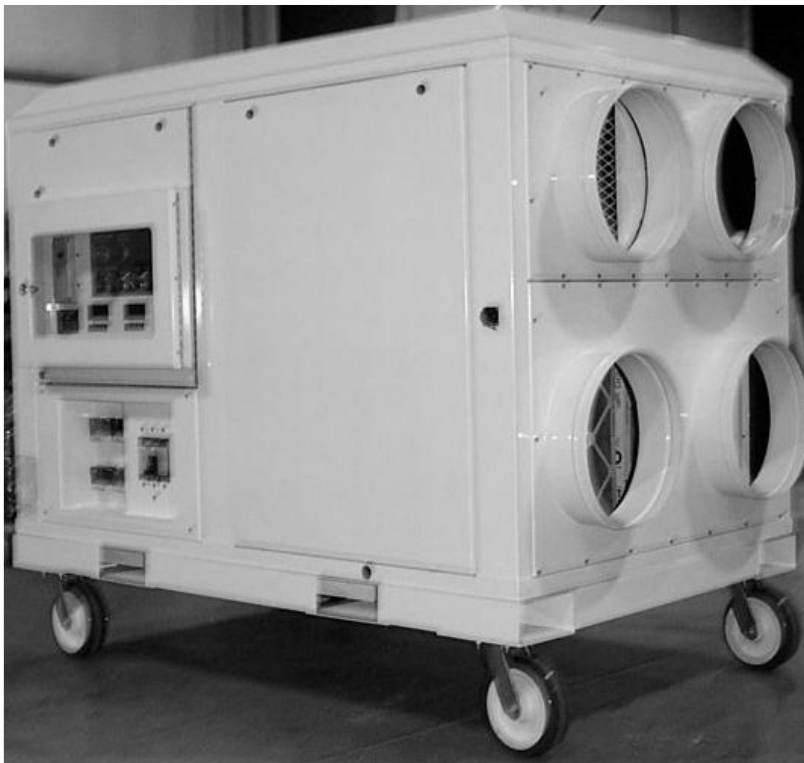


TRAILER MOUNTED

12-TON PORTABLE AIR CONDITIONING UNIT

INSTALLATION AND OPERATION MANUAL



CTM - Cooling Tower Maintenance Inc.
Phone: 1 (800) 311.1200

Website: www.coolingtowerinc.com Email: info@coolingtowerinc.com

TABLE OF CONTENTS

CONTENTS	PAGE NO.
I. GENERAL INFORMATION	3
II. UNIT INSPECTION	3
III. UNIT SETUP	4
IV. OPERATION	7
V. REMOTE THERMOSTAT CONTROL	8
VI. ROUTINE MAINTENANCE	9
SERVICE INFORMATION	14
PARTS LIST	15
DRAWINGS AND SCHEMATICS	
Electrical Schematic 208 Volt Units	CA6325
Electrical Schematic 460 Volt Units	CA6254A
Dimensional Data Standard Discharge	CA6173-1
Dimensional Data Condenser Duct Connection	CA6173-2
Refrigeration Schematic	CA6516
APPENDIX	
A. RANCO programmable Thermostat Manual	

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.

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.

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.

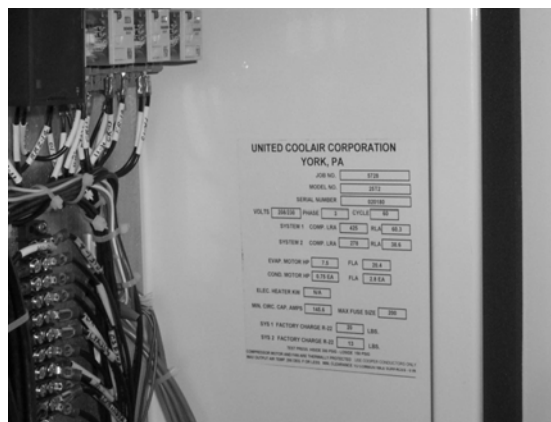


FIGURE 1 – Data Plate



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. See Figure 3 below.



Figure 3 – 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

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

Caution: Do not attempt to lift this unit using a Crane.

Pre-Installation Inspection

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

1. Open the condenser blower/motor access panel located to the right of the compressor compartment. Check the condenser blower drive motor mounting hardware, pulley, belt, blower shaft and bearing, 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 drive motor mounting hardware, pulley, belt, blower shaft and bearing, 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 ANSI/NFPA 70 Latest Revision. Refer to the electrical wiring diagram for Main Power connections also shown in Figure 4 – Camlock Power Connections which are located directly below the control panel.



Figure 4 – 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.
2. 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 12 Ton Spot Cooler 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 "Phase Correct 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.

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. These units will not operate if phase sequence is not correct.

Duct Connections

Connect all air ducts to the outlet air adapters.

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

There is an optional condenser air intake plenum available for these units. For additional information please contact your local representative at (800) 654 – 3857.

Condensate Drain

There are condensate drains on both sides of the unit. There are two drain connection 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 Dimesional 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.

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

IV. OPERATION

Getting Started

1. Connect the 12 Ton Portable Spot Cooler Air Conditioning unit to the correct power source.
2. Turn **ON** the main power.
3. Verify the green Phase 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 (S3) to the **Fan** position.

System Cool Mode

Turn the Selector Switch (S3) to the Cool position. If the Ranco temperature controller is calling for cooling, the compressor contactor (CCR) will energize the Compressor (CR) the amber cool light will illuminate. When the compressor energizes, condenser fan contactor (CCM) will energize and condenser fan motor (MC) will start.

Sensors located in the supply and return plenum openings and a thermostat located inside the main control box controls the cycling of the compressor system. Only the Supply air sensor setting or the Return air sensor setting is used to control the On/Off cycling of the Compressor. Use the toggle switch marked Temperature Control located on the Control Panel to select the Supply or Return Air method of controlling.

To stop the unit, turn Selector Switch (S3) to the off position.

There is a manual damper provided to adjust the External Static Pressure on the condenser air flow during higher ambient conditions. This will allow the air to flow at a higher velocity across the condenser coil that in turn will reduce the head pressure of the system.

Alarm Pilot Light

Your control panel is equipped with an alarm pilot light, which is intended to alarm the operator that a high or low refrigerant pressure condition has occurred within the system. When an abnormal situation has been detected, appropriate actions must be taken to ensure the safety of the operators and equipment. Once the reason for failure has been corrected, pressing the Reset push button located on the control panel should reset the alarm condition. The compressor system will when the Reset button is pressed but repeated alarms will occur until the problem has been located and corrected. If these conditions occur, have a qualified technician service the system as soon as possible.

V. REMOTE THERMOSTAT CONTROL – RTC (Option)

These units are pre-wired for this specific option. If remote thermostat control is desired, contact your representatives at (800) 654 – 3857.

1. When the remote thermostat is desired, insert the plug at the end of the cord into the unit's adapter located on the control panel side of the unit at the evaporator sections corner post. 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.

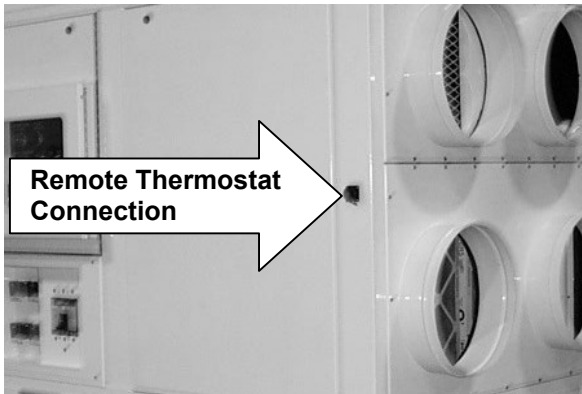


Figure 4 – Remote Thermostat Connection



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.

VI. ROUTINE MAINTENANCE

To keep the Portable 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 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

Grease fittings are provided directly on the pillow block bearings for both the evaporator blower assembly and the condenser blower assembly. See Figure 6 for Evaporator Blower grease fittings. One side of the condenser blower is directly behind the control panel. In this case, a tube is attached to the grease fitting on the pillow block bearing and extends to a grease fitting mounted on the framework of the blower in the condenser section allowing easier access. See Figure 7 for Condenser Blower grease fittings.

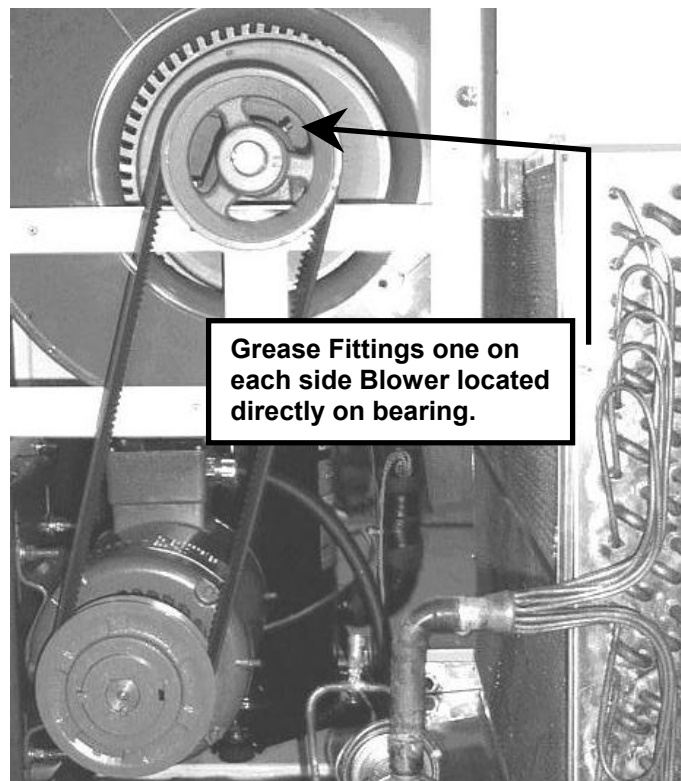


Figure 6 – Evaporator Blower

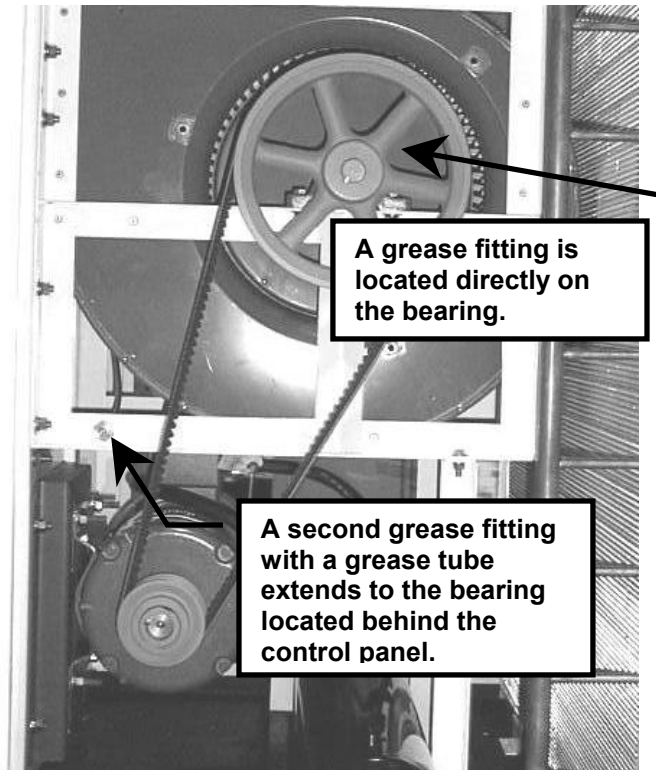


Figure 7 – Condenser Blower

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.

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

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 8 – Belt Tensioning below.

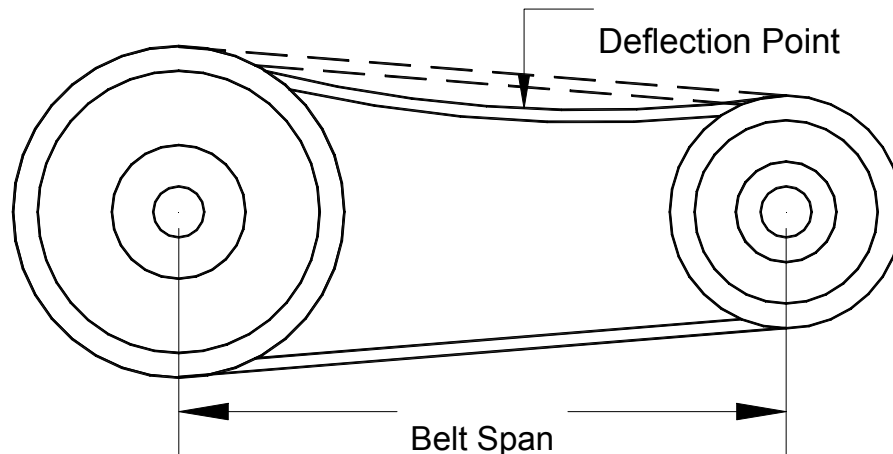


Figure 8 – Belt Tensioning

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 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.

SERVICE INFORMATION

12-Ton Portable Air Conditioner

RATINGS

95°F Ambient
 Entering Air - 80°F Drybulb / 67°F Wet Bulb
 Total 144,000 Btuh
 Sensible 104,000 Btuh

ELECTRICAL - V/Ph/Hz 208-230/3/60
 Full Load Amps 74
 Minimum Circuit Ampacity 91.2
 Max. Fuse Size (Amps) 140

ELECTRICAL - V/Ph/Hz 460/3/60
 Full Load Amps 35.6
 Minimum Circuit Ampacity 40.5
 Max. Fuse Size (Amps) 65

COMPRESSOR Scroll System
 System 12 Tons
 Energy Efficiency Ratio (ARI Standard) 11.4

Volts/Ph/Hz 208-230/3/60
 R.L. Amps 47.1
 L.R. Amps 245

Volts/Ph/Hz 460/3/60
 R.L. Amps 19.6
 L.R. Amps 125

CONDENSER COIL Plate Fin
 Rows/F.P.I. 4/14
 Face Area 9.25
 Tube Size (In.) 0.375

EVAPORATOR COIL Plate Fins
 Rows/F.P.I. 4/10
 Face Area (Sq. Ft.) 6.0

Tube Size (In.) 0.375
 Refrigerant Control T.E.V.
 Drain Connection 1" FPT

CONDENSER BLOWER F.C. Centrifugal
 Diameter 15 x 9
 Drive/Speed (R.P.M.) Belt/1750
 Motor Hp 7.5
 Air Flow @ 1.5 E.S.P. 6000 CFM
 Volts/Ph/Hz 208-230/460/3/60
 F.L. Amps 18/9

EVAPORATOR BLOWER F.C. Centrifugal
 Diameter 10 x 8
 Motor HP 5
 Drive/Speed (R.P.M.) Belt/1750
 Air Flow @ 1.0 E.S.P. 4,800CFM
 Volts/Ph/Hz 208-230/460/3/60
 F.L. Amps 14/7

FILTERS Disposable
 No. – Filter Size 2 – 24x20x2

REFRIGERANT CIRCUIT R-22
 Charge 32 lbs. 8 oz.
 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 1200 lbs.

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

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

Parts List

12-Ton Portable Spot Cooler

Component	Description	Qty.	United CoolAir P/N
Air Filters - Pleated	Evaporator Coil	2	8CA1002
Absorber - Vibration	Discharge Line	1	063W116
	Suction Line	1	063W111
Bearings	Pillow Block	4	11CA1405
Belts	Condenser Motor	2	11CA1015
	Evaporator Motor	1	11CA1008-9
Blower Assembly	Condenser	1	5CA1002
	Evaporator	1	5CA1001
Circuit Breaker	Main Power Disconnect	1	4CA1713
	Transformer Secondary	1	4CA1723
Compressor	12 Ton Scroll	1	2CAB12003-5
Compressor Mounting	Spector Mounting Kit	1	2CA1001-2
Control	Ranco Temperature Control	1	18CA1071
Contactor / Starters	Compressor	1	4CA1009-1
	Condenser Blower Motor	1	4CA1026-1
	Evaporator Blower Motor	1	4CA1002-1
Coil	Condenser	1	025W134
	Evaporator	1	025W135
Filter Drier / Sight Glass Combo	Liquid Line Filter & Sight Glass	1	6CA1033-1
Motor	Condenser 7.5 HP	1	3CA1037-6
	Evaporator 5 HP	1	3CA1036-2
Mist Eliminator	Evaporator Moisture Blowoff	2	8CA1136
Overload	Condenser Motor Starter	3	4CA1017
Phase Relay	208-230 Volt Units	1	4CA1219
	460 Volt Units	1	4CA1218
	Phase Relay Base	1	4CA1217
Pilot Light	Amber	2	19CA1078
	Green	2	19CA1077
	Red	1	19CA1076
Pulley	Condenser Motor	1	11CA1304
	Condenser Blower	1	11CA1213
	Evaporator Motor	1	11CA1303-3
	Evaporator Blower	1	11CA1200-1
Receiver	Liquid Receiver	1	6CA1084
Relay	Lockout	1	4CA1204
	Slave (R3) see wiring diagram	1	4CA1244-1
Shaft	Evaporator & Condenser Blower	2	5CA7003
Switch	High Pressure Cutout	1	4CA1203
	Low Pressure Cutout	1	4CA1202
	Reset Push Button	1	19CA1079
	Selector	1	19CA1080
Temperature Sensor	Temperature Sensor	1	18CA1072-A
Transformer	208-230/460 Pri. – 24 Sec.	1	4CA1105
Valve	Hot Gas Bypass	1	6CA1051
	Expansion 12-Ton TXV	1	6CA1027-1
	Head Pressure Control	1	6CA1052
Display	Temperature	2	18CA1073
Receptacle	Remote T-Stat	1	4CA3000
Thermostat	Temperature Control	1	18CA1072
Timer	Delay – Anti Cycle	1	4CA1212
	Bypass (Low Pressure)	1	4CA1211
Wheel	Wheel (Caster w / Brake)	4	70CA1599