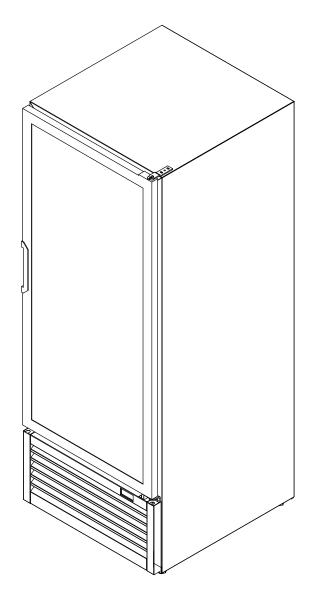
Royal Vendors Freezer

Operation, Service, and Parts Manual



Manufactured by



Royal Vendors, Inc.

426 Industrial Boulevard Kearneysville, West Virginia 25430-2776 USA

TABLE OF CONTENTS

Safety Information	3
Royal Vendors Freezer Standard Parts	4
General Information and Setup	
• Introduction	
• Unpacking the Cooler and Installing It On Location	5
Start-Up • Preliminary Checks	6
• Initial Start-Up	7
Maintenance	7
Refrigeration System Service	8
Refrigeration Unit Components	8
Refrigeration Deck Removal	8
Refrigeration Controller Information	9
Carel Controller	9
Display and Functions	9
Refrigeration System Troubleshooting	10
Wiring Diagram	11
Parts Catalogue	12
Credit and Replacement Policy	



Royal Vendors, Inc. • 426 Industrial Boulevard • Kearneysville WV 25430-2776 • USA Customer Service: +1 304 728 7056 or Toll Free in North America 1 800 931 9214 • Fax +1 304 725 4016

E-mail: technicalinquiry@royalvendors.com parts@royalvendors.com

Website: www.royalvendors.com

SAFETY INFORMATION

ROYAL VENDORS' COMMITMENT TO SAFETY

Royal Vendors is committed to safety with all of our product designs. We are committed to notifying the user of any possible danger involving the improper handling or maintenance of our products. The servicing of any electrical or mechanical device involves potential dangers, both to those servicing the equipment and to users of the equipment. These dangers can occur because of improper maintenance or usage. The purpose of this safety segment is to alert anyone servicing Royal equipment of potentially dangerous areas and to provide basic safety guidelines for proper upkeep.

This service manual contains various warnings that should be carefully read to minimize the risk of personal injury. This manual also contains service information to ensure that proper methods are followed to avoid damaging the machine or making it unsafe. It is also important to understand these warnings provide general guidance only. Royal could not possibly know, evaluate, or advise of all the conceivable ways in which service might be done. Consequently, Royal cannot predict all of the possible dangerous results. These outlined safety precautions are the basis for an effective safety program. Use these safety measures, along with the service bulletins, helpful hints, and product specification sheets, when installing or servicing Royal equipment.

We recommend that persons servicing our equipment maintain a similar commitment to safety. Only personnel properly trained should have access to the interior electrical and / or mechanical parts of the machine. This will minimize the potential dangers that are inherent in electrical and mechanical devices. Royal has no control over the vender once it leaves the premises. It is the owner or lessor's responsibility to maintain the vender in a safe condition. See installation insert located in the new machine for proper installation procedures, and refer to the service manual for recommended maintenance procedures. If you have any questions, please contact the Technical Service Department at 1 800 931 9214 (outside North America, dial +1 304 728 7056).

SAFETY REGULATIONS

- Read the safety segment before installation or service.
- Test for proper grounding before installing the machine to reduce the risk of electrical shock and fire.
- Disconnect the power cord from the wall outlet before servicing the machine.
- Only fully-trained service technicians should service the machine when it has power.
- · Remove any product before moving a machine.
- Use appropriate equipment when moving a machine.
- Always wear eye protection, and protect your hands, face, and body when working near the refrigeration system.
- Use only authorized replacement parts.
- Be aware of inherent dangers in rocking or tipping a machine.

SECTION 1: ELECTRICAL HAZARDS GENERAL ADVICE

Careless or improper handling of electrical circuits can result in injury or death. Anyone installing, repairing, loading, opening, or otherwise servicing a machine should be aware of this precaution. Apply all of the normal precautions when handling electrical circuits, such as:

- Refrigeration servicing to be performed by qualified personnel only.
- Unplug the vender before servicing.
- Replace electrical cords if there is any evidence of fraying or other damage.
- Keep all protective covers and ground wires in place.
- Plug equipment into outlets that are properly grounded and polarized (where applicable), and protected with fuses or circuit breakers of the correct size.
- All electrical connections must be dry and free of moisture before applying power.

WARNING: ALWAYS TEST TO VERIFY PROPER GROUNDING PRIOR TO INSTALLATION IN ORDER TO REDUCE THE RISK OF ELECTRICAL SHOCK AND FIRE.

SECTION 2: ELECTRICAL HAZARDS

1. Servicing with power off.

For maximum safety, unplug the power cord from the wall outlet before opening the machine's door. This will aid in avoiding electrical hazards. Service personnel should remain aware of possible hazards from hot components although electrical power is off.

2. Servicing with power on.

Some service situations may require access with power on. Only fully-qualified service technicians should perform power-on servicing. Particular caution is required in servicing assemblies that combine electrical power and mechanical movement. Sudden movement (to escape mechanical action) can result in contact with live circuits and vice versa. It is therefore important to maintain maximum clearances from both moving parts and live circuits when servicing.

This equipment is intended for the storage of non-potentially hazardous bottled or canned products only.

WARNINGS:

- 1. ONLY FULLY-TRAINED SERVICE PERSONNEL SHOULD ACCOMPLISH SERVICING WITH POWER ON. SUCH SERVICE BY UNQUALIFIED INDIVIDUALS CAN BE DANGEROUS.
- 2. LIGHTING CIRCUITS CAN BE HAZARDOUS. ALWAYS DISCONNECT THE MACHINE FROM THE WALL OUTLET BEFORE REPLACING A BULB OR SERVICING THE MACHINE IN THAT AREA.
- 3. NEVER USE A HOSE, PRESSURE WASHER, OR ANY CLEANING METHOD THAT COULD WET ELECTRICAL COMPONENTS. IF WATER CONTAMINATION OF ELECTRICAL COMPONENTS IS SUSPECTED, USE QUALIFIED ELECTRICAL TESTING EQUIPMENT AND TEST METHODS TO ASSURE THAT THE MACHINE IS NOT A HAZARD BEFORE APPLYING POWER FOR ANY REASON.



CAUTION

If an extension cord is necessary, use only the three-wire grounding type. The use of ungrounded cords or an overloaded circuit voids the compressor warranty.



DANGER

Before servicing the unit, disconnect electrical service. Failure to do so could result in electrical shock or electrocution and could cause personal injury or death!

ROYAL VENDORS FREEZER STANDARD PARTS				
	Unit Size			
Parts	Parts Factory Installed Field Installed		027	
			Quantity	
Refrigeration Deck	Х		1	
Shelves		X	5	
Shelf Clips		X	20	
Operation and Service Manual	-	-	1	
Levelling Legs	X		4	
Lamps	X		1 (standard) / 2 (optional)	
Leg Protective Sleeve		X	4	

NOTE: Parts shown are for standard units. Quantity of shelves and clips may vary based on factory-supplied options.

GENERAL INFORMATION AND SETUP

INTRODUCTION

This manual contains installation, operation, and service instructions for the Royal Vendors Freezer, by Royal Vendors, Inc. This manual also contains a parts catalog and electrical schematic for the Freezer.

UNPACKING THE FREEZER AND INSTALLING IT ON LOCATION UNWRAP THE MACHINE

Unwrap the unit and remove the padding. Examine all packages for damage to packaging material. Damage to external packaging may have resulted in unit damage. Check packages for all accessories and components, including legs, casters, and shelves. File a claim immediately with the shipping company if the shipment is damaged or incomplete.

PLACE THE UNIT ON LOCATION

Units are designed for indoor placement only. Provide at least 4" (10 cm) of wall space behind the unit cabinet and any adjacent wall or fixture. Remove the shipping skids by inserting a claw hammer, crowbar, or similar device into the slot of each section to break it apart. Tilt the unit slightly to remove the separated pieces. Remove the leveling legs, and place the protective sleeve over the threads of the legs. Replace the leveling legs with the protective sleeve in place, and be sure the unit is level (see following section). The protective sleeves provide 3" (7.5 cm) clearance under the unit for cleaning.

UNIT DATA		
UNIT	RVZ-027	
Voltage AC Nominal Range	115 105-125	
Frequency	60 Hz	
Total Amps	10.5	
Refrigerant Type Charge Amount	R404a 13.5 oz. (0.38 kg)	
Design Pressure High Side (psig) Low Side (psig)	500 200	

LEVEL THE UNIT

To provide adequate condensate drainage and proper door alignment and operation of unit, the unit cabinet must be level. The leveling legs are factory-installed.

To level the unit:

The door is spring-loaded and will not function properly without proper leveling of the cabinet. Using an adjustable wrench, adjust the leveling legs so that the unit sits approximately level to the floor and the door closes properly. For best door operation, adjust the leveling legs so that the cabinet has a 1/16" (2 mm) rake or slant from front to rear. Optional casters are available to replace the leveling legs.

INSTALL THE SHELVES

Product shelves and a bag containing shelf support clips are packed inside the unit. Refer to the table below to verify the quantity of shelves and shelf supporting clips.

To install the shelves:

- 1. Determine the proper location for the shelf clips. Refer to the numbers on the pilaster to ensure that all clips are properly located.
- 2. Insert the top tab of the shelf clip into the desired hole of the pilaster. The retaining tab should be facing upward, as shown in Figure 1.
- 3. Rotate the clip downward and insert the bottom tab into the appropriate hole on the pilaster. If necessary, squeeze the clip slightly during installation.
- 4. Install all remaining clips as described above.
- 5. Install the shelves onto the clips so that the product retention bars are facing upward. Be careful not to dislodge the clips during shelf installation.
- 6. Shelves must be placed so that the retaining tab on the shelf clip captures the shelf, as shown in Figure 2.
- 7. Before loading the shelf, ensure that the shelf is resting on each of the four clips and that the clips are installed as shown in Figures 1 and 2 (on next page).



WARNING

Improper shelf clip installation may cause shelf and / or product to fall, which could result in personal injury or damage to the unit.

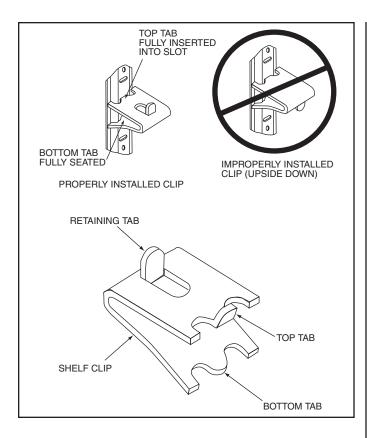


Figure 1. Shelf clip installation.

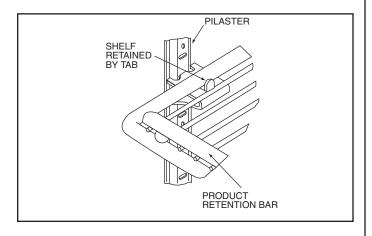


Figure 2. Proper installation of the shelf on the clip.



WARNING

Do not overload the shelves. The unit is designed to use all the shelves provided, installed in equally-spaced configuration.

Failure to install shelves correctly could result in personal injury or damage to the unit. If fewer shelves or a different installation configuration is desired, contact the manufacturer to ensure that shelf overloading will not occur.

START-UP

PRELIMINARY CHECKS

Bi-pin lamp installation / verification

Before applying power to the unit, verify that the lamp has been properly installed and is fully engaged in the lamp holders. The Freezer has one (standard) or two (optional) lamps inside the cooler.

To achieve proper lamp engagement, rotate the lamp 90 degrees from its insertion position until it snaps or clicks into place.

Visually verify proper lamp installation by checking the identification mark on the end of the bulb. If the bulb has been properly installed, the mark will be centered between the halves of the lamp holder. (Refer to Figure 3.)

Electrical supply and connections

Check to be sure that the electrical service to the unit meets all local and national electrical codes. Unit electrical data is shown on the unit data label, located on the inside of the cabinet in the upper left-hand corner. Review this label before initiating electrical service. The voltage range of the power supply to the unit should be 105 to 125 volts. Refer to the table below for unit data.

NOTE: Other motors or heavy appliances should not be used on the same circuit with the freezer.

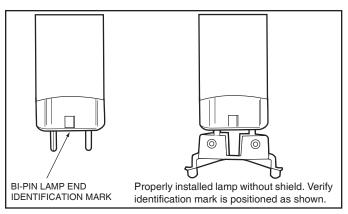


Figure 3. Installation of lamp.

INITIAL START-UP

Power supply

Connect the unit to the power supply. Check to verify that the compressor, lamps, and fans are running.

IMPORTANT: Low line voltage is often the cause of service complaints. Check to see that the line voltage is within the specified range with the unit running.

Temperature control

The temperature is controlled by a pre-set electronic thermostat.

MAINTENANCE

LAMP REPLACEMENT

Remove the lamps by rotating 90 degrees to align the lamp pins with the holder slots. Refer to "Bi-pin fluorescent lamp installation / verification" on page 8 for further information on lamp removal.

CONDENSATE DISPOSAL

The evaporator drain pan is located in the base of the refrigeration deck. Airflow in the deck compartment hastens condensate evaporation so that external drain plumbing is not required. In general, this renders the condensate pan maintenance-free.

CONDENSER

The condenser should be inspected periodically for accumulation of debris, which should be removed. A vacuum cleaner or wire brush can be used to remove debris. Be careful to not bend the condenser fins.

CABINET EXTERIOR

Cabinets should be cleaned with a solution of mild soap and water or mild household cleaner. Do not use caustic soap or abrasive cleaners, since these might damage the cabinet finish. Do not use steel wool, or rusting might occur.

INTERIOR SURFACE

The inside of the cabinet is coated with powder-coat paint. To clean, use a mild soap and water solution or mild household cleaner.

UNDERNEATH FREEZER

Underneath the freezer can be cleaned by hand or with an appropriate cleaning tool up to 1 1/2" thick, using a mild soap and water solution or mild household cleaner.



CAUTION

Improperly installed lamps may cause damage to the lighting circuit. Royal Vendors will not be responsible for equipment or component failures or other damages that arise from improper lamp installation.



DANGER

Before servicing the unit, disconnect electrical service. Failure to do so could result in electrical shock or electrocution and could cause personal injury or death!

REFRIGERATION SYSTEM SERVICE

REFRIGERATION UNIT COMPONENTS

The Royal Vendors Freezer refrigeration system consists of a hermetically-sealed compressor and finned evaporator and condenser coils.

Condenser

The condenser has finned coils which assist in removing heat from the refrigerant. The condenser requires periodic cleaning for maximum efficiency.

Condenser fan motor

The condenser fan motor assembly is mounted between the condenser and the compressor. Air is drawn through the condenser, over the body of the compressor, and out the rear of the unit compartment.

The motor is wired to cycle with the compressor, but it will continue to operate should the compressor cut out on the overload. The motor is permanently lubricated; therefore, oiling is not required or recommended.

Drier

The drier is installed in the system just before the capillary tube. It traps minute particles of foreign material and absorbs any moisture in the system.

Thermal expansion valve

The expansion valve is located in the refrigerant line between the condenser and evaporator coils. The expansion valve is used as a metering device to control the flow of liquid refrigerant to the evaporator coil. This creates a low pressure causing the refrigerant to vaporize and absorb heat as it passess through the evaporator.

REFRIGERATION DECK REMOVAL

Note: The refrigeration unit weighs in excess of 70 lbs (32 kg). Use caution when lifting the unit.

- 1. Remove power from the vender.
- 2. Disconnect the refrigeration unit's power cord from the main wiring harness junction block.
- 3. Disconnect the 4-wire connection on the right side air baffle (located beside the refrigeration unit's power cord connection to the junction block).
- 4. Remove the evaporator cover.
- 5. Remove the mullion cover.
- 6. Remove the refrigeration lines cover.
- 7. Remove the two bolts that secure the refrigeration base plate.
- 8. Remove the two screws that secure the refrigeration unit to the baffles on each side of the condensor.
- 9. Pull the refrigeration unit completely out of the cabinet.
- 10. Installation of the new unit is the reverse of the removal process.



DANGER

Before servicing the unit, disconnect electrical service. Failure to do so could result in electrical shock or electrocution and could cause personal injury or death!



CAUTION

If an extension cord is necessary, use only the three-wire grounding type. The use of ungrounded cords or an overloaded circuit voids the compressor warranty.

REFRIGERATION CONTROLLER INFORMATION

CAREL CONTROLLER

Operation of the Royal Vendors Freezer is regulated by a Carel PJEZC electronic microprocessor controller with LED display.

DISPLAY AND FUNCTIONS

During normal operation, the controller displays the value of the probe set using parameter /4 (1 = ambient probe; 2 = second probe; 3 = third probe). In addition, the display has LEDs that indicate the activation of the control functions (as shown in the first table below), while the three buttons can be used to activate or deactivate some of the functions (as shown in the second table below).

LEDs and associated functions

Icon	Function	Normal operation			G ₄ ,	
Icon	Function	ON	OFF	Blink	Start up	
	Compressor	on	off	request	ON	
H	Fan	on	off	request	ON	
***	Defrost	on	off	request	ON	
AUX	Aux	Output on	Output off	-	ON	
Ü	Alarm	All	No alarm	-	ON	
0	Clock	RTC fitted and enabled, at least one time band set	RTC not fitted or disabled, not even one time band set	-	ON if RTC fitted	

Table of functions activated by the buttons

Button		Normal operation			
		pressing the button alone	pressed together	Start up	
	up ON/ OFF	more than 3 s: toggle ON / OFF	Pressed together start/stop	-	
▽ ***	down defrost	more than 3 s: start/stop defrost	continuous cycle	Pressed together start parameter reset	For 1 s display firmware vers. code
set set	set mute	- 1 s: display / set the set point - more than 3 s: access parameter setting menu (enter password '22') - mute audible alarm (buzzer)	-	structure	For 1 s RESET current EZY set

Setting the set point

- Press SET for 1 second. The set point will start flashing after a few moments.
- Increase or decrease the value using the UP or DOWN buttons.
- · Press SET to confirm the new value.
- Factory set point is -7°F.
- The set point can be adjusted from -10°F to 0°F.

Switching the device ON or OFF

Press UP for more than 3 seconds. The control and defrost algorithms are now disabled and the instrument displays the message "OFF", alternating with the temperature read by the set probe.

Manual defrost

Press DOWN for more than 3 seconds. *NOTE:* The defrost starts only if the temperature conditions are valid.

Defrost interval

The defrost mode is activated every four hours.

Continuous cycle

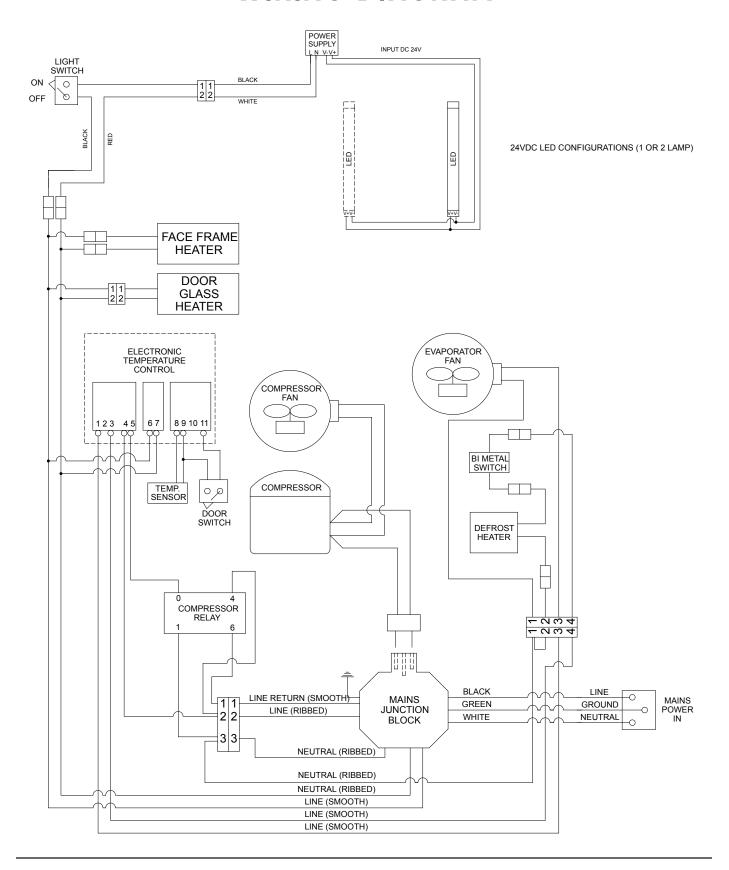
Press UP and DOWN together for more than 3 seconds.

Table of alarms

Alarm code	Buzzer and alarm relay	LED	Description	Parameters involved
E0	active	ON	probe 1 error=control	-
E1	inactive	ON	probe 2 error=defrost	[d0 = 0/1]
E2	inactive	ON	probe 3 error=condenser	[A4=10]
IA	active	ON	external alarm	[A4=1] [+A7]
dOr	active	ON	open door alarm	[A4=7/8][+A7]
LO	active	ON	low temperature alarm	[AL] [Ad]
HI	active	ON	high temperature alarm	[AH] [Ad]
EE	inactive	ON	unit parameter error	-
EF	inactive	ON	operating parameter error	-
Ed	inactive	ON	defrost ended by timeout	[dP] [dt] [d4] [A8]
dF	inactive	OFF	defrost running	[d6=0]
cht	inactive	ON	condenser dirty pre- alarm	[A4=10]
CHt	active	ON	condenser dirty alarm	[A4=10]
EtC	inactive	ON	clock alarm	if bands active

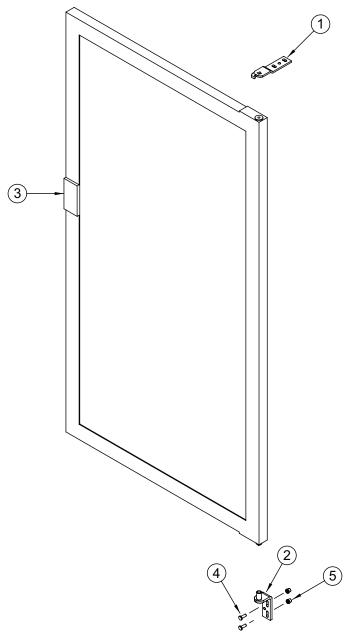
REFRIGERATION SYSTEM TROUBLESHOOTING				
PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION		
Compressor will not start; does not hum.	Line cord not plugged in. Wiring improper or loose. The electronic cold control is faulty.	Plug in the cord. Check wiring against schematic. Replace the refrigeration assembly.		
Compressor will not start; hums but trips on overload protector.	Low voltage to unit. Start capacitor defective. Improperly wired.	 Determine reason and correct. Replace the capacitor. Check wiring against schematic. 		
Compressor starts but does not switch off or start winding.	Low voltage to unit. Run capacitor defective. Compressor motor winding is defective or shorted.	Determine reason and correct. Replace the capacitor. Determine cause, correct, and replace compressor.		
Compressor starts and runs, but short-cycles on overload protector.	 Additional current passing through overload protector. Low voltage to unit. Overload protector defective. Run capacitor defective. Excessive discharge pressure. Compressor too hot. 	 Check wiring schematic. Check for added fan motors, pumps, etc., connected to wrong side or protector. Determine reason and correct. Check current and replace protector. Replace the capacitor. Check ventilation, restrictions in cooling medium, restrictions in refrigeration system. Check airflow across condenser. 		
Unit runs but short-cycles.	Overload protector.	Check wiring schematic for correct wiring.		
Unit operates too long or continuously.	 Bad refrigeration unit. Dirty condenser. Evaporator fan not working. Bad refrigeration unit. 	 Replace the refrigeration unit. Clean condenser. Check evaporator fan wiring. If correct, replace evaporator fan. Replace refrigeration unit. 		
Cabinet temperature too high.	 Inadequate cabinet air circulation. Dirty evaporator. Dirty condenser. Inadequate air circulation at refrigeration deck. The electronic cold control is faulty. Evaporator frozen. 	Check evaporator fan motor. Clean evaporator. Clean condenser. Check condenser fan motor. Replace the refrigeration assembly. Check defrost heater.		
Unit is noisy.	 Loose parts or mountings. Tubing rattling. Bent fan blade causing vibration. Fan motor bearings worn. 	Find and tighten. Reform to be free of contact. Replace blade. Replace motor.		
Excessive condensation on door.	Unplugged door heater. Faulty door heater.	Plug in door heater. Replace door.		

WIRING DIAGRAM



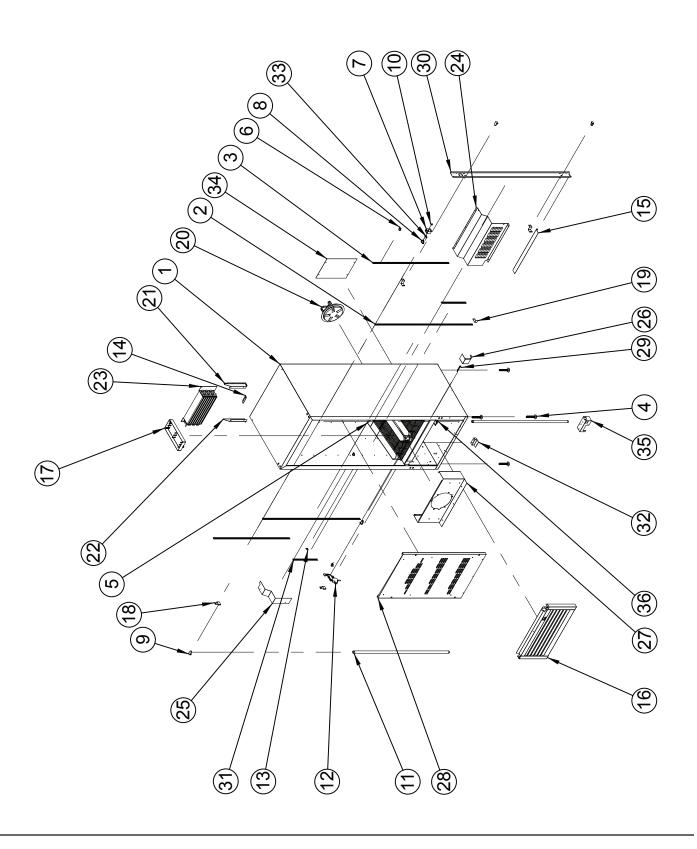
Parts Catalogue

DOOR ASSEMBLY



Item	Description	Part Number
1 2 3 4 5	Top Door Hinge	
•	Washer, Flat, Nylon 6/6 Black, 0.05" (1.27 mm) thick (between bottom hinge and door)	904053

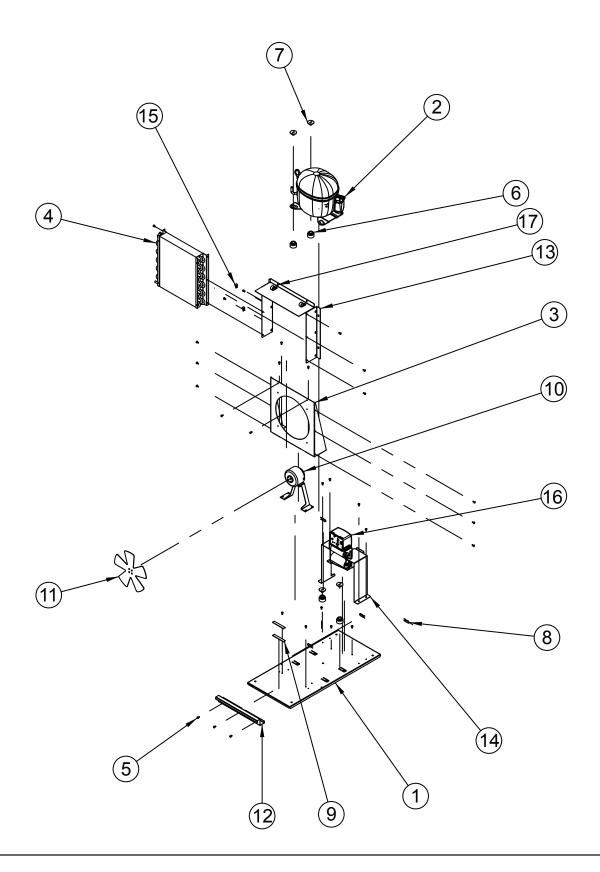
CABINET PARTS



CABINET PARTS

Item	Description	Part Number
1	Cabinet Assembly, Foamed	400246
2	Pilaster, Front, 54"	
3	Pilaster, Rear, 44"	810387
4	Levelling Leg	803117
5	Shelf, Full	811094
	- Half (Bottom)	811095
6	Pilaster Clip	810339
7	Lamp Switch Bracket	370046
8	On / Off Switch	835027
9	Lampholder	842565
10	Line Interrupt	835033
11	LED Tube	N/A
12	Main Wire Harness	842845
13	Cable Clamp	916014
14	Hold Down Angle	201206
15	Bottom Edge Guard	400318
16	Grille Assembly, Freezer	400008
17	Condensate Pan	815368
18	Lamp Guard	370048
19	Condensate Pan Stop	370430
20	Evaporator Fan	839061
21	Evaporator Bracket, Left	400433
22	Evaporator Bracket, Right	
23	Evaporator	820030
24	Evaporator Cover	
25	Evaporator Cover Extension	
26	Mullion Cover	
27	Evaporator Fan Shroud	
28	Air Duct Back	
29	Mullion Water Block	
30	Lamp Bracket Panel Cover	
31	Pilaster, Middle, 12"	
32	Grille Attachment Plate	
33	Screw, #8-32 x 3/8"	901011
34	Air Guide	
35	Door Switch Mounting Bracket	400217
36	Door Switch Strike	
•	Carel Cold Control	
•	Harness, Controller to Refrigeration Unit	
•	Harness, Temperature Sensor	842896
•	Harness. Controller to Door Switch	400902

REFRIGERATION UNIT



REFRIGERATION UNIT

Item	Description	Part Number
•	Refrigeration Assembly (includes all items below)	400436
1	Refrigeration Base Plate	400435
2	Compressor	819058
3	Condensor Shroud	400419
4	Condensor	820029
5	Screw, Sems, #8-32 x 3/8"	901011
6	Grommet	916015
7	Grommet Plug	
8	Compression Clip	914002
9	Sealer Gum	
10	Condensor Fan Motor	839063
11	Condensor Fan Blade	810014
12	Refrigeration Base Plate Handle	
13	Condensor Fan Shroud	
14	Evaporator Support	400437
15	Cable Clamp, 1/4"	916180
16	Compressor Electronics	819061
17	Cable Clamp	
•	Refrigeration Harness	845846





CREDIT AND REPLACEMENT POLICY

Credits or replacements will be issued on warranty items if the proper procedures are followed:

- 1. ROYAL VENDORS will pay shipping charges on all parts covered under this warranty when transportation has been made the most economical way. (Example: Within the continental USA, regular ground UPS.) An A.R.S. (Authorized Return Service) sticker will be sent with all warranty parts. This method of shipping is preferred for returning parts to Royal.
- 2. Credits will only be issued to warranty parts that have been ordered in advance, not for parts ordered as stock. (NO EXCEPTIONS.)
- 3. When ordering warranty parts in advance, please have the full vender, refrigeration unit, and / or control board serial numbers.
- 4. A copy of the Packing Slip, the correct serial number and complete Return Material Tag (provided with part) are required for returning parts. Please fill out the Return Material Tag completely, keeping the white copy for your records and returning the yellow tag with the attached part. Make sure to fill in the company name, address, telephone number, serial number, and model number, along with a brief explanation of the problem.
- 5. If the item returned is not under warranty, it will be returned at your expense along with a US\$10.00 handling fee or it will be scrapped.
- 6. All warranty parts should be properly wrapped and packed securely to avoid further damage. Parts that are returned from the field and have been tapped into, tampered with, not packaged properly, or have had the serial plate or label removed, will void the warranty.
- 7. If parts are not returned within 15 working days, the invoice will be due in full.



