



Installation, Operation & Maintenance Manual

Refrigerated Base – Remote

MODELS

20036RSB	20084RSB
20048RSB	20096RSB
20060RSB	20108RSB
20072RSB	



1100 Old Honeycutt Rd. - Fuquay-Varina, NC 27526
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GENERAL INFORMATION

This technical manual provides information for the installation, operation, maintenance, and inspection of this unit manufactured by Middleby. A complete parts breakdown is also provided.

TECHNICAL SUPPORT

For any questions regarding the installation, operation or maintenance of the unit, contact the factory at the following address:

Technical Service Department
Middleby
1100 Honeycutt Road
Fuquay-Varina, NC 27526

SCOPE OF THE MANUAL

This manual provides sufficient information for maintenance of the equipment.

EQUIPMENT DESCRIPTION

The unit consists of the following parts:

- Storage compartment - The insulated food storage compartment is clear storage area. The cooling coil (evaporator) is contained in this area.
- Drawers - Product is stored by means of food pans set in drawers. The drawer face is made of an insulated panel. The drawer face (panel) is fully “gasketed” to provide a tight seal against the cabinet.
- Condensing Unit Compartment - This area contains the condensing unit(s) along with the necessary controls and other components.
- Evaporator Coil - The evaporator coil is located in the storage compartment and is responsible for distributing the cold air associated with the refrigeration system.
- Cabinet - The cabinet is the enclosure in which all of the above mentioned items are housed.

EQUIPMENT SUPPLIED

The unit is shipped from the factory assembled. The complete assembly is palletized and crated to minimize the possibility of damage in shipping and storage.

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NOTICE! MIDDLEBY RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AND PRODUCT DESIGN WITHOUT NOTICE. SUCH REVISIONS DO NOT ENTITLE THE BUYER TO CORRESPONDING CHANGES, IMPROVEMENTS, ADDITIONS OR REPLACEMENTS FOR PREVIOUSLY PURCHASED EQUIPMENT.

SAFETY NOTICES

⚠ DANGER
 This symbol warns of immediate hazards which **WILL** result in severe injury or death.

⚠ WARNING
 This symbol refers to a potential hazard or unsafe practice which **COULD** result in injury or death.

⚠ CAUTION
 This symbol refers to a potential hazard or unsafe practice which **COULD** result in injury, product or property damage.

NOTICE! This symbol refers to information that requires special attention or must be fully understood, even though not dangerous.

SAFETY PRECAUTIONS

NOTICE! Post the emergency telephone number of your gas supplier and instructions to follow if gas odor is detected.

⚠ DANGER
EXPLOSION HAZARD
 If gas odor is detected, shut down equipment at the main shutoff valve. Immediately call the emergency phone number of your gas supplier.

⚠ WARNING
FIRE HAZARD
 For your safety, do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
 Keep area around appliances free and clear of combustibles.

⚠ WARNING
 Asphyxiation can result from improper ventilation. Do not obstruct the flow of combustion and ventilation air to /and from your cooking equipment.

NOTICE! Be sure this manual and important papers are given to the proper authority to retain for future reference.

SPECIFICATIONS

Table 1.1 - Leading Particulars

<i>Remote, Refrigerated Bases</i>												
Model Number	W	D	H*	Drawers			No. of Pans 12"x20"x4"	Ref. Volume (cu.ft.)	Elec. V/Ph/Hz	Evap. BTU	Amps	Shipping Weight (lbs.)
				18"	26"	31"						
20036RSB	36"	32"	26"	-	2	-	4	6.8	115/1/60	1100	0.9	300
20048RSB	48"	32"	26"	-	-	2	4	13	115/1/60	1100	0.9	400
20060RSB	60"	32"	26"	2	2	-	6	14	115/1/60	1100	0.9	510
20072RSB	72"	32"	26"	-	2	2	8	17.5	115/1/60	1600	0.925	610
20084RSB	84"	32"	26"	4	2	-	8	21	115/1/60	1600	0.925	715
20096RSB	96"	32"	26"	-	6	-	12	24.6	115/1/60	1600	0.925	815
20108RSB	108"	32"	26"	-	2	4	12	28.2	115/1/60	1600	0.925	920

*Includes 6" legs or casters

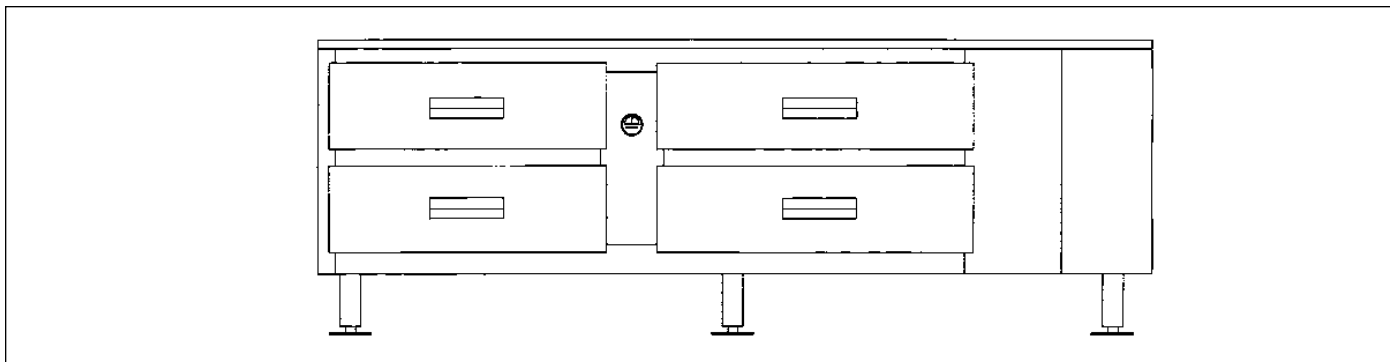


Figure 1.1 - General Arrangement Picture

INTRODUCTION

This model is a heavy-duty piece of equipment designed for continuous use. It incorporates automatic controls to regulate the cycling of the refrigeration system.

CONTROLS AND INDICATORS

Table 2.1 - Controls and Indicators

NAME	TYPE	FUNCTION
Thermostat	Contact Points	Cycles the refrigerator system (automatic)

START-UP PROCEDURE

The refrigeration system is to be remotely located from the refrigerated cabinet. An authorized and certified refrigeration company should make all of the connections from the condensing unit to the refrigerated cabinet.

Table 2.2 - Start-up Procedure (Refrigerated Storage)

Operation	Results
1. Activate system by inserting electrical service cord into electrical supply source and flip power control switch.	Compressor should immediately come on line along with the condenser fan and the evaporator fan.
2. Locate liquid refrigerant indication glass mounted on the receiver.	Once the system has been operating for two minutes, the glass should appear clear and full of liquid refrigerant.
3. Wait 15 minutes.	The temperature in the storage area should begin to approach the "green zone" on the thermometer indicating adequate operation.
4. Wait 3 hours.	Once the operating temperature has been reached, stocking of the containment area can begin.

SHUT-DOWN PROCEDURE

To shut down, disconnect the electrical supply cord and open or remove the drawer(s) allowing the interior cabinet temperature to equalize with the room temperature. A mild detergent diluted in warm water should be used to wash down the interior and exterior surfaces of the cabinet.


 WARNING Prior to any cleaning of the system involving placing hands in areas with moving parts, the system should be deactivated by disconnecting the power supply cord.

Table 2.3 - Shut Down Procedures

Operation	Results
1. De-energize the system by flipping the power control switch to the "OFF" position and disconnecting the electrical supply cord.	Once the system is de-energized, the condenser fan and the evaporator fan will cease operation.

PREPARATION FOR AN EXTENDED PERIOD OF INACTIVITY

This unit is designed for continued use at automatically cycled intervals. However, in the event of an extended shut down, both the mechanical refrigeration system and the food storage compartment system must be serviced.

Table 2.4 - Shut Down Procedures for an Extended Period

Operation	Results
1. Fully close discharge valve at the receiver.	Compressor will pump liquid refrigerant from system to receiver.
2. Fully close suction valve at the compressor.	This will isolate the refrigerant between the two valves.
3. Disconnect power supply.	De-energizes the system.
4. Clean and wipe dry the food storage compartment.	This will reduce the odor buildup during shut down.

FUNCTIONAL DESCRIPTION

SYSTEM DESCRIPTION

This unit consists of an insulated storage cabinet with drawers, an evaporator coil, a thermal expansion valve, a thermostat, and a compartment to make remote refrigeration and electrical connections. It is designed with the intent and purpose of storing food items.

SYSTEM OPERATION

The design of the refrigerated cabinet focuses primarily on the safe storage of food products requiring refrigeration. In engineering, considerable attention was placed on its functionality and its serviceability.

Special care in the initial loading of the storage compartment should be taken. It is suggested that the loading be scheduled in three equal portions allowing three hours between each loading.

The chilled food compartment is designed for the storage of perishable food items that require a temperature range of 37 to 40 degrees Fahrenheit. It is a general rule that adequate spacing is allowed between stored items to allow for proper air circulation.

INTRODUCTION

To ensure the longest and most trouble free operation of the unit, a thorough maintenance schedule is required to be adhered to periodically. The maintenance system should be designed to maximize the efficient use of maintenance personnel, reduce down time, and provide the orderly acquisition of spare parts support.

The Middleby refrigeration cabinet will generally be in operation in a facility where scheduled maintenance is performed according to Maintenance Index Plans. Your unit is no exception to required maintenance. This section of the manual is intended as an alternative to any standard maintenance program that may pre-exist. The preventive maintenance schedule is based upon similar maintenance requirements for commercial refrigeration equipment.

PREVENTIVE MAINTENANCE ACTION INDEX

If you do not have a Maintenance Index Plan, one is included for you in Table 4.1.

PREPARATION FOR MAINTENANCE

Since many areas affected by the maintenance schedule are electrically supplied, it is recommended that the system be de-energized prior to making the inspections.

MAINTENANCE

Weekly Inspection

1. The unit should first be de-energized.
2. Using a vacuum or small hand broom, brush the condenser in a vertical motion to remove any dust or debris that may have accumulated.

Monthly Inspection

1. Check the evaporator drain line at both the inlet and outlet ends to make certain that there are no obstructions. It is not recommended to use any chemicals in clearing a clogged drain. The preferred method of unstopping an obstructed drain is to use compressed air. Approximately 60 lbs. should be sufficient. Simply remove the drain line at the evaporator coil and attach an air-line to it.
2. With the unit in a cooling cycle, use a flashlight and locate the refrigerant sight glass¹. If the compressor has been running for three minutes there should be no visible bubbles.
3. If bubbles are present:
 - a. Determine if there is a leak by using a halide or electronic leak detector.
 - b. Repair leak(s).

WARNING

The system should be de-energized when checking for leaks.

- i. If a leak is found on a flared fitting, it can often be repaired by simply tightening the brass flare nut 1/4 of a turn. If tightening does not repair the leak, it may be necessary to reflare the tubing.
 - ii. If a leak is found on a brazed joint, it will be necessary to pump down the system's refrigerant charge to remedy the problem.
 - iii. To pump the refrigerant into the receiver, you must first connect service gauges to the system at the suction valve on the compressor and the liquid valve on the receiver. Purge the gauges before opening the system's valves to avoid contamination. Run the receiver (liquid or high pressure) valve all the way in to stop the refrigerant from exiting the receiver. Start the unit and allow it to run until the suction or low-pressure gauge reads 5 lbs. When it reaches 5 lbs., de-energize the system.
 - iv. Once pumped down, the necessary repairs can be made.
4. Using a mild non-abrasive detergent and soft cloth, wipe the interior lining beginning with the top and working down. Also, wipe the gasket and where it sits on the cabinet exterior.
 5. Check the condenser fan motor and make certain that it is not loose. Inspect the fan for cracks and make sure that it is tight on the motor¹.
 6. To inspect the evaporator motor, first turn the unit off. Then, remove the drain line from the evaporator pan. Loosen the four screws that hold the shroud. Lower the shroud and disconnect the polarized electrical connection. With the shroud out of the cabinet, proceed to inspect the motor mounting bolts and the fan for cracks or excessive play.
 7. Using a mild detergent and water, wipe the vinyl gasket. Make certain to also clean under the gasket to remove any mildew or residue.
 8. Using a mild, non-abrasive detergent and warm water, wipe the cabinet exterior. When cleaning always follow the grain of the stainless steel to prevent scratching or marring of the finish surface.

Annual Maintenance

1. Check all refrigerant lines for leaks or fatigue. Make certain that no exposed copper tubing is in contact with any other metal surface. If there is contact, install an insulating material between the two metal components.
2. With the breaker at the main panel "OFF", inspect the system's wiring. Look for a tight fit of all connections and make certain that the wire restraining devices are tight. Inspect all wires and cords, paying particular attention to nicks or age cracks in the insulation.
3. Visually inspect the outer panel and components of the cabinet. Check screws and bolts to make certain that they are tight. Also, make sure that the bolts that secure the base frame to the deck are tight.

Three Year Frequency

1. Replace the drawer gaskets. To accomplish this, it is first necessary to remove all products from the refrigerated compartment to avoid spoilage. Open the drawers and remove the old gasket. The gaskets snap in and out of a channel on the back side of the door. Clean the track thoroughly. Replace the old gasket with the new one by snapping it into place.
2. Inspect all motors and shafts¹ for both noise and wear. If they show age, replace them.
3. With the main power off, remove the condensing unit from its compartment and inspect all wiring. Also, remove the cover from the controls and check them to make certain that they are operational and do not show signs of wear.
4. Inspect the operation of the drawer slide assembly. Make certain that the moving parts do not show any signs of wear. Make sure that all screws are tight.
5. To recalibrate the thermometer, remove it from the cabinet. Using a small, flat screwdriver, remove the lens. Prepare an ice water bath and immerse the thermometer bulb at least two inches into the ice bath. Within 30 seconds the indicator dial should read 32 degrees Fahrenheit. If it does not, it needs to be recalibrated. Do this by placing your index finger on the opposite side of the needle that needs to move. Then, using a flat screwdriver, turn the screw at the center of the dial 1/4 of a turn in the direction you want to move the dial. Repeat the procedure until the needle is on 32 degrees. See Figure 4.1.

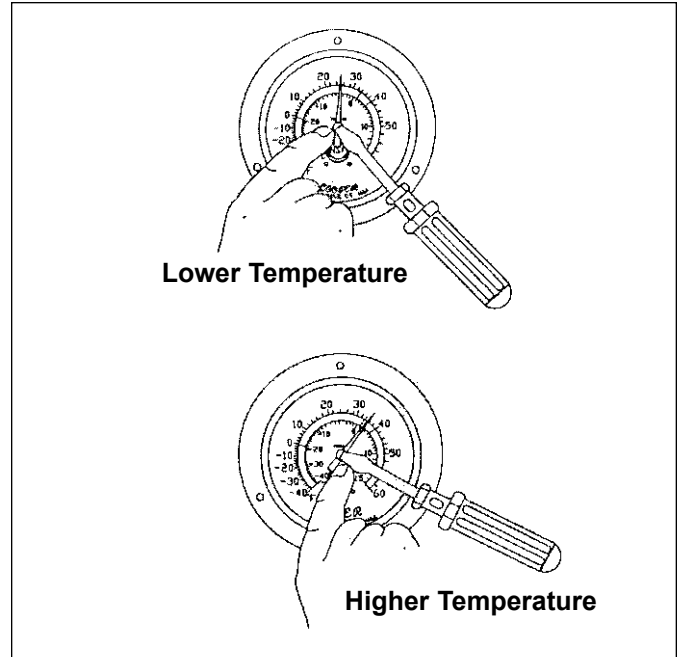


Figure 4.1 - Thermometer Calibration

Table 4.1 - Preventative Maintenance Action Index

1.	Weekly	a. Inspect condenser coil ⁱ to make certain that air flow is not hampered and that it is clear of dust and debris.
2.	Monthly	a. Inspect and clear drain line. b. Check the liquid refrigerant sight glass ⁱ to make certain that the system is completely charged. c. Clean the interior of the cabinet with a mild soap and warm water solution. Be certain to dry thoroughly. d. Check both the condenser fan motor ⁱ and the evaporator fan motor to make certain that they are operational and that the fans are tight and secure. e. Clean door gaskets and breaker strips with a damp cloth. f. Clean exterior of cabinet with mild soap and warm water. Dry thoroughly.
3.	Annually	a. Check all joints and fittings for any signs of leaks or fatigue. b. Inspect electrical connections to confirm that there is good contact and that wires are neither weakened nor frayed. c. Check the integrity of the cabinet.
4.	Three-year Frequency	a. Replace door gaskets. b. Inspect motor shafts ⁱ for noise or wear. c. Inspect electrical controls and wiring. d. Inspect drawer slides. e. Recalibrate thermometer.

ⁱ If supplied with a condensing unit

INTRODUCTION

This chapter provides a systematic check of components in determining a possible cause of failure in the event of various symptoms.

The following tables list the most common symptoms that may be experienced and the recommended corrective action.

It is necessary that the individual performing the troubleshooting tasks be familiar with the function of the equipment as described in the Functional Description section.

Table 5.1 - Mechanical and Electrical Troubleshooting Guide

SYMPTOM	POSSIBLE FAILURE	REMEDY
Unit does not operate	<ol style="list-style-type: none"> 1. Control failure 2. Incorrect voltage 3. Failed compressorⁱ 	<ol style="list-style-type: none"> 1. Adjust or replace control 2. Correct 3. Replace
Unit runs continuously	<ol style="list-style-type: none"> 1. Low on refrigerant 2. Control failure 3. Bad connection at TXV 4. Restricted air flow or dirty 5. Bad condenser fan motorⁱ 6. TXV stuck open 7. Compressor failure 8. Ineffective door seal 9. Restricted circulation in storage compartment 	<ol style="list-style-type: none"> 1. Leak check system and recharge 2. Adjust or replace control 3. Check and secure sensor bulb to suction line 4. Rectify air flow problem and clean condenser 5. Check and replace if necessary 6. Replace 7. Replace 8. Adjust door strike and hinges 9. Redistribute food for even air flow
Low head pressure	<ol style="list-style-type: none"> 1. Defective compressorⁱ 2. Low refrigerant 3. Ambient temperature too low 	<ol style="list-style-type: none"> 1. Replace 2. Leak check system and recharge 3. Raise room temperature
High head pressure	<ol style="list-style-type: none"> 1. Blocked or dirty condenserⁱ 2. Ambient temperature too high 3. System contains air 4. Refrigerant overcharge 	<ol style="list-style-type: none"> 1. Clean and remove any obstructions 2. Lower room temperatures 3. Evacuate, change filter dryer, recharge 4. Reduce amount of refrigeration in system
Short cycling	<ol style="list-style-type: none"> 1. Maladjusted control 	<ol style="list-style-type: none"> 1. Adjust control
Unit does not cool	<ol style="list-style-type: none"> 1. Blown fuse/circuit breaker 2. Bad connection at supply cord 3. Ill fitting gasket 	<ol style="list-style-type: none"> 1. Replace fuse/reset circuit breaker 2. Check supply cord at outlet 3. Tighten strike on door latch

ⁱ If supplied with a condensing unit

INTRODUCTION

This chapter focuses on the instruction needed in the removal and replacement of certain components. It also addresses the repair of components not listed under the scheduled maintenance index covered in the Scheduled Maintenance section.

The level of skills required to perform the service or repair will vary. Some may require specific training while others may be performed by any type of mechanic. It is up to the individual and his/her supervisor to determine the breadth of knowledge required to perform the necessary service or to make the necessary repairs.

It is also important to know that any procedure requiring the handling of refrigerant requires proper certification.

The service or repair items are limited to those parts listed in Table 7-3.

REPAIR PROCEDURES

 **WARNING**

Prior to performing any work on the refrigeration system, it is required that the unit be de-energized.

Replacement of Compressor Motor^d

1. Evacuate the refrigerant from the system using a refrigeration vacuum pump.

NOTE: Federal laws require the proper handling and disposal of refrigerant. It is unlawful to release any refrigerant into the atmosphere.

2. Disconnect the electrical power to the unit. This is done by turning off the circuit in the main supply panel. It should be noted on the panel that the refrigerator is being serviced and that the breaker must remain off.
3. Find the electrical terminal box on the side of the compressor and remove the front cover. Disconnect the wires from the compressor. Remove the screws that attach the terminal box to the compressor. At this point, the compressor will be electrically detached.
4. Using wrenches, remove the suction and discharge valve stem cover caps on each side of the compressor. Also, remove the cap nut on the suction and discharge side as well.
5. Disconnect the high-side line at the compressor. This is done by heating the brazed connection using an acetylene and oxygen torch set.

NOTE: Do not apply a flame to a line containing refrigerant.

6. To remove the low-pressure control capillary tube and service fitting, loosen the 1/4" brass flare nut on the suction valve.

7. The final step in removing the compressor is to disconnect it from its mounting. To free the compressor, remove the wire clips on each of the four feet.
8. To install the compressor, place it in position on the base and reinstall the four wire clips.
9. Reattach the suction and discharge valve blocks to the appropriate sides of the compressor.
10. Reattach the low-pressure control capillary tube and service fittings to the suction side of the compressor.
11. Reattach the suction line to the compressor.
12. In reconnecting the high-pressure line, it is necessary to first prepare the line's end. Using a fine sandpaper or emery cloth, clean the residue off of the end. Also, clean the connection on the compressor. Apply flux to both ends and braze the connections into place.
13. Remove the valve stem cap from the suction valve block on the side of the compressor. Run the valve stem all of the way out and then in one turn clockwise.
14. Place the refrigeration service manifold gauge hoses on the suction and high-side valves. Attach a bottle of refrigerant to the charging hose and charge the system with 150 psi of vapor. Using an electronic leak detector, check the new connections for leaks. Should a leak appear, evacuate the charge and repair the leak. Repeat the leak check process again.
15. If the system checks out with no leaks, recover the test charge using a vacuum recovery pump.
16. With the system pressure at zero, connect the vacuum pump and evacuate the system. The pump should run for one hour. The vacuum pump should pull the system down to 30 inches of vacuum.
17. Reattach the electrical terminal box and secure all wiring.
18. Check the refrigeration tag on the unit for the number of ounces of refrigerant to place into the system for start-up. Monitor the pressure on both the suction and discharge sides of the manifold gauges. As the temperature in the storage area begins to fall, check the refrigerant flow through the sight glass. The unit is fully charged when there are no bubbles in the sight glass. If after five minutes of operation, bubbles are still present, it may be necessary to add more refrigerant (add refrigerant in small amount to keep from overcharging).

 **WARNING**

Overcharging a refrigeration system can be dangerous.

If the system overcharge is sufficient enough to immerse the major parts of a hermetic compressor in liquid refrigerant, a situation has been created that when followed by unusual but possible circumstances, can lead to compressor housing seam separation or rupture.

The sequence of circumstances that can lead to compressor housing seam separation or rupture occurs in the following manner:

1. The system overcharge immerses the compressor motor, piston, connecting rods, cylinders, etc. in liquid refrigerant, thereby effectively forming a hydraulic block preventing the compressor from starting. This condition is known as locked rotor.
2. Electrical current continues to flow through the compressor motor windings that become, in effect, electric resistance heaters. The heat produced begins to vaporize the excessive liquid overcharge, causing a rapid increase in system pressure.
3. If the system compressor protective devices fail for any reason prior to or during this locked rotor heating cycle or cycles, liquid refrigerant may be vaporized sufficiently fast enough to raise the pressure within the system to extremes far greater than the housing or weld seam is designed to handle.
4. In some instances where the amount of refrigerant overcharge is critical in proportion to the system internal volume, the pressure reached can cause a compressor housing seam separation or rupture that can be hazardous.

The remedy to eliminate this exceedingly rare, but potential hazard is to use correct refrigerant charge amounts and techniques.

Middleby urges that all individuals responsible for training, teaching, or advising installation mechanics and service personnel emphasize proper charging techniques. In addition, Middleby advises strict adherence to refrigerant charge amounts specifically recommended by the manufacturer of the refrigeration, air conditioning, or heat pump system.

Replacement of Low Pressure Control

1. Disconnect the unit from electrical service.
2. Remove control cover and disconnect electrical terminals.
3. Disconnect capillary tube.
4. Remove mounting fasteners on control base and install new control by reversing the procedure.
5. To adjust the control, hook up the service gauges to the suction and discharge valves and crack them to allow the gauges to read.

6. Using a standard screwdriver, coarsely adjust the control by turning the adjustment screws on top of the control. Preset the cut-in and cutout and 68 lbs. and 38 lbs. respectively for a refrigerator and 25 lbs. and 10 lbs. respectively for a freezer.
7. Start the system. Allow it to run for five minutes. Monitor the low side pressure. Fine adjustments will be required to achieve the prescribed cycling pressures.

NOTE: *Running the suction valve in or out as required to effectively change the pressures can speed up the control adjustment process.*

Replacement of Thermal Expansion Valve (TXV)

1. Close liquid valve and run compressor until it pumps refrigerant into the receiver (low side service gauge will read 1 lbs.). Close the suction line valve.
2. Disconnect the sensor bulb on the suction line.
3. Disconnect the liquid line (1/4") and suction line (3/8") then remove the TXV.
4. Install new TXV, reconnect lines, and re-fasten the sensor bulb.

NOTE: *It is not recommended to adjust the valve super heat as this comes pre-set from the factory.*

Replacement of Filter Dryer¹

1. Close liquid line valve and run compressor until the low side refrigeration gauge indicates zero lbs., then close suction.
2. Remove filter dryer from system and replace with new dryer.
3. Purge system and add refrigerant if needed.

Replacement of Condenser Fan Motor¹

1. Disconnect all electrical power to the unit.
2. Remove the condensing unit from the condensing unit compartment.
3. Remove the protective wire shroud from around the motor.
4. Disconnect the fan motor leads from the terminal box on the compressor.
5. Remove the mounting screws at the motor base.
6. Using an allen wrench, remove the aluminum fan.
7. To install the new motor, reverse the process.

Replacement of the Condensing Fanⁱ

1. Disconnect all electrical power to the unit.
2. Remove the condensing unit from the condensing unit compartment.
3. Remove the protective wire shroud from around the motor.
4. Using an allen wrench, loosen the set screw on the blade hub and slide the blade from the shaft.
5. Reverse the procedure to reassemble.

Replacement of the Anti-Condensate Heater

NOTE: *The anti-condensate heater is located behind the front edge of the vinyl breakers in the door opening.*

1. Disconnect all electrical power to the cabinet.
2. Remove vinyl breakers by exerting pressure at the front edge toward the center of the door.
3. Disconnect anti-condensate heater wiring connection.
4. Remove heater from recessed rail.
5. Replace new heater in rail and reconnect electrical.

Replacement of Drawer Gasket

1. Remove the gasket by pulling it out of the snap-in track.
2. Clean the gasket track and the immediate area.
3. Snap new gasket into retainer.

Replacement of Power Switch

1. Shut off all electrical power going to the unit.
2. Remove the front air grill.
3. Using a flat blade screwdriver, remove the cover plate with the switch attached.
4. Remove the wires connected to the switch.
5. Unscrew the lock washer and remove the switch.
6. Reverse the process when installing the new switch.

Replacement of the Drain Line

NOTE: *To replace the vinyl drain line, it is necessary that there be access to the rear of the cabinet.*

1. On the cabinet exterior, remove the rear tubing cover using a 1/4" nut driver.
2. On the interior of the cabinet, remove the drain line cover.
3. From the inside of the cabinet, pull the drain from the evaporator shroud fitting.
4. From the drain exit location, pull the drain through the penetration of the cabinet.
5. At the bottom of the condensing unit compartment, cut the drain line retaining strap. The drain line should now be free.
6. To install the new drain line, reverse the process.

CHARGING THE REFRIGERATION SYSTEMⁱ

1. Connect service gauges to the suction and discharge service valves then open valves one full turn.
2. If the system is pressurized slightly, open both manifold gauge valves and purge the service line gauges.
3. With manifold gauge valves closed, start refrigeration system.
4. Attach a drum of refrigerant to the suction service side of the manifold gauges and add refrigerant until the liquid sight glass is clear of bubbles.

RECALIBRATING THE THERMOMETER

1. To recalibrate the thermometer, remove it from the cabinet. Using a small, flat screwdriver, remove the lens. Prepare an ice water bath and immerse the thermometer bulb at least two inches into the ice bath. Within 30 seconds the indicator dial should read 32 degrees Fahrenheit. If it does not, it needs to be recalibrated. Do this by placing your index finger on the opposite side of the needle that needs to move. Then, using a flat screwdriver, turn the screw at the center of the dial 1/4 of a turn in the direction you want to move the dial. Repeat the procedure until the needle is on 32 degrees. See Figure 4.1.

ⁱ If supplied with a condensing unit

INTRODUCTION

This section of the manual contains lists of replaceable parts. Each of the tables contains a list of removable parts associated with an assembly of the cabinet or refrigeration system. No parts identification has been provided for details of permanently assembled items or those that are not suitable for field repair.

Table 7.1 is a parts list of special tools required for routine service.

Table 7.1 - Parts List - Special Tools List

Part Number	Description	Quantity
R1412	Refrigerant service gauges with hoses	1
VA70264	Service valve wrench	1
50992	Refrigerant	30 lbs.

Table 7.2 - Parts List

Parts List - Cabinet 20036RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	26"	DSB26C	Middleby	1
Gasket	GSB60MV	6449	Jeans	2
Recessed Pulls	HXHL08	P73-2000	Component Hardware	2
Drawer Rollers	HXDW02	7319000201	Kason	8
Heater Wire	L1HR82	82"	Refrigeration Hdwe.	1
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	4
Parts List - Refrigeration 20036RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EFS1/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

Parts List - Cabinet 20048RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	31"	DSB31C	Middleby	1
Gasket	GSB64MV	6449	Jeans	2
Recessed Pulls	HXHL08	P73-2000	Component Hardware	2
Drawer Rollers	HXDW02	7319000201	Kason	8
Heater Wire	L1HR90	90"	Refrigeration Hdwe.	1
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	4

Parts List - Refrigeration 20048RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EFS1/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

Parts List - Cabinet 20060RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	18"	DSB18C	Middleby	1
Drawer Cartridge	26"	DSB26C	Middleby	1
Gasket	GSB60MV	6449	Jeans	1
Gasket	GSB62MV	6449	Jeans	1
Recessed Pulls	HXHL08	P73-2000	Component Hardware	2
Drawer Rollers	HXDW02	7319000201	Kason	8
Heater Wire	L1HR64	64"	Refrigeration Hdwe.	1
Heater Wire	L1HR82	82"	Refrigeration Hdwe.	1
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	4

Parts List - Refrigeration 20060RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EFS1/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

Parts List - Cabinet 20072RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	26"	DSB26C	Middleby	1
Drawer Cartridge	31"	DSB31C	Middleby	1
Gasket	GSB62MV	6449	Jeans	2
Gasket	GSB64MV	6449	Jeans	2
Recessed Pulls	HXHL08	P73-2000	Component Hardware	4
Drawer Rollers	HXDW02	7319000201	Kason	16
Heater Wire	L1HR64	64"	Refrigeration Hdwe.	1
Heater Wire	L1HR90	90"	Refrigeration Hdwe.	1
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	4

Parts List - Refrigeration 20072RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EFS1/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

Parts List - Cabinet 20084RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	18"	DSB18C	Middleby	2
Drawer Cartridge	26"	DSB26C	Middleby	1
Gasket	GSB60MV	6449	Jeans	4
Gasket	GSB62MV	6449	Jeans	2
Recessed Pulls	HXHL08	P73-2000	Component Hardware	4
Drawer Rollers	HXDW02	7319000201	Kason	16
Heater Wire	L1HR64	64"	Refrigeration Hdwe.	2
Heater Wire	L1HR82	82"	Refrigeration Hdwe.	1
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	6

Parts List - Refrigeration 20084RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EFS1/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

Parts List - Cabinet 20096RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	26"	DSB26C	Middleby	3
Gasket	GSB62MV	6449	Jeans	2
Recessed Pulls	HXHL08	P73-2000	Component Hardware	6
Drawer Rollers	HXDW02	7319000201	Kason	24
Heater Wire	L1HR82	82"	Refrigeration Hdwe.	3
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	6

Parts List - Refrigeration 20096RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EF51/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

Parts List - Cabinet 20108RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Drawer Cartridge	26"	DSB26C	Middleby	3
Drawer Cartridge	31"	DSB31C	Middleby	2
Gasket	GSB62MV	6449	Jeans	2
Gasket	GSB64MV	6449	Jeans	4
Recessed Pulls	HXHL08	P73-2000	Component Hardware	6
Drawer Rollers	HXDW02	7319000201	Kason	24
Heater Wire	L1HR64	64"	Refrigeration Hdwe.	1
Heater Wire	L1HR90	90"	Refrigeration Hdwe.	2
Leg nut	CNNP01MS	3/4" large hex nut	Best Bolt	6

Parts List - Refrigeration 20108RSB				
Item	Middleby#	Mfg#	Vendor	Qty
Evaporator Coil Assy.	RWE430	BBM11A	Heatcraft	1
Evaporator Motor	RWEM03	25300701	Heatcraft	1
Evaporator Fan	RWE5101B	5101B	Heatcraft	1
Expansion Valve	RWEV39	EFS1/4C	Sporlan	1
Thermostat	RWTT08	A319ABC-24-01	Johnson Controls	1

UNPACKING

Note: Before unpacking the unit, note any crate markings and check for damage to crating. Notify the carrier if there should appear to be damage to the unit.

The unit is shipped directly from the manufacturing factory securely fastened to a single pallet then protected by an external wrapping.

1. After inspection, carefully remove all external wrappings and other protective coverings.
2. Review the installation section of the manual completely prior to installing the unit.
3. Discard crating materials.

INSTALLATION

1. Before moving the unit to the installation sight, double-check passageways to ensure that the unit will move through without modification.

Note: In certain instances, it may be necessary to remove the drawers. This will allow the unit to fit through tighter spaces.

2. Position the unit to allow for sufficient ventilation. Typically, approximately 3" clearance from walls and other equipment is sufficient.
3. Level the cabinet from front to back and side to side. This is important so that the cabinet will not be pulled out of square.
4. Evaporator coil drain lines are factory installed and are either plumbed into a condensate evaporator pan or the condensate evaporative base of the condensing unit¹ to eliminate the need for exterior plumbing. Make certain that the drain outlet is located such that the condensate falls into the pan or base. On units with remotely located refrigeration, the condensate evaporator pan is optional.
5. Check the door gasket to make certain that it is sealing properly to the cabinet.
6. Before applying electrical power to the unit, you should first check the electrical characteristics of the condensing unit to ensure that they agree with those of the electrical supply source.



CAUTION

Low or excessive voltage can severely damage the electrical system.

Note: Adjusting any valves or controls on the system is not necessary and may void your warranty. All valves and controls have been set by the factory.

¹ When a condensing unit is supplied

INTRODUCTION

This section of the manual contains drawings and schematics of the electrical and mechanical piping systems.

ELECTRICAL ABBREVIATIONS AND TERMINOLOGY

- RLA - Rated Load Amperage

Rated load amps is a measure of the current drawn by a compressor when operated at compressor manufacturer rating conditions at nominal voltage. This value is listed at U.L. and C.S.A. as "RLA". It is in agreement with the N.E.C. definition that the RLA be the current draw when the compressor is delivering rated output.

- LRA - Locked Rotor Amperage

The locked rotor amps of a compressor is the current value recorded three seconds after rated voltage is applied under locked rotor conditions from a 75 degree Fahrenheit motor soakout temperature (The voltage drop is to be predetermined and adjusted accordingly prior to testing). This value appears on the compressor serial plate and on all compressor statistics sheets.

It may be well to note that the practice in the past was to show an additional column marked, "LRA U.L. Test Report". This is no longer needed since the U.L. investigation work, regarding component rating, will be guided by the compressor manufacturer's published value.

- MCG - Maximum Continuous Current

Maximum continuous current is a limiting ampere value that must not be greater than 156% of the RLA of the compressor as marked on the nameplate of the particular unit into which that compressor is applied.

Table 9.1 - Operating Pressures

REFRIGERANT: R-12			
Cabinet	Ambient	Suction Pressure	Head Pressure
-5 degrees F (Fre.)	90 degrees F	0-10 lbs.	120-150 lbs.
37 degrees F (Ref.)	90 degrees F	18-35 lbs.	120-150 lbs.
REFRIGERANT: R-22			
Cabinet	Ambient	Suction Pressure	Head Pressure
-5 degrees F (Fre.)	90 degrees F	10-15 lbs.	200-250 lbs.
37 degrees F (Ref.)	90 degrees F	37-67 lbs.	200-250 lbs.
REFRIGERANT: 134A			
Cabinet	Ambient	Suction Pressure	Head Pressure
-5 degrees F (Fre.)	90 degrees F	-5-10 lbs.	120-150 lbs.
37 degrees F (Ref.)	90 degrees F	16-37 lbs.	120-150 lbs.
REFRIGERANT: 404A			
Cabinet	Ambient	Suction Pressure	Head Pressure
-5 degrees F (Fre.)	90 degrees F	15-20 lbs.	250-300 lbs.
37 degrees F (Ref.)	90 degrees F	68-84 lbs.	250-300 lbs.

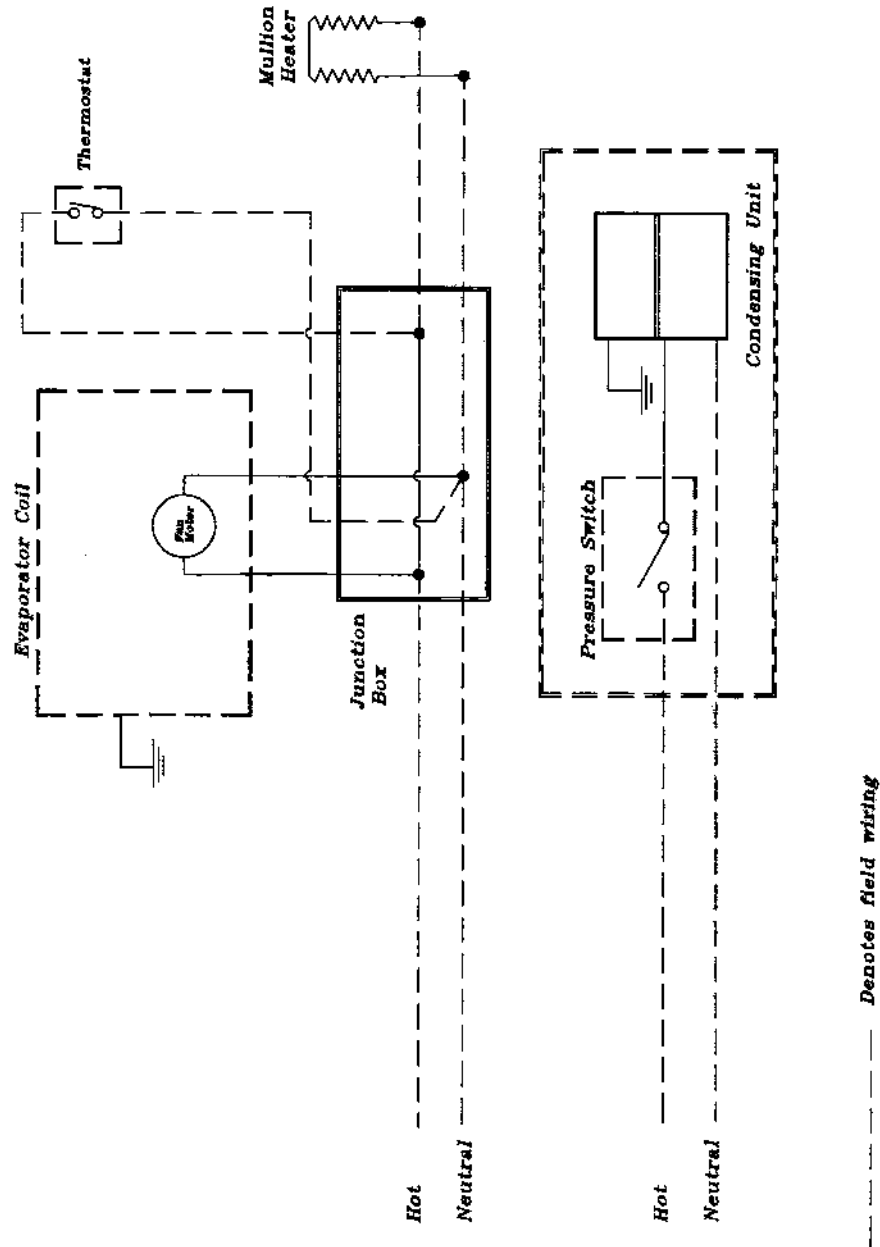


Figure 9.1 - Electrical Schematic

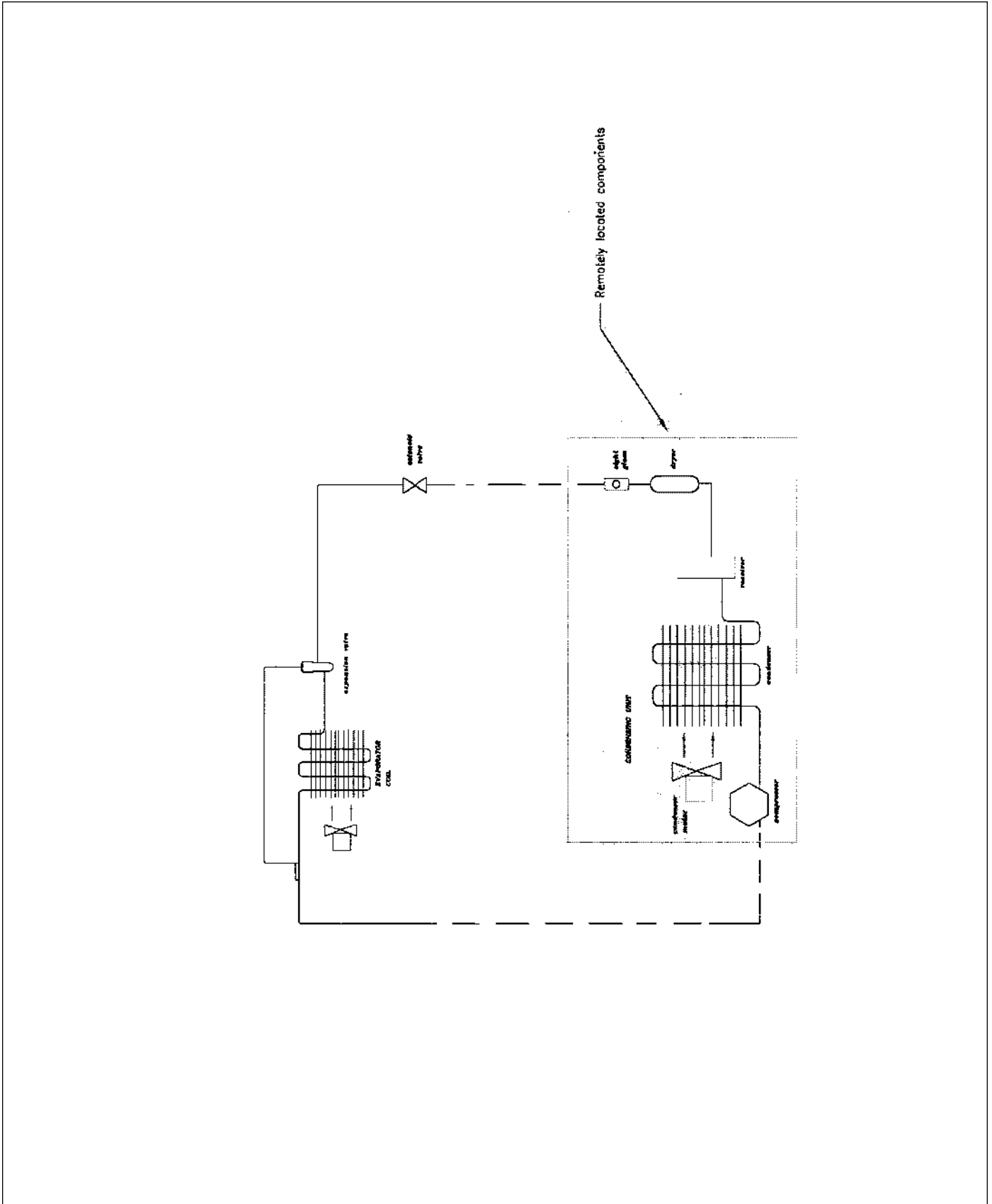


Figure 9.2 - Refrigeration Piping Schematic

INTRODUCTION

Middleby warrants their cabinets and units to consumers only against defects in material or workmanship under normal use and service for a period of one year from the date of shipment. Middleby will repair or replace at their option, any part, assembly, or portion thereof, which, by their examination, is deemed to be defective. Middleby will pay the labor costs for the repair up to twelve (12) months from the date of shipment.

TERMS

Exclusions

- Middleby's obligations under this warranty shall not extend to any malfunction or other problem caused by unreasonable use, such as, but not limited to, improper setting of controls, improper installation, improper voltage supply, loose electrical connections or blown fuses, and damage not attributable to a defect in workmanship. This warranty will not apply to any cabinet or component part that has been subject to any accident, abuse, misuse, damage caused by fire or floor or any other act of God, and to any product serviced by an unauthorized service person or company.
- Middleby will not accept responsibility for the labor costs related to service and repair of remote condensing units or other field installations.
- It remains the responsibility of the qualified refrigeration installation company to provide any accessories required for a specific climate or application. Middleby does not imply nor warrant the use of this equipment in adverse conditions or beyond its intended use.

To Secure Warranty Service

1. To claim a defect under this warranty, direct your claim to whomever you purchased the product. Be prepared to provide the model number, serial number, and a description of the problem.
2. If the above procedure fails to satisfy your claim, you may write directly to the **Middleby, 1100 Old Honeycutt Road, Fuquay-Varina, NC 27526**. Again, please provide the model number, serial number, and a description of the problem.

Note: *There is no other express warranty on Middleby units except as stated herein. Any implied warrants of fitness and merchantability are limited in duration to the duration of this warranty. The liabilities of Middleby are limited solely and exclusively to replacement as stated herein and do not include any liability for any incidental, consequential, or other damages of any kind whatsoever, whether any claim is based upon theories of contract negligence or tort. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitations of incidental or consequential damages. So, the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights that vary from state to state.*