KOOLTRONIC
ENCLOSURE COOLING SOLUTIONS

ADVANTAGE RT TOP MOUNT SERIES

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Technical Documents

AIR CONDITIONER

OPERATOR'S MANUAL

CAUTION

BEFORE INSTALLING AND USING THIS AIR CONDITIONER, IT IS IMPORTANT THAT THIS MANUAL BE READ AND UNDERSTOOD THOROUGHLY

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NOTE: Wiring Schematics are available on the specific model page of the Kooltronic website.

I. Introduction

Kooltronic Air Conditioners are designed to provide a cool, dehumidified environment for your electronic components. There are models to fit virtually all sizes and shapes of electronics enclosures, in capacities ranging from 1,000 to 30,000 BTU/H. Our "closed-loop" design also ensures that your components will not be exposed to hot, dirty operating conditions.

This Manual provides you with the necessary general information for properly installing and operating standard Kooltronic Air Conditioners. Technical data and mounting instructions are presented on pages 7 through 10.

II. Incoming Inspection

Kooltronic Air Conditioners are designed, built and packaged to withstand the shock and vibration normally associated with shipment by common carriers. Occasionally improper handling during shipping causes damage. Such handling could include unbanding of palletized shipments, failing to respect **"This Side Up"** arrows, rough handling, falling off conveyors, excessive vibration, crushing, etc. Therefore, a thorough inspection should be done upon receipt of all shipments. Any carton tears, dents, scratches, loose articles or evidence of oil are signs of damage and should be noted on the Freight Bill. Cartons should be opened promptly and the units inspected for CONCEALED DAMAGE. Kooltronic Air Conditioners must be delivered in the proper mounting position to assure that damage to the compressor has not occurred during shipping. Any Kooltronic Air Conditioner that is delivered removed from the banded pallet, lying down or double stacked should be refused.

An immediate claim MUST be filed with the freight carrier and an inspection requested. Retain all packing materials. Kooltronic cannot assume responsibility for Consignee's failure to file a timely freight claim.

III. Product Handling:

1) Do not attempt to operate your Kooltronic Air Conditioner until you read and thoroughly understand this Manual. See section **VI PRE-INSTALLATION TESTING.**

2) Before operating the Kooltronic Air Conditioner be certain that it is placed in its correct mounting position. **This Air Conditioner is designed to operate in a horizontal position only.** This placement must be done a minimum of 5 minutes prior to operating in order to allow the compressor oil to drain to the compressor sump area.

CAUTION

Kooltronic Air Conditioners must be operated in their proper mounting position. If attempts are made to operate a unit that is not in its designed mounting position, permanent compressor damage will occur. This action will void the warranty. To avoid compressor damage do not tip the unit more than 45° from its proper mounting position.

3) Before operating this unit, all electrical wiring must be checked to assure the proper connection to the correct power source. Minimum circuit ampacity should be at least 125% of the amperage found on the nameplate for the corresponding voltage. Do not exceed the maximum fuse size found on the nameplate.

4) We do not recommend that Air Conditioners be shipped to their final destination attached to an enclosure. In the event that the Air Conditioner needs to be shipped attached to an enclosure it is strongly recommended that proper support be provided for the Air Conditioner. Excessive vibration can occur if Air Conditioners are not properly supported when shipped on enclosures, increasing the potential for internal damage and voiding the warranty.

5) **PROCEDURE FOR PROPER PACKING AND SHIPMENT OF KOOLTRONIC AIR CONDITIONERS:**

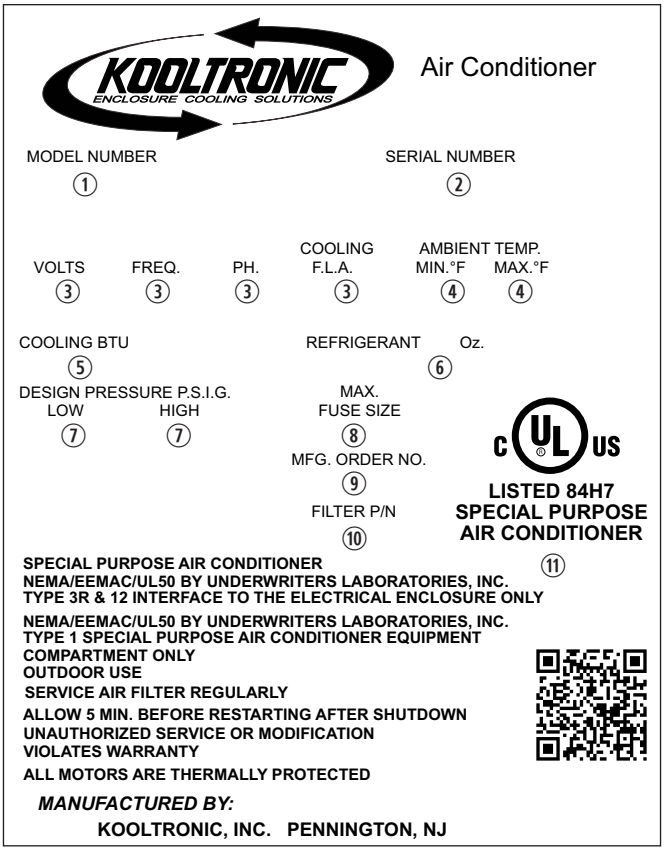
- Keep Air Conditioner in proper upright position indicated by arrow markers.
- Pack Air Conditioner in an appropriate carton (preferably original carton if possible), with adequate internal protective packaging, making sure carton is marked and is kept in correct upright position.
- For local, controlled transportation, strap carton to a secure part of truck to prevent falling or sliding, minimize vibration, etc.
- For common carrier shipment, band unit(s) securely to a pallet. Unpalleted shipment risks severe damage which voids the warranty.

IV. Product Identification and Nameplate

Each Kooltronic Air Conditioner includes an identification nameplate. This nameplate provides:

① Model Number
② Serial Number
③ Electrical power characteristics
④ Maximum and minimum ambient operating temperatures
⑤ Cooling capacity
⑥ Type and amount of refrigerant required for recharging
⑦ Design Pressure
⑧ Maximum Fuse Size
⑨ Manufacturing Order Number
⑩ Filter Part Number
⑪ Underwriters Laboratories Inc. Listed or Recognized Marks and NEMA ratings

We recommend you copy this information from your unit.



①②⑨ When ordering parts, specify the Model Number, Serial Number & MFG. Order Number.

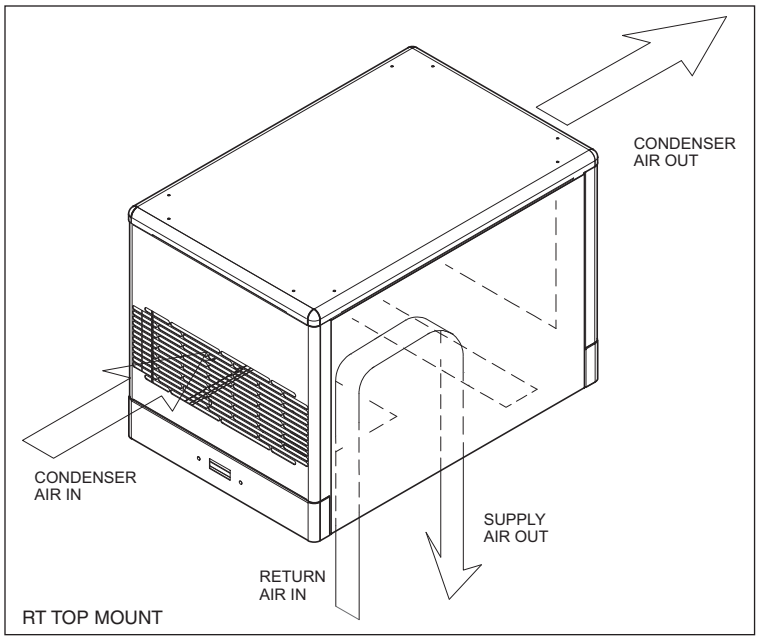
③ Before operating, be sure that the power source matches these requirements.

④ Make sure that these parameters are met. Failure to do so may result in permanent damage to the unit.

⑥ Use of incorrect type or amount of refrigerant will adversely affect performance and may damage the unit.

V. Principles of Operation

Kooltronic Air Conditioners are required when the equipment operating temperature must be kept near or lower than the ambient room temperature, and/or the cabinet must be sealed from dust, fumes, oil, corrosives and other contaminants. These Air Conditioners utilize a "Closed-Loop Cooling System" to ensure optimum performance of the installed components.



Closed-Loop cooling seals the electronic enclosure from hostile elements in the environment. Two separate circulation systems are employed. The internal system cools and dehumidifies the air inside the cabinet, totally isolating the sensitive electronics and other components from the environment. The external system uses circulating ambient air or water to discharge the heat removed from the electronics. The heat is dissipated from the enclosure by means of the vapor compression refrigeration cycle. This takes place in a hermetically-sealed refrigeration system, utilizing either an air-cooled or water-cooled condenser heat exchanger. The warm air inside the enclosure is drawn through the evaporator coil where it is cooled, dehumidified and returned.

Any enclosure moisture accumulated on the evaporator coil is collected in the condensate tray and removed through the drain tube to the condensate evaporator. Condensate evaporates in the condensate evaporator and is released to the ambient air by the condenser impeller.

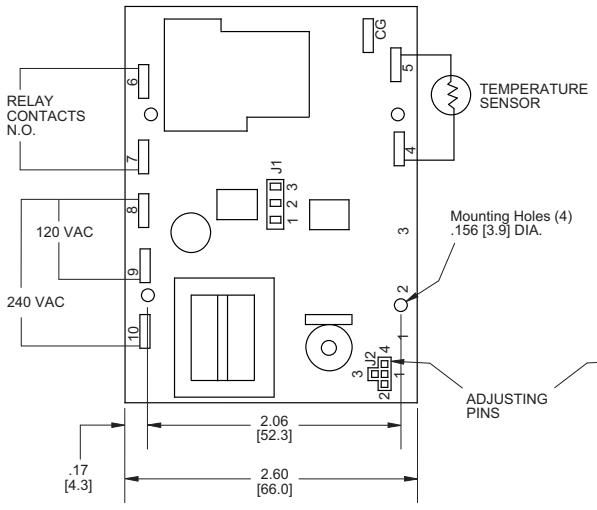
The heat removed through the evaporator coil is transferred by the compressed refrigerant to the condenser coil. Ambient air is then passed through the condenser coil, where it absorbs the heat and is then discharged to the environment.

This unit is equipped with a Low Temperature Thermostat to prevent the evaporator coil from freezing. In conditions of low ambient temperature and low enclosure load, the thermostat regulates the return air temperature from 75°F to 86°F. The standard set point of the Low Temperature Thermostat is 75°F. The set point can be changed to 70°F or to 79°F by changing the location of the thermostat jumper (see illustrations below).

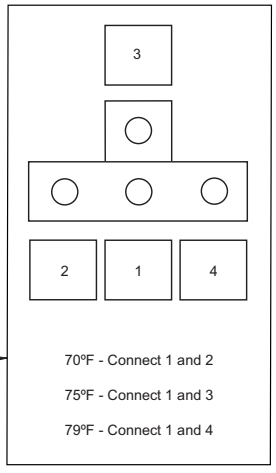
The Low Temperature Thermostat has a test start relay. When the air conditioner is turned on it will run constantly for the first 15 minutes regardless of external temperatures. Afterwards, if the entering evaporator air temperature is lower than the thermostat set point, the compressor and condenser blower will stop, and the thermostat will begin to control the air conditioner.

The crankcase compressor heater allows the unit to start with an ambient temperature of 0°F. In applications having frequent voluntary heat load fluctuations, an optional Compressor Short Cycle Protector is recommended.

ELECTRONIC THERMOSTAT CONTROL



Electronic Thermostat Control



Thermostat Jumper

Dimensions, inches [mm], are for reference only and are subject to change.

IMPORTANT NOTE

The temperature of the returning air to the air conditioner is displayed on the exterior panel of the unit. This is considered the maximum temperature within the enclosure and not the temperature of the air supplied to the enclosure.

When the Kooltronic Air Conditioner is properly sized it should operate constantly and maintain 75°F to 115°F enclosure temperatures, depending on the ambient temperatures.

VI. Pre-Installation Testing

Before mounting the air conditioner to the enclosure, test for proper operation. This will verify the shipping integrity of the system. Please follow the steps below prior to installation.

CAUTION

The air conditioner must be standing in its proper mounting position for a minimum of five (5) minutes prior to testing. Failure to follow this procedure will cause permanent damage to the compressor. To avoid compressor damage do not tip the unit more than 45° from its proper mounting position.

1. The unit must sit in an upright position at a minimum room temperature of 65°F to allow the system to warm-up. This is particularly important during winter months.
2. Refer to the nameplate for proper electrical voltage and current requirements. Connect the power cord to a properly grounded and fused electrical supply, leaving electrical power to the unit turned off.
3. Elevate the unit approximately 3" above the floor to ensure proper evaporator airflow. Do not block evaporator air inlet on bottom of unit.
4. Note the factory thermostat setting which is 75°F.
5. Turn the electrical power on.
6. Verify that the evaporator blower or fan is running.
7. Verify that the condenser blower or fan is running. **Note:** The start of the condenser fan or blower will be delayed until the system pressures rise.
8. Operate the air conditioner for approximately ten (10) minutes. During this period no unusual noise or vibration should be evident. Both the evaporator and condenser fans or blowers should be delivering air through their respective discharge ports. The cool air discharged should be less than 70°F when the room temperature is between 70°F and 80°F.
9. Turn off the electrical power and disconnect the air conditioner from the power source.
10. If any cover plug was removed to adjust the unit, be sure to replace it in order to maintain the integrity of the closed-loop airflow system.

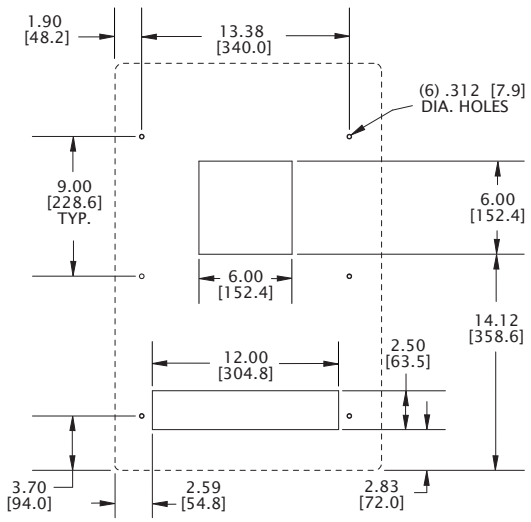
NOTE: Before shipment all Kooltronic Air Conditioners are subjected to a performance test.

VII. Specific Model Data

Mounting

FIGURE 1

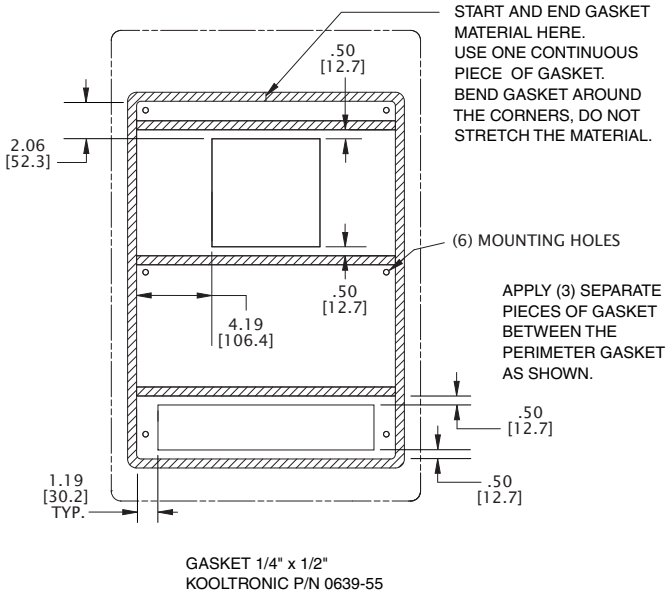
MOUNTING PLAN



Dimensions, inches [metric], are for reference only and are subject to change.

FIGURE 2

GASKET PLACEMENT



Dimensions, inches [metric], are for reference only and are subject to change.

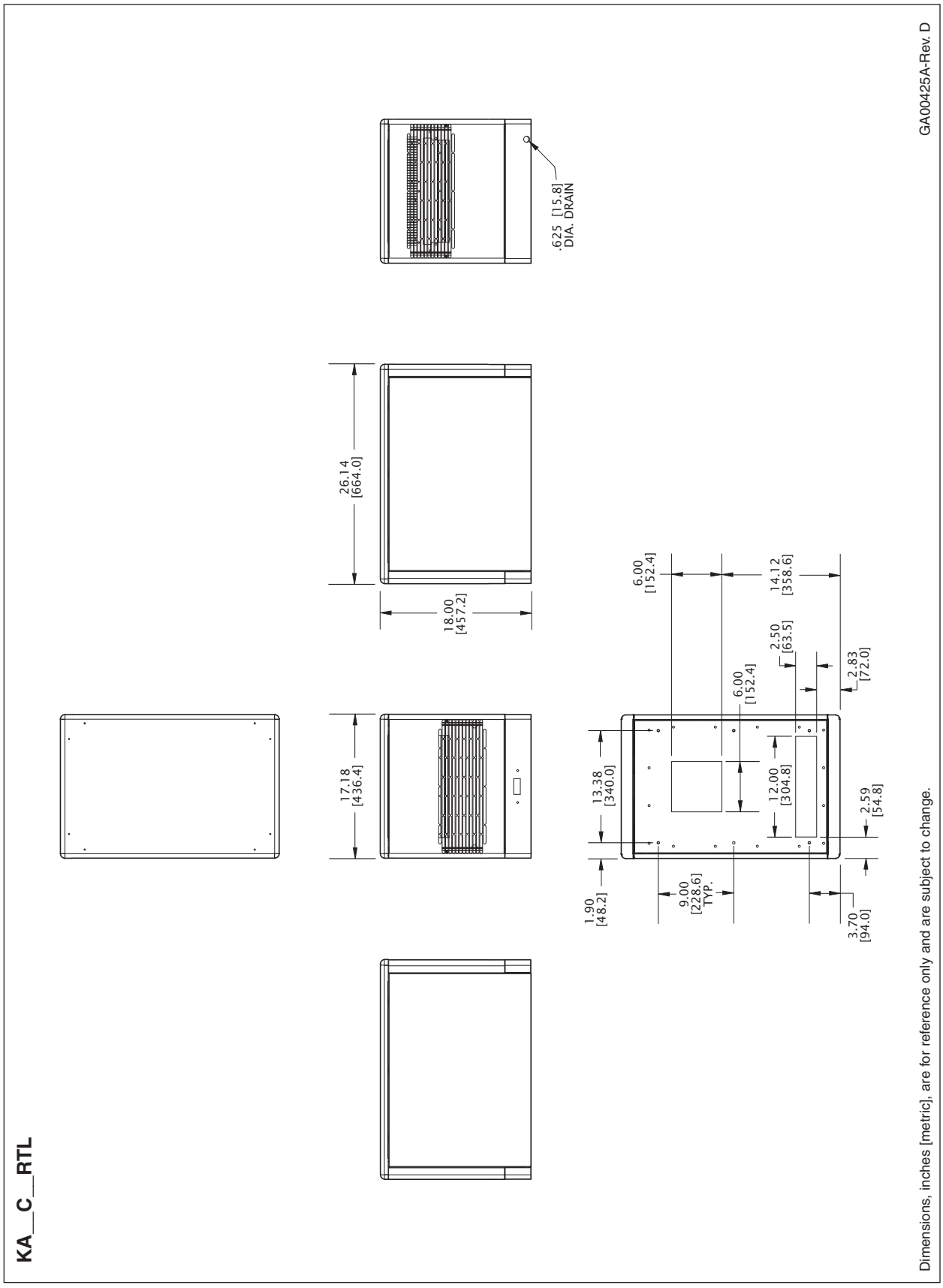
Kooltronic Air Conditioners have been engineered to be installed easily. To avoid damaging your Air Conditioner, please read the following information before installation.

- Top-Mounted Air Conditioners for external top installation contain weld-nuts.
- Refer to Figure 1 above for the location of all mounting holes and cutouts.
- Make sure the cutouts don't interfere with components inside your cabinet.
- Proper alignment of all air inlets and outlets is essential for optimum performance of the Air Conditioner.
- All externally-mounted Air Conditioners must be fully gasketed to ensure proper sealing. This seal is necessary to maintain the integrity of the closed loop system. See Gasket Placement, Figure 2, above.
- Use all existing mounting holes to insure stability and a tight seal.
- High strength mounting screws are recommended.
- The external drain hose must not be elevated above the exit port. Improper mounting will impede the flow of condensate and may cause internal malfunctions.

CAUTION

When unmounting the unit from the cabinet, make certain to keep the unit level to avoid spilling any water that may be in the condensate pan.

Drawings and Dimensions



Units in bold are current standard products. Other units are prior product offerings and shown for reference only.

Technical Data - Current Models

Model	BTU/H Rating	BTU/H 95°F/95°F	Ambient Temp. °F Max.	Ambient Temp. °F Min.	Volts	Hz	* Cooling Amps	** Heating Amps	Approximate Weight (lbs.)
KA4C6RTL	**6000**	**6171**	**125**	**0**	**115/100**	**60/50**	**12.8/13.0**	**8.0/14.6**	**131**
K2A4C6RTL	**6000**	**4600**	**120**	**0**	**230/208**	**60**	**6.3/7.0**	**4.0/7.5**	**131**
			120	**0**	**220/200**	**50**	**5.6/6.0**	**4.0/7.5**	

* Rating shown is for operation at maximum ambient temperature.

** Optional Single Enclosure Heater/Double Enclosure Heaters.

Major Component Replacements - Current Models

Part	KA4C6RTL Part Number	K2A4C6RTL Part Number
Compressor	**0665-145***	**0665-146***
Compressor Capacitor	0452-32	0452-32
Condenser Blower Motor	0261-287	0261-288
Condenser Blower Capacitor	0452-03	0452-03
Evaporator Blower Motor	0194-76	0194-101
Evaporator Blower Capacitor	0456-65	0452-64
Evaporator Coil	0666-27	0666-27
Condenser Coil	0666-30	0666-30
Filter	10871F	10871F
	*** Unit s/n ending with xxxxxxx and higher**	*** Unit s/n ending with xxxxxxx and higher**

Standard Features

CFC-Free Refrigerant
Digital Temperature Display
Filter
Head Pressure Contro
Low Ambient Kit
Low Temperature Control Thermostat
NEMA 12 & 3R Ratings Maintained (UL50)
Painted Metal Grille
UL/CUL Listed

Technical Data/Major Component Replacement for discontinued products, see next page.

Technical Data - Discontinued Models

Model	BTU/H Rating	Ambient Temp. °F Max.	Ambient Temp. °F Min.	Volts	Hz	* Cooling Amps	** Heating Amps	Approximate Weight (lbs.)
KA4C3RTL	3000	125	0	115	60/50	12.5/12.0	6.0/5.7	125
K2A4C3RTL	3000	125	0	230	60/50	6.0/5.7	4.0/7.5	125
KA3C6RTL	6000	120	0	115	60/50	13.5/13.3	8.0/14.6	131
K2A3C6RTL	6000	120	0	230	60/50	6.0/5.7	4.0/7.5	131
KA3C12RTL	12000	120	0	115	60/50	18.0/19.0	8.0/14.6	140
K2A3C12RTL	12000	120	0	230	60/50	9.0/9.2	4.0/7.5	140
KA4C6RTL	6000	125	0	115/100	60/50	14.6/14.3	8.0/14.6	131
K2A4C6RTL	6000	120 120	0 0	230/208 220/200	60 50	6.3/7.0 5.6/6.0	4.0/7.5 4.0/7.5	131
KA4C12RTL	12000	120	0	115/100	60/50	17.6/18.7	8.0/14.6	140
K2A4C12RTL	12000	125 125	0 0	230/208 200	60 50	8.7/9.3 8.5	4.0/7.5 4.0/7.5	140

Major Component Replacements - Discontinued Models

Part	KA4C3RTL Part Number*	KA3C6RTL Part Number*	KA3C12RTL Part Number*	KA4C6RTL Part Number*	KA4C12RTL Part Number*
Compressor	0665-116	0665-71	0665-76	0665-119	0665-131
Compressor Capacitor	N/A	0452-54	0452-54	0452-32	0452-52
Condenser Blower Motor	0261-287	0261-287	0261-287	0261-287	0261-287
Condenser Blower Capacitor	0452-03	0452-03	0452-03	0452-03	0452-03
Evaporator Blower Motor	0265-03	0194-76	0194-14	0194-76	0194-14
Evaporator Blower Capacitor	N/A	0452-65	0452-65	0452-65	0452-65
Evaporator Coil	0667-45	0666-27	0666-27	0666-27	0666-27
Condenser Coil	0666-27	0666-30	0666-30	0666-30	0666-30
Filter	10871F	10871F	10871F	10871F	10871F
	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**

Part	K2A4C3RTL Part Number*	K2A3C6RTL Part Number*	K2A3C12RTL Part Number*	K2A4C6RTL Part Number*	K2A4C12RTL Part Number*
Compressor	0665-107	0665-72	0665-77	0665-120	0665-125
Compressor Capacitor	N/A	0452-12	0452-14	0452-32	0452-32
Condenser Blower Motor	0261-288	0261-288	0261-288	0261-288	0261-288
Condenser Blower Capacitor	0452-03	0452-03	0452-03	0452-03	0452-03
Evaporator Blower Motor	0265-06	0194-101	0194-15	0194-101	0194-15
Evaporator Blower Capacitor	N/A	0452-64	0452-64	0452-64	0452-64
Evaporator Coil	0667-45	0666-27	0666-27	0666-27	0666-27
Condenser Coil	0667-27	0666-30	0667-30	0666-30	0667-30
Filter	10871F	10871F	10871F	10871F	10871F
	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**	*** Unit s/n ending with xxxxxxx and lower**

VIII. Maintenance

Kooltronic Air-Cooled Air Conditioners require routine cleaning of the condenser coil (if necessary) and the air filters to assure unimpeded airflow through the condenser heat exchanger. It is not possible to recommend specific condenser coil or filter cleaning intervals, since the level and the nature of airborne particulate matter differs widely with each installation. It is generally sufficient to clean the condenser coil and/or the aluminum mesh filter when the outer surfaces appear covered with a thin layer of dust, lint or other foreign matter. The condenser coil can be blown out with air, or washed, depending on the foreign matter involved. Disconnect power and remove air conditioner from cabinet before using liquids to clean the unit. (see below - **Filter and condenser coil service**). The aluminum mesh filter can be washed with warm water. Appropriate disposable replacement filters are available from Kooltronic.

If routine condenser coil or filter service is neglected or delayed, the air conditioner will not perform at its design capacity. The first indication of an excessively clogged condenser coil or air filter is usually a gradual increase of temperature within the equipment cabinet. If operation is continued under these conditions, the compressor will be shut off by the thermal overload device. The compressor will restart when its external temperature drops below the protector threshold setting and the compressor will continue to cycle on and off. Continued operation under these conditions will cause damage, shorten compressor life and void the warranty.

A. Filter and condenser coil service

Kooltronic RT Top Mount Air Conditioners feature an easily removable inlet filter to facilitate necessary cleaning. To access the filter, loosen the torx screws and remove the front grille. Push the filter upward and pull the bottom edge forward to remove. After removal, the filters should be flushed under warm running water with clean side up. If the accumulated dirt is oily, washing in a detergent bath is recommended, followed by a warm water wash as above. To reinstall the filter, insert the filter into the filter holder and push the filter back into position. Reinstall the front grille using the torx screws.

The condenser coil must be cleaned using pressurized air. If liquid cleaning solutions are used, it is necessary that the air conditioner be removed from the cabinet to avoid liquids draining into the electronics. Disconnect power before performing this type of operation.

CAUTION

Do not operate the air conditioner for extended periods of time with the filter removed. The condenser coil may become clogged with dust or lint from the air entering the face. A clogged condenser coil is not readily detected and will give the same reaction as a clogged filter. A clean filter is the best protection.

B. Blowers

The design life of the blowers employed in all Kooltronic Air Conditioners is substantially in excess of 20,000 hours. All Kooltronic condenser and evaporator blowers are equipped with UL/CSA permanently-lubricated precision ball-bearing motors, with automatic-reset thermal overload protectors. If field replacement of a blower motor is necessary, most blower assemblies, including the mounting plate, are readily removable. Each of the blower mounting plates is held to the air conditioner cabinet structure by screws and nuts. For installation of the replacement blower, electrical connections may be broken at the terminal block, or power leads may be cut and appropriately spliced together.

CAUTION

Before opening the air conditioner, disconnect all power.

C. Compressor

All Kooltronic compressors are approved by UL and CSA, and require no maintenance. They are hermetically sealed and charged at the factory, and equipped with automatic-reset thermal overload protectors.

If the compressor or the hot gas bypass valve fails, it is strongly recommended that the air conditioner be returned to Kooltronic for service.

D. Refrigerant Loss

Kooltronic Air Conditioners are subjected to a series of tests to detect refrigerant leaks, during and after manufacture. It is possible that shipping or other damage, or microscopic leaks over a long period, may result in the need for replenishment of refrigerant charge. **When it has been verified by a Certified EPA Technician that a refrigerant shortage does exist, the leak must be repaired. Then the unit may be evacuated and recharged in the field by a Certified EPA Technician only.**

CAUTION

Refer to the data on the unit nameplate which specifies the type of refrigerant and the amount of charge in ounces.

E. Relocation

If your Kooltronic Air Conditioner has to be moved to another location by truck, the following precautions should be taken:

- De-mount the air conditioner from the equipment, controller or enclosure.
- Conform to the applicable provisions of PROCEDURE FOR PROPER PACKING AND SHIPMENT OF KOOLTRONIC AIR CONDITIONERS in this manual under *Section III. "PRODUCT HANDLING".*

IX. Trouble-Shooting

Each Kooltronic Air Conditioner is engineered for performance and built for reliability. They are designed to require only routine maintenance. If your air conditioner should require service, we have compiled a trouble-shooting chart to assist your service personnel. If additional assistance is required contact Kooltronic at (609) 466-3400.

Problem	Cause	Solution
Unit not Cooling	No Power	Check Power Source and Electrical Connections
	Loss of Refrigerant	Locate and repair leak
	Evaporator or Condenser Blower not operating	Replace Motor, Capacitor or entire Assembly
	Filter clogged	Clean or replace Filter
	Clogged Evaporator or Condenser Coil	Clean Coil
	Low Temperature Control (Thermostat) improperly set	Lower setting until unit starts
	Low Temperature Control (Thermostat) defective	Replace Thermostat or Relay when applicable
	Failed Compressor	Replace Compressor
Ice on Evaporator Coil	Insufficient Heat Load or Unit Oversized for Application	Contact Kooltronic
	Failed Evaporator Blower	Replace Evaporator Blower Motor or Assembly
	Clogged Evaporator Coil	Clean Coil
Condensate draining continuously	Enclosure not properly sealed	Check and seal all openings
	Excessive opening of Enclosure	Eliminate the frequency of door opening
Excessive vibration	Defective Motor in Blower	Replace Motor
	Defective Wheel in Blower	Replace Wheel
	Compressor Loose	Tighten Mounting Bolts
Compressor Inoperative	Low line Voltage	Check Nameplate Voltage against supply
	Loss of Compressor Oil	Replace Compressor
	Loss of Refrigerant	Locate and repair leak
	Failed Compressor Capacitor	Replace Capacitor
	Thermal Overload	Contact Kooltronic
	Power interruptions	Allow Compressor time to reset
Refrigerant or Oil leaks	Crack or pin hole in tubing or brazed joint	Replace tubing or rebraze joint
Condensate on the outside surface of the Enclosure	Insufficient Heat Load or Unit oversized for application	Contact Kooltronic