

UNITED **CoolAir**

All-Indoor Solutions

INSTALLATION AND OPERATION MANUAL 5-TON PORTABLE AIR CONDITIONING & HEATING UNIT



Serial Number _____

UNITED COOLAIR CORPORATION YORK, PA

MODEL NO. **SCPAC5GxAS_3_24_16**

SERIAL NUMBER **1610057**

VOLTS **460** PHASE **3** CYCLE **60**

COMP. LRA **351 EA** QTY **2** RLA **53.6 EA**

EVAP. MOTOR HP **15.0** FLA **35**

COND. MOTOR HP **3.0 EA** QTY **2** RLA **8.6 EA**

ELEC. HEATER KW **15**

MCA **25.8**

MOP **30**

FACTORY CHARGE **R-410A** **46 lb 0oz CKT1**

46 lb 0oz CKT2

TEST PRESS. HISIDE 500 PSIG - LOSIDE 250 PSIG
 COMPRESSOR MOTOR AND FAN ARE THERMALLY PROTECTED
 USE COPPER CONDUCTORS ONLY.
 EXT. STATIC PRESS - 0.1 TO 1.0 IN. WC.
 MAX OUTPUT AIR TEMP. 200 DEG. F OR LESS
 MIN. CLEARANCE TO COMBUSTIBLE SURFACES - 0 IN

9CA-6242

IDENTIFICATION OF YOUR UNIT

The Data Tag contains important information on how identify your United CoolAir Unit. See Figure 1 for more information on locating tag.

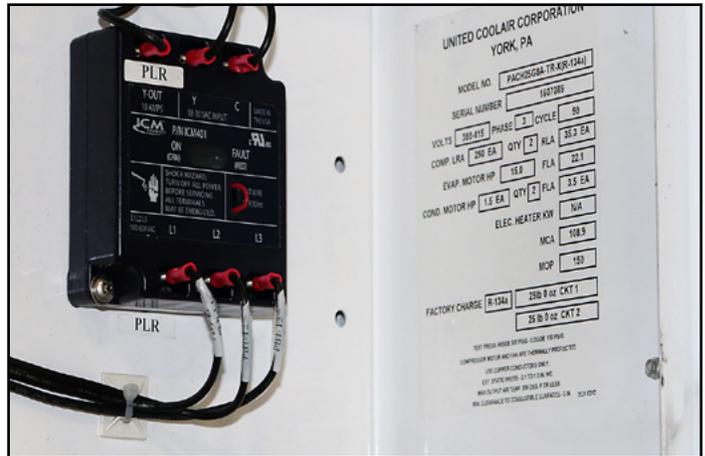


TABLE of CONTENTS

IDENTIFICATION OF YOUR UNIT	2
PACH5G1AS* – PRODUCT SPECIFICATIONS	4
PACH5G3AS* – PRODUCT SPECIFICATIONS	5
PACH5G4AS* – PRODUCT SPECIFICATIONS	6
PACH5G5AS* – PRODUCT SPECIFICATIONS	7
GENERAL INFORMATION	8
UNIT INSPECTION	8
UNIT SETUP	9
DUCT CONNECTIONS	11
CONDENSATE DRAIN	11
SYSTEM OPERATION	12
UNIT SAFETY DEVICES	14
UNIT COMPONENTS	14
REFRIGERATION SYSTEM COMPONENTS	15
ROUTINE MAINTENANCE	16
WIRING DIAGRAM	18
TROUBLESHOOTING GUIDE	19

APPENDIX – DRAWINGS

Product Drawing

WARNING: HIGH VOLTAGE – DISCONNECT POWER BEFORE SERVICING	
DISCONNECT POWER Failure to disconnect power before servicing could lead to severe personal injury or death.	RE-CONNECT ALL GROUNDS All parts of this product capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for servicing, they must be reconnected at their original location.

PACH5G1AS* – PRODUCT SPECIFICATIONS

COOLING MODE		
Design Indoor Dry Bulb / Wet Bulb		80°F / 67°F
Design Outdoor Ambient Temperature		95°F
Total Cooling Capacity	BTU/HR	63,500
Sensible Cooling Capacity	BTU/HR	47,800
Minimum Indoor Ambient Temperature		65°F
Design Return Air Dry Bulb		80°F
Design Return Air Relative Humidity		50%
Approximate Supply Air Flow Rate		2000 CFM
Rated External Static Pressure		0.7" w.c.
HEATING MODE		
15 kW Option		MCA = 55.8 / MOP = 90
Total Heating Capacity	BTU/HR	55,700
POWER REQUIREMENTS		
Voltage / Phasing / Frequency		230/1/60
Minimum Circuit Ampacity	(Amps)	53.2
Maximum Overcurrent Protection	(Amps)	85
COMPRESSOR		
Type		5 Ton Scroll
Voltage / Phasing / Frequency		230/1/60
RLA	(Amps)	30.1
LRA	(Amps)	158
CONDENSER BLOWER MOTOR		
Horsepower		1.5
Voltage / Phasing / Frequency		230/1/60
FLA	(Amps)	8.8
Speed	RPM	1725
EVAPORATOR BLOWER MOTOR		
Horsepower		1
Voltage / Phasing / Frequency		230/1/60
FLA	(Amps)	6.8
Speed	RPM	1725
REFRIGERANT		
R-410	12 lbs. 0 oz.	
Low Pressure	70 PSIG Cutout	100 PSIG Reset
High Pressure	600 PSIG Cutout	Manual Reset
Suction Operating Pressure	104 PSIG Low 1	130 PSIG High ¹
Discharge Operating Pressure	290 PSIG Low1	600 PSIG High ¹
Subcooling	@ approx. 80 °F ambient	10-12°F ¹
DIMENSIONS AND WEIGHT		
Height/Width/Length	Refer to Drawing	CA7595x
Weight		750 lbs.

*Readings are dependent upon ambient conditions; numbers listed are approximate.

PACH5G3AS* – PRODUCT SPECIFICATIONS

COOLING MODE		
Design Indoor Dry Bulb / Wet Bulb		80°F / 67°F
Design Outdoor Ambient Temperature		95°F
Total Cooling Capacity	BTU/HR	63,500
Sensible Cooling Capacity	BTU/HR	47,800
Minimum Indoor Ambient Temperature		65°F
Design Return Air Dry Bulb		80°F
Design Return Air Relative Humidity		50%
Approximate Supply Air Flow Rate		2000 CFM
Rated External Static Pressure		0.7" w.c.
HEATING MODE		
15 kW Option		MCA= 36.7 / MOP= 40
Total Heating Capacity	BTU/HR	55,700
POWER REQUIREMENTS		
Voltage / Phasing / Frequency		208-230/3/60
Minimum Circuit Ampacity	(Amps)	33.9
Maximum Overcurrent Protection	(Amps)	55
COMPRESSOR		
Type		5 Ton Scroll
Voltage / Phasing / Frequency		208-230/3/60
RLA	(Amps)	20.5
LRA	(Amps)	155
CONDENSER BLOWER MOTOR		
Horsepower		1.5
Voltage / Phasing / Frequency		208-230/3/60
FLA	(Amps)	4.7
Speed	RPM	1725
EVAPORATOR BLOWER MOTOR		
Horsepower		1
Voltage / Phasing / Frequency		208-230/3/60
FLA	(Amps)	3.6
Speed	RPM	1725
REFRIGERANT		
R-410	12 lbs. 0 oz.	
Low Pressure	70 PSIG Cutout	100 PSIG Reset
High Pressure	600 PSIG Cutout	Manual Reset
Suction Operating Pressure	104 PSIG Low 1	130 PSIG High1
Discharge Operating Pressure	290 PSIG Low1	600 PSIG High1
Subcooling	@ approx. 80 °F ambient	10-12°F1
DIMENSIONS AND WEIGHT		
Height/Width/Length	Refer to Drawing	CA7595x
Weight		750 lbs.

*Readings are dependent upon ambient conditions; numbers listed are approximate.

PACH5G4AS* – PRODUCT SPECIFICATIONS

COOLING MODE		
Design Indoor Dry Bulb / Wet Bulb		80°F / 67°F
Design Outdoor Ambient Temperature		95°F
Total Cooling Capacity	BTU/HR	63,500
Sensible Cooling Capacity	BTU/HR	47,800
Minimum Indoor Ambient Temperature		65°F
Design Return Air Dry Bulb		80°F
Design Return Air Relative Humidity		50%
Approximate Supply Air Flow Rate		2000 CFM
Rated External Static Pressure		0.7" w.c.
HEATING MODE		
15 kW Option		MCA=25.8; / MOP=30
Total Heating Capacity	BTU/HR	55,700
POWER REQUIREMENTS		
Voltage / Phasing / Frequency		460/3/60
Minimum Circuit Ampacity	(Amps)	16.7
Maximum Overcurrent Protection	(Amps)	30
COMPRESSOR		
Type		5 Ton Scroll
Voltage / Phasing / Frequency		460/3/60
RLA	(Amps)	10.7
LRA	(Amps)	75
CONDENSER BLOWER MOTOR		
Horsepower		1.5
Voltage / Phasing / Frequency		460/3/60
FLA	(Amps)	2.2
Speed	RPM	1725
EVAPORATOR BLOWER MOTOR		
Horsepower		1
Voltage / Phasing / Frequency		460/3/60
FLA	(Amps)	1.8
Speed	RPM	1725
REFRIGERANT		
R-410	12 lbs. 0 oz.	
Low Pressure	70 PSIG Cutout	100 PSIG Reset
High Pressure	600 PSIG Cutout	Manual Reset
Suction Operating Pressure	104 PSIG Low 1	130 PSIG High1
Discharge Operating Pressure	290 PSIG Low1	600 PSIG High1
Subcooling	@ approx. 80 °F ambient	10-12°F1
DEMENSION AND WEIGHT		
Height/Width/Length	Refer to Drawing	CA7595x
Weight		750 lbs.

*Readings are dependent upon ambient conditions; numbers listed are approximate.

PACH5G5AS* – PRODUCT SPECIFICATIONS

COOLING MODE		
Design Indoor Dry Bulb / Wet Bulb		80oF/ 67oF
Design Outdoor Ambient Temperature		95°F
Total Cooling Capacity	BTU/HR	63,500
Sensible Cooling Capacity	BTU/HR	47,800
Minimum Indoor Ambient Temperature		65°F
Design Return Air Dry Bulb		80°F
Design Return Air Relative Humidity		50%
Approximate Supply Air Flow Rate		2000 CFM
Rated External Static Pressure		0.7" wc
HEATING MODE		
15kW OPTION		MCA = 21.8 / MOP = 25
Total Heating Capacity	BTU/HR	55,700
POWER REQUIRMENTS		
Voltage / Phasing / Frequency		575/3/60
Minimum Circuit Ampacity	(Amps)	12.9
Maximum Overcurrent protection	(Amps)	25
COMPRESSOR		
Type		5 Ton Scroll
Voltage / Phasing / Frequency		575/3/60
RLA	(Amps)	6.9
LRA	(Amps)	55.3
CONDENSER BLOWER MOTOR		
Horsepower		575/3/60
Voltage/ Phasing / Frequency		
FLA	(Amps)	1.9
Speed	RPM	1750
EVAPORATOR BLOWER MOTOR		
Horsepower		2
Voltage/ Phasing / Frequency		575/3/60
FLA	(Amps)	2.4
Speed	RPM	1725
REFRIGERANT		
R-410A	12LBS. 0 oz.	
Low Pressure	70 PSIG Cutout	100 PSIG Reset
High Pressure	600 PSIG Cutout	manual Reset
Suction Operating Pressure	104 PSIG Low 1	130 PSIG High 1
Discharge Operating Pressure	290 PSIG Low 1	600 PSIG High 1
Subcooling	@ approx. 80F ambient	10-12oF
WIRING DIAGRAM		
	Refer to Drawing	CA10123T
DIMENSIONS AND WEIGHT		
Height / Width / Length	Refer to Drawing	CA7595E
Weight		750 lbs.

GENERAL INFORMATION

The PACH5G*AS is a portable air conditioning unit designed for air conditioning of spaces such as tents, construction sites and remote buildings. This product may also have optional electric heaters. If supplied with the electric heat option, refer to the specifications and operating sections provided for the electric heaters.

IMPORTANT – Read this instruction manual carefully before attempting to install, operate, or perform maintenance on this unit. This unit must be installed and maintained by qualified service technicians.

WARNING: BODILY INJURY CAN RESULT FROM HIGH VOLTAGE ELECTRICAL COMPONENTS AND FAST MOVING FAN DRIVES. FOR PROTECTION FROM INHERENT HAZARDS DURING INSTALLATION AND SERVICING, THE ELECTRICAL SUPPLY MUST BE DISCONNECTED. IF CHECKS MUST BE PERFORMED WITH THE UNIT OPERATING, IT IS THE RESPONSIBILITY OF THE TECHNICIAN TO RECOGNIZE THESE HAZARDS AND PROCEED WITH EXTREME CAUTION.

NOTE: “Warnings and Cautions” appear at the appropriate places throughout this manual. Your personal safety and the proper operation of this unit require that you follow them carefully. The manufacturer assumes no liability for installations or servicing performed by non-qualified personnel.

UNIT INSPECTION

Upon receiving the unit, inspect for damage to the unit structural interior and exterior components that may have happened during transit. Immediately notify the carrier of damage to the unit. Verify the unit is the correct unit ordered by looking at the unit’s data plate. Figure 1 – Data Plate is located on the right hand side of the electrical box section. The main power source must be capable

of delivering the required amount of power to the unit. Refer to the installation instructions for connections.

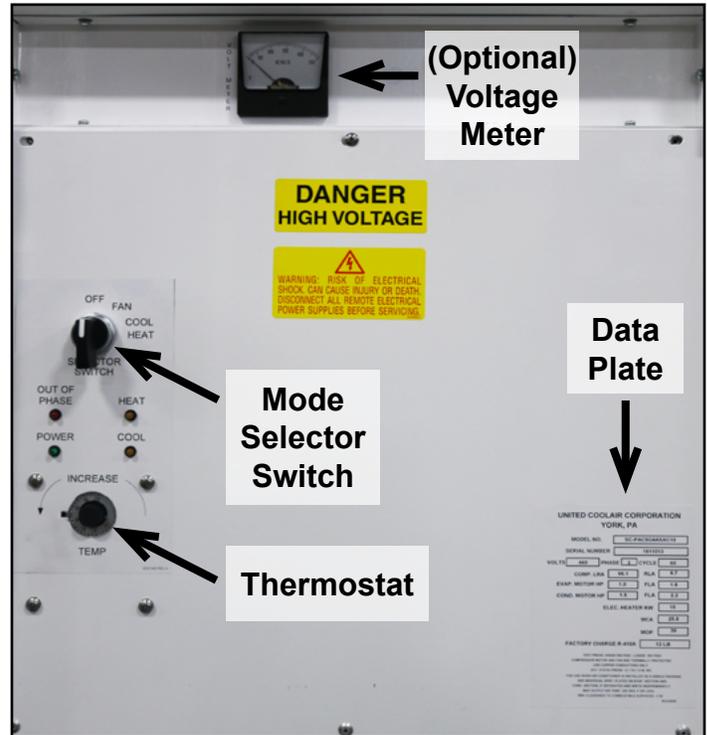


Figure 1 – Data Plate

Access to the Schrader pressure taps is located behind the access panel to the compressor compartment. These taps are sealed from serviceability. Break these seals only when there is a necessity to check or service the system to ensure correct operation. Refer to the specifications section for operating pressures and maximum operating currents. See Figure 2 – Compressor Compartment.

The unit has a manual reset high pressure safety switch which is designed to lock out the compressor from operation upon opening up on high pressure safety. The unit also has a low pressure safety switch which locks out the compressor under a low refrigerant pressure safety condition. If the high pressure safety switch opens to protect the compressor, there is a manual reset button located on the top of the switch that must be pressed for reset of the switch. If the low pressure switch opens on low refrigerant pressure safety, power must be disconnected to from the

unit then re applied to reset the low pressure safety switch. Please refer to the troubleshooting section for additional details of the High and Low Pressure safety devices. If this section does not list the corrective action to the problem, contact a qualified refrigeration technician to check the refrigeration system for proper operation.

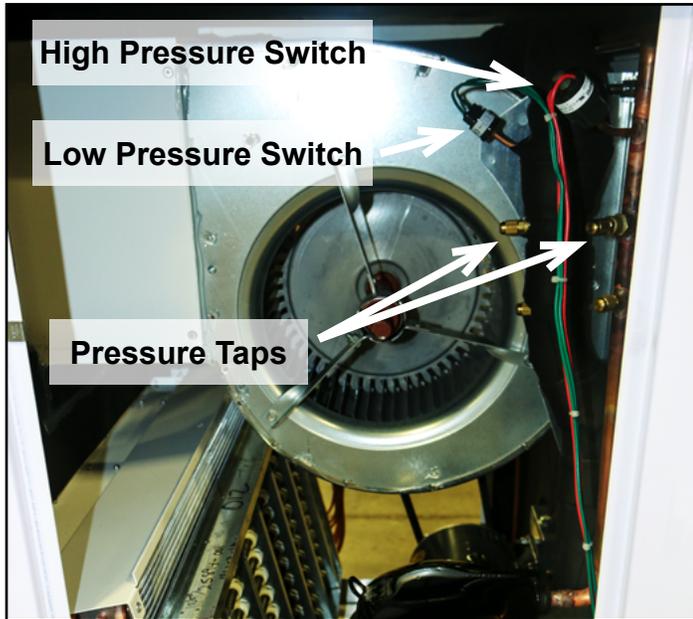


Figure 2 – Compressor Compartment

UNIT SETUP

Location and Clearances

Select a location that permits unobstructed airflow into the condenser coil and away from the condenser fan discharge air outlets.

Placement and Rigging

When using a forklift to set the portable air conditioning unit into place, ensure the forks are centered directly into the openings in the base frame of the equipment.

CAUTION: Never attempt to lift this unit using a Crane.

Pre-Installation Inspection

It is recommended that the following components are inspected to insure internal components have

not vibrated loose during shipment or transit from job site to job site.

1. Open the condenser blower/motor access panel located to the right of the compressor compartment. Check the condenser blower assembly, motor mounting hardware, pulley, belt, blower shaft, blower bearings, and blower wheel for proper tightness.
2. Open the evaporator blower/motor access panel located to the right of the control panel. Check the evaporator blower assembly, motor mounting hardware, pulley, belt, blower shaft, blower bearings, and blower wheel for proper tightness.
3. Close and lock all panel doors.

Electrical Connection

Refer to the unit data plate for main power requirements. Electrical wiring and grounding must be installed in accordance with The National Electrical Code NEC/NFPA Latest Revision. Refer to the electrical wiring diagram for Main Power connections also shown in Figure 3 – Camlock Power Connections which are located directly below the control panel.

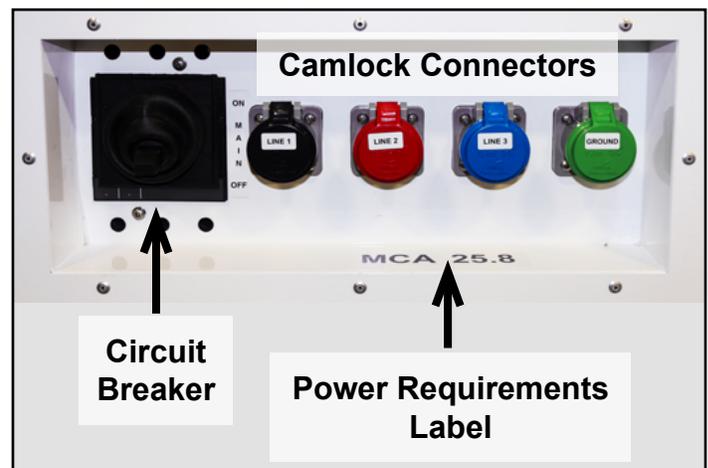


Figure 3 – Camlock Power Connections

CAUTION: Only qualified electrical technicians should perform the electrical installation.

1. An envelope containing the electrical schematic is located in the electrical control box section for reference.

Notes:

1. Do not operate this unit if any of the voltage readings from line to line are more than $\pm 10\%$ of the rated voltage.
2. This unit also has an optional Voltage Meter which is beneficial to the setup and operation of the unit. Refer to Figure 1 previously.

208 – 230 Volt Applications

In a 208-230 Volt AC application, the meter is used for two functions. The most important function is to check the applied voltage from the main power source. **If the applied voltage from the main power source is less than 190 Volts AC or greater than 250 Volts AC, do not operate the unit until power is corrected at the main power source.** The second function is to use the measured voltage to select the control circuit type 208 or 230 volt. Selecting the type of voltage for the control circuit based the measured voltage helps to stiffen the control voltage to the control components (motor contactor, time delays, etc.).

460 – Volt Applications

In a 460 Volt AC application, the meter is only used for an over/under applied voltage check. **If the applied voltage from the main power source is less than 420 Volts AC or greater than 500 Volts AC, do not operate the unit until power is corrected at the main power source.**

3. Review the following steps to insure that electrical phasing and voltage setup is correct prior to initial start-up and unit operation. Single phase units require a voltage check and all three phase units require a check of both proper phasing and voltage.
4. On Three Phase Units, proper phasing of the electrical power wiring is critical for proper rotation of the motors and operation of the compressor. Electrical phase sequence monitors are standard on all three-phase 5 Ton Spot Cooler A/C units.

- (a) Connect the power cable to the correct power source as verified by the unit's data plate shown in Figure 1 or at the Camlock connection fittings.
- (b) Turn ON the main power to the unit.
- (c) As soon as power is applied to the unit, check two items immediately.
 - (iv) Voltage
 - (v) Phase Rotation
- (d) Read and remember/record the voltage on the Voltage Meter.
- (e) Next, verify the Red Out-of-Phase Indicator (OPI) (Three Phase Units) located on the front of the control panel is not illuminated as viewed from the control panel.
- (f) At this point, **TURN OFF POWER** to the unit at the main power source.
- (g) If the Red OPI light is illuminated, switch any two leads of the three main power wires connected from the main power source.

CAUTION: Do not switch Green. Green is Ground.

- (h) For 208 volt applications, if the displayed voltage is greater than 190 VAC and less than 219 volts AC, set the Control Voltage Selector Switch (CVSS) to the 208 Volt position.
- (i) For 230 volt applications, if the displayed voltage is greater than 219 VAC and less than 250 volts AC, set the Control Voltage Selector Switch (CVSS) to the 230 Volt position.
- (j) Turn main power **ON** again. When the Red OPI indicator light is off, the phase sequence is correct.
- (k) Turn **OFF** main power at this point and lockout the disconnect switch until the supply and return air ducting is connected.

CAUTION:

1. IN 208 – 230 VOLT APPLICATIONS, DO NOT OPERATE THE UNIT IF THE APPLIED VOLTAGE IS LESS THAN 190 VAC OR GREATER THAN 250 VAC.
2. IN 460 VOLT APPLICATIONS, DO NOT OPERATE THE UNIT IF THE APPLIED VOLTAGE IS LESS THAN 420 VAC OR GREATER THAN 500 VAC.
3. These units will not operate if phase sequence is not correct.

DUCT CONNECTIONS

Supply Air Duct

The supply air duct connections are labeled “AIR OUT”. The connection size is 14” in diameter. Connect the flexible air ducting as follows:

1. Attach the flexible air ducting to the unit’s duct collars making sure that air will not leak past the connection collar by using appropriate round flexible ducting clamps.
2. Route the ducting as straight as possible to the space being conditioned avoiding excessive turns and pinches in the ducting.
3. Terminate the ends of each duct to the space being conditioned making sure that supply air does not have the possibility of short cycling back into the return air.
4. Verify the termination points are not restricted meaning no objects are directly in front of the termination.

Return Air Duct

The Return Air duct connection is labeled “AIR IN”. Follow the same procedures as the Supply Air Duct Connections. If outdoor air is required for specific applications use only one (1) Air In duct collar to pull in fresh outdoor air. The other must be ducted to the return air from the space being

conditioned. Determine which Return Air Duct will be connected and terminate the return air ducts to that particular duct collars.

CAUTION: Do not operate the unit without the duct attached to the return air side of the unit. If operated without duct, the evaporator blower motor overloads will cut out on thermal overload due to the motor operating higher than design Full Load Amperage.

If the application requires 100% outdoor air to be used as conditioned air to the space, the return air inlet must be blocked a minimum $\frac{1}{4}$ to $\frac{1}{2}$ of the entire surface area of the return air inlet collar.

CONDENSATE DRAIN

There are condensate drains on both sides of the unit as well as two drain connection options:

1. Drain to the ground. The drain line must be trapped and filled with water before operating the unit. Filling the trap with water prevents negative air pressure inside the unit cabinet from holding the condensate internal to the drain pan which may eventually overflow if a trap is not installed.

If drain to ground is not a desirable option, connect the drain to a suitable drainage point such as a storm drain using a hose. The hose must still have a form of trap to allow the water to drain. Fill the trap with water before operation to form a seal.

Or

2. Drain to an optional condensate pump, to pump condensate to a remote location. Refer to the Figure 4 – Condensate Pump for information on installation of this option. The pump plugs into a standard 115 vac receptacle. Use of an extension cord is acceptable. Make sure to slide catch lip at point B back onto the front edge of the fork lift pocket. Angle point A downward until point B is completely secured

back onto the fork lift pocket then tilt the pump downward so that point A rises upward to meet the back edge of the fork lift pocket.

Before installing the flexible condensate tubing from the condensate drain connection on the unit to the condensate pump, fill the pump with water. Next, make sure the flexible condensate tubing that will be installed from the condensate outlet of the unit into the

condensate pump has a V shaped notch cut into the end of the tube so that when the end of the tube is pushed down into the pump, the bottom of the pump cannot seal off the end preventing water from flowing into the pump. See Figure 5 – V Notch.

SYSTEM OPERATION

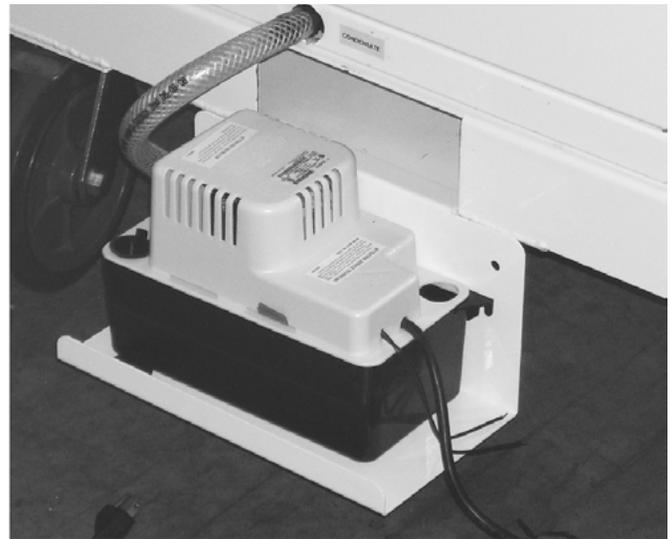
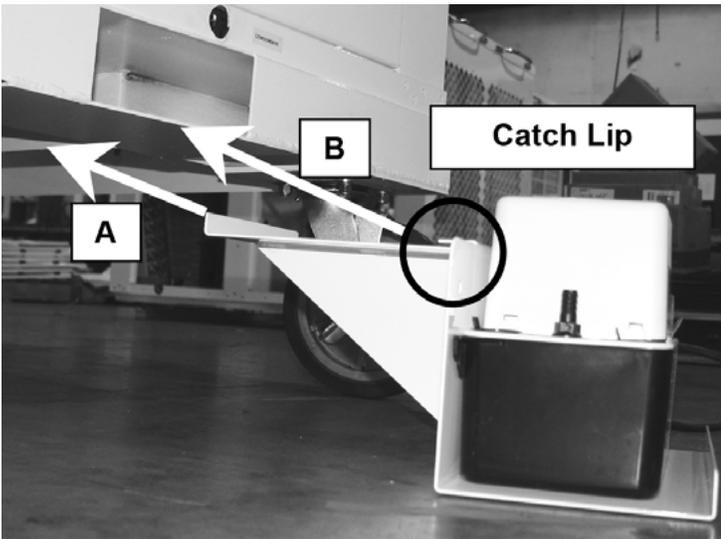


Figure 4 – Condensate Pump

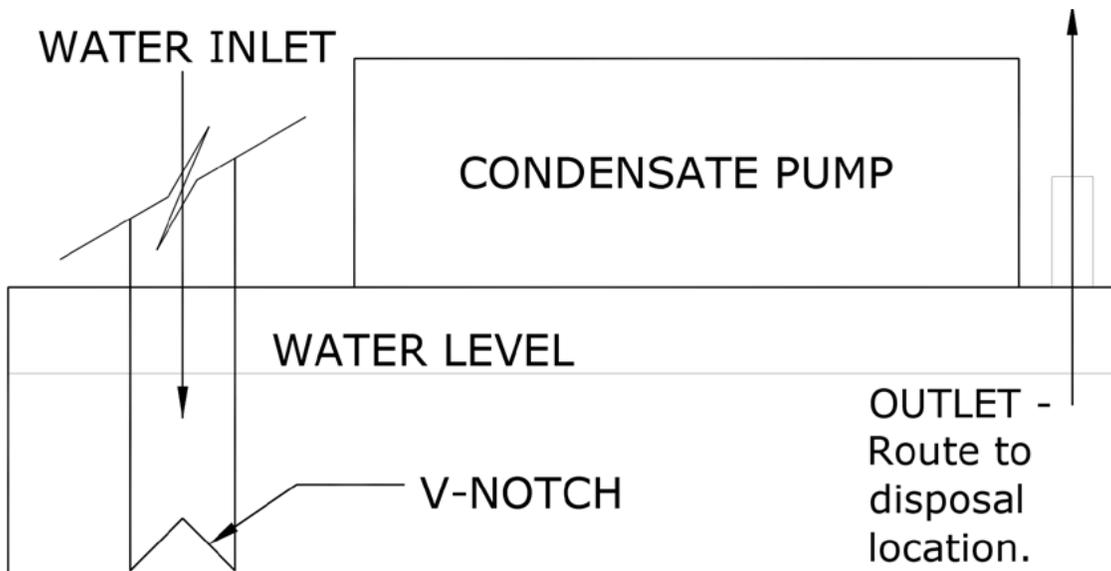


Figure 5 – V-Notch

Getting Started

Please make sure the following setup items have been completed before system operation.

1. Connect the 5 Ton Portable Spot Cooler Air Conditioning unit to the correct power source.
2. Turn **ON** the main supply power at the main power source.
3. Verify the Applied Voltage to the unit is with unit operating design.
4. Verify the Red Out-of-Phase Indicator (OPI) is not illuminated and that the voltage is within the required range. Refer to the procedures under the Installation Instructions.
5. Connect all Ducting to the Unit and Space(s) being conditioned.
6. Connect a method to dispose of the condensate.

System Fan Mode

Turn Selector Switch (SS) to the **Fan** position. The Evaporator Motor Contactor (CEM) will energize to start the Evaporator Motor (ME). The Evaporator Fan will operate continuously in the Fan and Cool modes of operation. It will also operate continuously during optional Heat Mode.

System Cool Mode

Turn the Selector Switch (SS) to the Cool position. If the Return Air Temperature "AIR IN" is greater than the Thermostat setting sensed by the thermostats temperature measuring bulb, the compressor contactor (CCR) will energize the Compressor (CR) and the Amber Cool Indicator light (CL) will illuminate. When the compressor energizes, condenser fan contactor (CCM) will energize and condenser fan motor (MC) will start. As soon as the return air temperature falls below the thermostat setting, the compressor and condenser motors are de-energized.

To stop the unit, turn Selector Switch (SS) to the OFF position.

NOTE: There is a manual "slide damper" at the top of the condenser blower discharge air outlet. This damper should be closed off approximately 1-2 inches when the condenser outlet is not ducted. This will reduce the condenser motor current and prevent overload conditions with the condenser motor. Adjust this damper only when the condenser discharge is not ducted. When it is ducted to a length of 20 feet or greater, make sure the slide plate is completely open.

System Heat Mode (Option)

Turn the Selector Switch (SS) to the Heat position. If the return air temperature is below the unit's thermostat setting, the heating contactor(s) (CHT or CHT1 and CHT2) will energize the Electric Heating Elements and the Amber Heat Indicator light (HL) will illuminate. As the return air temperature rises above the Thermostat's setting, the heater(s) are de-energized.

To stop the unit, turn Selector Switch (SS) to the OFF position.

Thermostat Bypass

The unit also has a Thermostat Bypass Switch which is used to manually force cooling or heating to be energized based on the mode selected by the Selector Switch. Thermostat bypass overrides the unit's on-board thermostat and the Remote Thermostat. Both of the thermostats become non-functional in the bypass mode.

To operate in Bypass Mode, set the Selector Switch to the desired mode of operation (COOL or HEAT). Set the Thermostat Bypass Switch to the BYPASS position. At this point either COOL or HEAT will operate continuously without shutting down.

UNIT SAFETY DEVICES

Evaporator Motor Overload

The evaporator and condenser motors are protected by thermal overloads. The evaporator blower motor protection is internal and automatically resets once the temperature inside the windings of the motor falls below the temperature trip point.

Condenser Motor Overload

The condenser blower motor overload is external and protected manually with an overload block. This overload block is tied directly to the condenser motor contactor (CCM). This is a manual reset overload. If the condenser motor for any reason should cut out on overload, disconnect power using the unit's circuit breaker then open the main control box. Press the reset button on the CCM overload block. Refer to the troubleshooting guide section for information on troubleshooting.

High Pressure Switch

The compressor system has a manual reset High Pressure Switch. If the unit is not providing cooling as evidenced by the Return Air Temperature "AIR IN" being approximately equal to the Supply Air Temperature "AIR OUT", the compressor system may have tripped on high refrigerant pressure. Disconnect power using the unit's circuit breaker. Remove the Access Panel to the Compressor Compartment and locate the Manual Reset High Pressure Switch. Press the button downward to verify if the switch tripped. If the button clicks the unit tripped on high pressure. Replace the access panel then reapply power using the unit's circuit breaker. Set the unit to Cool Mode. Refer to the Troubleshooting section for causes and corrective actions. It may require a service technician to check system pressures if the switch trips more than 1-2 times.

Low Pressure Switch

The compressor system has an automatic reset low pressure safety switch. If the unit trips on low pressure, the compressor will shut down but automatically restart once the switch resets. The low pressure switch shuts down the compressor system if the refrigerant pressure falls below 70 psig and automatically restarts the compressor once the pressure rises above 100 psig.

Compressor Internal Overload

Each compressor has an internal motor overload switch. This switch opens to protect the compressor motor when the temperature within the windings of the compressor motor exceeds the high temperature trip point. When this switch opens, the compressor motor will continue to operate but the compressor pumping mechanism "scroll" will become disconnected. To reset this condition, the power must be disconnected from the compressor contactor. Set the unit back to the FAN position and allow the unit to operate in the FAN position for approximately 30-45 minutes. This should be enough time to cool the windings of the compressor motor which will allow the switch to reset (re-engaging the scroll). Set the Selector Switch back to COOL mode and the compressor should re-start. If this compressor goes out on internal overload condition, check the voltage. Since the compressor motor windings are cooled by the refrigerant gas as it enters the compressor, the unit may also be low on refrigerant.

UNIT COMPONENTS

Electrical Components:

Contactors

Contactors are used to energize the evaporator and condenser blower motors and compressor motor. Contactors have a set of high current

carrying contacts for conducting line voltage to the load device (compressor, blower motors, etc.) and a magnetic holding coil which closes the line voltage contacts whenever control voltage of 24 VAC is applied by the control panel devices. The evaporator blower and compressor motors have built in internal overload protection to protect against high current draw. They automatically reset when the motors have cooled down.

High Pressure Safety Switch

The high-pressure switch is designed to protect the compressor circuit from unusually high refrigerant pressures. If the refrigerant pressure rises above 600 PSIG, the pressure switch will open causing the compressor to shut off and the switch prevents it from re-starting until the manual reset button is pressed. Refer to the troubleshooting section for resolutions to the problem.

Low Pressure Safety Switch

The low-pressure switch is designed to protect the compressor circuit from unusually low refrigerant pressures. If the refrigerant pressure falls below 70 PSIG, the switch will open causing the compressor to shut off. As the pressure starts to rise above 100 PSIG, the switch will reset and allow the compressor to restart.

Thermostat

The unit has thermostat for one stage of cooling. Rotate the dial to set to the desired temperature set point.

REFRIGERATION SYSTEM COMPONENTS

Compressor

The compressor is scroll hermetic type. The function of the compressor is to create a differential in refrigerant pressure. It converts low pressure, low temperature refrigerant vapor entering the suction side of the compressor into a high pressure, high temperature gas at the

discharge side of the compressor. The function of the compressor also pumps the refrigerant through the refrigerant piping and components within the refrigeration system.

Condenser Coil

The condenser receives the high-pressure high-temperature gas from the compressor. As the condenser blower draws the ambient air across the fins and tubes of the condenser coil and the high-pressure high-temperature gas enters the condenser coil, the gas starts to condense back into liquid state. At the outlet piping of the condenser coil, the gas has been turned back into liquid refrigerant and flows toward the receiver.

Evaporator Coil

As the liquid refrigerant passes through the expansion valve, the liquid refrigerant's pressure is regulated downward. This significant change in pressure causes a drop in temperature of the refrigerant. When the warmer ambient air is drawn over the cooler evaporator coil, the warmer or latent heat is exchanged. As the heat is being exchanged, the exchange of heat energy causes the liquid refrigerant to boil into a vapor which greatly reduces the temperature of the air on the outlet side of the coil. The liquid refrigerant is converted into the lower temperature, lower pressure refrigerant causing it to changing into a vapor state.

Filter Drier

The filter drier, filters loose particles, moisture and possible brazing residue from the system. If the unit starts tripping on low pressure cutout and the refrigerant line is frosted up to the outlet of the filter drier, check the refrigerant pressure drop across the filter drier and replace the filter drier if necessary.

Sight Glass

A liquid sight glass is located before the thermostatic expansion valve. During the cooling

mode of operation, pure liquid should flow through the liquid sight glass. The liquid refrigerant will appear clear enough to see the back of the inside of the sight glass. Flashing (bubbles) will appear in the sight glass during the first minute or two of operation until the expansion valve fully adjusts. If flashing is constant during the cooling mode, it may be an indication the unit is short of refrigerant. There may also be some flashing during hot gas bypass operation. See the Troubleshooting Chart for further details.

Thermostatic Expansion Valve

The expansion valve regulates the amount of liquid refrigerant entering into the evaporator. As the liquid enters into the expansion valve, the valve will start to change the state by changing the pressure of the liquid refrigerant as it passes through and starts to enter the evaporator coil. When the environments load conditions start to change, the bulb recognizes a change in temperature at the outlet piping of the evaporator to the suction side of the compressor and automatically adjusts the valve to maintain the correct flow into the evaporator coil.

ROUTINE MAINTENANCE

To keep the Portable Air Conditioner operating safely and efficiently, it is recommended that a qualified service technician check the entire system at least once a year. Check the system more frequently depending on use and surrounding conditions.

Filters

It is very important to keep the air filters clean. Be sure to inspect them at least once each month when the system is in constant operation. If the unit is equipped with a cleanable air filter, wash dirt and debris off the filter with a stream of cold water. If the unit is equipped with disposable type air filters, replace them with the same type and size.

NOTE: Do not attempt to clean disposable air filters

CONDENSER COIL

Inspect the condenser coil. If the condenser coil is dirty, clean with a stream of cold water, or pressurized air not exceeding 50 psig, or vacuum cleaner. Do not use hot water or steam, which can cause excessive high pressure in the refrigerant system. Clean the condenser coil in the opposite direction of the airflow.

MOTOR AND DRIVE COMPONENTS

Blowers and Motor bearings are pre-lubricated and sealed from serviceability. They do not require maintenance.

Belt Tensioning

Excessive belt tension is the number one cause for blower bearing failure. Proper belt tension and pulley alignment are essential for trouble free operation. Insufficient deflection indicates that the belt tension is entirely too tight, and if not loosened somewhat, noise due to excessive vibration, premature bearing failure, shortened belt life, and a reduction in fan performance may result. **Deflection** is the amount the belt gives when force is applied, usually by finger, to the belt at the approximate center point to the belt span. Tight belts may also overload the motor and cause the efficiency drop considerably or even premature motor failure as well. **Belt Span** is the distance in inches between the drive shaft center point and the fan shaft center point. Refer to Figure 6 – Belt Tensioning below.

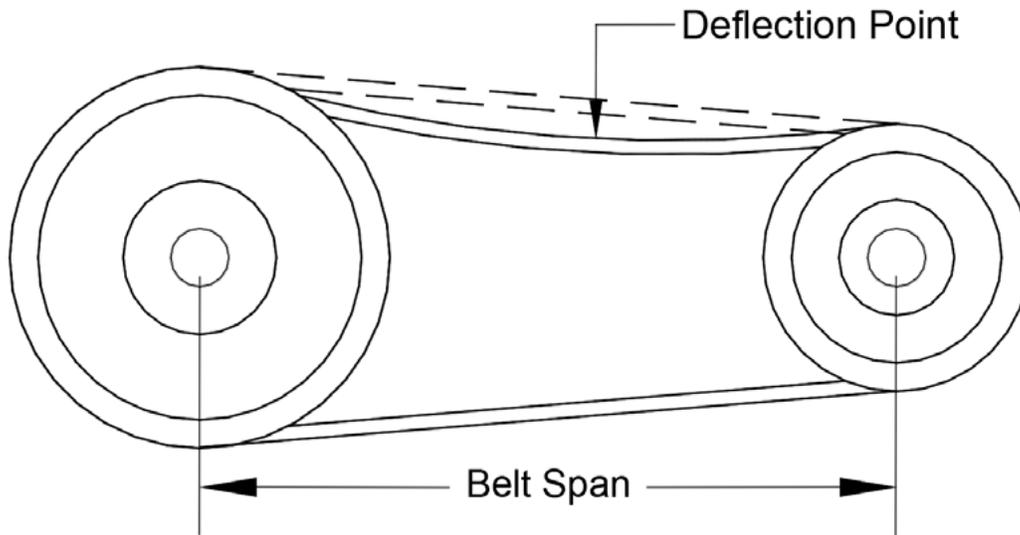


Figure 6 – Belt Tensioning

Excessive deflection is an indication that the belt is not tight enough. If not corrected, the belts will slip causing loss of blower speed, the belts will glaze due to excessive slipping and heat leading to premature belt failure. Belts may slip during start-up, but slipping should stop as soon as the fan reaches full speed. Please use the chart below for recommended deflection amount for the measured Belt Span.

Belt Span	Deflection Amount	Belt Span	Deflection Amount
12"	3/16"	36"	9/16"
15"	1/4"	39"	5/8"
18"	1/4"	42"	5/8"
21"	5/16"	45"	3/4"
24"	3/8"	48"	3/4"
27"	7/16"	51"	13/16"
30"	7/16"	54"	7/8"
33"	1/2"	57"	7/8"
36"	9/16"	60"	15/16"
39"	5/8"	63"	1"

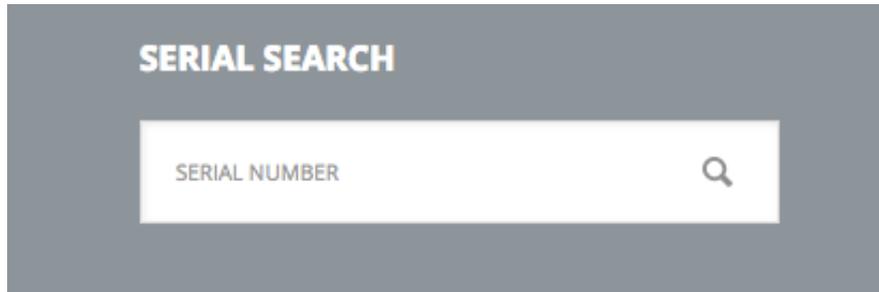
Check the sheave alignment to make sure that the sheave faces are in the same plane. Check this by placing a straight edge across the face of the sheaves. Any gap between the edge and sheave faces indicates misalignment.

Caution: This method is only valid when the width of the surfaces between the belt edges is the same for both sheaves. When they are not equal or when using adjustable pitch pulleys, adjust so that the belts have approximately equal tension. Both shafts should be at right angles to the belt. Check the setscrew and/or bushing bolt tightness.

Belts tend to stretch somewhat after installation. Recheck belt tension after several hours of operation.

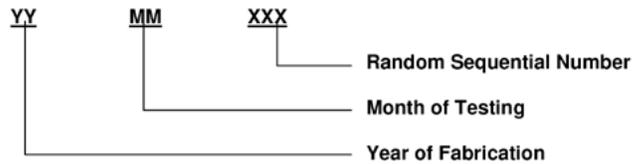
WIRING DIAGRAM

United CoolAir provides a wiring schematic for each unit produced. To retrieve the diagram for your unit please visit www.unitedcoolair.com, on your computer or mobile device, scroll to the footer section or Home/industry-resources, enter your serial number in the **Serial Search** field and press return to retrieve your product-wiring diagram.



Your serial number is a combination of the year, month and sequential order of build date.

Serial Number



This action will return the Model number, Job Number and the wiring diagram for viewing as well as downloading.

1 results

Serial Number	Model Number	Job Number	Wiring Diagram
1802030	B2G3ASHA	28168-002	View

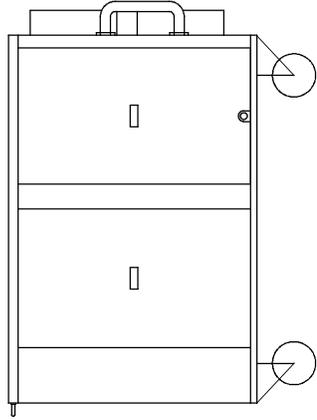
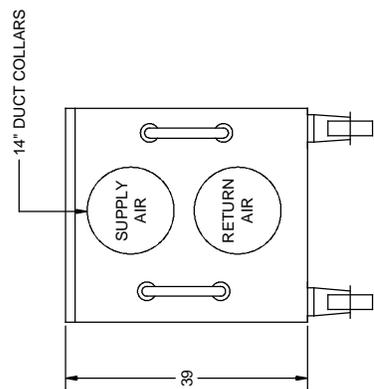
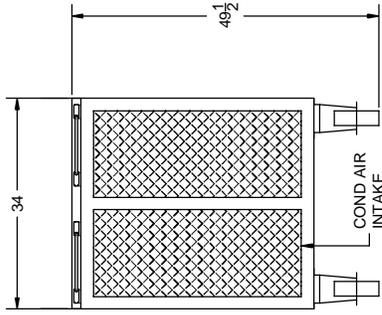
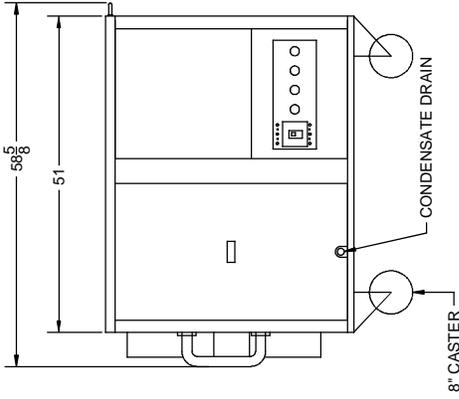
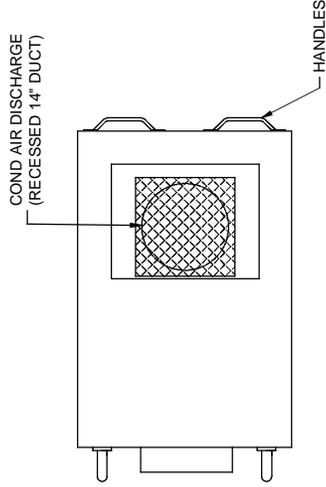
NOTE: Only units shipped since November 2016 are available on the site, for older units please contact the factory directly at 717-843-4311.

TROUBLESHOOTING GUIDE

WARNING: BE AWARE OF HIGH POWER SITUATIONS WHILE TROUBLESHOOTING. THERE ARE ALSO MOVING BELTS, BLOWERS, AND MOTORS WHILE POWER IS CONNECTED TO THE UNIT. WHEN REACHING INTO ANY OF THE UNIT SECTIONS TO MAKE ADJUSTMENTS TO THE UNIT. PLEASE DISCONNECT POWER FROM THE UNIT.

Problem	Cause	Description
Power Lamp (PL) OFF	<ol style="list-style-type: none"> 1. No voltage to unit. 	<ol style="list-style-type: none"> 1. Check voltage at power supply and check for broken power wires.
Power Lamp (PL) ON	<ol style="list-style-type: none"> 1. No cooling or no blower. 	<ol style="list-style-type: none"> 1. Check and/or replace defective selector switch. 2. Check phase indicator light for correct phasing. 3. Check for defective phase monitor.
Unit Locked in Cooling Mode	<ol style="list-style-type: none"> 1. Thermostat incorrectly set. 2. Defective thermostat. 3. Defective compressor contactor CCR. 	<ol style="list-style-type: none"> 1. Check thermostat setting and selector switch mode. 2. Replace thermostat. 3. Replace compressor contactor CCR.
No Cooling	<ol style="list-style-type: none"> 1. Dirty air filter. 2. Check thermostat setting and mode selector switch. 3. Defective power wiring to compressor. 4. Defective compressor contactor CCR. 5. Defective compressor motor 6. Compressor won't start. 7. Compression pressures almost equalized. 8. Condenser motor tripped on overload may have also caused high pressure trip. 	<ol style="list-style-type: none"> 1. Clean or replace air filters in front of evaporator coil. 2. Reset thermostat setting or mode selector switch. 3. Check continuity of power wiring. 4. Replace compressor contactor CCR. 5. Check motor windings for shorts or opens and/or replace compressor if necessary. 6. Internal overload opened up. Wait one hour to see if it resets and starts. 7. Defective compressor valves. Replace compressor. 8. Reset the overload and also check and reset the high pressure switch if required.
High Pressure Trips	<ol style="list-style-type: none"> 1. Condenser air inlet and/or outlets are restricted. 2. High-pressure switch open but doesn't reset. 3. Defective condenser blower motor. 4. Defective condenser blower motor contactor CCR. 5. System is over-charged or has non-condensibles. 6. Condenser blower v-belts loose, slipping, or broken. 	<ol style="list-style-type: none"> 1. Re-locate unit to a place with unobstructed airflow. 2. Replace high-pressure switch. 3. Replace condenser blower motor. 4. Replace defective condenser blower motor contactor CCR. 5. Remove some refrigerant. If the high side pressure doesn't start to drop, recover the refrigerant and re-charge with fresh R-22 to correct system charge. 6. Re-tighten or replace v-belts.

<p>Low Pressure Trips</p>	<ol style="list-style-type: none"> 1. Supply and return air grills in space are restricted. 2. Dirty return air filter. 3. Low-pressure switch open and does not reset. 4. Defective evaporator blower motor 5. Defective evaporator blower motor contactor CEM. 6. System might be under charged check sight glass and perform leak checks. 7. Expansion valve is sticking or binding. 8. Filter drier is dirty or plugged. 9. Evaporator blower v-belts loose, slipping, or broken. 	<ol style="list-style-type: none"> 1. Re-locate objects in front of air grills or re-locate supply and return air grills in space. 2. Clean or replace air filter. 3. Replace low-pressure switch. 4. Replace evaporator blower motor. 5. Replace defective evaporator blower motor contactor CEM. 6. Recover refrigerant, repair leaks, re-leak check, evacuate and re-charge to system operating charge 7. Replace expansion valve. 8. Replace filter drier. 9. Re-tighten or replace v-belts.
<p>No Condenser Blower Operation</p>	<ol style="list-style-type: none"> 1. Tripped Condenser Motor Contactor Overload. 	<ol style="list-style-type: none"> 1. Condenser blower motor moving too much air due to no blower ducting attached. Close off damper slide plate. 2. If access panels are off of unit, replace access panels.



SUBJECT TO CHANGE WITHOUT NOTICE

<p>ALL PROPRIETARY RIGHTS IN THIS PURCHASE ORDER/DRAWING ARE RESERVED. NO PERMISSION IS GRANTED TO REPRODUCE THIS DRAWING IN PART OR IN WHOLE, OR DISCLOSE ANY OF THE INFORMATION UPON IT TO OTHERS WITHOUT WRITTEN PERMISSION FROM UNITED COOLAIR CORP.</p>		<p>REDRAWN & UPDATED</p>	<p>JTP</p>	<p>11/04/13</p>
<p>REV. E</p>	<p>REVISED SHEET 2</p>	<p>JTP</p>	<p>JTP</p>	<p>05/23/11</p>
<p>D</p>	<p>ADDED DETAIL F, DIM 39.9 WAS 38.9</p>	<p>WAG</p>	<p>WAG</p>	<p>03/30/05</p>
<p>C</p>	<p>ADDED DETAIL E, & 9.5 DIM</p>	<p>WAG</p>	<p>WAG</p>	<p>09/29/04</p>
<p>B</p>	<p>ADDED THIS SHEET</p>	<p>WAG</p>	<p>WAG</p>	<p>08/03/04</p>
<p>A</p>	<p>NEW</p>	<p>WAG</p>	<p>WAG</p>	<p>10/15/03</p>
<p>-</p>	<p>DESCRIPTION</p>	<p>BY</p>	<p>ECN#</p>	<p>DATE</p>
<p>REV. E</p>	<p>SHT: 1 OF 1</p>	<p>CA7595</p>	<p>CA7595</p>	<p>REV. LEV. E</p>

UNITED COOLAIR CORP.
YORK, PA. U.S.A.

TITLE: **PACH 2-5**

DWN BY: **WAG** APP. BY: SCALE: **NOT TO SCALE**

DATE: **10/15/03** DATE: DWG. NO: **CA7595** REV. LEV. **E**