

ADVANTAGE RP52 SERIES

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Technical Documents



**Keep This Manual
With Air Conditioner**



AIR CONDITIONER OPERATOR'S MANUAL

CAUTION

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

**KOOLTRONIC, INC.
30 Pennington-Hopewell Road
Pennington, NJ 08534
609•466-3400
FAX: 609•466-1114
www.kooltronic.com**

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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 electronic 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. **All Air Conditioners containing an MM, NM, P, or V as part of the model number are designed to operate in a vertical position only. All Air Conditioners containing an H, RT or RM in the model number are 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 air conditioner label for the corresponding voltage. Do not exceed the maximum fuse size found on the label.
- 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. Unpalletted 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.

		Air Conditioner			
MODEL NUMBER ①		SERIAL NUMBER ②			
VOLTS ③	FREQ. ③	PH. ③	COOLING F.L.A. ③	AMBIENT TEMP. MIN.°F ④	MAX.°F ④
COOLING BTU ⑤		REFRIGERANT ⑥		Oz.	
DESIGN PRESSURE P.S.I.G. LOW ⑦		HIGH ⑦		MAX. FUSE SIZE ⑧	
		MFG. ORDER NO. ⑨		FILTER P/N ⑩	
					
				⑪	
SPECIAL PURPOSE AIR CONDITIONER NEMA/EEMAC/UL50 BY UNDERWRITERS LABORATORIES, INC. TYPE 3R & 12 INTERFACE TO THE ELECTRICAL ENCLOSURE ONLY					
NEMA/EEMAC/UL50 BY UNDERWRITERS LABORATORIES, INC. TYPE 1 SPECIAL PURPOSE AIR CONDITIONER EQUIPMENT COMPARTMENT ONLY OUTDOOR USE SERVICE AIR FILTER REGULARLY ALLOW 5 MIN. BEFORE RESTARTING AFTER SHUTDOWN UNAUTHORIZED SERVICE OR MODIFICATION VIOLATES WARRANTY ALL MOTORS ARE THERMALLY PROTECTED					
MANUFACTURED BY: KOOLTRONIC, INC. PENNINGTON, NJ					
					

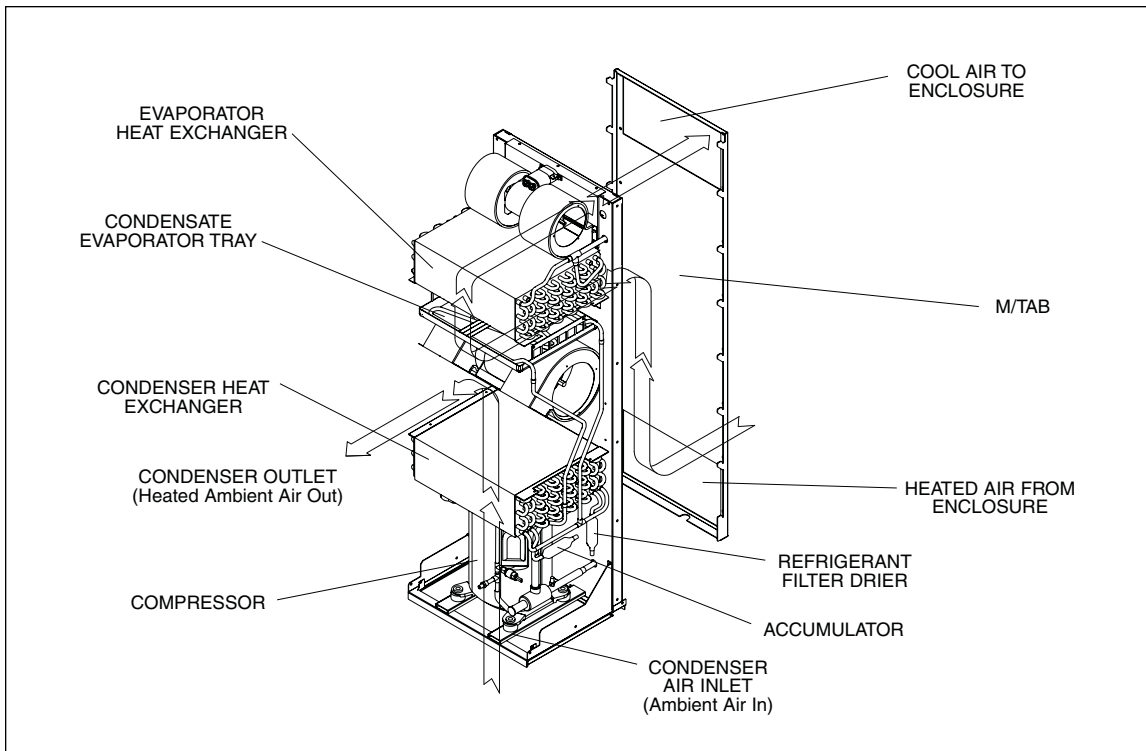
①②⑨ When ordering parts, specify the Model Number, Serial Number & MFG. Order Number.

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. This Air Conditioner utilizes a "Closed-Loop Cooling System" to ensure optimum performance of the installed components.

Closed-Loop cooling seals the electronics 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 and evaporated in the condensate evaporator tray and released to the ambient air by the condenser blower. If latent heat exceeds 25% of the total cooling capacity excess condensate is released to the ambient through the drain tube.

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

The unit is equipped with a Low Temperature Thermostat to prevent the evaporator coil from freezing and must not be set below factory setting of 75°F (16°F differential). If necessary the thermostat may be adjusted to increase the temperature within the cabinet. Unlike thermostats that are commonly found in household air conditioners that control the room temperature, the thermostat found on the RP52 monitors the return air from the enclosure to prevent the evaporator from freezing. In conditions of low ambient temperature and low enclosure load, the thermostat regulates the return air temperature from 75°F to 91°F. If the unit is equipped with an optional non-adjustable high temperature alarm, it will activate when the return air temperature reaches 130°F.

A high head pressure switch is standard on this unit and prevents the evaporator coil from freezing under low ambient temperature. The crankcase compressor heater allows the unit to start with an ambient temperature of 0°F. In applications having frequent voluntary or involuntary power interruptions, a Short Cycle Protector is recommended to allow adequate time for the internal pressures of the Air Conditioner to equalize before restarting.

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 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.

1. Allow the unit to sit in a upright position at a room temperature of 65°F minimum, allowing the system to warm-up particularly in winter months.
2. Refer to the identification label form power requirements then connect the power cord to a properly grounded and fused electrical supply. Leave the electrical power off.
3. Elevate the unit approximately 3" above the floor to ensure proper condenser airflow. Do not block condenser air inlet on bottom of unit.
4. Heat up sensor bulb in evaporator compartment to 90°F using a low temperature heat gun, or adjust the thermostat to 55°F to simulate the need for cooling.

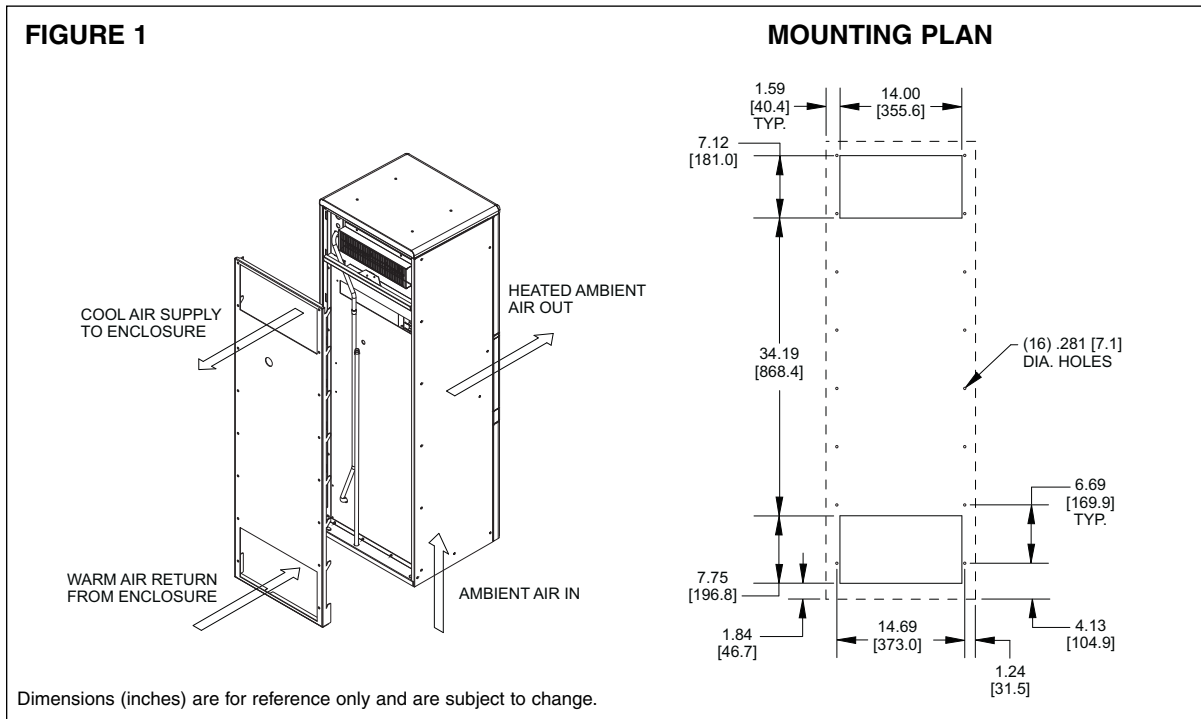
To access the thermostat, remove grille and upper panel. The thermostat is located in the upper corner of the unit. All panels need to be re-installed to continue testing.

5. Turn electrical power on.
6. Verify that the evaporator blower fan is running.
7. The compressor should start. Units equipped with a Short Cycle Protector have a 3-minute delay from when the power is turned on until the compressor begins to operate.
8. Verify that the condenser blower/fan is running. Note: the start of the condenser blower/fan will be delayed until the system pressure rises.
9. Operate the air conditioner for approximately ten (10) minutes. During the 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.
10. Turn off the electrical power source, and disconnect the air conditioner from the power source.
11. If the thermostat was lowered, adjust the thermostat back to 75°F. Failure to do this will result in coil freezing.

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

VII. Specific Model Data

Mounting



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

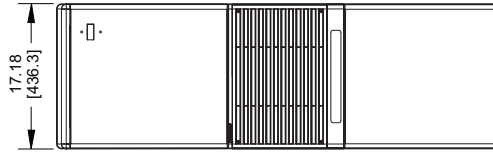
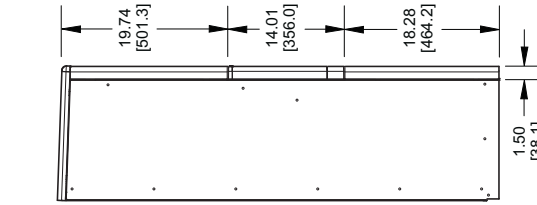
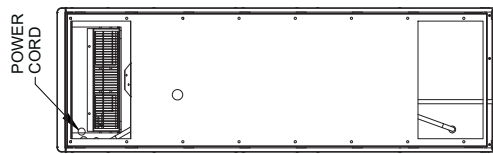
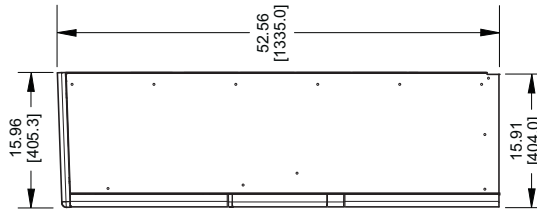
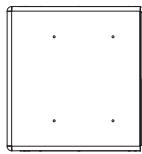
1. Loosen two screws on the bottom of the unit.
2. See Figure 1 for proper M/TAB orientation. Place the M/TAB flush against the outside of the enclosure to locate cutouts and mounting holes.
3. NOTE: The top cutout for the warm air return does not have to match the full 4.87" opening on the M/TAB. You can locate your cutout anywhere within this opening. Locate your cutout close to the bottom and not less than 3" high. Make sure the cutouts don't interfere with components inside your cabinet.
4. Mount the M/TAB to the outside of the cabinet using all the mounting hardware supplied by Kooltronic ($\frac{1}{4}$ "-20 screws/nuts/washers). NOTE: Make sure the screws are inserted with heads on M/TAB side. Tighten nuts securely.
5. Route the power cord through the top cut out in your cabinet. Mount the unit to the M/TAB by sliding the slots located on the front panel on the hooks of the M/TAB.
6. Tighten two screws on the bottom of the unit and seal the unit against the enclosure.
7. Attach overflow drain hose supplied to the drain exit in bottom of the unit.

CAUTION

If the Air Conditioner is mounted to the cabinet door you must be sure that the door hinges will support the additional weight of the Air Conditioner. Also be certain that when the door is opened fully, the cabinet does not become unbalanced. The actual weight of the unit can be found in the performance specifications.

Drawings and Dimensions

RP52 SERIES



Dimensions (inches) are for reference only and are subject to change.

GA00359A - Rev. A

Technical Data

Model	BTU/H Rating	Ambient Temp. °F Max.	Ambient Temp. °F Min.	Volts	Hz	* Running Amps	Approximate Weight (lbs.)
<u>RP52 Series</u>							
K2A3C14RP52R	14000	120	0	230/200	60/50	17.5	280
K2A3C16RP52R	16000	120	0	230/200	60/50	17.5	280
K2A3C18RP52R	18000	120	0	230/200	60/50	17.5	280

* Rating shown is for operation at maximum ambient temperature.

Major Component Replacements

Part	K2A3C_RP52R Part Number
Compressor	0665-50
Compressor Capacitor	0452-54
Condenser Blower Motor	0261-80
Condenser Blower Motor Capacitor	0452-06
Evaporator Blower Motor	0261-54
Evaporator Blower Motor Capacitor	0452-03
Evaporator Blower Assembly	200052-00-59
Condenser Coil	0280-10
Evaporator Coil	0280-10
Filter	11751F

NOTE: Part Numbers shown are for 60Hz/1Ø. For 50Hz consult Kooltronic.

Standard Features

Built-in Condensate Evaporator

Low-ODP Refrigerant

EMI/RFI Suppressor

Low Temperature Control Thermostat

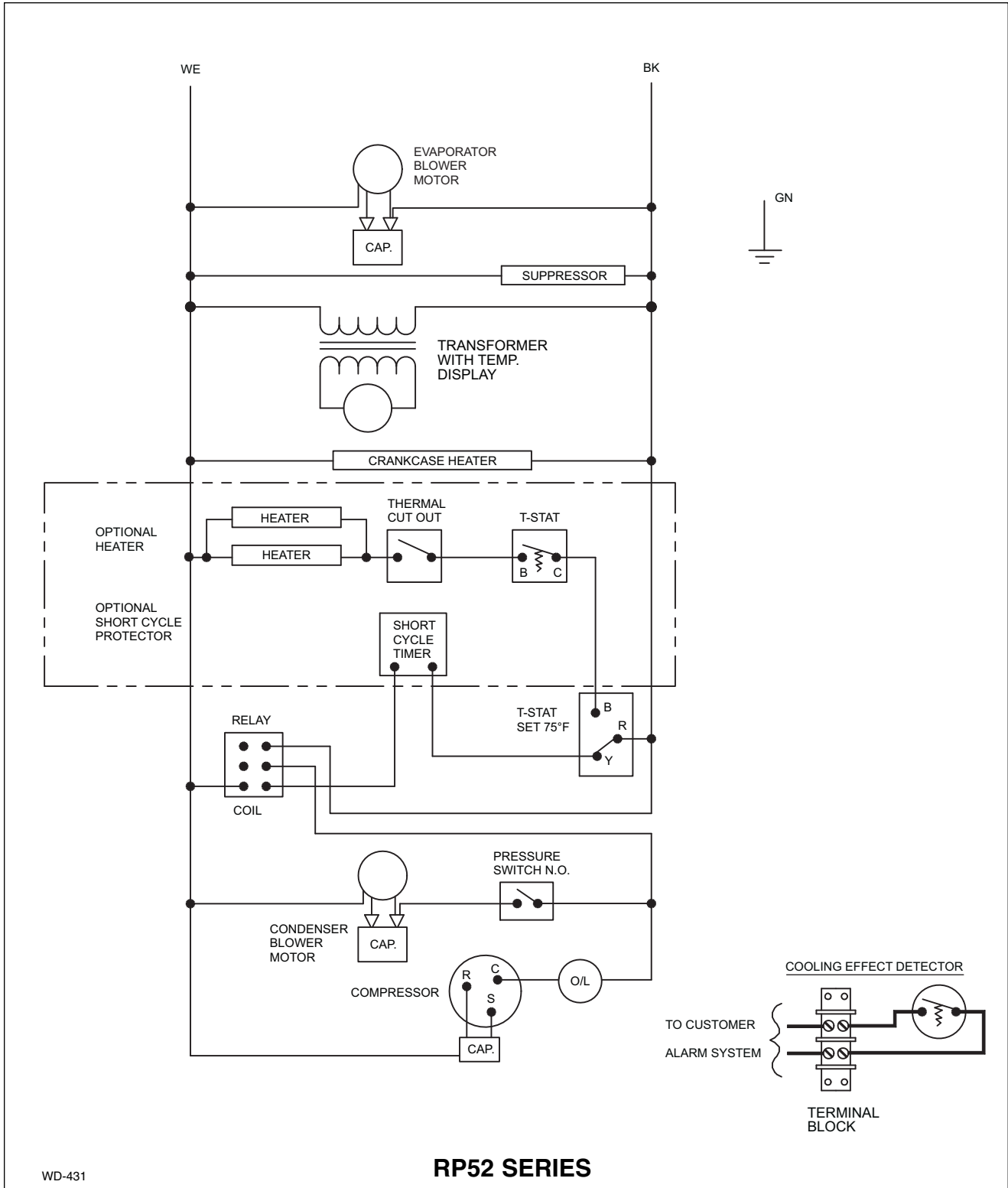
M/TAB Mounting System

NEMA 3R Rating

Head Pressure Control Switch

Crankcase Compressor Heater

Wiring Schematic



VIII. Maintenance

Kooltronic Water-Cooled Air Conditioners require no maintenance. Air-Cooled Air Conditioners are designed to require only the routine cleaning of air filters to assure unimpeded air flow through the condenser heat exchanger. It is not possible to recommend specific filter cleaning intervals since the level and the nature of airborne particulate matter differs widely with each installation. It is generally sufficient to remove and wash the reusable aluminum mesh air filters when the outer surfaces of these filters appear covered with a thin layer of dust or lint. Filter recoating adhesive is recommended. Appropriate disposable filters are available from Kooltronic.

If filter service is neglected or delayed, the air conditioner will not perform at its design capacity. The first indication of excessively clogged air filters 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 Removal and Service

Kooltronic Air Conditioners feature an easily removable inlet filter to facilitate necessary cleaning.

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.

- 1) Loosen the screw on the bottom of the filter holder.
- 2) Push the filter holder forward and move it down.
- 3) Remove the filter from the filter holder.
- 4) After removal, the filters should be flushed under warm running water with the clean side up, driving contaminants out the dirty side of the filter. If the accumulated dirt is oily, washing in a detergent bath is recommended, followed by a warm water rinse as above.
- 5) The filters may be sprayed with **Kooltronic A-16 Filter Recoating Adhesive** to trap fine airborne contaminants, or they may simply be dried and reinstalled as strainer type filters. **Recoating is recommended for best results.**
- 6) Reinstall the filter: Insert the filter inside the filter holder, push the filter holder forward, move it up into place and replace the screw on the bottom of the filter holder.

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.

CAUTION

Before opening the Air Conditioner, disconnect all power.

If field replacement of a blower motor is necessary, most blower assemblies, including 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.

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 qualified professional that a refrigerant shortage does exist, the leak must be repaired. Then the unit may be evacuated and recharged in the field by qualified service people only.**

CAUTION

Refer to the data on the unit name plate 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 Air Conditioner from 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 no routine maintenance other than the cleaning of ambient air filters. 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
Ice on Evaporator Coil	Failed Compressor	Replace Compressor
	Insufficient Heat Load or Unit Oversized for Application	Contact Kooltronic
	Failed Evaporator Blower	Replace Evaporator Blower Motor or Assembly
Condensate draining continuously	Clogged Evaporator Coil	Clean Coil
	Enclosure not properly sealed	Check and seal all openings
Excessive vibration	Excessive opening of Enclosure	Eliminate the frequency of door opening
	Defective Motor in Blower	Replace Motor
	Defective Wheel in Blower	Replace Wheel
Compressor Inoperative	Compressor Loose	Tighten Mounting Bolts
	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
Refrigerant or Oil leaks	Power interruptions	Allow Compressor time to reset
	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

X. Standard Warranty

KOOLTRONIC products are warranted to be free of defects in workmanship, materials and components. The following warranty periods apply from date of shipment:

- Air moving devices/components and hermetic system components: 1 year
- Spare parts, except filters: 90 days

The above warranty applies when the equipment is operated under the following conditions:

- Ambient temperature not in excess of 125°F (52°C) in normal atmosphere or as stated on product nameplate
- Voltage variation no greater than $\pm 10\%$ from nameplate rating
- Frequency variation no greater than $\pm 3\text{Hz}$ from nameplate rating
- Maximum cooling load no higher than air conditioner nameplate rating
- Waiting five minutes before restarting air conditioner after intentional or accidental shutoff
- Compliance to all other installation, maintenance and operating instructions, as supplied
- The purchaser assumes the responsibility of grounding the unit and installing it in accordance with local electrical and safety codes, as well as the National Electric Code (NEC) and OSHA

KOOLTRONIC cannot assume responsibility for mis-application of its products or the erroneous selection of an inappropriate product by a non-authorized KOOLTRONIC representative. Our applications engineers will gladly assist in the selection of the proper product, provided all required details of the application are furnished.

THIS WARRANTY CONSTITUTES THE ENTIRE WARRANTY WITH RESPECT TO THE PRODUCT AND IS IN LIEU OF ALL OTHERS, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND IN NO EVENT IS KOOLTRONIC RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER.

RETURN AUTHORIZATION (RA) PROCEDURE

- All returns require a Return Authorization number whether the return is for warranty or non-warranty repair, rotation of stock, damage or any other reason. Returns without an RA number will be refused.
- Customer must call KOOLTRONIC After Sale Kare (ASK), Pennington, New Jersey (609 • 466 • 3400) to obtain an RA number, or email ask@kooltronic.com.
- The following information is required when an RA is requested:
 - Original customer Purchase Order number and date
 - Date product was received by customer
 - Number of parts to be returned
 - Product description, model and serial number
 - Reason for return
 - Action requested
 - Contact name, telephone, FAX numbers and e-mail address
- Pack unit in a suitable container for shipment, preferably the

KOOLTRONIC assumes no liability beyond the repair or replacement of its own product. This Warranty does not cover:

- Labor or reimbursement of labor for evaluation, removal, installation, repair, or cost of any warranted part, unless authorized in writing by KOOLTRONIC
- Use of equipment for other than its designed purpose or operating conditions
- Operation in harsh, oily, corrosive or other abnormal environmental conditions, without the proper filtration, sealing, protective coatings and/or weather protection
- Damage to hermetic system resulting from continuous operation with dirty or clogged air filters or improper or negligent maintenance
- Use of refrigerant other than designated
- Customer modification or abuse
- Shipping damage or other accident (Claims for shipping damage are the responsibility of the customer. Timely claims must be filed by the customer with the freight carrier)
- Cracked or broken hermetic tubing, brazed joints or other internal damage caused by shipping or mishandling
- Damage caused by shipping units attached to an enclosure
- Any and all conditions resulting from noncompliance with the preceding operating conditions
- Returned freight must be paid by customer
- **This standard warranty does not apply to custom products. Consult your KOOLTRONIC representative for limitations**

original packaging if available. All Air Conditioners must be returned in an upright position properly secured to a pallet. **Improper packaging may void warranty claim.** If an Air Conditioner is received laying down or shipped via UPS or similar small parcel service the warranty will be void.

- Mark carton prominently with KOOLTRONIC's Return Authorization Number.
- Enclose all pertinent documents.
- Freight charges on all products returned to KOOLTRONIC shall be paid by the customer. Unauthorized collect shipments will be refused.
- If a unit is repaired under Warranty, KOOLTRONIC will pay the freight charges both ways within the Continental USA at KOOLTRONIC's negotiated rates. Warranty repaired units will be returned to customer at KOOLTRONIC expense only within the Continental USA.
- All authorized returns are subject to a restocking fee.