Installation Manual: PC3 Series - 208/230 V - 1 Phase

13.4 SEER2 R-454B Packaged Air Conditioner with Optional Field-Installed Electric Heat

CAUTION

Risk of fire

This unit uses a mildly flammable (A2L) refrigerant. See A2L refrigerant safety considerations to ensure safe installation, operation, and servicing of this unit.

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6651472-UIM-B-0425

Supersedes: 6651472-UIM-A-0425

B

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Contents

About the PC3 unit

PC3 units are factory-assembled air conditioners designed for outdoor installation on a roof or at ground level. Field-installed electric heat kits are available to provide electric heat.

The units are completely assembled on rigid, removable base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require only electric power and duct connections at the point of installation.

Certification

AHRI CERTIFIED™ www.ahridirectory.org Unitary Small AC AHRI Standard 210/240 Certification applies only when the complete system is listed with AHRI

C SA® US

Assembled at a facility with an ISO 9001:2015-certified Quality Management System

DS Solutions App

Johnson Controls believes in empowering our customers with unit-specific information at all times. Download the Ducted Systems Solutions Mobile App (DS Solutions App), which is available through the App Store for iOS and Google Play for Android. Users can use the DS Solutions App to scan the QR code located on the rating plate that is unique to each unit and provides information specific to the product. Take advantage of the features available for all units: Nomenclature, Literature (Technical Guide, Installation Manual and Wiring Diagrams), Parts list, Product Registration, Claims Tracking, and more.

Ducted Systems Solutions

iOS

Android

Safety

It is important to understand the safety symbols used in this manual. Read safety information carefully and follow all safety requirements.

Understanding safety symbols and instructions

This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, or **CAUTION**, as well as the **NOTICE**, **Important**, and **Note** alerts.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury**.

WARNING indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury**.

CAUTION indicates a **potentially** hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

NOTICE indicates information considered important, but not hazard-related, such as messages relating to property damage.

Important indicates information that is essential to complete a task or may result in damage to the device if not followed.

Note indicates something of special interest or importance. Notes can contain any type of information except safety information.

Safety requirements

⚠ WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Failure to carefully read and follow all instructions in this manual can result in unit malfunction, death, personal injury, and/or property damage. A qualified contractor, installer, or service agency must install this product.

⚠ CAUTION

This product must be installed in strict compliance with the installation instructions and any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury. Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency, or the gas supplier.

⚠ CAUTION

This system uses R-454B refrigerant. No other refrigerant may be used in this system. Gauge sets, hoses, refrigerant containers, and recovery systems must be designed to handle R-454B. If you are unsure, consult the equipment manufacturer. Failure to use R-454B compatible servicing equipment may result in property damage or injury.

⚠ WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given proper supervision and sufficient instruction concerning use of the appliance by a person responsible for their safety.

Children must be supervised to ensure that they do not play with the appliance.

⚠ CAUTION

Do not install the appliance above 3353 m (11,000 ft) altitude. Ensure the appliance’s functions, including and not limited to electric heat, work properly before installation/servicing is completed.

⚠ CAUTION

In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

⚠ WARNING

RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH

System contains oversize protective earthing (grounding) terminal which shall be properly connected.

⚠ WARNING

RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH

System contains two independent protective earthing (grounding) terminals which both shall be properly connected and secured.

Adhere to the following:

- Be aware that due to system pressure, moving parts, and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, licensed service personnel must install, repair, or service this equipment. Unlicensed personnel can perform the basic maintenance functions of cleaning coils and filters and replacing filters.
- Observe all precautions in the literature, labels, and tags accompanying the equipment when working on air conditioning equipment. Install the unit in strict compliance with the installation instructions and any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.
- Wear safety glasses and work gloves. Use quenching cloth and have a fire extinguisher available during brazing operations.

A2L refrigerant safety guidance

⚠ CAUTION

You must read all of this section before installing this unit.

⚠ WARNING

Do not use means to accelerate the defrosting or thawing process or to clean, other than those recommended by the manufacturer.

The appliance shall be placed outdoors and kept away from continuously operating ignition sources (for example: open flames, a third-party operating gas appliance or a third-party operating electric heater.)

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

⚠ WARNING

Any required ventilation and circulation openings must be kept clear of obstruction.

⚠ WARNING

Any ducts connected to the unit shall not contain any potential ignition source(s).

Do not install auxiliary devices not approved by the appliance manufacturer or not declared suitable with the refrigerant in connecting ductwork.

⚠ WARNING

If disconnect switch(es) are installed within 6.6 ft (2 m) of any surfaces of the unit and/or the installation/commissioning/troubleshooting/servicing requires powering up or down the unit by operating the disconnect switch(es), confirm there is no presence of A2L refrigerant around the disconnect switch(es) before operating them. This requirement can be waived if such disconnect switch(es) are intrinsically safe or compliant with necessary safety standard to not cause any flammability concern with A2L refrigerant.

General

Table 1: General

Item number	Safety guideline
1	Typical potential continuously operating sources that could cause ignition of A2L refrigerants include but are not limited to gas appliances, electric heaters, hot surfaces over 700°C (1292°F), all sorts of continuously operating open flames, all sorts of continuously operating devices that generate open arcs and/or sparks, and cigarette smoking. Follow the A2L safety guideline in this manual to eliminate such a concern or risk and ensure safe/compliant operation of the unit.
2	Any appliance containing 1.776 kg (3.915 lb) or more of A2L charge amount for any refrigerant circuit must be constructed such that any refrigerant leak cannot flow or stagnate in a way that would create a fire or explosion hazard.
3	Ensure return and supply duct openings of the unit are not obstructed. Ensure all air vents in all rooms are not obstructed in any way. If zoning dampers are installed in a place that is conditioned by 4 ton or 5 ton packaged AC units, ensure that one of the following requirements is met: • All zoning dampers are actuated by the A2L mitigation controls to be open in a detected A2L leakage event **and** the total conditioned space floor area TA is no less than TA_{min}. • Zoning dampers are not actuated by the A2L mitigation controls but the combined conditioned space floor area in each zone is no less than TA_{min}. ⓘ **Note:** If zoning dampers are installed in a place that is conditioned by 2 ton to 3.5 ton packaged AC units, there is no requirement on zoning dampers for A2L mitigation.
4	For the unit marked as LEAK DETECTION SYSTEM installed, the unit must be powered except for service. Such a unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.
5	Ensure the unit refrigerant circuit is protected from physical damage in installation, operation, and service. Ensure pipe work including piping material, pipe routing, and installation follows the factory design and specification and complies with applicable national and local codes and standards such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection before being covered or enclosed. Consider leaving sufficient inspection space in addition to following the unit clearances table.
6	If the refrigerant tubing in the unit needs repair during servicing, the refrigerant tubing must be pressure tested with nitrogen and then vacuum tested before refrigerant charging. Adhere to the following: • The minimum test pressure is 423 PSIG (2.92 MPa, gauge) for Respack AC units. • Field-made joints or refrigerant tubing not directly exposed to ambient air must be tightness tested. Use a tester with a sensitivity of 5 grams per year of refrigerant or better under 163+ PSIG test pressure. Ensure no leak can be detected.
7	You must verify actuation of A2L mitigation actions before installation or any A2L refrigerant-leakage-related service is completed.
8	You must replace refrigerant detection sensors only with the ones specified by the appliance manufacturer for the refrigerant detection system (RDS). There are no exceptions.
9	Do not use false ceilings or drop ceilings as a return air plenum.
10	After transporting a unit to the installation site **and** before working on any electrical connection/ wiring, ensure there is no refrigerant leak in the system, especially in the indoor coil section.
11	Before beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, item 12 to item 18 below must be adhered to before conducting work on the system.

Table 1: General

Item number	Safety guideline
12	Work must be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
13	Instruct all maintenance staff and others working in the local area on the nature of work being carried out. Avoid work in confined spaces.
14	The area must be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants: non-sparking, adequately sealed, or intrinsically safe.
15	If conducting any hot work on the refrigerating equipment or any associated parts, you must have appropriate fire-extinguishing equipment on hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
16	If conducting work in relation to the refrigerating system that involves exposing any pipework, do not use any sources of ignition in such a manner that may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, must be kept sufficiently far away from the site of installation, repair, removal, and disposal, during which refrigerant can possibly be released to the surrounding space. Before conducting any work, survey the area around the equipment to ensure that there are no flammable hazards or ignition risks. Display “No Smoking” signs.
17	Ensure the area is in the open or that it is adequately ventilated before opening the system or while conducting any hot work. The ventilation must safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
18	Ensure that the refrigerant detection sensor is not obstructed in any way.

Meeting conditioned space and system requirements

Important: For 2 ton to 3.5 ton packaged unit models, the refrigerant charge is less than 1.776 kg (3.915 lb) so an A2L mitigation system is not required.

For 4 ton and 5 ton packaged unit models, the refrigerant charge is more than 1.776 kg (3.915 lb), so an A2L mitigation system that meets requirements for minimum floor area and system airflow rates as outlined in Table 2 is required. In typical applications of 4 ton or 5 ton packaged unit models, the TA (total area) for the total conditioned space floor area is well above the TA_{min} requirement, so adding natural ventilation openings to meet the TA_{min} requirement or installing a mechanical ventilation system as outlined in this procedure is not generally required. Figure 1 and Figure 2 provide more specific sizing and installation information for upper and lower natural ventilation openings if needed.

Table 2: Requirements for minimum conditioned space floor area and system airflow rates

Model	Unit charge		Minimum opening for natural ventilation connecting occupied and unoccupied spaces		Actual total conditioned space floor area		Required minimum area of total conditioned space		Allowable maximum refrigerant charge in A2L system		Minimum circulation airflow by A2L system to total conditioned space		Minimum mechanical ventilation airflow required if TA_{min} is not met	
	m_c		Anv_{min}		TA		TA_{min}		m_{max}		Q_{min_circ}		$Q_{min\_mech\_vent}$	
	lb	kg	in^2	m^2	ft^2	m^2	ft^2	m^2	lb	kg	CFM	m^3/h	CFM	m^3/h
PC3E48	4.06	1.84	181	0.117	75	7.0	121.8	11.32	2.50	1.13	220	374	42	72
PG3E48	4.06	1.84	170	0.110	100	9.3	121.8	11.32	3.33	1.51	220	374	20	33
	4.06	1.84	165	0.107	121.8	11.3	121.8	11.32	4.06	1.84	220	374	0	0
PC3E60	4.81	2.18	216	0.139	100	9.3	144.3	13.41	3.33	1.51	260	442	40	68
PG3E60	4.81	2.18	205	0.132	125	11.6	144.3	13.41	4.17	1.89	260	442	17	30
	4.81	2.18	195	0.126	144.3	13.4	144.3	13.41	4.81	2.18	260	442	0	0

Note:
- The data in the *Minimum opening for natural ventilation connecting occupied and unoccupied spaces* column is for increasing total conditioned space floor area if needed.
- One of the required warning labels on the unit refers to the following:
  - Minimum installation height, X m (W ft). The minimum installation height does not apply to this model series.
  - Minimum room area (operating or storage), Y m^2 (Z ft^2). For the minimum room area, use the values in the *Required minimum area of total conditioned space* column.

Figure 1: Natural ventilation openings - lower opening entirely below the 0.3 m point above the floor

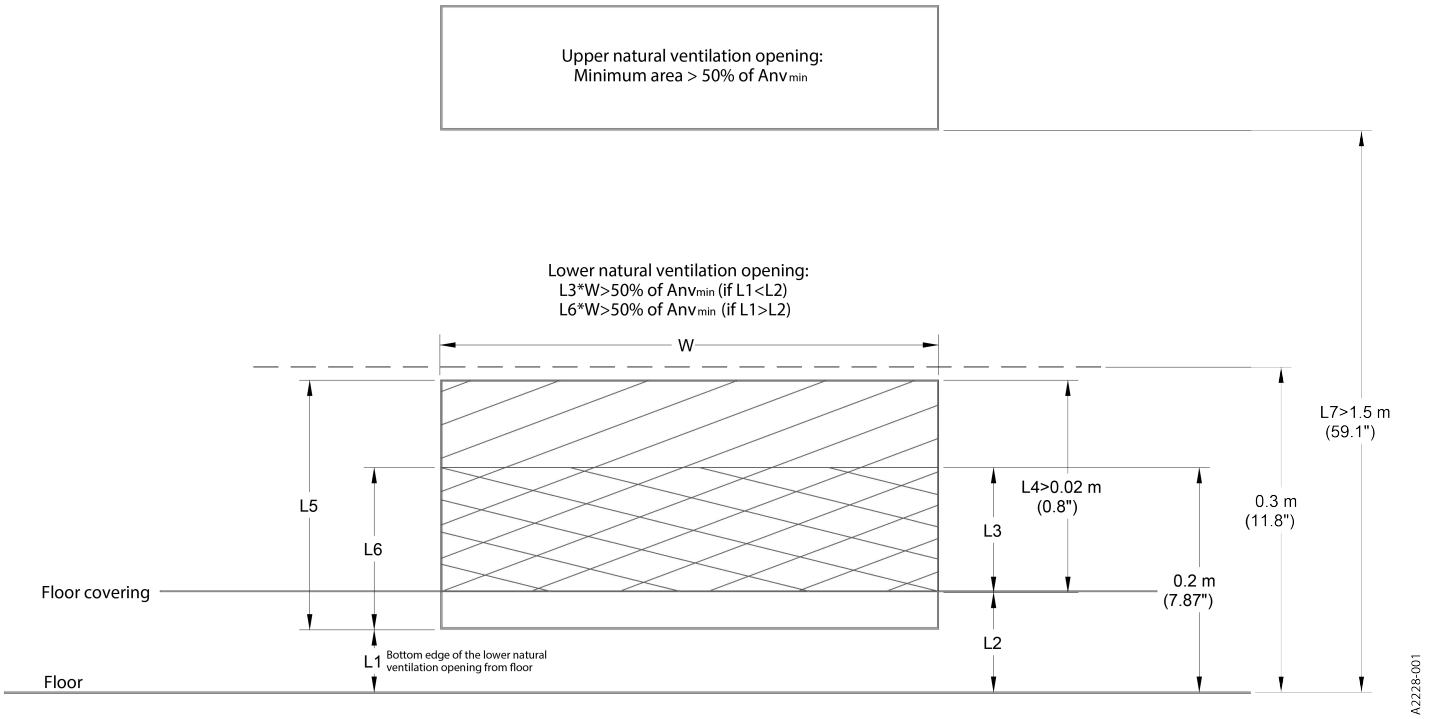
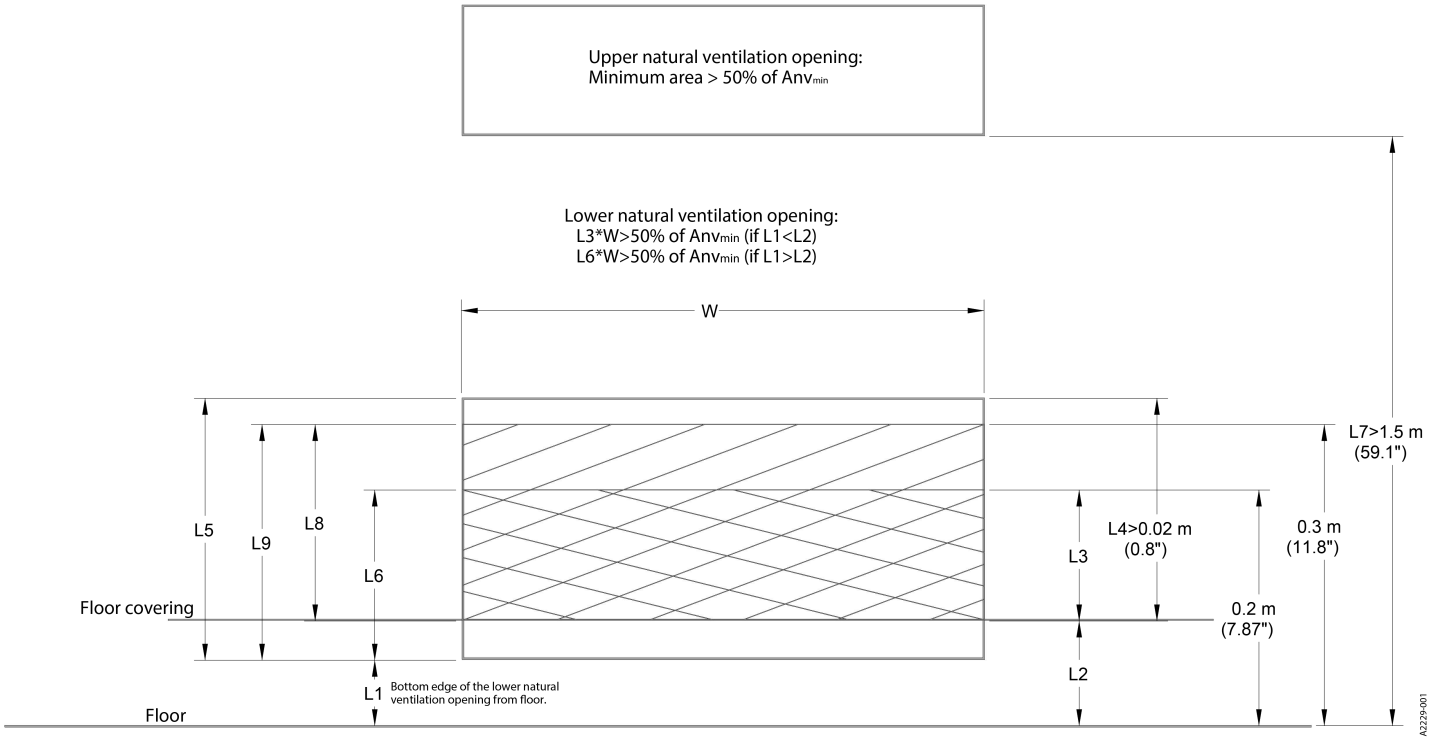


Figure 2: Natural ventilation openings - lower opening partially below the 0.3 m point above the floor



Note: In Figure 2, only the shaded opening area below the 0.3 m point and above the floor covering (L2) counts as the effective natural ventilation area for the lower natural ventilation opening. To discern the effective natural ventilation area for the lower natural ventilation opening, you use the area between the 0.3 m point and whichever is higher of the floor covering height (L2) or the opening bottom edge height (L1).

To meet conditioned space and system requirements for 4 ton and 5 ton packaged unit models, do the following:

1. Measure the area of each occupied space that has air vents in it, for example, bedroom, office, living room, kitchen, and dining room) to calculate the actual TA for the total conditioned space floor area.
2. Check if the TA is equal to or above the TA_{min} value in Table 2 and proceed as follows:
   - If the TA is equal to or above the TA_{min} value in Table 2, you do not need to install a mechanical ventilation system.
   - If the TA is below the TA_{min} value in Table 2, do the following:
     i. Select one occupied space and check its adjacent unoccupied space, for example, linen closet, space under the staircase, or pantry, to determine if it is feasible to add two natural ventilation openings to connect the two adjacent spaces, so the added floor area of the occupied space increases. Do the same for other applicable occupied spaces to determine if is possible to attain a TA equal to or above the TA_{min} value in Table 2.

        Note: The two natural ventilation openings are an upper natural ventilation opening and a lower natural ventilation opening. Each opening must be at least 50% of the Anv_{min} area and the openings must be located on the same side of the wall. See Figure 1 and Figure 2.

     ii. If you can attain a TA equal to or above the TA_{min} value in Table 2, add the natural ventilation openings as required. This is a cost-competitive approach to meet the TA_{min} requirement and avoid installing a mechanical ventilation system.
     iii. If you can not attain a TA equal to or above the TA_{min} value in Table 2, install a mechanical ventilation system to ventilate outdoors and bring in makeup air from the atmosphere.

3. Make sure that the circulation airflow is above the Q_{min_circ} value in Table 2. The factory set motor tap provides sufficiently large A2L leakage mitigation airflow to promptly remove any leaked R-454B from the unit. If you adjust the circulation airflow setting, you must take precautions to ensure the actual circulation airflow is no less than the Q_{min_circ} value in Table 2 and ensure the safety of the A2L system and the conditioned space. See Configuring the unit and use Table 2 to help determine the motor tap for A2L mitigation flow.
4. For applications where a mechanical ventilation system is required, make sure that the mechanical ventilation airflow is above the $Q_{min\_mech\_vent}$ value in Table 2, and adhere to the following:
   - For mechanical ventilation, ensure that the lower edge of openings extracting air from the occupied space are not more than 3.94 in. (100 mm) above the floor.
   - Locate the openings supplying makeup air to the occupied space so the supplied makeup air mixes with any leaked refrigerant.
   - Set the mechanical ventilation system so the makeup air is supplied from the atmosphere and the ventilation air extracted from the occupied space is discharged to the atmosphere. Ensure that the ventilation air discharge openings are separated by a sufficient distance, but not less than 9.84 ft (3 m), from the makeup air intake openings to prevent re-circulation to the occupied space.

   Note: As the TA increases from a very low value to the TA_{min}, the $Q_{min\_mech\_vent}$ decreases from a positive value to 0. When the TA is above the TA_{min}, no mechanical ventilation system is required.

Refrigerant equipment checks

Table 3: Refrigerant equipment checks

Item number	Safety guideline
1	Where electrical components are being changed, they must be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines must be followed. If in doubt, consult the manufacturer's technical department for assistance.
2	Apply the following checks to installations using flammable refrigerants: • Ensure the actual refrigerant charge is in accordance with the total conditioned space floor area. • Ensure the ventilation machinery and outlets are operating adequately and are not obstructed. • Ensure marking on the equipment continues to be visible and legible. Correct any markings and signs that are illegible. • Install refrigerating pipe or components in a position where they are unlikely to be exposed to any substance that may corrode refrigerant-containing components, unless the components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being corroded.

Electrical devices checks

Table 4: Electrical devices checks

Item number	Safety guideline
1	Repair and maintenance to electrical components must include initial safety checks and component inspection procedures.
2	If a fault exists that could compromise safety, then do not connect any electrical supply to the circuit until the fault is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, use an adequate temporary solution. This must be reported to the owner of the equipment so all parties are advised.
3	Initial safety checks must include: • Ensure capacitors are discharged: take care to avoid the possibility of sparking. • Ensure no live electrical components and wiring are exposed while charging, recovering, or purging the system. • Ensure there is continuity of earth bonding.
4	Check that wiring and/or cabling are not subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors, indoor blowers, and outdoor fans.

Detection of refrigerant

Table 5: Detection of refrigerant

Item number	Safety guideline
1	Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. Do not use a halide torch or any other detector using a naked flame.
2	The following leak detection methods are deemed acceptable for all refrigerant systems. • Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate or may need re-calibration. Calibrate the detection equipment in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Set leak detection equipment at a percentage of the LFL of the refrigerant and calibrate to the refrigerant employed. Ensure the appropriate percentage of gas with a maximum of 25% is confirmed. • Leak detection fluids are also suitable for use with most refrigerants but avoid the use of detergents containing chlorine as the chlorine may react with the refrigerant and corrode the copper pipework. Examples of leak detection fluids are bubble method and fluorescent method agents.
3	If a leak is suspected, all naked flames shall be removed/extinguished.
4	If a leakage of refrigerant is found that requires brazing, recover all of the refrigerant from the system and purge the system with nitrogen.

Removing and evacuating refrigerant

You must follow conventional procedures to remove and evacuate A2L flammable refrigerant charge before breaking into the refrigerant circuit to make repairs or for any other purposes. Safely remove refrigerant following local and national regulations, and adhere to the following requirements:

1. During evacuation, the outlet for the vacuum pump must not be close to any potential ignition sources, and ventilation must be available. The refrigerant charge must be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. See Recovering refrigerant for servicing or decommissioning for more requirements on recovery.
2. Continuously flush or purge with oxygen-free nitrogen before and when using flame to open the refrigerant circuit. **Do not** use compressed air or oxygen for purging.

Charging

For standard charging procedures, see Checking the refrigerant charge and refer to the charging chart on the compressor barrier. Follow standard charging procedures and adhere to the following requirements:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Keep hoses or lines as short as possible to minimize the amount of refrigerant contained in them.
- Keep cylinders in an appropriate position according to the instructions.
- Ensure that the refrigerating system is grounded before charging the system with refrigerant.
- Ensure to meet the requirements for weighing scales outlined in Recovering refrigerant for servicing or decommissioning.
- Label the system when charging is complete, if this has not been done already.
- Take extreme care not to overfill the refrigerating system.
- Before recharging the system, pressure test the system with oxygen-free nitrogen. Leak test the system on completion of charging but before commissioning. Do a follow-up leak test before leaving the site.

Recovering refrigerant for servicing or decommissioning

Before you begin:
Before starting the procedure, do the following:

- Ensure that you (the technician) are completely familiar with the equipment and all its detail.
- Take an oil and refrigerant sample in case analysis is required before reusing the recovered refrigerant.
- Ensure that electrical power is available.
- Ensure that mechanical handling equipment is available, if required, for handling refrigerant cylinders.
- Ensure that all personal protective equipment is available and being used correctly.
- Ensure that a competent person is available to supervise the recovery process at all times.
- Ensure that recovery equipment and cylinders conform to the appropriate standards. Note the following:
  - The recovery equipment must be in good working order with necessary and sufficient instructions and must be suitable for the recovery of the flammable refrigerant. If in doubt, consult the manufacturer.
  - All cylinders to be used must be designated for the recovered refrigerant and labeled for that refrigerant.
  - Cylinders must have a pressure relief valve and associated shut-off valves in good working order.
  - Empty recovery cylinders must be evacuated and, if possible, cooled before recovery occurs.

To safely recover all refrigerants for unit servicing or decommissioning, do the following:

1. Isolate the system electrically.
2. Connect a recovery machine to remove refrigerant from the system.
3. Ensure that the cylinder is situated on the scales before recovery takes place and the following requirements are met:
   - The weighing scales are calibrated and in good working order.

   - The weighing scales are placed on solid horizontal foundation that can sufficiently support the total weight of the cylinders and weighing scales without any compromise.
   - Hoses are complete with leak-free disconnect couplings and in good condition.
4. Start the recovery machine and operate in accordance with the instructions provided with the machine. Adhere to the following requirements:
   - Do not overfill cylinders to more than 80% volume liquid charge.
   - Do not exceed the maximum working pressure of the cylinder, even temporarily.
5. When the cylinders have been filled correctly and the process completed, ensure that the cylinders and the equipment are removed from the site promptly and that all isolation valves on the equipment are closed off. Adhere to the following requirements:
   - Process the recovered refrigerant according to local legislation in the correct recovery cylinder, and arrange the relevant waste transfer note.
   - Do not mix refrigerants in recovery units and especially not in cylinders.
   - Do not charge recovered refrigerant into another refrigerating system unless it has been cleaned and checked.
   - If removing compressors or compressor oils, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. Do not heat the compressor body by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it must be carried out safely.

- If you are servicing the unit, read Removing and evacuating refrigerant and Charging to get the refrigerant circuit to proper function. Before any other checks, follow the guidance in Detection of refrigerant to ensure safety.
- If you are decommissioning the unit, label the equipment stating that it has been decommissioned and emptied of refrigerant. Date and sign the label. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating that the equipment contains a flammable refrigerant.

Competence of service personnel

Training on all required and relevant procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. The achieved competence must be documented by a certificate. Training must include but is not limited to information about the following:

- The explosive potential of flammable refrigerants to show that flammables may be dangerous when handled without care
- Potential ignition sources especially those that are not obvious
- Safety concepts such as unventilated and ventilated enclosure and ventilated room
- Refrigerant detectors or detection sensors including a focus on the following:
  - Principle of function, including influences on the operation
  - Procedures for repairing, checking, or replacing a refrigerant detection sensor or parts of it in a safe way
  - Procedures for disabling a refrigerant detection sensor if repair work on the refrigerant carrying parts is needed
- The concept of sealed components and sealed enclosures
- Correct working procedures as outlined in Table 6

Table 6: Correct working procedures

Item number	Commissioning	Maintenance and repair	Decommissioning	Disposal
1	n/a	n/a	If safety is affected when the equipment is put out of service, the refrigerant charge must be removed before decommissioning.	n/a
2	Ensure that the total conditioned space floor area is sufficient for the refrigerant charge or that the ventilation duct is assembled correctly.	Ensure that there is sufficient ventilation at the equipment place.		
3	Confirm that there is no refrigerant leak before doing any other commissioning or installation work.	Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.		n/a
4	Check safety equipment before putting it into service.	Discharge capacitors in a safe way that does not cause any spark. The standard procedure to short circuit the capacitor terminals usually creates sparks.		n/a
5	n/a	When brazing is required for A2L system, the following procedures must be carried out in the correct order: 1. Safely remove the refrigerant following local and national regulations. Follow the procedure outlined in Recovering refrigerant for servicing or decommissioning for recovery. 2. Purge the refrigerant circuit with oxygen-free nitrogen. 3. Remove parts that are to be replaced by cutting or brazing. 4. Continuously purge the braze point with nitrogen during the brazing procedure required for repair. 5. Perform a leak test. 6. Evacuate the refrigerant circuit. 7. Charge with refrigerant.	Safely remove the refrigerant following local and national regulations. Follow the procedure outlined in Recovering refrigerant for servicing or decommissioning for recovery.	
6	n/a	Reassemble sealed enclosures accurately. If seals are worn, replace them.	Fill with nitrogen up to atmospheric pressure.	Evacuate the refrigerant circuit and purge the refrigerant circuit with oxygen-free nitrogen.
7	n/a	Check safety equipment before putting it into service.	Put a label on the equipment indicating that the refrigerant is removed.	Cut out the compressor and drain the oil. Follow the procedure outlined in Recovering refrigerant for servicing or decommissioning for compressor and compressor oil treatment.

Wiring installation

Figure 3 shows mitigation control wiring for PC3E48 and PC3E60 units. The control board in the RDS is generally referred to as the A2L mitigation control board or the mitigation control board.

NOTICE

Cap unused wiring connections.

NOTICE

The mitigation control board has a bank of DIP switches. Both DIP switches must be in the 1 or on position.

Figure 3: Mitigation control wiring

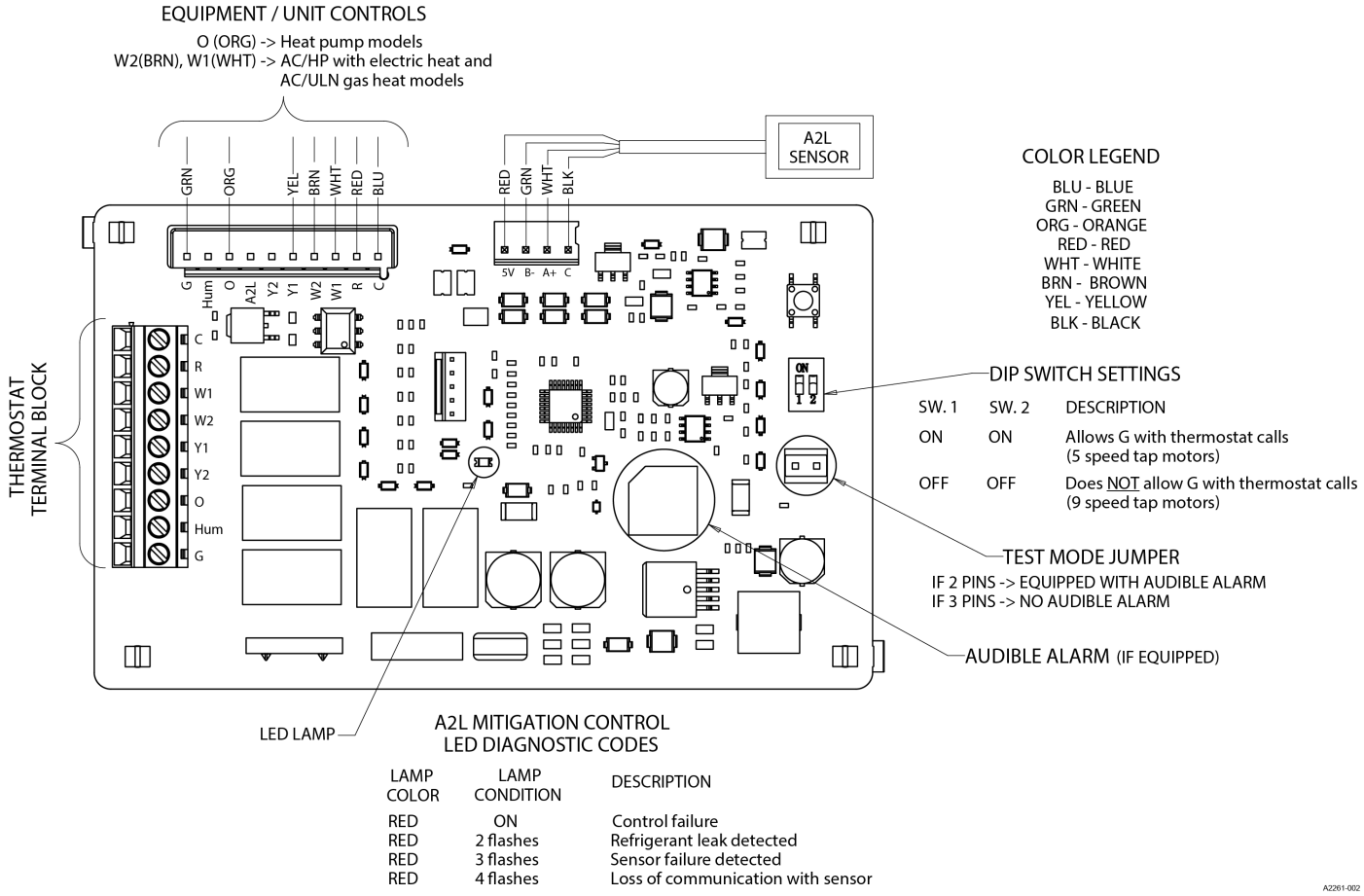
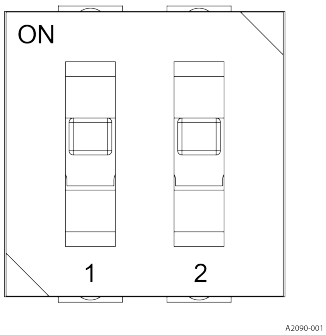


Figure 4 shows the DIP switches on the mitigation control board in the on position.

Figure 4: DIP switches in on position

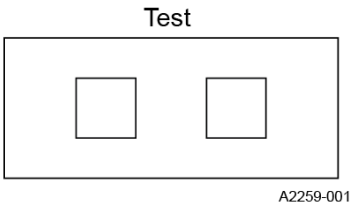


Field-testing the sensor and taking A2L mitigation actions

This task applies to PC3E48 and PC3E60 units.

1. After wiring and configuring the system, provide a Y call for compressor operation.
2. Simulate an A2L leak by disconnecting the A2L sensor wire from the mitigation control board **or** shorting the test pins with a screwdriver.

Figure 5: Test pins



3. After 15 s, verify that the call for the compressor is removed.
4. Verify that the Y output pin has no voltage and that the G output pin has 24 VAC.
5. Reinstall the sensor, then wait 15 s and verify that the system returns to cooling mode.
6. When the system is in standby mode, repeat the test for a W call for heating.
7. When testing is complete, put the controls access panel on until it is time for more testing of the unit normal operation.

Understanding RDS status codes and fault codes

The LED labeled as red on the mitigation control board in the RDS indicates the following:

- Status codes that indicate the state of the mitigation control board
- Fault codes

Table 7 gives an overview of how the status codes and fault codes display and troubleshooting guidance.

Table 7: RDS status codes and fault codes

LED	Condition	Solution
Off	No power to mitigation control board	Do the following: 1. Supply power to the mitigation control board. 2. Replace the fuse on the mitigation control board if the fuse is open. 3. If the mitigation control board is still off, replace it with a new mitigation control board.
Red 2 s on/red 2 s off (or slow heartbeat)	Mitigation control board is powered and microprocessor is active. No active faults, normal operation	No action needed
Red 0.5 s on/red 0.5 s off (or fast heartbeat) and buzzer sounds if equipped with audible alarm	Mitigation control board is powered and test mode has been activated by shorting test pins	No action needed
Red (solid)	Mitigation control board failure detected	Do the following: 1. Ensure the correct A2L sensor is correctly plugged in the A2L terminal of the mitigation control board. 2. Ensure the A2L sensor cable is not damaged.
2 red flashes and buzzer sounds if equipped with audible alarm	Leak detected above 15% low flammable limit (LFL)	Proceed as follows: 1. Owner is to notify service personnel as soon as possible. 2. Maintain power to the unit, and try to keep the conditioned space ventilated by opening windows if possible. 3. Service personnel to locate refrigerant leak point(s) and repair. Adjust the unit charge and get the unit back to proper functions. ⓘ **Note:** There is potential for the A2L sensor to detect gas or propane leakage. If service person can not find refrigerant leakage, check gas piping and other gas heat components for leaks and make any necessary repairs.
3 red flashes and buzzer sounds if equipped with audible alarm	Refrigerant sensor failure	If the fault code occurs during normal operation, cycle power to the unit. If the fault code remains, replace the A2L sensor with a new one. ⓘ **Note:** The A2L sensor may have this fault code if the unit is out of temperature range or out of humidity range, or if the A2L sensor is at its end of life.
4 red flashes and buzzer sounds if equipped with audible alarm	Refrigerant sensor communications lost	Do the following: 1. Ensure the correct A2L sensor is correctly plugged in the A2L terminal of the mitigation control board. 2. Ensure the A2L sensor cable is not damaged.

Displaying and clearing stored RDS fault codes

The mitigation control board in the RDS stores fault codes for 30 days. You can use the push button on the mitigation control board to retrieve and clear stored RDS fault codes if no active faults are present.

Important:

- If you press and hold the push button for less than 2 s, the mitigation control board does not respond.
- If an active fault is present when you press and hold the push button, the mitigation control board does not respond.

To display and clear stored RDS fault codes, do the following:

1. On the mitigation control board, press and hold the push button for 2 s to 5 s. If stored fault codes are present, the fault codes display.
2. Press and hold the push button for more than 5 s to clear the stored fault codes.

Model number nomenclature

Table 8: Model nomenclature description

Number	Category	Option	Description
1, 2	Model type	PG	Packaged air conditioner with gas heat
		PD	Packaged heat pump with gas heat
		PC	Packaged air conditioner with optional electric heat
		PH	Packaged heat pump with optional electric heat
3	Efficiency	3	13.4 SEER2
		5	15.2 SEER2
4	Refrigerant	E	R-454B
5, 6	Nominal capacity (Btu/h x 1000)	24	24,000 Btu/h or 2 ton
		30	30,000 Btu/h or 2.5 ton
		36	36,000 Btu/h or 3 ton
		42	42,000 Btu/h or 3.5 ton
		48	48,000 Btu/h or 4 ton
		60	60,000 Btu/h or 5 ton
7	Heat type	L	Low NOx <40ng/J
		U	ULNx <14ng/J
		N	Electric heat
8, 9	Gas heating input (Btu/h x 1000)	05	50,000 Btu/h
		06	65,000 Btu/h
		07	75,000 Btu/h
		10	100,000 Btu/h
		12	125,000 Btu/h
		00	Electric heat
10	Control strategy	C	Communicating
		B	Wireless, communicating
		S	Standard, conventional
		W	Wireless, conventional
11	Voltage (V-phase-Hz)	2	208/230-1-60
		3	208/230-3-60
		4	460-3-60
12	Generation	1	First generation
		2	Second generation
		3	Third generation
		4	Fourth generation
13	Style	A	Style A
		B	Style B
		C	Style C
		D	Style D

Model number nomenclature example

Table 9: Model nomenclature example

Number	1, 2	3	4	5, 6	7	8, 9	10	11	12	13
Option	PC	3	E	36	N	00	S	2	1	A

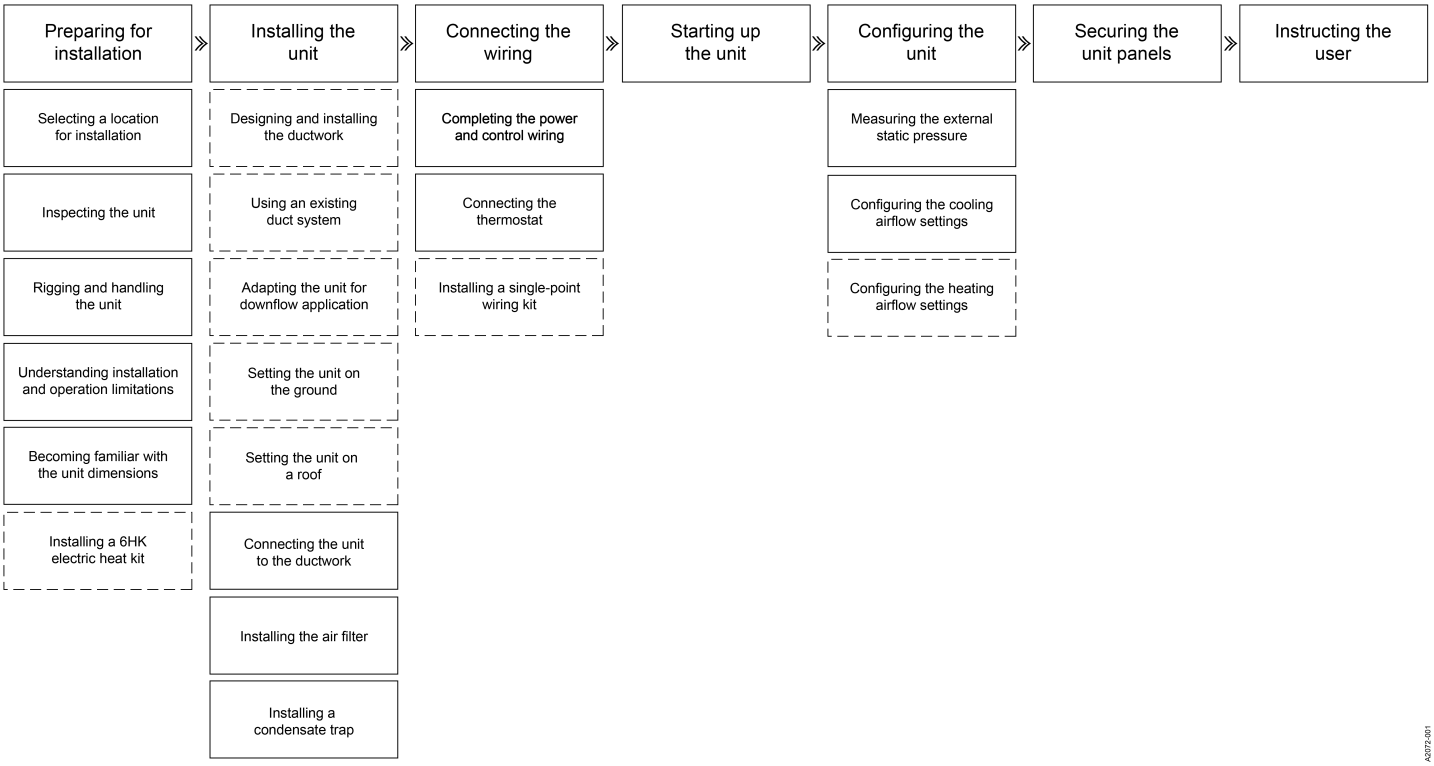
The PC3E36N00S21A model is a packaged air conditioner with optional electric heat. It has a 13.4 SEER2 efficiency rating and uses R-454B refrigerant. It has a nominal capacity of 36,000 Btu/h or 3 ton for cooling. It uses a standard control strategy and voltage of 208 V/230 V, single phase, 60 Hz. It is a first generation, style A model.

Installation overview

Complete all of the stages outlined in Figure 6. You may not need to perform tasks indicated with a dashed outline, depending on the specific installation. See Unit components and operation to familiarize yourself with unit components and system operation as required. See Physical data, Electrical data, and Airflow data for unit data as needed throughout the installation.

Important: See A2L refrigerant safety guidance and follow procedures as required.

Figure 6: Installation overview



Preparing for installation

Complete the necessary preparation before you begin the installation:

1. Visit the installation site to select a suitable location for the unit.
2. Inspect the unit.
3. Follow the requirements for rigging and handling the unit to avoid damage to the unit.
4. Make sure that you are aware of the installation and operation limitations.
5. Make sure that you are familiar with the unit dimensions.
6. Install a 6HK electric heat kit if required for the specific installation.

   Important: If you do not install an electric heat kit, you must mark the unit rating plate appropriately to indicate that no electric heat kit is installed.

Selecting a location for installation

Before starting the installation, you must select a suitable location for the unit. You can install the unit on a roof or on the ground.

WARNING

Do not permit overhanging structures or shrubs to obstruct outdoor air discharge outlet.

Important: The unit is designed for outdoor installation only.

To select a location for installation, do the following:

- Select a location for the unit that meets the following general requirements for installation:
  - Provides the outdoor coil with an unlimited supply of air. Where a choice of location is available, position the unit on either the north or east side of the building.
  - Allows you to maintain the required clearances for construction, servicing, and correct unit operation shown in Table 11.
  - Allows you to maintain level tolerance to 1/8 in. across the entire width and length of the unit.
- Select a location for the unit that meets any requirements that are specific to the type of installation as outlined in Table 10.

Table 10: Additional location requirements for each type of installation

Type of installation	Additional location requirements
Ground installation	• The location of the unit allows you to install the unit on a level equipment pad or concrete slab.
Roof installation	• The location of the unit allows you to install the unit on a solid, level roof curb or an appropriate angle iron frame. • The roof structure is able to support the weight of the unit and its options and accessories.

Unit clearances

Table 11: Unit clearances

Direction	Distance (in.)	Direction	Distance (in.)
Top	36	Right side	36
Side opposite ducts	36	Left side	24
Duct panel	6	Bottom	1

Note:

- For 20 kW and 25 kW electric heat kits, provide a minimum clearance of 1 in. on all sides of the supply air duct for the first 3 ft of the supply air duct. 0 in. clearance is acceptable on all sides of the supply air duct for the remaining length of the supply air duct. For all other electric heat kits, 0 in. clearance is acceptable on all sides of the supply air duct for the entire length of the supply air duct.
- Install units outdoors. Make sure that overhanging structures or shrubs do not obstruct the outdoor air discharge outlet.
- You can install units on combustible materials made from wood or class A, B, or C roof covering materials if the factory base rails are left in place as shipped.
- For units installed on a roof curb, you can reduce the minimum clearance between combustible roof curb material and the supply air duct from 1 in. to 1/2 in.

Inspecting the unit

1. Inspect the unit immediately after receiving it for possible damage during transit.
2. If damage is evident, do the following:
   a. Note the extent of any damage on the carrier's receipt.
   b. Make a separate written request for the carrier's agent to inspect the unit.
   c. Contact your local distributor for more information.

Rigging and handling the unit

CAUTION

All panels must be secured in place when the unit is lifted. The outdoor coils must be protected from rigging cable damage with plywood or other suitable material.

CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

To rig and handle the unit, do the following:

- Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation.
- Use the slotted openings in the base rails if moving or lifting the unit with a forklift.
- Use Figure 7 and Table 12 to determine the required capacity of lifting gear to use.

Figure 7: Unit four-point load

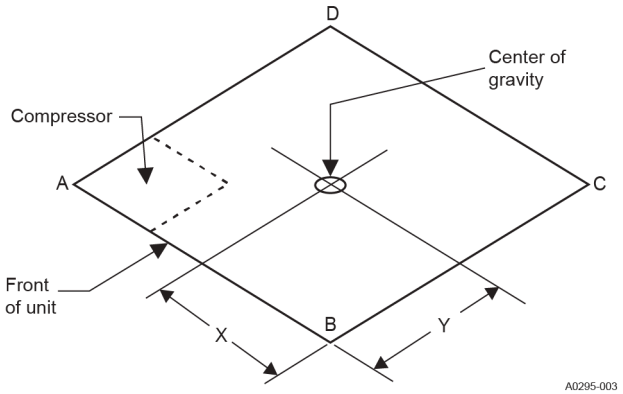


Table 12: Weights and dimensions

Model	Weight (lb)		Center of gravity (in.)		Four-point load location (lb)			
	Shipping	Operating	X	Y	A	B	C	D
PC3E24N00S2	317	312	29	15	79	101	37	95
PC3E30N00S2	341	336	30	16	133	56	84	64
PC3E36N00S2	351	346	29	15	121	80	71	74
PC3E42N00S2	352	347	29	15	122	81	69	75
PC3E48N00S2	410	405	29	19	158	83	91	73
PC3E60N00S2	432	427	30	19	154	100	78	95

ⓘ **Note:** The data in this table is preliminary.

- Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails.
- Use spreader bars across the top of the unit. The length of the spreader bars must exceed the unit's longest width.

Understanding installation and operation limitations

Adhere to the following:

- Install the unit in accordance with the following national and local safety codes:
  - National Electrical Code (NEC) ANSI/NFPS No. 70, latest edition or Canadian Electrical Code (CEC) Part 1, C22.1, latest edition
  - Local plumbing and wastewater codes and other applicable local codes

  ⓘ **Note:** If it is necessary to add components to a unit to meet local codes, installation is done at the dealer's or the customer's expense.
- Observe the unit limitations shown in Table 13.
- Observe the application limitations shown in Table 14.
- Observe the physical data for the unit shown in Table 20.
- Observe the electrical data for the unit shown in Table 24, Table 21, Table 22, and Table 23.
- Make sure that the size of the unit for proposed installation is based on heat loss or heat gain calculations made in accordance with industry-recognized procedures such as the procedures of the Air Conditioning Contractors of America. Refer to *Manual J*.

Unit limitations

Table 13: Unit limitations

Model	Voltage (V-phase-Hz)	Unit limitations		
		Applied voltage (V)		Outdoor DB temperature (°F)
		Minimum	Maximum	Maximum
PC3E24N00S2	208/230-1-60	187	252	125
PC3E30N00S2				
PC3E36N00S2				
PC3E42N00S2				
PC3E48N00S2				
PC3E60N00S2				

Application limitations

Table 14: Application limitations

Model	Air temperature at outdoor coil (°F)		Air temperature at indoor coil (°F)	
	Minimum	Maximum	Minimum	Maximum
	DB cool	DB cool	WB cool	WB cool
PC3E24N00S2	55	125	57	72
PC3E30N00S2				
PC3E36N00S2				
PC3E42N00S2				
PC3E48N00S2				
PC3E60N00S2				

Becoming familiar with the unit dimensions

- Make sure that you are familiar with the unit dimensions before you begin the installation. See Figure 8 and Table 15.

Unit dimensions and access locations

Figure 8: Unit dimensions and access locations

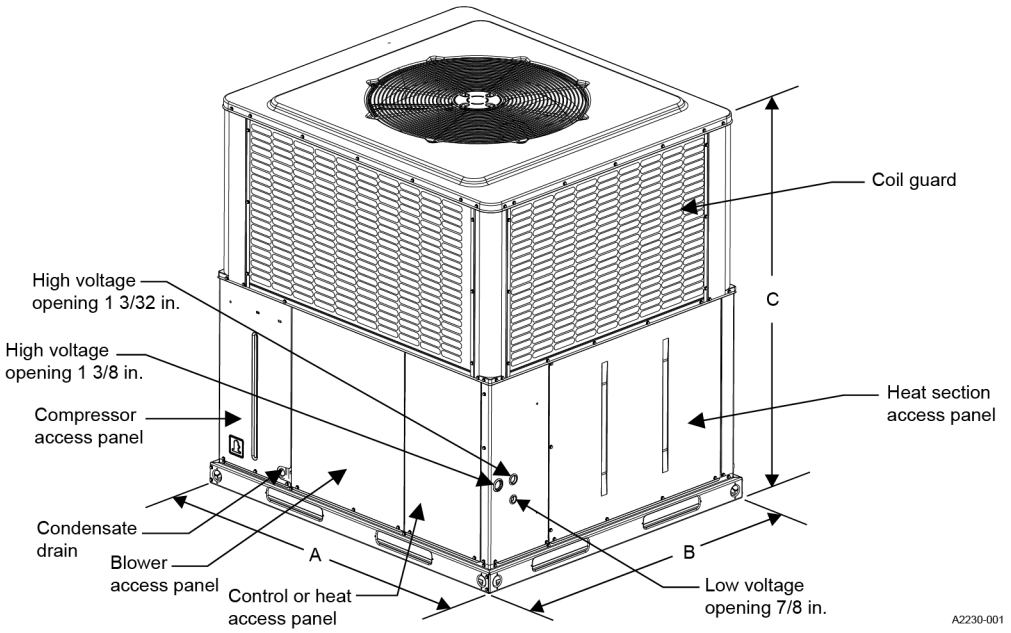


Table 15: Unit dimensions

Model	Dimensions (in.)		
	A	B	C
PC3E24N00S2	51 1/4	35 3/4	44
PC3E30N00S2	51 1/4	35 3/4	45
PC3E36N00S2	51 1/4	35 3/4	47
PC3E42N00S2	51 1/4	35 3/4	47
PC3E48N00S2	51 1/4	45 3/4	47
PC3E60N00S2	51 1/4	45 3/4	50

Installing a 6HK electric heat kit

You have the option to install an electric heat kit from the 6HK series for all unit models. For the electric heat kits you can use for each unit model and associated electrical data, see Table 21, Table 22, and Table 23 as relevant.

Important:

- Install the 6HK electric heat kit before you install the unit. You connect the wiring for the 6HK electric heat kit as part of the procedures outlined in Connecting the wiring. You set the blower speed for the 6HK electric heat kit as part of the procedures outlined in Configuring the unit.
- If you do not install a 6HK electric heat kit, you must mark the unit rating plate appropriately to indicate that no electric heat kit is installed.

To install a 6HK electric heat kit, do the following:

- Follow the installation procedure in the *Installation Manual* for the 6HK series of electric heat kits.

Installing the unit

There are two installation options for the unit: ground installation or roof installation. You must follow all requirements for the specific type of installation.

To install the unit correctly, you must do the following:

1. Design and install the ductwork or make sure that the existing duct system meets requirements.
2. Adapt the unit for downflow application if required for the specific installation.
3. Set the unit on the ground or roof.
4. Connect the unit to the ductwork.
5. Install a filter or filter frame kit.
6. Install a condensate trap for the unit.

Designing and installing the ductwork

You may need to design and install ductwork, depending on the specific installation, for example, in a new construction.

To design and install the ductwork, do the following:

- Design and size ductwork according to the methods of the Air Conditioning Contractors of America (ACCA), as outlined in their *Manual D*.
- Always consider filter size, type, and pressure drop during duct system design. Correct filter sizing is very important.
- Use a closed return duct system. This does not preclude use of economizers or ventilation air intake.

Using an existing duct system

- Check that the ductwork meets requirements and is correctly sized, and adjust the ductwork if needed. See Designing and installing the ductwork for more information about requirements.

Adapting the unit for downflow application

You can adapt the unit for downflow application if needed.

To adapt the unit for downflow application, do the following:

1. Remove the duct covers from the bottom return and supply air duct openings. Save the four screws securing each duct cover to use in Step 2.
2. Install the duct covers removed in Step 1 to the rear supply and return air duct openings. Secure the duct covers with the four screws removed in Step 1.
3. Seal the duct covers with silicone caulk.

Setting the unit on the ground

Before you begin:
Make sure that the location you have selected for the unit is suitable. See Selecting a location for installation.

For ground installation, you must use a level equipment pad or concrete slab. The thickness and size of the equipment pad or concrete slab must meet local codes and support the weight of the unit. Do not tie the equipment pad or concrete slab to the building foundation.

To set the unit on the ground, do the following:

1. Position the equipment pad or concrete slab so the unit is level.
2. Set the unit on the equipment pad or concrete slab.

Setting the unit on a roof

Before you begin:
Make sure that the location you have selected for the unit is suitable. See Selecting a location for installation.

For roof installation, you must use a solid, level roof curb or an appropriate angle iron frame.

⚠ CAUTION

If a unit is to be installed on a roof curb other than a Johnson Controls Ducted Systems roof curb, gasket or sealant must be applied to all surfaces that come in contact with the unit underside.

To set the unit on the roof, do the following:

1. Position the roof curb or iron frame so the unit is level.
2. Set the unit on the roof curb or iron frame.

Connecting the unit to the ductwork

⚠ WARNING

Do not attach supply and return ductwork to the bottom of the unit base pan as the drain pan could be compromised.

⚠ CAUTION

When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. **Do not** insert the screws through the casing. Seal the ductwork to the unit using duct mastic. Outdoor ductwork must be insulated and waterproofed.

NOTICE

All units are shipped in the horizontal supply/return configuration. It is important to reduce the possibility of any air leakage through the bottom duct covers (resulting from cut, torn, or rolled gasket) due to improper handling or shipping processes. To ensure a good tight seal, it is recommended that silicone caulk and/or foil tape be applied along the cover edges.

NOTICE

Be sure to note supply and return openings.

To connect the unit to the ductwork, do the following:

- Use flexible duct connectors in the supply and return ductwork to minimize the transmission of vibration and noise.
- Observe the information about bottom and rear supply and return air duct openings in Figure 9, Table 16, Figure 10, and Table 17.

Bottom duct dimensions

Figure 9: Bottom duct dimensions (in.)

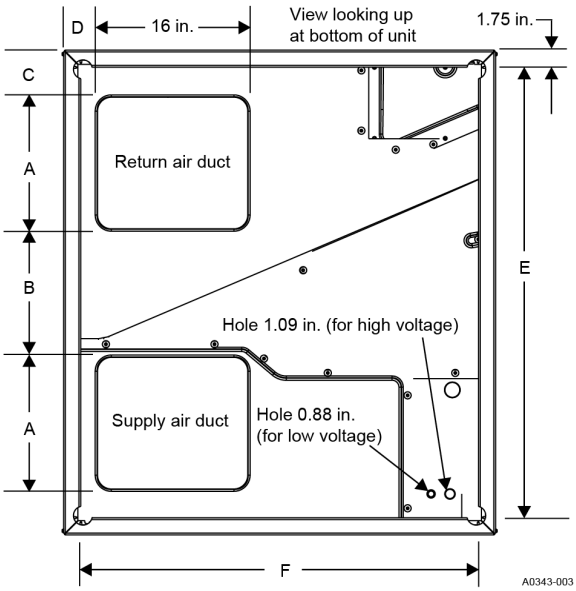


Table 16: Bottom duct dimensions

Model	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)
PC3E24, PC3E30, PC3E36, PC3E42	10	21.5	5	4.5	47.5	32
PC3E48, PC3E60	14	13.5	5	3.5	47.5	42

Rear duct dimensions

Figure 10: Rear duct dimensions (in.)

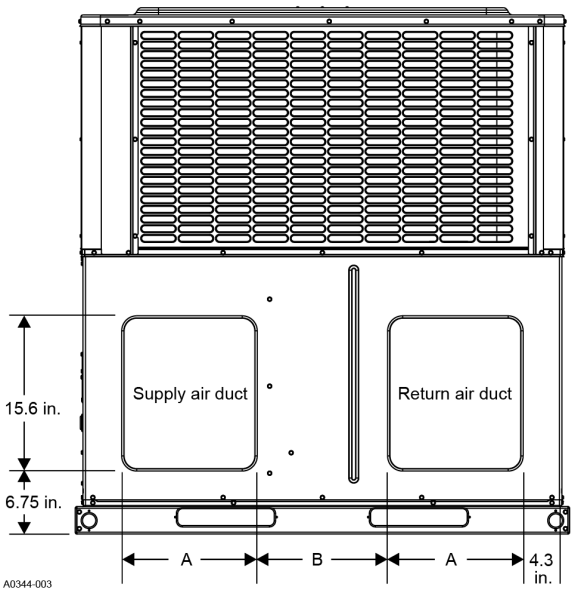


Table 17: Rear duct dimensions

Model	A (in.)	B (in.)
PC3E24, PC3E30, PC3E36, PC3E42	9.6	22
PC3E48, PC3E60	13.6	14
ⓘ **Note:** See Figure 8 for side hole sizes of electrical lines.		

Installing the air filter

Single-phase units are shipped without air filters or an air filter frame kit. You must install an air filter or an air filter frame kit.

Important:

- One air filter is typically used, but this depends on the specific installation.
- Make sure that the air filter size is correct.
- It is essential to always use air filters and keep air filters clean. When air filters become dirty, insufficient air is delivered by the blower, decreasing the unit's efficiency and increasing operating costs and deterioration of the unit and controls.

To install the air filter, do the following:

- Secure an air filter in the return air ductwork or inside the conditioned space at the return air opening, **or** install an air filter frame kit using the installation procedure in the *Installation Manual* provided with the kit.

Installing a condensate trap

You must install a condensate trap for the unit. The plumbing must conform to local codes.

⚠ CAUTION

Hand tighten only.

To install a condensate trap, do the following:

- Install a condensate trap in the condensate drain.

Connecting the wiring

To connect the wiring correctly, you must do the following:

1. Complete the power and control wiring.
2. Connect the thermostat.
3. Install a single-point wiring kit if required.

See Wiring diagrams for the connection wiring diagram and the ladder wiring diagram for the unit.

Completing the power and control wiring

Make sure that all field wiring to the unit conforms to provisions of the current NEC ANSI/NFPA No. 70 or CEC and/or local ordinances. The unit must be electrically grounded in accordance with local codes or, in their absence, with the NEC/CEC. See Table 21, Table 22, and Table 23 for unit electrical data as needed.

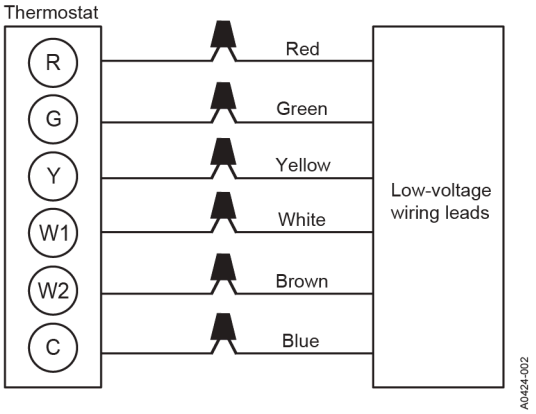
Important:

If a 6HK electric heat kit is installed, refer to the *Installation Manual* for the 6HK electric heat kit for additional information about connecting the wiring for the 6HK electric heat kit as needed.

To complete the power and control wiring, do the following:

- See Figure 8, which shows where wiring enters the unit.
- Use Figure 11 and Figure 12, which show typical field wiring, as a guide, and refer to the appropriate unit wiring diagram for control circuit and power wiring information. See Wiring diagrams.

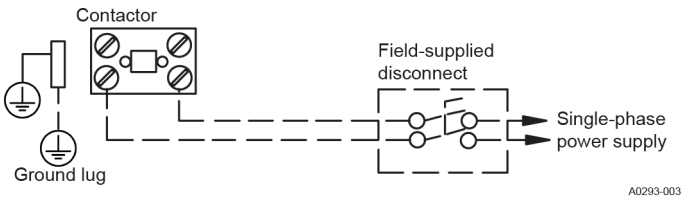
Figure 11: Typical field control wiring diagram for air conditioner models



Note:

- Use a minimum wire size of 18 AWG wire for all field-installed control wiring.
- Set the heat anticipator at 0.35 A for all unit models.

Figure 12: Typical field power wiring diagram



Note: Use the relevant electrical data table to size the disconnect switch. See Table 21, Table 22, or Table 23.

NOTICE

In some applications, the service disconnects on the electric heat kits must be rotated 180° so the up position of the disconnect is the ON position. This service disconnect orientation change is required by UL1995 (5th edition), Article 26.20 (in reference to all circuit breakers).

- Observe the voltage tolerances that must be maintained at the compressor terminals during starting and running conditions as outlined on the unit rating plate and in Table 13.
- Provide the wiring entering the unit cabinet with mechanical strain relief.
- Install a fused disconnect switch for the unit.

  ⓘ **Note:** The fused disconnect switch is field provided.
- If you need to replace any of the wire supplied with the unit, make sure that the replacement wire is the type shown on the wiring diagrams. See Wiring diagrams.
- Make sure that the electrical service is sized correctly to carry the load. Each unit must be wired with a separate branch circuit fed directly from the main distribution panel and correctly fused.
- Be aware that the unit comes wired for 230 V power. If the supply power is 208 V, move wires connected to the control transformer 230 V tap to the 208 V tap.

Connecting the thermostat

➤ **Important:** Do not use a power-stealing thermostat.

To connect the thermostat, do the following:

1. Locate the room thermostat on an inside wall approximately 60 in. above the floor where it is not subject to drafts, sun exposure, or heat from electrical fixtures or appliances.
2. Use sealant behind the thermostat to prevent air infiltration.
3. Install the thermostat in accordance with the installation instructions for the thermostat provided by the manufacturer.
4. Use color-coded insulated wires that are No. 18 AWG minimum to connect the thermostat to the unit. See Figure 11.

Installing a single-point wiring kit

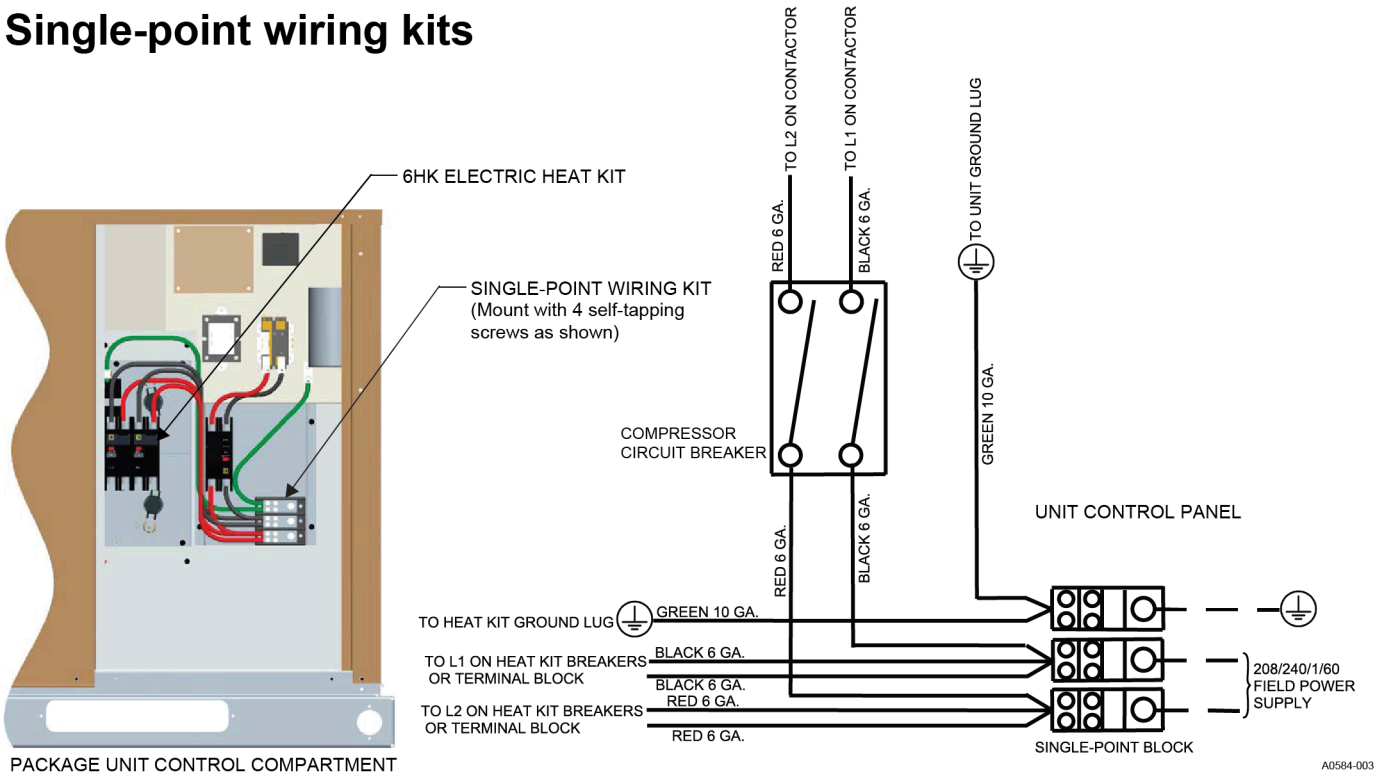
If you have installed a 6HK electric heat kit and you want to use single-source power wiring, you must install a single phase single-point wiring kit. Single-phase single-point wiring kits are available for all electric heat kits except 25 kW electric heat kits. The single-point wiring kit allows one appropriately sized electrical circuit to power the electric heat kit and the unit. Use Table 18 to check which single-point wiring kit to use for the unit model.

Table 18: Single-point wiring kit

Model	Single-point wiring kit part number	Breaker size (A)	Electric heat kit (kW)
PC3E24N00S2	S1-2SPWK006	25	Up to 10
PC3E30N00S2	S1-2SPWK001	30	Up to 15
PC3E36N00S2	S1-2SPWK007	40	Up to 15
PC3E42N00S2	S1-2SPWK007	40	Up to 20
PC3E48N00S2	S1-2SPWK004	50	Up to 20
PC3E60N00S2	S1-2SPWK005	60	Up to 20

See Figure 13 for an illustration of how to install a single-point wiring kit and connect the wiring.

Figure 13: Installing and connecting a single-point wiring kit



Note:

- For single circuit electric heat kits, remove the wires for the second circuit from the single-point block.
- The wire gauge varies depending on the specific electric heat kit model.

To install a single-point wiring kit, do the following:

- Follow the installation procedure in the *Installation Manual* for the single-point wiring kit.

Starting up the unit

1. Check the electrical supply voltage being supplied. Make sure that it is within the specified range on the unit rating plate.
2. Make sure that all electrical connections are tight.
3. If the unit is connected to 208 V supply power, make sure that the control transformer is wired accordingly. See Completing the power and control wiring.
4. Turn on the electrical power to the unit.
5. Set the room thermostat to the **COOL** position and set the temperature setting on the thermostat lower than the room temperature to create a call for cooling.
6. Make sure that the unit is operating correctly.

ⓘ **Note:** See Unit components and operation for more information about the unit if needed. See Troubleshooting if needed.

Configuring the unit

To configure the unit correctly, you must do the following:

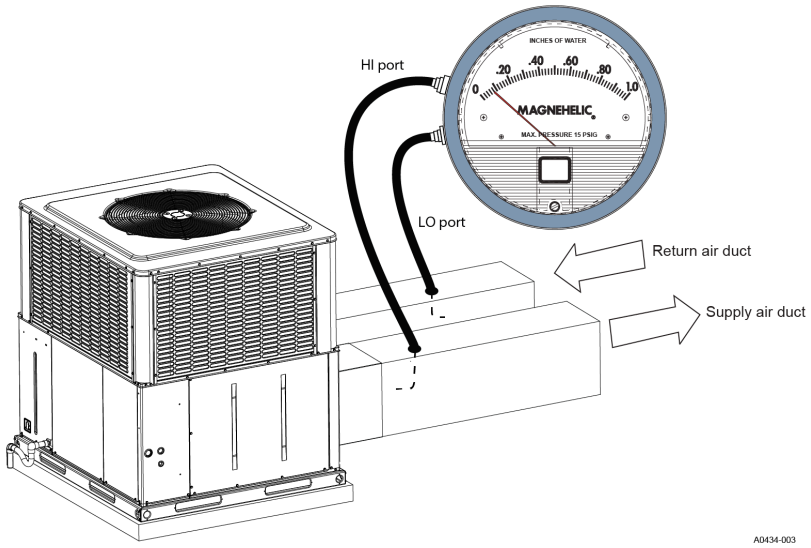
1. Measure the external static pressure.
2. Configure the cooling airflow settings as required for the measured external static pressure.
3. Configure the heating airflow settings as required if an electric heat kit is installed.

Measuring the external static pressure

Before you begin:
Make sure that the unit is in cooling mode.

You must use a manometer as part of this procedure. Figure 14 shows how to use a manometer to measure external static pressure.

Figure 14: Measuring the external static pressure



To measure the external static pressure, do the following:

1. Measure the supply air static pressure and record this positive number.
2. Measure the return air static pressure and record this negative number.
3. Treat the negative number as a positive number and add the two numbers together. This is the total external static pressure.

Configuring the cooling airflow settings

Before you begin:
Measure the external static pressure.

To configure the cooling airflow settings, do the following:

- Using Table 26, compare the CFM data for the energized blower motor cooling speed tap with the measured external static pressure and adjust the blower motor cooling speed tap as necessary to obtain the correct cooling airflow.

Configuring the heating airflow settings

1. Check the required minimum blower speed for the electric heat kit installed for the unit model in Table 27.
2. Set the W blower speed at or above the required minimum blower speed.

Securing the unit panels

Before you begin:
If the air filter is located inside the unit, make sure that you have installed the air filter before you secure the unit panels. See Installing the air filter.

- Secure all of the unit panels in place.

Instructing the user

The unit requires regular maintenance, so it is important to instruct the user about maintenance.

⚠ WARNING

Before performing any maintenance procedure, shut off all power to the unit to avoid personal injury.

- Instruct the user to refer to *Maintaining your system* in the *User's Information Manual* for the unit for detailed information about maintenance and procedures.
- Direct the user to their limited warranty certificate in the *User's Information Manual*. Complete the following information fields in the limited warranty certificate for user reference:
  - Product Model Number
  - Unit Serial Number
  - Installation Date
  - Participating Dealer

Unit components and operation

It is important to be familiar with the different unit components and understand how they operate.

Unit components

Figure 15: Unit components - PC3E24, PC3E30, and PC3E36 units with rotary compressor

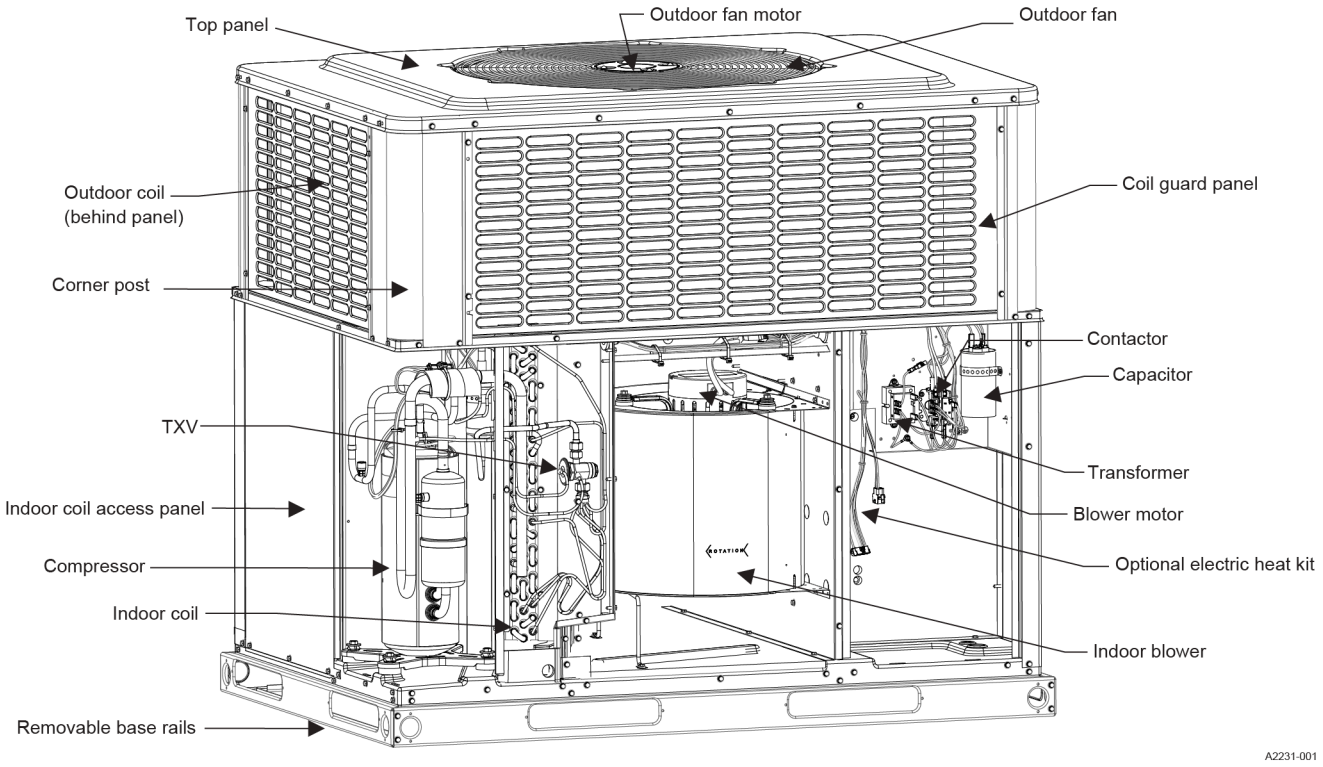
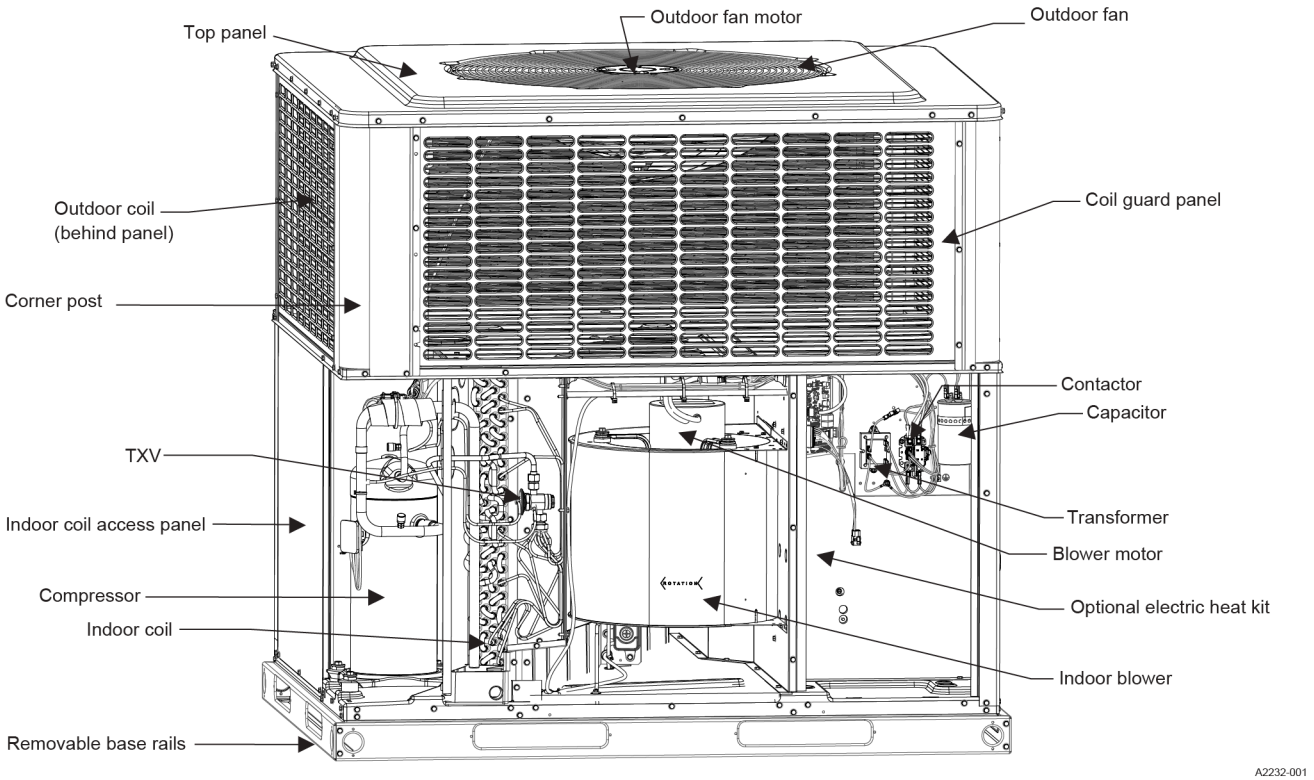


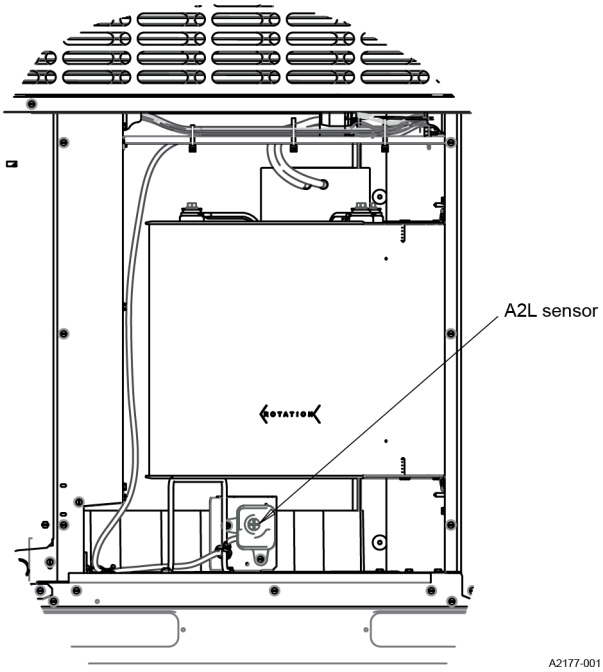
Figure 16: Unit components - PC3E42, PC3E48, and PC3E60 units with scroll compressor



A2L components

PC3E48 and PC3E60 units include an A2L sensor and a mitigation control board because they contain over 1.776 kg (3.915 lb) of refrigerant and require an RDS. Figure 17 shows the location of the A2L sensor. See A2L refrigerant safety guidance for more information.

Figure 17: A2L sensor location - PC3E48 and PC3E60 units



Compressor

It is important to be aware of the following:

- The unit compressor is specifically designed to operate with R-454B refrigerant and cannot be interchanged with a different type of compressor.
- The unit compressor uses polyolester (POE) oil. This oil is extremely hygroscopic, meaning it absorbs water readily. POE oil can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. If the refrigerant circuit is opened, take all necessary precautions to avoid exposure of the oil to the atmosphere.

⚠ CAUTION

Do not leave the system open to the atmosphere. Unit damage could occur due to moisture being absorbed by the **POE oil** in the system. This type of oil is highly susceptible to moisture absorption.

- POE compressor lubricants are known to cause long-term damage to some synthetic roofing materials.

⚠ CAUTION

Exposure, even if immediately cleaned up, may cause embrittlement (leading to cracking) to occur in one year or more. When performing any service that may risk exposure of compressor oil to the roof, take precautions to protect roofing.

- Procedures that risk oil leakage include, but are not limited to the following:
  - Replacing the compressor
  - Repairing refrigerant leaks
  - Replacing refrigerant components, for example, filter drier, pressure switch, metering device, or coil
- The unit is shipped with compressor mountings, which are factory-adjusted and ready for operation.

⚠ CAUTION

Do not loosen compressor mounting bolts.

Cooling sequence of operation

The following cooling sequence of operation is based on using a single-stage air conditioning thermostat:

1. On a call for cooling, the wall thermostat sends a 24 V Y signal to the unit. The unit contactor closes, which energizes the outdoor fan and the compressor. The 24 V signal is also sent to the indoor blower motor, which runs at the selected cooling speed.
2. When the demand for cooling is satisfied, the wall thermostat removes the 24 V Y signal from the unit. The contactor opens and the outdoor fan and the compressor stop. The indoor blower has a built-in delay and continues to run for 60 s after the cooling signal is removed.

Heating sequence of operation

You have the option to install an electric heat kit for all unit models. See Installing a 6HK electric heat kit. The following heating sequence of operation is based on using a single-stage air conditioning thermostat:

1. On a call for heating, the wall thermostat sends a 24 V W signal to the unit. The indoor blower starts to run at the selected heating speed. The 24 V signal also goes to the sequencers or relays in the electric heat kit and turns on the electric heating elements.
2. When the demand for heating is removed, the wall thermostat removes the 24 V W signal. When the 24 V signal is removed from the electric heat sequencer, the heating elements turn off. The indoor blower continues to run for 60 s after the call for heat is removed.

Electric heat limit switch operation

When the electric heat limit switch opens, the heating elements turn off. The indoor blower continues to run. The electric heat limit switch automatically resets when the temperature falls to a normal level, and the heating elements turn on again.

Thermostat signals

Table 19 provides an overview of how the unit responds to specific thermostat signals.

Table 19: Thermostat signals

Signal	State	Function
G	On	Indoor blower instant on
	Off	Indoor blower off after 60 s delay
W	On	Indoor blower instant on
		Electric heat stages on - if unit is equipped with a 6HK electric heat kit
	Off	Electric heat stages off - if unit is equipped with a 6HK electric heat kit
		Indoor blower off after 60 s delay
G and W	On	Indoor blower instant on in heating speed
		Electric heat stages on - if unit is equipped with a 6HK electric heat kit
	W off	Electric heat stages off - if unit is equipped with a 6HK electric heat kit
		Indoor blower switches to continuous fan speed
	G and W off	Electric heat stages off - if unit is equipped with a 6HK electric heat kit
		Indoor blower off after 60 s delay
G and Y	On	Outdoor fan on
		Indoor blower instant on in cooling speed
		Compressor on
		System operates in cooling mode
	Y off	Compressor instant off
		Outdoor fan instant off
		Indoor blower switches to continuous fan speed
	G and Y off	Compressor instant off
		Outdoor fan instant off
		Indoor blower off after 60 s delay
ⓘ **Note:** The motor program has a 60 s blower off delay on all five speed taps.		

Physical data

Table 20: Physical data

Model		PC3E24N00S2	PC3E30N00S2	PC3E36N00S2	PC3E42N00S2	PC3E48N00S2	PC3E60N00S2
Nominal tonnage		**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**5.0**
Refrigerant information	**Refrigerant type**	R-454B	R-454B	R-454B	R-454B	R-454B	R-454B
	Refrigerant charge (lb-oz)	2-11	3-3	3-13	3-7	4-1	4-13
Dimensions	**Length (in.)**	51 1/4	51 1/4	51 1/4	51 1/4	51 1/4	51 1/4
	Width (in.)	35 3/4	35 3/4	35 3/4	35 3/4	45 3/4	45 3/4
	Height (in.)	44	45	47	47	47	50
Operating weight (lb)		312	336	346	347	405	427
Compressor type		Rotary	Rotary	Rotary	Scroll	Scroll	Scroll
Outdoor coil data	**Face area (sq ft)**	12.3	13.8	15.3	15.3	17.5	21.1
	Rows	1	1	1	1	1	1
	Fins per inch	21	23	23	23	23	23
	Tube width (mm)	12	16	16	16	16	16
	Coil type	Microchannel	Microchannel	Microchannel	Microchannel	Microchannel	Microchannel
Indoor coil data	**Face area (sq ft)**	4.6	4.6	4.6	4.6	6.2	6.2
	Rows	2	2	3	3	3	4
	Fins per inch	16	16	16	16	16	16
	Tube diameter (in.)	3/8	3/8	3/8	3/8	3/8	3/8
	Circuitry type	Straight	Straight	Straight	Straight	Straight	Straight
	Refrigerant control	TXV	TXV	TXV	TXV	TXV	TXV
	Coil type	Finned tube	Finned tube	Finned tube	Finned tube	Finned tube	Finned tube
Outdoor fan data	**Fan diameter (in.)**	24	24	24	24	26	26
	Type	Propeller	Propeller	Propeller	Propeller	Propeller	Propeller
	Drive type	Direct	Direct	Direct	Direct	Direct	Direct
	Number of speeds	1	1	1	1	1	1
	Motor (hp)	1/8	1/8	1/3	1/3	1/3	1/3
	RPM	790	790	850	850	850	850
	Nominal total CFM	2400	2400	2400	2400	3200	3200
Direct drive indoor blower data	**Blower size (in.)**	11 x 8	11 x 8	11 x 10	11 x 10	11 x 10	11 x 10
	Type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
	Motor (hp)	1/2	1/2	1/2	3/4	3/4	1
	RPM (maximum)	1400	1400	1400	1400	1400	1400
	Frame size (in.)	48	48	48	48	48	48
Filter size		A	A	A	A	B	B

ⓘ **Note:** You must size field-supplied external filters so as not to exceed 300 fpm air velocity through disposable filters. For internal filter use, an air filter frame kit is available for field installation. Refer to the instructions supplied with the kit for replacement filter sizes. Filter size A is 20 in. x 20 in. Filter size B is 20 in. x 30 in.

Electrical data

See Table 21, Table 22, Table 23, Table 24, and Table 25 for electrical data for the unit.

Electrical data for 208/230-1-60 single source power

Table 21: Electrical data for 208/230-1-60 single source power

Model	Compressor			Outdoor fan motor	Blower motor	Electric heat option						MCA (A)		MOP (A)	
						Electric heat kit model	Electric heat kit (kW)		Stages	Electric heat kit (A)					
	RLA	LRA	MCC	FLA	FLA		208 V	230 V		208 V	230 V	208 V	230 V	208 V	230 V
PC3E24	10.7	53	15.0	0.8	4.8	none	—	—	—	—	—	19.0	19.0	25	25
						6HK16500506	3.6	4.4	1	17.3	19.2	27.7	30.0	30	30
						6HK16500806	5.8	7.1	1	27.7	30.7	40.7	44.3	45	45
						6HK16501006	7.2	8.8	1	34.7	38.3	49.3	53.9	50	60
PC3E30	12.9	61	18.0	0.8	4.8	none	—	—	—	—	—	21.7	21.7	30	30
						6HK16500506	3.6	4.4	1	17.3	19.2	27.7	30.0	30	30
						6HK16500806	5.8	7.1	1	27.7	30.7	40.7	44.3	45	45
						6HK16501006	7.2	8.8	1	34.7	38.3	49.3	53.9	50	60
						6HK16501506	10.8	13.2	2	52.0	57.5	71.0	77.9	80	80
PC3E36	15.4	70	21.5	1.7	4.8	none	—	—	—	—	—	25.8	25.8	40	40
						6HK16500506	3.6	4.4	1	17.3	19.2	27.7	30.0	40	40
						6HK16500806	5.8	7.1	1	27.7	30.7	40.7	44.3	45	45
						6HK16501006	7.2	8.8	1	34.7	38.3	49.3	53.9	50	60
						6HK16501506	10.8	13.2	2	52.0	57.5	71.0	77.9	80	80
PC3E42	15.8	96	24.6	1.7	6.8	none	—	—	—	—	—	28.3	28.3	40	40
						6HK16500506	3.6	4.4	1	17.3	19.2	30.2	32.5	40	40
						6HK16500806	5.8	7.1	1	27.7	30.7	43.2	46.8	45	50
						6HK16501006	7.2	8.8	1	34.7	38.3	51.8	56.4	60	60
						6HK16501506	10.8	13.2	2	52.0	57.5	73.5	80.4	80	90
						6HK16502006	14.4	17.6	2	69.3	76.7	95.2	104.3	100	110
PC3E48	19.4	102	30.2	1.7	6.8	none	—	—	—	—	—	32.8	32.8	50	50
						6HK16500506	3.6	4.4	1	17.3	19.2	32.8	32.8	50	50
						6HK16500806	5.8	7.1	1	27.7	30.7	43.2	46.8	50	50
						6HK16501006	7.2	8.8	1	34.7	38.3	51.8	56.4	60	60
						6HK16501506	10.8	13.2	2	52.0	57.5	73.5	80.4	80	90
						6HK16502006	14.4	17.6	2	69.3	76.7	95.2	104.3	100	110
PC3E60	22.5	148	35.2	1.7	7.8	none	—	—	—	—	—	37.6	37.6	60	60
						6HK16500506	3.6	4.4	1	17.3	19.2	37.6	37.6	60	60
						6HK16500806	5.8	7.1	1	27.7	30.7	44.4	48.1	60	60
						6HK16501006	7.2	8.8	1	34.7	38.3	53.1	57.7	60	60
						6HK16501506	10.8	13.2	2	52.0	57.5	74.8	81.6	80	90
						6HK16502006	14.4	17.6	2	69.3	76.7	96.4	105.6	100	110

Note:

- 208/230-1-60 indicates 208 V/230 V, single phase, 60 Hz.
- MCA indicates minimum circuit ampacity.
- MOP indicates maximum overcurrent protection device. This must be a HACR circuit breaker or time delay fuse. The HACR circuit breaker or time delay fuse must be field installed. The maximum overcurrent protection must be in accordance with the UL 60335-2-40 standard (fourth edition).
- A single-point wiring kit is required.

Electrical data for 208-1-60 multi source power

Table 22: Electrical data for 208-1-60 multi source power

Model	Compressor			Outdoor fan motor	Blower motor	Electric heat option (208 V)				Multi source (208 V)							
						Electric heat kit model	Electric heat kit (kW)	Stages	Electric heat kit (A)	Circuit 1 (compressor)		Circuit 2 (heat)		Circuit 3 (heat)		Circuit 4 (heat)	
	RLA	LRA	MCC	FLA	FLA					MCA (A)	MOP (A)	MCA (A)	MOP (A)	MCA (A)	MOP (A)	MCA (A)	MOP (A)
PC3E24	10.7	53	15.0	0.8	4.8	none	—	—	—	19.0	25	—	—	—	—	—	—
						6HK(0,1)6500506	3.6	1	17.3	19.0	25	21.7	25	—	—	—	—
						6HK(0,1)6500806	5.8	1	27.7	19.0	25	34.7	35	—	—	—	—
						6HK(0,1)6501006	7.2	1	34.7	19.0	25	43.3	45	—	—	—	—
PC3E30	12.9	61	18.0	0.8	4.8	none	—	—	—	21.7	30	—	—	—	—	—	—
						6HK(0,1)6500506	3.6	1	17.3	21.7	30	21.7	25	—	—	—	—
						6HK(0,1)6500806	5.8	1	27.7	21.7	30	34.7	35	—	—	—	—
						6HK(0,1)6501006	7.2	1	34.7	21.7	30	43.3	45	—	—	—	—
						6HK16501506	10.8	2	52.0	21.7	30	21.7	25	43.3	45	—	—
						6HK26501506	10.8	2	52.0	21.7	30	65.0	70	—	—	—	—
PC3E36	15.4	70	21.5	1.7	4.8	none	—	—	—	25.8	40	—	—	—	—	—	—
						6HK(0,1)6500506	3.6	1	17.3	25.8	40	21.7	25	—	—	—	—
						6HK(0,1)6500806	5.8	1	27.7	25.8	40	34.7	35	—	—	—	—
						6HK(0,1)6501006	7.2	1	34.7	25.8	40	43.3	45	—	—	—	—
						6HK16501506	10.8	2	52.0	25.8	40	21.7	25	43.3	45	—	—
						6HK26501506	10.8	2	52.0	25.8	40	65.0	70	—	—	—	—
PC3E42	15.8	96	24.6	1.7	6.8	none	—	—	—	28.3	40	—	—	—	—	—	—
						6HK(0,1)6500506	3.6	1	17.3	28.3	40	21.7	25	—	—	—	—
						6HK(0,1)6500806	5.8	1	27.7	28.3	40	34.7	35	—	—	—	—
						6HK(0,1)6501006	7.2	1	34.7	28.3	40	43.3	45	—	—	—	—
						6HK16501506	10.8	2	52.0	28.3	40	21.7	25	43.3	45	—	—
						6HK16502006	14.4	2	69.3	28.3	40	43.3	45	43.3	45	—	—
						6HK26501506	10.8	2	52.0	28.3	40	65.0	70	—	—	—	—
						6HK26502006	14.4	2	69.3	28.3	40	86.7	90	—	—	—	—
PC3E48	19.4	102	30.2	1.7	6.8	none	—	—	—	32.8	50	—	—	—	—	—	—
						6HK(0,1)6500506	3.6	1	17.3	32.8	50	21.7	25	—	—	—	—
						6HK(0,1)6500806	5.8	1	27.7	32.8	50	34.7	35	—	—	—	—
						6HK(0,1)6501006	7.2	1	34.7	32.8	50	43.3	45	—	—	—	—
						6HK16501506	10.8	2	52.0	32.8	50	21.7	25	43.3	45	—	—
						6HK16502006	14.4	2	69.3	32.8	50	43.3	45	43.3	45	—	—
						6HK26501506	10.8	2	52.0	32.8	50	65.0	70	—	—	—	—
						6HK26502006	14.4	2	69.3	32.8	50	86.7	90	—	—	—	—
PC3E60	22.5	148	35.2	1.7	7.8	none	—	—	—	37.6	60	—	—	—	—	—	—
						6HK(0,1)6500506	3.6	1	17.3	37.6	60	21.7	25	—	—	—	—
						6HK(0,1)6500806	5.8	1	27.7	37.6	60	34.7	35	—	—	—	—
						6HK(0,1)6501006	7.2	1	34.7	37.6	60	43.3	45	—	—	—	—
						6HK16501506	10.8	2	52.0	37.6	60	21.7	25	43.3	45	—	—
						6HK16502006	14.4	2	69.3	37.6	60	43.3	45	43.3	45	—	—
						6HK16502506	18.0	2	86.7	37.6	60	43.3	45	43.3	45	21.7	25
						6HK26501506	10.8	2	52.0	37.6	60	65.0	70	—	—	—	—
						6HK26502006	14.4	2	69.3	37.6	60	86.7	90	—	—	—	—
						6HK26502506	18.0	2	86.7	37.6	60	108.3	110	—	—	—	—

Note:

- 208-1-60 indicates 208 V, single phase, 60 Hz.
- MCA indicates minimum circuit ampacity.
- MOP indicates maximum overcurrent protection device. This must be a HACR circuit breaker or time delay fuse.

Electrical data for 230-1-60 multi source power

Table 23: Electrical data for 230-1-60 multi source power

Model	Compressor			Outdoor fan motor	Blower motor	Electric heat option (230 V)				Multi source (230 V)							
						Electric heat kit model	Electric heat kit (kW)	Stages	Electric heat kit (A)	Circuit 1 (compressor)		Circuit 2 (heat)		Circuit 3 (heat)		Circuit 4 (heat)	
	RLA	LRA	MCC	FLA	FLA					MCA (A)	MOP (A)	MCA (A)	MOP (A)	MCA (A)	MOP (A)	MCA (A)	MOP (A)
PC3E24	10.7	53	15	0.8	4.8	none	—	—	—	19	25	—	—	—	—	—	—
						6HK(0,1)6500506	4.4	1	19.2	19	25	24.0	25	—	—	—	—
						6HK(0,1)6500806	7.1	1	30.7	19	25	38.3	40	—	—	—	—
						6HK(0,1)6501006	8.8	1	38.3	19	25	47.9	50	—	—	—	—
PC3E30	12.9	61	18	0.8	4.8	none	—	—	—	21.7	30	—	—	—	—	—	—
						6HK(0,1)6500506	4.4	1	19.2	21.7	30	24.0	25	—	—	—	—
						6HK(0,1)6500806	7.1	1	30.7	21.7	30	38.3	40	—	—	—	—
						6HK(0,1)6501006	8.8	1	38.3	21.7	30	47.9	50	—	—	—	—
						6HK16501506	13.2	2	57.5	21.7	30	24.0	25	47.9	50	—	—
						6HK26501506	13.2	2	57.5	21.7	30	71.9	80	—	—	—	—
PC3E36	15.4	70	21.5	1.7	4.8	none	—	—	—	25.8	40	—	—	—	—	—	—
						6HK(0,1)6500506	4.4	1	19.2	25.8	40	24.0	25	—	—	—	—
						6HK(0,1)6500806	7.1	1	30.7	25.8	40	38.3	40	—	—	—	—
						6HK(0,1)6501006	8.8	1	38.3	25.8	40	47.9	50	—	—	—	—
						6HK16501506	13.2	2	57.5	25.8	40	24.0	25	47.9	50	—	—
						6HK26501506	13.2	2	57.5	25.8	40	71.9	80	—	—	—	—
PC3E42	15.8	96	24.6	1.7	6.8	none	—	—	—	28.3	40	—	—	—	—	—	—
						6HK(0,1)6500506	4.4	1	19.2	28.3	40	24.0	25	—	—	—	—
						6HK(0,1)6500806	7.1	1	30.7	28.3	40	38.3	40	—	—	—	—
						6HK(0,1)6501006	8.8	1	38.3	28.3	40	47.9	50	—	—	—	—
						6HK16501506	13.2	2	57.5	28.3	40	24.0	25	47.9	50	—	—
						6HK16502006	17.6	2	76.7	28.3	40	47.9	50	47.9	50	—	—
						6HK26501506	13.2	2	57.5	28.3	40	71.9	80	—	—	—	—
						6HK26502006	17.6	2	76.7	28.3	40	95.8	100	—	—	—	—
PC3E48	19.4	102	30.2	1.7	6.8	none	—	—	—	32.8	50	—	—	—	—	—	—
						6HK(0,1)6500506	4.4	1	19.2	32.8	50	24.0	25	—	—	—	—
						6HK(0,1)6500806	7.1	1	30.7	32.8	50	38.3	40	—	—	—	—
						6HK(0,1)6501006	8.8	1	38.3	32.8	50	47.9	50	—	—	—	—
						6HK16501506	13.2	2	57.5	32.8	50	24.0	25	47.9	50	—	—
						6HK16502006	17.6	2	76.7	32.8	50	47.9	50	47.9	50	—	—
						6HK26501506	13.2	2	57.5	32.8	50	71.9	80	—	—	—	—
						6HK26502006	17.6	2	76.7	32.8	50	95.8	100	—	—	—	—
PC3E60	22.5	148	35.2	1.7	7.8	none	—	—	—	37.6	60	—	—	—	—	—	—
						6HK(0,1)6500506	4.4	1	19.2	37.6	60	24.0	25	—	—	—	—
						6HK(0,1)6500806	7.1	1	30.7	37.6	60	38.3	40	—	—	—	—
						6HK(0,1)6501006	8.8	1	38.3	37.6	60	47.9	50	—	—	—	—
						6HK16501506	13.2	2	57.5	37.6	60	24.0	25	47.9	50	—	—
						6HK16502006	17.6	2	76.7	37.6	60	47.9	50	47.9	50	—	—
						6HK16502506	22.0	2	95.8	37.6	60	47.9	50	47.9	50	24.0	25
						6HK26501506	13.2	2	57.5	37.6	60	71.9	80	—	—	—	—
						6HK26502006	17.6	2	76.7	37.6	60	95.8	100	—	—	—	—
						6HK26502506	22.0	2	95.8	37.6	60	119.8	125	—	—	—	—

Note:

- 230-1-60 indicates 230 V, single phase, 60 Hz.
- MCA indicates minimum circuit ampacity.
- MOP indicates maximum overcurrent protection device. This must be a HACR circuit breaker or time delay fuse.

Electric heat performance data for 208/230-1-60

Table 24: Electric heat performance data for 208/230-1-60

Electric heat kit model	Nominal kW at 240 V	Total heat				kW staging			
		kW		MBH		W1 only		W1 + W2	
		208 V	230 V	208 V	230 V	208 V	230 V	208 V	230 V
6HK(0,1)6500506	4.8	3.6	4.4	12.3	15	3.6	4.4	3.6	4.4
6HK(0,1)6500806	7.7	5.8	7.1	19.7	24.1	5.8	7.1	5.8	7.1
6HK(0,1)6501006	9.6	7.2	8.8	24.6	30.1	7.2	8.8	7.2	8.8
6HK(1,2)6501506	14.4	10.8	13.2	36.9	45.1	3.6	4.4	10.8	13.2
6HK(1,2)6502006	19.2	14.4	17.6	49.2	60.2	7.2	8.8	14.4	17.6
6HK(1,2)6502506	24.0	18.0	22.0	61.5	75.2	7.2	8.8	18	22

Note:
- 208/230-1-60 indicates 208 V/230 V, single phase, 60 Hz.
- For electric heat kit model numbers in this table that include (0,1), 0 indicates no service disconnect **or** 1 indicates with service disconnect.
- For electric heat kit model numbers in this table that include (1,2), 1 indicates with service disconnect and no breaker jumper bar **or** 2 indicates with service disconnect and breaker jumper bar.

Electric heat multipliers data

Table 25: Electric heat multipliers

Nominal voltage (V)	Applied voltage (V)	kW capacity multipliers
240	208	0.75
	230	0.92

Note: Electric heat kits are rated at nominal voltage. Use the data is this table to determine the electric heat capacity for electric heat kits applied at lower voltages.

Airflow data

See Table 26, Table 27, and Table 28 for airflow data for the unit.

Airflow performance data for side duct application

Table 26: Airflow performance data for side duct application

Model	Motor speed	External static pressure (in. W.C.)								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0
		SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM
PC3E24	Low (1)	580	550	500	440	390	350	290	240	130
	Low/Medium (2)	690	660	620	570	520	460	410	360	270
	Medium (3)	800	760	720	680	630	570	530	480	400
	Medium/High (4)	880	850	810	780	740	690	640	580	500
	High (5)	1120	1080	1060	1030	1000	970	930	890	820
PC3E30	Low (1)	690	660	620	570	520	460	410	360	270
	Low/Medium (2)	840	800	770	730	680	630	590	530	450
	Medium (3)	1090	1060	1030	1000	970	940	900	870	780
	Medium/High (4)	1180	1160	1130	1100	1070	1050	1010	980	910
	High (5)	1310	1280	1260	1230	1200	1180	1150	1110	1050
PC3E36	Low (1)	850	790	710	660	610	560	510	450	400
	Low/Medium (2)	1100	1050	1010	960	900	840	790	750	660
	Medium (3)	1270	1230	1190	1150	1110	1060	1000	960	860
	Medium/High (4)	1320	1280	1250	1210	1160	1120	1060	1010	920
	High (5)	1490	1450	1420	1380	1340	1300	1260	1210	1120
PC3E42	Low (1)	950	890	830	760	700	650	590	550	390
	Low/Medium (2)	1320	1280	1240	1200	1150	1100	1050	990	900
	Medium (3)	1530	1490	1450	1420	1370	1330	1280	1230	1120
	Medium/High (4)	1600	1570	1530	1490	1450	1410	1370	1320	1210
	High (5)	1890	1860	1830	1800	1760	1730	1700	1640	1510
PC3E48	Low (1)	2020	1980	1940	1910	1870	1830	1790	1760	1690
	Low/Medium (2)	1350	1300	1250	1200	1160	1100	1050	1000	870
	Medium (3)	1690	1650	1600	1570	1530	1490	1440	1400	1310
	Medium/High (4)	1800	1760	1720	1680	1650	1610	1560	1520	1440
	High (5)	2020	1980	1940	1910	1870	1830	1790	1760	1690
PC3E60	Low (1)	2240	2210	2180	2150	2100	2070	2040	2010	1940
	Low/Medium (2)	1520	1480	1450	1400	1360	1320	1280	1240	1150
	Medium (3)	1870	1840	1810	1770	1730	1690	1650	1620	1540
	Medium/High (4)	1940	1910	1870	1830	1800	1770	1720	1680	1610
	High (5)	2240	2210	2180	2150	2100	2070	2040	2010	1940

Note:

- Airflow is tested with dry coil conditions, without air filters, at 230 V.
- Applications above 0.8 in. W.C. external static pressure are not recommended.
- A brushless DC high-efficiency standard ECM blower motor is used for all indoor blower assemblies
- Minimal variations in airflow performance data result from operating at 208 V. The data in this table can be used in those cases.
- Heating applications are tested at 0.50 in. W.C. external static pressure. Cooling applications are tested according to AHRI Standard 210/240.
- The differences between side duct airflows and bottom duct airflows are insignificant.

Electric heat minimum supply air data

Table 27: Electric heat minimum supply air

Model	Voltage (V-phase-Hz)	Minimum blower speed for electric heat					
		Electric heat kit (kW)					
		5	8	10	15	20	25
PC3E24N00S2	208/230-1-60	Medium (3)	Medium high (4)	Medium high (4)	—	—	—
PC3E30N00S2	208/230-1-60	Medium low (2)	Medium high (4)	Medium high (4)	Medium high (4)	—	—
PC3E36N00S2	208/230-1-60	Medium low (2)	Medium low (2)	Medium high (4)	Medium high (4)	—	—
PC3E42N00S2	208/230-1-60	Medium low (2)	Medium low (2)	Medium low (2)	High (5)	High (5)	—
PC3E48N00S2	208/230-1-60	Medium low (2)	Medium low (2)	Medium low (2)	Medium (3)	Medium (3)	—
PC3E60N00S2	208/230-1-60	Medium low (2)	Medium low (2)	Medium (3)	Medium (3)	Medium (3)	Medium (3)

Additional static resistance data

Table 28: Additional static resistance

Model	CFM	Wet indoor coil	Economizer	Filter frame kit
PC3E24N00S2 - 2 ton	500	0.01	0.00	0.01
	600	0.01	0.00	0.02
	700	0.01	0.00	0.04
	800	0.02	0.01	0.06
	900	0.03	0.01	0.08
	1000	0.04	0.01	0.10
	1100	0.05	0.01	0.13
	1200	0.06	0.02	0.16
PC3E30N00S2 - 2.5 ton	700	0.01	0.00	0.04
	800	0.02	0.01	0.06
	900	0.03	0.01	0.08
	1000	0.04	0.01	0.10
	1100	0.05	0.01	0.13
	1200	0.06	0.02	0.16
	1300	0.07	0.03	0.17
PC3E36N00S2 - 3 ton	700	0.01	0.00	0.04
	800	0.02	0.01	0.06
	900	0.03	0.01	0.08
	1000	0.04	0.01	0.10
	1100	0.05	0.01	0.13
	1200	0.06	0.02	0.16
	1300	0.07	0.03	0.17
	1400	0.08	0.04	0.18
PC3E42N00S2 - 3.5 ton	1100	0.02	0.02	0.04
	1200	0.03	0.02	0.04
	1300	0.04	0.02	0.05
	1400	0.05	0.03	0.05
	1500	0.06	0.04	0.06
	1600	0.07	0.04	0.07
	1700	0.07	0.04	0.08
	1800	0.08	0.04	0.09
	1900	0.09	0.05	0.10
	2000	0.09	0.05	0.11
PC3E48N00S2 - 4 ton	1100	0.02	0.02	0.04
	1200	0.03	0.02	0.04
	1300	0.04	0.02	0.05
	1400	0.05	0.03	0.05
	1500	0.06	0.04	0.06
	1600	0.07	0.04	0.07
	1700	0.07	0.04	0.08
	1800	0.08	0.04	0.09
	1900	0.09	0.05	0.10
	2000	0.09	0.05	0.11
PC3E60N00S2 - 5 ton	1100	0.02	0.02	0.04
	1200	0.03	0.02	0.04
	1300	0.04	0.02	0.05
	1400	0.05	0.03	0.05
	1500	0.06	0.04	0.06
	1600	0.07	0.04	0.07
	1700	0.07	0.04	0.08
	1800	0.08	0.04	0.09
	1900	0.09	0.05	0.10
	2000	0.09	0.05	0.11

Note:

- The pressure drop through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit delivers less CFM during full economizer operation.
- The filter pressure drop is based on standard filter media tested at velocities not exceeding 300 ft/min.

Servicing the unit

You can access all serviceable unit components at the following locations:

- Coil guards
- Unit top panel
- Corner posts
- Blower access panel
- Control access panel
- Indoor coil access panel
- Compressor access panel
- Heat section access panel

See Figure 15 or Figure 16 and Figure 8 for an illustration.

See Table 11 for the minimum clearances you must maintain for the unit.

⚠ CAUTION

This system uses R-454B refrigerant. No other refrigerant may be used in this system. Gauge sets, hoses, refrigerant containers, and recovery systems must be designed to handle R-454B. If you are unsure, consult the equipment manufacturer. Failure to use R-454B compatible servicing equipment may result in property damage or injury.

⚠ WARNING

Wear safety glasses and gloves when handling refrigerants. Failure to follow this warning can cause serious personal injury.

Sourcing replacement parts

Contact your local Ducted Systems parts distribution center for authorized replacement parts.

Troubleshooting

The unit does not typically require troubleshooting. If troubleshooting is needed, follow all safety requirements.

If you suspect there is a refrigerant circuit problem, see Checking the refrigerant charge.

For PC3E48 and PC3E60 units, the LED labeled as red on the mitigation control board in the RDS indicates A2L-related status codes and fault codes. See Figure 3 for an illustration of the mitigation control board and Understanding RDS status codes and fault codes for an overview of the status and fault codes. To display and clear stored fault codes, follow the procedure in Displaying and clearing stored RDS fault codes.

⚠ WARNING

Troubleshooting of components necessarily requires opening the electrical control box with the power connected to the unit. Use extreme care when working with live circuit! Check the unit nameplate for the correct range before making any connections with line terminals.

⚠ CAUTION

The wire number or color and terminal designations referred to may vary. Check the wiring label inside the control box access panel for the correct wiring.

Checking the refrigerant charge

If you suspect there is a refrigerant circuit problem, check the refrigerant charge.

➤ **Important:**

- The unit is critically charged. Several ounces of refrigerant are lost each time you connect a refrigerant gauge to the unit. **Do not** connect a refrigerant gauge to the unit to check the refrigerant charge unless you suspect there is a refrigerant circuit problem.
- See A2L refrigerant safety guidance and follow procedures as required. See Charging after refrigerant circuit repair work.

To check the refrigerant charge, do the following:

1. Connect a temperature probe to the compressor discharge line approximately 6 in. away from the compressor shell.
2. Connect a high side refrigerant pressure gauge to the unit discharge pressure port.
3. Record the discharge line temperature and discharge pressure. Using an R-454B temperature pressure chart, convert gauge pressure to saturation temperature. The difference between discharge saturation temperature and discharge line temperature is discharge superheat.
4. Obtain an entering indoor wet bulb temperature reading.
5. Obtain an ambient dry bulb temperature reading.
6. Compare readings taken to the unit charging chart.

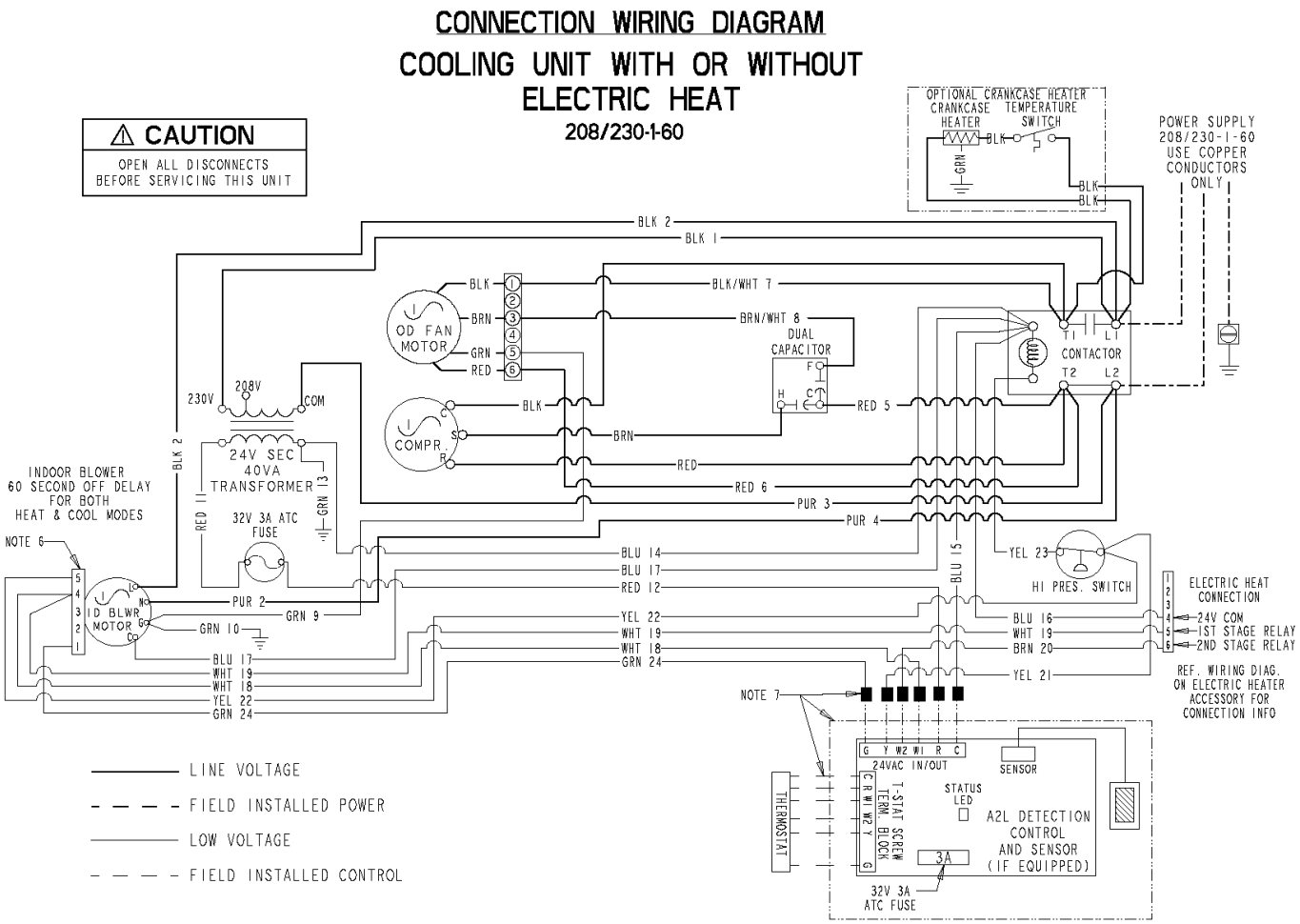
   ➤ **Important:** You can follow the charging chart to check and adjust unit charge if there is no hot work or refrigerant circuit repair involved; otherwise, read the A2L refrigerant safety guidance in its entirety before charging the unit. Whenever applicable, it is preferred to accurately charge the rating plate charge amount into the unit after satisfactory vacuuming.

Third-party trademarks

Third-Party Trademarks Notice: For information about third-party trademarks, refer to the relevant company websites.

Wiring diagrams

Figure 18: Connection wiring diagram



NOTES:

1. ALL FIELD WIRING TO BE ACCOMPLISHED FOLLOWING CITY, LOCAL AND/OR NATIONAL CODES IN EFFECT AT THE TIME OF INSTALLATION OF THE UNIT.
2. CAUTION : LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. IF ANY OF THE WIRING AS SUPPLIED WITH THE UNIT MUST BE REMOVED, IT MUST BE REPLACED WITH TYPE 105 C. 600 VOLT WIRE OR EQUIVALENT AND CLEARLY RENUMBERED FOR IDENTIFICATION. VERIFY PROPER OPERATION AFTER SERVICING.
3. FACTORY WIRED FOR 230 VOLT SUPPLY POWER. FOR 208 VOLT, MOVE WIRE (BLK 1) FROM THE 230V TO THE 208V TAP ON THE TRANSFORMER.
4. MOTORS ARE INHERENTLY PROTECTED.
5. SEE UNIT NAMEPLATE FOR MAXIMUM FUSE AND/OR CIRCUIT BREAKER SIZE AND MINIMUM CIRCUIT AMPACITY.
6. BLOWER MOTOR SPEED CONNECTIONS SHOWN ARE TYPICAL BUT MAY VARY BY MODEL AND APPLICATION. SEE INSTALLATION MANUAL FOR PROPER SPEED TAP INFORMATION FOR EACH APPLICATION TO OBTAIN APPROX. 400 CFM/TON IN COOLING.
7. CONNECT THERMOSTAT CONTROL WIRING TO SCREW TERMINALS ON A2L CONTROL BOARD ON UNITS EQUIPPED WITH A2L REFRIGERANT LEAK DETECTION COMPONENTS.

   CONNECT THERMOSTAT CONTROL WIRING TO MAIN WIRING HARNESS WITH CONTROL CONNECTOR REMOVED USING SPRING TYPE WIRE CONNECTORS OR EQUIVALENT ON UNITS WITHOUT A2L REFRIGERANT LEAK DETECTION COMPONENTS.

A2L REFRIGERANT DETECTION CONTROL DIAGNOSTIC CODES

LED STATUS	CONDITION
NONE	NO POWER TO CONTROL
SOLID ON	CONTROL FAILURE
SLOW HEARTBEAT	NO ACTIVE FAULTS
FAST HEARTBEAT	FACTORY TEST MODE
2 FLASHES	REFRIG. LEAK DETECTED
3 FLASHES	REFRIG. DET. SENSOR FAILURE
4 FLASHES	REFRIG. SENSOR COMM FAILURE

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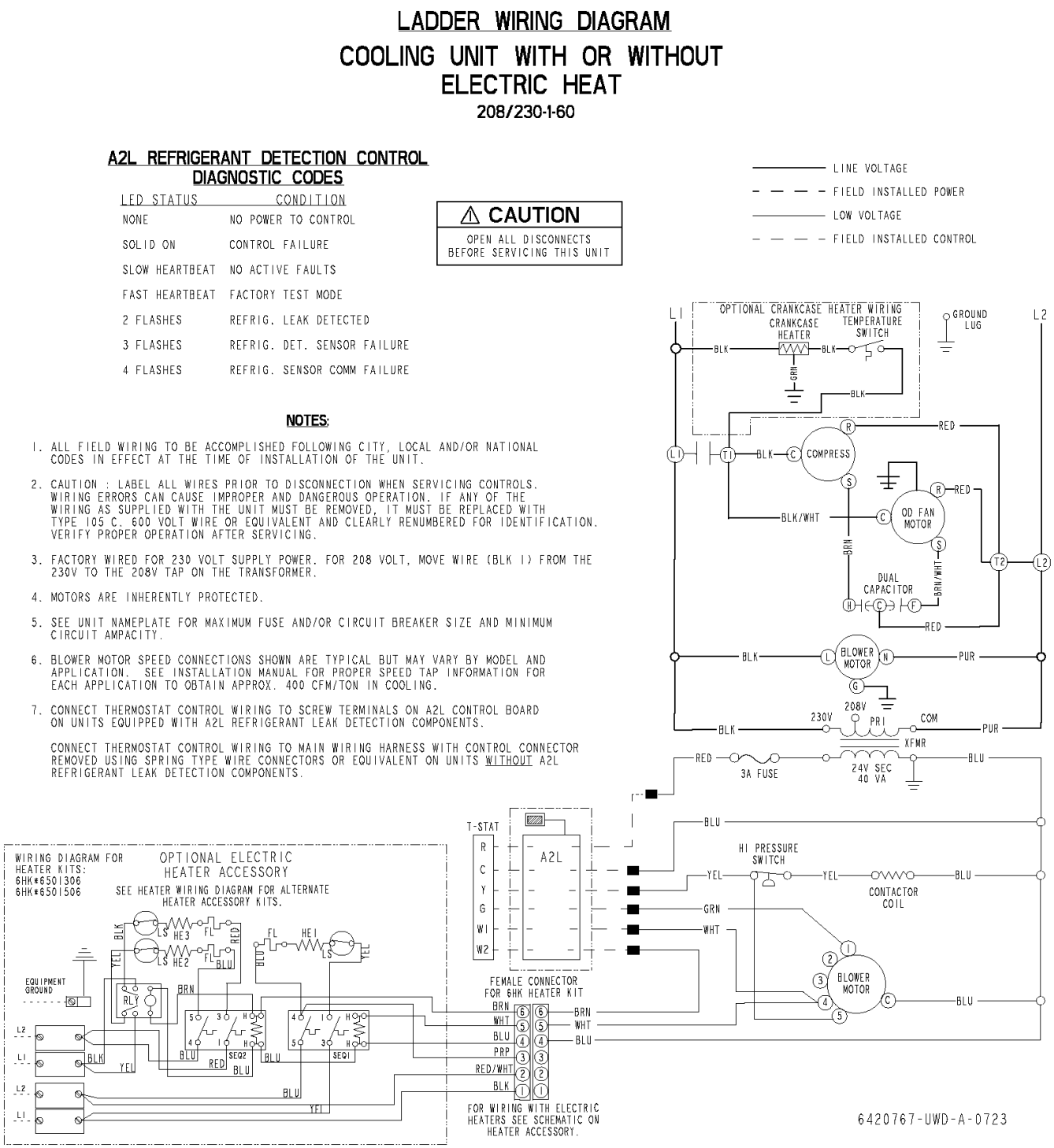
Figure 19: Ladder wiring diagram



Start-up sheet

Residential package unit heat pump or cooling only with electric heat start-up sheet

Correct start-up is critical to customer comfort and equipment longevity

Start-up date		Company name		Start-up technician	

Owner information

Name		Address		Daytime phone	
City		State or province		Zip or postal code	

Equipment data

Unit model number		Unit serial number	

General information (Check all that apply)

◯ Residential	◯ New construction	◯ Roof level	◯ Down flow
◯ Commercial	◯ Retrofit	◯ Grade level	◯ Side flow

Unit location and connections (Check all that apply)

☐ Unit is level and installed on: ☐ Slab ☐ Roof curb ☐ Duct connections are complete: ☐ Supply ☐ Return

☐ Condensate drain correctly connected per the installation instructions ☐ Condensate trap has been primed with water

Filters

☐ Filters installed Number of filters | | Filter size | | ◯ Filter located inside ◯ Filter located outside

Additional kits and accessories installed (Check all that apply)

☐ Refrigerant safety kit	☐ Low ambient kit	☐ Anti-recycle timer	☐ Crankcase heater	☐ Filter frame kit
☐ Transformer kit	☐ Economizer	☐ Roof curb kit	☐ Burglar bar kit	☐ Hail guard kit
☐ Manual fresh air damper kit	☐ Motorized fresh air damper kit			

Electrical connections and inspection (Check all that apply)

◯ Single phase ◯ Three phase ◯ 208 VAC ◯ 230 VAC ◯ 460 VAC ◯ 575 VAC

☐ Inspect wires and electrical connections ☐ Transformer wired correctly for primary supply voltage ☐ Ground connected

☐ Low voltage present at control board R and C Measured voltage R and C outdoor unit control board

☐ Line voltage present at disconnect Measured voltage L1 to L2 | L2 to L3 | L1 to L3

Compressor amperes L1 | L2 | L3 Total amperes L1 | L2 | L3

◯ Single-stage compressor ◯ Two-stage compressor

Airflow setup

Blower type and set-up	◯ Enhanced ECM	COOL	◯ A	◯ B	◯ C	◯ D	
		DELAY	◯ A	◯ B	◯ C	◯ D	
		HEAT	◯ A	◯ B	◯ C	◯ D	
	◯ Standard ECM	COOL	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5
	◯ Standard ECM	HEAT	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5

Supply static (in. W.C.)		Supply air dry bulb temperature		Outside air dry bulb temperature	
Return static (in. W.C.)		Return air dry bulb temperature		Return air wet bulb temperature	
Total external static pressure		Temperature drop		Supply air wet bulb temperature	

Page 1 of 2

Refrigerant charge and metering device

○ R-410A ○ R-454B	Data plate - lb-oz	Suction line temperature	Discharge pressure
		Suction pressure	Liquid line temperature
○ TXV	Discharge line temperature	Superheat	Subcooling

Electric heat (supplemental and emergency heat)

Electric heat kit model number		Serial number		Rated kW		
○ Single phase ○ Three phase	Measured amperage	Heater 1		Heater 2		Heater 3	
		Heater 4		Heater 5		Heater 6	
Number of elements	Measured voltage	Heater 1		Heater 2		Heater 3	
		Heater 4		Heater 5		Heater 6	
Heating return air dry bulb temperature		Heating supply air dry bulb temperature		Air temperature rise			

Clean up job site

- ☐ Job site has been cleaned and indoor and outdoor debris removed from job site
- ☐ Tools have been removed from unit
- ☐ All panels have been installed

Unit operation and cycle test

- ☐ If the unit includes an A2L sensor and a refrigerant detection system (RDS), operate the unit through field testing the A2L sensor and taking A2L mitigation actions, noting and correcting any problems
- ☐ Operate the unit through continuous fan cycles from the thermostat, noting and correcting any problems
- ☐ Operate the unit through cooling cycles from the thermostat, noting and correcting any problems
- ☐ Operate the unit through mechanical heating cycles from the thermostat, noting and correcting any problems
- ☐ Operate the unit through emergency heating cycles from the thermostat, noting and correcting any problems

Owner education

- ☐ Provide owner with the user's information manual
- ☐ Explain operation of system to equipment owner
- ☐ Explain thermostat use and programming (if applicable) to owner
- ☐ Explain the importance of regular filter replacement and equipment maintenance

Comments and additional job details

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