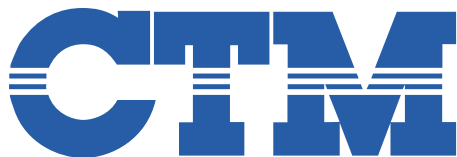


# TRAILER MOUNTED

25-TON PORTABLE AIR CONDITIONING UNIT

INSTALLATION AND OPERATION MANUAL



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## I. GENERAL INFORMATION

**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.

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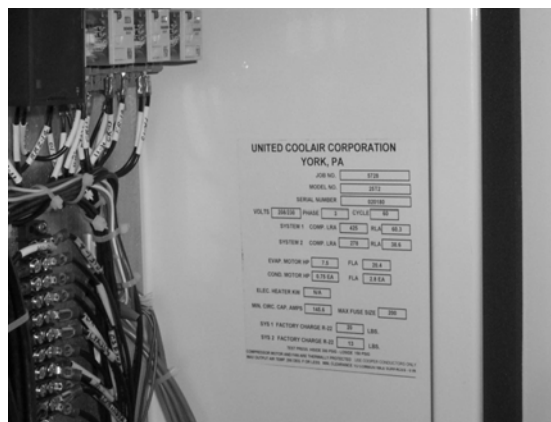
**WARNING:** BODILY INJURY CAN RESULT FROM HIGH VOLTAGE ELECTRICAL COMPONENTS AND FAST MOVING FAN DRIVES. FOR PROTECTION FROM INHERENT HAZARDS DURING INSTALLATION AND SERVICING, THE ELECTRICAL SUPPLY MUST BE DISCONNECTED. IF CHECKS MUST BE PERFORMED WITH THE UNIT OPERATING, IT IS THE RESPONSIBILITY OF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

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**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.

## II. UNIT INSPECTION

Upon receiving the unit, inspect for any damage to the unit structural interior and exterior components that may have happened during transit. Immediately notify the carrier of any damage to the unit. Verify the unit is indeed 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 electrical box section is located behind the control panel hinged access door Figure 2 – Control Panel next page.



**FIGURE 1 – Data Plate**



**Figure 2 – Control Panel**

The power supply must be adequate for all unit power requirements and all accessories. See installation instructions for connections.

Check to ensure the refrigerant charge has not escaped during transit. Access to the Schrader pressure taps can be gained by opening the service access panels to the compressor compartment.

### **III. INSTALLATION**

#### **Location and Clearances**

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

#### **Placing and Rigging**

If the unit is to be lifted into position with a crane, rig the unit using either belts or cable slings. The unit must be rigged using the eyelets located at the top of the unit.

## Pre-Installation Inspection

It is recommended that the following be inspected to insure internal components have not vibrated loose during shipment.

1. Remove the condenser fan guards, and check the condenser fan motor mounting hardware and condenser fan blade set screw for proper tightness.
2. Open the evaporator blower/motor access panel located opposite of the control panel side toward the rear off the trailer. Check the evaporator blower drive motor mounting hardware, pulley, belt, and blower wheel for proper tightness.
3. Close and lock all panels and replace fan guards making certain to tighten all hardware.

## 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 ANSI/NFPA 70 Latest Revision. Refer to the electrical wiring diagram for Main Power connections. Also shown in Figure 3 – Power Connections below.



**Figure 3 – Power Connections**

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

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1. An envelope containing the engineering data sheets and refrigeration and electrical schematics is located in the electrical control box section for reference.
2. Proper phasing of the electrical power wiring is critical for proper rotation of the motors and operation of the compressor. Electrical phase sequence/low voltage

monitors are standard on all three-phase Trailer Mounted A/C units. The following steps insure that electrical phasing is correct prior to initial start-up.

- a. Connect the power cable to the correct power source as verified by the unit's data plate shown in Figure 1.
- b. Turn **ON** the main power to the unit and measure the phase-to-phase voltage at the main power terminal block.
- c. Verify the green pilot lamp (PCL) "Phase Sequence Correct Pilot Light" located on the front of the control panel is illuminated as viewed from the control panel Figure 2.
- d. If the green lamp is not illuminated, turn **OFF** main power and swap any two leads of the three main power wires connected to the main power source.
- e. Turn main power **ON** again. When the green lamp is on, the phase sequence is correct, and the voltages on all three (3) phases are within tolerance.
- f. Turn **OFF** main power at this point and lockout the disconnect switch.

**Note:** Unit will not operate if phase sequence is not correct or the supply voltage is more than 10 % above or below the phase monitor setting.

### Duct Connections

Connect all air ducts to the outlet air adapters.

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**CAUTION:** Do not operate unit without duct(s) attached. If operated without duct(s), the evaporator blower motor will cut out on thermal overload.

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### Condensate Drain

The condensate drain has two options:

1. Drain to the ground. If this is not a desirable option, connect the drain to a suitable drainage point. The drain line must be trapped and filled with water before operation the unit.

or

2. Install a condensate drain pump, to pump condensate to another location. Refer to the Engineering Data Sheet for condensate drain locations.

## Warranty Registration

Complete and return the Warranty Registration Card today so United CoolAir Corporation can activate your warranty and keep you advised on new product or safety related updates.

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You are now ready to operate this system! For additional information or assistance, call toll free (800) 654 – 3857.

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## IV. OPERATION

### Getting Started

1. Connect the Trailer Mounted Air Conditioning unit to the correct power source.
2. Turn **ON** the main power.
3. Verify the green (PCL) Phase Sequence Correct Light is illuminated. If not, follow the procedures under the Installation Instructions.
4. Press the **Reset** pushbutton to reset the unit.

### Fan System Mode

Turn **Selector Switch** (SS1) to the **Fan** position.

### System Cool Mode

Turn the **Selector Switch** (SS1) to the Cool position. If the temperature controller is calling for cooling, **Compressor Stage 1** (C1L) will light up. The compressor (CPR1) for the stage 1 circuit will energize after the anti-short cycling timer, two minute time delay has timed out. At that point, condenser fans 1 and 2 (CF1/CF2) contactors will energize and condenser fans 1 and 2 should start. Condenser fan 2 is operated by (CF2) contactor will cycle on and off to control the head pressure of the circuit. The compressor will cycle to satisfy the desired setting of the Temperature Controller (TC1).

If the desired temperature cannot be satisfied by the first stage circuit, the **Compressor Stage 2** (C2L) pilot light will light up, and the second stage compressor (CPR2) will energize after the anti-short cycling timer, four minute time delay has timed out. At that

point, condenser fan contactors 3 and 4 (CF3/CF4) will energize and condenser fans 3 and 4 should start. Condenser fan 4 is operated by (CF4) which controls the head pressure of refrigeration circuit 2. The compressor and pilot light will cycle to satisfy the desired setting of the **Temperature Controller** (TC1) allowing circuit 1 to continue to operate.

The compressors are controlled by two remote sensors located in the supply and return plenum openings and a thermostat located inside the main control box.

**CAUTION:** Do not set the thermostat lower than 50°F Supply Air Temperature and 70°F Return Air Temperature or low-pressure trips will occur as well as frosting on the coil face.

To stop the unit, turn **Selector Switch** (SS1) to the off position.

## V. REMOTE THERMOSTAT CONTROL - RTC

1. When the remote thermostat is required, insert the plug at the end of the cord into the unit's adapter located in the rear of the unit on the main control box side. See Figure 4 – Remote Thermostat Connection below for location. After the plug has been inserted and properly tightened follow the procedures listed below:
  - a. Press the ON/OFF button show in Figure 5 – Remote Thermostat Control. ON will display in the LCD. To turn off, press the ON/OFF button again and OFF will appear on the LCD.
  - b. Press the (+) or (–) sign and the Digits on the LCD will flash. Press and (+) to increase the temperature setpoint. Press the (–) to decrease the temperature setpoint.



**Figure 4 – Remote Thermostat Connection**



**Figure 5 – Remote Thermostat Control**

- c. Press the SELECT button and adjust the COOL/HEAT setting using the (+,-) to the COOL mode.
- d. Press the SELECT button again and adjust the fan to Continuous Mode using the (+,-). Using continuous fan mode will allow for more accurate readings at the temperature sensor.
- e. Return – in this position, the Return air temperature sensor controls the thermostat. This setting should be used when the unit is set up for a return air application. This is when ductwork is mounted to the return duct plenum.

### **Alarm Pilot Light**

Your control panel is equipped with two alarm pilot lights, which are intended to alarm the operator that an abnormal situation has occurred within the system. When an abnormal situation has been detected, appropriate actions should be taken to ensure the safety of the operators and equipment. Once the abnormal situation has been remedied, pressing the Alarm Reset push button located on the control panel should reset the trouble alarms.

**Stage 1 Failure** This pilot light indicates that the first stage cooling circuit has failed. In the event of a Stage 1 Failure, the Stage 1 pilot light (CS1F) will illuminate and CPR1 is locked out. Compressor system 1 will not re-energize until the problem has been fixed, and the **Alarm Reset** button has been pressed.

**Stage 2 Failure** This pilot light indicates that the second stage cooling circuit has failed. In the event of a Stage 2 Failure, the Stage 2 pilot light (CS2F) will illuminate and CPR2 is locked out. Compressor system 2 will not re-energize until the problem has been fixed, and the **Alarm Reset** button has been pressed.

## **VI. ROUTINE MAINTENANCE**

To keep the Trailer Mounted Air Conditioner operating safely and efficiently, it is recommended that a qualified serviceman 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 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, an air jet 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 allowing the water to drain into the pans in the compressor section.

## MOTOR AND DRIVE COMPONENTS

Lubricate the bearings with high quality lithium grease while hand turning the shaft using the pulleys. It is preferable to add grease while rotating the shaft to ensure that grease forces the air pockets from the bearing and to allow a good grease seal the entire volume of the bearing. Grease should be added until it exudes through the bearing seals. When enough grease is added, beads will form at the seals. Wipe excess grease from the faces of the bearing with a rag.

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**CAUTION:** Over lubricating will cause the bearing to overheat and could cause the grease seal to blow out.

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Both excessive and inadequate grease may cause premature failure. Provided there is some grease in the bearings for lubrication, under lubrication is better than over lubrication as grease can easily be added but not removed. Always allow a slight bead around the circumference of the seals to protect the bearing from foreign matter and helps flush out the bearing as well.

### Frequency of Lubrication

Frequency of Lubrication depends on operating conditions. The following chart gives the frequency of lubrication based upon operational duty and should be used as a guide for determining when bearings should be lubricated.

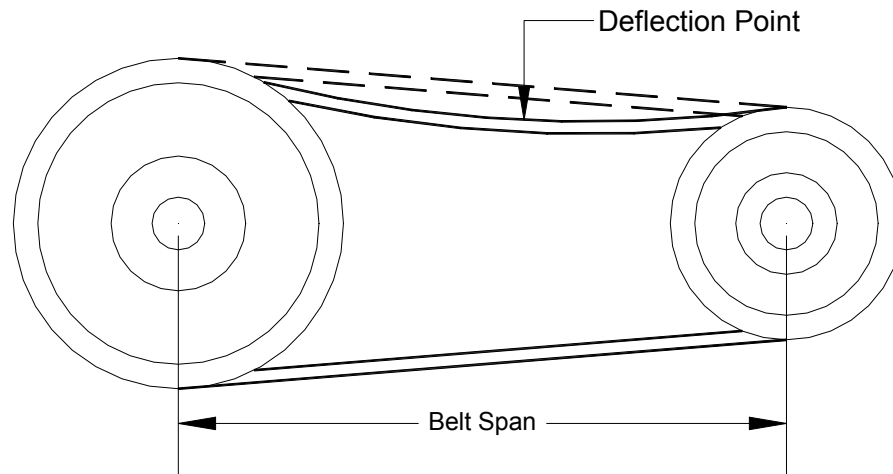
Duty	Grease Interval
Low Usage	12 months
Periodic	6 months
Continuous	1-2 months

### 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, slippage may occur causing loss of blower speed and belt failure. The belts will glaze then crack or even break due to increased temperatures caused by slippage. Belts may slip during start-up, but slipping should stop as soon as the fan reaches full speed. For proper tensioning, an excellent method to use is listed in the equation below. Belt span is in inches.

$$\text{Deflection} = \frac{\text{Belt Span}}{64}$$

Check 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.

# SERVICE INFORMATION

## 25-Ton Trailer Mounted Mobile Air Conditioner

**RATINGS**

BTUH Cooling (@ 95°F ambient) ..... 299,000  
 Indoor Air Flow (@ 1.25 E.S.P.).....9,375CFM

**POWER CONNS.-V/Ph/Hz**..... 208-230/3/60  
 Min. Branch Circuit Ampacity ..... 124  
 Fuse Size-Max. (Amps) ..... 150

**COMPRESSORS** ..... Scroll  
 No. Used ..... 2  
 Volts/Ph/Hz ..... 208-230/3/60  
 R.L. Amps (1<sup>st</sup> Stage) ..... 56.8  
 R.L. Amps (2<sup>nd</sup> Stage) ..... 39.4  
 L.R. Amps (1<sup>st</sup> Stage) ..... 425  
 L.R. Amps (2<sup>nd</sup> Stage) ..... 278  
 System 1 ..... 15 Tons  
 System 2 ..... 10 Tons

**OUTDOOR COIL-TYPE** ..... Plate Fin  
 Rows/F.P.I. (1<sup>st</sup> & 2<sup>nd</sup> Stages) ..... 2/11  
 Face Area (1<sup>st</sup> stage) ..... 20.4  
 Face Area (2<sup>nd</sup> stage) ..... 14.0  
 Tube Size (In.) ..... 0.375

**INDOOR COIL-TYPE (INTERLACED CIRCUIITS)** ..... Plate Fins  
 Rows/F.P.I. (1<sup>st</sup> Stage) ..... 4/10  
 Rows/F.P.I. (2<sup>nd</sup> Stage) ..... 4/9  
 Face Area (Sq. Ft.) (1<sup>st</sup> Stage) ..... 9.4  
 Face Area (Sq. Ft.) (2<sup>nd</sup> Stage) ..... 7.1  
 Tube Size (In.) (1<sup>st</sup> Stage) ..... 0.375  
 Tube Size (In.) (2<sup>nd</sup> Stage) ..... 0.5  
 Refrigerant Control ..... T.E.V.  
 Drain Connection ..... 1" FPT

**OUTDOOR FAN-TYPE** ..... Propeller  
 No. Used/Diameter ..... 4/22  
 Type Drive/No. Speeds ..... Direct  
 No. Motors – Hp ..... 4/0.8  
 Motor Speed R.P.M. .... 1140  
 Volts/Ph/Hz ..... 208-230/3/60  
 F.L. Amps ..... 2.8

**OUTDOOR FAN-TYPE** ..... F.C. Centrifugal  
 No. Used/Diameter ..... 13.2  
 Type Drive/No. Speeds ..... 1 Dual Blower  
 No. Motors – Hp ..... 7.5  
 Drive/Speed (R.P.M.) ..... Belt/1750  
 Volts/Ph/Hz ..... 208-230/3/60  
 F.L. Amps ..... 20.4

**FILTERS** ..... Furnished  
 Type Recommended ..... Disposable  
 No. – Filter Size ..... 2 – 4x24x24  
 No. – Filter Size ..... 2 – 4x20x24  
 No. – Filter Size ..... 2 – 4x18x24

**REFRIGERANT CHARGE** ..... (lb. of R-22)  
 Circuit 1 ..... 22.5  
 Circuit 2 ..... 13.0  
 Suction Pressure ..... 60-75 PSIG  
 Discharge Pressure ..... 175-300 PSIG  
 \*Superheat ..... 15-20°F  
 \*Sub Cooling ..... 5-10°F  
 Low Pressure Cutout ..... 25 PSIG  
 High Pressure Cutout ..... 425 PSIG

**WEIGHT** ..... Approximate  
 Net ..... 6,000 lbs.

\*Readings are dependant upon ambient conditions; numbers listed are approximate.

<b>WARNING: HIGH VOLTAGE – DISCONNECT POWER BEFORE SERVICING</b>	
<p><b>DISCONNECT POWER</b>                  Failure to disconnect power before servicing could lead to severe personal injury or death.</p>	<p><b>RE-CONNECT ALL GROUNDS</b>                  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.</p>

# Parts List

## 25-Ton Spot Cooler Trailer

Component	Description	Qty.	United CoolAir P/N
Pleated Air Filters	Evaporator Coil	3	8CA1053
Belts	Evaporator Motor	2	11CA1011-3
Compressor	15 Ton Scroll	1	2CAB12004
	10 Ton Scroll	1	2CAB12001
Motor	Condenser ¾" HP	4	3CA1031-4
	Evaporator 7.5 HP	1	3CA1037-5
Contactor	15 Ton Compressor	1	4CA1009-2
	10 Ton Compressor	1	4CA1004-1
	Fan Motors	5	4CA1002-1
Switch	Phase Monitor	1	4CA1219
	Disconnect	1	4CA1724
	Toggle	1	19CA1001-1
	High Pressure Cutout	2	4CA1247
	Low Pressure Cutout	2	4CA1248
	Fan Cycling	2	4CA1246
	Selector	1	19CA1080
Pushbutton	1	19CA1079	
Electrical	Transformer (250 VA) 24 Sec.	1	4CA1109-2
	Transformer (250 VA) 120 Sec.	1	4CA1102-1
	Delay Timer	3	4CA1212
Fan Blade	Propeller 10 Ton Circuit	2	5CA6004
	Propeller 15 Ton Circuit	2	5CA6005
Blower Wheel	Evaporator Coil	2	5CA3005
Pilot Light	Amber	2	19CA1078
	Green	2	19CA1076
	Red	1	19CA1077
Control	Ranco Temperature Control	1	18CA1071
Temperature Sensor	Temperature Sensor	1	18CA1072-A
Fuse	Bussman FNQR1.5 or KLDR1.5	4	4CA1111
	Bussman FNQR2.5	1	4CA1112
	Bussman FNQ10	1	4CA1879
Valve	Expansion 10-Ton	1	6CA1025
	Expansion 12-Ton	1	6CA1026
Display	Temperature	2	18CA1073
Motor Overloads	Condenser Fans	4	4CA1041-1
	Evaporator Fan	1	4CA1042-2
Receptacle	115 Vac Convenience Outlet	1	4CA1249
Thermostat	Remote T-Stat	1	18CA1003