



Koldwave 5AK Series Installation, Operation, & Maintenance Manual

ATTENTION: READ THIS MANUAL, FACTORY INSTALLED OPTIONS MANUAL, UNIT SUBMITTAL DATA SHEETS AND ALL LABELS ATTACHED TO THE UNIT CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THESE UNITS. CHECK DATA PLATES FOR ELECTRICAL SPECIFICATIONS AND MAKE CERTAIN THAT THESE AGREE WITH THOSE AT THE POINT OF INSTALLATION. RECORD THE UNIT MODEL AND SERIAL NUMBER IN THE SPACE PROVIDED. RETAIN THIS DOCUMENT FOR FUTURE REFERENCE.

Model No. _____ Serial No. _____

IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. THIS APPLIANCE MUST BE INSTALLED BY A LICENSED CONTRACTOR OR QUALIFIED SERVICE PERSONNEL. READ THESE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THE UNIT.

WARNING: INSTALL, OPERATE AND MAINTAIN UNIT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS TO AVOID ANY DETURING FACTORS THAT MAY CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

INSTALLER'S RESPONSIBILITY: THIS EQUIPMENT HAS BEEN RUN TESTED AND INSPECTED THOROUGHLY. IT HAS BEEN SHIPPED FREE FROM DEFECTS FROM OUR FACTORY. HOWEVER, DURING SHIPMENT AND INSTALLATION, PROBLEMS SUCH AS LOOSE WIRES, LEAKS, OR LOOSE FASTENERS MAY OCCUR. IT IS THE INSTALLER'S RESPONSIBILITY TO INSPECT AND CORRECT ANY PROBLEMS THAT MAY BE FOUND.

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General Information

The Koldwave 5AK Series Air Conditioners are portable, air-cooled air conditioners/zone coolers suitable for indoor/outdoor use. The Koldwave air-conditioner cools an entire area by discharging air through its supply grille. This self-contained unit is also designed to direct cool air to specific areas or objects through (optional) flexible snozzles[®]. This provides precision cooling for heat-sensitive equipment, production processes and personnel.

Each unit is completely self-contained with the entire refrigeration system, electrical components, condenser and evaporator housed in one cabinet. The Koldwave unit is provided with heavy-duty casters. Two swivel-locking casters prevent sliding; two stationary casters provide handling ease for relocation.



Model 5AK30

NOMENCLATURE

Example	5AK	14	B	G	A	1	A	A	A0
Code	MD	US	R	V	C	SS	EC	CC	O
Field	1,2,3	4,5	6	7	8	9	10	11	12,13

1,2,3 – MODEL (MD)

5AK – Air Cooled Portable
5WK - Water Cooled Portable

4,5 – UNIT SIZE (US)

AK – Air Cooled Models
14 – 11,000 Btuh
18 – 18,300 Btuh
30 – 28,100 Btuh
39 – 36,800 Btuh
65 – 61,200 Btuh
WK - Water Cooled Portable
07 – 6,300 Btuh
14 – 10,800 Btuh
18 – 16,100 Btuh
23 – 23,000 Btuh
26 – 23,000 Btuh
36 – 34,700 Btuh

6 - REFRIGERANT (R)

A – R22
B – R410A

7 – VOLTAGE (V)

A – 208/3/60 (used only on 5AK65)
B – 230/3/60 (used only on 5AK65)
C – 460/3/60 (used only on 5AK65)
D – 575/3/60 (not used at this time)
E – 120/1/60
F – 208/1/60
G – 230/1/60
H – 100/1/50 (not used at this time)
J – 220/1/50 (not used at this time)

8 – CONFIGURATION (C)

A – Front Discharge with Adjustable Grilles

9 CONFIGURATION (SS)

1 – Stainless Steel
2 – Painted (5AK65 only)

10 – EVAPORATOR COIL (EC)

A – Standard Copper/Aluminum
E – Electrofin Coated

11 – CONDENSER COIL (CC)

A – Standard Copper/Aluminum
E – Electrofin Coated (Air Cooled Only)
N – Cupro-Nickel

12,13 – OPTIONS (O) WK Only

A0 – Standard Cooling
AP – Standard Cooling with High Lift Condensate Pump
AT – Standard Cooling for Cooling Tower Application (no water valve)
AV – Standard Cooling for Cooling Tower Application with High Lift Condensate Pump (no water valve)
H0 – Heat Pump
HP – Heat Pump with High Lift Condensate Pump
HT – Heat Pump for Cooling Tower Application (no water valve)

Installation Instructions

IMPORTANT: Following the installation and preventative maintenance instructions can extend the length of service you receive from your Koldwave unit.

Electrical Requirements







Check the power supply to make certain it is within 10% of the voltage listed on the data plate located on the back of the unit.

Operating the unit on improper voltage will void the product warranty.

Refer to the Rating Plate for voltage and current information.

Each unit should have a dedicated circuit breaker.

Service Cord

	15 A 125V NEMA 5 - 15P	NEMA 5-15R
	15 A 250V NEMA 6 - 15P	NEMA 6-15R
	20 A 125V NEMA 5 - 20P	NEMA 5-20R
	20 A 250V NEMA 6 - 20P	NEMA 6-20R
	30 A 250V NEMA 6 - 30P	NEMA 6-30R
	50 A 250V NEMA 6 - 50P	NEMA 6-50R

C-000705A

PLUG TYPES

MODEL	VOLTAGE	PLUG TYPE
5AK14	120/1/60	5 – 15P
5AK18	208-230/1/60	6 – 15P
5AK30	208-230/1/60	6 – 30P
5AK39	208-230/1/60	6 – 30P
5AK65	240/1/60	Field wired
	240/3/60	
	460/3/60	

Koldwave 5AK14 & 18 units are equipped with LCDI device service cords. The service cords employed have plug configurations and receptacle requirements as shown in the chart above. **Modifications to the cord will void the product warranty.**

Extension cords used with the Koldwave units should match the plug configuration of the service cord provided on the unit. The extension cord must be equipped with an equipment grounding conductor, a grounding type attachment plug, and a grounding type attachment connector. The cord must also have a rating suitable for the voltage and ampacity.

The Koldwave 5AK65 is a field wired unit which requires a field supplied electrical service disconnect. Check the unit nameplate for the correct voltage, phase and maximum fuse size for the electrical service for the unit. A high voltage terminal block is provided in the unit's control box for the electrical connection. Route the electrical power leads through the electrical knockouts provided on either side of the control box. Install the required electrical service wiring in accordance with all applicable codes.

Specification and Electric Data

	<u>14</u>	<u>18</u>	<u>30</u>
ELECTRIC DATA	***	***	***
Voltage/Phase/Hertz	115/1/60	208-230/1/60	208-230/1/60
Amperage	12.8	10.6	19.68
Fuse Size (Amps)	15	15	30
Watts	1389	2465	3910
REFRIGERANT CHARGE			
R410A (Ounces)	36	50	79
UNIT DIMENSIONS (INCHES)			
Height with Casters	49	49	53
Height without Casters	44	44	40
Width	22.25	22.25	22.25
Depth	33.5	33.5	33.5
Evaporator Filter (qty)	(1) 13 x 16.5 x 0.5	(1) 13 x 16.5 x 0.5	(1) 16.5 x 17.25 x 0.5
Condenser Filter (qty)	(1) 23.25 x 17.38 x 0.5	(1) 23.25 x 17.38 x 0.5	(1) 17.38 x 20 x 0.5
NET UNIT WEIGHT (LBS.)	216	220	303
SHIPPING WEIGHT (LBS.)	242	246	335

	<u>39</u>	<u>65</u>		
ELECTRIC DATA	***	###	***	###
Voltage/Phase/Hertz	230/1/60	230/1/60	230/3/60	460/3/60
Amperage	22.7	49.7	26.1	15.4
Fuse Size (Amps)	30	60	40	30
Watts	4666		8380	
REFRIGERANT CHARGE				
R410A (Ounces)	116		176	
UNIT DIMENSIONS (INCHES)				
Height with Casters	64		78	
Height without Casters	69		73	
Width	40.5		40.25	
Depth	31.5		30.56	
Evaporator Filter (qty)	(1) 13.75 x 29.75 x 0.88		(1) 29.75 x 17.75 x 0.88	
Condenser Filter (qty)	(1) 23 x 29.5 x 0.88		(1) 29.5 x 29 x 0.88	
NET UNIT WEIGHT (LBS.)	590		650	
SHIPPING WEIGHT (LBS.)	620		830	

Time delay fuses and circuit breakers are recommended.

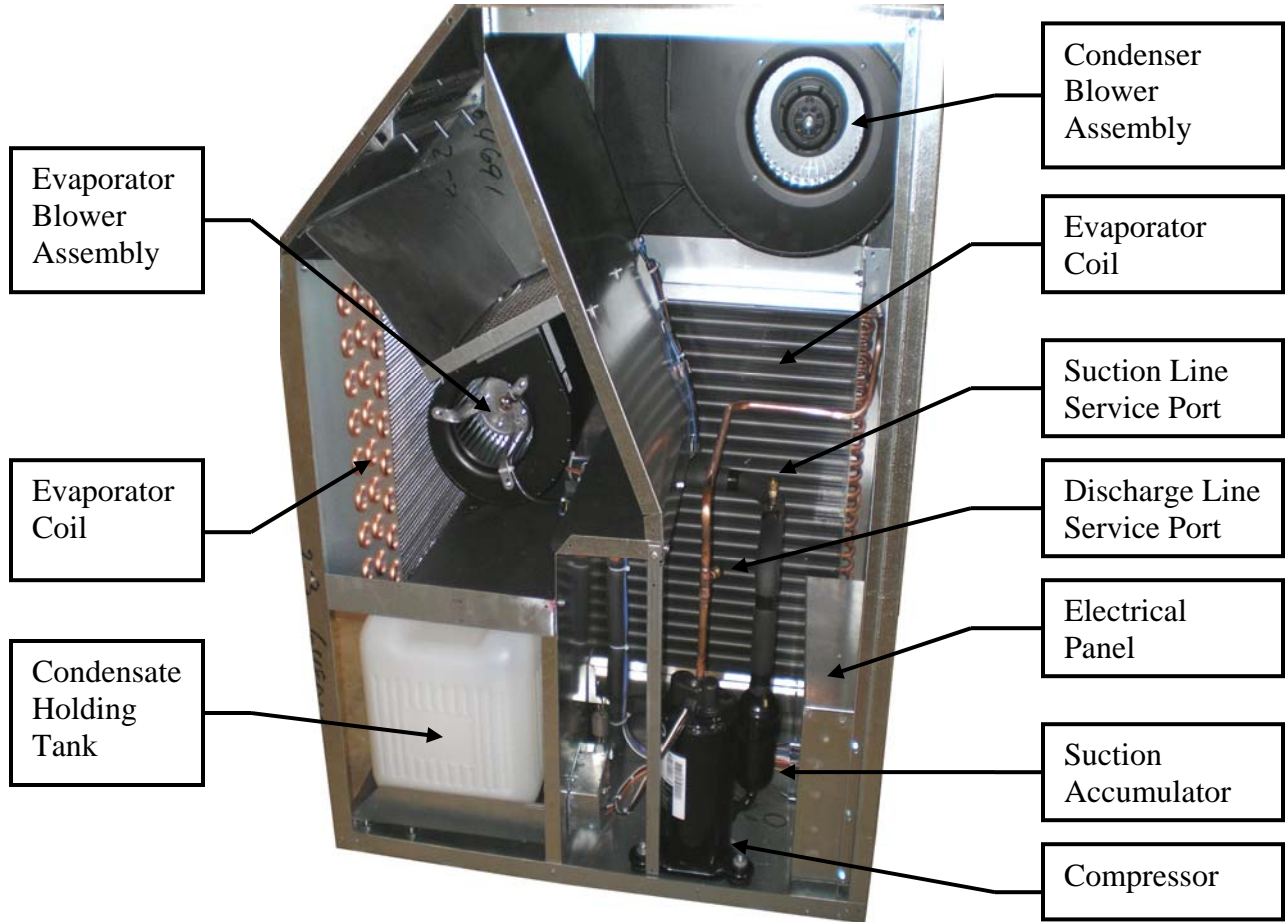
*** Electrical ratings per U.L Standard 484 at 95°F DB/75° WB on high speed at 115VAC or 230VAC single phase except 5AK65 at 230VAC three phase.

Electrical ratings estimated from component nameplate ratings on high speed.

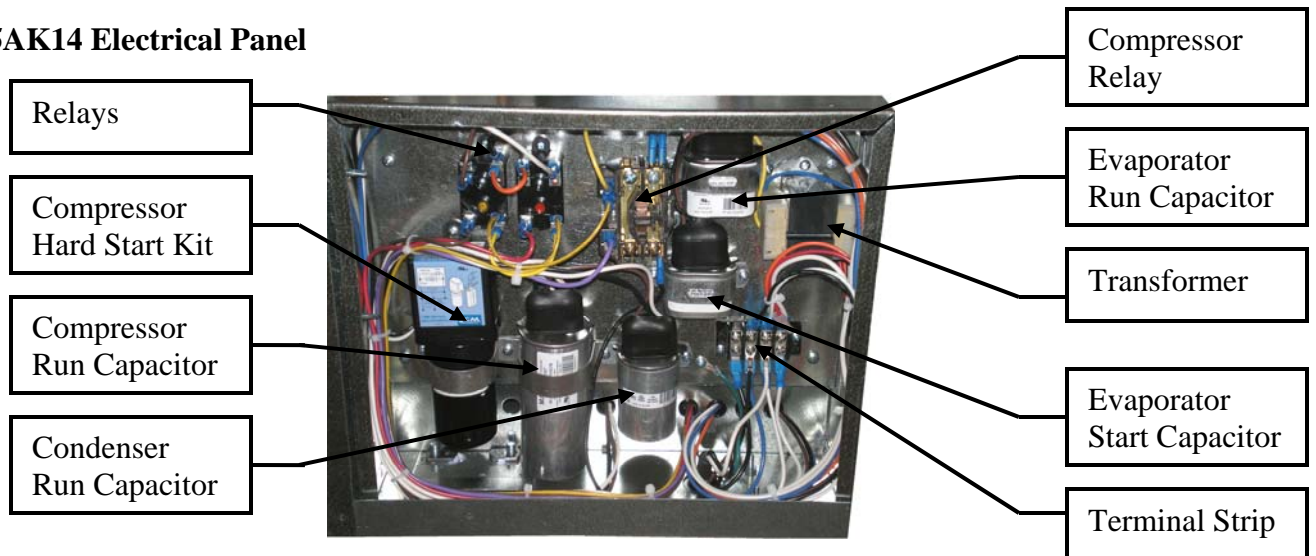
Serviceability

The Koldwave unit has removable panels to provide full service accessibility.

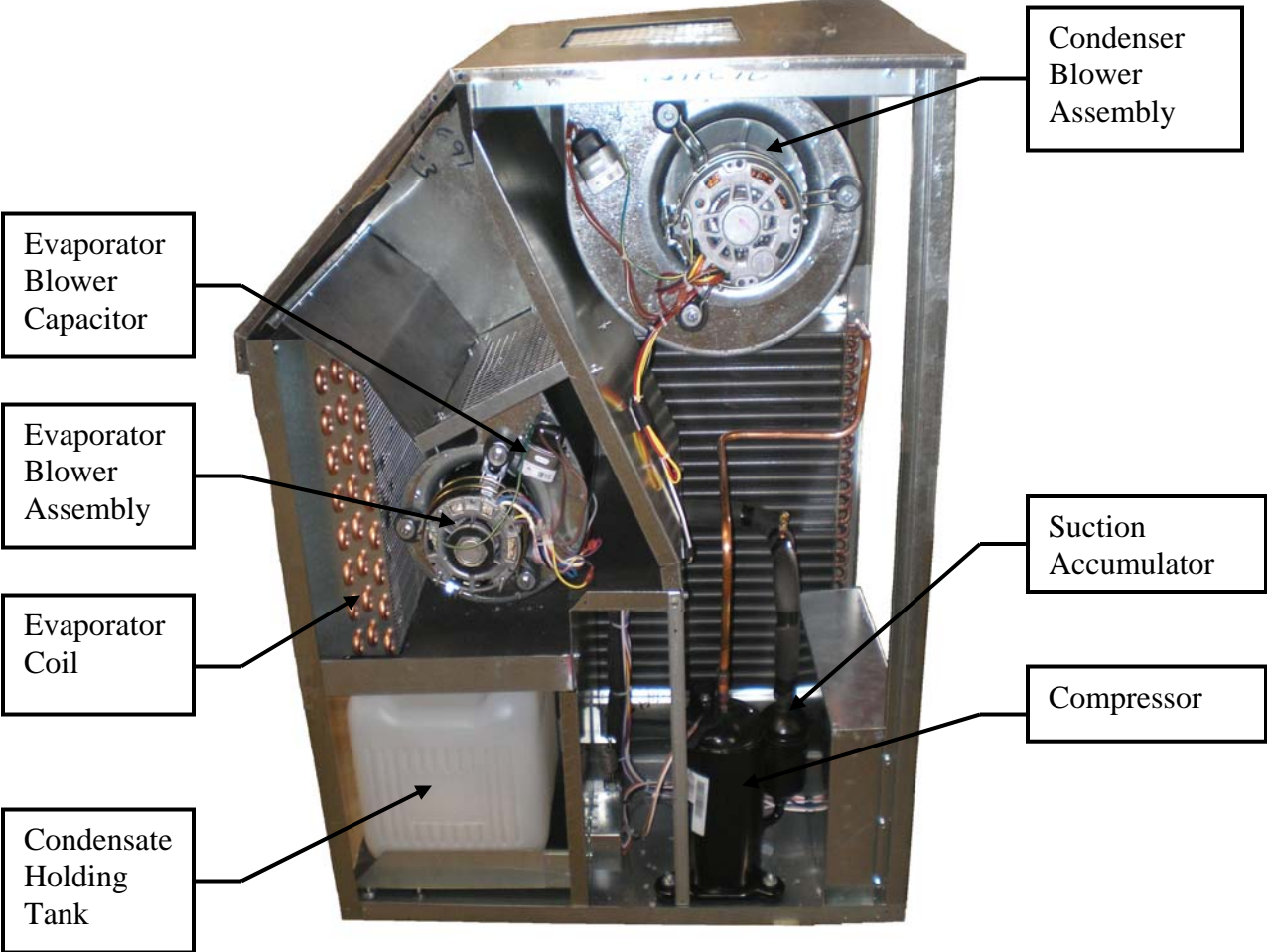
5AK14 Right Side View



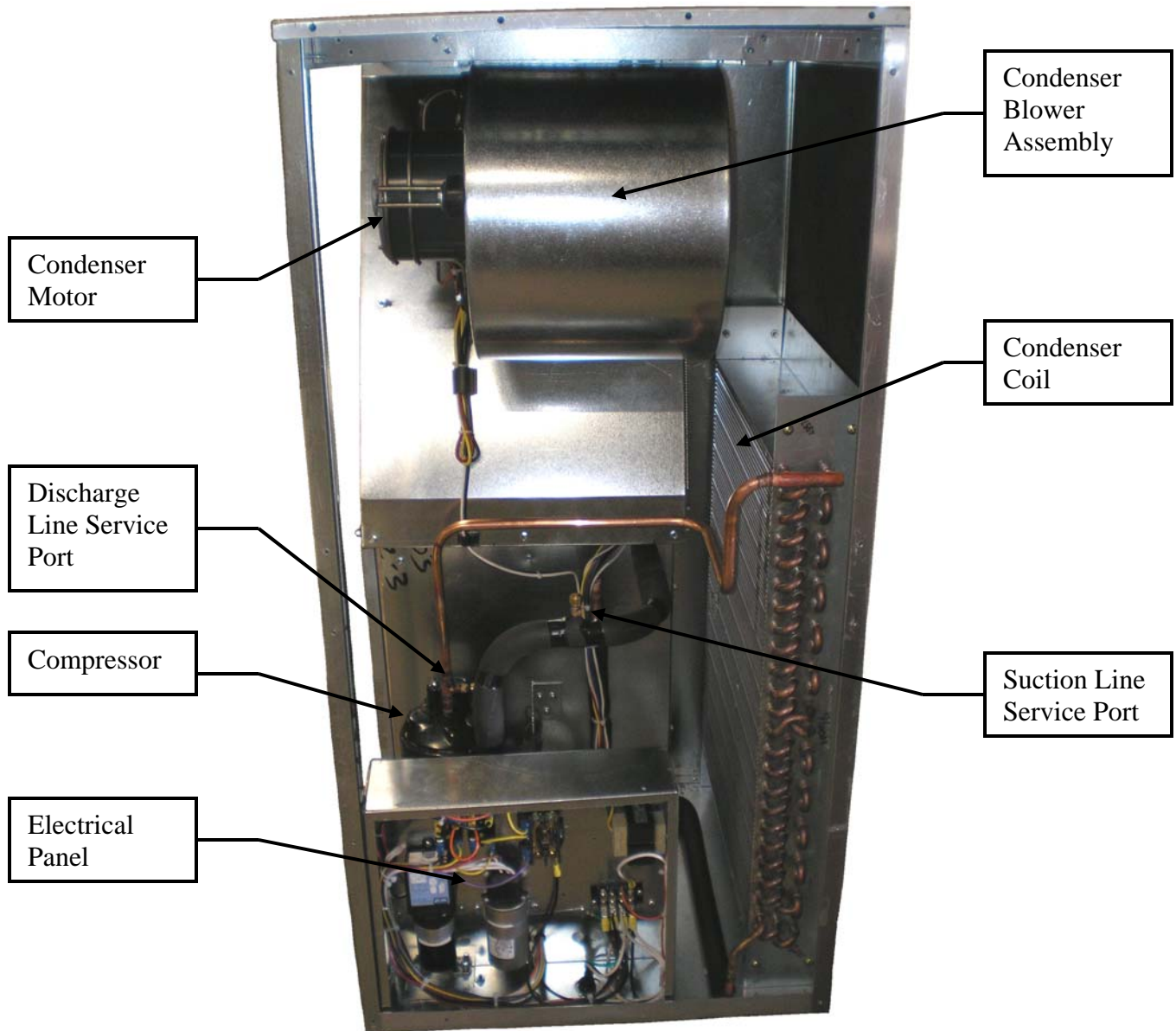
5AK14 Electrical Panel



5AK18 Right Side View



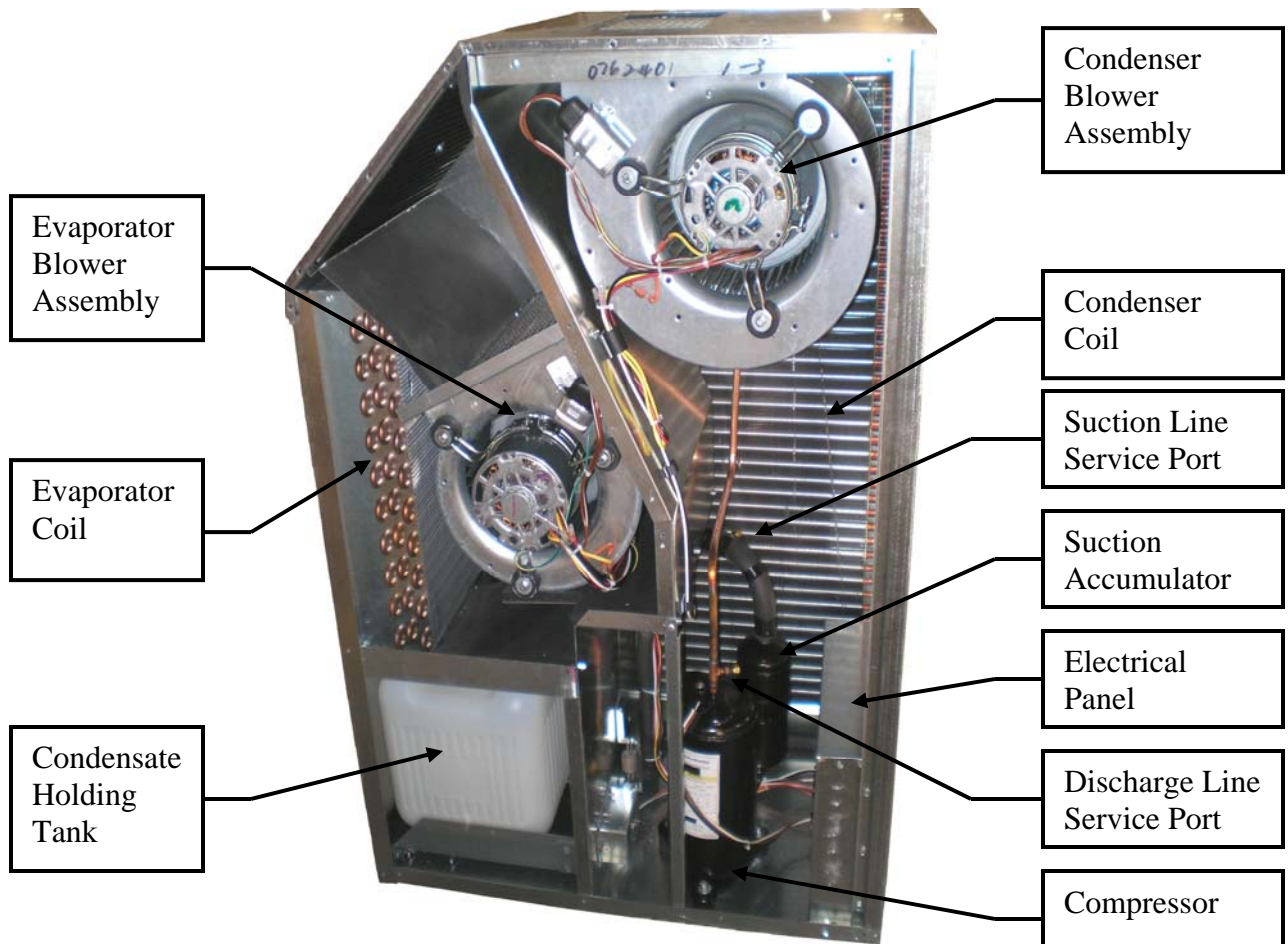
5AK18 Rear View



5AK18 & 5AK30 Electrical Panel



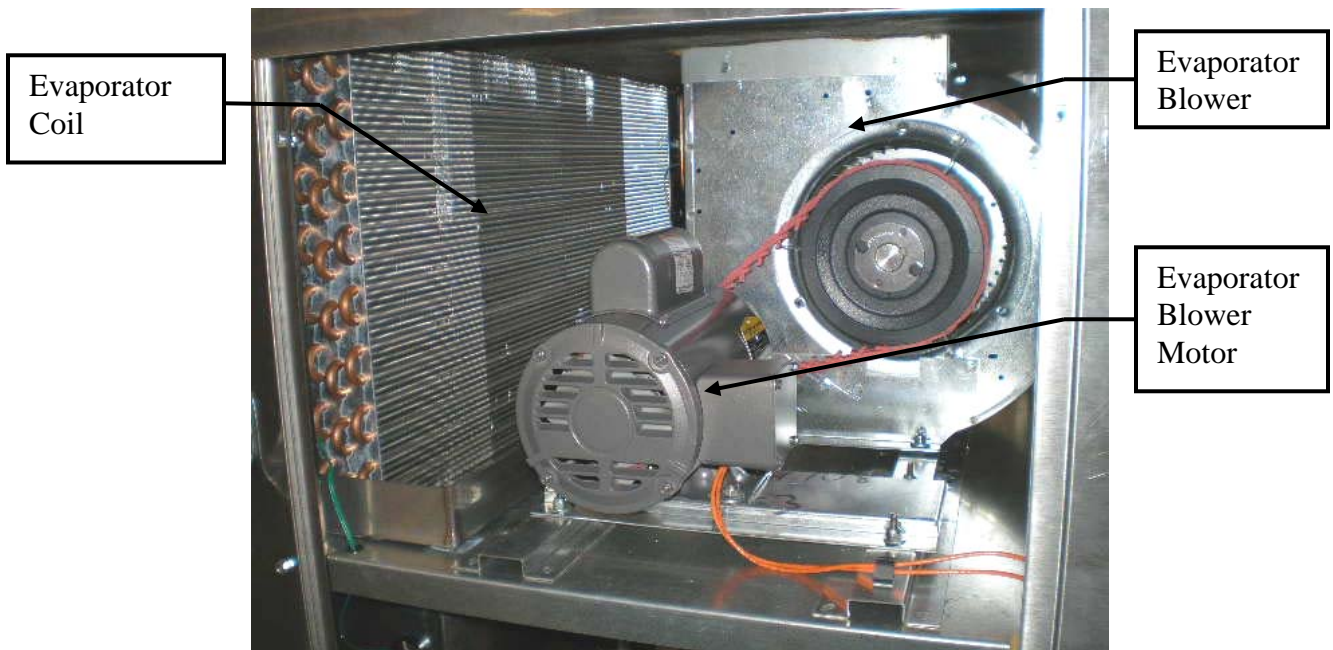
5AK30 Right Side View



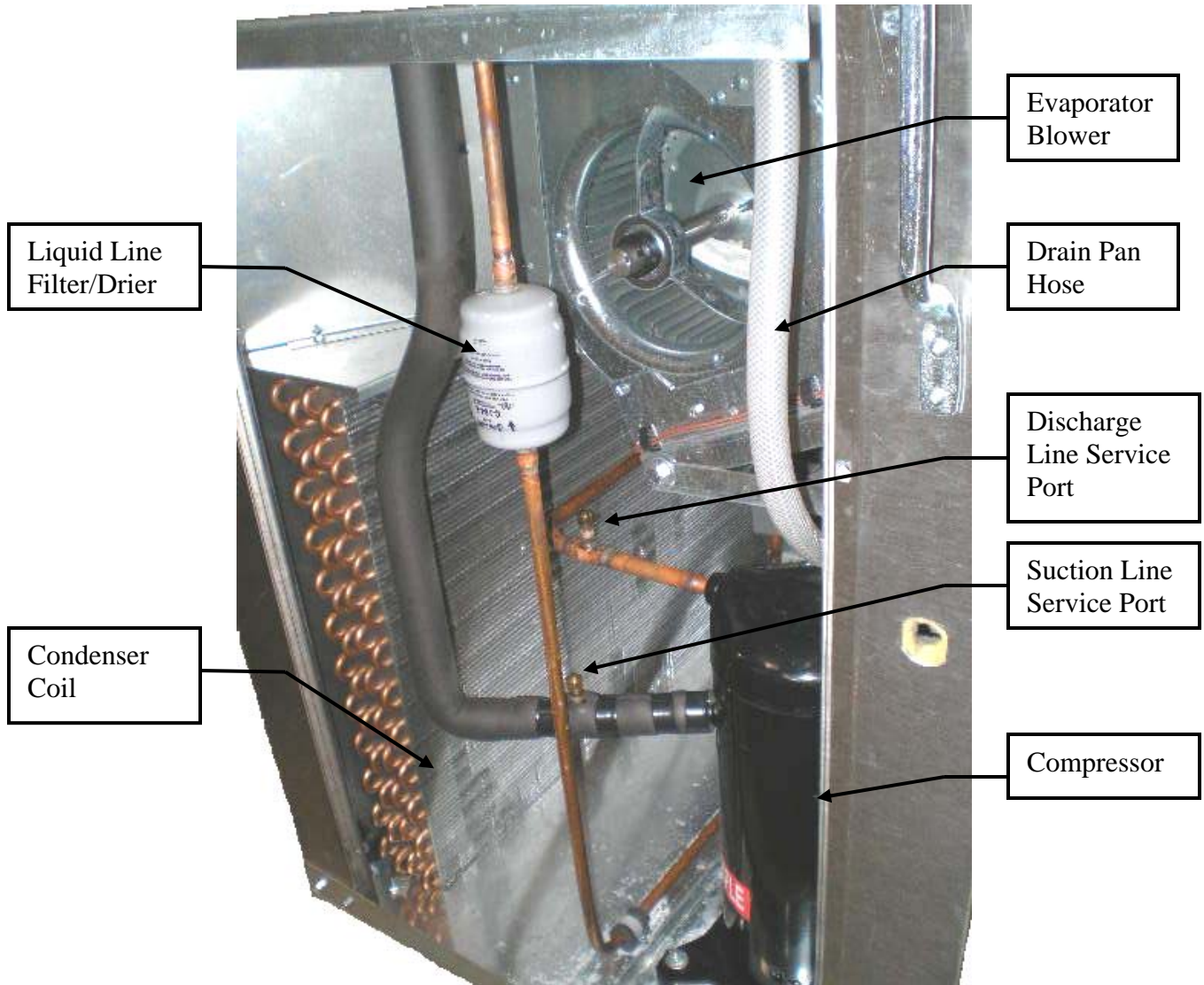
5AK39 Upper Left Side View



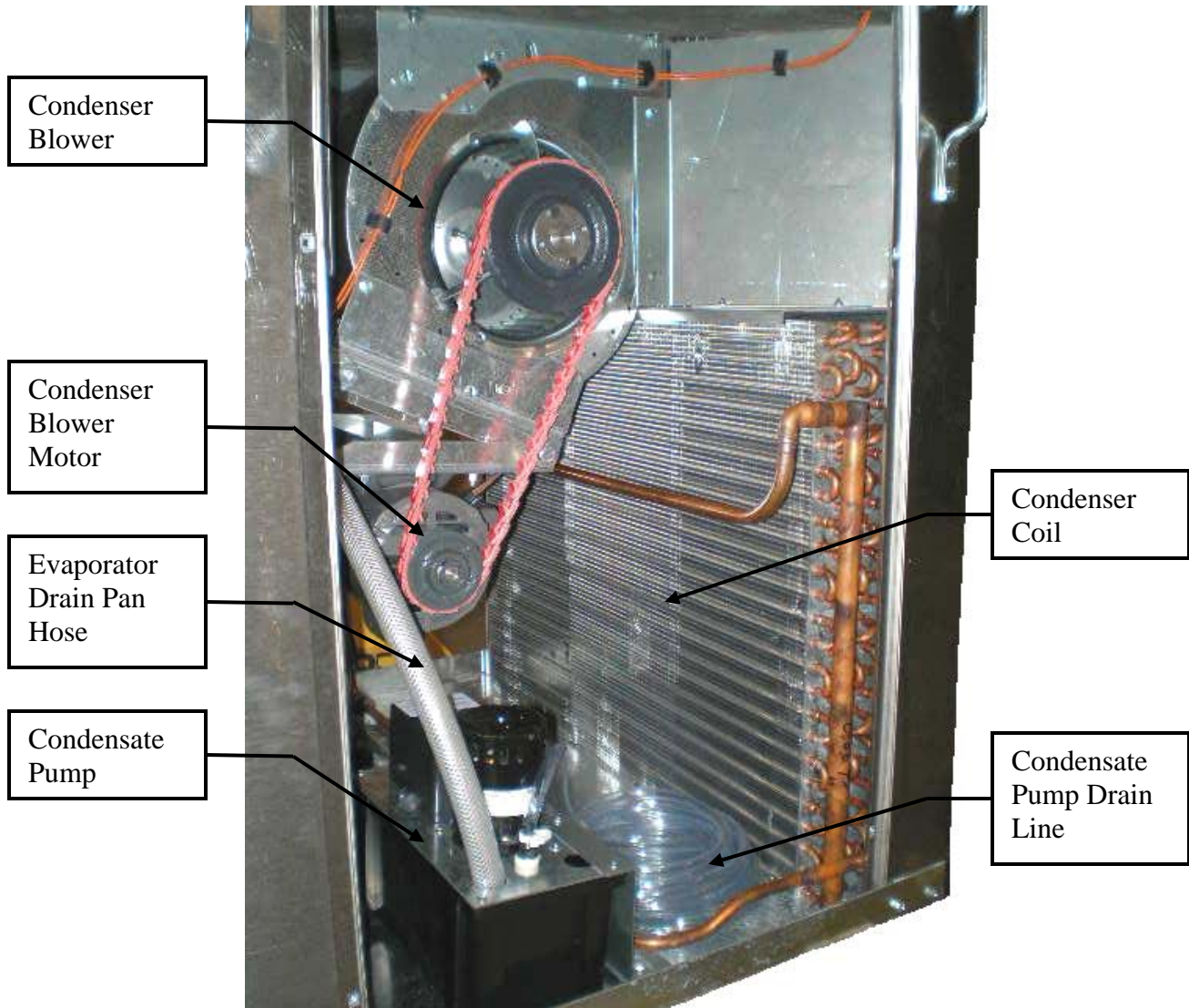
5AK39 Upper Right Side View



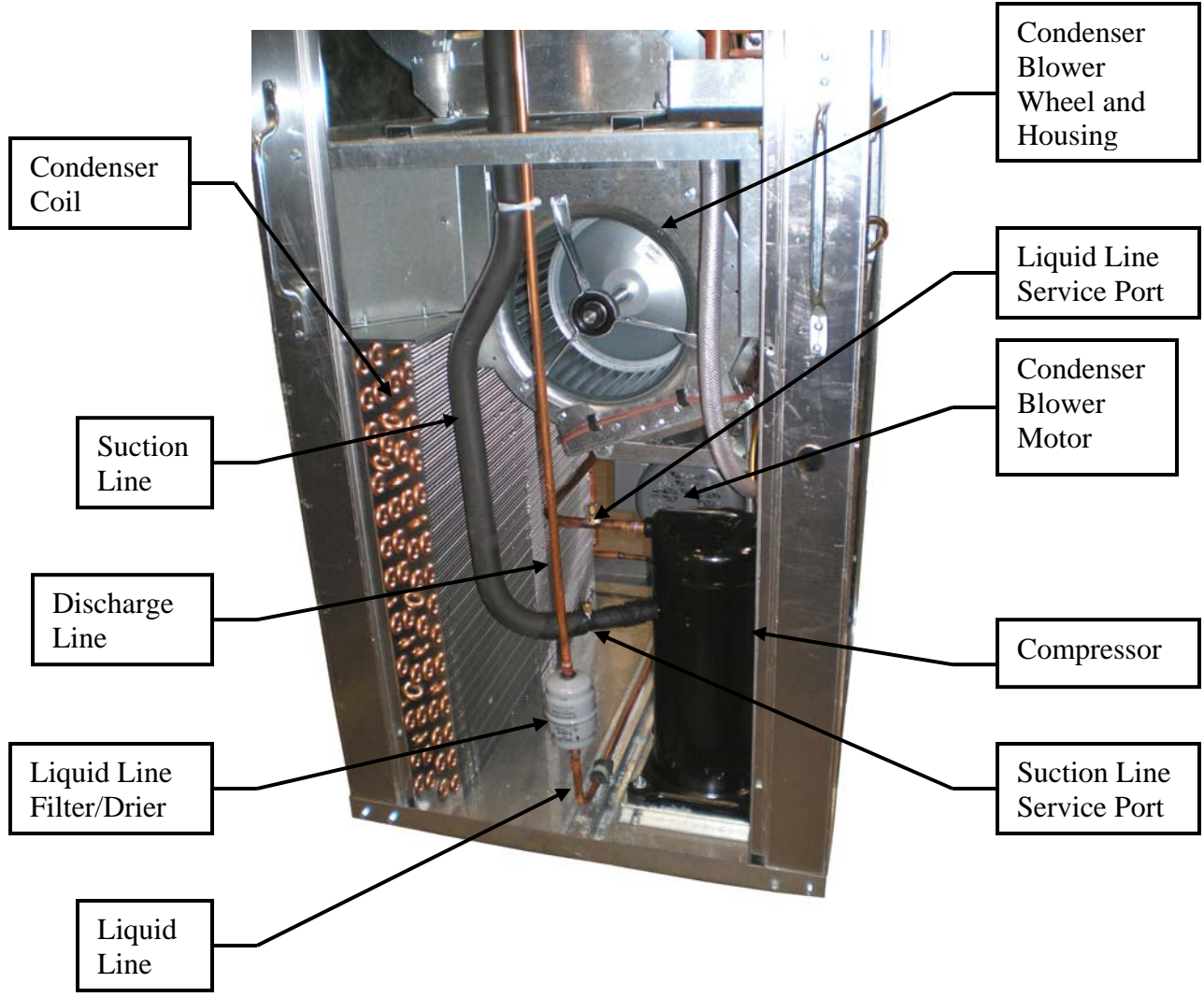
5AK39 Upper Left Side View



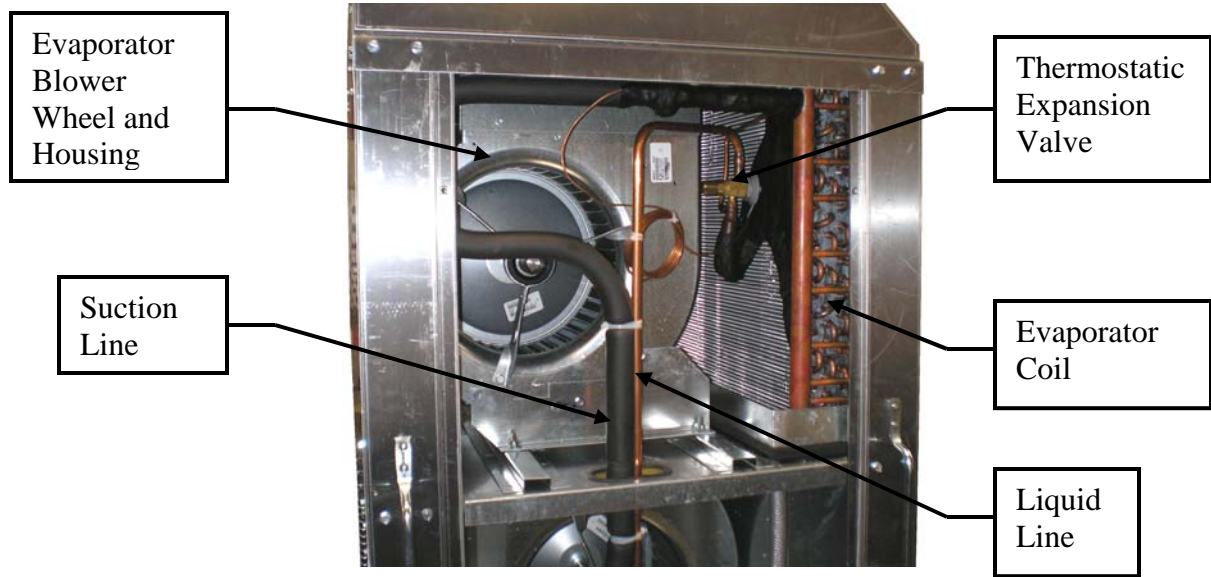
5AK39 Upper Right Side View



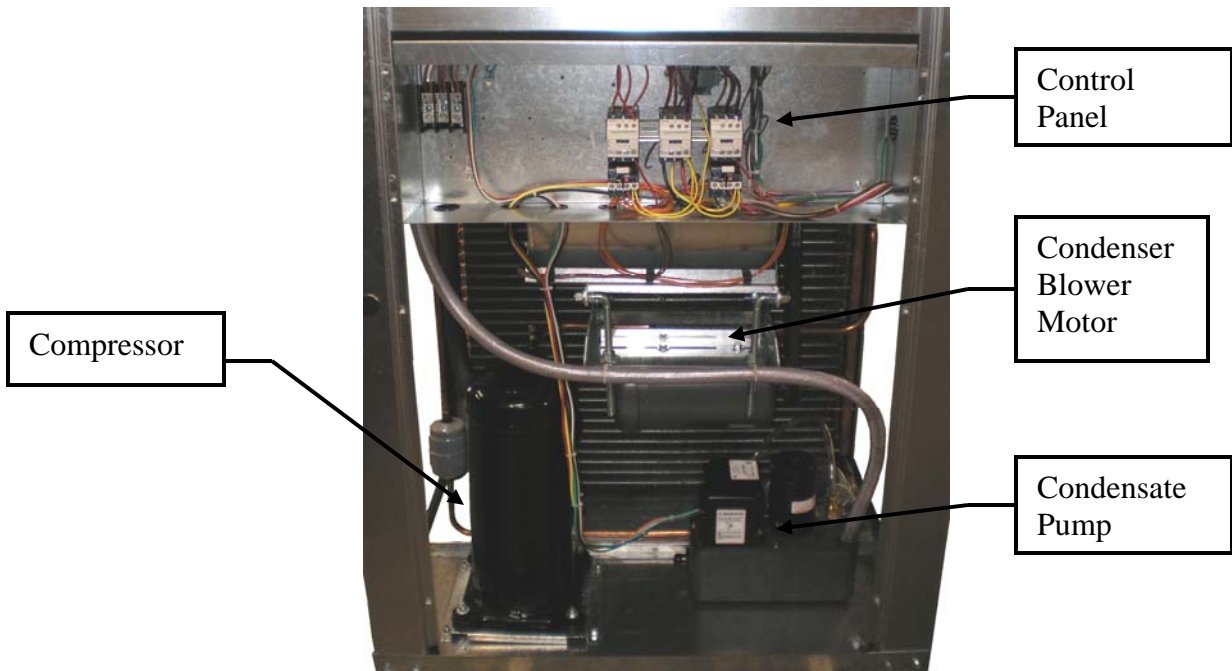
5AK65 Lower Left Side View



5AK65 Upper Left Side View



5AK65 Front View



Air Filter

The Koldwave unit employs washable aluminum mesh air filters, located behind the evaporator and condenser air intake panels. Refer to the Specification and Electrical Data section for filter size.

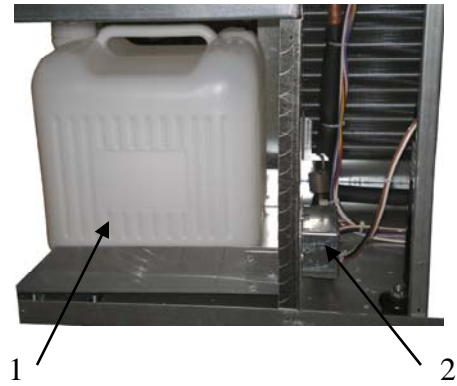
Condensate Removal

Koldwave models 5AK14 – 30 incorporate a 5.0 gallon capacity, polyethylene, condensate drain tank, located in the lower front section of the unit. A high water level cut-out switch, installed on the bulkhead behind the compressor as shown in the photo, is used to stop the entire unit's operation automatically when the tank is full of water.

CAUTION: Turn unit off before emptying tank.

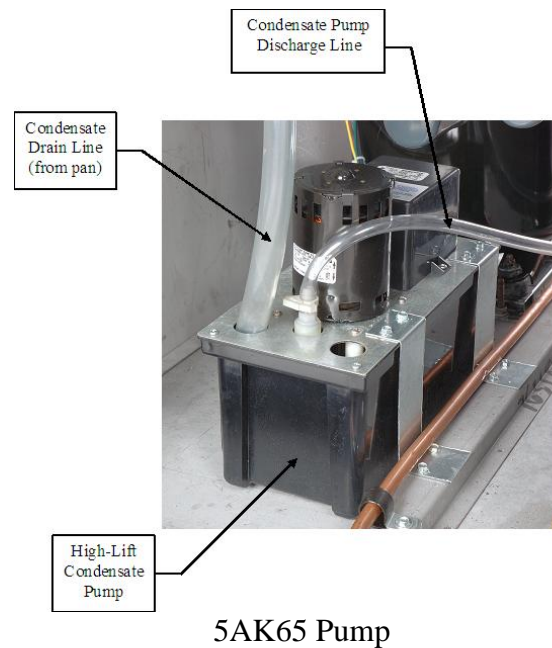
There are three methods in which to remove condensate water from the unit:

1. With condensate tank and water level detection system, which comes **standard** on 5AK14 – 30 models.
2. With **optional** condensate pump kit.
3. By gravity draining out the bottom of unit. This is accomplished by connecting a hose to the bottom of the evaporator drain pan and routing it through a 3/4" hole in the base pan located just to the left of the condensate tank tray. A snap-in plug has to be removed from hole to permit this.



1. Condensate Tank
2. Water Level Detection Control

The 5AK39 & 65 incorporate a condensate removal pump. The pump is connected to approximately 8' of pump discharge line. The discharge line runs through the bottom of the unit and is coiled beneath the unit casing. This line must be field piped to an appropriate drain. If necessary, the discharge line may be extended. The discharge line must not rise more than 20'.



General Flow Pattern

Condenser intake air is drawn in and passes through the condenser coil, extracting heat from the refrigeration system. The hot air is discharged out the exhaust air opening. Evaporator air is taken in through the evaporator intake door and is cooled by the evaporator coil. The cool air is then discharged out of the unit through a plastic grille. Both condenser and evaporator inlets are provided with filters.



Model 5AK30

Safety Controls

Compressor Overload

The compressor is equipped with a current/thermal overload.

Unit Operation

Unit Power On:

Plug in the unit to the power source. The LED display will show the current controller version number for 0.5 seconds. Then, the LED temperature indicator will illuminate the set point for 5 seconds and then switch to the room temperature reading. The Power RED LED will illuminate. By depressing any mode button, the Power LED will turn off.

Fan Hi:

Depress the FAN HIGH button, the unit will be in fan mode and the evaporator fan blower will operate at High Speed. The GREEN LED will illuminate accordingly.

Fan Lo:

Depress the FAN LOW button, the unit will be in fan mode and the evaporator fan blower will operate at Low Speed. The GREEN LED will illuminate accordingly.

Cooling Hi:

Depress the COOL HIGH button, the unit will be in cooling mode depending on thermostat reading. The compressor will turn on based on the thermostat reading and the Compressor Off Time setting. The evaporator fan blower will operate at High Speed. The BLUE LED will illuminate accordingly.

Cooling Lo:

Depress the COOL HIGH button, the unit will be in cooling mode depending on thermostat reading. The compressor will turn on based on the thermostat reading and the Compressor Off Time setting. The evaporator fan blower will operate at Low Speed. The BLUE LED will illuminate accordingly.

Temperature Setting:

During any mode of operation, the user is able to change the set point by depressing the arrow buttons. The temperature indicator will switch to display “set point temperature”. Depressing the ARROW UP or ARROW DOWN button will change the set point. The SETPOINT LED will illuminate. The temperature indicator will switch back to display “room temperature” after 5 seconds.

Unit Off:

Depress the OFF button at any time to turn the SYSTEM MODE off. The unit will remain idle until further instruction. The Power RED LED will illuminate.

Other Settings:

During the cooling mode, the compressor will only be energized if the temperature is at least 2 degrees above the set point, and de-energized once the temperature falls to 2 degrees below the set point. User is able to manually change the temperature differential (default set at 2) by depressing both UP and DOWN arrow key and then adjust UP and DOWN arrow to set the differential from 1-4 degrees. After 3 seconds, it will return to the room temperature reading.

Compressor Off Time:

The compressor routine guarantees a 5-minute minimum off time on the compressor, and it will not energize until the 5-minute off time has been satisfy.

Self Recovery Mode (*):

The unit controller is shipped with self-recovery mode activated so that with any sudden power interruption, the set point and operating mode are stored in memory and the unit will retain these settings and resume operation once power is restored. When the self-recovery mode is enabled the decimal point on the second character on the LED

display is always On. If self-recovery mode is not enabled, then the second decimal point is always Off. However, the user is able to enable the “Self Recovery Mode” by depressing the OFF button for 5 seconds and then adjust the setting from the arrow key.

A0 – Self Recovery Mode “off “

A1 – Self Recovery Mode “on” (Factory Default Setting)

Check Alarms:

The controller will monitor and check the status of two alarm signals:

1. Alarm_Tank_Full (E.F),
2. Alarm_Temperature_Sensor (E.S).

When **E.F**, or **E.S** alarm is present, the **Power LED** will blink, signaling that the alarm condition is present, and the unit will lock out. Once the failure is cleared, press the OFF button, the Power LED will stop blinking, and room temperature will display.

Optional Remote Control:

The optional remote control has the identical function as the main unit excluding the followings:

1. Ability to change the “temperature differential” setting. User can only adjust such setting through the main unit panel.
2. Ability to enable or disable the “self recovery mode” setting. User can only adjust such setting through the main unit panel.

* User is only allowed to change setting when unit is OFF*



Unit Control Panel



Optional Remote Control

Inspection and Repair of Electrical System

**** Koldwave Technical Services Department must be contacted prior to or during any repair/service on a unit which is under warranty.***

Service other than routine maintenance should be performed only by a qualified refrigeration service person.

Always disconnect power and discharge capacitors before servicing.

Compressor and Fan Motor Capacitors
Visually check the capacitors for bulges or signs of leakage. Using a capacitor tester, check each capacitor shorts, grounds, or leakage. Also verify the capacitance in mfd matches the capacitor rating.

Inspection and Repair of Refrigerant System

**** Koldwave Technical Services Department must be contacted prior to or during any repair/service on a unit which is under warranty.***

Service other than routine maintenance should be performed only by a qualified refrigeration service person.

Check all connections and every part for leaks whenever the refrigerant system is repaired. Use a leak detector, soap solution, or a halide torch to inspect the system.

When repairing a refrigerant leak, the brazing flame will cause oxidation to occur inside the copper tubing being repaired. It is therefore desirable to use a slightly reduced flame and to flow dry nitrogen gas through

the refrigerant piping while brazing to prevent this oxidation from taking place. Once the repair is completed, thoroughly evacuate the refrigerant system with a vacuum pump before recharging the system.

Koldwave strongly recommends a filter/dryer be installed when any repairs are made to the refrigeration system.

Preventative Maintenance

Your Koldwave portable spot cooler has been designed to give maximum performance and reliability with minimum maintenance. Maintenance of the system is concentrated in three areas covered in the following paragraphs.

Blower Motors

Caution: Always disconnect the power source before working on or near a motor or its connected load.

The motor may require periodic cleaning to prevent the possibility of overheating due to an accumulation of dust and dirt on the windings or on the motor exterior.

Filter

The life of a filter depends entirely on its environment and use. It is recommended that air filters be inspected on a regular basis every four to six weeks. A clogged filter will cause the unit to operate at greatly reduced efficiency. This unit employs one 1/2" thick, washable aluminum mesh air filter located behind the louvered front panel of the evaporator coil and, depending on the unit size, one or two in front of the condenser coil on the left side or back of the unit. The evaporator filter can easily be removed and cleaned; just pull down the

evaporator intake hinged door and pull the filter out. The condenser filters can be removed by lifting filters and pulling toward you and down. The filters must be washed periodically when needed. This may be done as follows:

1. Soak filter in solution of warm water and detergent for 15 minutes.
2. Rinse in clean, hot water and shake excess moisture from filter.
3. Spray one side of filter with light film of oil.
4. Reinstall with oiled surface facing out from unit.

Coils and Related Items

Coil Maintenance

Coil surfaces must be kept clean of dirt and lint in order to operate at rated efficiency. Coils should be inspected on a regular basis and cleaned as required.

CAUTION: Solutions used to clean coils must not be corrosive to metals or materials used in the manufacture of this equipment. Take care not to damage the coil or fins if using a high pressure spray to apply the cleaning solutions.

Condensate Pump (Optional 5AK14 - 30)

Caution: Always disconnect power source before working on or near the pump.

Pump Maintenance:

Do not use solvent based cleaning agents. Only mild detergents may be used, but rinse thoroughly before refitting.

Do not use if the pump or its cable is damaged in any way. Protect cable and tubing from sharp edges.

The condensate drain pan and drain system must be periodically flushed.

5AK39 - 65 Condensate Pump

Pump Maintenance

Caution: Always disconnect the power source before working on or near the pump.

Be sure the float moves freely.

Do not touch or clean the sensor device with sharp objects or tools. The sensor element is fragile so handle with care. Replace pump if damaged in any way. If servicing, clean carefully with a soft brush, cloth, or under a slow running tap. Rinse out tray thoroughly.

Do not use solvent based cleaning agents. Only mild detergents may be used, but rinse thoroughly before refitting.

Do not use if the pump or its cable is damaged in any way. Protect cable and tubing from sharp edges.

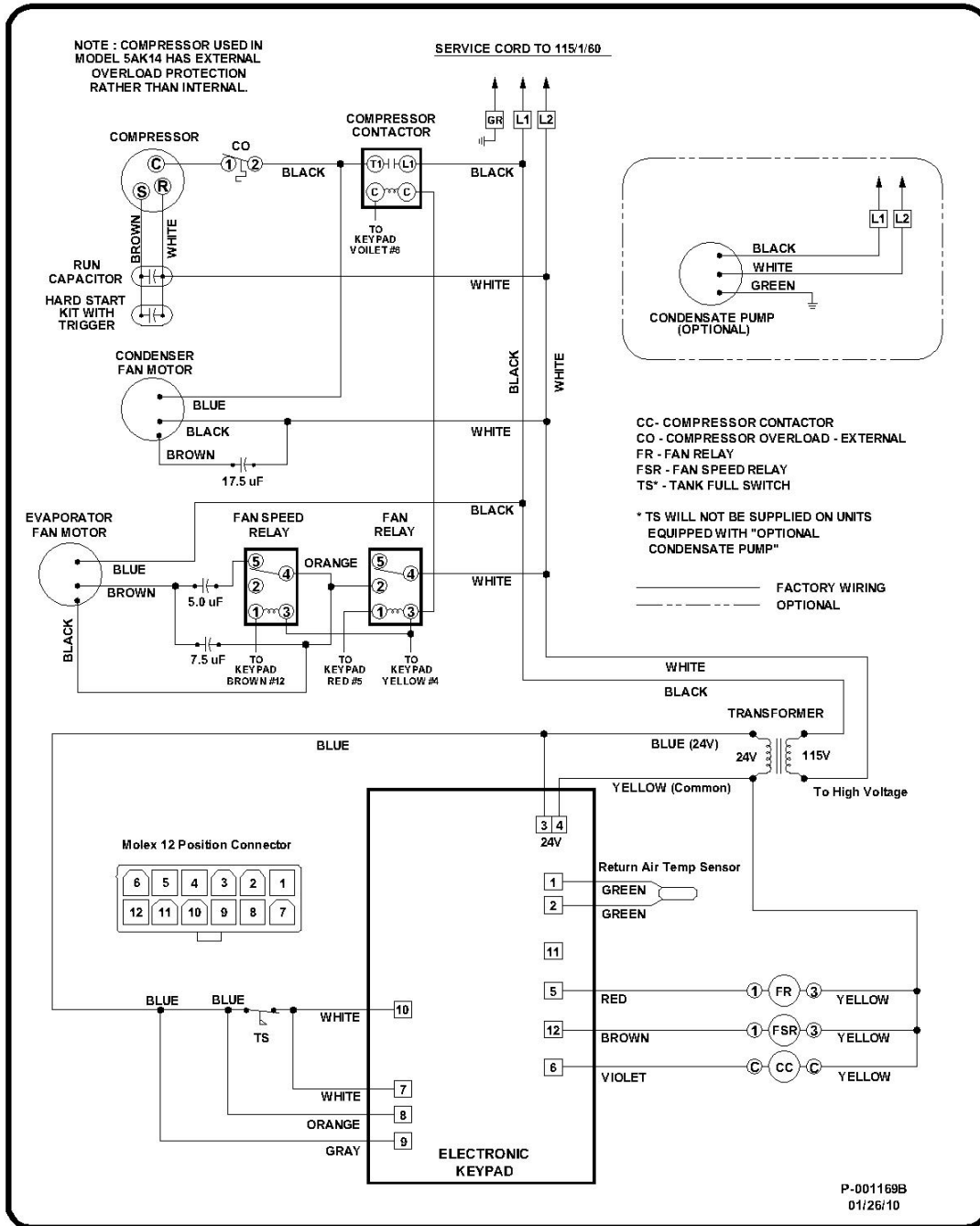
The condensate drain pan and drain system must be periodically flushed.

277V Pumps Only

Oil the motor at the start of each AC season. Use SAE #10 or #20 non-detergent oil. Do not over oil.

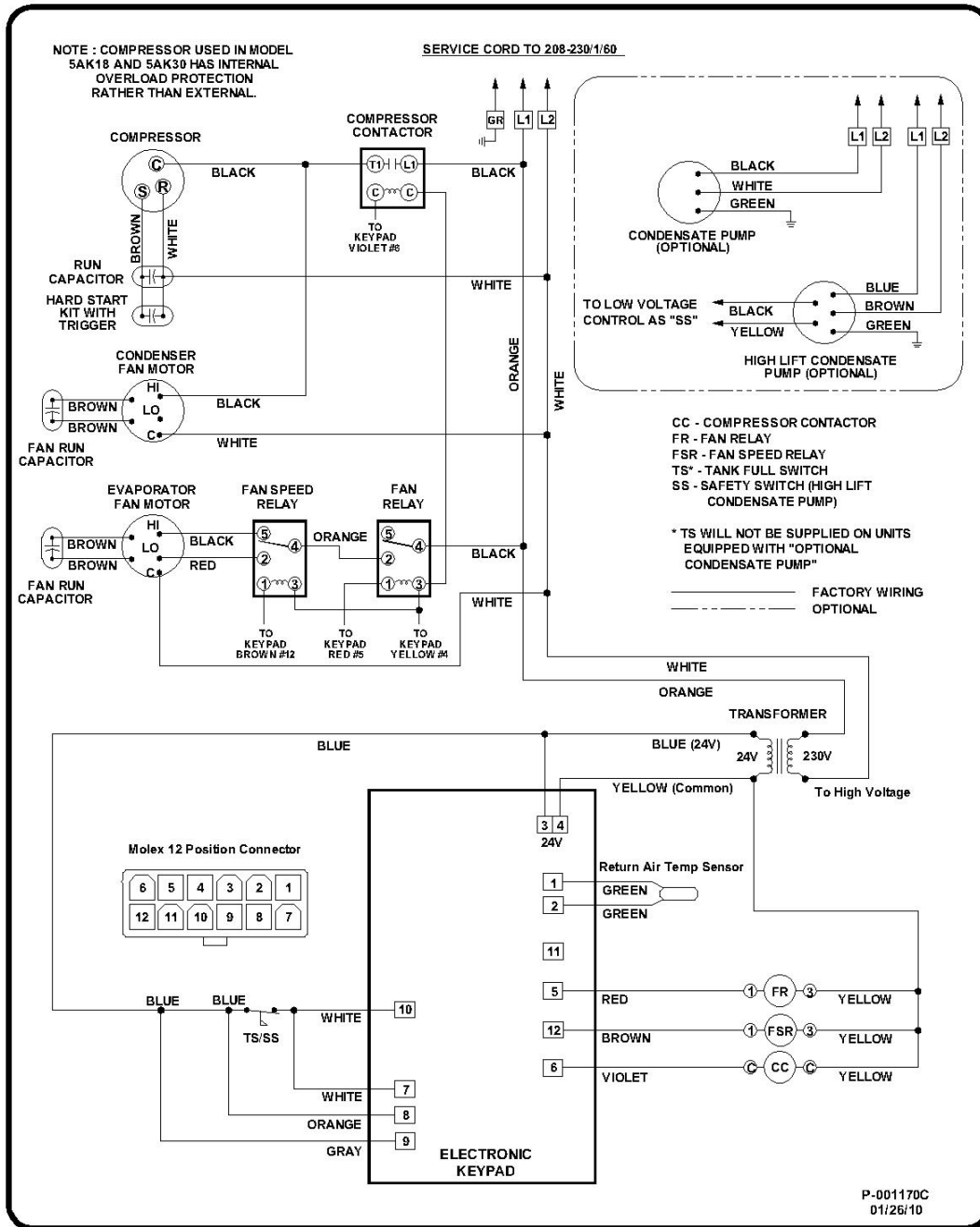
Electrical Diagram

5AK14 115V/1PH



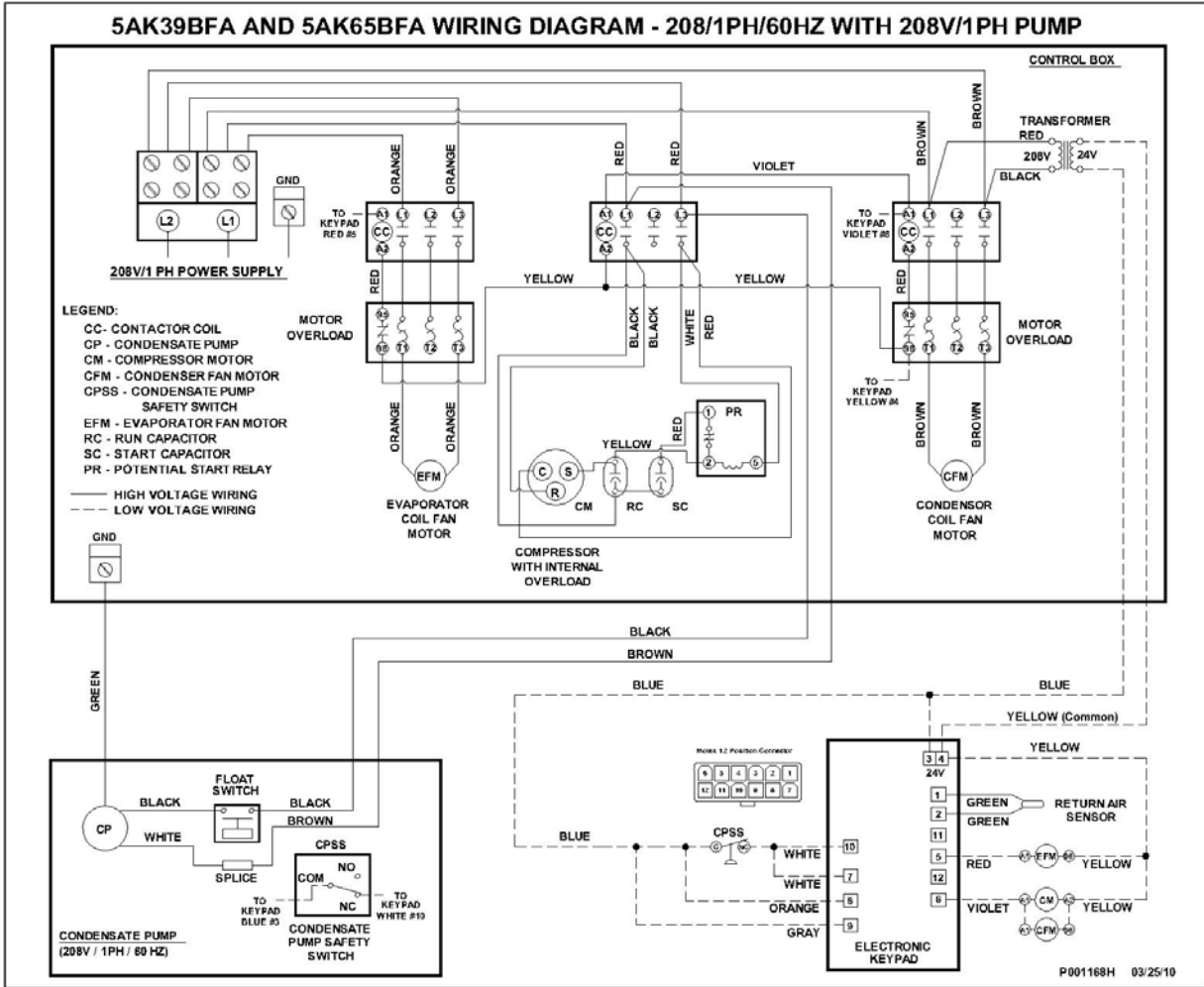
5AK14 - 115/1 PH

5AK18, 5AK30 208-230V/1PH

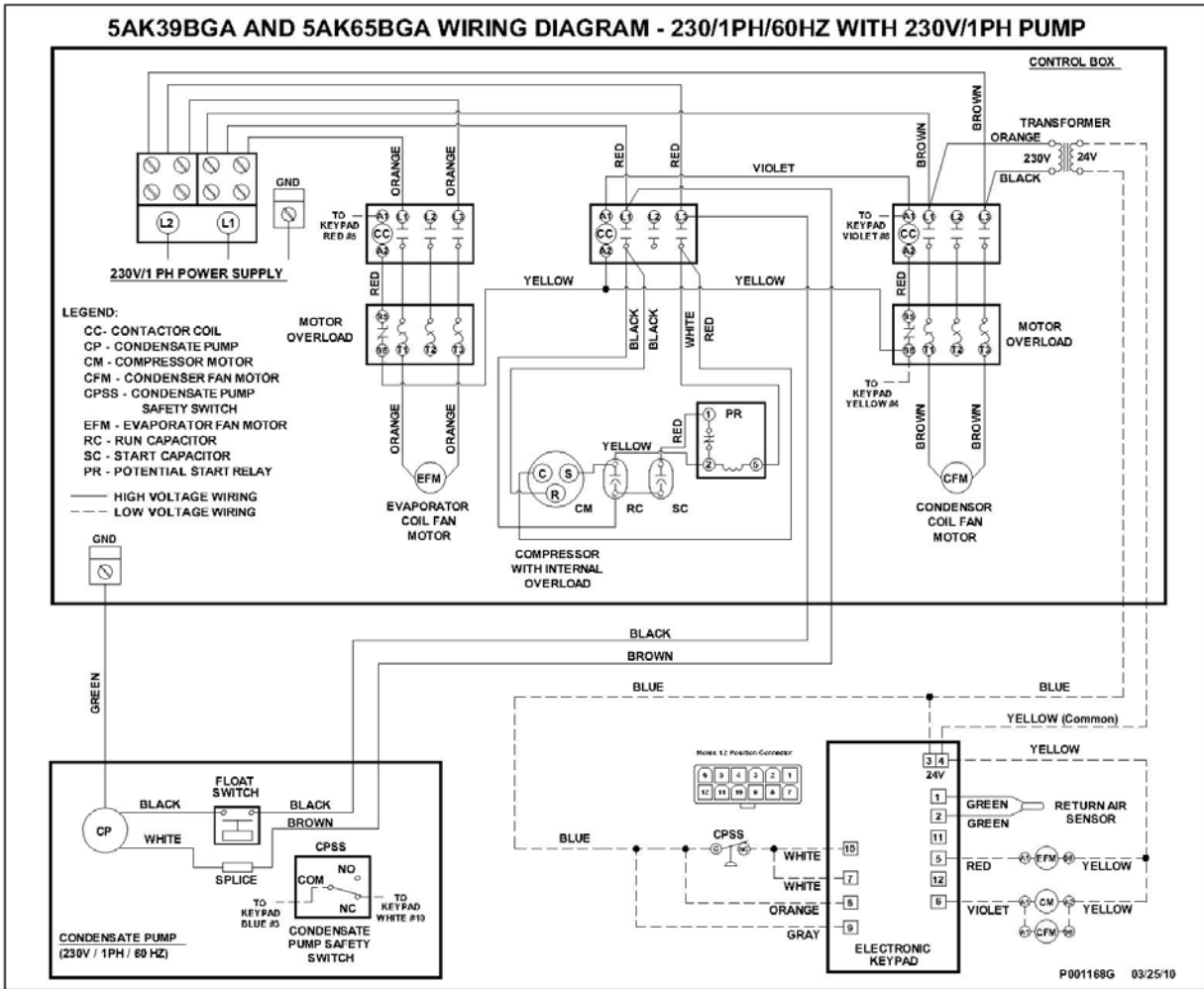


5AK18 AND 5AK30 - 208-230/1 PH

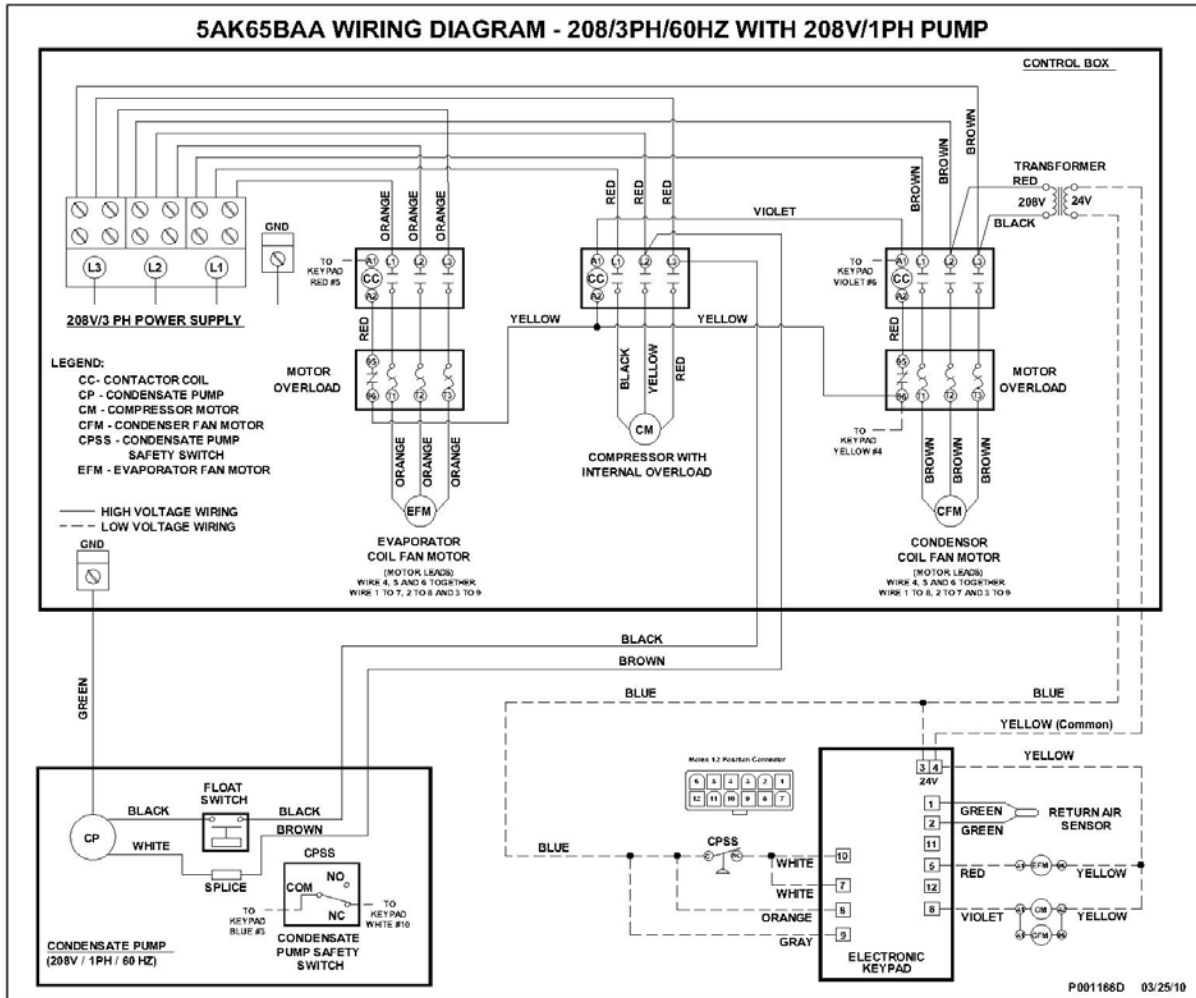
5AK39, 5AK65 208V/1PH



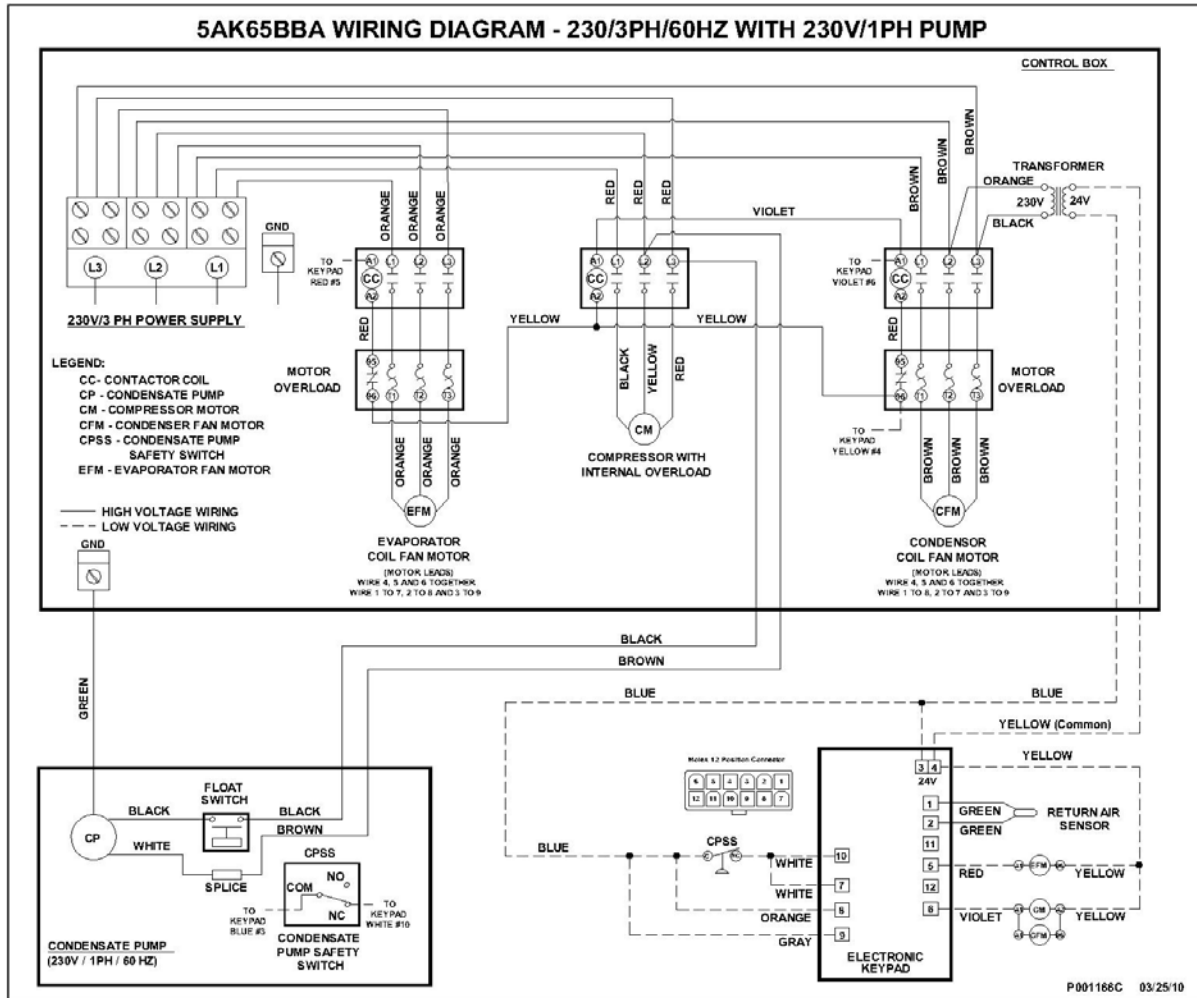
5AK39, 5AK65 230V/1PH



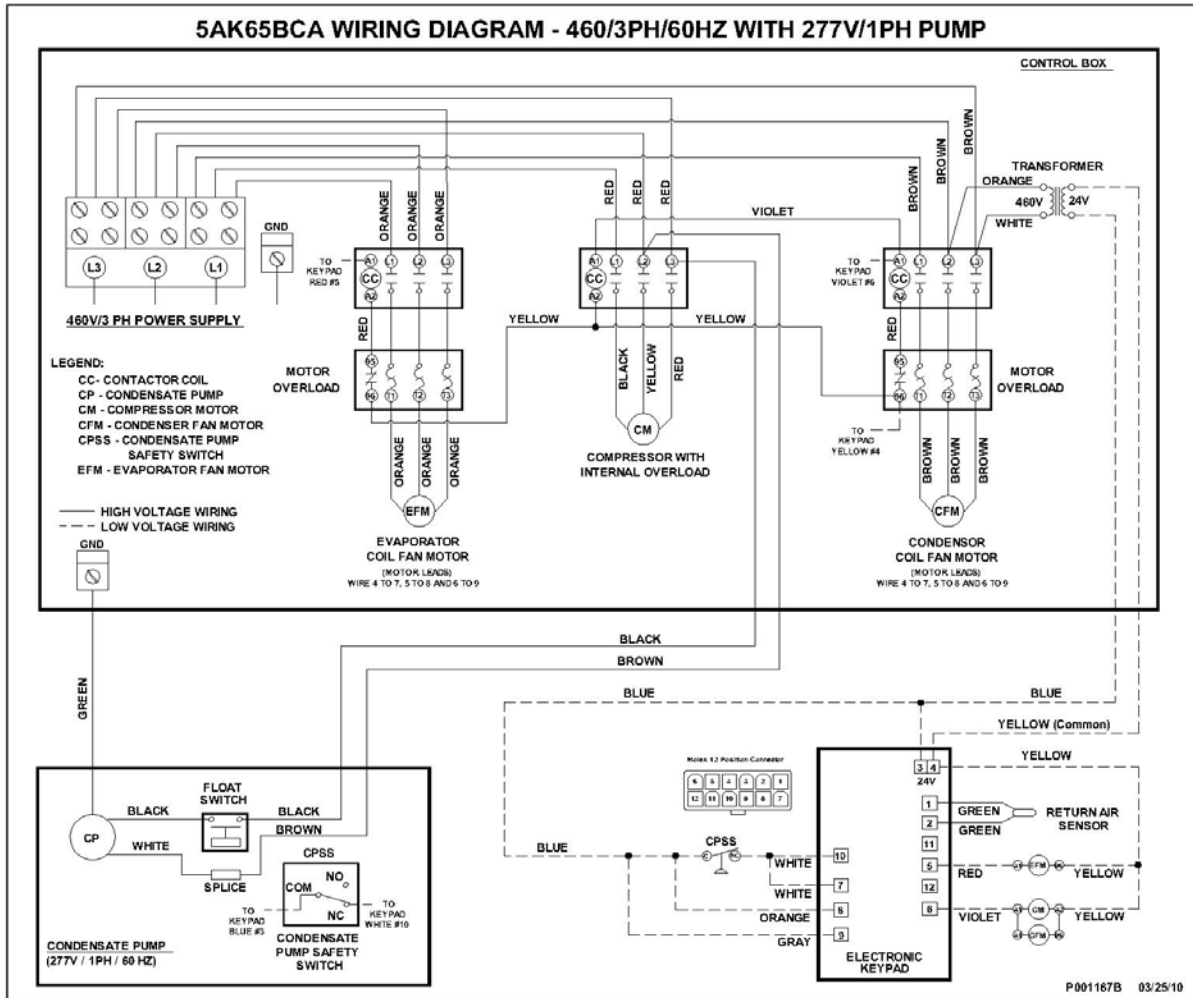
5AK65 208V/3PH with 208V/1PH Pump



5AK65 230V/3PH with 230V/1PH Pump



5AK65 460V/3PH with 277V/1PH Pump



Trouble Shooting Guide

Before troubleshooting this system, read this manual to determine electrical power and installation requirements to allow the spot cooler to perform at its maximum efficiency. Refer to general description, wiring diagrams and photographs to get an understanding of how the unit functions.

Service other than routine maintenance should be performed only by a qualified refrigeration service person.

GENERAL TROUBLESHOOTING

Problem	Possible Cause	Remedy
Entire unit does not operate.	1 Power interruption.	1 Check external power supply for tripped breaker or blown fuse. Check reset button on power cord.
	2 Defective tank full unit cutout switch	2 Check and replace.
	3 Condensate tank could be full.	3 Check tank and empty if necessary.
	4 Unit keypad control setting may be too high.	4 Lower setting.
	5 Return air sensor out of calibration or defective.	5 Replace if error message ES is displayed on keypad.
	6 No control voltage 24VAC on transformer secondary.	6 Check and replace.
Insufficient cooling.	1 Improper sizing of unit.	1 Check if the unit is undersized for the load. Add supplemental unit(s).
	2 Dirty air filter in unit.	2 Clean filter
	3 Dirty evaporator coil.	3 Clean evaporator coil.
	4 Ice on evaporator coil.	4 Defrost; use fan only operation.
	5 Obstructed intake.	5 Remove obstruction.
	6 Other possible causes.	6 Refer to condenser, evaporator and compressor sections.
	7 Low voltage.	7 Check supply power. Must be within 10% of nameplate rating.
	8 Condenser coil dirty or restricted airflow.	8 Clean condenser coil and filter.
	9 Thermostat set too high.	10 Lower setting.
Abnormal noise.	1 Loose compressor mounting nuts.	1 Tighten.
	2 Defective, improper or worn rubber grommets on the compressor mounting bolts.	2 Replace grommets.
	3 Copper tube vibrating.	3 Adjust by bending slightly to firm position. Separate tubes touching cabinet or each other.
	4 Loose cabinet or internal component.	4 Check and tighten loose screws.
	5 Loose blower wheel.	5 Tighten screws on blower wheel to shaft.
	6 Blower wheel hitting shroud.	6 Adjust wheel position on motor shaft.
	7 Blower bearing defective.	7 Replace blower bearing.
	8 Blower motor bearing defective.	8 Replace blower motor.
	9 Unit overcharged	9 Recover entire refrigerant charge and weigh in proper charge.
	10 Compressor motor defective.	10 Replace compressor.

Trouble Shooting Guide Continued

GENERAL TROUBLESHOOTING

Evaporator fan runs but compressor doesn't start	1	Low voltage to unit.	1	Check power supply for proper voltage at unit plus or minus 10% of rated nameplate voltage.
	2	Keypad control.	2	Check the temperature control for loose wires. Tighten any loose connections. Replace if defective.
	3	Loose or defective wires.	3	Tug on wires to see if they will separate from connections.
	4	Compressor shorted, open or burned.	4	Check for shorts, opens and grounds. Remove and replace compressor.
	5	Shorted or open run capacitor.	5	Check capacitance and replace if necessary.
	6	Unit in fan only mode.	6	Change mode.
	7	Defective compressor relay.	7	Check and replace.
Evaporator blower motor not running.	1	Defective fan motor.	1	Check and replace.
	2	Defective fan capacitor.	2	Check capacitance and replace if necessary.
	3	Defective wiring or connection.	3	Tug on wires to see if they will separate from connections.
	4	Defective fan speed contactor.	4	Check and replace.
	5	Keypad control.	5	Check the temperature control for loose wires. Tighten any loose connections. Replace if defective.
Evaporator blower not running up to full speed.	1	Low voltage to unit.	1	Check power supply for proper voltage at unit plus or minus 10% of rated nameplate voltage.
	2	Defective motor capacitor.	2	Check capacitance and replace if necessary.
	3	Blower wheel rubbing against housing.	3	Inspect wheel alignment and correct.
Water leaking from unit.	1	Leaking evaporator condensate pan.	1	Locate leak and repair pan.
	2	Condensate pump related.	2	Check to see if the elevation is over 11 ft (19.5 ft. on 5AK39 - 65). Pump will operate properly against 11 ft (19.5 ft. on 5AK39 - 65) of water total head pressure on pump. Otherwise, replace pump if defective. Make sure pump is sitting level and is clean.
	3	Defective drain hose (clogged or loose connection).	3	Inspect hose for loose connections, clogs or kinks. Repair or replace.
	4	Defective micro-switch causing condensate tank to overflow.	4	Remove and replace.
	5	Hole or crack in condensate tank.	5	Remove and replace.
Unit tripping when plugged in (cord connected units only)	1	Undesirable "Arc" from power receptacle.	1	Disconnect power completely from receptacle and reset the plug by pressing the "reset" button. Reconnect the plug to the receptacle. If tripping again, it means there is an "Arc" detected. Check for shorts in unit wiring. Check for correct polarity at receptacle. Replace the electrical receptacle outlet if defective.
	2	Building does not have a dedicated grounding system.	2	The units must be connected to a grounding system.
Circuit breaker or fuses blowing	1	Low voltage to unit.	1	Check power supply for proper voltage at unit plus or minus 10% of rated nameplate voltage.
	2	Compressor short cycles	2	See section on compressor troubleshooting.
	3	Defective wiring or connection.	3	Tug on wires to see if they will separate from connections.
	4	Refrigerant system not equalized (wait 5 min. before restart).	4	Compressor is starting under a load. If this condition persists, see section on compressor troubleshooting.
	5	Improper fuses or dedicated circuit.	5	Connect unit to a dedicated circuit. Check unit rating plate for circuit amperage.
	6	Grounded component.	6	Check unit components for short to ground and correct wiring or replace component as necessary.

Trouble Shooting Guide Continued

GENERAL TROUBLESHOOTING

Electric shock from unit.	1	Grounded electric circuit.	1	An ungrounded wire or component is touching the unit casing. Use an ohmmeter or hipot tester to find trouble. Replace or rewire.
	2	Ungrounded unit.	2	The units must be connected to a grounding system.
Cycle too long or unit operates continuously.	1	Condenser dirty, clogged or restricted.	1	Clean condenser.
	2	Compressor motor or mechanism defective.	2	Replace compressor
	3	Air or non-condensable gases in system.	3	Recover refrigerant, install filter/dryer, evacuate system and weigh in proper charge of virgin refrigerant.
	4	Capillary tube or strainer restricted.	4	Replace restricted capillary tube.
	5	Compressor contactor stuck closed.	5	Replace contactor.
	6	Low refrigerant charge.	6	Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge.
	7	Improper unit installation.	7	Check for airflow restrictions and objects blocking front of unit
	8	Unit too small for its application.	8	Replace with larger unit.
	9	High ambient temperature	9	Install condenser air intake kit to draw air from another area
	10	Leak in system	10	Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge.
	11	Dirty air filter (air flow restricted)	11	Clean air filter .

COMPRESSOR TROUBLESHOOTING

Compressor starts and runs but cycles on overload	1	Low voltage	1	Check power supply for proper voltage at unit plus or minus 10% of rated nameplate voltage.
	2	Capacitor incorrect or defective	2	Check capacitance and replace if necessary.
	3	Condenser dirty, clogged or restricted	3	Clean condenser coil.
	4	Compressor grounded	4	Check compressor windings to ground. Replace compressor if shorted.
	5	Air or non-condensable gases in system	5	Recover refrigerant, install filter/dryer, evacuate system and weigh in proper charge of virgin refrigerant.
	6	Wiring incorrect or defective	5	Tug on wires to see if they will separate from connections.
	7	High head-pressure	7	Clean coils and filter, check system pressures
	8	Capillary tube or strainer restricted	8	Replace restricted capillary tube.
	9	Overload protector incorrect or defective	9	Replace as necessary.
	10	Refrigerant overcharged	10	Recover entire refrigerant charge and weigh in proper charge.
Compressor tries to start when t-stat closes, but cuts out on overload; finally starts after several attempts	1	Low voltage	1	Check voltage at wall outlet. Must be within 10% of nameplate rating voltage.
	2	Compressor capacitor incorrect or defective	2	Check capacitance and replace if necessary.
	3	Compressor motor requires start assist	3	Unit is equipped with hard start capacitor. Check capacitance and replace if necessary.
	4	Air or non-condensable gases in system	4	Recover refrigerant, install filter/dryer, evacuate system and weigh in proper charge of virgin refrigerant.
	5	Capillary tube or strainer restricted	5	Replace restricted capillary tube.
	6	Refrigerant system not equalized.	6	The unit was programmed at the factory with a 5 minute time delay between compressor starts. If the compressor cycles more frequently, contact factory.
	7	Discharge line restricted	7	Repair as necessary.

Trouble Shooting Guide Continued

COMPRESSOR TROUBLESHOOTING

Compressor will not start; hums, and cycles on overload protector	1	Low voltage	1	Check voltage at wall outlet. Must be within 10% of nameplate rating voltage.
	2	Start capacitor incorrect or defective	2	Check capacitance and replace if necessary.
	3	Compressor grounded	3	Check compressor windings to ground. Replace compressor if shorted.
	4	Compressor motor or mechanism defective	4	Replace compressor.
	5	Compressor motor requires start assist	5	Unit is equipped with hard start capacitor. Check capacitance and replace if necessary.
	6	Wiring incorrect or defective	6	Tug on wires to see if they will separate from connections.
	7	Refrigerant system not equalized.	7	The unit was programmed at the factory with a 5 minute time delay between compressor starts. If the compressor cycles more frequently, contact factory.
	8	Defective compressor relay.	8	Check and replace.
	9	High head-pressure.	9	Clean coils and filter, check system pressures.
	10	Compressor locked.	10	Replace compressor.
Will not start; no hum	1	Compressor motor defective.	1	Replace compressor.
	2	Wiring incorrect or defective.	2	Tug on wires to see if they will separate from connections.
	3	No power to cord connected unit.	3	Check reset button on LCDI cord at wall outlet.
	4	Fuse or circuit breaker blown	4	Check unit for shorts or defective electrical parts. Correct shorts and replace parts as necessary then replace fuse or reset circuit breaker as necessary.
	5	Overload protector tripped	5	Verify compressor is not shorted. Replace overload.
	6	Thermostat contacts open	6	Lower control setting and wait 5 minutes. If still no call for cooling, replace control board.
	7	Thermostat set too high	7	Lower control setting.
Compressor short cycles	1	Low voltage	1	Check voltage at wall outlet. Must be within 10% of nameplate rating voltage.
	2	Capacitor incorrect or defective	2	Check capacitance and replace if necessary.
	3	Compressor motor defective	3	Replace compressor
	4	Wiring incorrect or defective	4	Tug on wires to see if they will separate from connections.
	5	Capillary tube or strainer restricted	5	Replace restricted capillary tube.
	6	Refrigerant system not equalized.	6	The unit was programmed at the factory with a 5 minute time delay between compressor starts. If the compressor cycles more frequently, contact factory.
	7	Fan motor too slow.	7	Select HI speed on control panel
	8	Fan motor defective.	8	Check and replace.
	9	Fan blade or blower wheel stuck.	9	Check for obstruction and clear. Realign blower within housing and tighten set screw onto fan motor shaft.
	10	Low refrigerant charge.	10	Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge.
	11	Refrigerant overcharged.	11	Recover entire refrigerant charge and weigh in proper charge.
	12	Evaporator air flow re-circulation.	12	Clean coil and filters if necessary. Unit should have 4' of free space in front of it.
	13	Unit missing front panel or front seals.	13	All panels must be in place and secured for proper unit operation.
	14	Unit oversized for application.	14	Replace with unit of appropriate size.

Trouble Shooting Guide Continued

COMPRESSOR TROUBLESHOOTING

Compressor starts, but stops after a few minutes.	1 Defective compressor motor.	1 Replace compressor.
	2 Defective compressor run capacitor.	2 Check capacitance and replace if necessary.
	3 Check the keypad error message ES.	3 Check return air sensor and replace if necessary.
	4 Defective condenser fan motor capacitor.	4 Check capacitance and replace if necessary.
	5 Loose connection in electrical circuit.	5 Trace loose wire(s) and tighten connection.
	6 Refrigerant overcharged.	6 Recover entire refrigerant charge and weigh in proper charge.
	7 Low refrigerant charge.	7 Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge.
	8 Dirty condenser coil and filter.	8 Clean filter and condenser coil.
	9 Condensate tank right at trip point.	9 Empty tank.
	10 Condenser fan running at high ESP.	10 Reduce duct length.
	11 High head-pressure	11 Check for obstructions within condenser coil and replace as necessary.
	12 High ambient temperature	12 Install condenser air intake kit to draw air from another area
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Compressor starts and runs but fan does not run.	1 Open fan motor contactor circuit.	1 Check and replace fan motor contactor as necessary.
	2 Shorted or open fan motor.	2 Replace motor.
	3 Fan motor capacitor incorrect or defective.	3 Check capacitance and replace if necessary.

HEAD PRESSURE TROUBLESHOOTING

Too high	1 Condenser dirty, clogged or restricted.	1 Clean condenser coil.
	2 Air or non-condensable gases in system.	2 Recover refrigerant, install filter/dryer, evacuate system and weigh in proper charge of virgin refrigerant.
	3 Fan blade or motor defective.	3 Check and replace.
	4 Refrigerant overcharged.	4 Recover entire refrigerant charge and weigh in proper charge.
	5 High ambient temperature.	5 Install condenser air intake kit to draw air from another area.
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Too low	1 Compressor motor or mechanism defective.	1 Replace compressor.
	2 Capillary tube or strainer restricted.	2 Replace restricted capillary tube.
	3 Low refrigerant charge.	3 Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge.
	4 Evaporator dirty, clogged or restricted.	4 Clean evaporator coil.
	5 Leak in system.	5 Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge.
	6 Dirty air filter (air flow restricted).	6 Clean filter .
	7 Low ambient temperature.	7 Install condenser air intake kit to draw air from another area.

Trouble Shooting Guide Continued

EVAPORATOR TROUBLESHOOTING

Coil freezes

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| 1 Capillary tube or strainer restricted. | 1 Replace restricted capillary tube. |
| 2 Fan blade or blower wheel stuck. | 2 Check for obstruction and clear. Realign blower within housing and tighten set screw onto fan motor shaft. |
| 3 Compressor contactor stuck closed. | 3 Replace contactor. |
| 4 Return air sensor defective. | 4 Replace sensor. |
| 5 Low refrigerant charge. | 5 Locate refrigerant leak, recover refrigerant, repair leak, install filter/dryer, evacuate system and weigh in proper charge. |
| 6 Evaporator dirty, clogged or restricted. | 6 Clean evaporator coil. |
| 7 Dirty air filter (air flow restricted). | 7 Clean filter. |
| 8 Defective fan motor. | 8 Replace fan motor. |
| 9 Low ambient temperature. | 9 Install condenser air intake kit to draw air from another area. |

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