



End User

Manual

KwiKool

Portable Air

Conditioners

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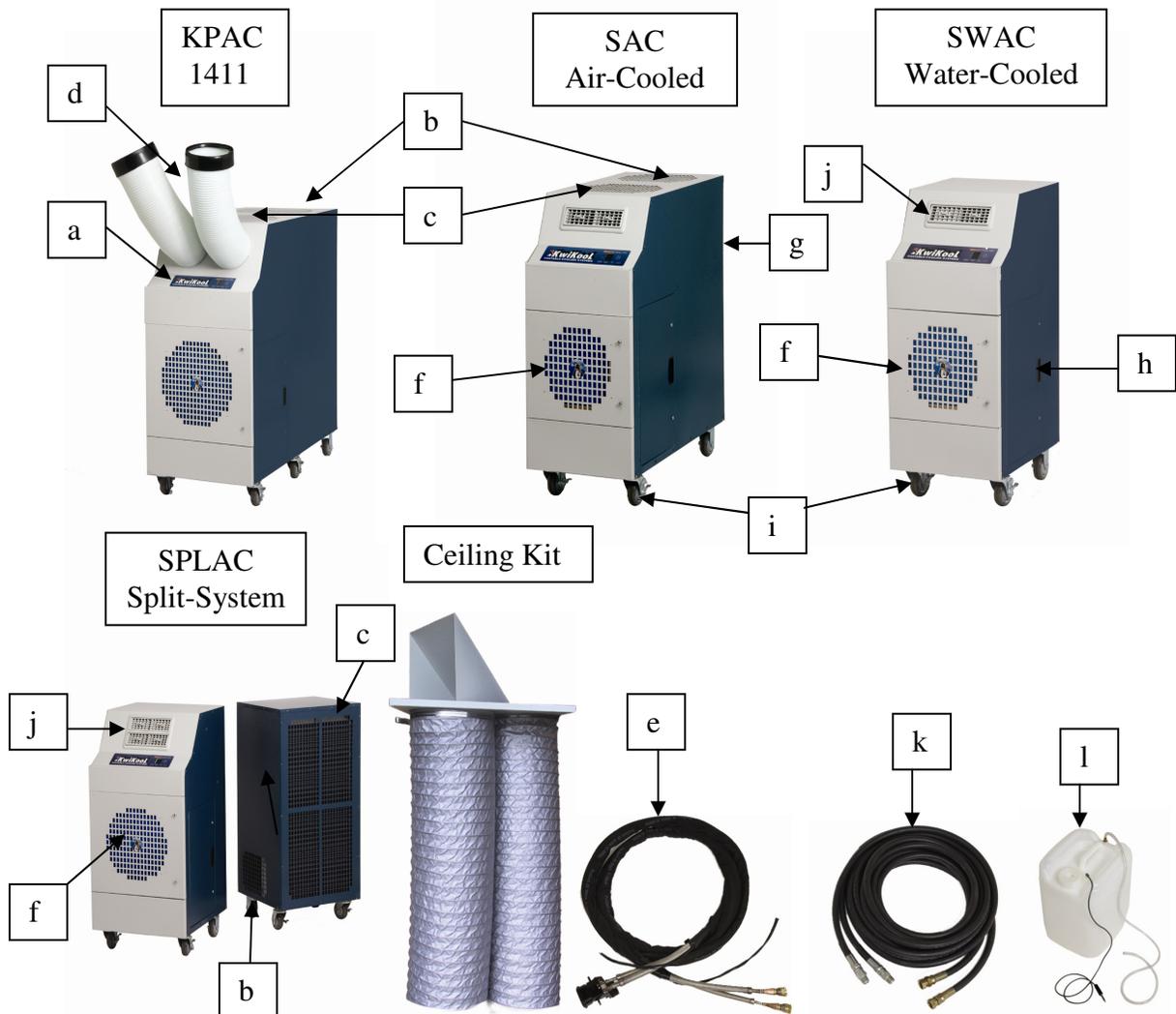
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## **Preface**

**Before installing and using your KwiKool portable air conditioner, read this manual carefully for instructions on proper usage and all safeguards. This manual should be retained for future reference.**

## 1. UNIT COMPONENTS

- a. Control Panel – Operational functions
- b. Condenser Exhaust Grill – Hot air condenser exhaust
- c. Condenser Intake Grill – Outside air condenser intake
- d. Air Chutes – Cold air supply, if equipped
- e. Line Set – Split-system only, 2 flexible 20-foot 2-inch diameter braided stainless steel lines with electrical condenser connection
- f. Filter Grill – Cold Air Return air filter grill
- g. Condensate Connections – 1/4-inch condensate nipple and female jack hole on back of unit
- h. Service Door – Access door to internal components
- i. Locking Casters – Locking wheels for stable placement
- j. Cold Air Grill – Cold air supply on models SAC1411 through SAC3021; optional air chute kit is available.
- k. High Pressure Water Line Set – 12', 25', & 50' Water-cooled only
- l. 5-gal Condensate Tank with float assembly for automatic cutoff



## 2. ASSEMBLY AND INSTALLATION

- a. **Air Chutes** (If Equipped) – Using the quick connect clamps (supplied); install two cooling air chutes to your KwiKool portable air conditioner. Slide the plastic flexible air chutes onto the metal flanges on the top front of the unit and tighten the screw part of the clamps until snug to secure the chute. If the chute does not fit, adjust the chute by a slight twist counter clockwise to open it further.
- b. **Condensate Tank** – KwiKool units come with an external 5-gallon condensate tank, except for the KPAC units, which have a built in tank. Both the internal and external condensate tanks are equipped with a float assembly for automatic unit shut down, when the condensate tank is full. The external tank's condensate line is attached to ¼-inch nipple located next to the power cord on the back of the unit. The tank also has an attached plug jack, which is inserted into the female hole above the nipple on the unit. **If the plug jack is not inserted, the unit will go into alarm and will not operate until the jack is inserted.** An independent condensate line can be used instead of the condensate tank. (See section 3.e. Condensate Pump.)
- c. **Ceiling Kit (Optional Accessory)** – The ceiling kit is comprised of two flanges with screws, two 8-foot lengths of duct, duct clamps, and one (for 1.5-ton units and below) or two (for all other air-cooled units) 2-foot by 2-foot replacement ceiling tiles. Attach the flanges to the top on the unit, and then attach the duct to each flange using the hose clamp. The other end of the duct is attached to the replacement ceiling tile. If the optional ceiling kit is used, follow these guidelines carefully. First, check above the ceiling to make sure that it is open to the whole floor. **If the sheet rock surrounding the room extends to the next floor above the ceiling, above ceiling ducting is required through the sheet rock, using a double flange ceiling kit. If the hot condenser air is ducted to dead air space, the pressure will back up into the machine shutting it down, due to high head pressure.** If above ceiling ducting is used, check the model specifications for the maximum condenser duct length. After you have determined that the area above the ceiling is open to the whole floor, attach the supplied duct to the replacement ceiling tiles using the clamps in the kit. Then remove the appropriate ceiling tile above the unit position and insert the replacement-ceiling tile. If there are two ceiling panels with your kit, make sure that the deflector is facing the opposite direction to the other opening. This prevents the intake and exhaust air streams from directly mixing. Attach the hanging ducts from the ceiling panel to the collars on top of the unit and attach with the supplied hose clamps. Split-system (SPLAC) models use a housing with a single flange, which is attached to the condenser hot air exhaust. A single 12-inch duct is attached to the flange and extended to a 2-ft by 2-ft replacement ceiling tile, using the screw clamps.
- d. **Power Connection** – Follow all safeguards as listed in this manual. For all units that come with a factory-supplied plug, make sure that the voltage, amperage, and receptacle type are consistent with the model specifications. For units 3.5-tons and above a qualified electrician is required for connection of the 6-foot pigtail lead on the recommended circuit for the specific model. For three-phase units, it is important that the rotation of the evaporator fan (cold air supply) is correct. Make sure the fan rotation is counter-clockwise in relation to the drive motor. If it is going clockwise, switch two of the power leads. This should correct the problem. **Note: If the unit runs with the evaporator motor turning backwards, the unit will overheat and either trip the high pressure compressor switch or burn up the condenser motor.**

- e. **Water Connection for Water-Cooled (SWAC) Models** – Water-cooled units are equipped with two brass female ½-inch pipe thread connections located on the lower left corner of the back panel, except for 10-ton units which have 4 female connections. Use a proper sized wrench to connect either hard piping or the optional high-pressure line set. Apply Teflon tape to the thread for a good seal. Water pressure should be limited to 150 PSI and should be between 40 and 85 degrees F. If the water supply is interrupted the unit will shut down and go into alarm “AL” mode.
- f. **Flexible Line Set Connection for Split-System (SPLAC) Models** – Split-systems units are supplied with a 20-foot pre-charged self-sealing refrigerant line set, which is used to connect the cold air evaporator to the condenser section. Be sure not to kink the line set by making sharp bends, which will block the gas flow. There are two types of coupling, which are located on the lower center back panel of the unit sections. For units sized 1.5-ton and under there is a lever connection into the evaporator and two female coupling for the condenser. For units 2.5-ton and above there are 4 female couplings, two for the condenser and two for the evaporator. For permanent application using the substituted rolled up copper line set, a qualified technician should perform installation, avoiding any kinks in the line set. The following steps should be followed for hook up: 1) Remove the line set from the box and lay it out flat making sure that the connections match the color codes on the units and that the lever type, if equipped, has the lever on the top side. 2) To connect the coupling type fitting, make sure that the female swivel and male threaded fittings are clean and free from debris. Connect the female swivel to the male threaded fitting by holding the line set in one hand while threading the couple on with the other hand. You will have to apply pressure to the fitting to make the connection. Be sure not to cross thread the fittings. Tighten the fitting with the appropriate wrench, until the fitting just barely bottoms out on the male fitting for a snug, but not tight fit. **Do not over tighten the fittings!!!** It is better to be a quarter-turn too loose than too tight. 3) For units with the lever-type connection pull the lever back until it is positioned in the up position. Hold the fitting in one hand and pull back on the black plastic sleeve. While holding this sleeve back, gently push the connector onto the male fitting on the evaporator. You may have to gently rock it to insure that it is totally inserted into the coupling. Push the sleeve toward the unit. It should go in completely. Gently pull on the line set to assure that it has engaged properly. When you are confident that the sleeve is locked in place, push the lever back to its closed position until it stops, completing your refrigeration connection. Now insert the electrical fitting into the female opening just above the refrigeration connections on the condenser and evaporator sections. **(Multiple disconnections may result in a loss of refrigerant.)** 4) Attach the electrical connection to the underside lip above the fittings, which provides power to the condenser.

### 3. OPERATIONAL SAFEGUARDS

**Read the following safeguards carefully before installing the unit:**

- a. Do not operate or install your KwiKool unit in a potentially explosive, combustible, or corrosive gas atmosphere.
- b. Keep your KwiKool unit away from flammable materials and other sources of heat.
- c. To avoid electrical shock keep your KwiKool unit away from direct contacts with water and any liquids and do not touch your unit with wet hands.

- d. To insure your KwiKool unit is stable, the floor on which the unit is to be placed should be level, free of vibration and strong enough to support the weight of your KwiKool model.
- e. Do not move the unit while it is running. Before moving the unit, first unplug the unit from the power source. Then set the caster locks to the "Off" position, freeing the casters to roll. Be sure to lock the casters by setting the caster lock to the "On" position, when the desired position is achieved.
- f. Do not tilt or overturn your unit, since this could damage the compressor.
- g. Do not place objects on top of your unit.
- h. Do not insert your hand or any other object into the cold air supply chutes.
- i. Do not operate your KwiKool unit with its service doors open or removed.
- j. Close supervision is necessary when the unit is used near children or pets.
- k. Your KwiKool unit should not make any abnormal noises or vibrate while in operation. **If this should occur, turn the unit off and call KwiKool at 1-800-594-5665.**

#### 4. UNIT OPERATION – Touch Pad Controls

- a. **Control Panel** – The operation of the unit is controlled by a microprocessor. The control board is located directly behind the touch pad control. Check the power supply before unit operation. If a power failure occurs, the unit control will return to the previous set point.
- b. **On/Off Button** – Depressing this pad will turn the unit on or off each time the pad is depressed. The unit has a three-minute short cycle protection time delay after turning on the unit before the compressor startup occurs.
- c. **Mode Button** – Depressing the fan mode button will cycle through the available modes. The modes are: 1) "Fan" mode, causes the fan to run continuously, without the compressor in operation. 2) "Cool" mode, causes the both the fan and the compressor to operate, after the two-minute delay. 3) Heat (if equipped), both fan and heat elements will operate. 4) Auto (if heat equipped) unit will auto change between heat and cool.
- d. **Fan Button Single Speed Models** – Models KPAC1011, KPAC1411, SAC2411 and SAC6043. Pressing this pad will cycle the fan from "auto fan" to "fan", as indicated by the display. The fan button can be overridden when the mode switch is set to "fan".
- e. **Fan Button for Cold-Air Supply** – On 3-speed models pressing the fan button will cycle the fan speed from "Low" to "Medium" to high to "Auto Speed". "Auto Speed" will automatically adjust the fan speed based on the current cooling demand from the compressor load. **For continuous cold air fan operation on all units, press and hold down the fan button for 3 to 5 seconds, until the display showing "auto" disappears. You can continue to press the fan button to change the fan speed. Placing the unit in "Fan On" mode can improve air circulation while retaining the appropriate cooling response.**
- f. **F/C Button** – Pressing this pad will cycle the display between Fahrenheit and Celsius temperature measurement. Note: For ambient temperatures in excess of 99 degrees F., the display will flash "99", indicating an ambient air temperature exceeding 99 degrees.
- g. **Up (+) and Down (-) Arrow Buttons** – Depressing these keys will change the temperature set point. During normal operation the display shows the incoming air temperature. When either arrow is pressed the display will change to the setting temperature and the word "Set" will be shown on the display, indicating target temperature set point. The display will revert back to ambient temperature

within a few seconds of releasing the arrow button. Unit capacity sizing is based on maintaining a 72-degree F. temperature. For every degree below 72 degrees F. the unit selected must have an additional 6,000 Btus of capacity for a 100 square foot server room. **Please note, if the heat load of the room exceeds the capacity of the unit, the unit will not shut off and may freeze up.** If the unit freezes up, raise the set point at least 2 degrees in order to allow the unit to hit its set point and cycle off.

## 5. BUILT IN UNIT SAFEGUARDS

- a. **Compressor Protection Time Delay** – An internal overload circuit to prevent overheating protects the compressor. There is a two-minute time delay in the control system to prevent short-cycling of the compressor. The delay is in effect anytime the compressor is turned on, whether by the controls or resumption of power after an outage. The display will flash the “F” of the “C” during the timeout.
- b. **Fan Cycling** – All KwiKool models, except water-cooled units, are equipped with fan cycling, which provides limited coil freeze protection from low ambient temperatures and reduces startup current. The condenser fan comes on as coil heat load requires, but does not start with the compressor. The condenser fan will cycle more frequently at lower ambient temperatures of the intake air (under 80 degrees F.)
- c. **High-Pressure Switch** – The compressor is equipped with a high pressure shut down switch. If the unit is subjected to ambient temperatures above its design or if the unit has condenser ducting beyond its recommended length, the safety switch will trip to protect the compressor from excessive head pressure damage. Check for restrictions in the condenser ducts and make sure that the space above the ceiling has sufficient air flow or cubic space to absorb the rejected heat. After correcting the problem reset the high-pressure switch by opening the service door and pressing the red button on top of the control box. You should feel the switch click. It is located near the filter dryer on the small high-pressure line. Close the service door and restart the unit.
- d. **Low-Pressure Switch** – All KwiKool models has a low-pressure switch, except for the KPAC models, which protects the compressor from low-pressure damage. The low-pressure switch is located above the compressor inside the service door with two yellow wires connected to it. This switch will trip when the intake condenser air pressure drops below recommended specifications, which may be due to a constrained airflow from the condenser intake.
- e. **Service Ports and Sight Glass** – Service ports and sight glass are used for convenient diagnosis of refrigerant pressures. For all models the service ports are located inside the return air grill. For SAC air-cooled models the site glass is inside the condenser intake. For water-cooled SWAC models they are inside the back service door. For water-cooled SWAC and split-system SPLAC models the sight glass is inside the service door. **It is normal to observe bubbles in the site glass and does not indicate a low refrigerant level.**

## 6. APPLICATION SAFEGUARDS

- a. **Automatic Restart** – The system will resume operation automatically after a power interruption and returns to the previous settings.
- b. **Condensate Tank** – **When the condensate tank is full**, an audible alarm will sound, and the compressor will stop running and the control panel will

display “CF” to signify “Condensate Full”. When this occurs, turn the On/Off switch to the off position and unplug the float jack and condensate drain line from behind the unit and drain the tank. Replace the tank, plug in the float jack and drain line and turn the On/Off switch to the on position. The unit will return to its previous settings in two minutes. The condensate tank is normally used only for short-term applications. **Note: If you do not turn the unit to the off position, the unit will continue to sound the alarm until the float jack plug is reinserted.**

- c. **Safety Alarm** – If the unit alarm “AL” is displayed, the unit will automatically shut down and an audible alarm will sound. The “AL” display may indicate low or high condenser pressure, or a condensate pump failure. Call KwiKool (1-800-594-5665) for technical assistance.
- d. **Condensate Pump** – All KwiKool models, except KPAC models, come standard with an internal high lift condensate pump with a 20-foot head pressure. The pump collects the condensation that forms on the evaporator coil into its one-quart reservoir, during normal cooling operation. If the unit is required to operate continuously, it is recommended to run a ¼-inch condensate line from the nipple on the back of the unit to the nearest drain. The line can be run up the same path as the ducting, then across the ceiling to a drain, up to 150 feet away. The jack plug, located in the same package with the owner’s manual, must be plugged into the hole just above the ¼-inch nipple. The insertion of the jack plug will deactivate the condensate alarm by sending a message to the unit that a condensate line has been run to a drain.

## 7. APPLICATION REQUIREMENTS

- a. **Air Temperature Requirements** – The environmental requirements of your KwiKool unit at the installation site are 60 to 110 degrees F for the intake condenser air. If the unit is operated in an environment above this range, the high head pressure switch will trip, stopping the unit’s compressor, which must be reset by pressing the red button on top of the switch. **Standard air-cooled KwiKool models are not designed to operate at temperatures below 60 degrees F. Low-ambient temperature controls must be special ordered at an additional cost.** If the intake air for the front duct is taken from outside the building, the unit will cause the unit to cycle excessively at temperatures below 60 degrees F. For split-system models the condenser section must be placed in an area with ambient air temperatures above 60 degrees F. or the unit will cycle excessively and damage the fan cycling switch.
- b. **Capacity & Temperature Settings** – Sizing of our units is based on matching capacity to a specific heat load while maintaining a 72-degree F. temperature. In order to reach temperatures below 72 degrees F., the unit must have extra capacity. **Therefore, we recommend that you do not set the temperature set point below 72 degrees F., unless you have excess cooling capacity, since this may cause the unit’s coil to freeze up.**
- c. **Condenser Intake/Exhaust Air Requirements** – Two ducts attached to the flanges on the top of the unit, are normally vented to a drop ceiling via the ceiling kit. The rear top flange is for the condenser hot air exhaust and the front flange is for the condenser intake air. The area above the ceiling must be open to the rest of the floor or tied into duct, which leads to the outside. **If the area above the ceiling is sealed the pressure will back up into the unit and shut it down, due to high head pressure. (See ceiling kit section c on page 4.)**

- d. **Positioning of Unit** – Do not place your KwiKool unit in direct sunlight, since this will affect the efficiency. The unit should be positioned as close to the heat generating equipment as possible with the front grill fully exposed. Do not block the front of the unit.
- e. **Electrical Connection** – Connect the plug to the proper power circuit and breaker, based on unit specifications on the rear of your KwiKool unit. Connect the power cable firmly into the socket. Disconnect the power cable by pulling the plug, not on the wire. **Do not use extension cords for connection to the unit, unless the proper wire size is used with a length not to exceed 25 feet.** Improper extension cord use may damage the compressor or prevent the unit from operating, due to a voltage drop. **Make sure that the KwiKool unit is connected to a dedicated circuit, since power surges from the compressor could damage other equipment or trip the breaker.**
- f. **Ducting Requirements** – The KwiKool unitary models are designed for two ducts to be run from the top of the unit to the drop ceiling above the unit. **The area above the ceiling must either be open to the rest of the floor or run above-ceiling duct to an open area, using a double flange ceiling tile. If there isn't a sufficient space for the hot air exhaust to dissipate, the unit will shut down on high head pressure.** If above-ceiling ducting is used, verify with KwiKool that the duct length is within the unit's specifications. **Also, any perforated panels in the ceiling must be replaced or blocked with a solid tile, since this will allow the heat in the ceiling to reenter the room being cooled.**

## 8. UNIT MAINTENANCE

- a. **Check Air Filters** – The air filter is located inside the door on the lower front of the unit. Inspect and replace air filters at least once a month. Replacements are available upon request or at your local HVAC supply store. Call 1-800-KWIKOOL (594-5665).
- b. **Fan Belts** – Check condenser fan belts every 3 months on models so equipped, models with 3.5-ton capacity and above. Follow the following steps:
  1. Turn unit off and disconnect the power cord.
  2. Check belt tension, no more than ½-inch of play, and belt wear.
  3. Replace belts, if belt is glazed or worn.
  4. Tighten loose belts with adjustable motor base.
- c. **Condensate Tank** – If the condensate tank is used, drain water that has collected in the unit tank. On KPAC models the tank is inside the inspection door. All other models use an external tank.

## 9. UTILIZING YOUR KWIKOOL SYSTEM

In contrast to conventional air conditioners, which circulate air conditioning capacity evenly to an entire floor, the KwiKool units are designed for cooling an area with a high concentration of heat load, usually from electrical or computer equipment. Understanding the capabilities of your unit can help you avoid problems. For example, if you add heat-generating equipment to the room after purchasing a KwiKool unit, you may be short of the necessary cooling capacity. Your KwiKool unit offers an effective affordable solution for many applications. It can also provide spot cooling for workers or process cooling within large space without the use of condenser ducting, such as a warehouse factory, or production areas. If the unit is used in this manner, the cold air supply must be within 5 feet of the person or equipment being cooled, since the hot ambient air will absorb the cool air very quickly. Your KwiKool Strategic Air Center is

specifically designed to adapt to today's high tech environments such as telecommunication or computer rooms and is equipped with the necessary controls to maintain those special environments. Call your nearest KwiKool distributor or 1-800-594-5665 for help or for questions about other applications.

## 10. TROUBLE SHOOTING GUIDE

- a. **Blank Display** – Caused by power failure, tripped circuit breaker, or unit not plugged in.
- b. **Unit will not Start** – Caused by:
  1. Unit is timing out. Wait 3 minutes.
  2. Tripped Breaker, Reset Breaker
  3. Unit is in Off Mode. Put unit in "On" Mode.
  4. Set point matches ambient air temperature.
- c. **Unit Off/Alarm Sounds & Panel Display Reads "CF"**
  1. Condensate Float Jack not installed.
  2. Condensate Tank Full. Empty tank.
- d. **Unit Alarm Sounds & "AL" Displays**
  1. High Pressure switch activated. Reset switch is the red button inside access panel.
  2. Check condenser intake & exhaust duct for restricted air movement.
  3. Check area above the ceiling for limited air movement. Provide additional path for exhaust & intake air flows.
  4. Pump drain line is restricted. Check water line for blockage.
- e. **Unit Will Not Cycle "Off", Continuous Cold Air** – The compressor never shuts off, indicated by constant cold air discharge. This condition may cause the evaporator coil to freeze up.
  1. Temperature set point is set too low.
  2. Improperly sized unit, insufficient capacity.
  3. Excessive outside ambient air from outside. Close doors when building air conditioning is shut down. Also, block perforated panels in ceiling, which may cause heat to come back into the room.
- f. **Unit Runs Without Cooling – Compressor Will Not Start**
  1. Check circuit voltage. For 208/230-volt units, a circuit voltage of 208 may prevent the compressor from starting, since the unit is set up to run at 230 volts. Change voltage switch inside the inspection door to the 208-position.
  2. If coil freezes, put unit in fan mode by holding down the fan button for 3 seconds, raise temperature set point to allow unit to cycle on & off. Wait about 30 minutes to the coil to unfreeze. The unit's capacity may be undersized for the application's heat load.
  3. A dirty intake filter on the front of the unit will block heat exchange across the evaporator coil, which will prevent cooling.
  4. Obstruction to the condenser air intake may cause the compressor to shut off on high pressure. Check the airflow going into the top of the unit's front flange from the space above the ceiling or the air intake.
  5. Unit's control mode is set to "fan" only.
- g. **Trouble-Shooting Failure** – If your trouble-shooting efforts fail, call KwiKool at 1-800-594-5665 and ask for service support.