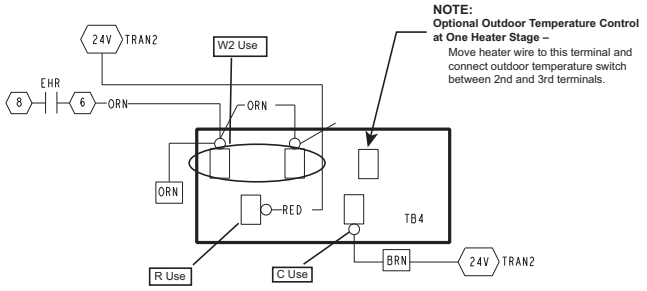
Fig. 42 - TB4 Wiring (HP Only)



C10604

Fig. 43 - TB4 Terminal Use (HP Only)

SMOKE DETECTORS

Smoke detectors are available as factory-installed options (FIOP) on 50HCQ models. Smoke detectors can be specified for Supply Air only or for Return Air with or without 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 can 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. 44) 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).

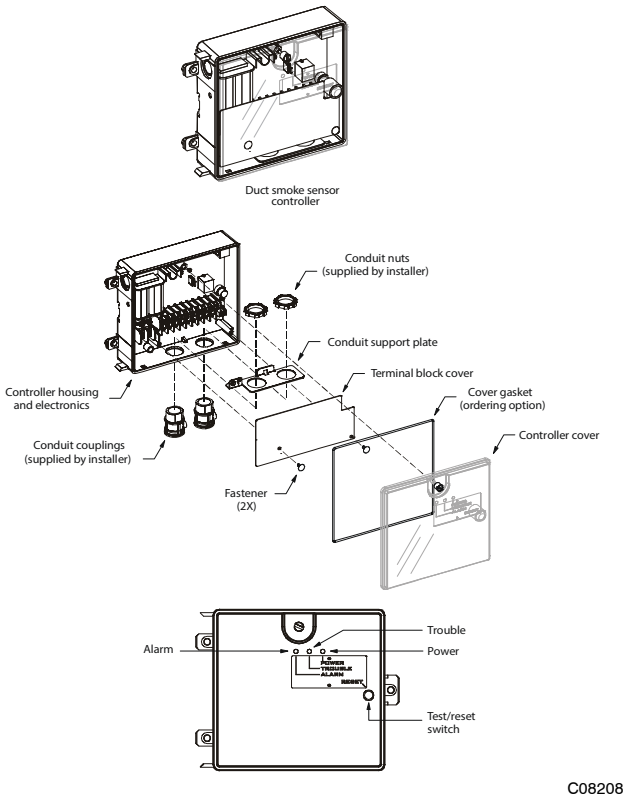


Fig. 44 - Controller Assembly

Sensor

The sensor (see Fig. 45) 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).

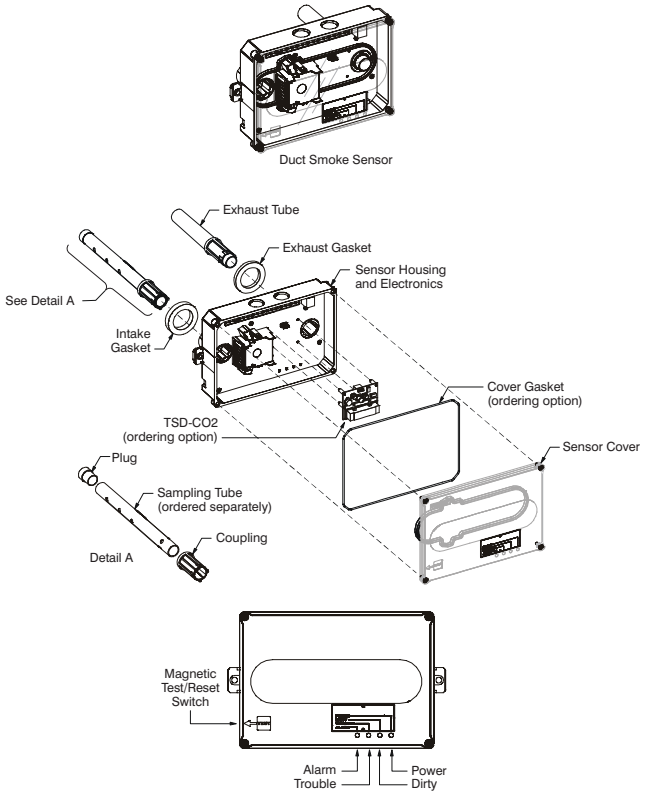


Fig. 45 - Smoke Detector Sensor

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.

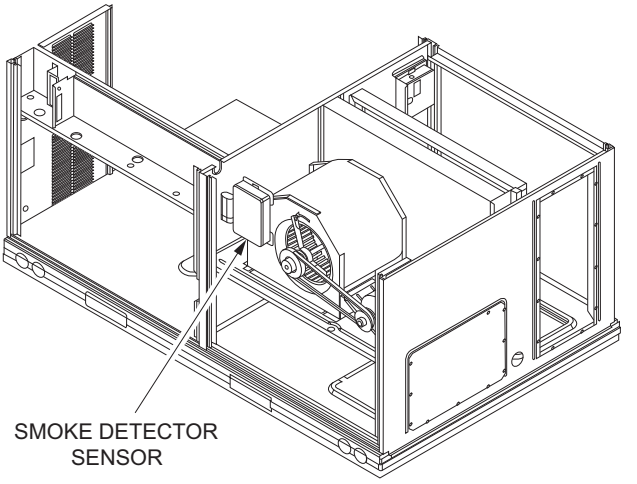
The sensor uses a process called *Differential Sensing* to prevent gradual environmental changes from triggering false alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the sensor to signal an

alarm state but dust and debris accumulated over time does not.

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

Smoke Detector Locations

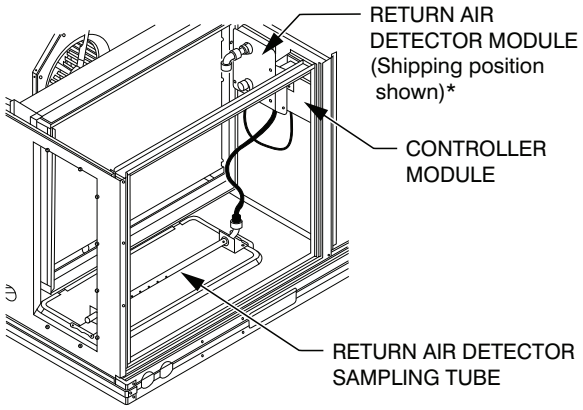
Supply Air — The Supply Air smoke detector sensor is located to the left of the unit's indoor (supply) fan. See Fig. 46. Access is through the fan access panel. There is no sampling tube used at this location. The sampling tube inlet extends through the side plate of the fan housing (into a high pressure area). The controller is located on a bracket to the right of the return filter, accessed through the lift-off filter panel.



C08245

Fig. 46 - Typical Supply Air Smoke Detector Sensor Location

Return Air without Economizer — The sampling tube is located across the return air opening on the unit base pan. See Fig. 47. The holes in the sampling tube face downward, into the return air stream. The sampling tube is connected by tubing to the return air sensor that is mounted on a bracket high on the partition between return filter and controller location. (This 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 "Completing Installation of Return Air Smoke Sensor" for installation.)

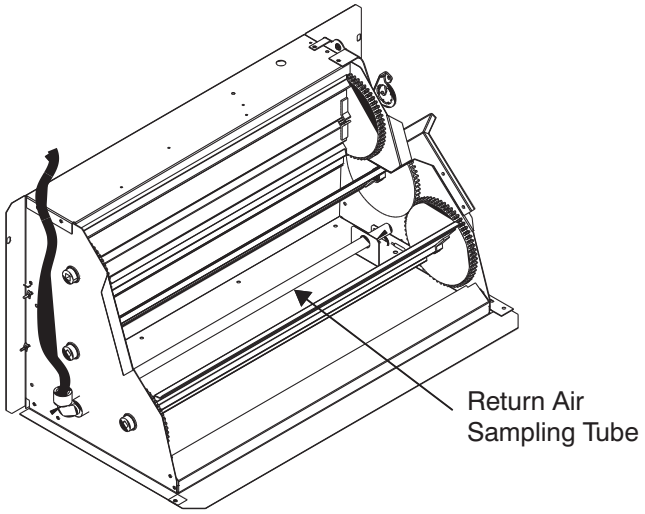


*RA detector must be moved from shipping position to operating position by installer

C07307

Fig. 47 - Typical Return Air Detector Location

Return Air 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 base pan. See Fig. 48. The holes in the sampling tube face downward, into the return air stream. The sampling tube is connected via tubing to the return air sensor that is mounted on a bracket high on the partition between return filter and controller location. (This 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 "Completing Installation of Return Air Smoke Sensor" for installation steps.)



C08129

Fig. 48 - Return Air Sampling Tube Location

Completing Installation of Return Air Smoke Sensor

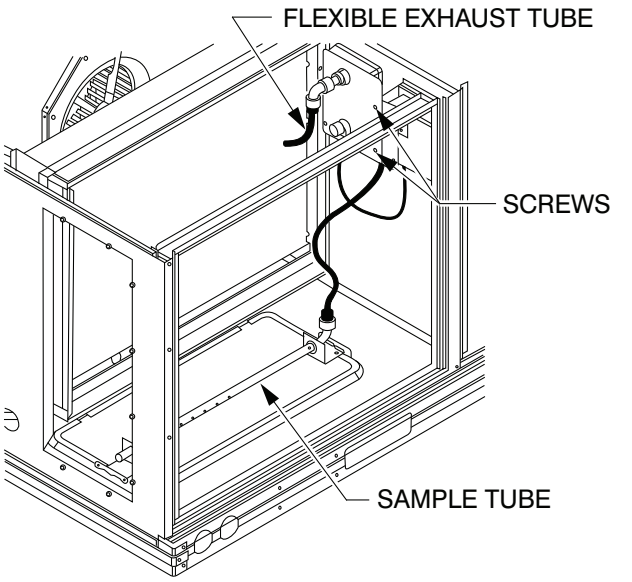


Fig. 49 - Return Air Detector Shipping Position

1. Unscrew the two screws holding the Return Air Sensor detector plate. See Fig. 49. Save the screws.
2. Remove the Return Air Sensor 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. 50.

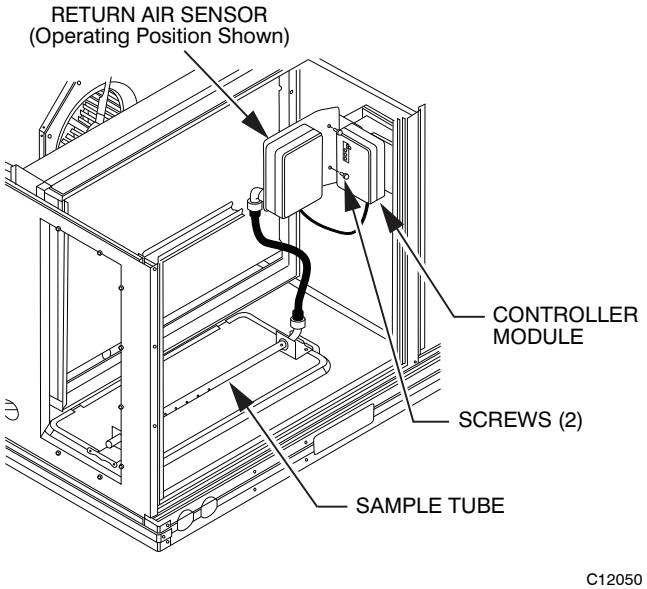


Fig. 50 - Return Air Sensor Operating Position

4. Screw the sensor and detector plate into its operating position using screws from Step 1. Make sure the sampling tube connection is on the bottom and the exhaust tube is on the top. See Fig. 50.
5. Connect the flexible tube on the sampling inlet to the sampling tube on the base pan.
6. For units with an economizer, the sampling tube is integrated into the economizer housing but the connection of the flexible tubing to the sampling tube is the same.

FIOP Smoke Detector Wiring and Response

All units: FIOP smoke detector is configured to automatically shut down all unit operations when smoke condition is detected. See Fig. 51, Typical Smoke Detector System 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: 24V power signal via ORN lead is removed at Smoke Detector input on CTB (Control Terminal Board); all unit operations cease immediately.

PremierLink Control: 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 24V power to GRA conductor.

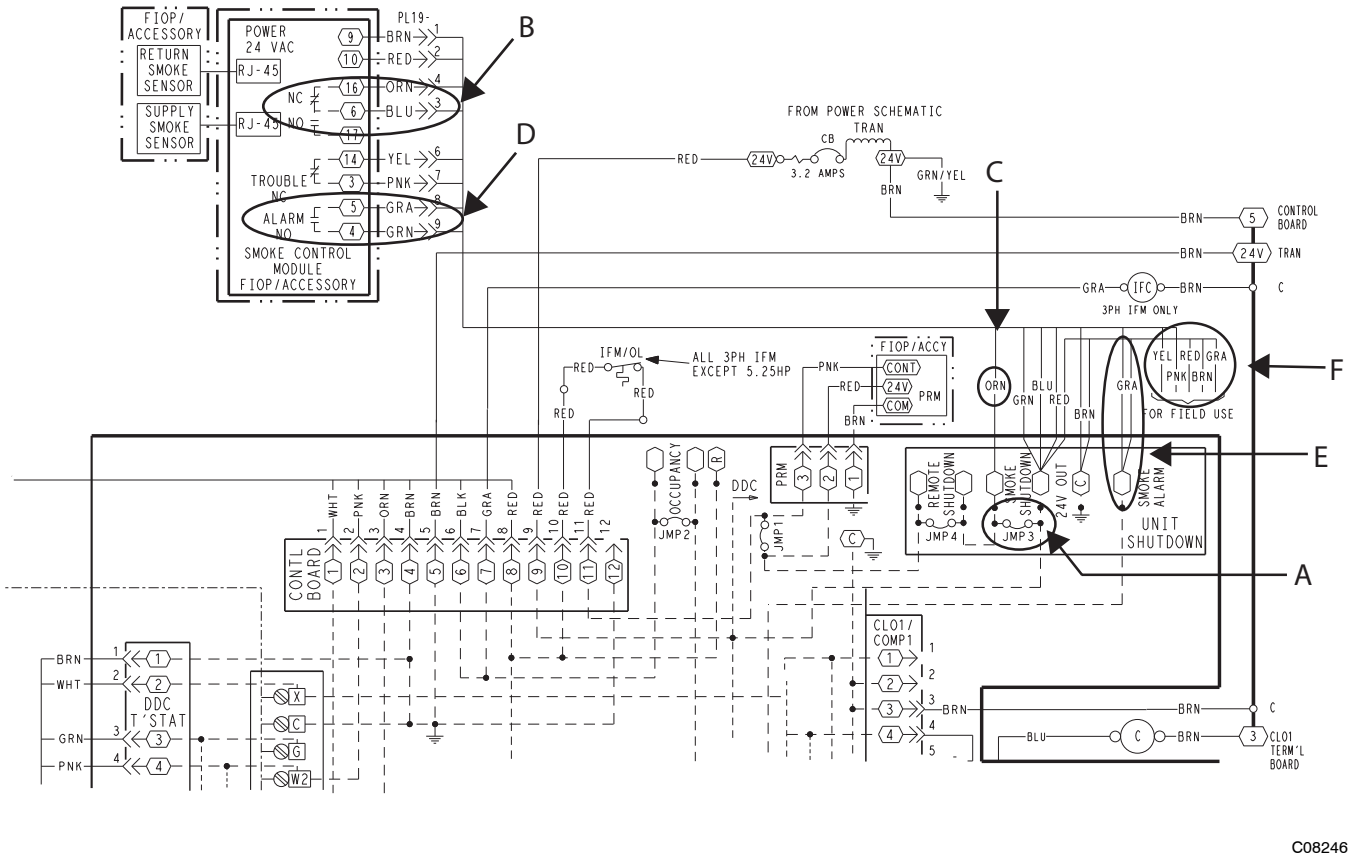
Highlight E: GRA lead at Smoke Alarm input on CTB provides 24V signal to FIOP DDC control.

PremierLink: This signal is conveyed to PremierLink FIOPs 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 24V signal is conveyed to RTU-OPEN's 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. 51) for additional annunciation functions.

Additional Application Data — Refer to Catalog No. HKRNKA-1XA for discussions on additional control features of these smoke detectors including multiple unit coordination. See Fig. 51.



C08246

Fig. 51 - Typical Smoke Detector System Wiring

Sensor and Controller Tests

Sensor Alarm Test

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

NOTICE

OPERATIONAL TEST ALERT

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 Light Emitting Diode (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.

NOTICE

OPERATIONAL TEST ALERT

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.

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.

Dirty Controller Test

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

NOTICE

OPERATIONAL TEST ALERT

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. You must use a field provided SD-MAG test magnet to initiate a sensor dirty test. The sensor's Dirty LED indicates the results of the dirty test as shown in Table 11.

NOTICE

OPERATIONAL TEST ALERT

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 11 – 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.

NOTICE

OPERATIONAL TEST ALERT

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.

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.

NOTICE

OPERATIONAL TEST ALERT

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.

NOTICE

OPERATIONAL TEST ALERT

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.

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. 52 and configured to operate the controller's supervision relay. For more information, see "Changing the Dirty Sensor Test."

NOTICE

OPERATIONAL TEST ALERT

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 Test Set:

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

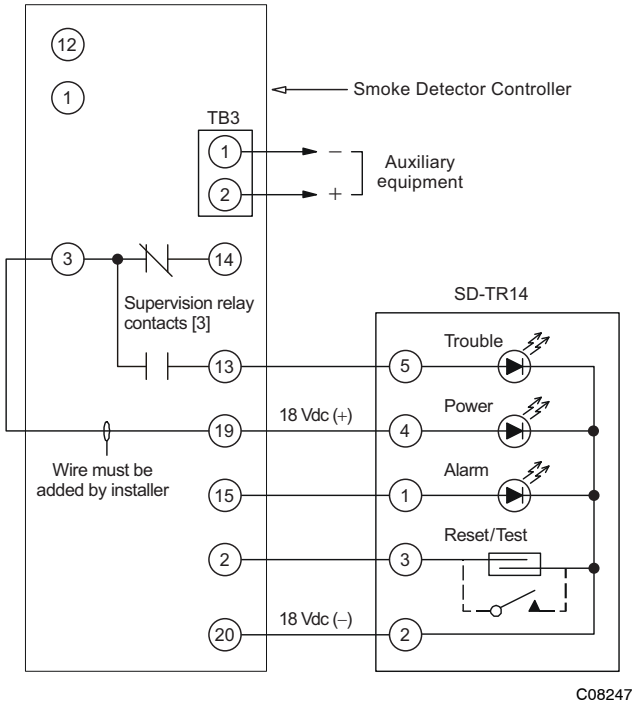


Fig. 52 - Remote Test/Reset Station Connections

Table 12 – 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.

Detector Cleaning

Cleaning the Smoke Detector:

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

NOTICE

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. 53.
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 then lift the housing away from the printed circuit board.
4. Gently remove dirt and debris from around the optic plate and inside the optic housing.
5. Replace the optic housing and sensor cover.
6. Connect power to the duct detector then perform a sensor alarm test.

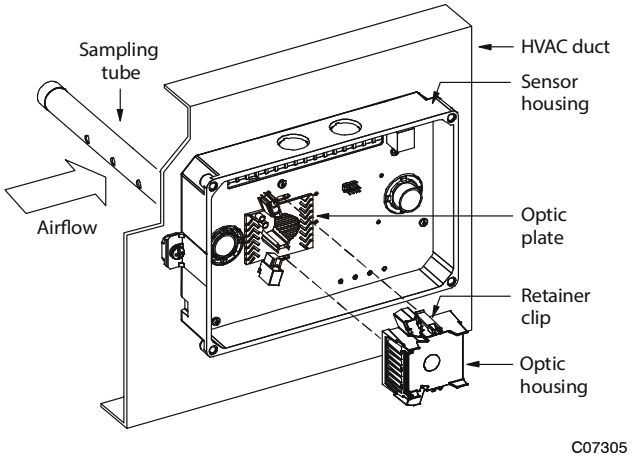


Fig. 53 - Sensor Cleaning Diagram

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 12. 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. 54.
- If a sensor trouble, the sensor's Trouble LED and 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.

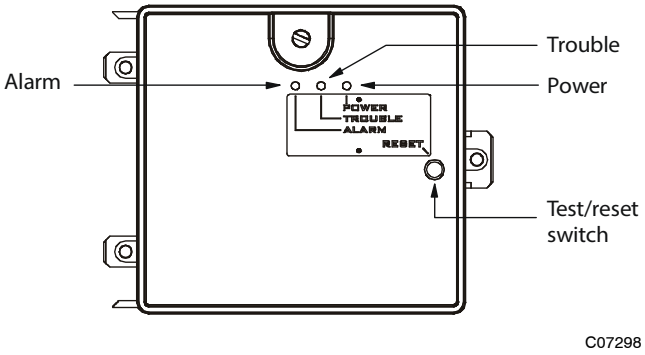


Fig. 54 - Controller Assembly

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. Ensure 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. 52. Repair or replace loose or missing wiring.
2. Configure the sensor dirty test to activate the controller's supervision relay. See "To Configure the Dirty Sensor Test Operation" for details.

Sensor's Trouble LED is On, But the Controller's Trouble LED is OFF:

Remove JP1 on the controller.

Supply Air Temperature (SAT) Sensor — On FIOP-equipped 50HCQ unit, the unit is supplied with a supply-air temperature (SAT) sensor (p/n:33ZCSENSAT). This sensor is a tubular probe type, approx 6-inches (12.7 mm) in length. It is a nominal 10-k ohm thermistor. See *PremierLink ™ Installation, Start-Up and Configuration Instructions*. for temperature-resistance characteristic.

PREMIERLINK™ CONTROL

The PremierLink controller (see Fig. 55) is compatible with Carrier Comfort Network® (CCN) devices. This control is designed to allow users the access and ability to change factory-defined settings, thus expanding the function of the standard unit control board. CCN service access tools include System Pilot™, Touch Pilot™ and Service Tool. Standard tier display tools Navigator™ and Scrolling Marquee are not suitable for use with latest PremierLink controller (Version 2.x).

The PremierLink control is factory-mounted in the 50HCQ unit's main control box to the left of the CTB. Factory wiring is completed through harnesses connected to the LVTB. Field connections are made at a 16-pole terminal block (TB1) located on the bottom shelf of the unit control box in front of the PremierLink controller The factory-installed PremierLink control includes the supply-air temperature (SAT) sensor. The outdoor air temperature (OAT) sensor is included in the FIOP/accessory EconoMi$er 2 package.

Refer to Fig. 55 for PremierLink connection locations.

NOTE: Refer to *PremierLink ™ Installation, Start-Up and Configuration Instructions*. Have a copy of this manual available at unit start-up.

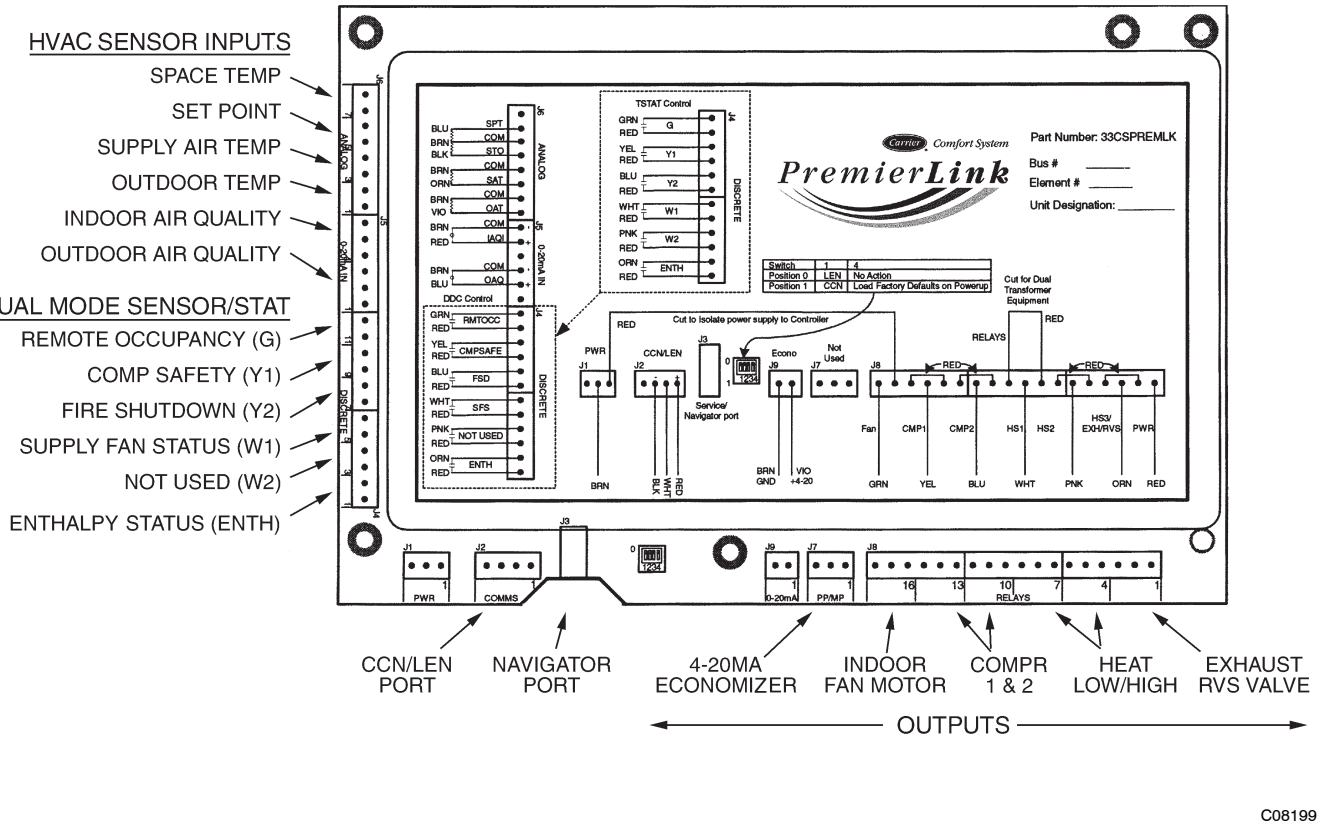


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Fig. 55 - PremierLink Controller

RTU-OPEN CONTROL SYSTEM

RTU-Open Controller

The RTU-OPEN controller is an integrated component of the Carrier rooftop unit. Its internal application programming provides optimum performance and energy efficiency. RTU-OPEN enables the unit to run in 100% stand-alone control mode, Carrier's I-Vu Open network, or a Third Party Building Automation System (BAS). On-board DIP switches allow you to select your protocol (and baud rate) of choice among the four most popular protocols in use today: BACnet, Modbus, Johnson N2 and LonWorks. (See Fig. 56.)

Carrier's diagnostic display tools such as Field Assistant BACview6 Handheld or Virtual BACview can be used with the RTU-OPEN controller. Access is available via a 5-pin J12 access port.

SENSORY/ACCESSORY INSTALLATION

There are a variety of sensors and accessories available for the RTU-OPEN. Some of these can be factory or field installed, while others are only field installable. The RTU-OPEN controller can also require connection to a building network system or building zoning system. All field control wiring that connects to the RTU-OPEN must be routed through the raceway built into the corner post of the unit or secured to the unit control box with electrical conduit. The unit raceway provides the UL required clearance between high and low-voltage wiring. Pass the control wires through the hole provided in the corner post, then feed the wires thorough the raceway to the RTU-OPEN. Connect the wires to the removable Phoenix connectors and then reconnect the connectors to the board. See Fig. 56.

IMPORTANT: Refer to the specific sensor or accessory instructions for its proper installation and for rooftop unit installation refer to base unit installation instructions and the unit's wiring diagrams.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Disconnect all electrical power to the unit and use appropriate Lock-out/Tagout procedures before wiring the RTU-OPEN controller.

ADDITIONAL RTU-OPEN INSTALLATION AND TROUBLESHOOTING

Refer to the following manuals: *"Controls, Start-up, Operation and Troubleshooting Instructions,"* and *"RTU Open Installation and Start-up Guide"* for additional installation, wiring and troubleshooting information for the RTU-OPEN Controller. Have a copy of this manual available at unit start-up.

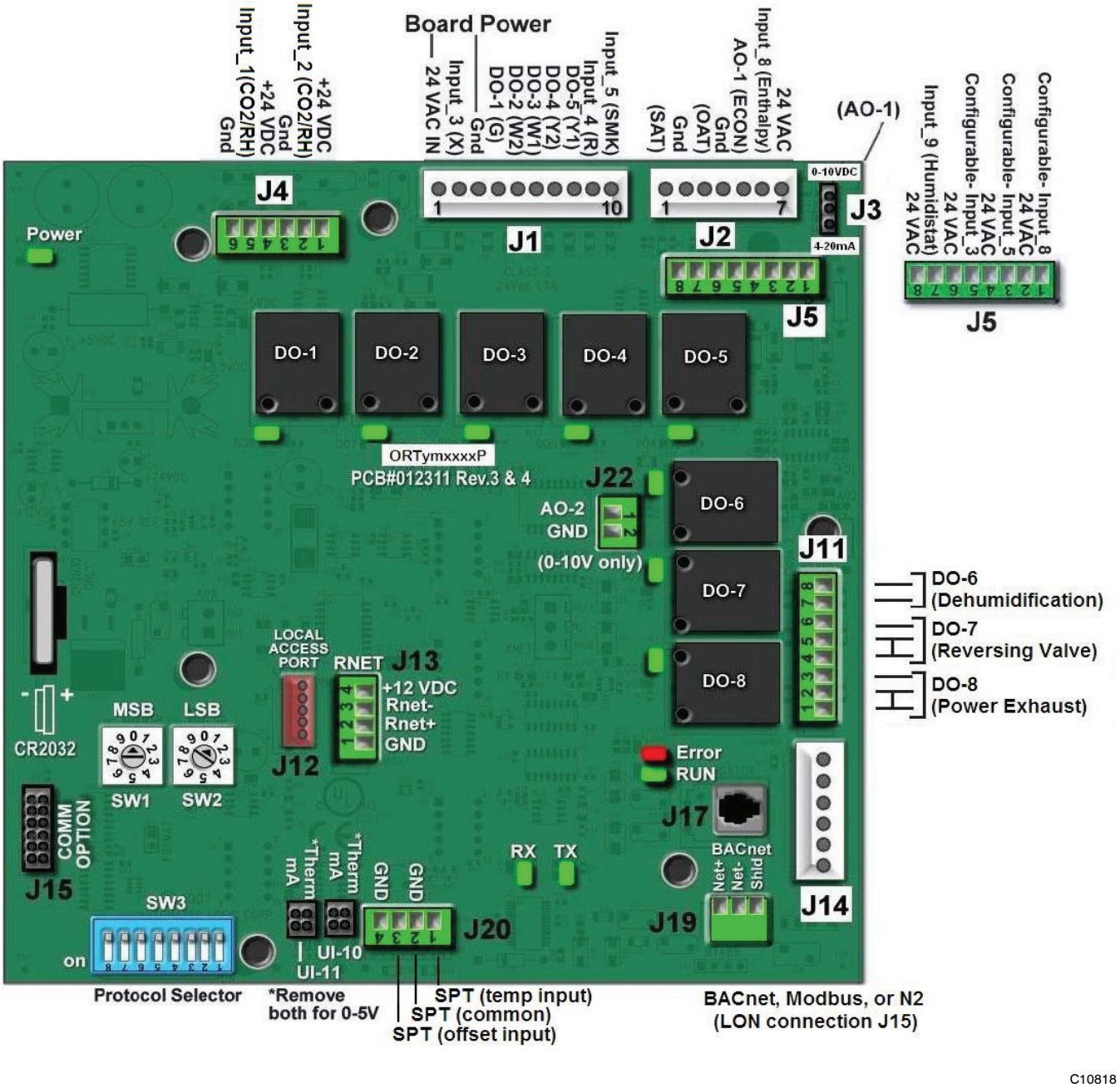

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Fig. 56 - RTU-OPEN Control Module

PRE-START-UP

START-UP

⚠ WARNING

PERSONAL INJURY HAZARD

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

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

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning 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.

⚠ WARNING

PERSONAL INJURY AND ENVIRONMENTAL HAZARD

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

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

Wear safety glasses and leather gloves when handling refrigerants.

Keep torches and other ignition sources away from refrigerants and oils.

3. Perform 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 all electrical 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. Ensure that condenser-fan blades are correctly positioned in fan orifice. See Condenser-Fan Adjustment section for more details.
   b. Ensure all air filters are in place.
   c. Ensure that condensate drain trap is filled with water to ensuring proper drainage.
   d. Ensure that all tools and miscellaneous loose parts have been removed.

START-UP, GENERAL

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. See troubleshooting section for alarms. Inspect the SAT sensor for relocation as intended during installation. Inspect special wiring as directed below.

Unit Preparation

Ensure the unit has been installed in accordance with installation instructions and applicable codes.

Return-Air Filters

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

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.

Compressor Rotation

⚠ CAUTION

EQUIPMENT DAMAGE

Failure to follow this caution can result in equipment damage.

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 gauges 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:

1. Note that the evaporator fan is probably also rotating in the wrong direction.
2. Turn off power to the unit and apply lockout/tagout procedures.
3. Reverse any two of the unit power leads.
4. 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.

Refrigerant Service Ports

Each unit system has two $^1/_4$" 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.

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 to AUTO. position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor. (D08–12: Second stage of thermostat will energize Circuit 2 contactor, start Compressor 2.)

Check unit charge. Refer to Refrigerant Charge section.

Reset thermostat at a position above room temperature. Compressor will shut off. Evaporator fan will shut off after a 60-second delay if the dip switch for the indoor fan off delay on the Defrost Control Board (DFB) is set to on.

To shut off unit - set system selector switch to the OFF position. Resetting thermostat at a position above room temperature shuts the 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 compressor heating (D08–12: both compressors will start). Second stage of thermostat energizes 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.

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. Supply fan operates continuously to provide constant air circulation.

START-UP, PREMIERLINK™

⚠ 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 Communication Network (CCN) 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 setpoints from a zone sensor or terminal control module. During start-up, the Carrier software can also be used to verify communication with PremierLink controller.

NOTICE

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 all power and communication connections ensuring the are properly connected and securely tightened.
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. Ensure all area around the unit is clear of construction dirt and debris.
5. Ensure final filters are installed in the unit. Dust and debris can adversely affect system operation.
6. Verify the PremierLink controls are properly connected to the CCN bus.

START-UP, RTU-OPEN

NOTICE

SET-UP INSTRUCTIONS

Refer to the following manuals for additional 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 13 – Torque Values

Supply fan motor mounting	120 ± 12 in–lbs	13.6 ± 1.4 Nm
Supply fan motor adjustment plate	120 ± 12 in–lbs	13.6 ± 1.4 Nm
Motor pulley setscrew	72 ± 5 in–lbs	8.1 ± 0.6 Nm
Fan pulley setscrew	72 ± 5 in–lbs	8.1 ± 0.6 Nm
Blower wheel hub setscrew	72 ±5 in–lbs	8.1 ±0.6 Nm
Bearing locking collar setscrew	55 to60 in–lbs	6.2 to 6.8 Nm
Compressor mounting bolts	65 to75 in–lbs	7.3 to 7.9 Nm
Condenser fan motor mounting bolts	65 to75 in–lbs	7.3 to 7.9 Nm
Condenser fan motor mounting bolts	20 ± 2 in–lbs	2.3 ± 0.2 Nm
Condenser fan hub setscrew	84 ± 12 in–lbs	9.5 ± 1.4 Nm

A04–06 Direct–Drive:		
Motor mount arm	60 ± 5 in–lbs	6.8 ± 0.5 Nm
Fan wheel hub setscrew	120 ± 12 in–lbs	13.6 ± 1.4 Nm
Motor belly band bolt	80 ± 5 in–lbs	9.0 ± 0.6 Nm

APPENDIX I. MODEL NUMBER SIGNIFICANCE

Model Number Nomenclature

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

Series - WeatherMaster®
50HC - Packaged Rooftop - High Efficiency

Q = Heat Pump

Refrig. Systems Options
A = One Stage Cooling Models
D = Two Stage Cooling Models

Cooling Tons
04 - 3 ton
05 - 4 ton
06 - 5 ton
07 - 6 ton
08 - 7.5 ton
09 - 8.5 ton
12 - 10 ton

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

Indoor Fan Options
0 = Electric Drive X13 Motor (04-06)
1 = Standard Static Option - Belt Drive
2 = Medium Static Option - Belt Drive
3 = High Static Option - Belt Drive
C = High Static Option with High Efficiency Motor- Belt Drive (size 12 only)

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

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

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 = Electro-mechanical Controls can be used with W7212 EconoMi$er IV (Non-Fault Detection and Diagnostic)
1 = PremierLink Controller
2 = RTU Open Multi-Protocol Controller
6 = Electro-mechanical w/ 2-speed fan and W7220 Economizer controller Controls. Can be used with W7220 EconoMi$er X (with Fault Detection and Diagnostic)

Intake / Exhaust Options
A = None
B = Temperature Economizer w/ Barometric Relief
F = Enthalpy Economizer w/ Barometric Relief
K = 2-Position Damper
U = Temperature Ultra Low Leak Economizer w/ Barometric Relief
W = Enthalpy Ultra Low Leak Economizer w/ Barometric Relief

Service Options
0 = None
1 = Unpowered Convenience Outlet
2 = Powered Convenience Outlet
3 = Hinged Access Panels
4 = Hinged Access Panels and Unpowered Convenience Outlet
5 = Hinged Panels and Powered Convenience Outlet

Electrical Options
A = None
C = Non-Fused Disconnect
D = Thru-The-Base Connections
F = Non-Fused Disconnect and Thru-The-Base Connections
G = 2-Speed Indoor Fan Controller (VFD)
J = 2-Speed Indoor Fan Controller (VFD) and Non-Fused Disconnect
K = 2-Speed Indoor Fan Controller (VFD) and Thru-The-Base Connections
M = 2-Speed Indoor Fan Controller (VFD) with Non-Fused Disconnect and Thru-The-Base Connections

Factory Assigned
0 = Standard
1 = LTL

C14235

Serial Number Format

POSITION NUMBER	1	2	3	4	5	6	7	8	9	10
TYPICAL	0	4	0	9	G	1	2	3	4	5

POSITION	DESIGNATES
1–2	Week of manufacture (fiscal calendar)
3–4	Year of manufacture (“08” = 2008)
5	Manufacturing location (G = ETP, Texas, USA)
6–10	Sequential number

APPENDIX II. PHYSICAL DATA

Table 14 – Physical Data (Cooling) 3 - 6 TONS)

		50HCQA04	50HCQA05	50HCQA06	50HCQA07
Refrigeration System					
	# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll
	Refrig. charge per circuit A/B(lbs–oz)	12 – 8 / –	15 – 8 / –	17 – 8 / –	15 – 8 / –
	Metering Device	TXV	TXV	TXV	TXV
	High pressure Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
	Loss of Charge Press. Trip / Reset (psig)	27 / 44	27 / 44	27 / 44	27 / 44
	Compressor Capacity Staging (%)	100	100	100	100
Evap. 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	4/ 15	3/ 15
	Total Face Area (ft^2)	5.5	7.3	7.3	8.9
	Condensate Drain Conn. Size	3/4–in	3/4–in	3/4–in	3/4–in
Evap. Fan and Motor					
Standard Static 1 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	N/A
	Max BHP	1.0	1.0	1.0	N/A
	RPM Range	600–1200	600–1200	600–1200	N/A
	Motor Frame Size	48	48	48	N/A
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	N/A
	Fan Diameter x Length (in)	10 x 10	10 x 10	11 x 10	N/A
Standard Static 3 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	1 / Belt
	Max BHP	1.0	1.0	1.0	1.2
	RPM Range	600–1200	600–1200	600–1200	489–747
	Motor Frame Size	48	48	48	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	10 x 10	10 x 10	11 x 10	15 x 15
Medium Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.5	1.5	2.0	2.9
	RPM Range	819–1251	920–1303	1066–1380	733–949
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	10 x 10	10 x 10	10 x 10	15 x 15
High Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.0	2.0	2.9	4.0
	RPM Range	1035–1466	1035–1466	1208–1550	909–1102
	Motor Frame Size	56	56	56	145
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	10 x 10	10 x 10	10 x 10	15 x 15
Cond. 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	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft^2)	16.5	21.3	21.3	20.5
Cond. fan / motor					
	Qty / Motor Drive Type	1 / direct	1 / direct	1 / direct	2 / direct
	Motor HP / RPM	1/8 / 825	1/4 / 1100	1/4 / 1100	1/4 / 1100
	Fan diameter (in)	22	22	22	22
Filters					
	RA Filter # / Size (in)	2 / 16 x 25 x 2	4 / 16 x 16 x 2	4 / 16 x 16 x 2	4 / 16 x 20 x 2
	OA inlet screen # / Size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 36 x 1

APPENDIX II. PHYSICAL DATA

Table 15 – Physical Data (Cooling) **7.5 - 10 TONS**

		50HCQD08	50HCQD09	50HCQD12
Refrigeration System				
	# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
	Refrig. charge per circuit A/B (lbs–oz)	11 – 12 / 11 – 12	14–1/14–4	16–3/17–3
	Metering Device	TXV	TXV	TXV
	High pressure Trip / Reset (psig)	630 / 505	630 / 505	630 / 505
	Loss of Charge Press. Trip / Reset (psig)	27 / 44	27 / 44	27 / 44
	Compressor Capacity Staging (%)	50 / 100	50 / 100	50 / 100
Evap. Coil				
	Material – Tube / Fin	Cu / Al	Cu / Al	Cu / Al
	Coil type	3/8–in RTPF	3/8–in RTPF	3/8–in RTPF
	Rows / FPI	4 / 15	4 / 15	3 / 15
	Total Face Area (ft^2)	11.1	11.1	17.3
	Condensate Drain Conn. Size	3/4–in	3/4–in	3/4–in
Evap. Fan and Motor				
Standard Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.2	1.7	1.9
	RPM Range	518–733	460–652	440–609
	Motor Frame Size	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	15 x 15	15 x 15	18 x 18
Medium Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.7	2.9	2.9
	RPM Range	690–936	591–838	547–757
	Motor Frame Size	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	15 x 15	15 x 15	18 x 18
High Statoc 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.8	2.8	6.1
	RPM Range	838–1084	838–1084	762–963
	Motor Frame Size	56	56	S184T
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	15 x 15	15 x 15	18 x 18
High Static – High Efficiency 3 phase	Motor Qty / Drive Type	–	–	1 / Belt
	Max BHP	–	–	6.5/6.9/7.0/8.3‡
	RPM Range	–	–	762–963
	Motor Frame Size	–	–	S184T
	Fan Qty / Type	–	–	1 / Centrifugal
	Fan Diameter x Length (in)	–	–	18 x 18
Cond. Coil				
	Material – Tube / Fin	Cu / Al	Cu / Al	Cu / Al
	Coil type	3/8–in RTPF	3/8–in RTPF	3/8–in RTPF
	Rows / FPI	2 / 17	3 / 17	2 / 17
	Total Face Area (ft^2)	25.1	25.1	46.2
Cond. fan / motor				
	Qty / Motor Drive Type	2 / direct	1 / direct	3 / direct
	Motor HP / RPM	1/4 / 1100	1 / 1175	1 / 1100
	Fan diameter (in)	22	30	22
Filters				
	RA Filter # / Size (in)	4 / 20 x 20 x 2	4 / 20 x 20 x 2	6 / 18 x 24 x 2
	OA inlet screen # / Size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	2 / 24 x 27 x 1 (Vert) 1 / 30 x 39 x 1 (Horiz)

‡ On Size 12 units, Max BHP for the High Static motor varies with the motor's voltage; see the table below.

Voltage	BHP
208	6.5
230	6.9
460	7.0
575	8.3

APPENDIX III. FAN PERFORMANCE

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 recommended the lower horsepower option.
5. For information on the electrical properties of Carrier's motors, please see the Electrical information section of this book.

APPENDIX III. FAN PERFORMANCE

Table 16 – 50HCQA04 ELECTRIC DRIVE, X13 MOTOR, 3 TON HORIZONTAL SUPPLY

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	900	0.57	0.25
	975	0.47	0.24
	1050	0.37	0.22
	1125	0.27	0.21
	1200	0.18	0.20
	1275	0.09	0.20
	1350	–	–
	1425	–	–
	1500	–	–
2	900	0.73	0.30
	975	0.62	0.29
	1050	0.51	0.28
	1125	0.41	0.27
	1200	0.30	0.25
	1275	0.19	0.24
	1350	0.08	0.22
	1425	–	–
	1500	–	–
3	900	1.04	0.41
	975	0.93	0.40
	1050	0.82	0.39
	1125	0.70	0.38
	1200	0.58	0.36
	1275	0.46	0.35
	1350	0.34	0.33
	1425	0.23	0.31
	1500	0.12	0.30
4	900	1.26	0.49
	975	1.18	0.50
	1050	1.09	0.50
	1125	0.99	0.50
	1200	0.88	0.49
	1275	0.76	0.47
	1350	0.63	0.46
	1425	0.50	0.44
	1500	0.37	0.42
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 17 – 50HCQA04 ELECTRIC DRIVE, X13 MOTOR, 3 TON VERTICAL SUPPLY

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	900	0.44	0.19
	975	0.34	0.18
	1050	0.24	0.17
	1125	0.15	0.16
	1200	0.07	0.16
	1275	–	–
	1350	–	–
	1425	–	–
	1500	–	–
2	900	0.60	0.24
	975	0.49	0.23
	1050	0.38	0.22
	1125	0.28	0.21
	1200	0.18	0.20
	1275	0.09	0.19
	1350	–	–
	1425	–	–
	1500	–	–
3	900	0.93	0.36
	975	0.81	0.35
	1050	0.70	0.34
	1125	0.58	0.33
	1200	0.47	0.31
	1275	0.36	0.30
	1350	0.25	0.29
	1425	0.14	0.27
	1500	–	–
4	900	1.15	0.44
	975	1.07	0.45
	1050	0.97	0.46
	1125	0.86	0.46
	1200	0.74	0.43
	1275	0.61	0.41
	1350	0.48	0.40
	1425	0.35	0.39
	1500	0.23	0.37
5	900	1.24	0.51
	975	1.19	0.52
	1050	1.24	0.54
	1125	1.24	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 III. FAN PERFORMANCE (cont.)

Table 18 – 50HCQA05
4 TON HORIZONTAL UNIT DIRECT DRIVE

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1200	0.93	0.48
	1300	0.80	0.46
	1400	0.66	0.44
	1500	0.51	0.41
	1600	0.36	0.39
	1700	0.22	0.36
	1800	0.08	0.33
	1900	–	–
	2000	–	–
2	1200	1.04	0.53
	1300	0.91	0.51
	1400	0.76	0.48
	1500	0.61	0.46
	1600	0.45	0.43
	1700	0.30	0.40
	1800	0.16	0.38
	1900	0.04	0.35
	2000	–	–
3	1200	1.18	0.58
	1300	1.09	0.59
	1400	0.98	0.60
	1500	0.86	0.60
	1600	0.72	0.57
	1700	0.57	0.54
	1800	0.42	0.51
	1900	0.28	0.48
	2000	0.15	0.45
4	1200	1.24	0.60
	1300	1.18	0.63
	1400	1.12	0.66
	1500	1.04	0.71
	1600	0.95	0.70
	1700	0.85	0.71
	1800	0.73	0.71
	1900	0.60	0.69
	2000	0.45	0.65
5	1200	1.25	0.61
	1300	1.20	0.65
	1400	1.12	0.68
	1500	1.04	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 19 – 50HCQA05
4 TON VERTICAL UNIT DIRECT DRIVE

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1200	0.87	0.43
	1300	0.73	0.41
	1400	0.59	0.39
	1500	0.43	0.37
	1600	0.27	0.34
	1700	0.12	0.33
	1800	–	–
	1900	–	–
	2000	–	–
2	1200	0.96	0.48
	1300	0.84	0.46
	1400	0.69	0.44
	1500	0.53	0.41
	1600	0.37	0.39
	1700	0.21	0.36
	1800	0.06	0.34
	1900	–	–
	2000	–	–
3	1200	1.13	0.53
	1300	1.06	0.53
	1400	0.98	0.54
	1500	0.88	0.56
	1600	0.76	0.54
	1700	0.62	0.52
	1800	0.47	0.50
	1900	0.31	0.47
	2000	0.15	0.45
4	1200	1.16	0.57
	1300	1.12	0.59
	1400	1.07	0.62
	1500	1.00	0.67
	1600	0.91	0.66
	1700	0.80	0.67
	1800	0.67	0.67
	1900	0.52	0.63
	2000	0.35	0.61
5	1200	1.16	0.59
	1300	1.11	0.63
	1400	1.01	0.67
	1500	0.91	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 III. FAN PERFORMANCE (cont.)

Table 20 – 50HCQA06
5 TON HORIZONTAL UNIT DIRECT DRIVE

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1500	1.37	0.74
	1625	1.22	0.73
	1750	0.08	0.70
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
2	1500	0.54	0.44
	1625	0.37	0.41
	1750	0.20	0.38
	1875	0.04	0.35
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
3	1500	1.28	0.83
	1625	1.10	0.81
	1750	0.90	0.78
	1875	0.68	0.74
	2000	0.47	0.70
	2125	0.27	0.66
	2250	0.10	0.62
	2375	–	–
	2500	–	–
4	1500	1.46	0.94
	1625	1.32	0.92
	1750	1.16	0.96
	1875	0.96	0.95
	2000	0.76	0.91
	2125	0.54	0.86
	2250	0.33	0.82
	2375	0.14	0.78
	2500	0.00	0.72
5	1500	1.52	0.97
	1625	1.42	1.01
	1750	1.16	1.05
	1875	0.96	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

Table 21 – 50HCQA06
5 TON VERTICAL UNIT DIRECT DRIVE

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1500	0.27	0.32
	1625	0.13	0.30
	1750	–	–
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
2	1500	0.42	0.40
	1625	0.25	0.37
	1750	0.08	0.34
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
3	1500	1.11	0.79
	1625	0.91	0.76
	1750	0.70	0.74
	1875	0.50	0.70
	2000	0.30	0.67
	2125	0.12	0.63
	2250	–	–
	2375	–	–
	2500	–	–
4	1500	1.29	0.90
	1625	1.13	0.88
	1750	0.95	0.91
	1875	0.74	0.88
	2000	0.52	0.84
	2125	0.30	0.80
	2250	0.11	0.77
	2375	–	–
	2500	–	–
5	1500	1.36	0.94
	1625	1.24	0.99
	1750	0.95	1.02
	1875	0.74	1.05
	2000	0.74	1.03
	2125	0.53	0.99
	2250	0.31	0.94
	2375	0.08	0.90
	2500	–0.14	0.86

APPENDIX III. FAN PERFORMANCE (cont.)

Table 22 – 50HCQA04 **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

Med Static – 819–1251 RPM, Max BHP 1.5 (motor is new 1.7 HP)

High Static – 1035–1466 RPM, Max BHP 2.0 (motor is 2.4 HP)

Table 23 – 50HCQA04 **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**	–	–

Bold – Field–supplied drive recommended using fan pulley (KR11AZ606), motor pulley (KR11HY191), and belt (KR29AF043)

Med Static – 819–1251 RPM, Max BHP 1.5 (motor is new 1.7 HP)

High Static – 1035–1466 RPM, Max BHP 2.0 (motor is 2.4 HP)

– Outside operating range

APPENDIX III. FAN PERFORMANCE (cont.)

Table 24 – 50HCQA05 **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	630	0.20	755	0.31	859	0.43	949	0.56	1030	0.70
1300	659	0.24	781	0.36	883	0.48	972	0.61	1052	0.76
1400	689	0.28	808	0.40	908	0.53	995	0.67	1075	0.82
1500	720	0.33	836	0.46	933	0.59	1020	0.74	1098	0.89
1600	752	0.38	864	0.52	960	0.66	1044	0.81	1121	0.97
1700	784	0.44	893	0.58	986	0.73	1070	0.89	1146	1.05
1800	816	0.50	922	0.65	1014	0.81	1096	0.97	1171	1.14
1900	849	0.58	952	0.73	1042	0.90	1122	1.07	1196	1.24
2000	882	0.66	982	0.82	1070	0.99	1149	1.17	1222	1.35

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	1104	0.84	1173	0.99	1237	1.15	1298	1.32	1356	1.49
1300	1125	0.91	1194	1.06	1258	1.23	1318	1.40	1375	1.58
1400	1147	0.98	1215	1.14	1278	1.31	1338	1.48	1395	1.67
1500	1170	1.05	1237	1.22	1299	1.39	1359	1.57	1416	1.76
1600	1193	1.13	1259	1.31	1321	1.49	1380	1.67	1437	1.86
1700	1216	1.22	1282	1.40	1344	1.59	1402	1.78	1458	1.97
1800	1240	1.32	1305	1.50	1366	1.69	1424	1.89	*1480*	*2.09*
1900	1265	1.43	1329	1.61	1390	1.81	*1447*	*2.01*	*1502*	*2.22*
2000	1290	1.54	1353	1.73	1413	1.93	*1470*	*2.14*	*1525*	*2.35*

Italics – Field–supplied motor and drive required recommended using motor (HD58FE651–230/460V or HD58FE576–575V), fan pulley (KR11AZ606), motor pulley (KR11HY213), and belt (KR29AF043)

High Static – 1035–1466 RPM, Max BHP 2.0 (motor 2.4 HP) Med Static – 920–1303 RPM, Max BHP 1.5 (motor new 1.7 HP)

Table 25 – 50HCQA05 **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	682	0.25	800	0.36	897	0.48	982	0.61	1058	0.75
1300	717	0.29	832	0.42	928	0.55	1011	0.68	1086	0.82
1400	753	0.34	865	0.48	958	0.61	1041	0.76	1115	0.91
1500	789	0.40	898	0.54	990	0.69	1071	0.84	1144	1.00
1600	826	0.47	932	0.62	1022	0.77	1102	0.93	1174	1.09
1700	863	0.54	966	0.70	1055	0.86	1133	1.03	1205	1.20
1800	901	0.62	1001	0.79	1088	0.96	1165	1.13	1235	1.31
1900	939	0.71	1037	0.89	1121	1.07	1197	1.25	1267	1.44
2000	978	0.81	1073	0.99	1156	1.18	1230	1.37	1299	1.57

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
1200	1128	0.89	1192	1.03	1252	1.18	1309	1.34	1363	1.50
1300	1155	0.97	1219	1.12	1279	1.28	1336	1.44	1389	1.61
1400	1183	1.06	1247	1.22	1306	1.38	1362	1.55	1416	1.72
1500	1212	1.16	1275	1.32	1334	1.49	1389	1.67	1443	1.85
1600	1241	1.26	1303	1.43	1362	1.61	1417	1.79	1470	1.98
1700	1271	1.37	1332	1.55	1390	1.74	1445	1.93	*1498*	*2.12*
1800	1301	1.50	1362	1.68	1419	1.87	*1474*	*2.07*	*1526*	*2.27*
1900	1331	1.63	1392	1.82	*1449*	*2.02*	*1503*	*2.22*	–	–
2000	1362	1.77	1422	1.97	*1478*	*2.18*	*1532*	*2.38*	–	–

Italics – Field–supplied motor and drive required recommended using motor (HD58FE651–230/460V or HD58FE576–575V), fan pulley (KR11AZ606), motor pulley (KR11HY213), and belt (KR29AF043)

High Static – 1035–1466 RPM, Max BHP 2.0 (motor 2.4 HP) Med Static – 920–1303 RPM, Max BHP 1.5 (motor new 1.7 HP)

APPENDIX III. FAN PERFORMANCE (cont.)

Table 26 – 50HCQA06 **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	1557	2.55
2250	1359	1.87	1420	2.08	1479	2.29	1534	2.51	1587	2.74
2375	1393	2.05	1453	2.27	1511	2.49	1566	2.72	–	–
2500	1427	2.24	1487	2.47	1543	2.70	–	–	–	–

Med Static – 1066–1380 RPM, Max BHP 2.0 (motor is new 2.4 HP)

High Static – 1208–1550 RPM, Max BHP 2.9 (motor is 2.9 HP)

– Outside operating range

Table 27 – 50HCQA06 **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	1586	2.61
2125	1406	1.97	1464	2.18	1520	2.40	1573	2.62	1623	2.84
2250	1446	2.18	1504	2.40	1559	2.62	1611	2.85	–	–
2375	1487	2.40	1544	2.63	1598	2.87	–	–	–	–
2500	1529	2.64	1585	2.89	–	–	–	–	–	–

Med Static – 1066–1380 RPM, Max BHP 2.0 (motor is new 2.4 HP)

High Static – 1208–1550 RPM, Max BHP 2.9 (motor is 2.9 HP)

– Outside operating range

APPENDIX III. FAN PERFORMANCE (cont.)

Table 28 – 50HCQA07 **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

Std Static – 489–747 RPM, Max BHP 1.2 (motor is 1.7 HP)
Med Static – 733–949 RPM, Max BHP 2.9 (motor is 2.9 HP)
High Static – 909–1102 RPM, Max BHP 4.0 (motor is 4.9 HP)

Table 29 – 50HCQA07 **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

Std Static – 489–747 RPM, Max BHP 1.2 (motor is 1.7 HP)
Med Static – 733–949 RPM, Max BHP 2.9 (motor is 2.9 HP)
High Static – 909–1102 RPM, Max BHP 4.0 (motor is 4.9 HP)

APPENDIX III. FAN PERFORMANCE (cont.)

Table 30 – 50HCQD08 **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

Std Static – 518–733 RPM, Max BHP 1.2 (motor is 1.7 HP)
Med Static – 690–936 RPM, Max BHP 1.7 (motor is 2.4 HP)
High Static – 838–1084 RPM, Max BHP 2.8 (motor is 3.7 HP)

Table 31 – 50HCQD08 **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	457	0.32	536	0.44	604	0.55	664	0.67	719	0.79
2438	481	0.39	557	0.51	623	0.64	682	0.77	735	0.89
2625	505	0.47	578	0.60	642	0.73	700	0.87	753	1.00
2813	530	0.55	601	0.70	663	0.84	719	0.98	771	1.13
3000	556	0.65	623	0.80	684	0.95	738	1.11	789	1.26
3188	582	0.76	647	0.92	705	1.08	759	1.25	808	1.41
3375	608	0.88	671	1.05	727	1.22	779	1.40	828	1.57
3563	634	1.01	695	1.19	750	1.38	801	1.56	848	1.74
3750	661	1.16	719	1.35	773	1.54	822	1.73	869	1.93

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	770	0.91	817	1.03	861	1.15	903	1.28	943	1.40
2438	785	1.02	832	1.15	876	1.28	917	1.41	957	1.55
2625	802	1.14	847	1.28	891	1.42	932	1.56	971	1.70
2813	819	1.27	864	1.42	907	1.57	947	1.72	986	1.87
3000	836	1.42	881	1.57	923	1.73	963	1.89	1001	2.05
3188	855	1.57	898	1.74	940	1.90	979	2.07	1017	2.24
3375	873	1.74	916	1.91	957	2.09	996	2.26	1034	2.44
3563	893	1.92	935	2.11	975	2.29	1014	2.47	1051	2.66
3750	912	2.12	954	2.31	994	2.50	1031	2.70	1068	2.89

Std Static – 518–733 RPM, Max BHP 1.2 (motor is 1.7 HP)
Med Static – 690–936 RPM, Max BHP 1.7 (motor is 2.4 HP)
High Static – 838–1084 RPM, Max BHP 2.8 (motor is 3.7 HP)

APPENDIX III. FAN PERFORMANCE (cont.)

Table 32 – 50HCQD09 **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
2763	493	0.47	567	0.61	635	0.76	699	0.91	760	1.07
2975	520	0.57	589	0.72	654	0.87	716	1.03	774	1.20
3188	547	0.68	613	0.83	675	1.00	733	1.17	789	1.34
3400	575	0.80	637	0.96	696	1.14	752	1.31	806	1.50
3613	603	0.94	662	1.11	719	1.29	773	1.48	824	1.67
3825	631	1.09	688	1.27	742	1.46	794	1.66	843	1.86
4038	660	1.26	714	1.45	766	1.65	816	1.85	864	2.06
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
2763	817	1.24	871	1.41	924	1.59	974	1.77	1022	1.95
2975	829	1.37	882	1.55	932	1.74	981	1.93	1028	2.12
3188	843	1.53	894	1.71	943	1.90	990	2.10	1036	2.30
3400	858	1.69	907	1.88	955	2.09	1001	2.29	1046	2.50
3613	874	1.87	922	2.07	968	2.28	1013	2.49	1057	2.71
3825	891	2.07	938	2.28	983	2.49	1027	2.71	–	–
4038	910	2.28	955	2.50	999	2.72	–	–	–	–
4250	930	2.51	973	2.74	–	–	–	–	–	–

Std static – 440–609 RPM, Max BHP 1.7 (motor is 2.4 HP)
Med static – 591–838 RPM, Max BHP 2.9 (motor is 2.9 HP)
High static – 838–1084 RPM, Max BHP 2.8 (motor is 3.7 HP)

Table 33 – 50HCQD09 **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
2763	524	0.53	595	0.67	657	0.81	714	0.95	766	1.09
2975	552	0.63	620	0.79	681	0.94	736	1.09	787	1.24
3188	582	0.76	647	0.92	705	1.08	759	1.25	808	1.41
3400	611	0.89	674	1.07	730	1.24	782	1.42	831	1.59
3613	641	1.05	701	1.23	756	1.42	806	1.60	854	1.79
3825	672	1.22	729	1.42	782	1.61	831	1.81	877	2.00
4038	702	1.41	758	1.62	809	1.83	857	2.03	901	2.24
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
2763	814	1.24	859	1.38	902	1.53	943	1.68	982	1.82
2975	834	1.40	878	1.55	921	1.71	961	1.86	999	2.02
3188	855	1.57	898	1.74	940	1.90	979	2.07	1017	2.24
3400	876	1.76	919	1.94	960	2.12	998	2.29	1036	2.47
3613	898	1.97	940	2.16	980	2.34	1018	2.53	1055	2.72
3825	921	2.20	962	2.40	1001	2.59	1039	2.79	–	–
4038	944	2.45	984	2.65	–	–	–	–	–	–
4250	968	2.71	1007	2.93	–	–	–	–	–	–

Std static – 440–609 RPM, Max BHP 1.7 (motor is 2.4 HP)
Med static – 591–838 RPM, Max BHP 2.9 (motor is 2.9 HP)
High static – 838–1084 RPM, Max BHP 2.8 (motor is 3.7 HP)

APPENDIX III. FAN PERFORMANCE (cont.)

Table 34 – 50HCQD12 **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	335	0.32	**421**	**0.51**	500	0.74	572	1.00	637	1.29
3250	**350**	**0.38**	**430**	**0.58**	505	0.81	575	1.08	640	1.37
3500	**365**	**0.45**	441	0.65	512	0.89	579	1.16	642	1.46
3750	**381**	**0.53**	452	0.74	520	0.98	584	1.26	645	1.56
4000	**397**	**0.61**	464	0.83	529	1.08	590	1.36	650	1.67
4250	**413**	**0.70**	477	0.93	538	1.19	598	1.47	655	1.78
4500	**429**	**0.81**	491	1.05	549	1.31	606	1.60	661	1.91
4750	445	0.92	505	1.17	561	1.44	615	1.73	667	2.05
5000	462	1.04	519	1.30	573	1.58	625	1.88	675	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
3000	697	1.59	751	1.91	801	2.24	847	2.59	891	2.94
3250	699	1.68	753	2.01	803	2.35	850	2.71	895	3.08
3500	701	1.78	755	2.12	806	2.47	853	2.84	898	3.22
3750	703	1.88	757	2.23	808	2.59	855	2.97	900	3.36
4000	706	2.00	*759*	*2.35*	809	2.72	857	3.11	902	3.51
4250	709	2.12	*761*	*2.48*	811	2.86	858	3.25	903	3.66
4500	714	2.25	765	2.62	813	3.00	860	3.40	905	3.82
4750	719	2.40	768	2.77	816	3.15	862	3.56	906	3.99
5000	725	2.55	773	2.93	820	3.32	865	3.73	908	4.16

*** Notes same as Vertical - see below**

Table 35 – 50HCQD12 **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	**383**	**0.39**	470	0.60	549	0.85	620	1.13	684	1.42
3250	**402**	**0.47**	483	0.68	559	0.94	629	1.22	692	1.53
3500	**421**	**0.55**	498	0.78	570	1.04	637	1.33	699	1.65
3750	441	0.65	513	0.88	582	1.15	647	1.45	707	1.78
4000	461	0.75	529	0.99	594	1.27	657	1.58	716	1.91
4250	481	0.87	545	1.12	608	1.41	668	1.72	725	2.06
4500	502	1.01	563	1.26	622	1.55	680	1.88	735	2.22
4750	522	1.15	581	1.42	637	1.72	693	2.05	746	2.40
5000	543	1.31	599	1.59	653	1.90	706	2.23	*758*	*2.59*

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	742	1.73	795	2.05	845	2.38	891	2.73	935	3.08
3250	749	1.85	802	2.19	852	2.54	899	2.89	943	3.26
3500	756	1.98	809	2.33	859	2.69	906	3.06	950	3.45
3750	764	2.12	816	2.48	866	2.86	912	3.24	956	3.64
4000	771	2.27	824	2.64	873	3.03	919	3.42	963	3.83
4250	780	2.43	831	2.81	880	3.21	926	3.62	970	4.04
4500	788	2.60	839	2.99	887	3.40	933	3.82	976	4.25
4750	798	2.78	847	3.18	895	3.60	940	4.03	983	4.47
5000	808	2.98	856	3.38	903	3.81	947	4.25	990	4.71

Std Static – 440–609 RPM, Max BHP 1.9 (motor is 2.4 HP)

Med Static – 547–757 RPM, Max BHP 2.9 (motor is 2.9 HP)

High Static – 762–963 RPM, Max BHP 6.5‡ (motor is 5.0 HP)

Bold–Field–supplied drive (motor pulley = KR11HY151, use belt and blower pulley from standard static), rpm range = 338–507

Italics – Field–supplied drive (motor pulley = KR11HY186, blower pulley = KR51BJ413, belt = KR30BE072, use medium static motor), rpm range = 684–864

Underline – Field–supplied (motor pulley = KR11HY194, blower pulley = KR51BJ413, belt = KR30BE072, use high static motor), rpm range = 846–1061

‡ **On Size 12 units, Max BHP for the High Static motor varies with the motor's voltage; see the table below.**

Voltage	BHP
208	6.5
230	6.9
460	7.0
575	8.3

Table 36 – PULLEY ADJUSTMENT - BELT DRIVE

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	3 phase	Medium Static	1251	1208	1165	1121	1078	1035	992	949	905	862	819
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
05	3 phase	Medium Static	1303	1265	1226	1188	1150	1112	1073	1035	997	958	920
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
06	3 phase	Medium Static	1380	1349	1317	1286	1254	1223	1192	1160	1129	1097	1066
		High Static	1639	1596	1553	1510	1467	1424	1380	1337	1294	1251	1208
07	3 phase	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	3 phase	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	3 phase	Standard Static	652	633	614	594	575	556	537	518	498	479	460
		Medium Static	838	813	789	764	739	715	690	665	640	616	591
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838
12	3 phase	Standard Static	609	592	575	558	541	525	508	491	474	457	440
		Medium Static	757	736	715	694	673	652	631	610	589	568	547
		High Static	963	943	923	903	883	863	842	822	802	782	762

NOTE: Do not adjust pulley further than 5 turns open.

– Factory settings

* Do not set motor pulley above 5 turns open for A or AX section belts

** Do not set motor pulley below 1 turn open for B or BX section belts

APPENDIX IV. ELECTRICAL INFORMATION

TABLE 37 – 50HCQA04 SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–1–60	187	253	16.6	79	190	1.0	DD–STD	78%	7.4
230–1–60	187	253	16.6	79	190	1.0	DD–STD	78%	7.4
208–3–60	187	253	10.4	73	190	1.0	DD–STD	78%	7.4
							MED	87%	5.2
							HIGH	87%	6.9
230–3–60	187	253	10.4	73	190	1.0	DD–STD	78%	7.4
							MED	87%	4.9
							HIGH	87%	6.7
460–3–60	414	506	5.8	38	190	0.5	DD–STD	78%	4.0
							MED	87%	2.5
							HIGH	87%	3.4
575–3–60	518	633	3.8	37	190	0.5	DD–STD	78%	4.0
							MED	72%	1.6
							HIGH	78%	2.0

TABLE 38 – 50HCQA05 SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–1–60	187	253	19.8	109	325	1.4	DD–STD	78%	7.4
230–1–60	187	253	19.8	109	325	1.4	DD–STD	78%	7.4
208–3–60	187	253	13.1	83	325	1.4	DD–STD	78%	7.4
							MED	87%	5.2
							HIGH	69%	5.2
230–3–60	187	253	13.1	83	325	1.4	DD–STD	78%	7.4
							MED	87%	4.9
							HIGH	69%	5.2
460–3–60	414	506	6.1	41	325	0.8	DD–STD	78%	4.0
							MED	87%	2.5
							HIGH	69%	2.6
575–3–60	518	633	4.4	33	325	0.8	DD–STD	78%	4.0
							MED	72%	1.6
							HIGH	78%	2.0

TABLE 39 – 50HCQA06 SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–1–60	187	253	25.0	134	325	1.4	DD–STD	78%	7.4
230–1–60	187	253	25.0	134	325	1.4	DD–STD	78%	7.4
208–3–60	187	253	15.9	110	325	1.4	DD–STD	78%	7.4
							MED	69%	5.2
							HIGH	89%	8.4
230–3–60	187	253	15.9	110	325	1.4	DD–STD	78%	7.4
							MED	69%	5.2
							HIGH	89%	8.3
460–3–60	414	506	7.0	52	325	0.8	DD–STD	78%	4.0
							MED	69%	2.6
							HIGH	89%	4.2
575–3–60	518	633	5.1	40	325	0.8	DD–STD	78%	4.0
							MED	78%	2.0
							HIGH	77%	2.8

TABLE 40 – 50HCQA07 SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

(Units Produced On or After 02/16/2015)

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	19.6	136	325	1.5	STD	87%	5.2
							MED	89%	8.4
							HIGH	83%	13.6
230–3–60	187	253	19.6	136	325	1.5	STD	87%	4.9
							MED	89%	8.3
							HIGH	83%	12.7
460–3–60	414	506	8.2	66	325	0.8	STD	87%	2.5
							MED	89%	4.2
							HIGH	83%	6.4
575–3–60	518	633	6.6	55	325	0.6	STD	72%	1.6
							MED	77%	2.8
							HIGH	81%	5.6

(Units Produced on or Prior to 02/15/2015)

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	19.0	123	325	1.5	STD	87%	5.2
							MED	89%	8.4
							HIGH	83%	13.6
230–3–60	187	253	19.0	123	325	1.5	STD	87%	4.9
							MED	89%	8.3
							HIGH	83%	12.7
460–3–60	414	506	9.7	62	325	0.8	STD	87%	2.5
							MED	89%	4.2
							HIGH	83%	6.4
575–3–60	518	633	7.4	50	325	0.6	STD	72%	1.6
							MED	77%	2.8
							HIGH	81%	5.6

TABLE 41 – 50HCQD08 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	13.1	83	13.1	83	325	1.5	STD	87%	5.2
									MED	87%	6.9
									HIGH	87%	10.6
230–3–60	187	253	13.1	83	13.1	83	325	1.5	STD	87%	4.9
									MED	87%	6.7
									HIGH	87%	10.6
460–3–60	414	506	6.1	41	6.1	41	325	0.8	STD	87%	2.5
									MED	87%	3.4
									HIGH	87%	5.3
575–3–60	518	633	4.4	33	4.4	33	325	0.6	STD	72%	1.6
									MED	78%	2.0
									HIGH	77%	2.8

APPENDIX IV. ELECTRICAL INFORMATION (cont.)

TABLE 42 – 50HCQD08 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	13.1	83	13.1	83	325	1.5	STD	84%	5.8
							325	1.5	MED	77%	7.1
							325	1.5	HIGH	82%	10.8
230–3–60	187	253	13.1	83	13.1	83	325	1.5	STD	84%	5.6
							325	1.5	MED	77%	6.8
							325	1.5	HIGH	82%	9.8
460–3–60	414	506	6.1	41	6.1	41	325	0.8	STD	79%	2.9
							325	0.8	MED	77%	3.8
							325	0.8	HIGH	82%	4.9
575–3–60	518	633	4.4	33	4.4	33	325	0.6	STD	81%	2.8
							325	0.6	MED	80%	3.5
							325	0.6	HIGH	84%	4.5

TABLE 43 – 50HCQD09 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	16.0	91	13.7	83	325	6.2	STD	80%	6.9
									MED	80%	8.4
									HIGH	81%	10.6
230–3–60	187	253	16.0	91	13.7	83	325	6.2	STD	80%	6.7
									MED	80%	8.3
									HIGH	81%	10.6
460–3–60	414	506	7.0	46	6.2	41	325	3.1	STD	80%	3.4
									MED	80%	4.2
									HIGH	81%	5.3
575–3–60	518	633	5.6	37	4.8	33	325	2.5	STD	80%	2.0
									MED	80%	2.8
									HIGH	81%	2.8

TABLE 44 – 50HCQD09 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	16.0	91	13.7	83	1070	6.2	STD	84%	7.1
							1070	6.2	MED	85%	8.6
							1070	6.2	HIGH	82%	10.8
230–3–60	187	253	16.0	91	13.7	83	1070	6.2	STD	84%	6.8
							1070	6.2	MED	85%	7.8
							1070	6.2	HIGH	82%	9.8
460–3–60	414	506	7.0	46	6.2	41	1070	3.1	STD	79%	3.8
							1070	3.1	MED	85%	3.8
							1070	3.1	HIGH	82%	4.9
575–3–60	518	633	5.6	37	4.8	33	1070	2.5	STD	80%	3.5
							1070	2.5	MED	84%	4.5
							1070	2.5	HIGH	84%	4.5

APPENDIX IV. ELECTRICAL INFORMATION (cont.)

TABLE 45 – 50HCQD12 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	15.6	110	15.9	110	280	1.5	STD	80%	6.8
									MED	80%	8.4
									HIGH	89.5%	17.0
230–3–60	187	253	15.6	110	15.9	110	280	1.5	STD	80%	6.7
									MED	80%	8.3
									HIGH	89.5%	15.0
460–3–60	414	506	7.7	52	7.7	52	280	0.8	STD	80%	3.4
									MED	80%	4.2
									HIGH	89.5%	7.6
575–3–60	518	633	5.8	39	5.7	39	280	0.7	STD	80%	2.0
									MED	80%	2.8
									HIGH	89.5%	6.1

TABLE 46 – 50HCQD12 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

V–Ph–Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	15.6	110	15.9	110	280	1.5	STD	77%	7.1
							280	1.5	MED	85%	8.6
							280	1.5	HIGH	90%	20.4
230–3–60	187	253	15.6	110	15.9	110	280	1.5	STD	77%	6.8
							280	1.5	MED	85%	7.8
							280	1.5	HIGH	90%	20.4
460–3–60	414	506	7.7	52	7.7	52	280	0.8	STD	77%	3.8
							280	0.8	MED	85%	3.8
							280	0.8	HIGH	90%	10.2
575–3–60	518	633	5.8	39	5.7	39	280	0.7	STD	80%	3.5
							280	0.7	MED	84%	4.5
							280	0.7	HIGH	94%	9

Legend and Notes for Tables 47-58

LEGEND

C.O.	–	Convenience outlet
DD	–	Electric Drive X13 Motor
DISC	–	Disconnect
FLA	–	Full load amps
IFM	–	Indoor fan motor
LRA	–	Locked rotor amps
MCA	–	Minimum circuit amps
P.E.	–	Power exhaust
UNPWRD C.O.	–	Unpowered Convenience outlet

NOTES:

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

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

Example: Supply voltage is 230-3-60

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

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

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

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

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.
IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Table 47 – 50HCQ*04A Unit Wire/Fuse or HACR Breaker Sizing Data - Single Stage Cooling with Single Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*04A	208/230–1–60	DD–STD	NONE	–	–	30	45	29	88	32	45	31	90	34	50	34	93	36	50	36	95
			101A	3.3/4.4	15.9/18.3	49/52	60/60	47/50	104/106	51/54	60/60	49/52	106/108	54/57	60/60	53/55	109/111	56/59	60/60	55/58	111/113
			102A	4.9/6.5	23.5/27.1	59/63	60/70	56/60	112/115	61/65	70/70	58/62	114/117	64/68	70/70	61/65	117/120	66/70	70/70	63/68	119/122
			103B	6.5/8.7	31.4/36.3	69/75	70/80	65/70	119/124	71/77	80/80	67/73	121/126	74/80	80/80	70/76	124/129	76/82	80/90	73/78	126/131
			104B	7.9/10.5	37.9/43.8	77/84	80/90	72/79	126/132	79/86	80/90	75/81	128/134	82/89	90/90	78/85	131/137	84/91	90/100	80/87	133/139
			102A+102A	9.8/13.0	46.9/54.2	88/97	90/100	83/91	182/196	90/99	90/100	85/93	184/198	93/102	100/110	88/97	187/201	95/104	100/110	90/99	189/203
	208/230–3–60	DD–STD	NONE	–	–	22	30	22	82	24	30	24	84	27	30	27	87	29	35	29	89
			101A	3.3/4.4	9.2/10.6	33/35	40/40	32/34	91/93	35/37	40/40	34/36	93/95	38/40	45/45	38/39	96/98	40/42	45/45	40/42	98/100
			102A	4.9/6.5	13.6/15.6	39/41	45/45	37/40	96/98	41/43	45/45	39/42	98/100	44/46	50/50	43/45	101/103	46/48	50/50	45/47	103/105
			103B	6.5/8.7	18.1/20.9	44/48	45/50	42/46	100/103	46/50	50/50	45/48	102/105	49/53	50/60	48/51	105/108	51/55	60/60	50/53	107/110
			104B	7.9/10.5	21.9/25.3	49/53	50/60	47/51	104/107	51/55	60/60	49/53	106/109	54/58	60/60	52/56	109/112	56/60	60/60	55/58	111/114
			105A	12.0/16.0	33.4/38.5	64/70	70/70	60/66	115/121	66/72	70/80	62/68	117/123	68/75	70/80	66/71	120/126	70/77	70/80	68/74	122/128
		MED	NONE	–	–	20/19	25/25	19/19	111	22/21	30/30	21/21	113	24/24	30/30	25/24	116	26/26	30/30	27/26	118
			101A	3.3/4.4	9.2/10.6	31/33	35/35	30/31	120/122	33/35	40/40	32/33	122/124	36/37	40/40	35/36	125/127	38/39	45/45	37/39	127/129
			102A	4.9/6.5	13.6/15.6	37/39	40/40	35/37	125/127	39/41	45/45	37/39	127/129	41/44	45/45	40/42	130/132	43/46	45/50	42/44	132/134
			103B	6.5/8.7	18.1/20.9	42/45	45/50	40/43	129/132	44/47	45/50	42/45	131/134	47/50	50/50	45/48	134/137	49/52	50/60	48/50	136/139
			104B	7.9/10.5	21.9/25.3	47/51	50/60	44/48	133/136	49/53	50/60	46/50	135/138	52/56	60/60	50/53	138/141	54/58	60/60	52/56	140/143
			105A	12.0/16.0	33.4/38.5	61/67	70/70	58/63	144/150	63/69	70/70	60/65	146/152	66/72	70/80	63/69	149/155	68/74	70/80	65/71	151/157
		HIGH	NONE	–	–	23/23	30/30	23/23	147	25/25	30/30	25/25	149	28/28	30/30	28/28	152	30/29	35/35	30/30	154
			101A	3.3/4.4	9.2/10.6	34/36	40/40	33/35	156/158	36/38	40/45	36/37	158/160	39/41	45/45	39/40	161/163	41/43	45/45	41/43	163/165
			102A	4.9/6.5	13.6/15.6	40/42	45/45	38/41	161/163	42/44	45/50	41/43	163/165	45/47	50/50	44/46	166/168	47/49	50/50	46/48	168/170
			103B	6.5/8.7	18.1/20.9	45/49	50/50	44/47	165/168	47/51	50/60	46/49	167/170	50/54	50/60	49/52	170/173	52/56	60/60	51/54	172/175
			104B	7.9/10.5	21.9/25.3	50/54	50/60	48/52	169/172	52/56	60/60	50/54	171/174	55/59	60/60	53/57	174/177	57/61	60/70	56/59	176/179
			105A	12.0/16.0	33.4/38.5	65/71	70/80	61/67	180/186	67/73	70/80	63/69	182/188	69/76	70/80	67/72	185/191	71/78	80/80	69/75	187/193
	460–3–60	DD–STD	NONE	–	–	12	15	12	43	13	15	13	44	14	20	14	45	15	20	16	46
			106A	6.0	7.2	21	25	20	50	22	25	21	51	23	25	23	52	24	25	24	53
			107A	8.8	10.6	25	25	24	54	26	30	25	55	28	30	27	56	29	30	28	57
			108A	11.5	13.8	29	30	28	57	30	30	29	58	32	35	30	59	33	35	31	60
			109A	14.0	16.8	33	35	31	60	34	35	32	61	35	35	34	62	36	40	35	63
		MED	NONE	–	–	11	15	10	57	12	15	11	58	13	15	13	59	14	15	14	60
			106A	6.0	7.2	20	20	18	64	21	25	20	65	22	25	21	66	23	25	22	67
			107A	8.8	10.6	24	25	22	68	25	25	23	69	26	30	25	70	27	30	26	71
			108A	11.5	13.8	28	30	26	71	29	30	27	72	30	30	29	73	31	35	30	74
			109A	14.0	16.8	32	35	29	74	33	35	31	75	34	35	32	76	35	35	33	77
		HIGH	NONE	–	–	12	15	12	75	13	15	13	76	15	20	15	77	16	20	16	78
			106A	6.0	7.2	21	25	20	82	22	25	22	83	24	25	23	84	25	25	24	85
			107A	8.8	10.6	26	30	24	86	27	30	25	87	28	30	27	88	29	30	28	89
			108A	11.5	13.8	30	30	28	89	31	35	29	90	32	35	30	91	33	35	32	92
			109A	14.0	16.8	33	35	31	92	34	35	33	93	36	40	34	94	37	40	35	95
	575–3–60	DD–STD	NONE	–	–	10	15	10	42	12	15	12	44	11	15	12	44	13	15	14	46
			297A	10.0	9.6	22	25	21	52	24	25	23	54	23	25	23	54	25	25	25	56
			298A	15.0	14.4	28	30	26	56	30	30	28	58	29	30	28	58	31	35	30	60
		MED	NONE	–	–	7	15	7	45	9	15	9	47	9	15	9	47	11	15	11	49
			297A	10.0	9.6	19	20	18	55	21	25	20	57	21	25	20	57	23	25	22	59
			298A	15.0	14.4	25	25	23	59	27	30	26	61	27	30	25	61	29	30	27	63
		HIGH	NONE	–	–	8	15	7	49	10	15	9	51	9	15	9	51	11	15	11	53
			297A	10.0	9.6	20	20	18	59	22	25	20	61	21	25	20	61	23	25	22	63
			298A	15.0	14.4	26	30	24	63	28	30	26	65	27	30	26	65	29	30	28	67

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 48 – 50HCQ*05A Unit Wire/Fuse or HACR Breaker Sizing Data – Single Stage Cooling with Single Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*05A	208/230–1–60	DD–STD	NONE	–	–	34	50	33	119	36	50	35	121	39	50	38	124	41	60	41	126
			101A	3.3/4.4	15.9/18.3	54/57	60/60	51/54	135/137	56/59	60/60	53/56	137/139	59/62	60/70	57/59	140/142	61/64	70/70	59/62	142/144
			103B	6.5/8.7	31.4/36.3	73/79	80/80	69/75	150/155	75/81	80/90	71/77	152/157	78/84	80/90	75/80	155/160	80/86	80/90	77/82	157/162
			102A+102A	9.8/13.0	46.9/54.2	93/102	100/110	87/95	213/227	95/104	100/110	89/97	215/229	97/107	100/110	92/101	218/232	99/108	100/110	95/103	220/234
			103B+103B	13.1/17.4	62.8/72.5	113/125	125/125	105/116	245/264	114/127	125/150	107/118	247/266	117/129	125/150	111/122	250/269	119/131	125/150	113/124	252/271
			104B+104B	15.8/21.0	75.8/87.5	129/143	150/150	120/134	271/294	131/145	150/150	122/136	273/296	134/148	150/150	126/139	276/299	135/150	150/150	128/141	278/301
	208/230–3–60	DD–STD	NONE	–	–	26	30	25	93	28	40	27	95	30	40	31	98	32	40	33	100
			102A	4.9/6.5	13.6/15.6	43/45	50/50	41/43	107/109	45/47	50/50	43/45	109/111	47/50	50/50	46/49	112/114	49/52	50/60	49/51	114/116
			103B	6.5/8.7	18.1/20.9	48/52	50/60	46/49	111/114	50/54	50/60	48/51	113/116	53/57	60/60	52/55	116/119	55/58	60/60	54/57	118/121
			105A	12.0/16.0	33.4/38.5	67/74	70/80	64/69	126/132	69/76	70/80	66/72	128/134	72/79	80/80	69/75	131/137	74/80	80/90	71/77	133/139
			104B+104B	15.8/21.0	43.8/50.5	80/89	80/90	76/83	181/194	82/91	90/100	78/85	183/196	85/94	90/100	81/89	186/199	87/95	90/100	83/91	188/201
		MED	NONE	–	–	23/23	30/30	23/22	122	25/25	30/30	25/24	124	28/28	40/40	28/28	127	30/30	40/40	30/30	129
			102A	4.9/6.5	13.6/15.6	40/43	45/50	38/40	136/138	42/45	50/50	40/42	138/140	45/47	50/50	44/46	141/143	47/49	50/50	46/48	143/145
			103B	6.5/8.7	18.1/20.9	46/49	50/50	43/46	140/143	48/51	50/60	46/49	142/145	51/54	60/60	49/52	145/148	53/56	60/60	51/54	147/150
			105A	12.0/16.0	33.4/38.5	65/71	70/80	61/67	155/161	67/73	70/80	63/69	157/163	70/76	70/80	67/72	160/166	72/78	80/80	69/74	162/168
			104B+104B	15.8/21.0	43.8/50.5	78/86	80/90	73/80	210/223	80/88	80/90	75/83	212/225	83/91	90/100	79/86	215/228	85/93	90/100	81/88	217/230
		HIGH	NONE	–	–	27/27	30/30	26/26	158	29/28	40/40	29/28	160	31/31	40/40	32/32	163	33/33	45/45	34/34	165
			102A	4.9/6.5	13.6/15.6	44/46	50/50	42/44	172/174	46/48	50/50	44/46	174/176	48/51	50/60	47/50	177/179	50/53	50/60	50/52	179/181
			103B	6.5/8.7	18.1/20.9	49/53	50/60	47/50	176/179	51/55	60/60	49/52	178/181	54/57	60/60	53/56	181/184	56/59	60/60	55/58	183/186
			105A	12.0/16.0	33.4/38.5	68/75	70/80	65/70	191/197	70/77	70/80	67/73	193/199	73/79	80/80	70/76	196/202	75/81	80/90	72/78	198/204
			104B+104B	15.8/21.0	43.8/50.5	81/90	90/90	77/84	246/259	83/92	90/100	79/86	248/261	86/94	90/100	82/90	251/264	88/96	90/100	84/92	253/266
	460–3–60	DD–STD	NONE	–	–	13	15	13	47	14	15	14	48	15	20	15	49	16	20	16	50
			106A	6.0	7.2	22	25	21	54	23	25	22	55	24	25	23	56	25	25	24	57
			108A	11.5	13.8	30	30	28	61	31	35	30	62	32	35	31	63	33	35	32	64
			109A	14.0	16.8	34	35	32	64	35	35	33	65	36	40	34	66	37	40	36	67
			108A+108A	23.0	27.7	48	50	44	102	49	50	46	103	50	50	47	104	51	60	48	105
		MED	NONE	–	–	11	15	11	61	12	15	12	62	14	15	13	63	15	20	14	64
			106A	6.0	7.2	20	20	19	68	21	25	20	69	23	25	22	70	24	25	23	71
			108A	11.5	13.8	29	30	27	75	30	30	28	76	31	35	29	77	32	35	30	78
			109A	14.0	16.8	32	35	30	78	33	35	31	79	35	35	33	80	36	40	34	81
			108A+108A	23.0	27.7	46	50	43	116	47	50	44	117	48	50	45	118	49	50	46	119
		HIGH	NONE	–	–	13	15	13	79	14	20	14	80	15	20	15	81	16	20	16	82
			106A	6.0	7.2	22	25	21	86	23	25	22	87	24	25	24	88	25	25	25	89
			108A	11.5	13.8	30	30	29	93	31	35	30	94	33	35	31	95	34	35	32	96
			109A	14.0	16.8	34	35	32	96	35	35	33	97	36	40	35	98	37	40	36	99
			108A+108A	23.0	27.7	48	50	45	134	49	50	46	135	50	50	47	136	51	60	48	137
	575–3–60	DD–STD	NONE	–	–	11	15	11	39	13	15	13	41	12	15	13	41	14	20	15	43
			297A	10.0	9.6	23	25	22	49	25	25	24	51	24	25	24	51	26	30	26	53
			298A	15.0	14.4	29	30	27	53	31	35	29	55	30	30	29	55	32	35	31	57
		MED	NONE	–	–	8	15	8	42	10	15	10	44	10	15	10	44	12	15	12	46
			297A	10.0	9.6	20	20	19	52	22	25	21	54	22	25	21	54	24	25	23	56
			298A	15.0	14.4	26	30	24	56	28	30	27	58	28	30	26	58	30	30	29	60
		HIGH	NONE	–	–	9	15	8	46	11	15	10	48	10	15	10	48	12	15	12	50
			297A	10.0	9.6	21	25	19	56	23	25	22	58	22	25	21	58	24	25	23	60
			298A	15.0	14.4	27	30	25	60	29	30	27	62	28	30	27	62	30	30	29	64

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 49 – 50HCQ*06A Unit Wire/Fuse or HACR Breaker Sizing Data - Single Stage Cooling with Single Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*06A	208/230–1–60	DD–STD	NONE	–	–	41	60	39	144	42	60	41	146	45	60	44	149	47	60	47	151
			102A	4.9/6.5	23.5/27.1	70/74	80/80	66/70	168/171	72/76	80/80	68/72	170/173	75/79	80/80	71/76	173/176	77/81	80/90	74/78	175/178
			103B	6.5/8.7	31.4/36.3	80/86	80/100	75/81	175/180	82/88	90/100	77/83	177/182	85/91	100/100	81/86	180/185	86/93	100/100	83/88	182/187
			102A+102A	9.8/13.0	46.9/54.2	99/108	100/110	93/101	238/252	101/110	110/110	95/103	240/254	104/113	110/125	98/107	243/257	106/115	110/125	101/109	245/259
			103B+103B	13.1/17.4	62.8/72.5	119/131	125/150	111/122	270/289	121/133	125/150	113/124	272/291	124/136	125/150	117/128	275/294	126/138	150/150	119/130	277/296
			104B+104B	15.8/21.0	75.8/87.5	135/150	150/150	126/139	296/319	137/152	150/175	128/142	298/321	140/155	150/175	132/145	301/324	142/157	150/175	134/147	303/326
	208/230–3–60	DD–STD	NONE	–	–	29	40	28	120	31	45	31	122	34	45	34	125	36	50	36	127
			102A	4.9/6.5	13.6/15.6	46/49	50/60	44/46	134/136	48/51	60/60	46/49	136/138	51/53	60/60	50/52	139/141	53/55	60/60	52/54	141/143
			104B	7.9/10.5	21.9/25.3	57/61	60/70	54/58	142/145	58/63	60/70	56/60	144/147	61/66	70/70	59/63	147/150	63/67	70/70	61/65	149/152
			105A	12.0/16.0	33.4/38.5	71/77	80/80	67/73	153/159	73/79	80/80	69/75	155/161	76/82	80/90	72/78	158/164	78/84	80/90	75/80	160/166
			104B+104B	15.8/21.0	43.8/50.5	84/92	90/100	79/86	208/221	86/94	90/100	81/89	210/223	89/97	90/100	84/92	213/226	91/99	100/100	86/94	215/228
			104B+105A	19.9/26.5	55.2/63.8	98/109	100/110	92/102	230/248	100/111	100/125	94/104	232/250	103/114	110/125	97/107	235/253	105/116	110/125	100/109	237/255
		MED	NONE	–	–	30/30	45/45	30/29	185	32/32	45/45	32/32	187	35/35	50/50	35/35	190	37/37	50/50	37/37	192
			102A	4.9/6.5	13.6/15.6	47/50	50/60	45/47	199/201	49/51	60/60	47/50	201/203	52/54	60/60	51/53	204/206	54/56	60/60	53/55	206/208
			104B	7.9/10.5	21.9/25.3	58/62	60/70	55/59	207/210	59/64	60/70	57/61	209/212	62/66	70/70	60/64	212/215	64/68	70/70	62/66	214/217
			105A	12.0/16.0	33.4/38.5	72/78	80/80	68/74	218/224	74/80	80/80	70/76	220/226	77/83	80/90	73/79	223/229	79/85	80/90	76/81	225/231
			104B+104B	15.8/21.0	43.8/50.5	85/93	90/100	80/88	273/286	87/95	90/100	82/90	275/288	90/98	90/100	85/93	278/291	92/100	100/100	88/95	280/293
			104B+105A	19.9/26.5	55.2/63.8	99/110	100/110	93/103	295/313	101/112	110/125	95/105	297/315	104/115	110/125	99/108	300/318	106/116	110/125	101/111	302/320
		HIGH	NONE	–	–	30/30	45/45	30/29	185	32/32	45/45	32/32	187	35/35	50/50	35/35	190	37/37	50/50	37/37	192
			102A	4.9/6.5	13.6/15.6	47/50	50/60	45/47	199/201	49/51	60/60	47/50	201/203	52/54	60/60	51/53	204/206	54/56	60/60	53/55	206/208
			104B	7.9/10.5	21.9/25.3	58/62	60/70	55/59	207/210	59/64	60/70	57/61	209/212	62/66	70/70	60/64	212/215	64/68	70/70	62/66	214/217
			105A	12.0/16.0	33.4/38.5	72/78	80/80	68/74	218/224	74/80	80/80	70/76	220/226	77/83	80/90	73/79	223/229	79/85	80/90	76/81	225/231
			104B+104B	15.8/21.0	43.8/50.5	85/93	90/100	80/88	273/286	87/95	90/100	82/90	275/288	90/98	90/100	85/93	278/291	92/100	100/100	88/95	280/293
			104B+105A	19.9/26.5	55.2/63.8	99/110	100/110	93/103	295/313	101/112	110/125	95/105	297/315	104/115	110/125	99/108	300/318	106/116	110/125	101/111	302/320
	460–3–60	DD–STD	NONE	–	–	14	20	14	58	15	20	15	59	16	20	16	60	17	20	17	61
			106A	6.0	7.2	23	25	22	65	24	25	23	66	25	25	24	67	26	30	26	68
			108A	11.5	13.8	31	35	29	72	32	35	31	73	33	35	32	74	34	35	33	75
			109A	14.0	16.8	35	35	33	75	36	40	34	76	37	40	35	77	38	40	37	78
			108A+108A	23.0	27.7	49	50	45	113	50	50	47	114	51	60	48	115	52	60	49	116
			108A+109A	25.5	30.7	52	60	49	119	53	60	50	120	55	60	51	121	56	60	53	122
		MED	NONE	–	–	14	20	14	90	15	20	15	91	16	20	16	92	17	20	17	93
			106A	6.0	7.2	23	25	22	97	24	25	23	98	25	30	25	99	26	30	26	100
			108A	11.5	13.8	31	35	30	104	32	35	31	105	34	35	32	106	35	35	33	107
			109A	14.0	16.8	35	35	33	107	36	40	34	108	37	40	36	109	38	40	37	110
			108A+108A	23.0	27.7	49	50	46	145	50	50	47	146	51	60	48	147	52	60	49	148
			108A+109A	25.5	30.7	53	60	49	151	54	60	50	152	55	60	52	153	56	60	53	154
		HIGH	NONE	–	–	14	20	14	90	15	20	15	91	16	20	16	92	17	20	17	93
			106A	6.0	7.2	23	25	22	97	24	25	23	98	25	30	25	99	26	30	26	100
			108A	11.5	13.8	31	35	30	104	32	35	31	105	34	35	32	106	35	35	33	107
			109A	14.0	16.8	35	35	33	107	36	40	34	108	37	40	36	109	38	40	37	110
			108A+108A	23.0	27.7	49	50	46	145	50	50	47	146	51	60	48	147	52	60	49	148
			108A+109A	25.5	30.7	53	60	49	151	54	60	50	152	55	60	52	153	56	60	53	154
	575–3–60	DD–STD	NONE	–	–	12	15	11	46	14	15	14	48	13	15	13	48	15	20	16	50
			298A	15.0	14.4	30	30	28	60	32	35	30	62	31	35	30	62	33	35	32	64
			301A	25.0	24.1	42	45	39	94	44	45	41	96	43	45	41	96	45	45	43	98
		MED	NONE	–	–	10	15	9	53	12	15	11	55	11	15	11	55	13	15	13	57
			298A	15.0	14.4	28	30	26	67	30	30	28	69	29	30	28	69	31	35	30	71
			301A	25.0	24.1	40	40	37	101	42	45	39	103	41	45	39	103	43	45	41	105
		HIGH	NONE	–	–	10	15	10	64	12	15	12	66	12	15	12	66	14	15	14	68
			298A	15.0	14.4	28	30	27	78	30	30	29	80	30	30	29	80	32	35	31	82
			301A	25.0	24.1	41	45	38	112	42	45	40	114	42	45	40	114	44	45	42	116

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 50 – 50HCQ*07A Unit Wire/Fuse or HACR Breaker Sizing Data - Single Stage Cooling with Single Speed Indoor Fan Motor (Units Produced On or After 05/18/2015)

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*07A	208/230–3–60	STD	NONE	–	–	33	50	32	161	37	50	36	165	38	50	37	166	42	60	42	170
			264A	4.9/6.5	13.6/15.6	50/53	60/60	48/50	175/177	54/56	60/60	52/54	179/181	55/57	60/60	53/55	180/182	59/61	60/70	58/60	184/186
			117A	7.8/10.4	21.7/25.0	60/64	60/70	57/61	183/186	64/68	70/80	61/65	187/190	65/69	70/80	62/66	188/191	69/73	80/80	67/71	192/195
			110A	12.0/16.0	33.4/38.5	75/81	80/90	70/76	194/200	79/85	80/90	75/81	198/204	80/86	80/90	76/82	199/205	84/90	90/90	80/86	203/209
			117A+117A	15.8/21.0	43.8/50.5	88/96	90/100	82/90	249/262	92/100	100/100	87/94	253/266	93/101	100/110	88/96	254/267	97/105	100/110	92/100	258/271
			110A+117A	19.9/26.5	55.2/63.8	102/113	110/125	95/105	271/289	106/117	110/125	100/110	275/293	107/118	110/125	101/111	276/294	111/122	125/125	105/115	280/298
		MED	NONE	–	–	35	50	35	198	39	50	39	202	40	50	40	203	44	60	45	207
			264A	4.9/6.5	13.6/15.6	52/55	60/60	50/53	212/214	56/59	60/60	55/57	216/218	57/60	60/70	56/58	217/219	61/64	70/70	60/62	221/223
			117A	7.8/10.4	21.7/25.0	63/67	70/70	60/63	220/223	66/71	80/80	64/68	224/227	67/72	80/80	65/69	225/228	71/75	80/80	69/73	229/232
			110A	12.0/16.0	33.4/38.5	77/84	80/90	73/79	231/237	81/87	90/90	77/83	235/241	82/88	90/90	79/84	236/242	86/92	90/100	83/89	240/246
			117A+117A	15.8/21.0	43.8/50.5	90/99	90/100	85/93	286/299	94/102	100/110	89/97	290/303	95/103	100/110	91/98	291/304	99/107	100/110	95/103	295/308
			110A+117A	19.9/26.5	55.2/63.8	104/115	110/125	98/108	308/326	108/119	110/125	102/112	312/330	109/120	110/125	104/114	313/331	113/124	125/125	108/118	317/335
		HIGH	NONE	–	–	42/41	60/50	42/41	230	45/44	60/60	46/45	234	46/45	60/60	47/46	235	50/49	60/60	52/50	239
			264A	4.9/6.5	13.6/15.6	59/60	60/70	57/59	244/246	62/64	70/70	62/63	248/250	63/65	70/80	63/64	249/251	67/69	80/80	67/68	253/255
			117A	7.8/10.4	21.7/25.0	69/72	80/80	67/69	252/255	72/76	80/80	71/74	256/259	73/77	80/80	72/75	257/260	77/81	80/90	76/79	261/264
			110A	12.0/16.0	33.4/38.5	83/89	90/90	80/85	263/269	87/93	90/100	84/89	267/273	88/94	90/100	86/90	268/274	92/97	100/100	90/95	272/278
			117A+117A	15.8/21.0	43.8/50.5	96/104	100/110	92/99	318/331	100/108	100/110	96/103	322/335	101/109	110/110	98/104	323/336	105/112	110/125	102/109	327/340
			110A+117A	19.9/26.5	55.2/63.8	111/120	125/125	105/114	340/358	114/124	125/125	109/118	344/362	115/125	125/125	111/119	345/363	119/129	125/150	115/124	349/367
	460–3–60	STD	NONE	–	–	15	20	14	79	17	20	16	81	17	20	17	81	19	25	19	83
			265A	6.0	7.2	24	25	23	86	26	30	25	88	26	30	25	88	28	30	27	90
			266A	11.5	13.8	32	35	30	93	34	35	32	95	34	35	33	95	36	40	35	97
			267A	14.0	16.8	36	40	34	96	38	40	36	98	38	40	36	98	40	40	38	100
			268A	23.0	27.7	50	50	46	107	51	60	48	109	52	60	49	109	54	60	51	111
			269A	25.5	30.7	53	60	50	110	55	60	52	112	55	60	52	112	57	60	54	114
		MED	NONE	–	–	16	20	15	98	18	25	17	100	18	25	18	100	20	25	20	102
			265A	6.0	7.2	25	30	23	105	27	30	26	107	27	30	26	107	29	30	28	109
			266A	11.5	13.8	33	35	31	112	35	35	33	114	35	35	34	114	37	40	36	116
			267A	14.0	16.8	37	40	35	115	39	40	37	117	39	40	37	117	41	45	39	119
			268A	23.0	27.7	50	50	47	126	52	60	49	128	53	60	50	128	54	60	52	130
			269A	25.5	30.7	54	60	50	129	56	60	53	131	56	60	53	131	58	60	55	133
		HIGH	NONE	–	–	19	25	19	114	21	25	21	116	21	25	21	116	23	30	23	118
			265A	6.0	7.2	28	30	27	121	30	30	29	123	30	30	29	123	32	35	32	125
			266A	11.5	13.8	36	40	35	128	38	40	37	130	38	40	37	130	40	40	39	132
			267A	14.0	16.8	40	40	38	131	42	45	40	133	42	45	40	133	44	45	43	135
			268A	23.0	27.7	53	60	50	142	55	60	53	144	56	60	53	144	57	60	55	146
			269A	25.5	30.7	57	60	54	145	59	60	56	147	59	60	56	147	61	70	59	149
	575–3–60	STD	NONE	–	–	12	15	11	66	15	20	15	70	13	15	13	68	17	20	17	72
			118A	18.0	17.3	33	35	31	83	37	40	35	87	35	35	33	85	39	40	37	89
			299A	28.0	26.9	45	45	42	93	49	50	46	97	47	50	44	95	51	60	48	99
		MED	NONE	–	–	13	15	12	81	17	20	17	85	14	20	14	83	18	20	19	87
			118A	18.0	17.3	34	35	32	98	38	40	36	102	36	40	34	100	40	40	38	104
			299A	28.0	26.9	46	50	43	108	50	50	47	112	48	50	45	110	52	60	49	114
		HIGH	NONE	–	–	16	20	15	95	19	25	20	99	17	20	17	97	21	25	22	101
			118A	18.0	17.3	37	40	35	112	41	45	40	116	39	40	37	114	43	45	42	118
			299A	28.0	26.9	49	50	46	122	53	60	51	126	51	60	48	124	55	60	53	128

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 51 – 50HCQ*07A Unit Wire/Fuse or HACR Breaker Sizing Data - Single Stage Cooling with Single Speed Indoor Fan Motor (Units Produced From 02/16/2015 to 05/17/2015)

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*07A	208/230–3–60	STD	NONE	–	–	33/33	50/50	32/32	178	37/37	50/50	36/36	182	38/38	50/50	37/37	183	42/41	60/60	42/42	187
			264A	4.9/6.5	13.6/15.6	50/52	60/60	48/50	192/194	54/56	60/60	52/54	196/198	55/57	60/60	53/55	197/199	59/61	60/70	58/59	201/203
			117A	7.8/10.4	21.7/25.0	60/64	60/70	57/60	200/203	64/68	70/80	61/65	204/207	65/69	70/80	62/66	205/208	69/73	80/80	67/70	209/212
			110A	12.0/16.0	33.4/38.5	75/81	80/90	70/76	211/217	79/85	80/90	75/80	215/221	80/86	80/90	76/81	216/222	84/90	90/90	80/86	220/226
			117A+117A	15.8/21.0	43.8/50.5	88/96	90/100	82/90	266/279	92/100	100/100	87/94	270/283	93/101	100/110	88/95	271/284	97/105	100/110	92/100	275/288
			110A+117A	19.9/26.5	55.2/63.8	102/113	110/125	95/105	288/306	106/116	110/125	100/109	292/310	107/117	110/125	101/111	293/311	111/121	125/125	105/115	297/315
		MED	NONE	–	–	36/36	50/50	36/36	214	40/40	50/50	40/40	218	41/41	60/60	41/41	219	45/45	60/60	46/45	223
			264A	4.9/6.5	13.6/15.6	53/56	60/60	51/53	228/230	57/60	60/70	56/58	232/234	58/61	60/70	57/59	233/235	62/64	70/70	61/63	237/239
			117A	7.8/10.4	21.7/25.0	63/68	70/80	61/64	236/239	67/71	80/80	65/69	240/243	68/72	80/80	66/70	241/244	72/76	80/80	70/74	245/248
			110A	12.0/16.0	33.4/38.5	78/84	80/90	74/80	247/253	82/88	90/90	78/84	251/257	83/89	90/90	80/85	252/258	87/93	90/100	84/90	256/262
			117A+117A	15.8/21.0	43.8/50.5	91/99	100/100	86/94	302/315	95/103	100/110	90/98	306/319	96/104	100/110	92/99	307/320	100/108	100/110	96/104	311/324
			110A+117A	19.9/26.5	55.2/63.8	105/116	110/125	99/109	324/342	109/120	110/125	104/113	328/346	110/121	110/125	105/114	329/347	114/125	125/125	109/119	333/351
		HIGH	NONE	–	–	42/41	60/50	42/41	230	45/44	60/60	46/45	234	46/45	60/60	47/46	235	50/49	60/60	52/50	239
			264A	4.9/6.5	13.6/15.6	59/60	60/70	57/59	244/246	62/64	70/70	62/63	248/250	63/65	70/80	63/64	249/251	67/69	80/80	67/68	253/255
			117A	7.8/10.4	21.7/25.0	69/72	80/80	67/69	252/255	72/76	80/80	71/74	256/259	73/77	80/80	72/75	257/260	77/81	80/90	76/79	261/264
			110A	12.0/16.0	33.4/38.5	83/89	90/90	80/85	263/269	87/93	90/100	84/89	267/273	88/94	90/100	86/90	268/274	92/97	100/100	90/95	272/278
			117A+117A	15.8/21.0	43.8/50.5	96/104	100/110	92/99	318/331	100/108	100/110	96/103	322/335	101/109	110/110	98/104	323/336	105/112	110/125	102/109	327/340
			110A+117A	19.9/26.5	55.2/63.8	111/120	125/125	105/114	340/358	114/124	125/125	109/118	344/362	115/125	125/125	111/119	345/363	119/129	125/150	115/124	349/367
	460–3–60	STD	NONE	–	–	15	20	14	88	17	20	16	90	17	20	17	90	19	25	19	92
			265A	6.0	7.2	24	25	22	95	26	30	24	97	26	30	25	97	28	30	27	99
			266A	11.5	13.8	32	35	30	102	34	35	32	104	34	35	33	104	36	40	35	106
			267A	14.0	16.8	36	40	33	105	38	40	36	107	38	40	36	107	40	40	38	109
			268A	23.0	27.7	49	50	46	116	51	60	48	118	52	60	49	118	53	60	51	120
			269A	25.5	30.7	53	60	49	119	55	60	52	121	55	60	52	121	57	60	54	123
		MED	NONE	–	–	17	20	16	106	18	25	18	108	19	25	19	108	21	25	21	110
			265A	6.0	7.2	26	30	24	113	27	30	26	115	28	30	27	115	30	30	29	117
			266A	11.5	13.8	34	35	32	120	36	40	34	122	36	40	35	122	38	40	37	124
			267A	14.0	16.8	38	40	35	123	39	40	37	125	40	40	38	125	42	45	40	127
			268A	23.0	27.7	51	60	48	134	53	60	50	136	53	60	50	136	55	60	53	138
			269A	25.5	30.7	55	60	51	137	57	60	53	139	57	60	54	139	59	60	56	141
		HIGH	NONE	–	–	19	25	19	114	21	25	21	116	21	25	21	116	23	30	23	118
			265A	6.0	7.2	28	30	27	121	30	30	29	123	30	30	29	123	32	35	32	125
			266A	11.5	13.8	36	40	35	128	38	40	37	130	38	40	37	130	40	40	39	132
			267A	14.0	16.8	40	40	38	131	42	45	40	133	42	45	40	133	44	45	43	135
			268A	23.0	27.7	53	60	50	142	55	60	53	144	56	60	53	144	57	60	55	146
			269A	25.5	30.7	57	60	54	145	59	60	56	147	59	60	56	147	61	70	59	149
	575–3–60	STD	NONE	–	–	12	15	11	66	15	20	15	70	13	15	13	68	17	20	17	72
			118A	17.0	20.4	37	40	34	86	41	45	39	90	39	40	36	88	43	45	41	92
			299A	25.7	25.8	44	45	40	92	48	50	45	96	45	50	42	94	49	50	47	98
		MED	NONE	–	–	13	15	12	81	17	20	17	85	14	20	14	83	18	20	19	87
			118A	17.0	20.4	38	40	36	101	42	45	40	105	40	40	38	103	44	45	42	107
			299A	25.7	25.8	45	45	42	107	49	50	46	111	47	50	44	109	50	50	48	113
		HIGH	NONE	–	–	16	20	15	95	19	25	20	99	17	20	17	97	21	25	22	101
			118A	17.0	20.4	41	45	39	115	45	45	43	119	43	45	41	117	47	50	45	121
			299A	25.7	25.8	48	50	45	121	52	60	49	125	49	50	47	123	53	60	51	127

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 52 – 50HCQ*07A Unit Wire/Fuse or HACR Breaker Sizing Data - Single Stage Cooling with Single Speed Indoor Fan Motor (Units Produced On or Prior to 02/15/2015)

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*07A	208/230–3–60	STD	NONE	–	–	32/32	50/50	31/31	165	36/36	50/50	36/35	169	38/38	50/50	37/37	183	42/41	60/60	42/42	187
			264A	4.9/6.5	13.6/15.6	49/52	60/60	47/49	179/181	53/55	60/60	51/53	183/185	55/57	60/60	53/55	197/199	59/61	60/70	58/59	201/203
			117A	7.8/10.4	21.7/25.0	60/63	60/70	56/60	187/190	63/67	70/70	61/64	191/194	65/69	70/80	62/66	205/208	69/73	80/80	67/70	209/212
			110A	12.0/16.0	33.4/38.5	74/80	80/80	70/75	198/204	78/84	80/90	74/80	202/208	80/86	80/90	76/81	216/222	84/90	90/90	80/86	220/226
			117A+117A	15.8/21.0	43.8/50.5	87/95	90/100	82/89	253/266	91/99	100/100	86/93	257/270	93/101	100/110	88/95	271/284	97/105	100/110	92/100	275/288
			110A+117A	19.9/26.5	55.2/63.8	101/112	110/125	95/104	275/293	105/116	110/125	99/109	279/297	107/117	110/125	101/111	293/311	111/121	125/125	105/115	297/315
		MED	NONE	–	–	36/36	50/50	35/35	201	39/39	50/50	39/39	205	41/41	60/60	41/41	219	45/45	60/60	46/45	223
			264A	4.9/6.5	13.6/15.6	53/55	60/60	51/53	215/217	56/59	60/60	55/57	219/221	58/61	60/70	57/59	233/235	62/64	70/70	61/63	237/239
			117A	7.8/10.4	21.7/25.0	63/67	70/70	60/64	223/226	67/71	70/80	64/68	227/230	68/72	80/80	66/70	241/244	72/76	80/80	70/74	245/248
			110A	12.0/16.0	33.4/38.5	77/84	80/90	73/79	234/240	81/87	90/90	78/83	238/244	83/89	90/90	80/85	252/258	87/93	90/100	84/90	256/262
			117A+117A	15.8/21.0	43.8/50.5	90/99	90/100	85/93	289/302	94/102	100/110	90/97	293/306	96/104	100/110	92/99	307/320	100/108	100/110	96/104	311/324
			110A+117A	19.9/26.5	55.2/63.8	105/115	110/125	98/108	311/329	108/119	110/125	103/113	315/333	110/121	110/125	105/114	329/347	114/125	125/125	109/119	333/351
		HIGH	NONE	–	–	41/40	50/50	41/40	217	45/44	60/60	45/44	221	46/45	60/60	47/46	235	50/49	60/60	52/50	239
			264A	4.9/6.5	13.6/15.6	58/59	60/60	57/58	231/233	62/63	70/70	61/62	235/237	63/65	70/80	63/64	249/251	67/69	80/80	67/68	253/255
			117A	7.8/10.4	21.7/25.0	68/71	80/80	66/69	239/242	72/75	80/80	70/73	243/246	73/77	80/80	72/75	257/260	77/81	80/90	76/79	261/264
			110A	12.0/16.0	33.4/38.5	83/88	90/90	79/84	250/256	86/92	90/100	84/89	254/260	88/94	90/100	86/90	268/274	92/97	100/100	90/95	272/278
			117A+117A	15.8/21.0	43.8/50.5	96/103	100/110	91/98	305/318	99/107	100/110	96/102	309/322	101/109	110/110	98/104	323/336	105/112	110/125	102/109	327/340
			110A+117A	19.9/26.5	55.2/63.8	110/120	110/125	104/113	327/345	114/123	125/125	109/118	331/349	115/125	125/125	111/119	345/363	119/129	125/150	115/124	349/367
	460–3–60	STD	NONE	–	–	17	25	16	84	18	25	18	86	17	20	17	90	19	25	19	92
			265A	6.0	7.2	26	30	24	91	27	30	26	93	26	30	25	97	28	30	27	99
			266A	11.5	13.8	34	35	32	98	36	40	34	100	34	35	33	104	36	40	35	106
			267A	14.0	16.8	38	40	35	101	39	40	37	103	38	40	36	107	40	40	38	109
			268A	23.0	27.7	51	60	48	112	53	60	50	114	52	60	49	118	53	60	51	120
			269A	25.5	30.7	55	60	51	115	57	60	53	117	55	60	52	121	57	60	54	123
		MED	NONE	–	–	18	25	18	102	20	25	20	104	19	25	19	108	21	25	21	110
			265A	6.0	7.2	27	30	26	109	29	30	28	111	28	30	27	115	30	30	29	117
			266A	11.5	13.8	36	40	34	116	37	40	36	118	36	40	35	122	38	40	37	124
			267A	14.0	16.8	39	40	37	119	41	45	39	121	40	40	38	125	42	45	40	127
			268A	23.0	27.7	53	60	50	130	55	60	52	132	53	60	50	136	55	60	53	138
			269A	25.5	30.7	57	60	53	133	59	60	55	135	57	60	54	139	59	60	56	141
		HIGH	NONE	–	–	21	25	20	110	22	30	22	112	21	25	21	116	23	30	23	118
			265A	6.0	7.2	30	30	29	117	31	35	31	119	30	30	29	123	32	35	32	125
			266A	11.5	13.8	38	40	36	124	40	45	38	126	38	40	37	130	40	40	39	132
			267A	14.0	16.8	42	45	40	127	43	45	42	129	42	45	40	133	44	45	43	135
			268A	23.0	27.7	55	60	52	138	57	60	54	140	56	60	53	144	57	60	55	146
			269A	25.5	30.7	59	60	56	141	61	70	58	143	59	60	56	147	61	70	59	149
	575–3–60	STD	NONE	–	–	13	15	12	61	16	20	16	65	13	15	13	68	17	20	17	72
			118A	17.0	20.4	38	40	35	81	42	45	40	85	39	40	36	88	43	45	41	92
			299A	25.7	25.8	45	45	41	87	49	50	46	91	45	50	42	94	49	50	47	98
		MED	NONE	–	–	14	20	13	76	18	20	17	80	14	20	14	83	18	20	19	87
			118A	17.0	20.4	39	40	37	96	43	45	41	100	40	40	38	103	44	45	42	107
			299A	25.7	25.8	46	50	43	102	50	50	47	106	47	50	44	109	50	50	48	113
		HIGH	NONE	–	–	17	20	16	90	20	25	21	94	17	20	17	97	21	25	22	101
			118A	17.0	20.4	42	45	40	110	46	50	44	114	43	45	41	117	47	50	45	121
			299A	25.7	25.8	49	50	46	116	53	60	50	120	49	50	47	123	53	60	51	127

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 53 – 50HCQ*08D Unit Wire/Fuse or HACR Breaker Sizing Data - Two Stage Cooling with Single Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*08D	208/230–3–60	STD	NONE	–	–	38	50	40	191	42	50	44	195	43	50	45	196	47	50	49	200
			117A	7.8/10.4	21.7/25.0	65/69	70/70	65/68	213/216	69/73	70/80	69/73	217/220	70/74	70/80	70/74	218/221	74/78	80/80	74/78	222/225
			110A	12.0/16.0	33.4/38.5	80/86	80/90	78/84	224/230	84/90	90/90	82/88	228/234	85/91	90/100	83/89	229/235	88/95	90/100	88/94	233/239
			111A	18.6/24.8	51.7/59.7	103/113	110/125	99/108	243/251	107/117	110/125	103/113	247/255	108/118	110/125	105/114	248/256	111/121	125/125	109/118	252/260
			112A	24.0/32.0	66.7/77.0	122/134	125/150	116/128	258/268	125/138	125/150	121/132	262/272	126/139	150/150	122/134	263/273	130/143	150/150	126/138	267/277
			112A+117A	31.8/42.4	88.4/102.0	149/166	150/175	141/157	368/395	152/169	175/175	146/161	372/399	153/170	175/175	147/162	373/400	157/174	175/175	151/167	377/404
		MED	NONE	–	–	40/40	50/50	42/41	229	44/43	50/50	46/46	233	45/44	50/50	47/47	234	48/48	60/60	51/51	238
			117A	7.8/10.4	21.7/25.0	67/71	70/80	66/70	251/254	71/75	80/80	71/74	255/258	72/76	80/80	72/76	256/259	76/79	80/80	76/80	260/263
			110A	12.0/16.0	33.4/38.5	82/88	90/90	80/86	262/268	85/92	90/100	84/90	266/272	86/93	90/100	85/91	267/273	90/96	90/100	90/95	271/277
			111A	18.6/24.8	51.7/59.7	104/114	110/125	101/110	281/289	108/118	110/125	105/114	285/293	109/119	110/125	106/115	286/294	113/123	125/125	111/120	290/298
			112A	24.0/32.0	66.7/77.0	123/136	125/150	118/130	296/306	127/140	150/150	123/134	300/310	128/141	150/150	124/135	301/311	132/144	150/150	128/140	305/315
			112A+117A	31.8/42.4	88.4/102.0	150/167	150/175	143/159	406/433	154/171	175/175	148/163	410/437	155/172	175/175	149/164	411/438	159/176	175/200	153/168	415/442
		HIGH	NONE	–	–	44	50	46	258	47	60	50	262	48	60	51	263	52	60	56	267
			117A	7.8/10.4	21.7/25.0	71/75	80/80	71/75	280/283	74/79	80/80	75/79	284/287	75/80	80/80	76/80	285/288	79/83	80/90	81/84	289/292
			110A	12.0/16.0	33.4/38.5	85/92	90/100	84/90	291/297	89/95	90/100	89/94	295/301	90/96	90/100	90/96	296/302	94/100	100/100	94/100	300/306
			111A	18.6/24.8	51.7/59.7	108/118	110/125	105/114	310/318	112/122	125/125	110/119	314/322	113/123	125/125	111/120	315/323	117/127	125/150	115/124	319/327
			112A	24.0/32.0	66.7/77.0	127/140	150/150	122/134	325/335	131/144	150/150	127/139	329/339	132/145	150/150	128/140	330/340	136/148	150/150	132/144	334/344
			112A+117A	31.8/42.4	88.4/102.0	154/171	175/175	147/163	435/462	158/175	175/175	152/167	439/466	159/176	175/200	153/169	440/467	163/180	175/200	157/173	444/471
	460–3–60	STD	NONE	–	–	18	20	19	95	20	25	21	97	21	25	21	97	22	25	23	99
			116A	13.9	16.7	39	40	38	112	41	45	40	114	41	45	41	114	43	45	43	116
			113A	16.5	19.8	43	45	42	115	45	45	44	117	45	45	44	117	47	50	46	119
			114A	27.8	33.4	60	60	57	128	62	70	59	130	62	70	60	130	64	70	62	132
			115A	33.0	39.7	68	70	65	135	70	70	67	137	70	70	67	137	72	80	69	139
			114A+116A	41.7	50.2	81	90	77	195	83	90	79	197	83	90	79	197	85	90	81	199
		MED	NONE	–	–	19	25	20	114	21	25	22	116	21	25	22	116	23	25	24	118
			116A	13.9	16.7	40	40	39	131	42	45	41	133	42	45	42	133	44	45	44	135
			113A	16.5	19.8	44	45	43	134	46	50	45	136	46	50	45	136	48	50	47	138
			114A	27.8	33.4	61	70	58	147	63	70	60	149	63	70	61	149	65	70	63	151
			115A	33.0	39.7	69	70	65	154	71	80	68	156	71	80	68	156	73	80	70	158
			114A+116A	41.7	50.2	82	90	78	214	84	90	80	216	84	90	80	216	86	90	82	218
		HIGH	NONE	–	–	21	25	22	129	23	25	24	131	23	25	24	131	25	30	27	133
			116A	13.9	16.7	42	45	41	146	44	45	43	148	44	45	44	148	46	50	46	150
			113A	16.5	19.8	46	50	45	149	48	50	47	151	48	50	47	151	50	50	49	153
			114A	27.8	33.4	63	70	60	162	65	70	62	164	65	70	63	164	67	70	65	166
			115A	33.0	39.7	71	80	68	169	73	80	70	171	73	80	70	171	75	80	72	173
			114A+116A	41.7	50.2	84	90	80	229	86	90	82	231	86	90	82	231	88	90	84	233
	575–3–60	STD	NONE	–	–	13	15	13	77	17	20	18	81	15	20	15	79	19	20	20	83
			118A	18.0	17.3	35	35	33	94	39	40	38	98	36	40	35	96	40	40	40	100
			119A	36.0	34.6	56	60	53	112	60	60	58	116	58	60	55	114	62	70	59	118
		MED	NONE	–	–	14	15	14	81	17	20	18	85	15	20	16	83	19	20	20	87
			118A	18.0	17.3	35	35	34	98	39	40	38	102	37	40	36	100	41	45	40	104
			119A	36.0	34.6	57	60	54	116	61	70	58	120	59	60	56	118	62	70	60	122
		HIGH	NONE	–	–	14	20	15	92	18	20	19	96	16	20	17	94	20	25	21	98
			118A	18.0	17.3	36	40	35	109	40	40	39	113	38	40	37	111	41	45	41	115
			119A	36.0	34.6	58	60	55	127	61	70	59	131	59	60	56	129	63	70	61	133

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 54 – 50HCQ*09D Unit Wire/Fuse or HACR Breaker Sizing Data - Two Stage Cooling with Single Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*09D	208/230–3–60	STD	NONE	–	–	46	60	47	236	49	60	52	240	50	60	53	241	54	60	57	245
			117A	7.8/10.4	21.7/25.0	73/77	80/80	72/76	258/261	76/81	80/90	77/80	262/265	77/82	80/90	78/82	263/266	81/85	90/90	82/86	267/270
			110A	12.0/16.0	33.4/38.5	87/94	90/100	86/92	269/275	91/97	100/100	90/96	273/279	92/98	100/100	91/97	274/280	96/102	100/110	96/101	278/284
			111A	18.6/24.8	51.7/59.7	110/120	110/125	107/116	288/296	114/124	125/125	111/120	292/300	115/125	125/125	112/121	293/301	119/129	125/150	117/126	297/305
			112A	24.0/32.0	66.7/77.0	129/142	150/150	124/136	303/313	133/146	150/150	128/140	307/317	134/147	150/150	129/141	308/318	138/150	150/150	134/146	312/322
			112A+117A	31.8/42.4	88.4/102.0	156/173	175/175	149/165	413/440	160/177	175/200	153/169	417/444	161/178	175/200	154/170	418/445	165/182	175/200	159/174	422/449
		MED	NONE	–	–	49/49	60/60	51/51	278	53/52	60/60	55/55	282	54/53	60/60	56/56	283	57/57	70/70	61/61	287
			117A	7.8/10.4	21.7/25.0	76/80	80/80	76/80	300/303	80/84	80/90	80/84	304/307	81/85	90/90	81/85	305/308	84/89	90/90	86/89	309/312
			110A	12.0/16.0	33.4/38.5	91/97	100/100	89/95	311/317	94/101	100/110	94/99	315/321	95/102	100/110	95/101	316/322	99/105	100/110	99/105	320/326
			111A	18.6/24.8	51.7/59.7	113/123	125/125	110/119	330/338	117/127	125/150	115/124	334/342	118/128	125/150	116/125	335/343	122/132	125/150	120/129	339/347
			112A	24.0/32.0	66.7/77.0	132/145	150/150	128/139	345/355	136/149	150/150	132/144	349/359	137/150	150/150	133/145	350/360	141/154	150/175	138/149	354/364
			112A+117A	31.8/42.4	88.4/102.0	159/176	175/200	153/168	455/482	163/180	175/200	157/173	459/486	164/181	175/200	158/174	460/487	168/185	175/200	162/178	464/491
		HIGH	NONE	–	–	51	60	53	292	55	60	58	296	56	60	59	297	60	70	63	301
			117A	7.8/10.4	21.7/25.0	78/82	80/90	78/82	314/317	82/86	90/90	83/87	318/321	83/87	90/90	84/88	319/322	87/91	90/100	88/92	323/326
			110A	12.0/16.0	33.4/38.5	93/99	100/100	92/98	325/331	97/103	100/110	96/102	329/335	98/104	100/110	97/103	330/336	101/108	110/110	102/108	334/340
			111A	18.6/24.8	51.7/59.7	116/126	125/150	113/122	344/352	119/129	125/150	117/127	348/356	120/130	125/150	118/128	349/357	124/134	125/150	123/132	353/361
			112A	24.0/32.0	66.7/77.0	134/147	150/150	130/142	359/369	138/151	150/175	135/146	363/373	139/152	150/175	136/148	364/374	143/156	150/175	140/152	368/378
			112A+117A	31.8/42.4	88.4/102.0	161/178	175/200	155/171	469/496	165/182	175/200	160/175	473/500	166/183	175/200	161/176	474/501	170/187	175/200	165/181	478/505
	460–3–60	STD	NONE	–	–	21	25	22	118	23	25	24	120	23	25	24	120	25	30	26	122
			116A	13.9	16.7	42	45	41	135	44	45	43	137	44	45	43	137	46	50	46	139
			113A	16.5	19.8	46	50	45	138	48	50	47	140	48	50	47	140	50	50	49	142
			114A	27.8	33.4	63	70	60	151	65	70	62	153	65	70	63	153	67	70	65	155
			115A	33.0	39.7	71	80	67	158	73	80	69	160	73	80	70	160	75	80	72	162
			114A+116A	41.7	50.2	84	90	79	218	86	90	82	220	86	90	82	220	88	90	84	222
		MED	NONE	–	–	23	25	24	139	25	30	26	141	25	30	26	141	27	30	28	143
			116A	13.9	16.7	44	45	43	156	45	45	45	158	46	50	45	158	48	50	47	160
			113A	16.5	19.8	47	50	46	159	49	50	48	161	50	50	49	161	51	60	51	163
			114A	27.8	33.4	64	70	62	172	66	70	64	174	67	70	65	174	68	70	67	176
			115A	33.0	39.7	72	80	69	179	74	80	71	181	75	80	72	181	76	80	74	183
			114A+116A	41.7	50.2	85	90	81	239	87	90	83	241	88	90	84	241	89	90	86	243
		HIGH	NONE	–	–	24	30	25	146	26	30	27	148	26	30	27	148	28	30	29	150
			116A	13.9	16.7	45	45	44	163	46	50	46	165	47	50	47	165	49	50	49	167
			113A	16.5	19.8	49	50	48	166	50	50	50	168	51	60	50	168	53	60	52	170
			114A	27.8	33.4	66	70	63	179	67	70	65	181	68	70	66	181	70	70	68	183
			115A	33.0	39.7	73	80	70	186	75	80	73	188	76	80	73	188	77	80	75	190
			114A+116A	41.7	50.2	87	90	83	246	88	90	85	248	89	90	85	248	91	100	87	250
	575–3–60	STD	NONE	–	–	17	20	17	97	21	25	22	101	18	20	19	99	22	25	23	103
			118A	18.0	17.3	38	40	37	114	42	45	41	118	40	40	39	116	44	45	43	120
			119A	36.0	34.6	60	60	57	132	64	70	61	136	62	70	59	134	66	70	63	138
		MED	NONE	–	–	18	20	18	108	21	25	22	112	19	25	20	110	23	25	24	114
			118A	18.0	17.3	39	40	38	125	43	45	42	129	41	45	40	127	45	45	44	131
			119A	36.0	34.6	61	70	58	143	65	70	62	147	63	70	60	145	66	70	64	149
		HIGH	NONE	–	–	18	20	18	108	21	25	22	112	19	25	20	110	23	25	24	114
			118A	18.0	17.3	39	40	38	125	43	45	42	129	41	45	40	127	45	45	44	131
			119A	36.0	34.6	61	70	58	143	65	70	62	147	63	70	60	145	66	70	64	149

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 55 – 50HCQ*12D Unit Wire/Fuse or HACR Breaker Sizing Data - Two Stage Cooling with Single Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*12D	208/230–3–60	STD	NONE	–	–	46	60	47	262	49	60	52	266	50	60	53	267	54	60	57	271
			288A	7.5/10.0	20.9/24.1	72/76	80/80	71/75	283/286	76/80	80/80	76/79	287/290	77/81	80/90	77/81	288/291	80/84	80/90	81/85	292/295
			291A	12.4/16.5	34.4/39.7	89/95	90/100	87/93	296/302	92/99	100/100	91/97	300/306	93/100	100/100	92/99	301/307	97/104	100/110	97/103	305/311
			294A	25.2/33.5	69.9/80.6	133/146	150/150	128/140	332/343	137/150	150/150	132/144	336/347	138/151	150/175	133/146	337/348	142/155	150/175	138/150	341/352
			288A+294A	32.7/43.5	90.7/104.7	159/177	175/200	152/168	443/471	163/180	175/200	156/172	447/475	164/181	175/200	157/173	448/476	168/185	175/200	162/178	452/480
			291A+294A	37.6/50.0	104.3/120.3	176/166	200/175	167/186	471/503	180/170	200/175	172/190	475/507	181/171	200/175	173/191	476/508	185/175	200/200	177/196	480/512
		MED	NONE	–	–	49/49	60/60	51/51	304	53/53	60/60	55/55	308	54/54	60/60	57/56	309	57/57	70/70	61/61	313
			288A	7.5/10.0	20.9/24.1	75/79	80/80	75/79	325/328	79/83	80/90	79/83	329/332	80/84	80/90	81/84	330/333	84/87	90/90	85/89	334/337
			291A	12.4/16.5	34.4/39.7	92/98	100/100	91/97	338/344	96/102	100/110	95/101	342/348	97/103	100/110	96/102	343/349	100/107	100/110	101/106	347/353
			294A	25.2/33.5	69.9/80.6	136/149	150/150	131/144	374/385	140/153	150/175	136/148	378/389	141/154	150/175	137/149	379/390	145/158	150/175	141/154	383/394
			288A+294A	32.7/43.5	90.7/104.7	162/180	175/200	155/171	485/513	166/183	175/200	160/176	489/517	167/184	175/200	161/177	490/518	171/188	175/200	165/181	494/522
			291A+294A	37.6/50.0	104.3/120.3	179/169	200/175	171/189	513/545	183/173	200/200	175/194	517/549	184/174	200/200	177/195	518/550	188/178	200/200	181/199	522/554
		HIGH	NONE	–	–	62	80	65	324	66	80	69	328	67	80	70	329	71	80	75	333
			288A	7.5/10.0	20.9/24.1	88/92	100/100	89/93	345/348	92/96	100/100	93/97	349/352	93/97	100/100	94/98	350/353	97/101	100/110	99/102	354/357
			291A	12.4/16.5	34.4/39.7	105/112	110/125	104/111	358/364	109/115	110/125	109/115	362/368	110/116	110/125	110/116	363/369	114/120	125/125	114/120	367/373
			294A	25.2/33.5	69.9/80.6	149/163	150/175	145/158	394/405	153/167	175/175	150/162	398/409	154/168	175/175	151/163	399/410	158/171	175/175	155/167	403/414
			288A+294A	32.7/43.5	90.7/104.7	175/193	175/200	169/185	505/533	179/197	200/200	174/190	509/537	180/198	200/200	175/191	510/538	184/201	200/225	179/195	514/542
			291A+294A	37.6/50.0	104.3/120.3	192/182	200/200	185/203	533/565	196/186	200/200	189/208	537/569	197/187	200/200	190/209	538/570	201/191	225/200	195/213	542/574
	460–3–60	STD	NONE	–	–	23	30	23	125	25	30	26	127	25	30	26	127	27	30	28	129
			289A	10.0	12.0	38	40	37	137	40	40	39	139	40	40	40	139	42	45	42	141
			292A	16.5	19.9	48	50	46	145	49	50	48	147	50	50	49	147	52	60	51	149
			295A	33.5	40.3	73	80	70	165	75	80	72	167	75	80	72	167	77	80	74	169
			289A+295A	43.5	52.3	88	90	84	230	90	90	86	232	90	90	86	232	92	100	88	234
			292A+295A	50.0	60.2	83	90	93	245	85	90	95	247	85	90	95	247	87	90	97	249
		MED	NONE	–	–	24	30	25	146	26	30	27	148	27	30	28	148	28	30	30	150
			289A	10.0	12.0	39	40	39	158	41	45	41	160	42	45	42	160	43	45	44	162
			292A	16.5	19.9	49	50	48	166	51	60	50	168	51	60	51	168	53	60	53	170
			295A	33.5	40.3	75	80	72	186	77	80	74	188	77	80	74	188	79	80	76	190
			289A+295A	43.5	52.3	90	90	85	251	92	100	88	253	92	100	88	253	94	100	90	255
			292A+295A	50.0	60.2	85	90	95	266	86	90	97	268	87	90	97	268	89	100	99	270
		HIGH	NONE	–	–	31	40	32	156	33	40	34	158	33	40	35	158	35	40	37	160
			289A	10.0	12.0	46	50	46	168	48	50	48	170	48	50	49	170	50	50	51	172
			292A	16.5	19.9	56	60	55	176	58	60	57	178	58	60	58	178	60	60	60	180
			295A	33.5	40.3	81	90	79	196	83	90	81	198	84	90	81	198	85	90	83	200
			289A+295A	43.5	52.3	96	100	92	261	98	100	94	263	99	100	95	263	100	100	97	265
			292A+295A	50.0	60.2	91	100	101	276	93	100	104	278	93	100	104	278	95	100	106	280
	575–3–60	STD	NONE	–	–	18	20	18	95	21	25	22	99	19	25	20	97	23	25	24	101
			290A	10.0	9.6	30	30	29	105	33	35	33	109	31	35	31	107	35	35	35	111
			293A	16.5	15.9	37	40	36	111	41	45	41	115	39	40	38	113	43	45	43	117
			296A	33.5	32.2	58	60	55	127	62	70	59	131	59	60	57	129	63	70	61	133
			290A+296A	43.5	41.9	70	70	66	179	74	80	70	183	72	80	68	181	75	80	72	185
			293A+296A	50.0	48.1	66	70	73	191	69	80	78	195	67	70	75	193	71	80	80	197
		MED	NONE	–	–	18	20	19	106	22	25	23	110	20	25	21	108	24	25	25	112
			290A	10.0	9.6	30	30	30	116	34	35	34	120	32	35	32	118	36	40	36	122
			293A	16.5	15.9	38	40	37	122	42	45	42	126	40	40	39	124	44	45	43	128
			296A	33.5	32.2	59	60	56	138	62	70	60	142	60	60	58	140	64	70	62	144
			290A+296A	43.5	41.9	71	80	67	190	74	80	71	194	72	80	69	192	76	80	73	196
			293A+296A	50.0	48.1	66	70	74	202	70	80	79	206	68	70	76	204	72	80	81	208
		HIGH	NONE	–	–	25	30	26	118	29	35	30	122	27	30	28	120	31	35	32	124
			290A	10.0	9.6	37	40	37	128	41	45	41	132	39	45	39	130	43	45	43	134
			293A	16.5	15.9	45	45	44	134	49	50	49	138	47	50	46	136	51	60	51	140
			296A	33.5	32.2	66	70	63	150	69	70	67	154	67	70	65	152	71	80	69	156
			290A+296A	43.5	41.9	78	80	74	202	81	90	79	206	79	80	76	204	83	90	81	208
			293A+296A	50.0	48.1	73	80	81	214	77	80	86	218	75	80	83	216	79	90	88	220

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 56 – 50HCQ*08D Unit Wire/Fuse or HACR Breaker Sizing Data - Two Stage Cooling with Two Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*08D	208/230–3–60	STD	NONE	–	–	39/39	50/50	40/40	195	43/42	50/50	45/44	199	44/43	50/50	46/46	200	47/47	60/50	50/50	204
			117A	7.8/10.4	21.7/25.0	66/70	70/70	65/69	217/220	70/74	70/80	70/73	221/224	71/75	80/80	71/74	222/225	74/78	80/80	75/79	226/229
			110A	12.0/16.0	33.4/38.5	80/87	90/90	79/84	228/234	84/90	90/90	83/89	232/238	85/91	90/100	84/90	233/239	89/95	90/100	89/94	237/243
			111A	18.6/24.8	51.7/59.7	103/113	110/125	100/109	247/255	107/117	110/125	104/113	251/259	108/118	110/125	105/114	252/260	112/122	125/125	110/119	256/264
			112A	24.0/32.0	66.7/77.0	122/135	125/150	117/129	262/272	126/139	150/150	121/133	266/276	127/140	150/150	122/134	267/277	131/143	150/150	127/138	271/281
			112A+117A	31.8/42.4	88.4/102.0	149/166	150/175	142/157	372/399	153/170	175/175	146/162	376/403	154/171	175/175	147/163	377/404	158/175	175/175	152/167	381/408
		MED	NONE	–	–	40/40	50/50	42/41	199	44/44	50/50	46/46	203	45/45	50/50	47/47	204	49/48	60/60	52/51	208
			117A	7.8/10.4	21.7/25.0	67/71	70/80	67/70	221/224	71/75	80/80	71/75	225/228	72/76	80/80	72/76	226/229	76/80	80/80	77/80	230/233
			110A	12.0/16.0	33.4/38.5	82/88	90/90	80/86	232/238	86/92	90/100	85/90	236/242	87/93	90/100	86/91	237/243	90/96	90/100	90/96	241/247
			111A	18.6/24.8	51.7/59.7	105/114	110/125	101/110	251/259	108/118	110/125	106/114	255/263	109/119	110/125	107/116	256/264	113/123	125/125	111/120	260/268
			112A	24.0/32.0	66.7/77.0	123/136	125/150	118/130	266/276	127/140	150/150	123/134	270/280	128/141	150/150	124/135	271/281	132/145	150/150	128/140	275/285
			112A+117A	31.8/42.4	88.4/102.0	151/167	175/175	143/159	376/403	154/171	175/175	148/163	380/407	155/172	175/175	149/164	381/408	159/176	175/200	153/169	385/412
		HIGH	NONE	–	–	44/43	50/50	46/45	249	48/47	60/50	50/49	253	49/48	60/60	52/50	254	52/51	60/60	56/55	258
			117A	7.8/10.4	21.7/25.0	71/74	80/80	71/74	271/274	75/78	80/80	75/78	275/278	76/79	80/80	76/79	276/279	79/83	80/90	81/83	280/283
			110A	12.0/16.0	33.4/38.5	85/91	90/100	84/89	282/288	89/95	90/100	89/93	286/292	90/96	90/100	90/95	287/293	94/99	100/100	94/99	291/297
			111A	18.6/24.8	51.7/59.7	108/117	110/125	105/114	301/309	112/121	125/125	110/118	305/313	113/122	125/125	111/119	306/314	117/126	125/150	115/123	310/318
			112A	24.0/32.0	66.7/77.0	127/139	150/150	123/133	316/326	131/143	150/150	127/138	320/330	132/144	150/150	128/139	321/331	136/148	150/150	133/143	325/335
			112A+117A	31.8/42.4	88.4/102.0	154/170	175/175	148/162	426/453	158/174	175/175	152/167	430/457	159/175	175/175	153/168	431/458	163/179	175/200	158/172	435/462
	460–3–60	STD	NONE	–	–	19	20	19	97	20	25	21	99	21	25	22	99	23	25	24	101
			116A	13.9	16.7	40	40	38	114	41	45	40	116	42	45	41	116	44	45	43	118
			113A	16.5	19.8	43	45	42	117	45	45	44	119	46	50	45	119	47	50	47	121
			114A	27.8	33.4	60	60	58	130	62	70	60	132	63	70	60	132	64	70	62	134
			115A	33.0	39.7	68	70	65	137	70	70	67	139	71	80	67	139	72	80	69	141
			114A+116A	41.7	50.2	81	90	77	197	83	90	79	199	84	90	79	199	85	90	82	201
		MED	NONE	–	–	19	25	20	100	21	25	22	102	21	25	22	102	23	25	24	104
			116A	13.9	16.7	40	40	39	117	42	45	41	119	42	45	42	119	44	45	44	121
			113A	16.5	19.8	44	45	43	120	46	50	45	122	46	50	45	122	48	50	47	124
			114A	27.8	33.4	61	70	58	133	63	70	60	135	63	70	61	135	65	70	63	137
			115A	33.0	39.7	69	70	65	140	71	80	68	142	71	80	68	142	73	80	70	144
			114A+116A	41.7	50.2	82	90	78	200	84	90	80	202	84	90	80	202	86	90	82	204
		HIGH	NONE	–	–	21	25	22	125	22	25	24	127	23	25	24	127	25	30	26	129
			116A	13.9	16.7	42	45	41	142	43	45	43	144	44	45	43	144	46	50	45	146
			113A	16.5	19.8	45	45	44	145	47	50	46	147	48	50	47	147	49	50	49	149
			114A	27.8	33.4	62	70	60	158	64	70	62	160	65	70	62	160	66	70	65	162
			115A	33.0	39.7	70	70	67	165	72	80	69	167	73	80	70	167	74	80	72	169
			114A+116A	41.7	50.2	83	90	79	225	85	90	81	227	86	90	82	227	87	90	84	229
	575–3–60	STD	NONE	–	–	14	20	15	79	18	20	19	83	16	20	17	81	20	25	21	85
			118A	18.0	17.3	36	40	35	96	40	40	39	100	38	40	37	98	41	45	41	102
			119A	36.0	34.6	58	60	55	114	61	70	59	118	59	60	56	116	63	70	61	120
		MED	NONE	–	–	15	20	16	83	19	20	20	87	17	20	17	85	21	25	22	89
			118A	18.0	17.3	37	40	35	100	40	45	40	104	38	40	37	102	42	45	42	106
			119A	36.0	34.6	58	60	55	118	62	70	60	122	60	60	57	120	64	70	62	124
		HIGH	NONE	–	–	16	20	17	92	20	25	21	96	18	20	19	94	22	25	23	98
			118A	18.0	17.3	38	40	37	109	42	45	41	113	39	40	39	111	43	45	43	115
			119A	36.0	34.6	59	60	56	127	63	70	61	131	61	70	58	129	65	70	63	133

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 57 – 50HCQ*09D Unit Wire/Fuse or HACR Breaker Sizing Data - Two Stage Cooling with Two Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*09D	208/230–3–60	STD	NONE	–	–	47/47	60/60	49/49	233	51/51	60/60	54/53	237	52/52	60/60	55/55	238	56/56	60/60	59/59	242
			117A	7.8/10.4	21.7/25.0	75/78	80/80	74/78	255/258	78/82	80/90	79/82	259/262	79/83	80/90	80/83	260/263	83/87	90/90	84/88	264/267
			110A	12.0/16.0	33.4/38.5	89/95	90/100	88/93	266/272	93/99	100/100	92/98	270/276	94/100	100/100	93/99	271/277	98/104	100/110	98/103	275/281
			111A	18.6/24.8	51.7/59.7	112/122	125/125	109/118	285/293	116/126	125/150	113/122	289/297	117/127	125/150	114/123	290/298	121/130	125/150	119/128	294/302
			112A	24.0/32.0	66.7/77.0	131/143	150/150	126/138	300/310	135/147	150/150	131/142	304/314	136/148	150/150	132/143	305/315	139/152	150/175	136/148	309/319
			112A+117A	31.8/42.4	88.4/102.0	158/175	175/175	151/166	410/437	162/178	175/200	155/171	414/441	163/179	175/200	157/172	415/442	167/183	175/200	161/176	419/446
		MED	NONE	–	–	49/48	60/60	51/50	259	53/52	60/60	56/55	263	54/53	60/60	57/56	264	58/57	70/70	61/60	268
			117A	7.8/10.4	21.7/25.0	76/79	80/80	76/79	281/284	80/83	80/90	81/83	285/288	81/84	90/90	82/85	286/289	85/88	90/90	86/89	290/293
			110A	12.0/16.0	33.4/38.5	91/96	100/100	90/95	292/298	95/100	100/100	94/99	296/302	96/101	100/110	95/100	297/303	99/105	100/110	99/104	301/307
			111A	18.6/24.8	51.7/59.7	114/123	125/125	111/119	311/319	117/127	125/150	115/123	315/323	118/128	125/150	116/124	316/324	122/131	125/150	121/129	320/328
			112A	24.0/32.0	66.7/77.0	132/144	150/150	128/139	326/336	136/148	150/150	132/143	330/340	137/149	150/150	133/144	331/341	141/153	150/175	138/149	335/345
			112A+117A	31.8/42.4	88.4/102.0	159/176	175/200	153/168	436/463	163/179	175/200	157/172	440/467	164/180	175/200	158/173	441/468	168/184	175/200	163/177	445/472
		HIGH	NONE	–	–	51/50	60/60	54/53	283	55/54	60/60	58/57	287	56/55	60/60	59/58	288	60/59	70/70	64/62	292
			117A	7.8/10.4	21.7/25.0	78/81	80/90	79/81	305/308	82/85	90/90	83/86	309/312	83/86	90/90	84/87	310/313	87/90	90/90	89/91	314/317
			110A	12.0/16.0	33.4/38.5	93/98	100/100	92/97	316/322	97/102	100/110	96/101	320/326	98/103	100/110	98/102	321/327	102/107	110/110	102/107	325/331
			111A	18.6/24.8	51.7/59.7	116/125	125/125	113/121	335/343	120/129	125/150	118/126	339/347	121/130	125/150	119/127	340/348	124/133	125/150	123/131	344/352
			112A	24.0/32.0	66.7/77.0	135/146	150/150	130/141	350/360	138/150	150/150	135/145	354/364	139/151	150/175	136/147	355/365	143/155	150/175	140/151	359/369
			112A+117A	31.8/42.4	88.4/102.0	162/178	175/200	155/170	460/487	165/181	175/200	160/174	464/491	166/182	175/200	161/175	465/492	170/186	175/200	165/180	469/496
	460–3–60	STD	NONE	–	–	22	25	23	117	24	30	25	119	24	30	25	119	26	30	27	121
			116A	13.9	16.7	43	45	42	134	45	45	44	136	45	45	44	136	47	50	46	138
			113A	16.5	19.8	47	50	45	137	48	50	47	139	49	50	48	139	51	60	50	141
			114A	27.8	33.4	64	70	61	150	65	70	63	152	66	70	64	152	68	70	66	154
			115A	33.0	39.7	72	80	68	157	73	80	70	159	74	80	71	159	76	80	73	161
			114A+116A	41.7	50.2	85	90	80	217	86	90	82	219	87	90	83	219	89	90	85	221
		MED	NONE	–	–	22	25	23	130	24	30	25	132	25	30	26	132	26	30	28	134
			116A	13.9	16.7	43	45	42	147	45	45	44	149	45	45	45	149	47	50	47	151
			113A	16.5	19.8	47	50	46	150	49	50	48	152	49	50	48	152	51	60	50	154
			114A	27.8	33.4	64	70	62	163	66	70	64	165	66	70	64	165	68	70	66	167
			115A	33.0	39.7	72	80	69	170	74	80	71	172	74	80	71	172	76	80	73	174
			114A+116A	41.7	50.2	85	90	81	230	87	90	83	232	87	90	83	232	89	90	85	234
		HIGH	NONE	–	–	23	25	24	142	25	30	26	144	26	30	27	144	27	30	29	146
			116A	13.9	16.7	44	45	44	159	46	50	46	161	46	50	46	161	48	50	48	163
			113A	16.5	19.8	48	50	47	162	50	50	49	164	50	50	50	164	52	60	52	166
			114A	27.8	33.4	65	70	63	175	67	70	65	177	67	70	65	177	69	70	67	179
			115A	33.0	39.7	73	80	70	182	75	80	72	184	75	80	73	184	77	80	75	186
			114A+116A	41.7	50.2	86	90	82	242	88	90	84	244	88	90	85	244	90	90	87	246
	575–3–60	STD	NONE	–	–	18	20	19	99	22	25	23	103	20	25	21	101	24	25	25	105
			118A	18.0	17.3	40	40	39	116	44	45	43	120	42	45	41	118	45	45	45	122
			119A	36.0	34.6	62	70	59	134	65	70	63	138	63	70	61	136	67	70	65	140
		MED	NONE	–	–	19	25	20	108	23	25	24	112	21	25	22	110	25	30	26	114
			118A	18.0	17.3	41	45	40	125	45	45	44	129	43	45	42	127	46	50	46	131
			119A	36.0	34.6	63	70	60	143	66	70	64	147	64	70	62	145	68	70	66	149
		HIGH	NONE	–	–	19	25	20	108	23	25	24	112	21	25	22	110	25	30	26	114
			118A	18.0	17.3	41	45	40	125	45	45	44	129	43	45	42	127	46	50	46	131
			119A	36.0	34.6	63	70	60	143	66	70	64	147	64	70	62	145	68	70	66	149

See: “Legend and Notes for Tables 47 – 58” on page 63.

Table 58 – 50HCQ*12D Unit Wire/Fuse or HACR Breaker Sizing Data - Two Stage Cooling with Two Speed Indoor Fan Motor

UNIT	NO M. V–Ph–HZ	IFMTYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)				NO P.E.				w/ P.E. (pwrd fr/unit)			
			CRHEATER***A00	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HCQ*12D	208/230–3–60	STD	NONE	–	–	48/47	60/60	50/49	259	51/51	60/60	54/54	263	52/52	60/60	55/55	264	56/56	60/60	59/59	268
			288A	7.5/10.0	20.9/24.1	74/77	80/80	74/77	280/283	77/81	80/90	78/81	284/287	78/82	80/90	79/82	285/288	82/86	90/90	83/87	289/292
			291A	12.4/16.5	34.4/39.7	91/97	100/100	89/95	293/299	94/101	100/110	93/99	297/303	95/102	100/110	95/100	298/304	99/105	100/110	99/105	302/308
			294A	25.2/33.5	69.9/80.6	135/148	150/150	130/142	329/340	139/152	150/175	134/146	333/344	140/153	150/175	135/147	334/345	144/157	150/175	140/152	338/349
			288A+294A	32.7/43.5	90.7/104.7	161/178	175/200	154/170	440/468	165/182	175/200	158/174	444/472	166/183	175/200	159/175	445/473	170/187	175/200	164/180	449/477
			291A+294A	37.6/50.0	104.3/120.3	178/168	200/175	170/188	468/500	182/171	200/175	174/192	472/504	183/172	200/200	175/193	473/505	187/176	200/200	179/197	477/509
		MED	NONE	–	–	49/48	60/60	51/50	285	53/52	60/60	56/55	289	54/53	60/60	57/56	290	58/57	70/70	61/60	294
			288A	7.5/10.0	20.9/24.1	75/78	80/80	75/78	306/309	79/82	80/90	80/82	310/313	80/83	80/90	81/84	311/314	84/87	90/90	85/88	315/318
			291A	12.4/16.5	34.4/39.7	92/98	100/100	91/96	319/325	96/102	100/110	95/100	323/329	97/103	100/110	96/102	324/330	101/106	110/110	101/106	328/334
			294A	25.2/33.5	69.9/80.6	136/149	150/150	132/143	355/366	140/153	150/175	136/147	359/370	141/154	150/175	137/149	360/371	145/158	150/175	142/153	364/375
			288A+294A	32.7/43.5	90.7/104.7	162/179	175/200	156/171	466/494	166/183	175/200	160/175	470/498	167/184	175/200	161/176	471/499	171/188	175/200	165/181	475/503
			291A+294A	37.6/50.0	104.3/120.3	179/169	200/175	171/189	494/526	183/172	200/200	176/193	498/530	184/173	200/200	177/194	499/531	188/177	200/200	181/199	503/535
		HIGH	NONE	–	–	62	80	65	324	66	80	69	328	67	80	70	329	71	80	75	333
			288A	7.5/10.0	20.9/24.1	88/92	100/100	89/93	345/348	92/96	100/100	93/97	349/352	93/97	100/100	94/98	350/353	97/101	100/110	99/102	354/357
			291A	12.4/16.5	34.4/39.7	105/112	110/125	104/111	358/364	109/115	110/125	109/115	362/368	110/116	110/125	110/116	363/369	114/120	125/125	114/120	367/373
			294A	25.2/33.5	69.9/80.6	149/163	150/175	145/158	394/405	153/167	175/175	150/162	398/409	154/168	175/175	151/163	399/410	158/171	175/175	155/167	403/414
			288A+294A	32.7/43.5	90.7/104.7	175/193	175/200	169/185	505/533	179/197	200/200	174/190	509/537	180/198	200/200	175/191	510/538	184/201	200/225	179/195	514/542
			291A+294A	37.6/50.0	104.3/120.3	192/182	200/200	185/203	533/565	196/186	200/200	189/208	537/569	197/187	200/200	190/209	538/570	201/191	225/200	195/213	542/574
	460–3–60	STD	NONE	–	–	24	30	24	124	25	30	26	126	26	30	27	126	28	30	29	128
			289A	10.0	12.0	39	40	38	136	40	40	40	138	41	45	41	138	43	45	43	140
			292A	16.5	19.9	48	50	47	144	50	50	49	146	51	60	50	146	52	60	52	148
			295A	33.5	40.3	74	80	71	164	76	80	73	166	76	80	73	166	78	80	75	168
			289A+295A	43.5	52.3	89	90	85	229	91	100	87	231	91	100	87	231	93	100	89	233
			292A+295A	50.0	60.2	84	90	94	244	86	90	96	246	86	90	96	246	88	90	98	248
		MED	NONE	–	–	24	30	25	137	26	30	27	139	26	30	27	139	28	30	29	141
			289A	10.0	12.0	39	40	39	149	41	45	41	151	41	45	41	151	43	45	43	153
			292A	16.5	19.9	49	50	48	157	51	60	50	159	51	60	50	159	53	60	52	161
			295A	33.5	40.3	74	80	71	177	76	80	73	179	77	80	74	179	78	80	76	181
			289A+295A	43.5	52.3	89	90	85	242	91	100	87	244	92	100	88	244	93	100	90	246
			292A+295A	50.0	60.2	84	90	94	257	86	90	96	259	86	90	97	259	88	90	99	261
		HIGH	NONE	–	–	31	40	32	156	33	40	34	158	33	40	35	158	35	40	37	160
			289A	10.0	12.0	46	50	46	168	48	50	48	170	48	50	49	170	50	50	51	172
			292A	16.5	19.9	56	60	55	176	58	60	57	178	58	60	58	178	60	60	60	180
			295A	33.5	40.3	81	90	79	196	83	90	81	198	84	90	81	198	85	90	83	200
			289A+295A	43.5	52.3	96	100	92	261	98	100	94	263	99	100	95	263	100	100	97	265
			292A+295A	50.0	60.2	91	100	101	276	93	100	104	278	93	100	104	278	95	100	106	280
	575–3–60	STD	NONE	–	–	19	25	20	97	23	25	24	101	21	25	22	99	25	30	26	103
			290A	10.0	9.6	31	35	31	107	35	35	35	111	33	35	33	109	37	40	37	113
			293A	16.5	15.9	39	40	38	113	43	45	42	117	41	45	40	115	44	45	44	119
			296A	33.5	32.2	59	60	57	129	63	70	61	133	61	70	59	131	65	70	63	135
			290A+296A	43.5	41.9	71	80	68	181	75	80	72	185	73	80	70	183	77	80	74	187
			293A+296A	50.0	48.1	67	70	75	193	71	80	79	197	69	70	77	195	73	80	81	199
		MED	NONE	–	–	20	25	21	106	24	25	25	110	22	25	23	108	26	30	27	112
			290A	10.0	9.6	32	35	32	116	36	40	36	120	34	35	34	118	38	40	38	122
			293A	16.5	15.9	40	40	39	122	44	45	43	126	42	45	41	124	45	45	45	128
			296A	33.5	32.2	60	60	58	138	64	70	62	142	62	70	60	140	66	70	64	144
			290A+296A	43.5	41.9	72	80	69	190	76	80	73	194	74	80	71	192	78	80	75	196
			293A+296A	50.0	48.1	68	70	76	202	72	80	81	206	70	80	78	204	74	80	82	208
		HIGH	NONE	–	–	25	30	26	118	29	35	30	122	27	30	28	120	31	35	32	124
			290A	10.0	9.6	37	40	37	128	41	45	41	132	39	45	39	130	43	45	43	134
			293A	16.5	15.9	45	45	44	134	49	50	49	138	47	50	46	136	51	60	51	140
			296A	33.5	32.2	66	70	63	150	69	70	67	154	67	70	65	152	71	80	69	156
			290A+296A	43.5	41.9	78	80	74	202	81	90	79	206	79	80	76	204	83	90	81	208
			293A+296A	50.0	48.1	73	80	81	214	77	80	86	218	75	80	83	216	79	90	88	220

See: “Legend and Notes for Tables 47 – 58” on page 63.

APPENDIX V. WIRING DIAGRAMS

50HCQA			
SIZE	**VOLTAGE**	**CONTROL**	**POWER**
A04	208/230–1–60	48TM501434–J	48TM501435–I
	208/230–3–60	48TM501434–J	48TM501436–I
	460–3–60	48TM501434–J	48TM501515–J
	575–3–60	48TM501520–J	48TM501516–J
A05	208/230–1–60	48TM501434–J	48TM501435–I
	208/230–3–60	48TM501434–J	48TM501436–I
	460–3–60	48TM501434–J	48TM501515–J
	575–3–60	48TM501520–J	48TM501516–J
A06	208/230–1–60	48TM502975–G	48TM501435–I
	208/230–3–60	48TM502975–G	48TM501436–I
	460–3–60	48TM502975–G	48TM501515–J
	575–3–60	48TM502976–G	48TM501516–J
A07	208/230–3–60	48TM502826–G	48TM502827–D
	460–3–60	48TM502826–G	48TM502827–D
	575–3–60	48TM502826–G	48TM502827–D

50HCQD			
SIZE	**VOLTAGE**	**CONTROL**	**POWER**
D08	208/230–3–60	48TM501370–O	48TM501371–L
	460–3–60	48TM501370–O	48TM501371–L
	575–3–60	48TM501370–O	48TM501371–L
D09	208/230–3–60	48TM501370–O	48TM501371–L
	460–3–60	48TM501370–O	48TM501371–L
	575–3–60	48TM501370–O	48TM501371–L
D12	208/230–3–60	48TM501926–K	48TM501927–G
	460–3–60	48TM501926–K	48TM501958–G
	575–3–60	48TM501926–K	48TM501958–G
	PremierLink*	48TM501529–H	
	RTU Open*	50HE500751–J	

NOTE: Component arrangement on Control; Legend on Power Schematic

* PremierLink and RTU OPEN control labels overlay a portion of the base unit control label. The base unit label drawing and the control option drawing are required to provide a complete unit control diagram.

APPENDIX V. WIRING DIAGRAMS

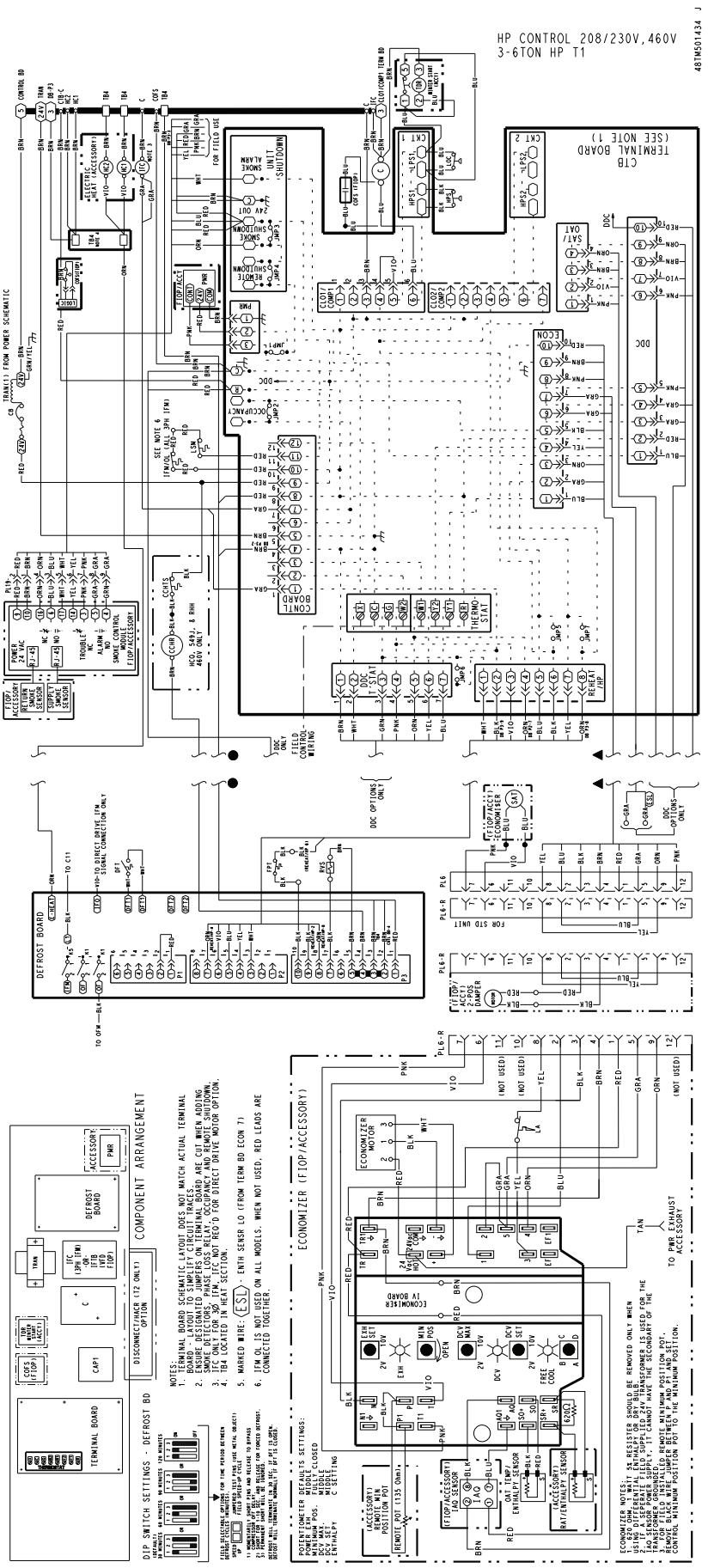
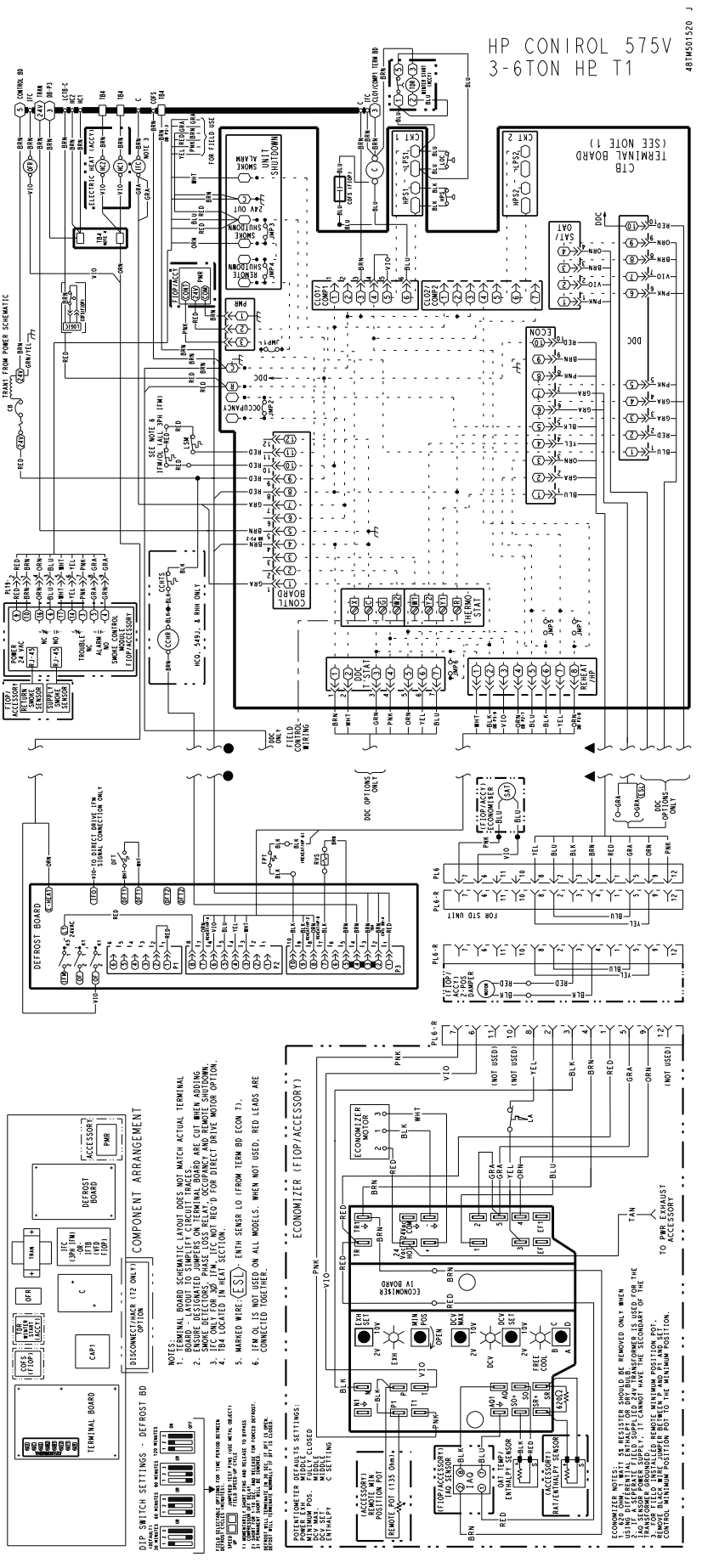


Fig. 57 - 50HCQA04/A05 Control Wiring Diagram - 208/230-1-60; 208/230-3-60; 460-3-60

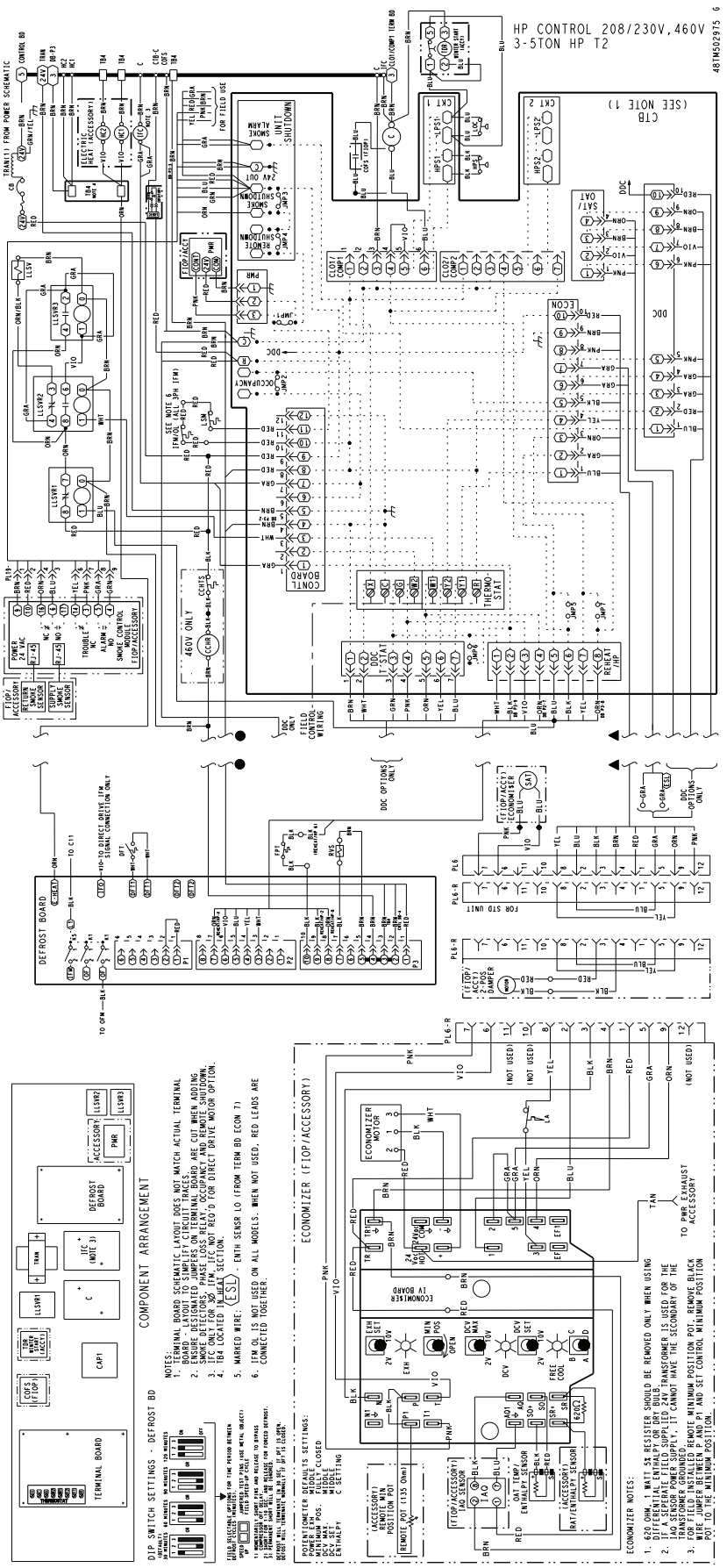
APPENDIX V. WIRING DIAGRAMS



C150427

Fig. 58 - 50HCQA04/A05 Control Wiring Diagram - 575-3-60

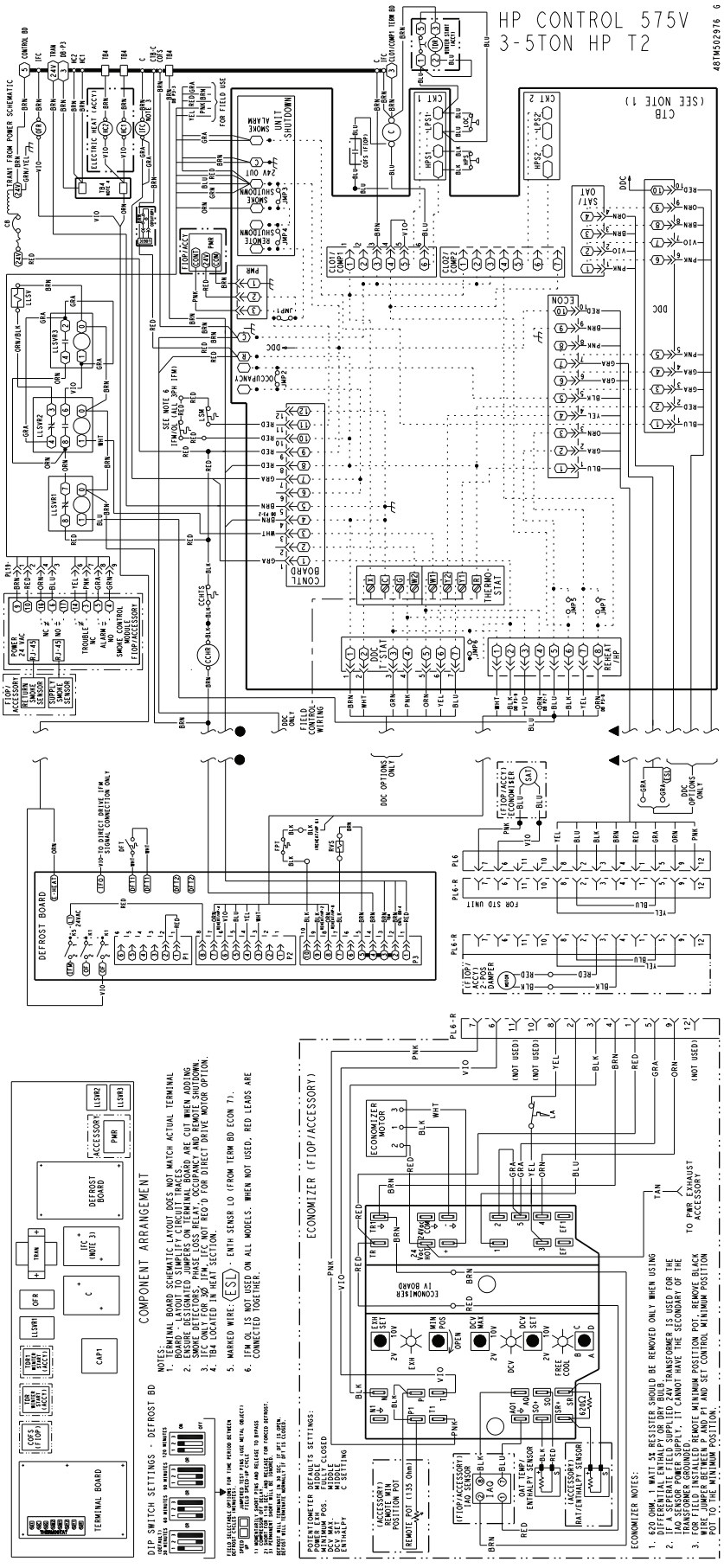
APPENDIX V. WIRING DIAGRAMS



C160012

Fig. 59 - 50HCQ*06 Control Wiring Diagram - 208/230-1-60; 208/230-3-60; 460-3-60

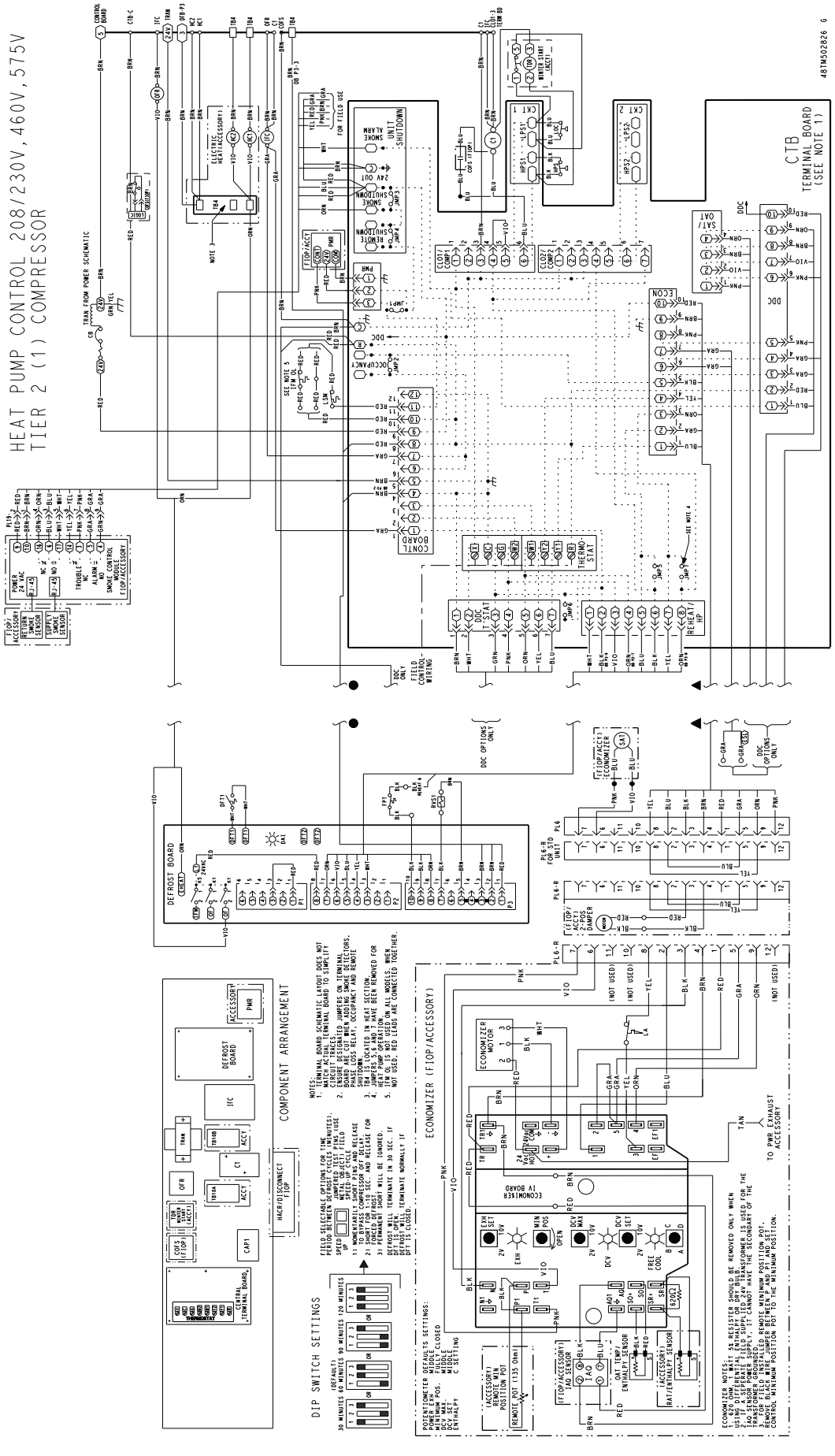
APPENDIX V. WIRING DIAGRAMS



C160013

Fig. 60 - 50HCQ*06 Control Wiring Diagram - 575-3-60

APPENDIX V. WIRING DIAGRAMS



C160014

Fig. 61 - 50HCQ*07 Control Wiring Diagram - 208/230-1-60; 208/230-3-60; 460-3-60; 575-3-60

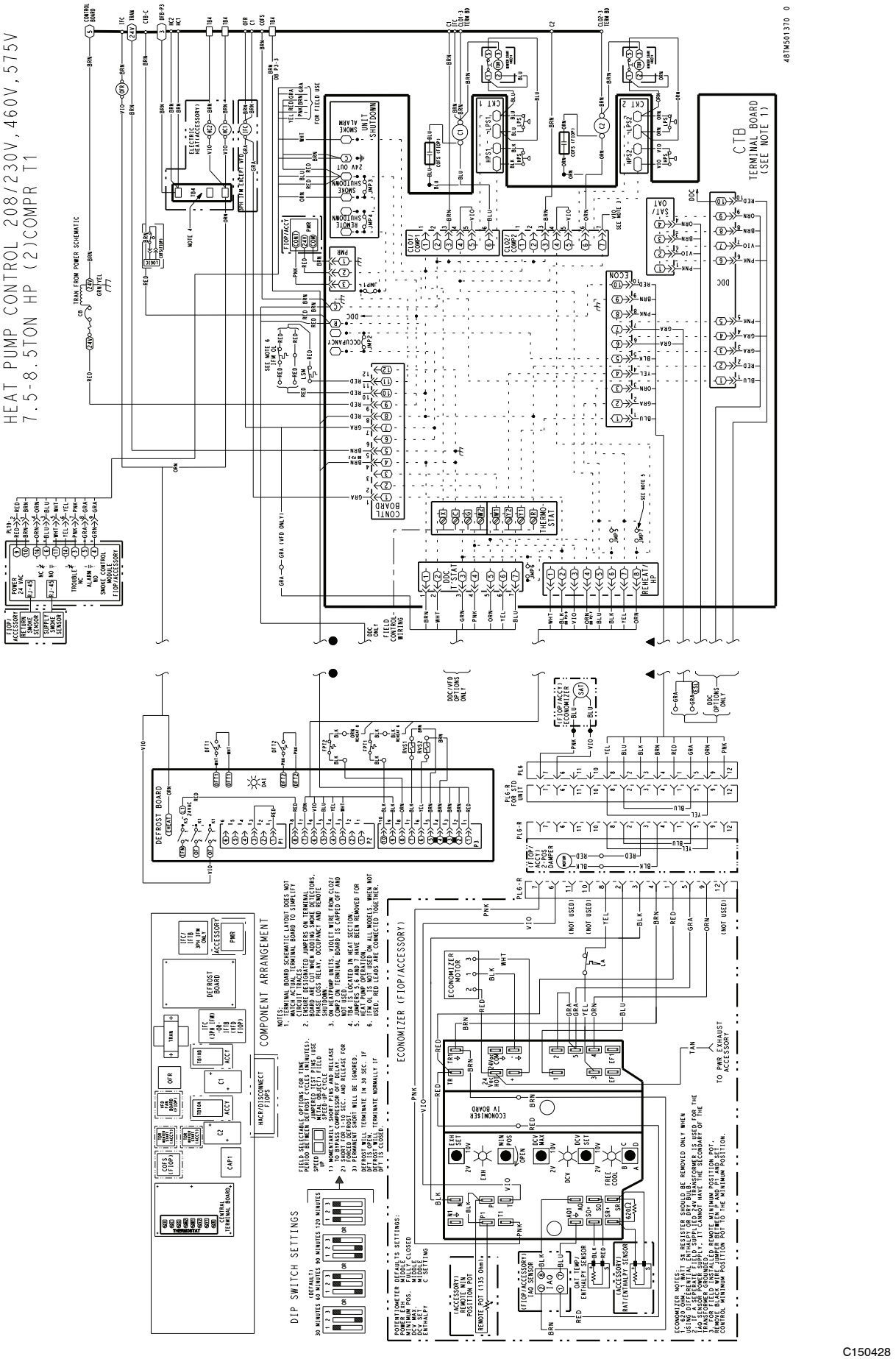


Fig. 62 - 50HCQ*08/09 Control Wiring Diagram - 208/230-1-60; 208/230-3-60; 460-3-60; 575-3-60

APPENDIX V. WIRING DIAGRAMS

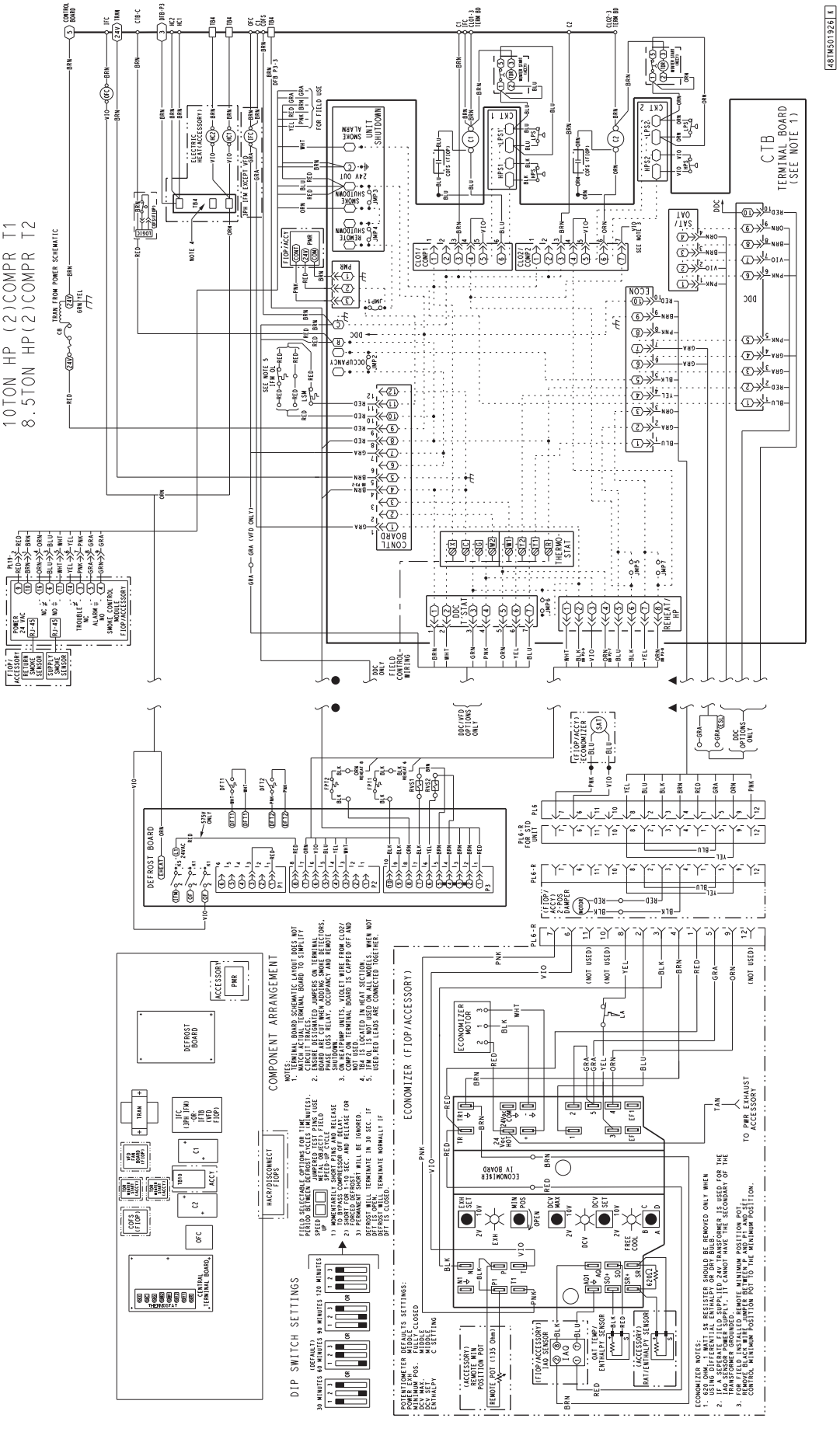


Fig. 63 - 50HCQ*12 Control Wiring Diagram - 208/230-1-60; 208/230-3-60; 460-3-60; 575-3-60

APPENDIX V. WIRING DIAGRAMS

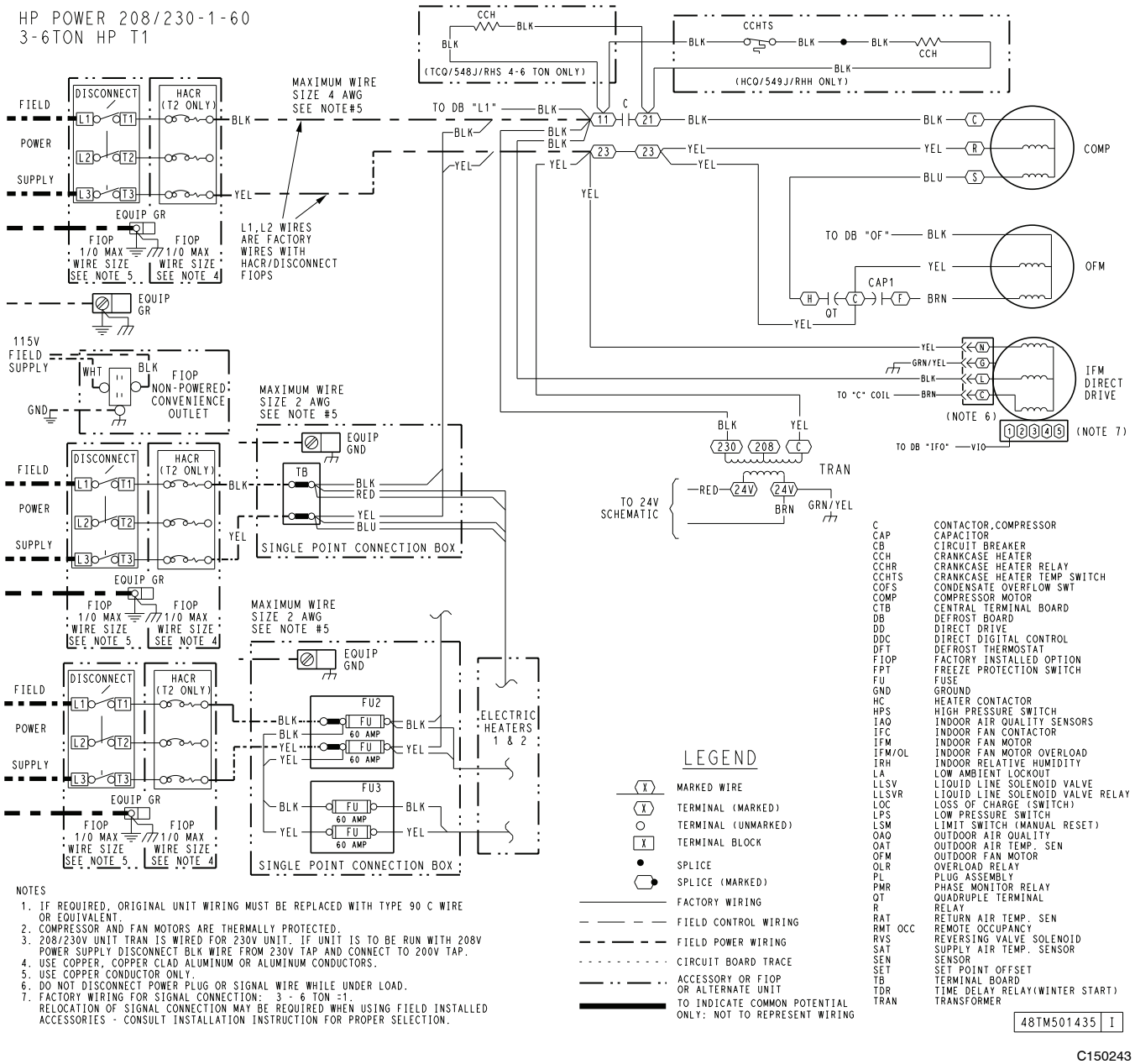


Fig. 64 - 50HCQ*04/05/06 Power Wiring Diagram - 208/230-1-60

APPENDIX V. WIRING DIAGRAMS

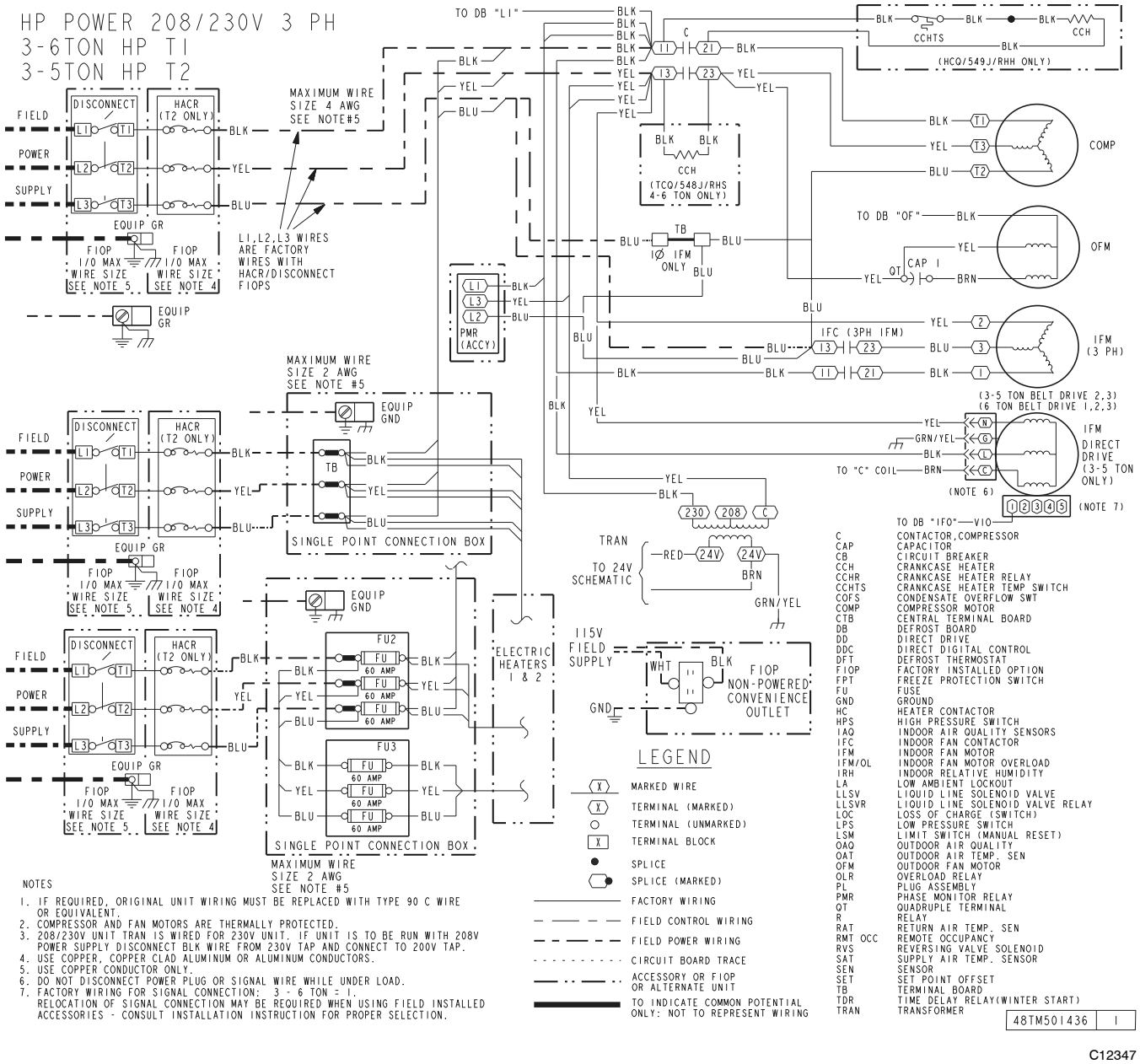


Fig. 65 - 50HCQ*04/05/06 Power Wiring Diagram - 208/230-3-60

APPENDIX V. WIRING DIAGRAMS

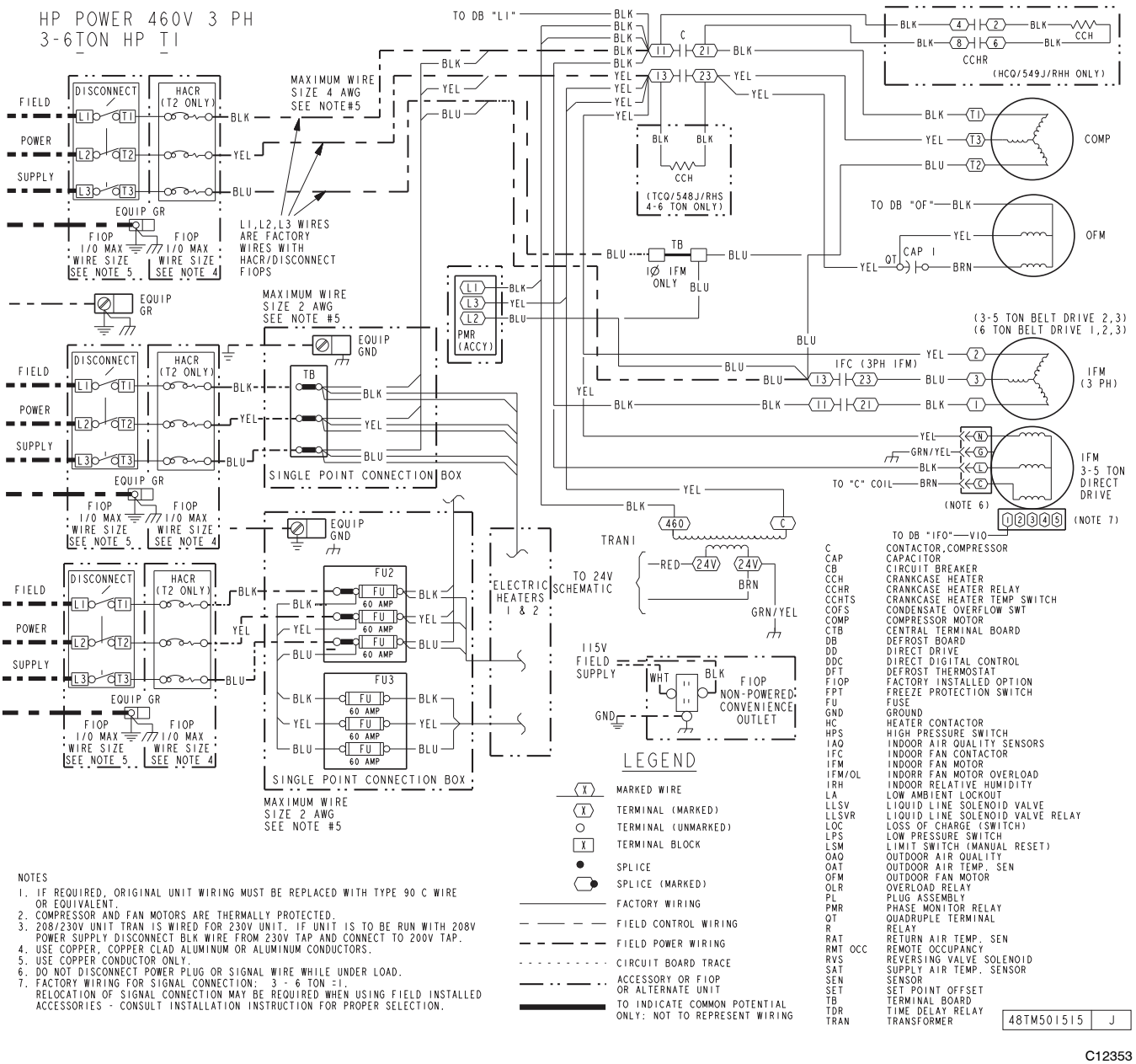
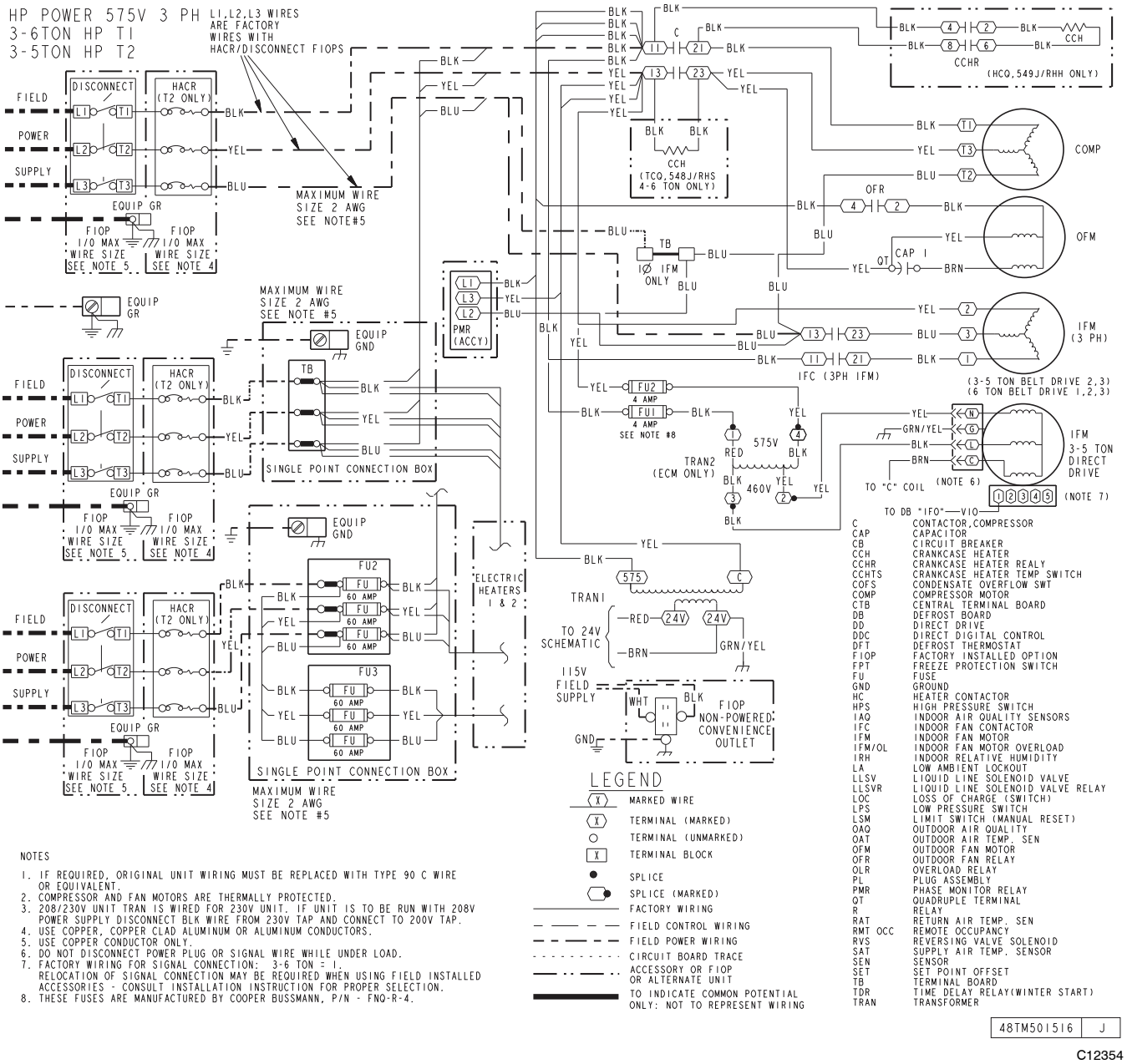


Fig. 66 - 50HCQ*04/05/06 Power Wiring Diagram - 460-3-60

APPENDIX V. WIRING DIAGRAMS



NOTES

1. IF REQUIRED, ORIGINAL UNIT WIRING MUST BE REPLACED WITH TYPE 90 C WIRE OR 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 CONDUCTORS.
5. USE COPPER CONDUCTOR ONLY.
6. DO NOT DISCONNECT POWER PLUG OR SIGNAL WIRE WHILE UNDER LOAD.
7. FACTORY WIRING FOR SIGNAL CONNECTION: 3-6 TON = 1. RELOCATION OF SIGNAL CONNECTION MAY BE REQUIRED WHEN USING FIELD INSTALLED ACCESSORIES - CONSULT INSTALLATION INSTRUCTION FOR PROPER SELECTION.
8. THESE FUSES ARE MANUFACTURED BY COOPER BUSSMANN, P/N - FNQ-R-4.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCHR	CRANKCASE HEATER REALY
CCHTS	CRANKCASE HEATER TEMP SWITCH
COFS	CONDENSATE OVERFLOW SWT
COMP	COMPRESSOR MOTOR
CTB	CENTRAL TERMINAL BOARD
DB	DEFROST BOARD
DD	DIRECT DRIVE
DDC	DIRECT DIGITAL CONTROL
DFT	DEFROST THERMOSTAT
FIOP	FACTORY INSTALLED OPTION
FPT	FREEZE PROTECTION SWITCH
FU	FUSE
GND	GROUND
HC	HEATER CONTACTOR
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFM	INDOOR FAN MOTOR
IFM/OL	INDOOR FAN MOTOR OVERLOAD
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LLSV	LIQUID LINE SOLENOID VALVE
LLSVR	LIQUID LINE SOLENOID VALVE RELAY
LOC	LOSS OF CHARGE (SWITCH)
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OLR	OVERLOAD RELAY
PL	PLUG ASSEMBLY
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
RVS	REVERSING VALVE SOLENOID
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
TB	TERMINAL BOARD
TDR	TIME DELAY RELAY(WINTER START)
TRAN	TRANSFORMER

48TM501516 | J

C12354

Fig. 67 - 50HCQ*04/05/06 Power Wiring Diagram - 575-3-60

APPENDIX V. WIRING DIAGRAMS

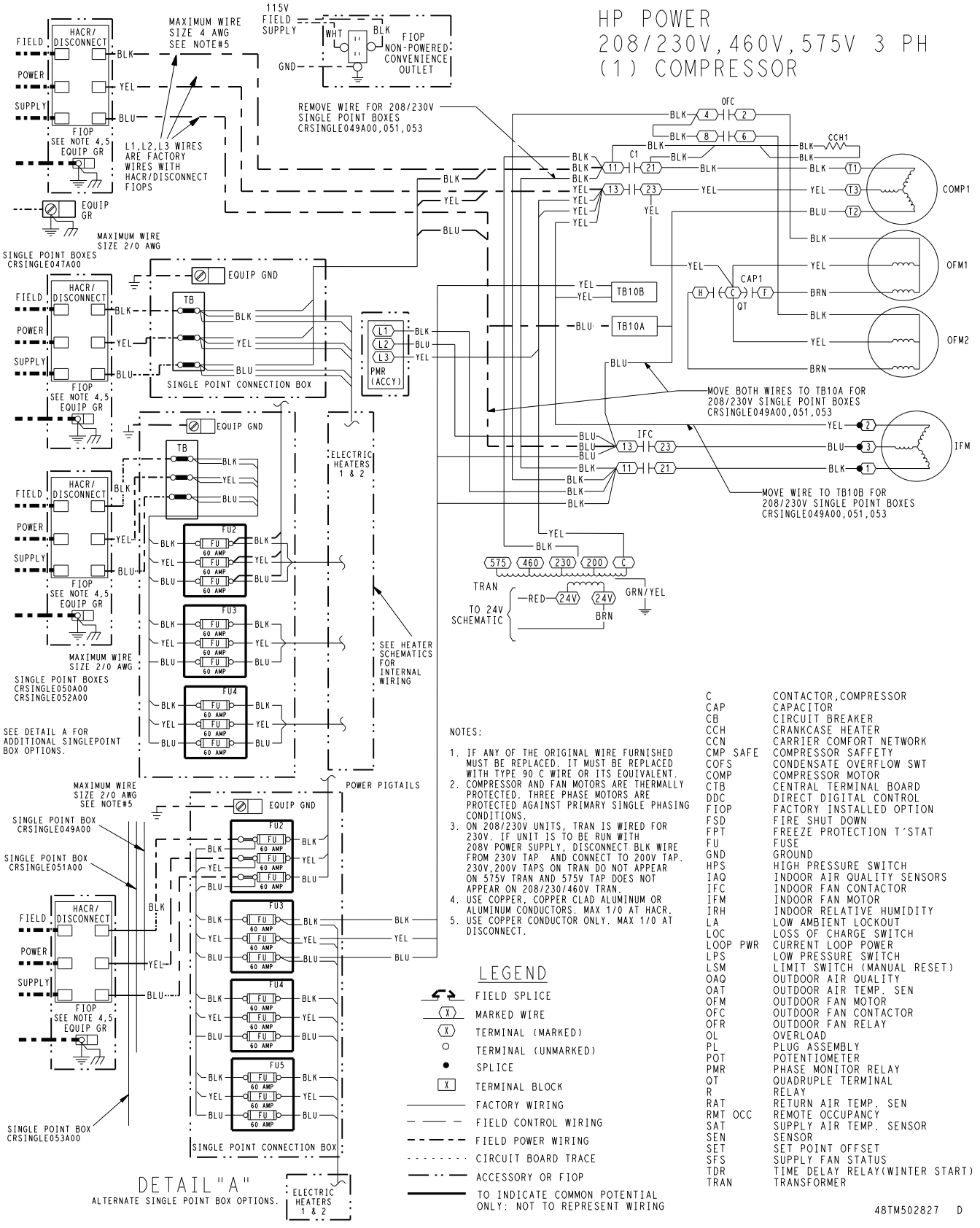


Fig. 68 - 50HCQ*07 Power Wiring Diagram - 208/230-3-60; 460-3-60; 575-3-60

APPENDIX V. WIRING DIAGRAMS

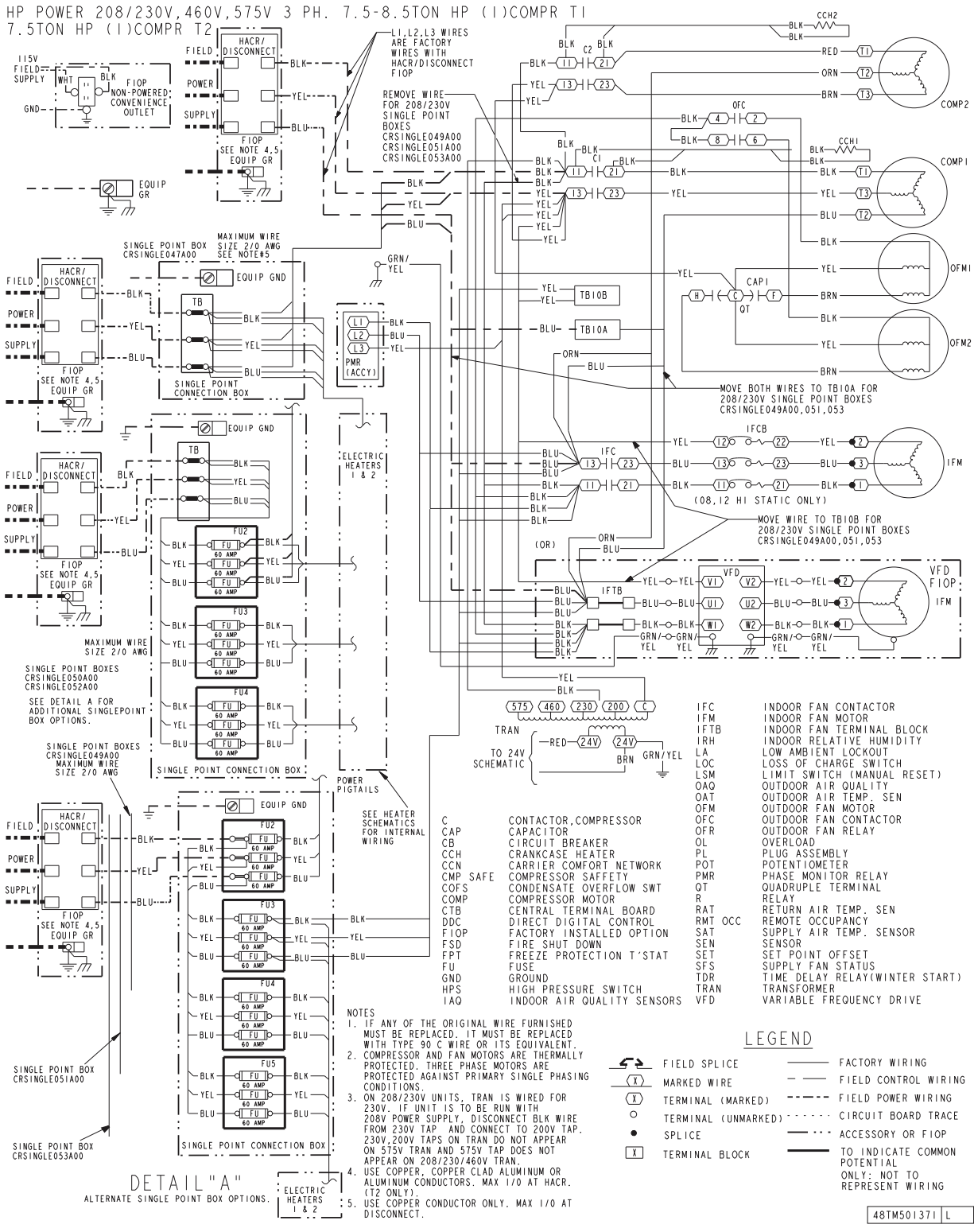


Fig. 69 - 50HCQ*09 Power Wiring Diagram - 208/230-3-60; 460-3-60; 575-3-60

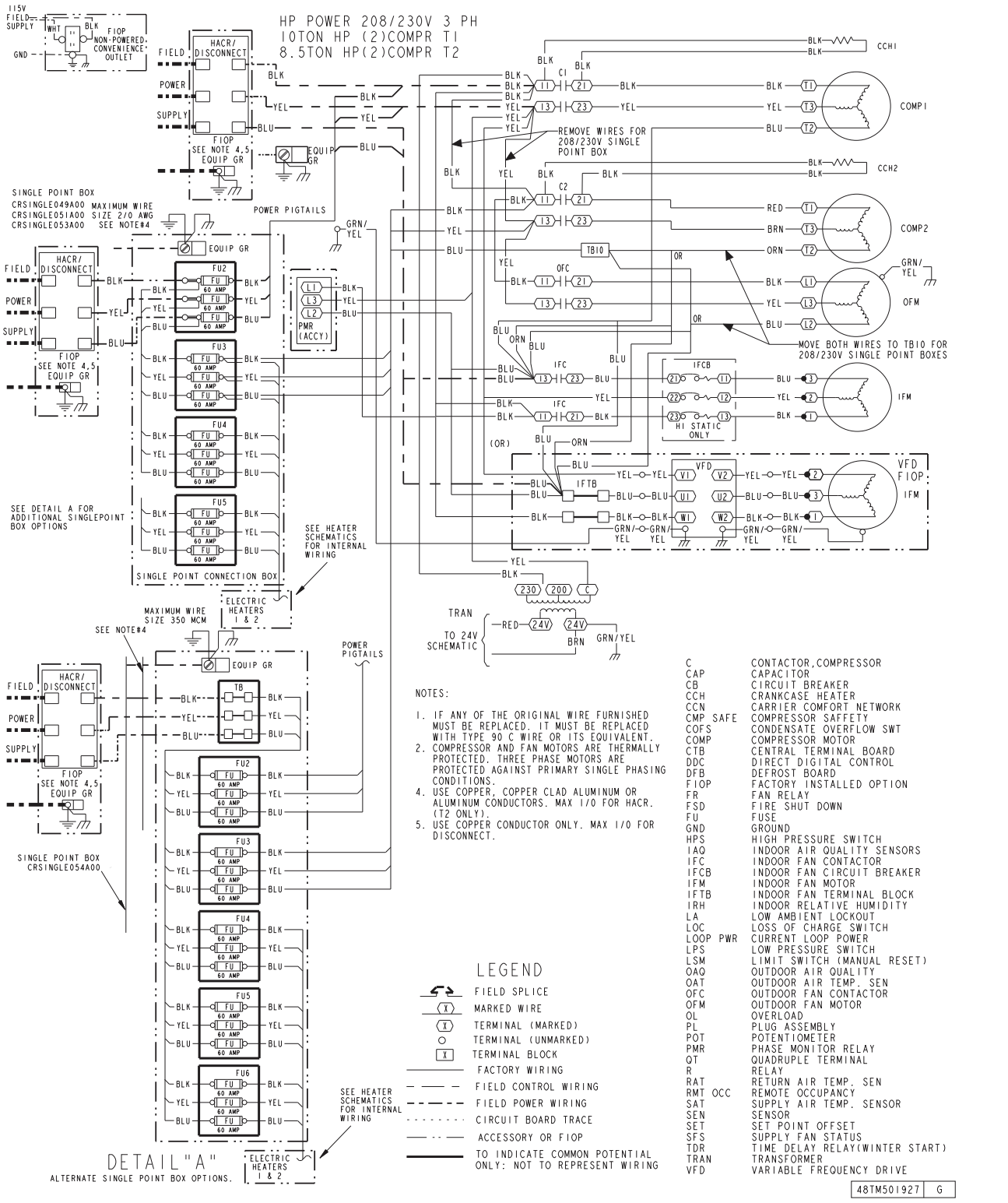


Fig. 70 - 50HCQ*12 Power Wiring Diagram - 208/230-3-60; 460-3-60; 575-3-60

APPENDIX V. WIRING DIAGRAMS

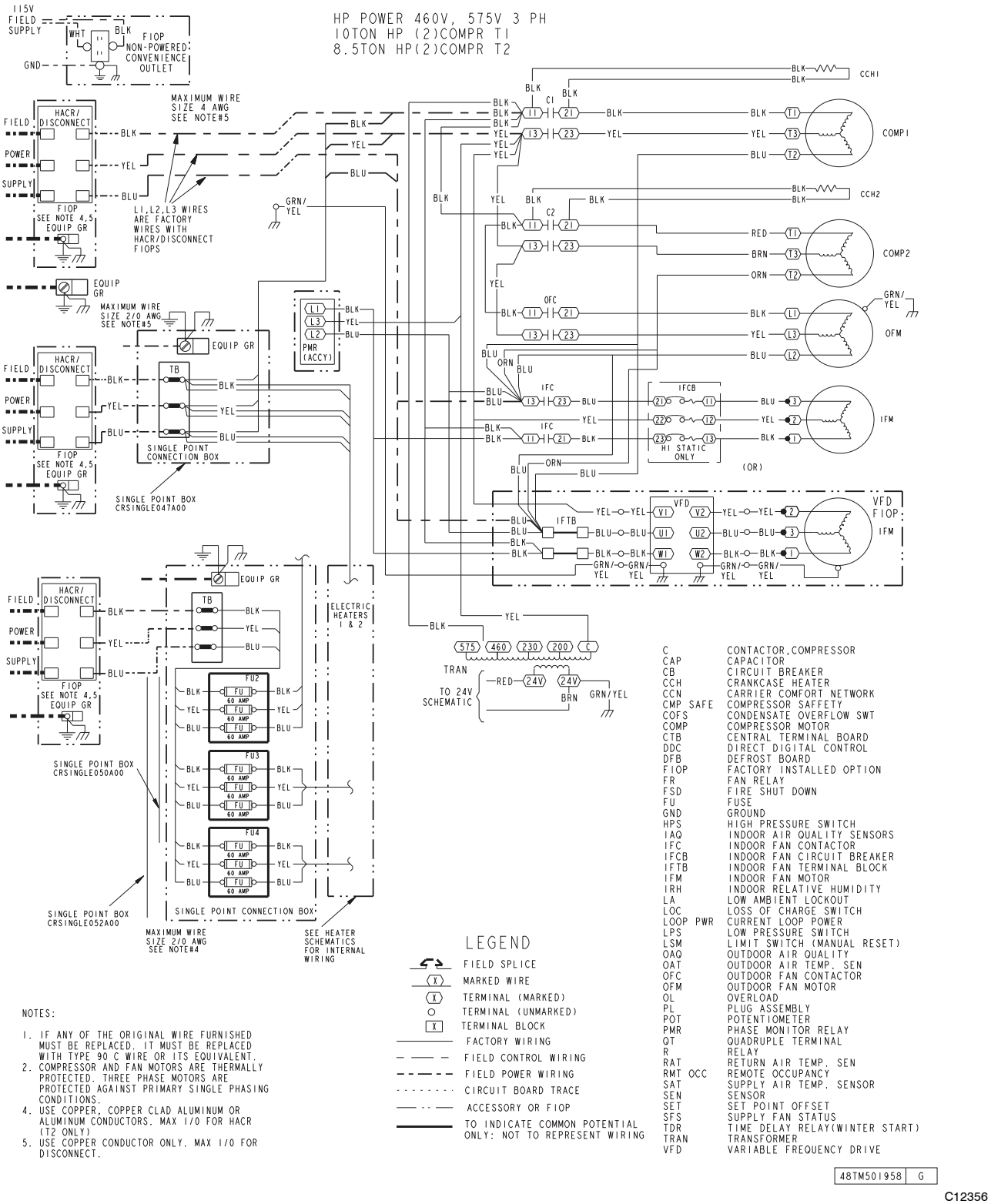
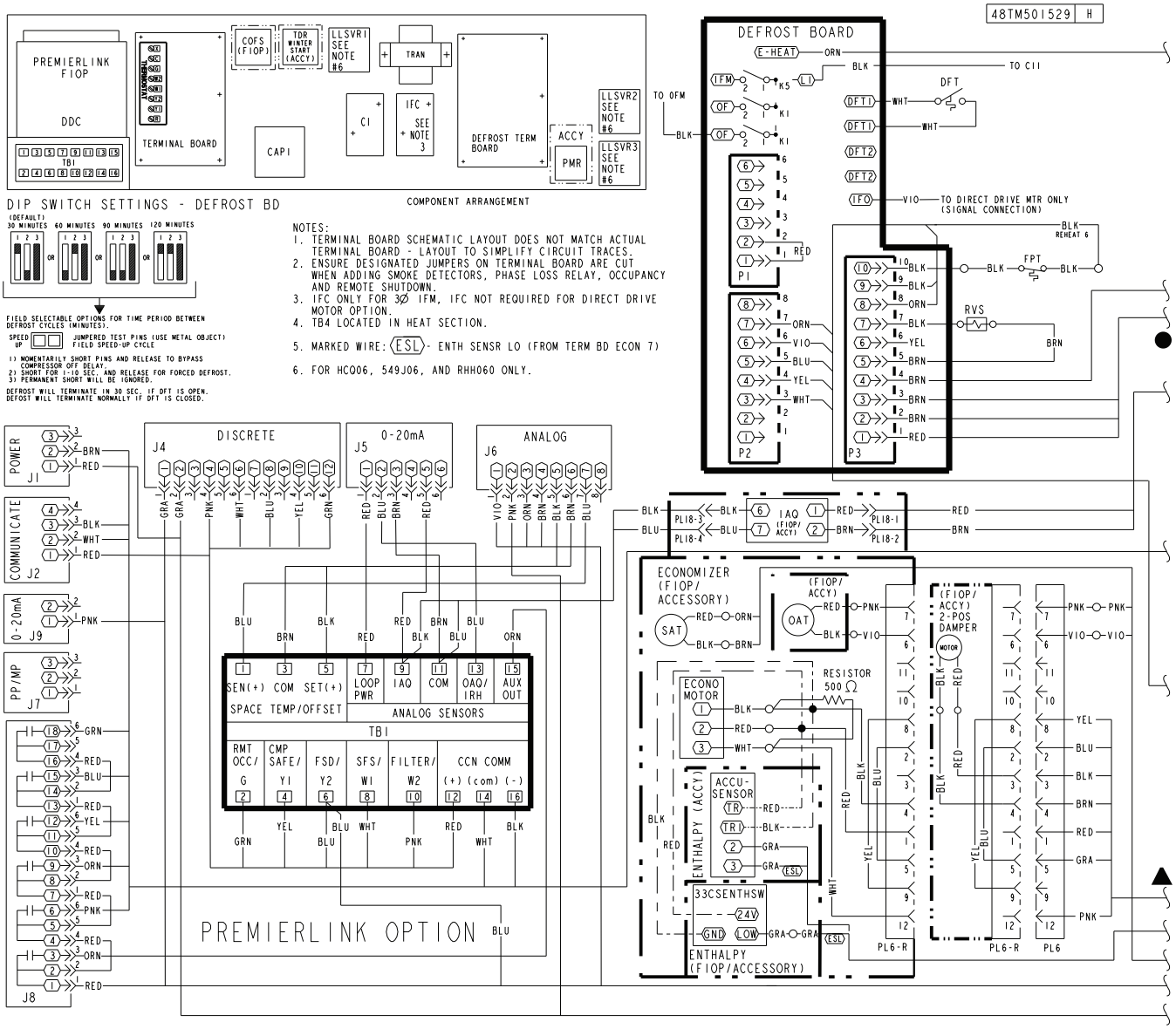


Fig. 71 - 50HCQ*12 Power Wiring Diagram - 460-3-60; 575-3-60

APPENDIX V. WIRING DIAGRAMS



C150432

Fig. 72 - 50HCQ PremierLink Control Diagram

APPENDIX V. WIRING DIAGRAMS

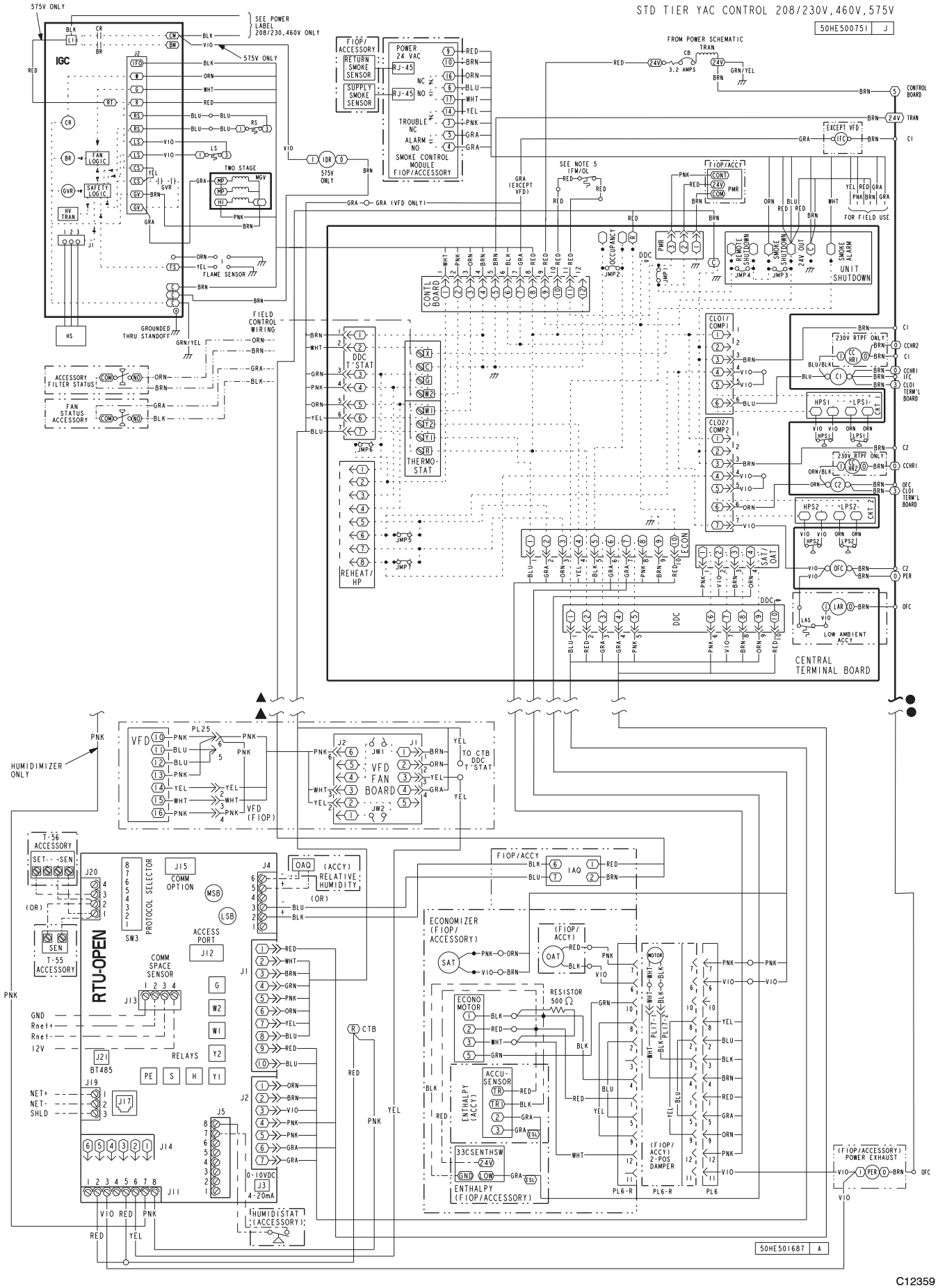


Fig. 73 - 50HCQ RTU-Open Control Diagram

APPENDIX VI. MOTORMASTER SENSOR LOCATIONS

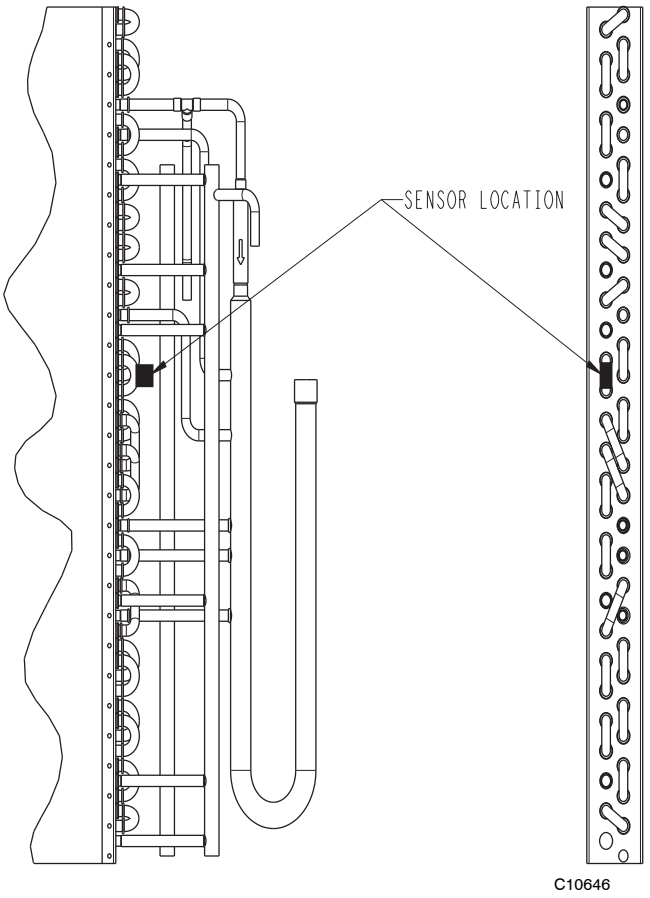


Fig. 74 - 50HCQA04 Outdoor Circuiting

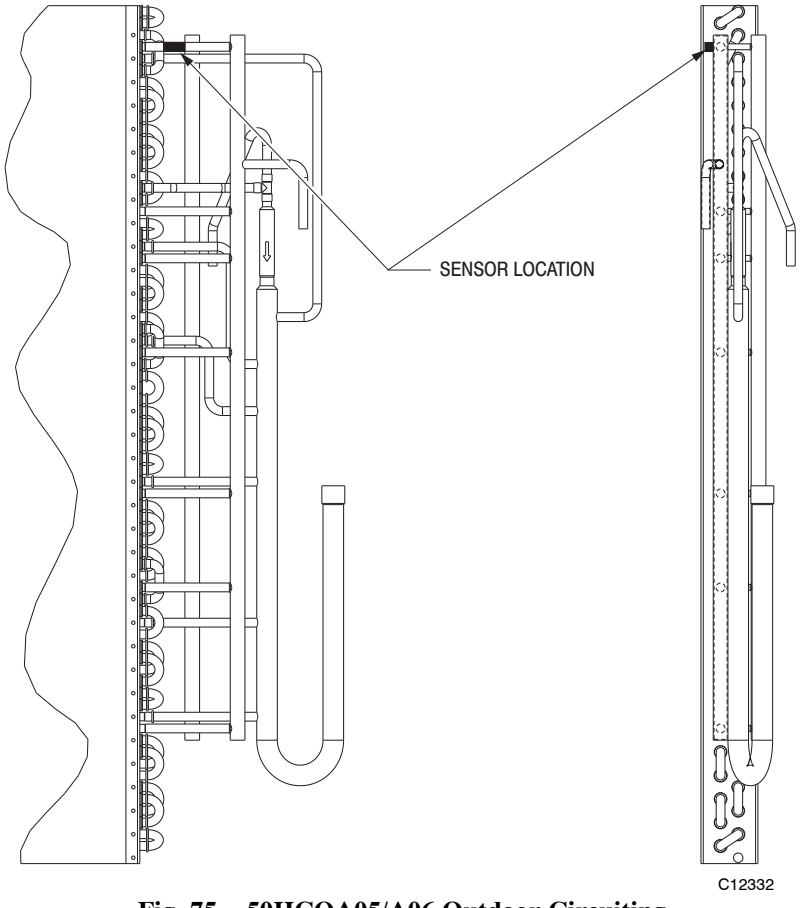


Fig. 75 - 50HCQA05/A06 Outdoor Circuiting

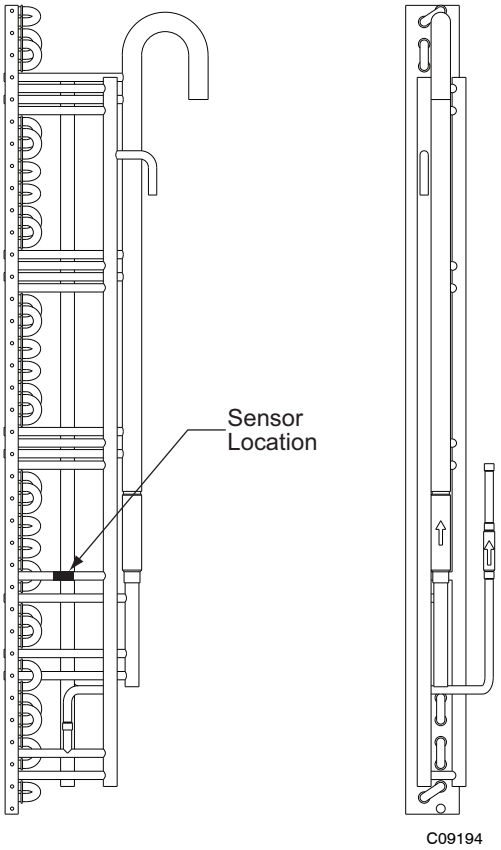


Fig. 76 - 50HCQA07 Outdoor Circuiting

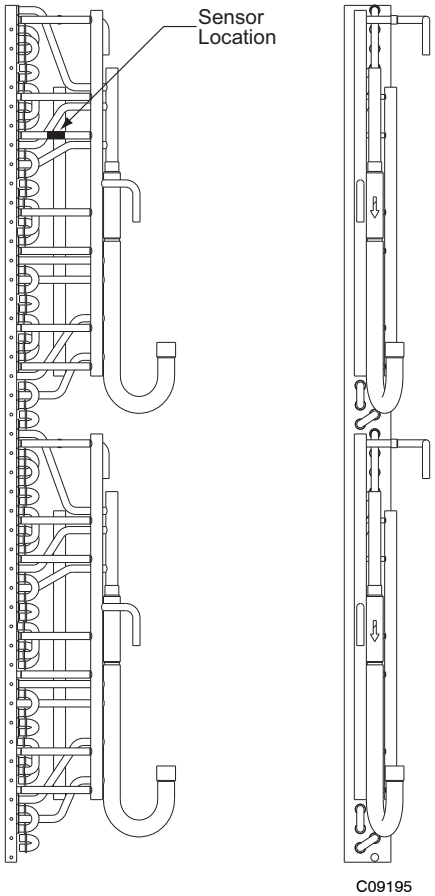


Fig. 77 - 50HCQD08/D09 Outdoor Circuiting

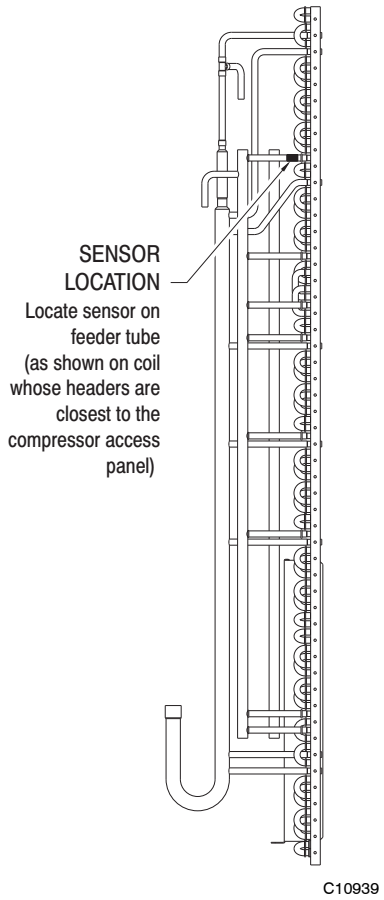


Fig. 78 - 50HCQD12 Outdoor Circuiting

Edition Date: 02/16

Catalog No: 50HCQ−04−12−01SM

Replaces:Replaces: 50HCQ−01SM

START-UP CHECKLIST
(Remove and Store in Job File)

I. PRELIMINARY INFORMATION

MODEL NO.: _____ SERIAL NO.: _____

DATE: _____ TECHNICIAN: _____

II. PRE-START-UP (insert checkmark in box as each item is completed)

☐ VERIFY THAT JOBSITE VOLTAGE AGREES WITH VOLTAGE LISTED ON RATING PLATE

☐ VERIFY THAT ALL PACKAGING MATERIALS HAVE BEEN REMOVED FROM UNIT

☐ REMOVE ALL SHIPPING HOLD DOWN BOLTS AND BRACKETS PER INSTALLATION INSTRUCTIONS

☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS

☐ CHECK REFRIGERANT PIPING FOR INDICATIONS OF LEAKS; INVESTIGATE AND REPAIR IF NECESSARY

☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS

☐ CHECK THAT RETURN (INDOOR) AIR FILTERS ARE CLEAN AND IN PLACE

☐ VERIFY THAT UNIT INSTALLATION IS LEVEL

☐ CHECK FAN WHEELS AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS

☐ CHECK TO ENSURE THAT ELECTRICAL WIRING IS NOT IN CONTACT WITH REFRIGERANT LINES OR SHARP METAL EDGES

☐ CHECK PULLEY ALIGNMENT AND BELT TENSION PER INSTALLATION INSTRUCTIONS

III. START-UP

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
CIRCUIT 1 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
CIRCUIT 2 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR-FAN AMPS		_____		_____		_____
OUTDOOR-FAN AMPS	NO. 1	_____	NO. 2	_____	NO. 3	_____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE	_____	DB	_____	WB
RETURN-AIR TEMPERATURE	_____	DB	_____	WB
COOLING SUPPLY AIR	_____	DB	_____	WB

PRESSURES (Cooling Mode)

REFRIGERANT SUCTION, CIRCUIT 1	_____	PSIG	_____	F
REFRIGERANT SUCTION, CIRCUIT 2	_____	PSIG	_____	F
REFRIGERANT DISCHARGE, CIRCUIT 1	_____	PSIG	_____	F
REFRIGERANT DISCHARGE, CIRCUIT 2	_____	PSIG	_____	F

☐ VERIFY THAT 3-PHASE FAN MOTOR AND BLOWER ARE ROTATING IN CORRECT DIRECTION.

☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS

GENERAL

☐ SET ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO MATCH JOB REQUIREMENTS (IF EQUIPPED)

Edition Date: 02/16

Catalog No: 50HCQ−04−12−01SM

Replaces:Replaces: 50HCQ−01SM