



Koldwave Kompac Installation & Operation Manual For models 4WK07, 4WK14, 4WK16, 4WK23, 4WK26

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 LISCENCED 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 DAMAGEDAMAGE.

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 OF LOOSE FASTENERS MAY OCCUR. IT IS THE INSTALLER'S RESPONSIBILITY TO INSPECT AND CORRECT ANY PROBLEMS THAT MAY BE FOUND.

RECEIVING INSTRUCTIONS: INSPECT SHIPMENT IMMEDIATELY UPON ARRIVAL TO DETERMINE IF ANY DAMAGE HAS OCCURRED TO THE UNIT DURING SHIPMENT. AFTER THE UNIT HAS BEEN UNCRATED, CHECK FOR ANY VISIBLE DAMAGE TO THE UNIT. IF ANY DAMAGE IS FOUND, THE CONSIGNEE SHOULD SIGN THE BILL OF LADING INDICATING SUCH DAMAGE AND IMMEDIATELY FILE A CLAIM FOR DAMAGE WITH THE TRANSPORTATION COMPANY.

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General Information

Kompac Series Air Conditioners and Heat Pumps are designed for applications where outside air is not available and spot cooling is required. The cord connected Koolette, Kompac and King Kompac is a 7000 (countertop application), 14000, 16000, 23000 or 26,000 Btu/Hr floor mount configuration unit to meet any space requirements.

Our Kompac units are completely self-contained with the entire refrigeration system, fan blower assembly, water valve, and electrical components housed in a metal cabinet with stainless steel finish. Each unit will also come along with an optional remote control. Only power and condenser water supply, water discharge, and condensate drain piping are required for installation. With the heat pump option, user can manually select HEAT or COOL options through the touch pad control panel or through the remote control, depending upon thermostat command.

The water-cooled condenser requires only that amount of water needed to achieve the desired high and low refrigeration system pressures. The condenser water flow rate for any entering water temperature can be obtained using the graph on page 12. A refrigeration system head pressure actuated water-regulating valve regulates condenser water.

General Requirements

For proper control of the water flow rate entering the automatic water valve, the minimum water pressure required for

condenser water supply is 30 PSIG. The condenser water temperature leaving the unit should not exceed 110F. Ignoring this compliance will void the warranty on the refrigeration system. On heat pump models, it is not recommended to operate the unit in the heating cycle when the water inlet temperature is below 50F. Doing so could reduce the specified heating capacity and may cause the freeze control to cycle the compressor off, resulting in a loss of heating.



IMPORTANT: The Koldwave Kompac unit has been designed and engineered to provide needed cooling within the performance parameters of this manual. Following the installation and preventative maintenance instructions can extend the length of service you receive.

Specification and Electric Data

CAPACITY CODE	4WK07	4WK14	4WK16	4WK23	4WK26
CAPACITY DATA					
Cooling Capacity (A)	7000	12500	16000	23200	26000
Heating Capacity (B) & (D)	7800	14200	17900	31000	31000
Evaporator-CFM @ 0.0 ESP	250	410	480	800	800
ELECTRICAL DATA					
Volts (Single Phase)	115	115	115*	208/230	208/230
Amperes (Cooling)	8.00	11.60	13.00	12.70/11.80	12.70/11.80
Amperes (Heating)	7.5	10.80	13.00	12.50/11.50	12.50/11.50
Watts (Cooling)	897	1276	1684	2416	2708
Watts (Heating)	840	1301	1692	2839	2839
E.E.R.	7.80	9.80	9.50	9.60	9.60
C.O.P.	2.70	3.20	3.10	3.20	3.20
Fuse/Breaker amps	15	15	20	20	20
Compressor H.P.	1/2	1	1 1/4	2	2
Blower Motor H.P.	1/25	1/15	1/15	1/7	1/7
In Rush Current (amps)	40.00	71.50	95.50	72.90	72.90
CONDENSATE PUMP					
Power Consumption with Pump on	30	30	30	30	30
Voltage	115	115	115	208/230	208/230
Maximum Discharge Lift (Feet)	19.5	19.5	19.5	19.5	19.5
CONDENSER WATER FLOW & PRESSURE DROP DATA (G)					
GPM @ 85F E.W.T.	1.75	3.00	4.00	6.00	6.00
Cond. Coil delta P (P.S.I.)	1.40	3.00	5.30	6.80	6.80
Water Valve delta (P.S.I.)	2.00	3.00	5.00	14.00	14.00
GPM @ 60F E.W.T. 100F L.W.T.	0.44	0.75	1.00	1.50	1.50
Cond. Coil delta P (P.S.I.)	0.60	0.80	1.00	0.80	0.80
Water Valve delta (P.S.I.)	2.00	2.00	2.00	2.00	2.00
Max. Water Side Working Pressure/With Water Valve-150 P.S.I./Without Valve-400 P.S.I.					
MISC. DATA					
Evap. Coil-# of Rows	3	3	3	4	4
Coil Face Area (FT ²)	0.83	1.20	1.20	1.90	1.90
Refrigerant Charge R-22 in oz.	14	20	22	39	39
DIMENSIONAL DATA (inches)					
Height-With Casters	17 5/8	31 1/2	31 1/2	28 3/4	28 3/4
Height-Without Casters	n/a	29 1/8	29 1/8	26 3/8	26 3/8
Length	22 3/8	25	25	36	36
Depth	12	10 3/16	10 3/16	12 1/4	12 1/4
Koldwave	4830 Transport Drive		Dallas, Texas 75247		
	www.koldwave.com		www.mestekparts.com		

AIR FILTER DATA (inches)					
Width	15 3/4	18	18	24	24
Height	9 1/4	16	16	11 3/4	11 3/4
Thickness	1/2	1/2	1/2	1/2	1/2
<hr/>					
NET WEIGHT	83	124	125	183	183
<hr/>					
SHIPPING WEIGHT	89	133	134	201	201

(A) Cooling Capacity Rating Test Conditions:

Evaporator Air - 80F D.B./67F W.B.
 Condenser Water - 85F E.W.T./95F L.W.T.

(B) Heating Capacity Rating Test Conditions:

Evaporator Air - 70F D.B./60F W.B.
 Condenser Water - 70F E.W.T.

(C) Time Delay Fuses and Circuit Breakers are recommended.

(D) Reverse cycle units require 50F minimum water inlet temperature during the heating cycle.

(E) Total pressure drop for unit with Water Regulating Valve is sum of Condenser Coil and Water Valve Pressure Drop.

* Also available in 208/230 volt.



4WK07



4WK16



4WK23

Standard and Optional Features

Standard Feature

All Kompac series unit has removable panels to provide full service accessibility. Each unit comes with standard sliding glides for ultimate mobility.

Air Flow Flexibility

Air is discharged through four-way adjustable grilles, enabling a variety of airflow possibilities. All King Kompac model five grilles respectively. Washable, aluminum air filters are installed in each unit. Periodic cleaning will ensure optimal unit performance.

Quite, Rugged Cabinet

All Kompac series unit outside panels are constructed stainless steel finish for rigid construction.

Automatic Water Valve

All Kompac (air conditioners and heat pumps) are equipped with a direct acting, refrigeration system head pressure actuated water-regulating valve. This valve, set at the factory for 95 to 100F outlet water temperature, permits only that amount of water to follow that is needed to achieve the desired refrigeration system pressures. In addition, heat pump models are quipped with a water bypass solenoid valve to provide immediate and continuous water flow on heating.

Safety Engineered

All units incorporate with in the refrigeration system, a high-pressure switch for maximum safety of the compressor. The cutout pressure setting is 375 PSIG +/- 5

PSIG, and it will reset at 265 PSIG. A low-pressure switch is also included which opens at 26 PSIG and reset at 68PSIG. During the heating cycle of the heat pump models, a freeze control sensor set at 37 +/- 2 F monitors the water temperature leaving the condenser to cut-out the unit and protect the condenser from freezing.

Touch Pad Controls & Remote

All models have self-contained thermostats to provide the desired amount of cooling, which can be selected by adjusting the Up and Down arrows on the unit touch pad or remote controls. (Please refer to the Unit Operation for detailed explanation)

Built-In Condensate Pump

Each unit contains a condensate pump for the positive removal of evaporator condensate. It is a completely automatic operation and the pump will operate only when water is present and will stop when the water has been pumped away. Each pump will remove up to 14 liters/hour (3.75 gph).



Water-cooled Condenser Coil

All Kompac series units are equipped with coaxial/trombone “tube-in-tube” design condenser coil. Water flows through the inner tube while refrigerant flows in the annulus between the inner and outer tubes.

Filter

All Kompac series units are equipped with 1/2” thick, washable, aluminum mesh air filter located behind the front panel that can

easily be removed and cleaned. Just pull the filter end cap tab at bottom of filter and slide out.

Discharge Air Grilles

All Kompac series units are equipped with four, or five 5" x 5", four-way adjustable, plastic grilles located in the upper front panel, enabling a variety of airflow possibilities. Life panel, enabling a variety of air flow possibilities. Life each black grilles (approximately 4/4") and rotate to the desired position. Release the grille and allow it to return to the set position within the cabinet. By this means air low can be positioned in any of four directions.

Quick Connect Water Hose

Customer must order one of the four quick hose kits along with their unit. Each of these quick connect hose kit will provide quick and precise water connection to all Kompac unit.




- 1) 18" hard pipe kit with dedicated male NPT fittings.
- 2) 10-foot hose kit.
- 3) 20-foot hose kit.
- 4) 40-foot hose kit.

The 10, 20 and 40-foot hose kit will supply with hose kit fitting to fit most water faucets on the water-in line. The water-out and condensate lines of the three-section flexible plastic hose can be fed to a sink or permanent drain.

Service Cord

All Kompac series units are equipped with LCDI device service cords, which reflects to the new UL484 standards. The service cords employed have plug configurations and receptacle requirements as shown in the

chart below. We strongly recommend user to follow the plug configurations without manually altering the pin layout on the plug.

	15A - 125V Nema 5 - 15P	Nema 5 - 15R
	20A - 125V Nema 5 - 20P	Nema 5 - 20R
	20A - 250V Nema 6-20P	Nema 6 - 20R

Optional Features

Treated Evaporator Coils

For air conditioning applications where airborne contaminants are a problem, acrylic coated evaporator coils are recommended to guard against pitting or corrosion.

Remote Control

Optional remote control can provide extra flexibility to customers. Users can remotely control all aspect of the functionality of units (both AC and Heat Pump unit).

Installation Instruction

Electrical Requirements

Check the data plate on the back of the unit to make certain that the proper power is available within plus or minus 10% of the rated voltage. Refer to the “Specification” section for voltage and fuse requirements. Check for proper wall outlet as described in “Standard Features”. Operating the unit on improper voltages will void the warranty.

Water Fitting Location

Prior to placing the air conditioner in the desired position, note the exact location of the water fittings on the valve plate on the unit side panel. Water lines should be securely attached to water valve plate fittings, and this will be accomplished easily though the quick connect hose kit provided along with the unit per customer’s selection on the hose kit requirement.



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 second. Then, the LED temperature indicator will illuminate the set point for 5 second 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.

Heating Hi (Heat Pump Unit):

Depress the HEAT HIGH button; the unit will be in heating mode depending on thermostat reading. The reversing valve will operate to prompt the heat pump mode. 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 AMBER LED will illuminate accordingly.

Heating Lo (Heat Pump Unit):

Depress the HEAT LOW button; the unit will be in heating mode depending on thermostat reading. The reversing valve will operate to prompt the heat pump mode. 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 AMBER LED will illuminate accordingly.

Temperature Setting:

During any mode of operation, user is able to change the set point by depressing the arrow buttons. The temperature indicator will switch to display “set point temperature”. By 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 second.

Unit Off:

Depress 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. During the

heating mode, the compressor will only be energized if the temperature is at least 2 degrees below the set point, and de-energized once the temperature rises to 2 degrees above 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:

Our 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 satisfied.

Self Recovery Mode (*):

Our unit controller is equipped with self-recovery mode 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 that 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” (Factory Default Setting)

A1 – Self-Recovery Mode “on”

Check Alarms:

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

1. Alarm_High_Press (E.H),
2. Alarm_Low_Press(E.L),
3. Alarm_Freeze (E.F),

4. 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 unit will lock out. Once the failure is clear, press the OFF button, the Power LED will stop blinking and room temperature will display.

Auto Reset High/Low Pressure switch:

If the High Pressure/Low Pressure Switch trips, "**H.P/L.P**" is displayed until the failure clears. Once failure clears the unit goes back to the previous mode it was in before the trip. If the High Pressure Switch trips 3 times within 30 minutes, the unit is locked out, forced into the Off position, and "**E.H/E.L**" is displayed on the display and **Power LED** will blink, signaling that the alarm condition is present. Once the failure is clear, the room temperature will display and pressing any mode button can manually reactivate the unit.

Optional Remote Control:

The optional remote control will have the identical function as the main unit excludes 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*



AC Unit Control Panel



Heat Pump Control Panel



Optional Remote Control

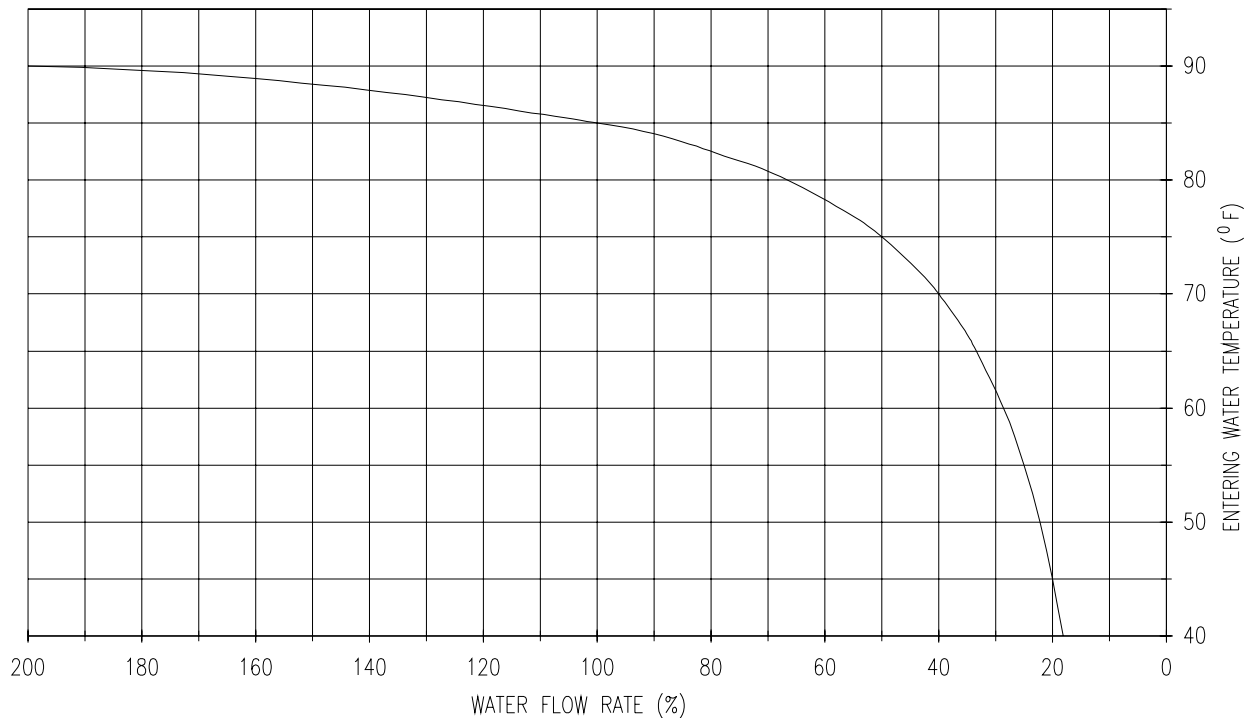
Water Flows at Various Entering Water Temperatures

The rated water flow rate at 85F entering water temperature (E.W.T) is given in the specification chart earlier in this manual. Water flow rates in that chart will be significantly different from rated water flow at other entering water temperatures. The variance from rated water flow rate is found using the graph below. Using your actual E.W.T., multiply the percentage by the condenser flow rate at 85F E.W.T. to obtain the actual water flow rate required.

For Example:

What is the actual condenser water flow rate at 50F E.W.T. (KPC-14)?

1. The condenser water flow rate at 85F E.W.T. is 3.0 G.P.M. from the Water Flow chart.
2. At 50F E.W.T., the water flow rate percentage would be 25% as seen on the graph.
3. Multiply 0.25 by 3.0 G.P.M. to get an actual water flow rate of 0.75 G.P.M.



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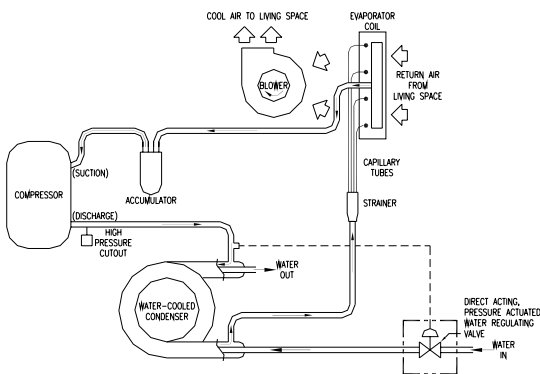
Modes of Operation

Kompac Series conditioners are available in either a “Cooling Only” or “Cooling/Heating” model.

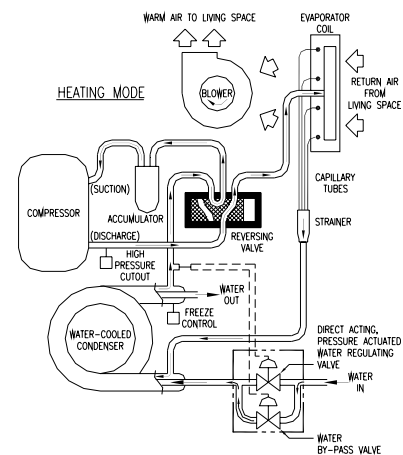
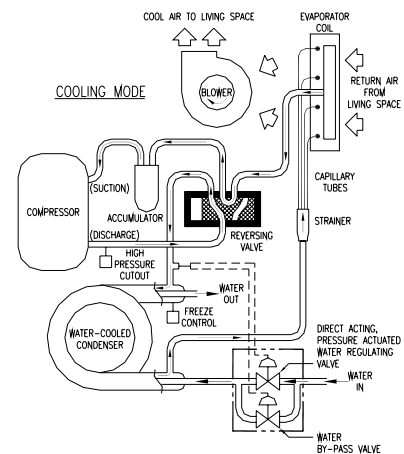
The “Cooling” mode directs refrigerant from the compressor to the water-to-refrigerant condenser when the dry bulb temperature is above the desired thermostat setting.

The Heat Pump Model operates in the cooling or heating modes, depending on thermostat command. A solenoid activated, reverse-cycle valve controls the flow of refrigerant gas through the unit. In the cooling mode, the solenoid is de-energized and the refrigerant is directed from the compressor to the water-to-refrigerant condenser. If heating is required, the solenoid coil is energized, reversing the cycle and directing refrigerant from compressor to the air-to-refrigerant condenser, i.e., air-to-refrigerant evaporator in the cooling mode.

Cooling Unit



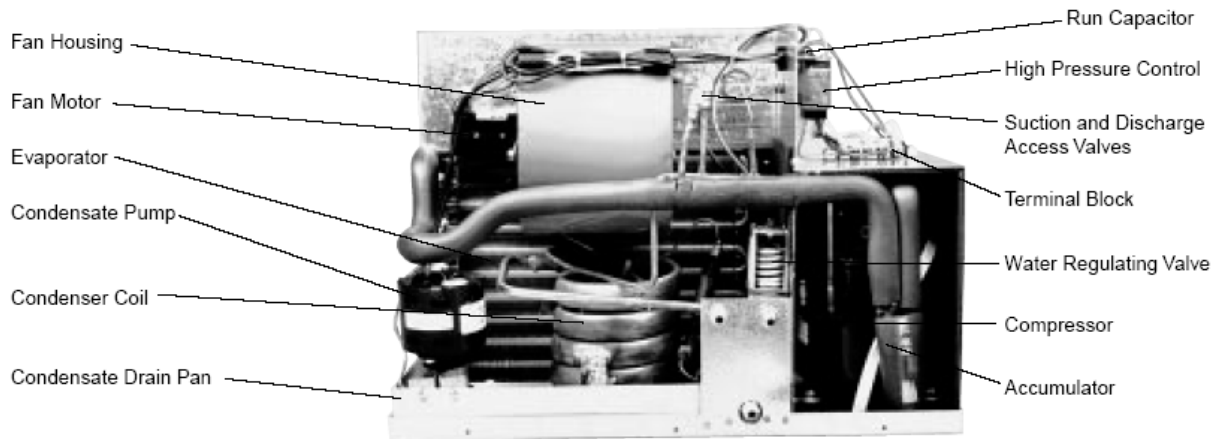
Heat Pump Unit



Koolette Unit Construction



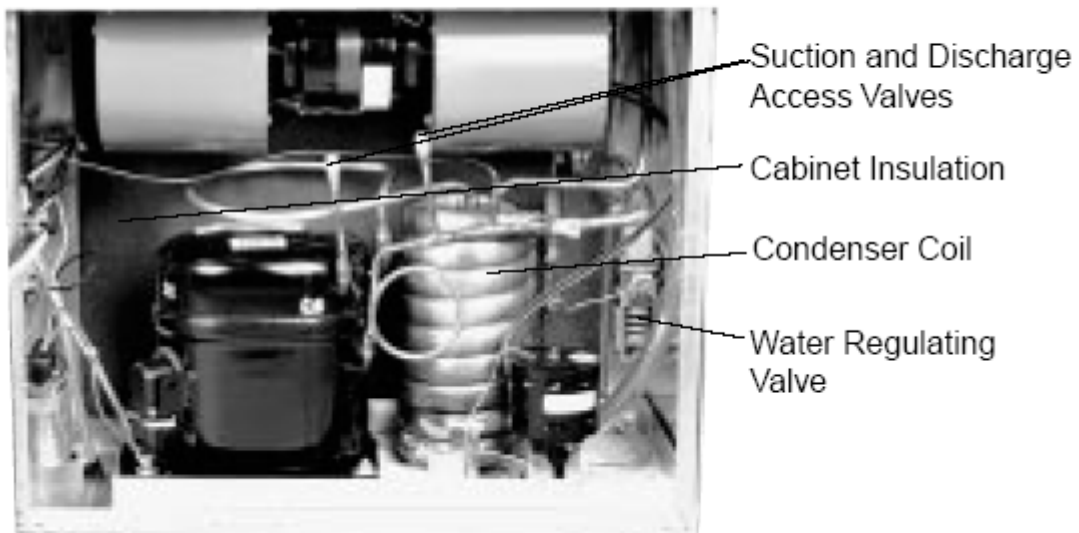
Air Conditioner Cutaway



Kompac Unit Construction

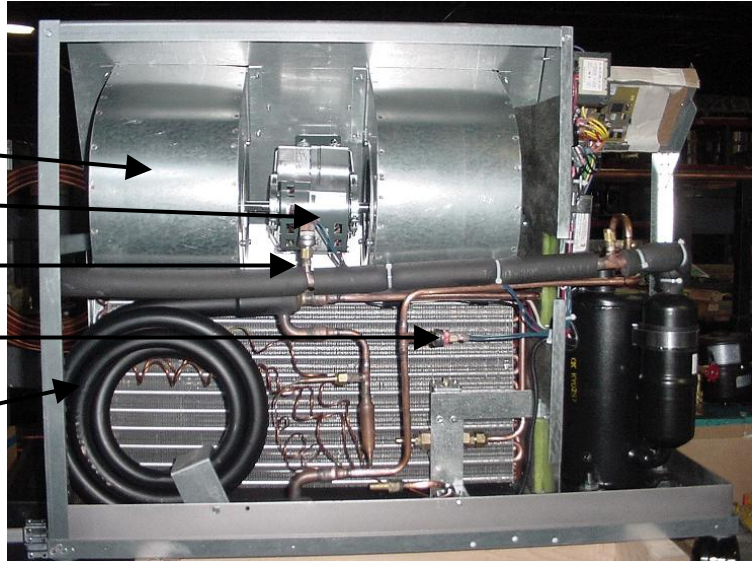


Air Conditioner Cutaway

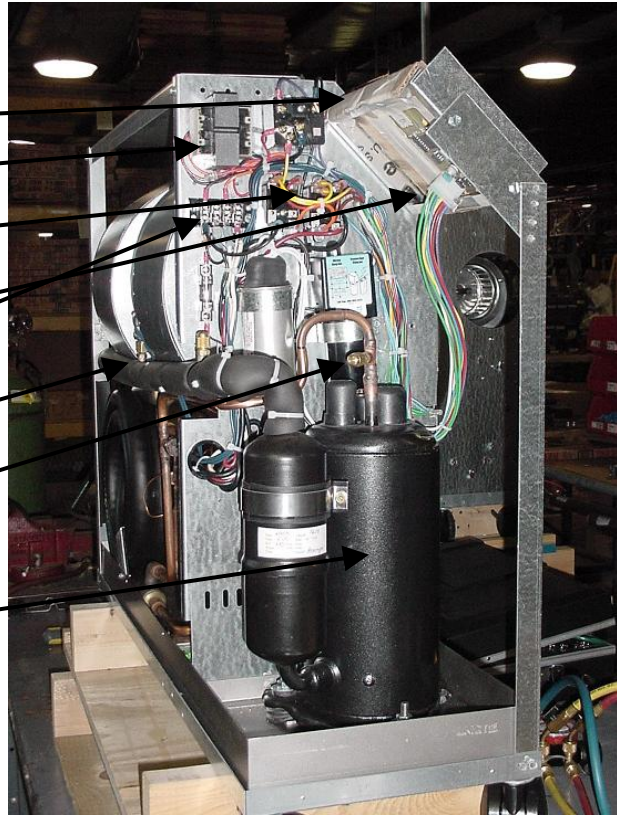


King Kompac Unit Construction

- Blower
- Fan Motor
- Auto-reset Low Pressure Switch
- Auto-reset High Pressure Switch
- Water Cooled Condenser



- Compressor Contactor
- Transformer
- Fan Relays
- Controller Board
- Terminal Blocks
- Suction Line
- Discharge Line
- Rotary Compressor



INSPECTION AND REPAIR OF ELECTRICAL SYSTEM

Always disconnect power and discharge capacitors before servicing.

High and Low Pressure Switch

Check for continuity across terminals 1 and 2 of the pressure switch. At normal pressure when the unit is not operating, there is continuity across the two terminals. If continuity is interrupted across the terminals, replace the pressure switch.

Compressor Overload Relay

Check for continuity across the overload relay's two terminals. At normal room temperatures, there is continuity across the two terminals. If no continuity exists, replace the overload relay.

Compressor and Fan Motor Capacitors

Check visually for bulges or signs of leakage. A capacitor tester is recommended. This instrument checks for an open capacitor, shorts, leaks, grounds, and also gives direct capacitor reading in mfd.

Inspection and Repair of Refrigerant

Attentively check all connections and every part for leaks whenever the refrigerant system is repaired. Use a leak detector or the 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.

Service Procedures

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. In service/troubleshooting, there is no substitute for a good understanding of the Koldwave modes of operation and control systems.

KOLDWAVE KOMPAC SERIES

PROCEDURE FOR PARTS REPLACEMENT

A. Fan Motor

1. Remove the entire cabinet on models 4WK10, 4WK14, and 4WK16. remove discharge air grilles first. Sides and back are one piece, with screws located at bottom of cabinet.
 2. For models 4WK23 and 4WK26, remove cabinet front panel first. Sides, front and top are one piece with screws located on the bottom of the cabinet.
 3. For all models, remove fan motor wires from terminal block and fan speed relay. On Kompac and King Kompac models, remove screws from blower housings located by discharge of blower. Remove locknuts retaining motor to motor base. Remove motor, blower housings and blower wheels as an assembly. On model 4WK07, the cabinet is in two pieces. Remove front and top first, then back and sides. All screws are external and visible. Loosen set screw in blower wheel. Loosen clamp around motor housing and remove motor.
 4. Install new motor, reversing the removing procedure.
2. For models 4WK10, 4WK14, and 4WK16, remove return air grille and filter. Take off panel on which controls are mounted by removing two screws on the left side of the unit by the corner, and two screws on the bottom of the control panel. Follow same removal procedure and controls replacement as described for model 4WK07.
 3. To replace unit touch pad control panel on models 4WK20 and 4WK26, remove front panel. Follow same removal procedure and controls replacement as described for model 4WK07.

C. Condensate Pump

1. To replace condensate pump on models 4WK07, remove the entire cabinet. Disconnect pump wire leads from terminal block. Remove retainer clamp and tygon tubing. Replace pump, reversing the above procedure.
2. On models 4WK10 to 16, remove return air grille, filter and control panel. Disconnect pump wire leads from terminal block. Remove Velcro and tygon tubing. Replace pump, reversing the above procedure.
3. For models 4WK23 and 4WK26, remove the front, back and right side panels only. Follow the same procedure as described for models 4WK07 to 16 to replace the pump.

B. Unit Touch Pad Control

1. For model 4WK07, remove return air grille and filter. Remove front top panel and pull away towards left. Disconnect wiring harness from controls. Lift up and remove the flexible panel cover. Loosen the four nuts from behind the circuit board and remove the board. Reverse the above process to install the new circuit board.

D. Pressure Actuated Water Valve

1. Gain access and disconnect water lines.

2. Disconnect sensing probe from Shrader valve on discharge line. Doing it quickly will minimize the amount of refrigerant loss.
3. Remove valve from mounting bracket.
4. Install new valve.

MISCELLANEOUS PARTS REPLACEMENT AND/OR ADJUSTMENTS

Part Name

- A. High and low pressure switch
- B. Compressor run capacitor
- C. Start capacitor and relay
- D. Freeze control
- E. Terminal block
Remove return air grille, filter and control panel and cabinet panels as described above.
- F. Compressor Overload
Remove return air grille, filter and control panel on Kompac models. Take off tope/front panel on model 4WK07.
- G. Reversing Valve
- H. Reversing Valve Solenoid Coil
Remove front return panel on models 4WK10 to 16. Take off back panel on 4WK20 to 26. Remove entire cabinet on 4WK07.

Preventive Maintenance

Kompac Series units have been designed to give maximum performance and reliability with minimum maintenance. Maintenance of the system is concentrated in four areas covered in the following paragraphs.

1. Blower Motor:

On model K07D, remove the one-piece front and top cabinet panel to reach the motor. On models K23-K26D, remove cabinet front and back panel to reach the motor. Take off the front louvered panel on models K10-K16D to gain access to fan motor.

Blower Motor Maintenance:

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

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.

2. Condensate Pump

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

Pump Maintenance:

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.

3. 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. If cleaning solutions are applied through means of high pressure spray, care must be taken to avoid damaging coil fins and water tube condenser.

Condensate drain pan and drain system must be periodically flushed.

4. Filter

The life of a filter depends entirely on its environment and use. It is recommended that the filter be inspected on a regular basis every five to six weeks. A clogged filter will cause the unit to operate at greatly reduced efficiency. Pulling filter end cap at bottom of filter, slightly lifting up and pulling out can easily remove washable aluminum air filters located behind the front panel. The filter must be washed periodically as needed this may be done as follows:

1. Soak 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. Re-install with oiled surface facing out from unit.

General

If necessary maintenance steps outlined above are carried out regularly, the unit will provide long and reliable service, which you should expect from a Koldwave quality product. The refrigeration and electrical circuits of the system should only be serviced by a fully qualified service technician.

CAUTION:

If the unit is to be stored in an unconditioned space during cold winter months, all water must be removed from the condenser coil prior to storage. To do this, disconnect the water outlet line on the water regulating valve and blow remaining water out using high pressure air or nitrogen.

If you experience any problems any problems or have comments on your Koldwave product, we are always pleased to hear from you. This is the main way in which we can improve our equipment and assist you in meeting your requirement.

Trouble Shooting Guide

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

Problem		Possible Cause		Remedy
Entire unit does not operate	1	Power interruption.	1	Check for blown fuses or tripped circuit breakers. Check reset button on power cord. Replace or reset if necessary
	2	Unit keypad control.	2	Setting may be too high; lower setting. Sensor may be out of calibration or defective; replace if error message ES is displayed. Check for loose wires and tighten
	3	No voltage at transformer	3	Check and replace.
Evap fan runs but compressor does not start	1	Low voltage.	1	Check power supply for proper voltage at unit plus or minus 10% of rated nameplate voltage.
	2	Unit keypad control.	2	Check keypad for loose wire. Tighten any loose connections.
	3	Freeze control open on heat pump models.	3	Replace if defective, tighten any loose connections. Inlet water temperature cannot be below 50 deg.F.
	4	High pressure switch.	4	Check for loose wires; tighten any loose connections. If defective, replace.
	5	Low pressure switch.	5	Check for loose wires; tighten any loose connections. Check system pressures; if unit out of refrigeration, repair leak, evaluate and recharge. If switch is defective, replace.
	6	Compressor and/or contactor shorted, open or burned.	6	Remove and replace.
	7	Loose wires.	7	Tighten any loose connections.
Compressor starts and runs but fan does not run.	1	Open fan motor contactor circuit.	1	Check or replace fan motor contactor.
	2	Shorted or open fan motor.	2	Replace fan motor.

Noisy operation.	1 Copper tubing vibrating.	1 Adjust by bending slightly to firm position. Separate tubes touching cabinet or each other.
	2 Machine vibrating out of level.	2 Level unit base. Fully support base.
	3 Loose cabinet or internal components.	3 Check and tighten loose screws.
	4 Loose blower wheel.	4 Tighten screws on blower wheel shaft.
	5 The blower wheel hitting shroud	5 Adjust wheel position on motor shaft.
	6 The blower motor bearing defective.	6 Replace the blower motor.
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Insufficient cooling or heating (for heat pump models)	1 Improper sizing of unit.	1 Check if the unit is undersized for the load. Add supplemental units.
	2 Insufficient air flow through evaporator due to:	2 Correct as follows:
	a) Dirty air filter in unit.	a) Clean filter
	b) Dirty evaporator.	b) Unusual condition required cleaning.
	c) Ice on evaporator coil.	c) Defrost; use fan only operating.
	3 Water bypass valve closed or not operating.	3 Replace or adjust.
	4 Water inlet temperature too cold or too hot	4 Check water inlet temperature using a thermometer. Inlet water temperature should never be below 50F and outlet water temperature should be between 95 and 100F.
5 Reverse cycle valve stuck open in heating or closed in cooling. Solenoid coil not switching valve to heating.	5 Check for power to solenoid coil, to verify that coil is functional. If the unit still does not switch to heating, replace reversing valve, evacuate and recharge unit.	
6 Unit not set for heating or cooling.	6 Refer to "Unit Operation" section.	
7 Loose connection in	7 Trace and repair.	

	electrical circuit.	
	8 Air restriction.	8 If air filter is dirty or if another air restriction exists, determine problem cause and control.
	9 Partial restriction in refrigeration system.	9 Restriction can be located by inspecting refrigerant lines for temperature changes. Remove restriction, evacuate and recharge.
	10 Water regulating valve inoperative or restricted.	10 Flush or blow dirt out of valve if necessary.
	11 Water temperature too high or low	11 "Water Out" not to exceed 110F or fall below 50F.
	12 Water to unit not turned on, or adjusted correctly.	12 Turn water on before starting unit. Adjust flow rate if necessary. 30 psig minimum.
Water leaking from unit.	1 Leaking drain pan.	1 Locate leak and repair.
	2 Defective or noisy condensate pump.	2 Replace pump if necessary. Make sure unit and pump are setting level. Check fuse, check and clean discharge line, clean pump.
	3 Loose evaporator drain or condensate pump hose.	3 Tighten connections.
Unit give electric shock.	1 Grounded electric circuit.	1 Test with an ohmmeter or high potential tester. Determine what is grounded and replace or rewire.
	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 receptable. If tripping again, it means there is an "Arc" detected. Check and replace the electrical receptacle outlet.
Unit tripping when plugged in	2 Commercial buildings do not have dedicated grounding system	2 Make sure the building where the units are being serviced have dedicated grounding system.

Compressor Troubleshooting

Starts and runs, but cycles on overload	1	Low voltage	1	Check overload protector
	2	Capacitor incorrect or defective	2	Replace start capacitor
	3	Condenser dirty, clogged or restricted	3	Clean condenser coil as described on page 18.
	4	Compressor grounded		
	5	Air or non-condensable gases in system		
	6	Wiring incorrect or defective		
	7	High head-pressure	7	Clean coils and filter, check system pressures
	8	Capillary tube or strainer restricted		
	9	Overload protector incorrect or defective		
	10	Refrigerant overcharged		
<hr/>				
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	Capacitor incorrect or defective		
	3	Compressor motor requires start assist	3	Unit is equipped with hard start capacitor. Check capacitor as described on page 17 and replace if necessary.
	4	Air or non-condensable gases in system		
	5	Capillary tube or strainer restricted		
	6	System not equalized (wait 5min. before re-start		
	7	Thermostat differential too close		
	8	Discharge line restricted		

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	Run capacitor incorrect or defective	2	Check capacitor as described on page 17 and replace if necessary.
	3	Compressor grounded		
	4	Compressor motor or mechanism defective	4	Replace compressor
	5	Compressor motor requires start assist	5	Unit is equipped with hard start capacitor. Check capacitor as described on page 17 and replace if necessary.
	6	Wiring incorrect or defective		
	7	System not equalized (wait 5 min. before re-start)		
	8	Overload protector incorrect or defective		
	9	Relay incorrect or defective	9	Replace relay.
	10	High head-pressure	10	Clean coils and filter, check system pressures
	11	Compressor locked	11	Replace compressor

Will not start; no hum	1	Compressor motor or mechanism defective	1	Replace compressor
	2	Wiring incorrect or defective		
	3	No power to unit	3	Check reset button on LCDI cord at wall outlet
	4	Fuse or circuit breaker blown		
	5	Overload protector tripped		
	6	Overload protector incorrect or defective		
	7	Thermostat contacts open		
	8	Thermostat set too high		

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 capacitor as described on page 17 and replace if necessary

3	Compressor motor or mechanism defective	3	Replace compressor
4	Wiring incorrect or defective		
5	Capillary tube or strainer restricted		
6	System not equalized (wait 5 min. before re-start)		
7	Fan motor too slow	7	Select HI speed on control panel
8	Fan blade or motor defective		
9	Fan blade or blower wheel stuck		
10	Overload protector incorrect or defective		
11	Thermostat differential too close		
12	Low refrigerant charge		
13	Refrigerant overcharged		
14	Improper louver setting		
15	Evaporator air flow re-circulation		
16	Room A/C front or front seals missing		
17	Unit oversized for application		

Run Capacitor

Burned out	1	Low voltage	1	Check voltage at wall outlet. Must be within 10% of nameplate rating voltage.
	2	High voltage	2	Check voltage at wall outlet. Must be within 10% of nameplate rating voltage.
	3	Compressor short cycles		

Condensor

Outlet (liquid line) hot	1	Condenser dirt, clogged or restricted	1	Clean condenser coil as described on page 18.
	2	Air or non-condensable gases in system		

- 3 High head-pressure
- 4 Refrigerant overcharged
- 5 High ambient temperature

Head Pressure

- Too high
- 1 Condenser dirty, clogged or restricted 1 Clean condenser coil as described on page 18
 - 2 Air or non-condensable gases in system
 - 3 Capillary tube or strainer restricted
 - 4 Fan blade or motor defective
 - 5 Refrigerant overcharged
 - 6 High ambient temperature

- Too low
- 1 Compressor motor or mechanism defective
 - 2 Capillary tube strainer restricted
 - 3 Low refrigerant charge
 - 4 Evaporator dirty, clogged or restricted 4 Clean evaporator coil as described on page 18
 - 5 Low ambient temperature
 - 6 Leak in system
 - 7 Dirty air filter (air flow restricted) 7 Clean filter as described on page 18

Evaporator

- Freezes
- 1 Capillary tube or strainer restricted
 - 2 Fan blade or blower wheel stuck
 - 3 Thermostat contacts stuck
 - 4 Thermostat defective
 - 5 Low refrigerant charge
 - 6 Evaporator dirty, clogged or 6 Clean evaporator coil as described on page 18

- restricted
 - 7 Low ambient temperature
 - 8 Dirty air filter (air flow restricted) 8 Clean filter as described on page 18
-

Noisy Unit

- 1 Compressor motor or mechanism defective
 - 2 Compressor mounting nut loose
 - 3 Fan motor bearings loose or worn
 - 4 Fan blade bent, causing vibration
 - 5 'Ping' due to fan blade hitting water droplets
 - 6 Refrigerant overcharged
 - 7 Improper unit installation
 - 8 Low ambient temperature
 - 9 High ambient temperature
 - 10 Dirty air filter (air flow restricted) 10 Clean filter as described on page 18
 - 11 Tube rattling
 - 12 Loose parts
-

Room Temperature

- Too high (insufficient cooling) 1 Low voltage 1 Check voltage at wall outlet. Must be within 10% of nameplate rating voltage.
- 2 Condenser dirty, clogged or restricted 2 Clean condenser coil as described on page 18
- 3 Compressor motor or mechanism defective
- 4 Wiring incorrect or defective
- 5 Capillary tube or strainer restricted
- 6 Fan blade or motor defective
- 7 Fan blade or blower wheel stuck
- 8 Thermostat set too high

9	Low refrigerant charge	
10	Improper unit installation	10 Check for airflow restrictions and objects blocking front of unit
11	Unit too small for its application	
12	Evaporator dirty, clogged or restricted	12 Clean evaporator coil as described on page 18
13	Leak in system	
14	Dirty air filter (air flow restricted)	14 Clean filter as described on page 18
15	Condenser water temperature too high	15 Adjust water temperature for 95 to 100 F outlet water temperature.

Running

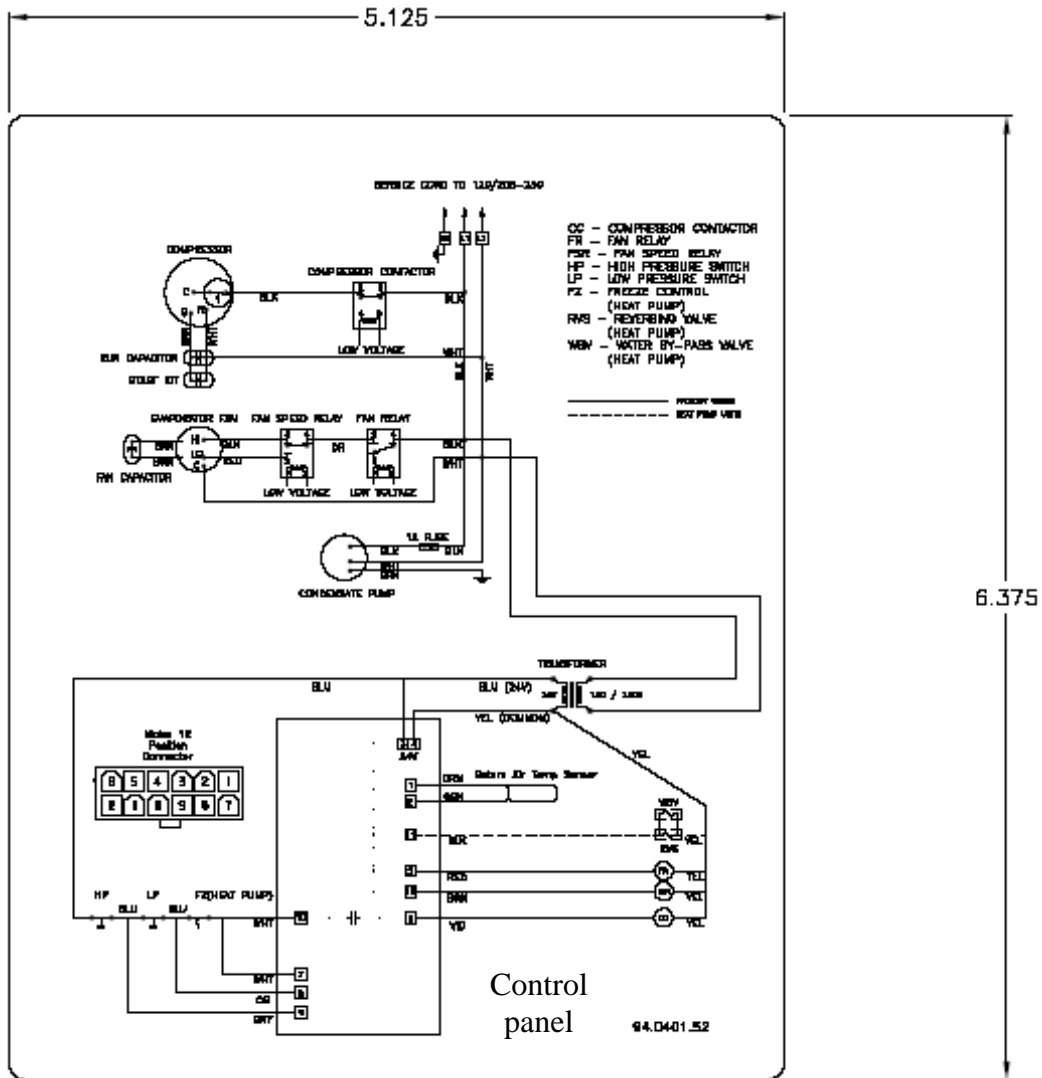
Cycle too long or unit operates continuousy	1	Condenser dirty, clogged or restricted	1 Clean condenser coil as described on page 18
	2	Compressor motor or mechanism defective	
	3	Air or non-condensable gases in system	
	4	Capillary tube or strainer restricted	
	5	Thermostat contacts stuck	
	6	Low refrigerant charge	
	7	Improper unit installation	7 Check for airflow restrictions and objects blocking front of unit
	8	Unit too small for its application	
	9	High ambient temperature	
	10	Leak in system	
	11	Dirty air filter (air flow restricted)	11 Clean air filter as described on page 18

House

Circuit breaker or fuses blowing	1	Low voltage
	2	Compressor short cycles
	3	Wiring incorrect or defective
	4	System not equalized

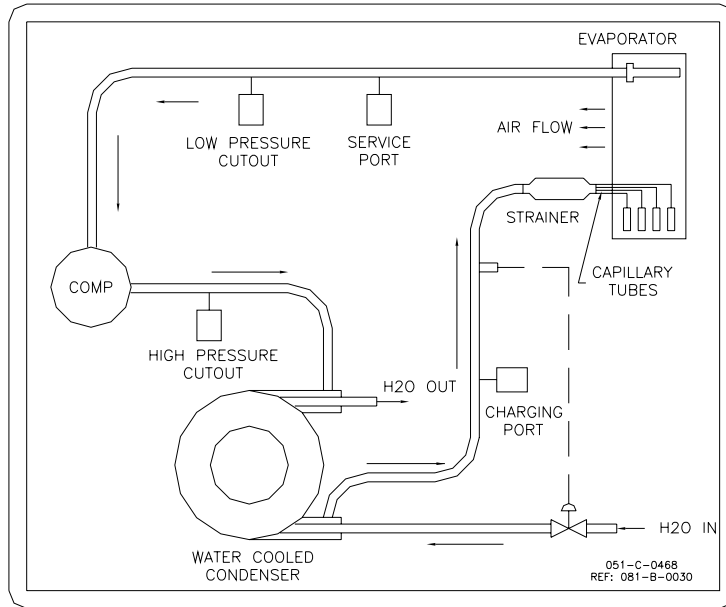
- 5 Improper fuses or circuit breakers
- 6 Room AC not on dedicated circuit
- 7 Grounded component

Wiring Diagram

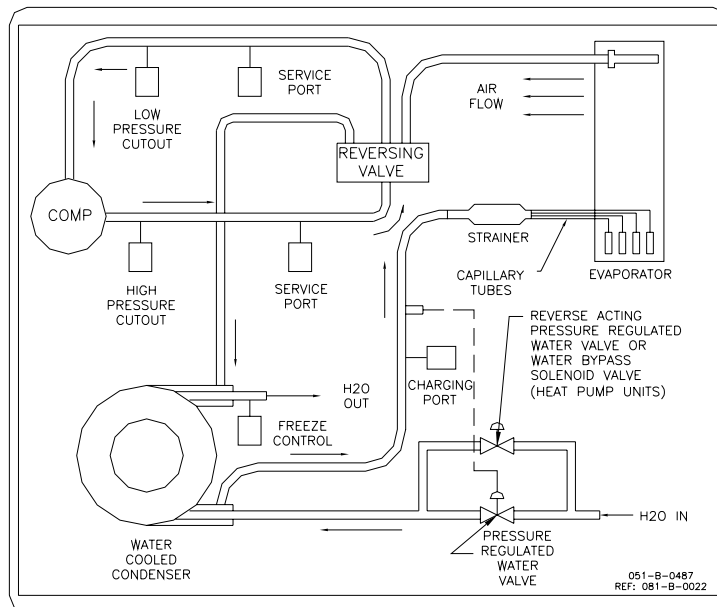


Piping Diagram

AC Unit Piping



Heat Pump Unit Piping



Limited Warranty

The Manufacturer warrants to the original owner that the Product will be free from defects in material or workmanship for a period not to exceed one (1) year from startup or eighteen months from date of shipment from the factory, whichever occurs first. If upon examination by the Manufacturer the Product is shown to have a defect in material or workmanship during the warranty period, the Manufacturer will repair or replace, at its option, that part of the Product which is shown to be defective.

The Manufacturer further warrants that the sealed refrigeration system (the product's compressor-motor condenser and evaporator) will be free from defects in materials and workmanship for five (5) years from date of start-up or sixty-six (66) months from date of shipment from the factory, whichever occurs first. If upon examination by the Manufacturer the Product is shown to have a defect in material or workmanship during the warranty period, the Manufacturer will repair or replace, at its option, that part of the Product, which is shown to be defective. Electrical parts (such as relays, overloads, capacitors, etc...) are included in the one year limited warranty but not with the five year limited warranty of the sealed refrigeration system.

This limited warranty does not apply:

1. if the Product has been subjected to misuse or neglect, has been accidentally or intentionally damaged, has not been installed, maintained or operated in accordance with the furnished written instructions, or has been altered or modified in any way.
2. to any expenses, including labor or material, incurred during removal or reinstallation of the Product.
3. to any workmanship of the installer of the Product.

This limited warranty is conditional upon:

1. shipment, to the Manufacturer, of that part of the Product thought to be defective. Goods can only be returned with prior written approval from the Manufacturer. All returns must be freight prepaid.
2. determination, in the reasonable opinion of the Manufacturer that there exists a defect in material or workmanship.

Repair or replacement of any part under this Limited Warranty shall not extend the duration of the warranty with respect to such repaired or replaced part beyond the stated warranty period.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, AND ALL SUCH OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED AND EXCLUDED FROM THIS LIMITED WARRANTY. IN NO EVENT SHALL THE MANUFACTURER BE LIABLE IN ANY WAY FOR ANY CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OF ANY NATURE WHATSOEVER, OR FOR ANY AMOUNTS IN EXCESS OF THE SELLING PRICE OF THE PRODUCT OR ANY PARTS THEREOF FOUND TO BE DEFECTIVE. THIS LIMITED WARRANTY GIVES THE ORIGINAL OWNER OF THE PRODUCT SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY BY EACH JURISDICTION.