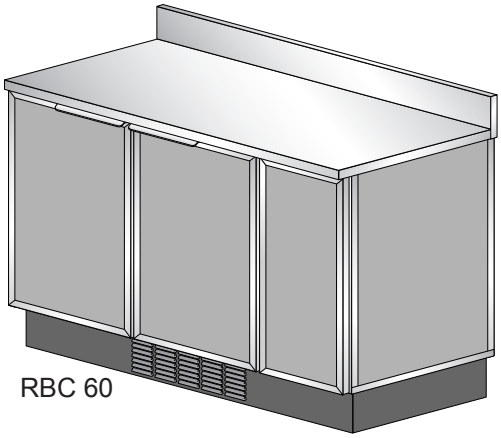
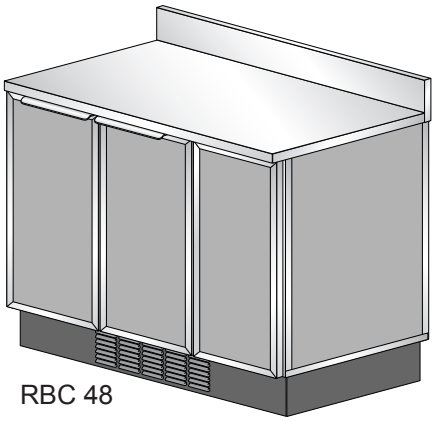
Service Manual



RBC 60



RBC 48

REFRIGERATED BACK COUNTER

MODEL
RBC 48
RBC 60

Please read this manual completely before attempting to install, operate or service this equipment

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IMPORTANT WARNING AND SAFETY INFORMATION

WARNING

READ THIS MANUAL THOROUGHLY BEFORE OPERATING, INSTALLING, OR PERFORMING MAINTENANCE ON THE EQUIPMENT.

WARNING

FAILURE TO FOLLOW INSTRUCTIONS IN THIS MANUAL CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

WARNING

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

WARNING

UNLESS ALL COVER AND ACCESS PANELS ARE IN PLACE AND PROPERLY SECURED, DO NOT OPERATE THIS EQUIPMENT.

CAUTION

Observe the following:

- Minimum clearances must be maintained from all walls and combustible materials.
- Keep the equipment area free and clear of combustible material.
- Adequate clearance for air openings.
- Unit exhausts air to the bottom and the rear.
- Do not set unit on a curb or seal to the wall.
- Do not block the slots in the front kickplate.
- Operate equipment only on the type of electricity indicated on the specification plate.
- Retain this manual for future reference.

CONTENTS

INTROUCTION

SPECIFICATIONS

MODEL	DESCRIPTION	VOLTAGE	AMPS	PH.
RBC 48	48" Refrigerated Back Counter	120 VAC (60 Hz) 220 VAC (50 Hz)	10 5	1 1
RBC 60	60" Refrigerated Back Counter	120 VAC (60 Hz) 220 VAC (50 Hz)	12 6	1 1

MODEL	DESCRIPTION	HEIGHT	WIDTH	LENGTH
RBC 48	48" Refrigerated Back Counter	40.00 In.	29.50 In.	48.00 In.
RBC 60	60" Refrigerated Back Counter	40.00 In.	29.50 In.	60.00 In.

INSTALLATION

Location

Units represented in this manual are intended for indoor use only. Be sure the location chosen has a floor or counter strong enough to support the total weight of the units. Reinforce the floor or counter if necessary to provide for maximum loading. For the most efficient operation, be sure to provide good air circulation inside and out. These units should be located so that they can be moved for service. Major service to the refrigeration system is done from the end of the cabinet.

The outline dimensional drawings for the units are shown below in Figures 1 and 2.

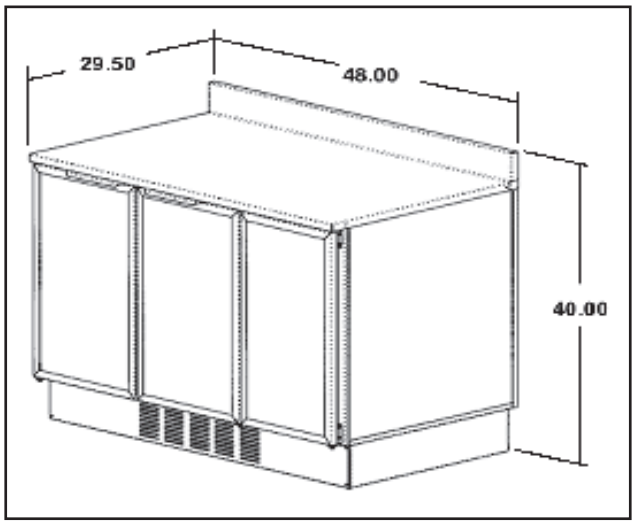


Figure 1
48" Refrigerated Back Counter (RBC 48)

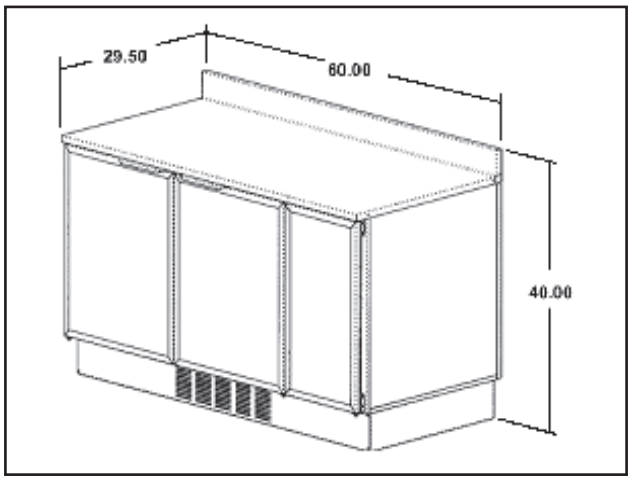


Figure 2
60" Refrigerated Back Counter (RBC 60)

Inside Unit

Take care not to block air flow to the fans and allow space along the front, back and sides.

Outside Unit

Be sure that the unit has access to ample air; avoid hot corners and locations near stoves and ovens.

CAUTION: This unit exhausts air to the bottom and the back. Do not seal the unit to the wall or set unit on a curb. The ventilation slots in the kickplate must remain open.

Leveling

Be sure that the units are placed on a firm, flat surface/floor. Check for cracks in flooring or tile and avoid these areas if possible. If necessary place support pads, properly rated for the weight of the unit, to “bridge” uneven or cracked flooring. Level unit accordingly.

Stabilizing

Use the leg adjustments to insure that the unit is solid to the floor surface at all four contact points. Insure that the unit does not “rock” when pressure is applied to the top corners.

Electrical Connection

The RBC 48 and RBC 60 are available as a 120VAC, 60 Hz or as 220VAC, 50 Hz dependent on model. All electrical connections should be performed by a certified electrician and should comply with local electrical codes for your municipality.

WARNING

REFER TO THE AMPERAGE DATA LIST IN THE SPECIFICATIONS OR THE SERIAL TAG DATA AND YOUR LOCAL CODE OR THE NATIONAL ELECTRICAL CODE TO BE SURE UNIT IS CONNECTED TO THE PROPER POWER SOURCE. A PROTECTED CIRCUIT OF THE CORRECT VOLTAGE AND AMPERAGE MUST BE RUN FOR CONNECTION OF THE SUPPLY CORD OR PERMANENT CONNECTION TO THE UNIT. THE POWER MUST BE TURNED OFF AND DISCONNECTED WHENEVER PERFORMING MAINTENANCE OR REPAIR FUNCTIONS.

MAINTENANCE

STAINLESS STEEL CARE AND CLEANING

To prevent discoloration or rust on stainless steel several important steps need to be taken. Stainless steel contains 70-80% iron which will rust. It also contains 12-30% chromium which forms an invisible passive film over the steels surface which acts as a shield against corrosion. As long as the protective layer is intact, the metal will not corrode. If the film is broken or contaminated, outside elements can begin to breakdown the steel and begin to form rust or discoloration.

Proper cleaning of stainless steel requires soft cloths or plastic scouring pads.

CAUTION: Never use steel pads, wire brushes or scrapers.

Cleaning solutions need to be alkaline based or non-chloride cleaners. Any cleaner containing chlorides will damage the protective film of the stainless steel. Chlorides are also commonly found in hard water, salts and household and industrial cleaners. If cleaners containing chlorides are used, be sure to rinse repeatedly and dry thoroughly upon completion.

Routine cleaning of stainless steel can be done with soap and water. Extreme stains or grease should be cleaned with a non-abrasive cleaner and plastic scrub pad. It is always good to rub with the grain of the steel. There are also stainless steel cleaners available which can restore and preserve the finish of the steels protective layer.

Early signs of stainless steel breakdown can consist of small pits and cracks. If this has begun, clean thoroughly and start to apply stainless steel cleaners in attempt to restore the passivity of the steel.

CAUTION: Never use an acid based cleaning solution! Many food products have an acidic content which can deteriorate the finish. Be sure to clean all food products from any stainless steel surface. Common items include, tomatoes, peppers and other vegetables.

WARNING

THE POWER MUST BE TURNED OFF AND DISCONNECTED AT ALL TIMES WHEN PERFORMING MAINTENANCE OR REPAIR FUNCTIONS.

PREVENTIVE MAINTENANCE

Cleaning the Condenser Coil

The condenser coil is located behind the filter panel and is accessed through the front of the unit (See Figure 3). The condenser coil requires regular cleaning and is recommended every 60 days. However, in some instances you may find that there is a large amount of debris, dust or grease that has accumulated prior to the 60 day time frame. In these cases the condenser coil should be cleaned every 30 days.

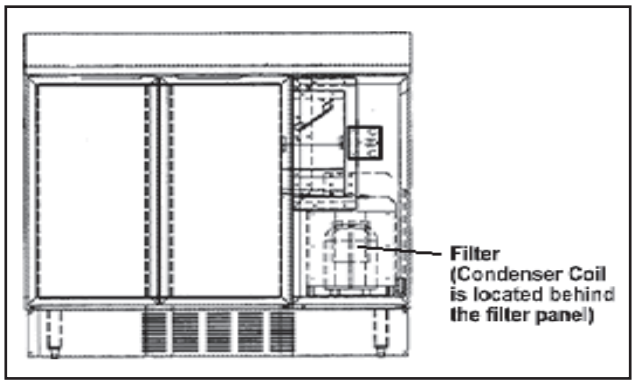


Figure 3
Location of Filter and Condensing Coil

If the build up on the coil consists of only light dust and debris the condenser coil can be cleaned with a simple brush, heavier dust build up may require a vacuum or even compressed air to blow through the condenser coil.

If heavy grease is present there are de-greasing agents available for refrigeration use and specifically for the condenser coils. The condenser coil may require a spray with the de-greasing agent and then blown through with compressed air.

Failure to maintain a clean condenser coil can initially cause high temperatures and excessive run times, continuous operation with dirty or clogged condenser coils can result in compressor failures. Neglecting the condenser coil cleaning procedures will void any warranties associated with the compressor or cost to replace the compressor.

CAUTION: Never use a high-pressure water wash for this cleaning procedure as water can damage the electrical components located near or at the condenser coil.

Gasket Maintenance

Gaskets require regular cleaning to prevent mold and mildew build up and also to keep the elasticity of the gasket. Gasket cleaning can be done with the use of warm soapy water. Avoid full strength cleaning products on gaskets as this can cause them to become brittle and prevent proper seals. Also, never use sharp tools or knives to scrape or clean the gasket which could possibly tear the gasket and rip the bellows.

Gaskets can easily be replaced and do not require the use of tools or authorized service persons. The gaskets are “Dart" style and can be pulled out of the groove in the door and new gaskets can be “pressed" back into place.

Drain Maintenance - Base

Each unit has a copper drain tube located inside the unit which removes the condensation from the evaporator coil and deposits it onto a drain pan where it can evaporate (See Figure 4). If you notice excessive water accumulation on the inside of the unit be sure that the drain tube is connected from the evaporator housing to the condensate evaporator drain pan. If water is collecting underneath the unit you may want to check the condensate evaporator drain tube to be sure it is still located above the drain pan. The leveling of the unit is also important as the units are designed to drain properly when on a level surface, if your floor is not level this can also cause drain problems. Be sure the drain pan is kept free of dirt, dust and other debris as excessive amounts will cause water to back up and overflow from the drain pan.

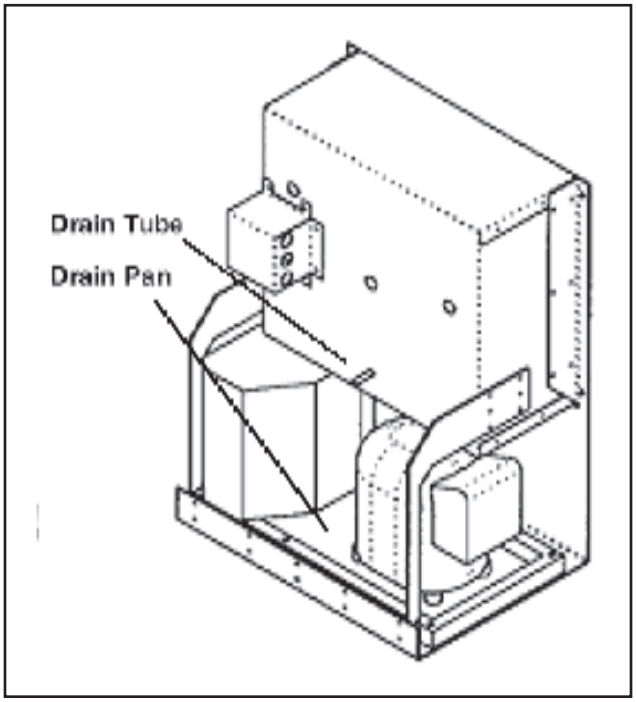


Figure 4
Location of Drain Tube and Drain Pan

PARTS REPLACEMENT

THERMOSTAT REPLACEMENT

The thermostat is located inside the main electrical control box and is accessible through the right side door.

1. Disconnect and isolate the refrigerator from the power source.
2. Remove upper sheet metal shroud behind right side door to gain full access to control box.
3. Remove the control box from the unit.
4. Remove the thermostat from the control box.
5. Remove interior ductwork from the right, inside of the unit to gain access to the evaporator fan assemble.
6. Remove the evaporator fan assembly.
7. Remove the thermostat control cap tube from the evaporator coil.
8. Remove thermostat from the unit.
9. Install replacement thermostat.
10. Replace the thermostat control cap tube.
11. Replace the evaporator fan assembly.
12. Replace all ductwork, reinstall the thermostat into the control box and reinstall the control box.
13. Replace the sheet metal shroud.
14. Reconnect main power source and test refrigeration unit.

NOTE: Care should be taken not to kink the new thermostat cap tube.

NOTE: 8" of the end of the thermostat cap tube must be in the evaporator coil to ensure proper operation.

EVAPORATOR FANS

The evaporator fans are a part of the main refrigeration unit. The refrigeration unit is accessed through the right side of the unit and is slid out as an assembly from the right side.

1. Disconnect and isolate the refrigerator from the power source.
2. Remove right rear corner angle strip.
3. Completely remove the right side laminate panel from its guide way.
4. Remove the inner, right side access panel.
5. Remove the refrigeration unit main mounting hardware.
6. Slide the entire refrigeration unit out through the right side as an assembly.
7. Disconnect and label the evaporator fan wiring.
8. Remove the evaporator fan mounting hardware.
9. Remove the evaporator fan.
10. Install the replacement evaporator fan.
11. Replace evaporator fan mounting hardware.
12. Reconnect the evaporator fan wiring.
13. Slide the refrigeration unit back to original mounting position.
14. Replace and secure the refrigeration unit main mounting hardware.
15. Replace side access panel, laminate panel and right rear corner angel strip.
16. Reconnect main power source and test the refrigeration unit.

REFRIGERATION SYSTEM UNIT REPLACEMENT

1. Disconnect and isolate the refrigerator from the power source.
2. Remove right rear corner angle strip.
3. Completely remove the right side laminate panel from its guide way.
4. Remove the inner, right side access panel.
5. Remove the refrigeration unit main mounting hardware.
6. Slide the entire refrigeration unit out through the right side as an assembly.
7. Install the replacement refrigeration unit onto the slide bars.
8. Slide the replacement refrigeration unit back to its mounting position.
9. Replace and secure the refrigeration unit main mounting hardware.
10. Replace side access panel, laminate panel and right rear corner angel strip.
11. Reconnect main power source and test refrigeration unit.

DOOR REPLACEMENT AND ADJUSTMENT

Doors may become misaligned during shipment but can be easily adjusted.

1. On the door that is hanging low, tighten hinge screws on top and bottom hinge with a 3/8" open wrench until snug. Do not over tighten.
2. Place a flat screwdriver against the side of the bottom hinge and lightly tap with a hammer until door is properly aligned.
3. Depending upon the degree of misalignment, it may be necessary to adjust the top hinge as well by gently tapping on the inside of the hinge.
4. Once doors have been aligned, assure that all screws are tight on all of the hinges.

DOOR GASKET REPLACEMENT

The door gasket is pulled from its retainer.

1. Starting in a corner, firmly pull the gasket from the retaining channel.
2. To reinstall, start in the corner and firmly press the gasket into the retaining channel.

MULLION AND CABINET HEATER REWIRING

General

In the event of mullion or cabinet heater failure, rewiring to the alternate heater (HTR2) is required.

Mullion Heater

The mullion heater is accessed behind the angle bracket that attaches the mullion to the main cabinet. The cabinet heater is accessed through the right side cabinet by removing the laminate from the right side of the unit.

Remove appropriate wire nuts (mullion heater) or spade connectors (cabinet heater) and transfer the supply power to the alternate heater.

RECHARGING REFRIGERANT SYSTEM

General

To analyze the performance of a refrigeration system; temperature readings can be taken and converted to pressures using a standard pressure/ temperature chart.

When access into a factory sealed refrigeration system is necessary to perform service, the following procedure must be followed to ensure the system is returned to a properly sealed state.

Tools Required

- Standard hand and refrigeration service tools, no special tools needed.
- Refrigerant Type: R-134A 8 ounces

Charging Procedure

NOTE: When service of the refrigeration system is necessary, care must be given during the evacuation process to ensure removal of air, moisture, and other non-condensables from the system. To evacuate the refrigeration system properly, Duke Manufacturing recommends a triple evacuation procedure outlined below. Failure to follow this process could cause poor performance of the refrigeration system.

- Evacuate system to 1500 microns
- Break the vacuum to 2 psig with dry nitrogen, if dry nitrogen is unavailable use the same type of refrigerant as used in the system
- Evacuate system to 1500 microns
- Break the vacuum to 2 psig with dry nitrogen, if dry nitrogen is unavailable use the same type of refrigerant as used in the system
- Evacuate system to 500 microns

The system is now ready to receive the refrigerant charge per the data plate information.

CAUTION: Never use oxygen or acetylene in place of refrigerant and dry nitrogen for leak testing. A violent explosion may result, causing personal injury or death. Always use a pressure regulator when using nitrogen to pressure test. Failure to do so will result in extremely high pressure which could exceed the burst pressure of the compressor or other system components and result in personal injury or death.

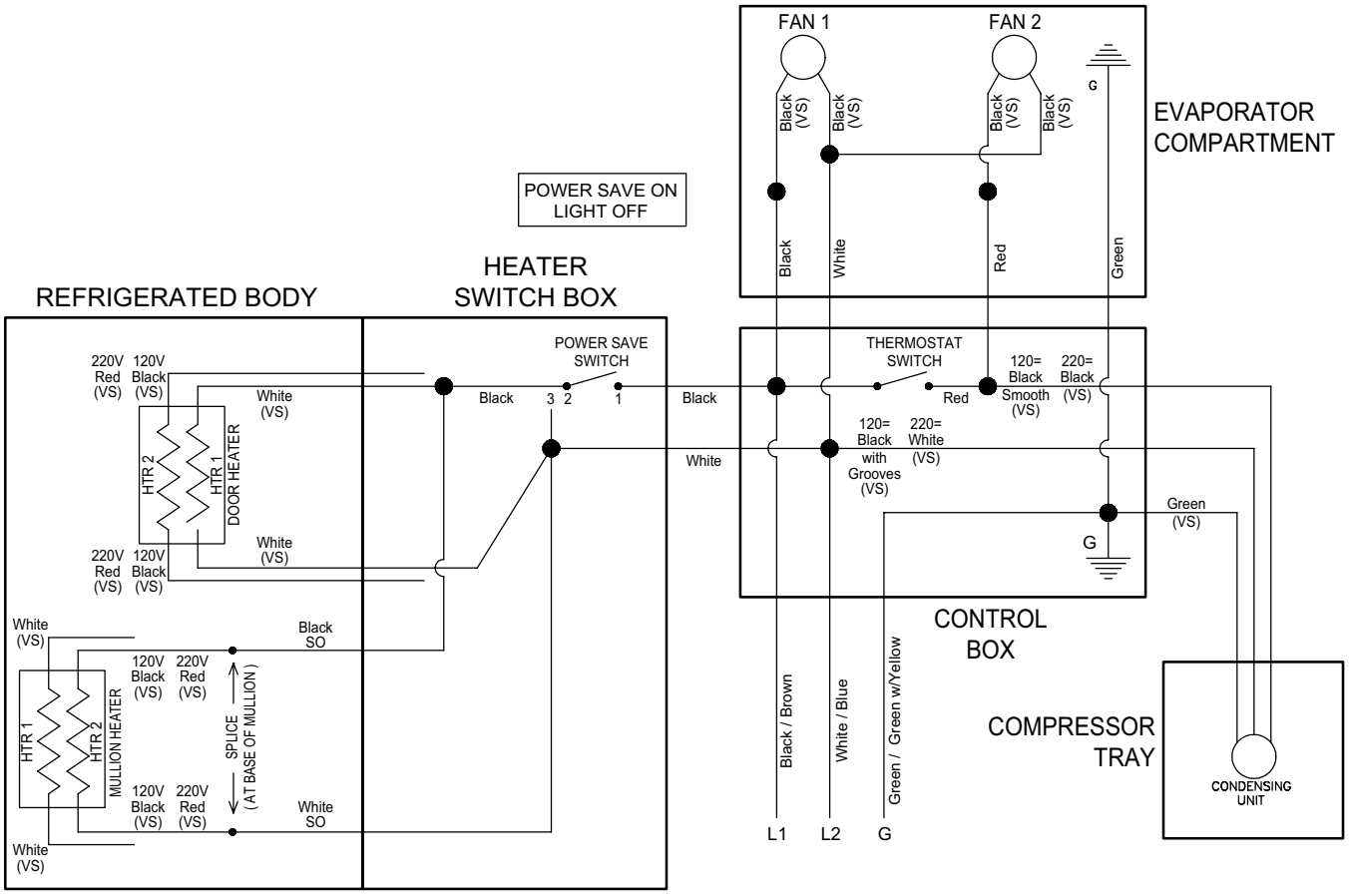
NOTE: Before beginning the repair, ensure there is enough of the process tube present to complete the repair using the above procedure. If not, install a new process tube (approximately 12") before beginning the repair sequence.

1. Install a temporary access valve on the high and low side process tubes as close to the factory crimps as possible.
2. Through the use of temporary valves, (Duke Manufacturing will not reimburse the cost of permanently installed valves) perform the required service needed to repair the unit.
3. Once the repair has been made, evacuate the system using the triple evacuation method described in Duke Manufacturing Service Bulletin Number 26. After the evacuation is complete, recharge the system as stated on the nameplate, using the proper refrigerant, Continue by crimping the process tube just below the temporary valve and again 2" below the crimp just made. Leaving the crimp tool in place, remove the temporary valve, braze shut the end of the process tube, allow to cool (approximately “5 minutes" time), remove the crimp tool, and leak check the brazed end.

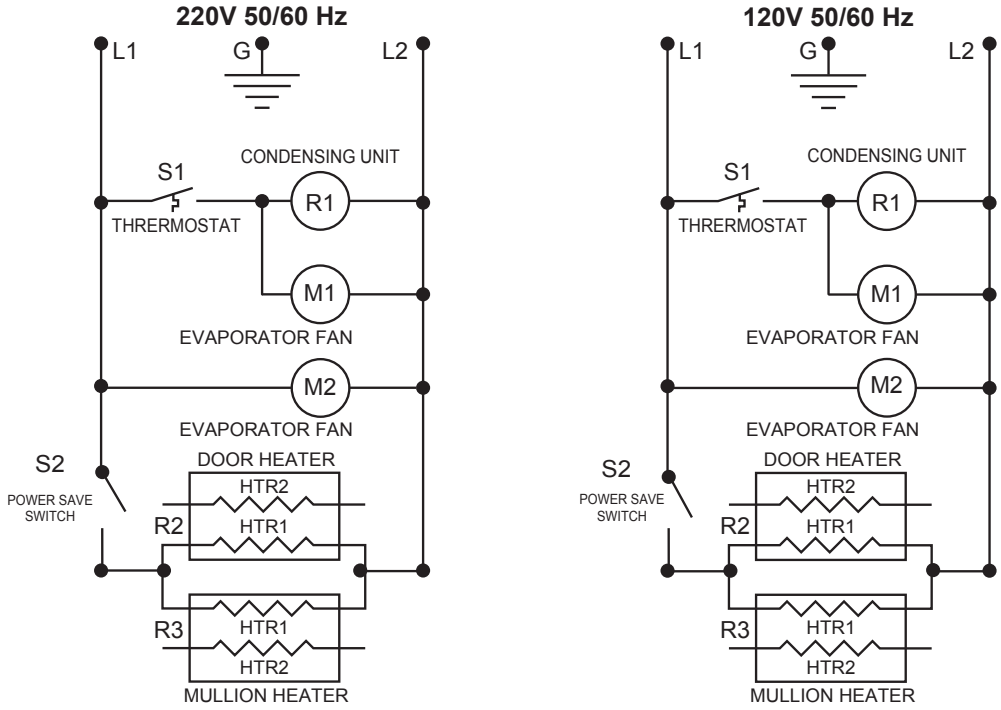
TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
Cabinet too warm	Unit not plugged in	Plug unit in
	Thermostat set too warm	Set thermostat colder, the higher the number, the colder the unit will be
	Faulty thermostat, in the coldest position, the switch is not closed	Replace thermostat
	Doors not sealing	Adjust doors
	Torn or damaged door gaskets	Replace gaskets
	Evaporator fan not running	Check motor, repair or replace
	Condenser fan motor not running	Check motor, repair or replace
	Condenser coil dirty/ filter dirty	Clean coil or filter
	Refrigerant leak	Leak check unit, repair, and recharge
Cabinet too cold	Thermostat set too cold	Turn thermostat to a warmer setting, the higher the number, the colder the unit will be
	Faulty thermostat, in the off position, the switch does not open, stuck closed	Replace thermostat
Water in the bottom of the unit	Drain tube plugged	Clear drain tube
	Drain tube loose or disconnected from drain pan	Tighten or re-connect drain tube

WIRING DIAGRAMS



(VS = Vendor Supplied)
Subject to change



NOTE: HTR2 IS A FAULT BACKUP FOR HTR1 IN THE HEATER ASSEMBLIES.

NOTES

CUSTOMER ASSISTANCE

To aid in reporting this unit in case of loss or theft, please record below the model number and serial number located on the unit. We also suggest you record all the information listed and retain for future reference.

MODEL NUMBER _____ **SERIAL NUMBER** _____

DATE OF PURCHASE _____

_____

DEALER _____ **TELEPHONE** _____

SERVICER _____ **TELEPHONE** _____

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TO ACCESS INTERNET: www.dukemfg.com

Please provide the following information when you write or call: model number, serial number, date of purchase, your complete mailing address (including zip code), and description of the problem.

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