Manitowoc® Koolaire™

Reach-In Refrigerators and Freezers
Service Manual



This manual contains important information regarding the installation and upkeep of your new Koolaire™ refrigerator or freezer. Please read the manual thoroughly prior to equipment handling, set-up, operation, and maintenance.

Recycled Paper

Part No. 80-1205-3
7/1/00

Safety Notices

As you work on a Manitowoc® Koolaire™ reach-in, be sure to pay close attention to the safety notices in this manual. Disregarding the notices may lead to serious injury and/or damage to the equipment.

Throughout this manual, you will see the following types of safety notices:

⚠ WARNING

Text in a **Warning** box alerts you to a potential personal injury situation. Be sure to read the Warning statement before proceeding, and work carefully.

⚠ CAUTION

Text in a **Caution** box alerts you to a situation in which you could damage the equipment. Be sure to read the Caution statement before proceeding, and work carefully.

Procedural Notices

As you work on a Manitowoc® Koolaire™ reach-in, be sure to read the procedural notices in this manual. These notices supply helpful information which may assist you as you work.

Throughout this manual, you will see the following types of procedural notices:

Important

Text in an **Important** box provides you with information that may help you perform a procedure more efficiently. Disregarding this information will not cause damage or injury, but it may slow you down as you work.

NOTE: Text set off as a **Note** provides you with simple, but useful, extra information about the procedure that you are performing.

About This Manual

This manual contains important information on the installation, use, and upkeep of your new your Manitowoc® Koolaire™ reach-in. Each reach-in has been carefully inspected for the highest possible quality. With proper installation and care, you will enjoy many years of reliable performance.

Please read and understand the information contained in this manual prior to installation, start-up, and operation. If you do not understand any part of the information contained in this manual, please contact your Manitowoc® Koolaire™ dealer or call the factory at 1-877-582-5086.

Table of Contents

Section 1 - Warranty

Model/Serial Number Location 1-1
Warranty 1-1
Warranty Service 1-1

Section 2 - Installation

General 2-1
Positioning the Cabinet 2-1
Heat of Rejection 2-1
Uncrating 2-2
Leveling the Cabinet 2-3
Shelf/Tray Slide Installation 2-3

Section 3 - Start-Up

Electrical Requirements 3-1
Electrical Specifications 3-2
Condensate Water Removal 3-3
Defrost Systems
- **General** 3-3
- **Defrost Settings** 3-3
- **Setting Time of Day** 3-3
- **Adjusting Defrost Duration** 3-3

Temperature Controls
- **Refrigerators and Freezers** 3-4

Loading Shelves 3-4

Section 4 - Cleaning

Exterior 4-1
Interior 4-1
Cleaning the Condenser Coil 4-2

Section 5 - Adjustments and Calibrations

Adjustments
- **Solid Door Adjustment** 5-1
- **Glass Door Adjustment** 5-1

Calibrations
- **Thermometer Calibration** 5-2

Continued on next page...

Table of Contents (cont.)

Section 6 - Before Requesting Service

Troubleshooting Guide **6-1**

Section 7 - Electrical Specifications

Main Power Switch **7-1**
Temperature Control **7-1**
Light Switch **7-2**
Defrost Terminator / Fan Delay Switch - Freezers **7-2**
Defrost Timer - Freezers **7-3**
Defrost Heater Element - Freezers **7-3**
Evaporator Drain Pan Heater - Freezers **7-4**
Anti-Condensate Door Heaters **7-4**
Compressor Overload Protector **7-5**
Compressor Start Relay **7-5**
Compressor Windings **7-6**
Wiring Diagrams **7-7**

Section 8 - Refrigeration

Temperature/Pressure/Refrigerant Charge Charts - Refrigerators/Freezers **8-1**
Recovery/Evacuation and Recharging **8-2**
Charging Procedures **8-3**
System Contamination Clean-up **8-4**
Refrigeration Re-Use Policy **8-6**

Section 9 Replacement Procedures

Evaporator Fan Assembly – 1 Section Cabinets **9-1**
Light Switch **9-3**
Evaporator Fan Assembly – 2 & 3 Section Cabinets **9-4**
Temperature Control **9-5**
Defrost Heater Element - Freezers **9-7**
Digital Thermometer Display and Probe **9-8**
Digital Thermometer Transformer **9-10**
Door Handle – Solid Doors **9-11**
Door Handle – Glass Doors **9-12**
Door Hinge – Solid Doors **9-12**
Door Gasket – Solid Doors **9-13**
Door Gasket – Glass Doors **9-14**
Vinyl Breaker Strips **9-15**
Anti-Condensate Door Heaters **9-16**
Defrost Terminator / Fan Delay Switch - Freezers **9-16**

Section 1
Warranty

Model/Serial Number Location

The Koolaire™ data plate, which includes the model number and serial number, as well as important electrical and technical information, is located on the left interior wall of the cabinet at approximately eye level.

For convenience and quick reference, record the model and serial numbers, voltage, and installation date in the spaces below:

Model Number	
Serial Number	
Voltage	
Installation Date	

Warranty

Warranty coverage on a Koolaire™ reach-in begins on the date it is installed. Please read the warranty certificate included with the cabinet for details.

PARTS COVERAGE

1. A Koolaire™ reach-in cabinet and the refrigeration and mechanical components are warranted against defects in materials and workmanship for a period of two (2) years from the date of original installation.
2. The evaporator coil and compressor are covered by an additional three (3) years (five years total) warranty beginning on the date of the original installation.

NOTE: The additional three year evaporator coil warranty does not apply to parts such as fan motors, defrost elements, housings, electrical wiring, or controls that are attached to the evaporator coil.

LABOR COVERAGE

Labor is covered to repair or replace defective components for two (2) years from the date of the original installation.

EXCLUSIONS FROM WARRANTY

1. Normal start-up, maintenance, adjustments, and cleaning.
2. Interior cabinet light bulb.
3. Repairs due to unauthorized modifications to the Refrigeration System/Reach-In Cabinet or the use of non-standard parts without prior written approval.
4. Damage caused by improper installation of the Reach-In cabinet, electrical supply, water supply or drainage, or damage caused by floods, storms, or other acts of God.
5. Premium labor rates due to holidays, overtime, travel time, mileage flat rate, service call charges and miscellaneous tools and material charges not listed on the payment schedule. Additional labor charges resulting from inaccessibility of the Reach-In are also excluded.
6. Parts or assemblies subjected to misuse, abuse, neglect or accidents.
7. Damage to the interior of cabinet or refrigeration system as a result of storing open acidic food containers.
8. Claims for special indirect or consequential damages, including food spoilage or product loss.

Warranty Service

To insure warranty coverage, a qualified service company must perform the warranty repair.

If the dealer the Koolaire™ reach-in was purchased from does not perform warranty service, please call 1-877-582-5086 for assistance.

THIS PAGE INTENTIONALLY LEFT BLANK

Section 2
Installation

General

⚠ CAUTION

These instructions are of the utmost importance in assuring that the Manitowoc® Koolaire™ cabinet operates as designed, and must be followed closely.

Positioning the Cabinet

⚠ CAUTION

When selecting a permanent location for the cabinet, observe the following guidelines. Failure to do so may cause reduced performance and efficiency, cause damage, and void your warranty.

CABINET LOCATION GUIDELINES

- Install the cabinet in an indoor environment only.
- The air temperature entering the refrigerator or freezer condenser should be between 55°F (13°C) and 100°F (38°C).
- Allow space for air circulation in the refrigeration condensing unit compartment on refrigerators and freezers. The minimum space requirements are:
  - 10” (25 cm) on top
  - 4” (10 cm) at the back
  - 4” (10 cm) on each side
- The floor must be strong enough to support the weight of the cabinet and product load.

⚠ CAUTION

A fully loaded reach-in cabinet can weigh more than 3,000 pounds.

Heat of Rejection

All refrigeration equipment rejects heat through the condenser. It is helpful to know the amount of heat rejected, to determine the additional load that will be placed on air conditioning equipment.

Refrigerators

Model	Solid Door	Half Door	Glass Door	Refrigerator BTU Per Hour
1 Door	KR-1	KR-101	--	2600
	--	--	KR-1GD	3780
2 Door	KR-2	KR-201	--	2600
	--	--	KR-2GD	4600
3 Door	KR-3	KR-301	--	3780
	--	--	KR-3GD	5580

Freezers

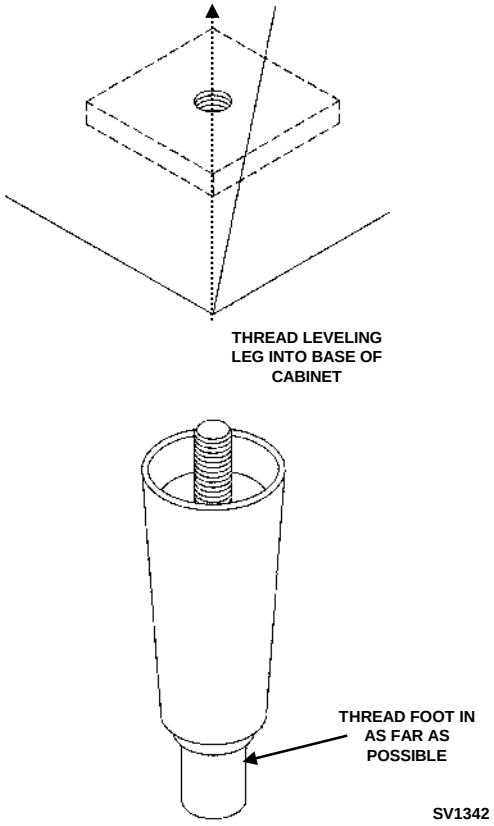
Model	Solid Door	Half Door	Freezer BTU Per Hour
1 Door	KF-1	KF-101	1700
2 Door	KF-2	KF-201	2840
3 Door	KF-3	KF-301	3450

Uncrating

⚠ WARNING

Never attempt to tilt the cabinet alone. Always use two or more people when tilting the cabinet to remove the shipping skid or to move it through doorways.

1. Remove the bottom shipping skid using one of the methods below:
   - Lay the cabinet on its back, elevated and supported by wooden blocks. Remove the skid mounting bolts and separate the skid from the cabinet.
   - Tilt the cabinet from side to side and remove the mounting bolts. Support the weight of the cabinet apart from the skid.
2. Install the legs or casters and torque them to 360 inch-pounds. Refer to the drawing at right.
3. Return the cabinet to the upright position.
4. Remove any remaining crating materials.



Installing Cabinet Legs

⚠ CAUTION

If the cabinet was placed on its back while moving it or while removing the bottom shipping skid, wait at least two hours after returning the cabinet to the upright position before starting the refrigeration system.

⚠ CAUTION

Never use sharp instruments to cut the plastic or cardboard crating materials. Damage to the cabinet exterior may result.

Leveling the Cabinet

The cabinet must be leveled after it is positioned in its permanent location. This insures proper door alignment on all cabinets, and adequate condensate water drainage and proper refrigeration system operation.

Leveling the Cabinet

> **⚠ CAUTION**
> If casters are installed instead of legs, the floor must be leveled before final positioning of the cabinet.

1. Place a level on top of the cabinet.
2. Turn the leveling foot of the lowest corner leg to center the bubble in the level.
3. Adjust each of the other corners until the bubble is centered and the cabinet is stable.
4. Re-check the cabinet from side to side and from front to rear with the level. Adjust the leg levelers as necessary.

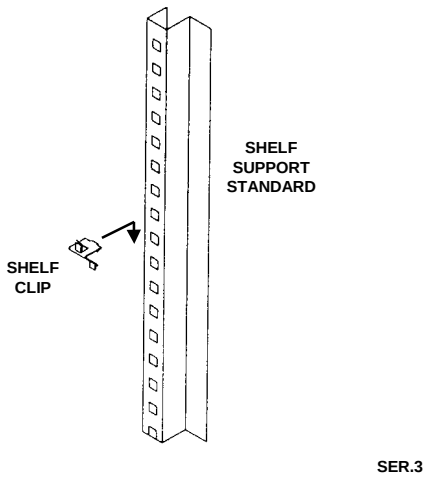
Shelf/Tray Slide Installation

SHELVES

1. Determine the desired shelf location.

NOTE: The shelves may be located at any position in 1" increments. Optimum spacing is one shelf near the bottom of the cabinet, one shelf near center height, and one shelf at eye level (Refer to drawing).

2. Install four clips per shelf, one at each corner. The shelf clips slip into the 3/8" holes and slide down.
3. Make sure that the clips are level from side to side and from front to rear at each corner.
4. Install the shelves with the smaller wires running from front to back.

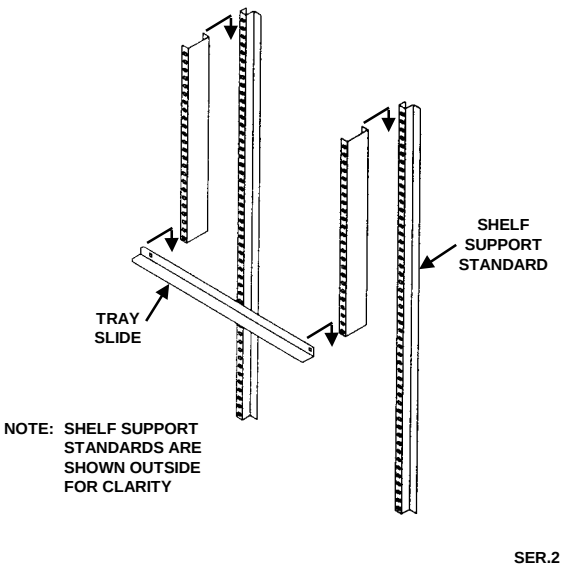


Shelf Installation

TRAY SLIDES

Tray slides are optional accessories and must be ordered separately. To install a tray slide:

1. Locate the appropriate square shelf standard holes at the desired height.
2. Insert the tabs of each slide into the 3/8" holes in the shelf support standards and pull it straight down to lock it into place (Refer to drawing below).



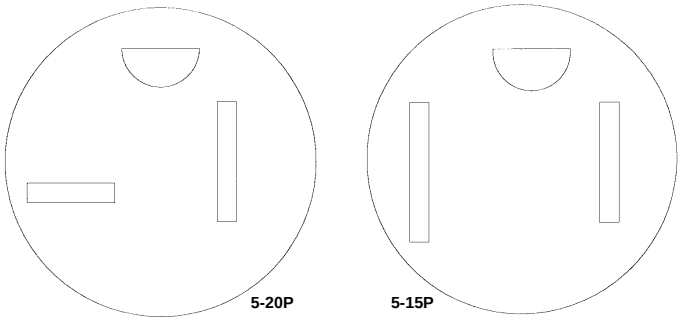
Tray Slide Installation

THIS PAGE INTENTIONALLY LEFT BLANK

Section 3
Start Up

Electrical Requirements

All cord-connected units should be plugged into a grounded and properly sized electrical outlet with appropriate overcurrent protection. Refer to the drawing below for electrical plug configurations.



5-20P and 5-15P Electrical Plug Configurations

All permanently connected (hard-wired) units are fitted with a power junction box and 6” pigtail wires for power connection.

Connect one end of the power line to the pigtail from the cabinet junction box. Connect the other end to a properly sized electrical source.

As a rule, the power lines must be enclosed inside a conduit secured to the power junction boxes on both ends.

⚠ CAUTION

Power installation must be in compliance with the National Electrical Code and all applicable local and state codes.

⚠ WARNING

Never use an extension cord.
Never alter the power cord or plug supplied with the cabinet.

After the power source has been connected, turn on the main power switch. The switch is located on the cabinet top, behind the front panel.

Electrical Specifications

REACH-IN REFRIGERATORS	Model	Voltage/ Phase/Cycles	Total Amps	Maximum Fuse Size	ANSI Electrical Plug Configuration
Full Door	KR-1	115/60/1	9.9	15 amp	5-15P
		230/50/1	**	**	**
	KR-2	115/60/1	10.4	15 amp	5-15P
		230/50/1	**	**	**
	KR-3	*115 & 208-230/60/1	Minimum circuit amps 15.1	20 amp	Hard-Wired
		230/50/1	**	**	**
Half Door	KR-101	115/60/1	9.9	15 amp	5-15P
		230/50/1	**	**	**
	KR-102	115/60/1	10.4	15 amp	5-15P
		230/50/1	**	**	**
	KR-103	*115 & 208-230/60/1	Minimum circuit amps 15.1	20 amp	Hard-Wired
		230/50/1	**	**	**
Glass Door	KR-1GD	115/60/1	14.7	20 amp	5-20P
		230/50/1	**	**	**
	KR-2GD	115/60/1	16.0	20 amp	5-20P
		230/50/1	**	**	**
	KR-3GD	*115 & 208-230/60/1	Minimum circuit amps 15.3	20 amp	Hard-Wired
		230/50/1	**	**	**

REACH-IN FREEZER	Model	Voltage/ Phase/Cycles	Total Amps	Maximum Fuse Size	ANSI Electrical Plug Configuration
Full Door	KF-1	115/60/1	12.4	20 amp	5-15P
		230/50/1	**	**	**
	KF-2	115/60/1	16	20 amp	5-20-P
		230/50/1	**	**	**
	KF-3	*115 & 208-230/60/1	Minimum circuit amps 15.8	20 amp	Hard-Wired
		230/50/1	**	**	**
Half Door	KF-101	115/60/1	12.4	20amp	5-15P
		230/50/1	**	**	**
	KF-201	208/230/60/1	16	20 amp	5-20-P
		230/50/1	**	**	**
	KF-301	*115 & 208-230/60/1	Minimum circuit amps 15.8	20 amp	Hard-Wired
		230/50/1	**	**	**

* 4 wire dual voltage required: 115 Volt for the lights and fans, 208-230 Volt for the compressor.
** Data not available at time of printing.

Condensate Water Removal
(Refrigerators and Freezers)

Manitowoc cabinets are equipped with a condensate vaporizer system. This system uses energy-saving hot gas supplied by the refrigeration system lines. No drain connection is required.

Defrost Systems

GENERAL
Refrigerator coils operate at temperatures below freezing (32°F). During compressor "off" time, the evaporator fan continues to circulate 38°F refrigerator compartment air through the evaporator coil. This air circulation raises the coil temperature above the freezing point, melting any frost that may have accumulated.

The run-off water is drained into the vaporizer pan and is evaporated by the hot gas refrigeration line during compressor "on" time.

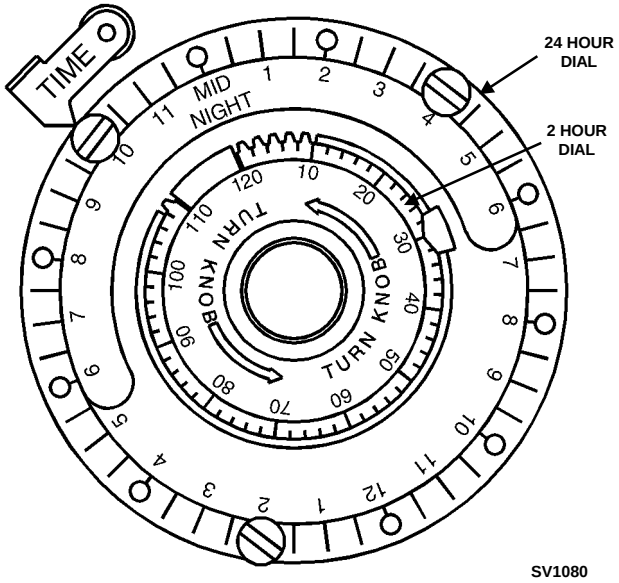
Freezer coils are defrosted electrically at user-determined times.

NOTE: A freezer's evaporator fans do not run immediately upon start-up or during and immediately following the defrost cycles. The fans start when the coil temperature falls below freezing. This prevents the fans from blowing moisture or heated air on the stored products.

DEFROST SETTINGS
The defrost timer is factory preset to defrost the evaporator coil each day at 2:00 AM, 8:00 AM, 2:00 PM, and 8:00 PM.

If you wish to change the defrost times, remove the pins from the outer dial and re-insert them into the desired time slots. (Refer to drawing.)

⚠ CAUTION
Leave at least one hole between adjacent pins.



Defrost Time Clock

Important
Set the defrost timer to defrost the reach-in during the lowest usage periods.

SETTING TIME OF DAY
The defrost timer must be set to "real time" after the power is turned on, or after a power failure.

To set the time:

1. Grasp the knob in the center of the inner dial.
2. Turn it counterclockwise to rotate the outer dial.
3. Line up the current time of day on the outer dial with the pointer.

ADJUSTING DEFROST DURATION
The defrost cycle is terminated by a temperature-sensing switch located on the suction line, adjacent to the evaporator coil.

The defrost duration is factory-set. Normally, no adjustment is required. For a longer defrost time, press down on the inner dial pointer and rotate the pointer until the desired time lines up.

Important
The coil defrosts only until the temperature-sensing switch terminates the cycle, regardless of the defrost duration that is set.

Temperature Control

REFRIGERATORS AND FREEZERS

The temperature controls are factory-set to maintain an average temperature of 38°F (3°C) in refrigerators, and an average temperature of 0°F (18°C) in freezers.

The temperature variance is 6-8 F (2°-4°C) degrees. A freezer should run between -2°F to +4°F (3°C to -15°C). A refrigerator should run between +35° to +42°F (1°C to 5°C).

For a different cabinet temperature setting, turn the temperature control knob, located behind the front cabinet louver.

⚠ CAUTION

Setting the temperature control to the coldest setting may cause the coil and/or air ducts to freeze and ice up. This will eventually result in a warmer cabinet temperature.

If ice accumulation occurs and the temperature is lower than the guidelines, turn the control knob to a warmer setting.

⚠ CAUTION

Allow the reach-in to reach proper operating temperature before filling it with product. Do not place hot or steaming foods in the cabinet.

Loading Shelves

For maximum operating efficiency, load the shelves with space between the stored items. This allows air to circulate properly.

⚠ CAUTION

Do not store more than 250 pounds of product on any shelf and no more than 800 pounds of product per cabinet.

⚠ CAUTION

Store products with high acid content (such as lettuce, other fresh vegetables or fruits, salad dressings, etc.) in closed containers. This will prevent corrosion on the evaporator coil and other metal parts in the air distribution system.

Important

Uncovered food will dehydrate much more rapidly than covered food. For best food quality, always store in covered container.

Section 4
Cleaning

Exterior

Clean cabinet exterior surfaces with a solution of mild soap and water. To minimize streaking, follow with a fresh water rinse.

If stainless steel becomes discolored, scrub only in the direction of the finished grain.

For high shine, see your kitchen equipment dealer for a high-quality stainless steel polish.

⚠ CAUTION

Do not use steel wool, caustic soap, or abrasive cleaners, as these may damage the metal finish. Alcohol-based cleaners may damage the nylon door cams.

Interior

Clean cabinet interior surfaces with warm water and baking soda, applied with a cloth or sponge.

The shelves and shelf support standards can be removed without special tools to facilitate cleaning.

Wash door gaskets weekly with a mild soap and water solution, followed by a fresh water rinse.

While cleaning, check the door gaskets for proper sealing. Adjust if needed.

⚠ CAUTION

Never use cleaners that are not approved for use where food may come into contact with cabinet interior surfaces.

⚠ CAUTION

Do not use steel wool, caustic soap, or abrasive cleaners, as these may damage the metal finish.

Cleaning the Condenser Coil

⚠ WARNING
Disconnect electric power before cleaning.

A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces efficiency and shortens component life.
The washable aluminum filter is designed to catch dust, dirt, lint and grease. This helps keep the condenser clean. For efficient operation, it is very important to clean the condenser coil surface and keep it free of dust, dirt, and lint.

The condition of the air filter and condenser coil should be checked monthly.

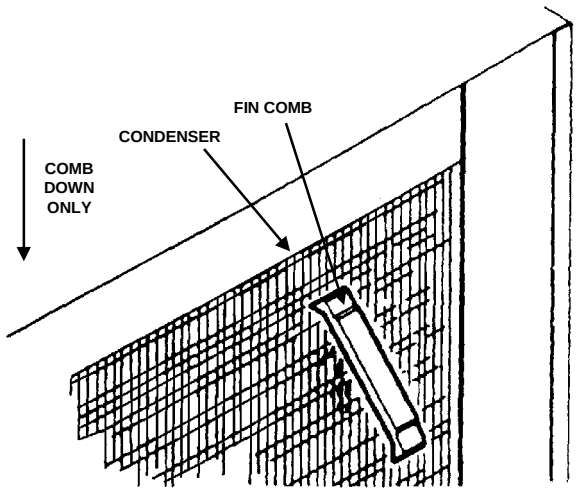
⚠ CAUTION
Failure to clean and maintain the condenser coil properly will result in reduced air circulation through the condenser fins. This will cause reduced efficiency, high operating pressures, and possible shortened compressor life.

⚠ WARNING
Condenser fins are sharp. Use care when working around them.

CONDENSER CLEANING PROCEDURE
Use this procedure to clean the condenser monthly:

1. Remove and clean the filter with a mild soap and water solution.
2. Clean the outside of the condenser with a soft brush or a vacuum with a brush attachment. Clean from top to bottom not side to side. Be careful not to bend the condenser fins.
3. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains:
   A. Blow compressed air through the condenser from the inside. Be careful not to bend the fan blades.
   B. Use a commercial condenser coil cleaner. Follow the directions and cautions supplied with the cleaner.

Repeat step 3 until all dirt is removed.
After cleaning, straighten any bent condenser fins with a fin comb.



Using a Fin Comb

⚠ WARNING
Disconnect electric power before cleaning.

CLEANING THE FAN BLADES AND MOTOR
If necessary, clean the fan blades and motor with a soft cloth. If it is necessary to wash the fan blades, cover the fan motor to prevent moisture damage.

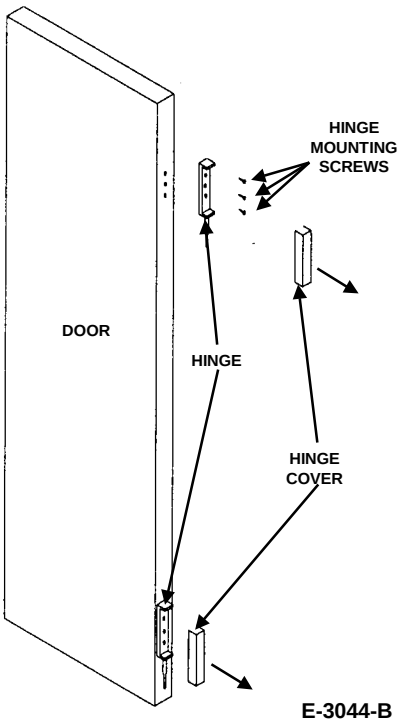
Section 5
Adjustments and Calibrations

Adjustments

Cabinet doors may require some adjustment after a period of usage, depending upon the frequency of door openings. This is normal. Follow the appropriate procedure below:

SOLID DOOR ADJUSTMENT

1. Remove the metal hinge covers that conceal the three hinge mounting screws. Gently pry it off with a flat-bladed screwdriver.



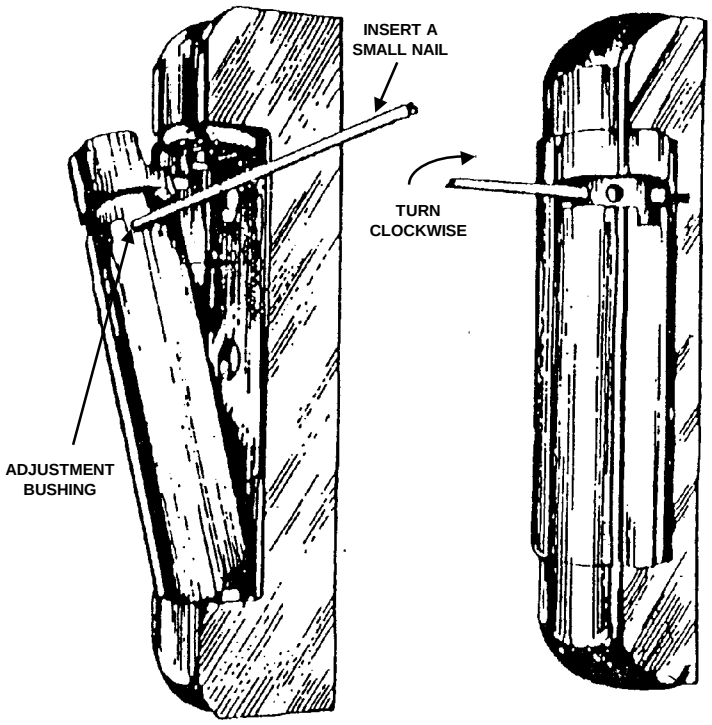
Hinge/Hinge Cover

2. Loosen the three hinge mounting screws approximately two rotations, using a Phillips screwdriver.
3. While a second person firmly pushes the door closed to the front face of the cabinet, re-tighten the screws.
4. Re-install the hinge covers.

GLASS DOOR ADJUSTMENT

To adjust the spring tension:

1. Locate the adjustment bushing on the hinges. This bushing is on top of the hinge for right-hand doors and on the bottom for left-hand doors.
2. Insert a small nail (1/8”) into a hole in the adjustment bushing. Wind the bushing clockwise until the pin can be removed from the bushing.



Hinge Adjustment

3. Continue winding the bushing clockwise until the desired tension is achieved.
4. Re-insert the bushing pin.

> **⚠ CAUTION**
> Do not over-tighten the hinge spring.
> Adjusting the hinge adjustment bushings one hole at a time is recommended.

Thermometer Calibration

Occasionally, the rigors of shipping and installation can shift the thermometer out of proper adjustment.

If the accuracy of the thermometer is in question, place another thermometer inside the cabinet at approximately mid-height and compare the readings.

If the thermometer requires adjustment, follow the procedure below.

1. Gently pry off the clear thermometer cover lens with a small flat-bladed screwdriver.
2. While carefully holding the dial indicator needle with one hand, turn the slotted center pivot with a flat-bladed screwdriver. Turn clockwise to decrease the reading and counterclockwise to increase the reading.
3. Replace the clear thermometer cover lens by pressing it into place around the perimeter.

Section 6
Before Requesting Service

Troubleshooting Guide

Before requesting any service on your Manitowoc cabinet, please check the following points.

This guide is not comprehensive; it is intended as a reference for solutions to common problems.

⚠ WARNING
Disconnect electric power before performing any service.

Symptom	Possible Cause	Corrective Action
Cabinet not running	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Power cord unplugged.	Plug in power cord.
	Thermostat set too high.	Set thermostat to lower temperature.
	Main power switch turned off.	Turn main power switch on.
	Cabinet in defrost cycle. (Freezer models)	Wait for defrost cycle to finish.
Condensing unit runs for long periods or continuously	Excessive amount of warm product placed in cabinet.	Allow adequate time for product to cool down.
	Prolonged door openings or door(s) ajar.	Make sure door(s) are closed when not in use. Avoid prolonged door openings.
	Door gasket(s) not sealing properly.	Check gasket condition. Adjust door or replace gasket if necessary.
	Dirty condenser coil.	Clean the condenser coil.
	Evaporator coil iced over.	Turn unit off and allow coil to defrost. Make sure thermostat is not set too cold. Also, check gasket condition.
Cabinet temperature is too high	Thermostat set too high.	Set thermostat to lower temperature.
	Poor air circulation in cabinet.	Re-arrange product to allow proper air circulation.
	Exterior thermometer is out of calibration.	Re-calibrate thermometer.
	Excessive amount of warm product placed in cabinet.	Allow adequate time for product to cool down.
	Prolonged door openings or door(s) ajar.	Make sure door(s) are closed when not in use. Avoid prolonged door openings.
	Dirty condenser coil.	Clean the condenser coil.
	Evaporator coil iced over.	Turn unit off and allow coil to defrost. Make sure thermostat is not set too cold. Also, check gasket condition.
Cabinet is noisy	Loose part(s).	Locate and tighten loose part(s).
	Tubing vibration.	Insure tubing is free from contact with other tubing or components.
Refrigerator is freezing product	Thermostat is set too low.	Set thermostat to higher temperature.
Compressor will not start - hums and trips on overload protector	Dirty condenser coil.	Clean the condenser coil.
	Not enough cabinet clearance for proper refrigeration system operation.	Move cabinet or make other adjustments to gain proper cabinet clearances.
	Low voltage to cabinet.	Check and correct incoming voltage to cabinet.

THIS PAGE INTENTIONALLY LEFT BLANK

Section 7
Electrical Specifications

Main Power Switch

Function
Switches power to the reach-in on and off.

Specifications
Double pole single throw (DPST)

Check Procedures
1. Check for proper line voltage (+/– 10%).
2. Inspect the switch for proper wiring.
3. Inspect the terminals for clean, tight connections.
4. Check across the switch terminals with a voltmeter. Replace the switch if you do not obtain the results below:

Switch Position	Voltage
On	0
Off	Line

Temperature Control (Thermostat)

Function
Opens and closes to start and stop the compressor and condenser fan(s) to maintain a constant cabinet temperature.

Specifications
Constant differential
Range 0°± 2°F (-17.8° ± -16.7°C) / 5°± 2°F (-15° ± -16.7°C)

Check Procedures
If the reach-in continues to run in the cooling cycle:

1. Turn the temperature control to the warmest setting.
2. Hook a voltmeter across the temperature control terminal leads.
3. If the voltmeter reads line voltage, the control has opened and is functioning normally. If the control fails to open, replace it.

If the reach in does not run:

1. Disconnect electrical power supply.
2. Turn the temperature control to the coldest setting.
3. Isolate the temperature control and hook an ohmmeter across the terminals.
4. If the ohmmeter registers continuity, the control is good.

Light Switch

Function
Turns the interior cabinet light on as the reach-in door is opened.

Specifications
Single pole push button switch.

Check Procedures
1. Check for proper line voltage (± 10%).
2. Inspect the switch for proper wiring.
3. Inspect the terminals for clean, tight connections.
4. Check across the switch terminals with a voltmeter. Replace the switch if you do not obtain the results below:

Door Position	N.O. Contacts	N.C. Contacts
Closed	0	Line
Open	Line	0

Defrost Termination/Fan Delay Switch

Function
Terminates the defrost cycle and delays the start of the evaporator fan(s) after defrost.

Specifications
Thermodisc
Open Temperature 55±60°F (12.8±15.6°C)

Close Temperature 35±60°F (1.7±15.6°C)

Check Procedures
1. Hook a voltmeter across the N.O. terminals. If, during the defrost cycle, the bimetal disc does not open when the evaporator reaches the specified temperature, replace the thermostat.
2. Hook a voltmeter across the N.C. terminals. If, after the defrost cycle, the bimeter disc does not close when the evaporator coil reaches the specified temperature, replace the thermostat.

Defrost Timer

Function
Initiates the defrost cycle at preset times to prevent evaporator frost buildup.

Specifications
Paragon 8145-00
See page 5-3 for defrost timer adjustment.

Check Procedures
1. Inspect the terminals for clean, tight connections.
2. Verify that correct line voltage is at terminals X and 3.

Voltage at Terminals X and 3	Action
Correct	If 24-hour dial is not turning, replace automatic defrost time clock
None	Restore line voltage

3. Hook a voltmeter across the switch terminals. Verify the readings below. If you do not get these readings, replace the defrost timer.

Cycle	Terminals	Expected Reading
Cooling	2 and 4	0 volts–closed
	3 and N	0 volts–closed
	3 and 1	Line volts - open
Start of Defrost	2 and 4	Line volts – open
	3 and N	Line volts - open
	3 and 1	0 volts - closed

Defrost Heater Element

Function
Defrosts the evaporator coil.

Coil Heater Specifications

Model °F/°C	Volt	Amp	Watt	Ohm
20/-6.7	115	7.0	800	14-18
45/7.2	115	7.0	800	14-18
70/21.1	230	3.5	800	64-67
1/-17.2	115	9.6	1100	8-12
2/-16.7	230	8.5	1950	26-30
14/-10	115	5.2	600	20-24
18/-7.8	115	5.2	600	20-24
36/2.2	230	4.8	1100	45-49

Check Procedures
1. Turn off the electric power to the reach-in freezer.
2. Disconnect the leads to the defrost heater and check across with an ohmmeter. See specifications (above) for ohm values.

Results of Check	Action
Continuity and ohm value within specifications	Element is OK
No continuity	Replace the element
Ohm value not within specifications	Replace the element

Drain Pan Heater Element

Function
Warms the drain pan to allow moisture to drain

Specifications

Model °F/°C	Volt	Amp	Watt	Ohm
20/-6.7	115	3.5	400	30-34
45/7.2	115	3.5	400	30-34
70/21.1	230	1.73	400	130-135

Check Procedures
1. Turn off the electric power to the reach-in freezer.
2. Disconnect the leads to the defrost heater and check across with an ohmmeter. See specifications (above) for ohm values.

Result of check	Action
Continuity and ohm value within specifications	Element is OK
No continuity	Replace the element
Ohm value not within specifications	Replace the element

See page 9-6 for replacement procedures

Anti-Condensate Door Heaters

Function
Prevents condensation (sweating) on the cabinet and door surfaces.

Specifications

	Heater Type	Ohm Reading (total)
Refrigerator Full Door(s)	2.5 Watts per foot	30 Ohm
Refrigerator Half Doors	1.6 Watts per foot	20 Ohm
Freezer Full Door(s)	5.0 Watts per foot	14 Ohm
Freezer Half Doors	3.7 Watts per foot	50 Ohm

Check Procedures
1. Turn off the electric power to the reach-in.
2. Disconnect the mullion heater leads. Check with an ohmmeter. See specifications (above) for ohm values.

Results of Check	Action
Continuity and ohm value within specifications	Heater is OK
No Continuity	Replace the heater
Ohm value not within specifications	Replace the heater

See page 9-16 for replacement procedure.

Compressor Overload Protector

Function
Shuts down the compressor if an overcurrent condition exists.

Check Procedures

> **⚠ WARNING**
> Disconnect the electric power to the freezer before proceeding with the following steps.

Check the continuity of the external overload protector.

1. Disconnect the wires from the overload protector from other components.
2. Check the continuity of the overload protector.

Results of check	Action
Continuity	Overload protector is OK
No continuity	Allow the compressor to reach room temperature and check again
No continuity at room temperature	Replace

Start Relay

Function
A relay used to disconnect the start winding.

Check Procedures

1. Disconnect the wires from the start relay. If the relay must be moved, keep it upright.
2. Check the continuity at the contact terminals.

Results of check	Action
Continuity	Replace the relay
No continuity	Relay is OK

3. Check continuity at the relay coil terminals. Refer to the wiring diagram for terminal identification.

Results of check	Action
Continuity	Relay is OK
No continuity	Replace the relay

Compressor Windings

Function

Draws current during the running cycle.

Check Procedures

NOTE: The compressor must be at room temperature.

1. Disconnect the wires from the compressor terminals.
2. Check the resistance between terminals C and R:

Results of check	Action
Resistance	See step 5
No resistance	1. Verify external overload is closed. 2. Run winding is open; replace compressor.

3. Check the resistance between terminals C and S:

Results of check	Action
Resistance	See step 5
No resistance	Start winding is opened; replace compressor.

4. Check the resistance between terminal C and the compressor shell:

Results of check	Action
Resistance	Compressor is grounded; replace compressor
No resistance	Compressor is not grounded - OK

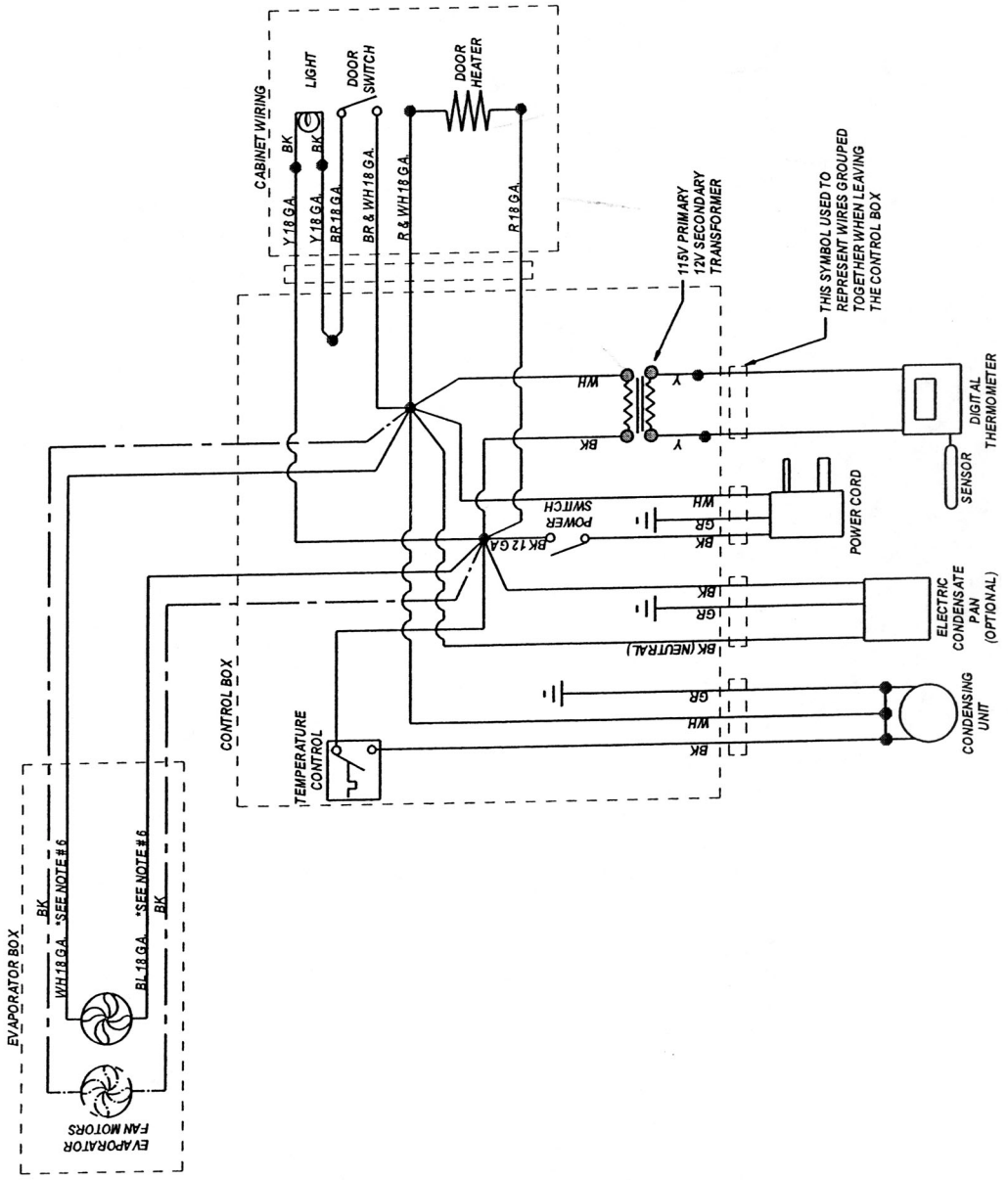
5. Check the resistance of the windings. The resistance reading between terminals S and R should equal the readings between terminals C and R, and terminals C and S added together:

$$S \text{ to } R = C \text{ to } R + C \text{ to } S$$

1-2-3 Door Refrigerator

KR-1 KR-2 KR-3 KR-101 KR-201 KR-301

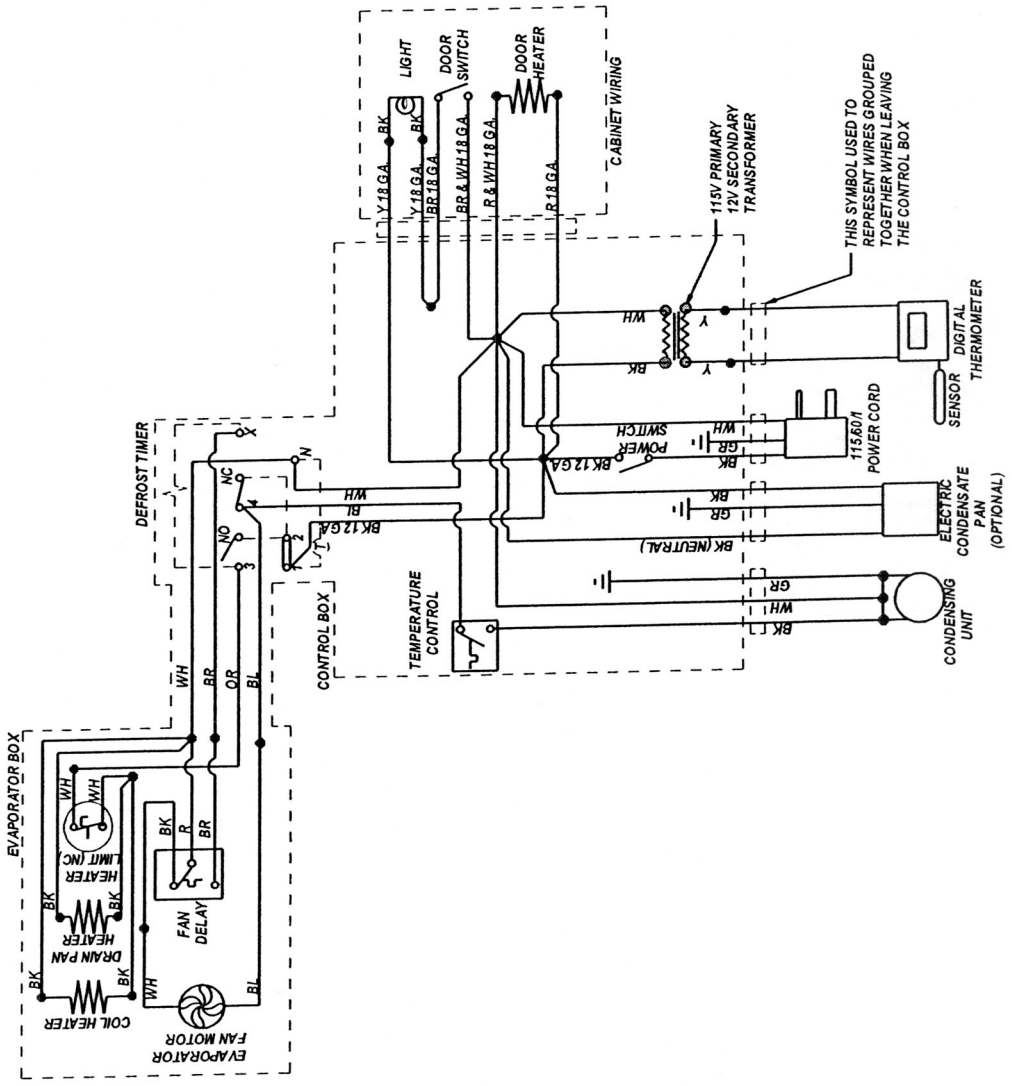
115/60/1



1-2 Door Freezer

KF-1 KF-2 KF-101 KF-201

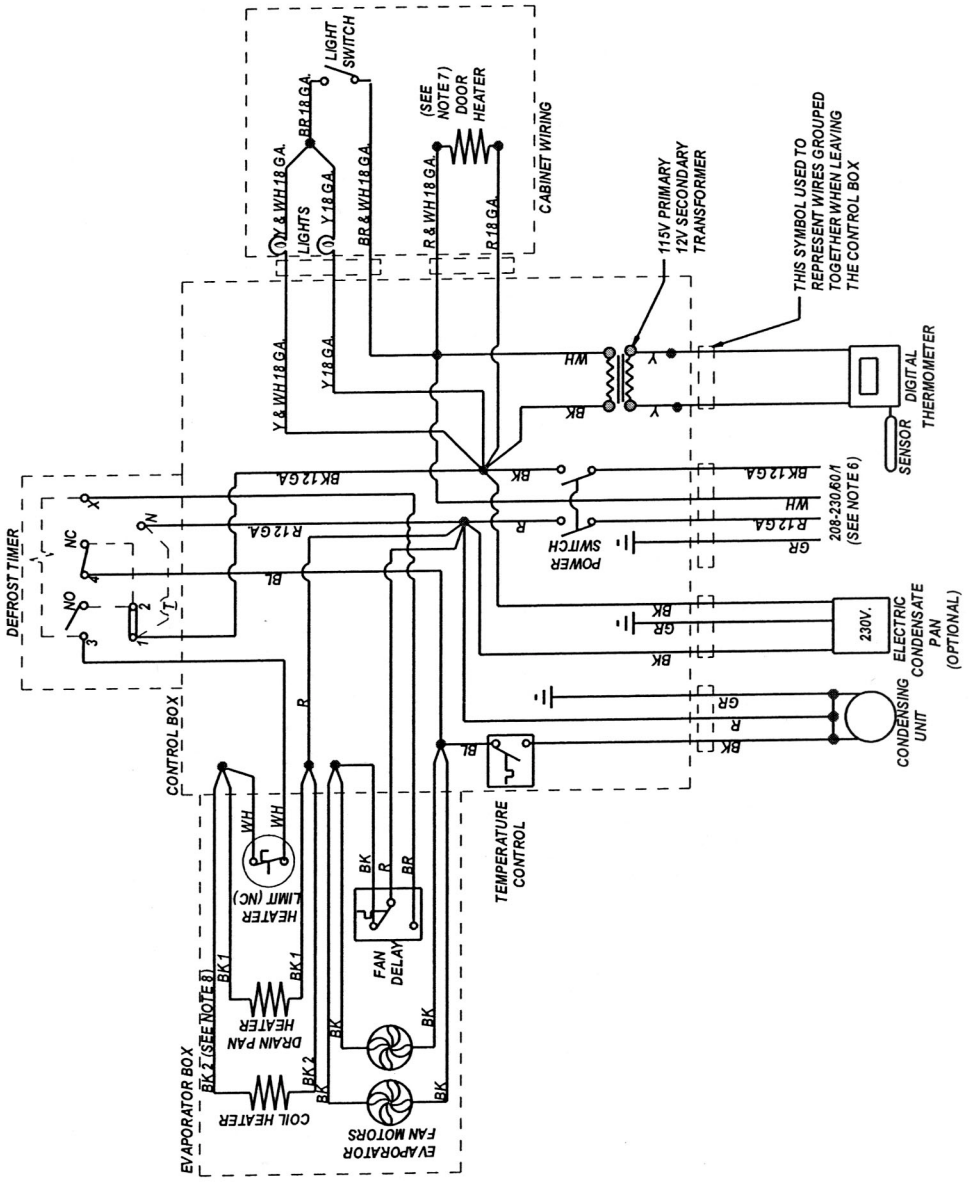
115/60/1



3 Door Freezer

KF-3 KF-301

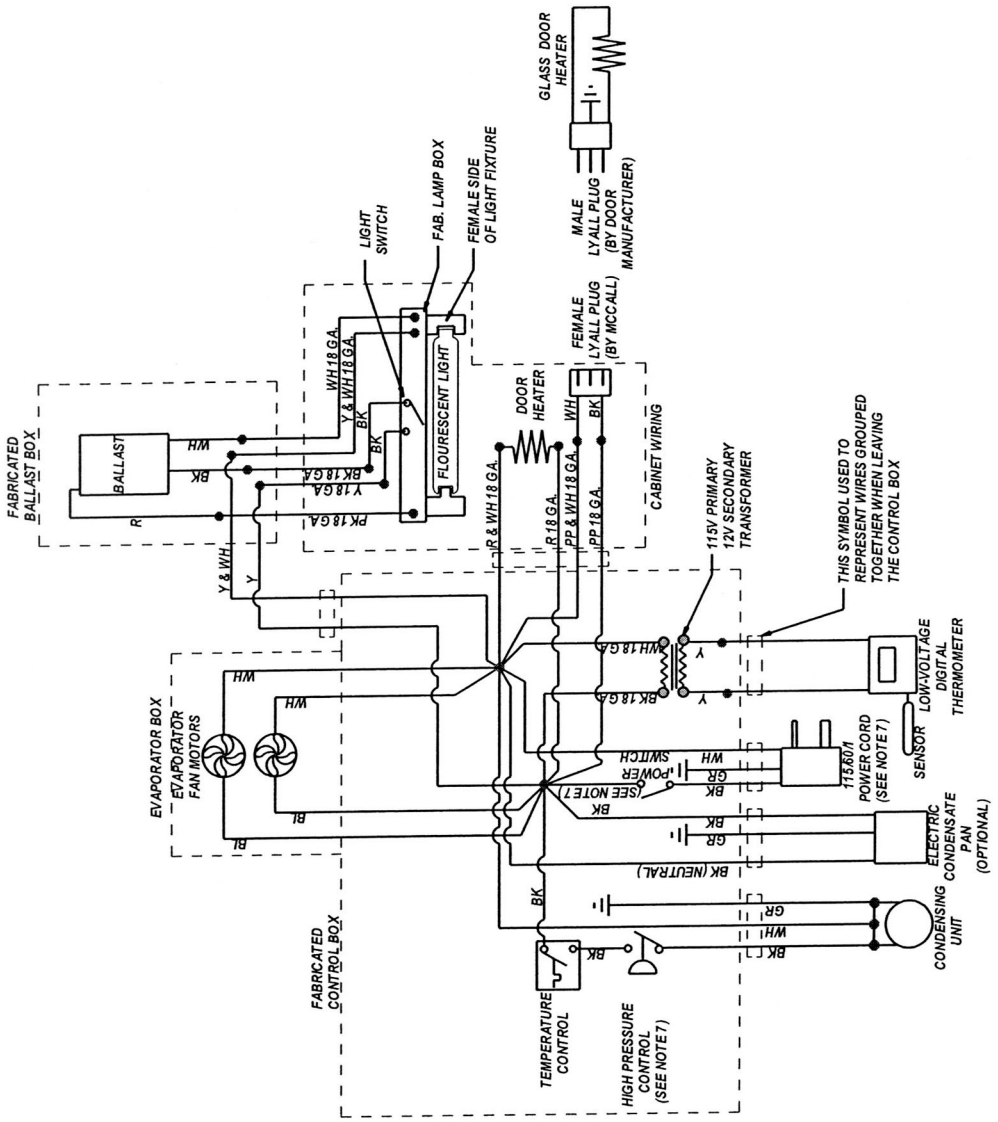
208-230/60/1



1 Door Glass Door Refrigerator

KR-1GD

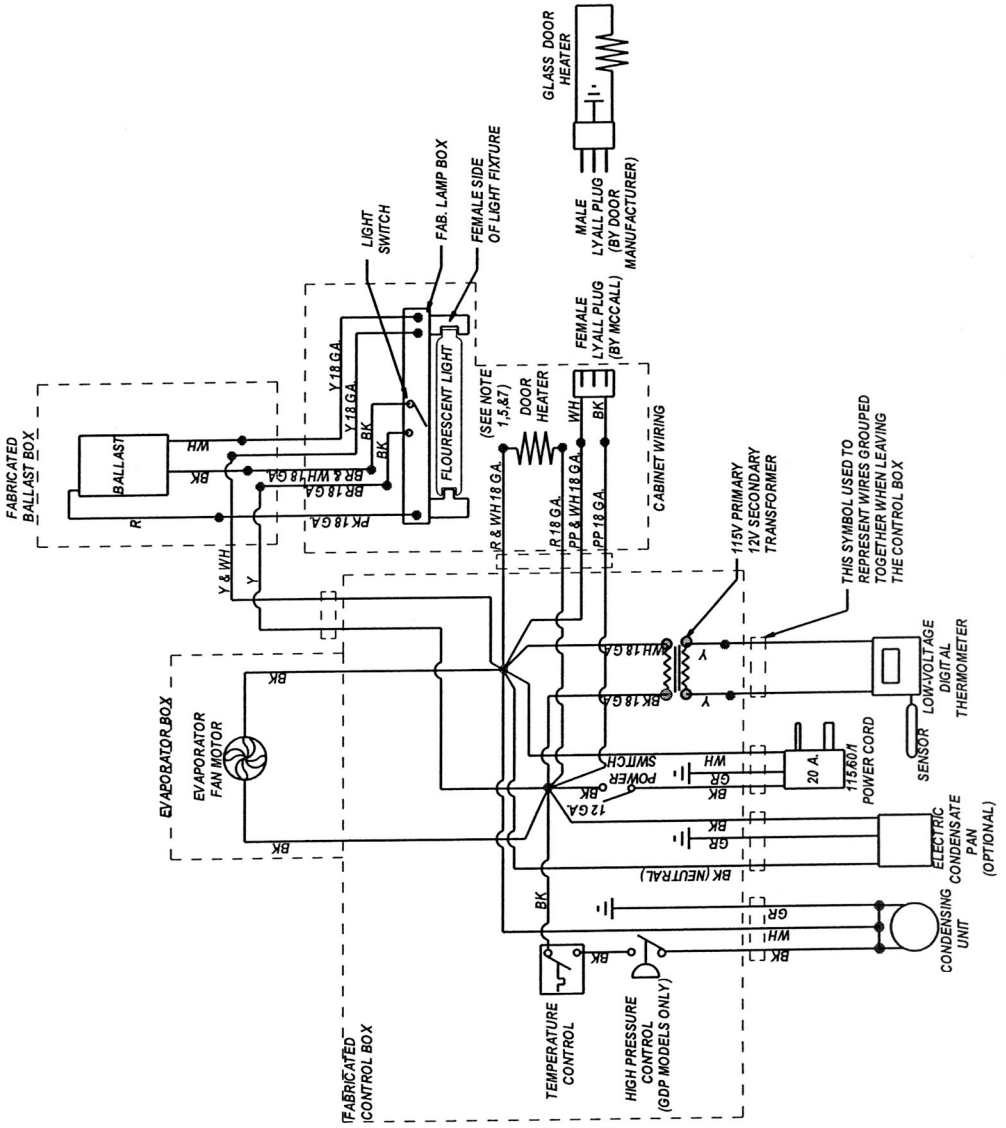
115/60/1



2 Door Glass Door Refrigerator

KR-2GD

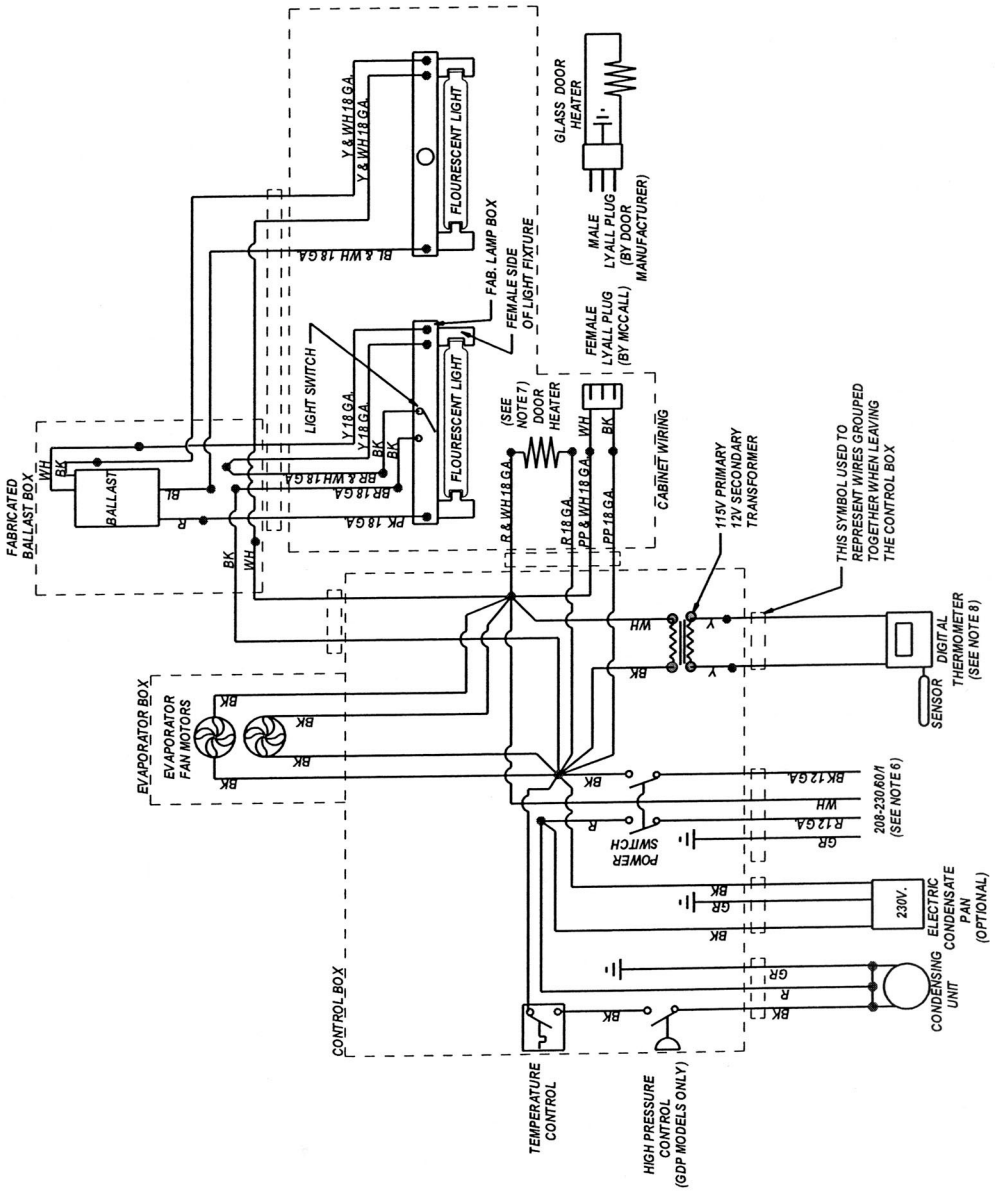
115/60/1



3 Door Glass Door Refrigerator

KR-3GD

208-230/60/1



Section 8
Refrigeration

Charging Specifications

BASE MODEL	Ambient Temperature °F/°C	Average Interior Temperature	Suction Pressure	Discharge Pressure	Compressor Size (H.P.)	Charge oz. grams	Refrigerant Type
KR-1	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.33	16 454 g	R-22
KR-101	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.33	16 454 g	R-22
KR-1GD	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.50	18 510 g	R-22
KF-1	70/21.1 100/37.8	0 F -17.8 C	20 PSI	185 PSI 286 PSI	.50	27 765 g	R-404A
KF-101	70/21.1 100/37.8	0 F -17.8 C	20 PSI	185 PSI 286 PSI	.50	27 765 g	R-404A
KR-2	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.33	12 340 g	R-22
KR-201	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.33	12 340 g	R-22
KR-2GD	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.50	24 680 g	R-22
KF-2	70/21.1 100/37.8	0 F -17.8 C	20 PSI	185 PSI 286 PSI	.75	33 936 g	R-404A
KF-201	70/21.1 100/37.8	0 F -17.8 C	20 PSI	185 PSI 286 PSI	.75	33 936 g	R-404A
KR-3	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.50	17 482 g	R-22
KR-301	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.50	17 482 g	R-22
KR-3GD	70/21.1 100/37.8	38 F 3.3°C	50 PSI	195 PSI 295 PSI	.75	35 992 g	R-22
KF-3	70/21.1 100/37.8	0 F -17.8 C	20 PSI	185 PSI 286 PSI	1.00	42 1191 g	R-404A
KF-301	70/21.1 100/37.8	0 F -17.8 C	20 PSI	185 PSI 286 PSI	1.00	42 1191 g	R-404A

Refrigerant Recovery / Evacuation & Recharging

Do not purge refrigerant to the atmosphere. Capture refrigerant using recovery equipment by specific manufacturer's recommendations.

IMPORTANT

We assume no responsibility for the use of contaminated refrigerant. Damage resulting from the use of contaminated refrigerant is the sole responsibility of the servicing company.

CONNECTIONS

1. Suction side of the compressor through the suction service valve.
2. Discharge side of the compressor through the discharge service valve.

SELF-CONTAINED RECOVERY/EVACUATION

1. Place the main ON/OFF toggle switch in the OFF position.
2. Install manifold gauges, charging cylinder/scale, and recovery unit or two-stage vacuum pump.



Figure 7.1

3. Open (backseat) the high and low side Reach-In service valves.
4. Perform recovery or evacuation:
   a) Recovery: Operate the recovery unit as directed by the manufacturer's instructions.

   b) Evacuation prior to recharging:
   Pull the system down to 250 microns. Then, allow the pump to run for an additional half-hour. Turn off the pump and perform a standing vacuum leak check.

NOTE: Check for leaks using halide or electronic leak detector after charging the Reach-In.

Continued next page…

Charging Procedures

IMPORTANT

The charge is critical on all Reach-In units. Use a scale or a charging cylinder to ensure the proper charge is installed.

1. Be sure the Main ON/OFF toggle switch is in the OFF position.
2. Close the vacuum pump valve, the low side service valve, and the low side manifold gauge valve.
3. Open the high side manifold gauge valve and the high side service valve.
4. Open the charging cylinder and add the proper refrigerant charge (shown on nameplate) through the discharge service valve.
5. Let the system "settle" for 2 to 3 minutes.
6. Place the main ON/OFF toggle switch in the ON position.
7. Close the high side valve on the manifold gauge set. Add any remaining vapor charge through the suction service valve (if necessary).

NOTE: Manifold gauges must be removed properly to ensure that no refrigerant contamination or loss occurs.

8. Make sure that all the vapor in the charging hoses is drawn into the Reach-In before disconnecting the charging hoses.

   a) Run the Reach-In cooling mode.

   b) Close the high side service valve at the Reach-In.

   c) Open the low side service valve at the Reach-In.

   d) Open the high and low side valves on the manifold gauge set. Any refrigerant in the lines will be pulled into the low side of the system.

   e) Allow the pressures to equalize while the Reach-In is running.

   f) Close the low side service valve at the Reach-In.

   g) Remove the hoses from the Reach-In and install the caps.

System Contamination Clean-up

This section describes the basic requirements for restoring contaminated systems to reliable service.

IMPORTANT

We assume no responsibility for the use of contaminated refrigerant. Damage resulting from the use of contaminated refrigerant is the sole responsibility of the servicing company.

DETERMINING SEVERITY OF CONTAMINATION

Either moisture or residue generally causes system contamination from compressor burnout entering the refrigeration system.

Inspection of the refrigerant usually provides the first indication of system contamination. Obvious moisture or an acrid odor in the refrigerant indicates contamination.

If either condition is found, or if contamination is suspected, use a Total Test Kit from Totaline or a similar diagnostic tool. Follow the manufacturer's directions. These devices sample refrigerant, eliminating the need to take an oil sample.

If a refrigerant test kit indicates harmful levels of contamination, or if a test kit is not available, inspect the compressor oil.

1. Remove the refrigerant charge from the Reach-In.
2. Remove the compressor from the system.
3. Check the odor and appearance of the oil.
4. Inspect the suction and discharge lines at the compressor for burnout deposits.
5. If no signs of contamination are present, perform an acid oil test.

Check the chart below to determine the type of cleanup required.

Contamination/Clean-up Chart

Symptoms/Findings	Required Cleanup Procedure
No Symptoms or suspicion of contamination	Normal evacuation/recharging procedure
Moisture/Air Contamination symptoms • Refrigeration system open to atmosphere for prolonged periods • Refrigeration test kit and/or acid oil test shows contamination • Leak in water-cooled condenser • No burnout deposits in open compressor lines	Mild contamination clean-up procedure
Mild Compressor Burnout symptoms • Oil appears clean but smells acrid • Refrigeration test kit or acid oil test shows harmful acid content • No burnout deposits in open compressor lines	Mild contamination clean-up procedure
Severe Compressor Burnout symptoms • Oil is discolored and smells acrid • Refrigeration test kit or acid oil test shows harmful acid content • Burnout deposits found in the compressor and lines, and in other components	Severe contamination clean-up procedure

MILD SYSTEM CONTAMINATION CLEAN-UP PROCEDURE

1. Replace any failed components.
2. If the compressor is good, change the oil.
3. Replace the liquid line drier.

NOTE: If the contamination is from moisture, use heat lamps during evacuation. Position them at the compressor, condenser and evaporator prior to evacuation.

IMPORTANT
Dry nitrogen is recommended for this procedure. This will prevent CFC release.

4. Follow the normal evacuation procedure, except replace the evacuation step with the following:

a) Pull vacuum to 1000 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 PSI.

b) Pull vacuum to 500 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 PSI.

c) Change the vacuum pump oil.

d) Pull vacuum to 250 microns. Run the vacuum pump for ½ hour on self-contained models, 1 hour on remotes.

NOTE: You may perform a standing vacuum test to make a preliminary leak check. You should use an electronic leak detector after system charging to be sure there are no leaks.

5. Charge the system with the proper refrigerant to the nameplate charge.
6. Operate the Reach-In unit.

SEVERE SYSTEM CONTAMINATION CLEAN-UP PROCEDURE

1. Remove the refrigerant charge.
2. Remove the compressor.
3. Remove the liquid line drier.
4. Replace the TXV.
5. Wipe away any burnout deposits from suction and discharge lines at compressor.
6. Sweep through the open system with dry nitrogen.

IMPORTANT
Refrigerant sweeps are not recommended, as they release CFC's into the atmosphere.

7. Install a new compressor and new start components.
8. Install a suction line filter-drier (with acid and moisture removal capability) of adequate size. Place the filter drier as close to the compressor as possible.
9. Install inlet and outlet access valves.
10. Install a new liquid line drier.

Continued next page…

11. Follow the normal evacuation procedure, except replace the evacuation step with the following:

a) Pull vacuum to 1000 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 PSI.

b) Change the vacuum pump oil.

c) Pull vacuum to 500 microns. Break the vacuum with dry nitrogen and sweep the system. Pressurize to a minimum of 5 PSI.

d) Change the vacuum pump oil.

e) Pull vacuum to 250 microns. Run the vacuum pump for ½ hour on self-contained models, 1 hour on remotes.

NOTE: You may perform a standing vacuum test to make a preliminary leak check. You should use an electronic leak detector after system charging to be sure there are no leaks.

12. Charge the system with the proper refrigerant to the nameplate charge.

13. Operate the Reach-In unit for one hour. Then check the pressure drop across the suction line filter-drier.

    a) If the pressure drop is less than 1 PSI, the filter-drier should be adequate for complete clean up.

    b) If the pressure drop exceeds 1 PSI, change the suction line filter-drier and the liquid line drier. Repeat steps 8 through 13 until the pressure drop is acceptable.

14. Operate the Reach-In unit for 48-72 hours. Then remove the suction line filter-drier and change the liquid line drier.

15. Follow normal evacuation procedures.

FILTER DRIERS

The size of the filter-drier is important. Using an improperly sized filter-drier will cause the Reach-In unit to be improperly charged with refrigerant.

IMPORTANT

Driers are covered as a warranty part. Driers must be replaced any time the system is opened for repairs**.**

Refrigerant Re-Use Policy

We recommend the use of:

1. New Refrigerant
   - Must be of original nameplate type.

2. Reclaimed Refrigerant
   - Must be of original nameplate type.

3. Recovered or Recycled Refrigerant
   - Must be recovered or recycled in accordance with current local, state and federal laws.
   - Must be from and re-used in the same McCall product. Re-use of recovered or recycled refrigerant from other products is not approved.
   - Recovered refrigerant must come from a "contaminant-free" system. To decide whether the system is contaminant free, consider:
     a) Type(s) of previous failure(s)
     b) Whether the system was cleaned, evacuated and recharge properly following failure(s)
     c) Compressor motor burn outs and improper past service, prevent refrigerant re-use.

Section 9
Replacement Procedures

Evaporator Fan Motor
1 Section Refrigerators and Freezers

If Mounting Bracket Is Not Broken

1. Remove air distribution duct from the cabinet interior ceiling (Figure 9.1).



Figure 9.1

2. Disconnect the (2) terminal connectors from the motor (Figure 9.2).



Figure 9.2

3. Using a ¼" nut driver, remove the (2) motor mounting screws and separate the motor from the bracket (Figure 9.3).



Figure 9.3

4. Reverse steps 1-3 to replace motor.
5. Reconnect power and return to normal use.

NOTE: The evaporator-housing lid may be removed to provide added lighting and visibility (Figure 9.4).

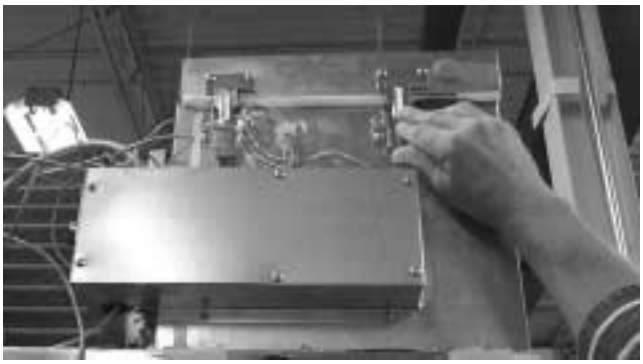


Figure 9.4

Evaporator Fan Motor
1 Section Refrigerators and Freezers

If Mounting Bracket Is Broken

1. Remove the air distribution duct from the interior ceiling (Figure 9.5).



Figure 9.5

2. Disconnect the (2) terminal connectors from the motor (Figure 9.6).



Figure 9.6

3. Using a ¼" nut driver, remove the (2) motor mounting screws and separate the motor from the bracket (Figure 9.7).



Figure 9.7

4. Remove the evaporator-housing lid, located on the cabinet top. (Figure 9.8)

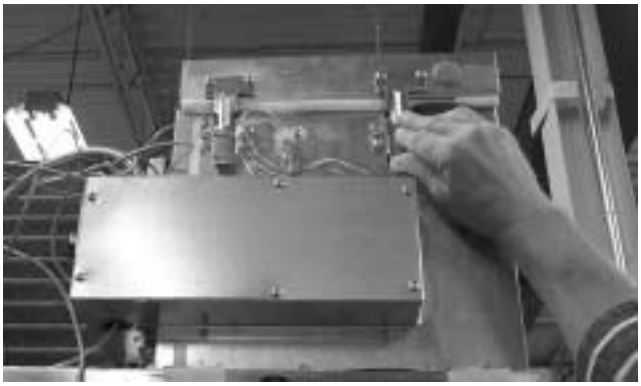


Figure 9.8

5. Remove the coil mounting screws and carefully lift the coil, only enough to gain access to the motor mounting screws (Figure 9.9).

Continued next page…



Figure 9.9

6. When the coil has been moved, remove the evaporator drain pan by removing (4) mounting screws.
7. Remove the bracket mounting screws and replace bracket-motor assembly.
8. Reverse Steps 1-5 to complete motor installation.
9. Reconnect power and return to normal use.

Light Switch

1. Remove the door by lifting straight up (Figure 9.10). Carefully set the door aside.



Figure 9.10

2. Pry off the TOP hinge cover on the cabinet hinge flange with a flat blade screwdriver or flat scraper (Figure 9.11).



Figure 9.11

3. Remove the (3) hinge mounting screws and carefully pull the hinge flange from the cabinet front.
4. Slide the light switch and switch retainer from the hinge. Unplug the switch (Figure 9.12).

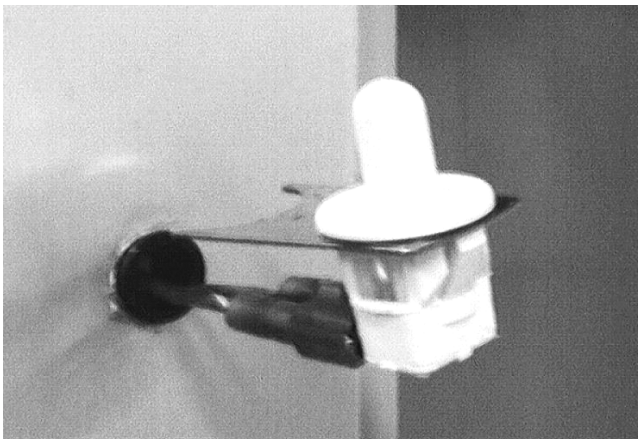


Figure 9.12

5. Install the new switch into the hinge and replace the door hinge onto the cabinet front. Install the (3) mounting screws. Snug the screws but DO NOT tighten fully.
6. Re-hang the door onto the hinges.
7. Make sure that the door is hanging plumb and that the door operates properly.
8. Tighten the screws and replace the hinge cover.

Evaporator Fan Motor

2 & 3 Section Refrigerators and Freezers

1. Remove the evaporator-housing lid, located on the cabinet top, exposing the evaporator fan motor (Figure 9.13).



Figure 9.13

2. Remove the wiring box cover. Locate and disconnect the fan motor wires (Figure 9.14).



Figure 9.14

3. Remove the fan bracket mounting screws. Disconnect the wiring terminals from the motor. Remove the defective motor and replace with the new motor. Replace screws (Figure 9.15).



Figure 9.15

4. Reconnect motor wires in wiring box. Check to make sure that wire access hole through the evaporator box is properly sealed and reseal if necessary.

5. Replace wiring box cover.

6. Replace the evaporator-housing lid.

7. Reconnect power and return to normal use.

Temperature Control

Refrigerators & Freezers

1. Remove the front louvered hatch cover by lifting straight up and pulling straight out.
2. Lay the hatch cover on top of the freezer evaporator housing.

IMPORTANT
Do not disconnect the wires to the digital thermometer display.

3. Remove the (6) screws from the thermostat/wiring box front (Figure 9.16).

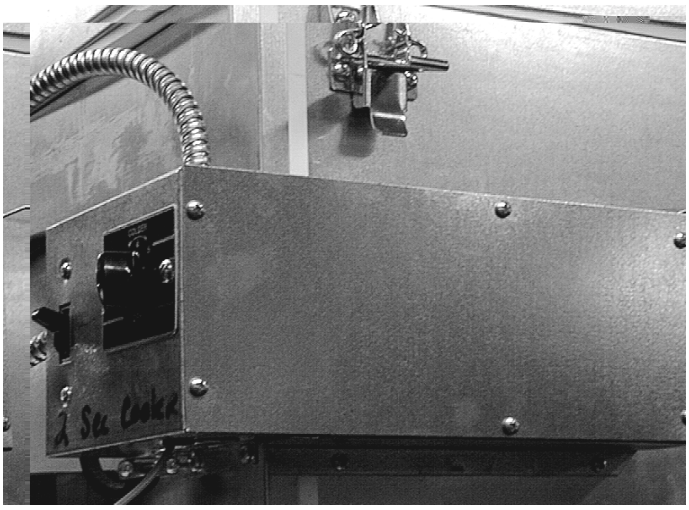


Figure 9.16

4. Remove the (2) mounting screws and the control knob from the face of the control.
5. Remove the lid from the evaporator housing by unlocking the (4) hold-down latches (Figure 9.17).



Figure 9.17

6. Remove the temperature control sensor from the aluminum sleeve by pulling out slowly (Figure 9.18). Remove the sensor from the evaporator housing.

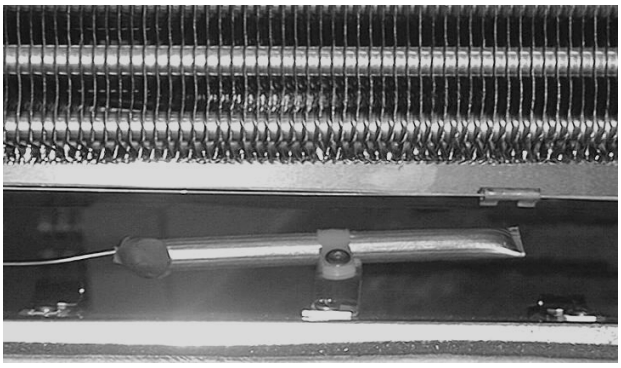


Figure 9.18

7. Replace the temperature control and install sensor.
8. Reset the temperature to setting #4 to #5 on refrigerators and #5 to #6 on freezers.
9. Monitor temperature for final control adjustments.

Evaporator Drain Pan Heater Element

⚠ WARNING
Disconnect the electric power to the freezer before proceeding with the following steps.

1. Remove front louvered hatch cover by lifting up and pulling straight out.

2. Remove the evaporator box cover lid (Figure 9.19).

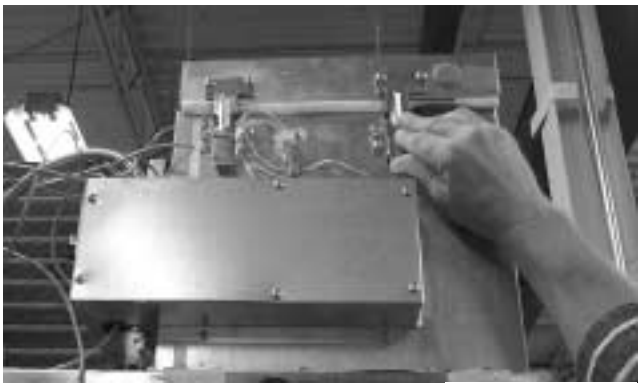


Figure 9.19

3. Remove coil mounting screws and lift coil up slowly, not to detach lines or wiring (Figure 9.20).



Figure 9.20

4. Disconnect the heater wires located in the wiring box (Figure 9.21) for 2 & 3 section cabinets or wiring bundle (Figure 9.22) for 1 section cabinets.



Figure 9.21

Continued next page…



Figure 9.22

5. Replace drain pan heater and reconnect wiring.
6. Reposition evaporator coil and secure with mounting screws.
7. Reposition the evaporator housing cover and lock down latches.
8. Attach front louvered hatch cove, making sure that the thermometer connections are fully engaged.
9. Return to normal use.

Heater Element

Heated Holding Cabinets

1. Turn off the main power to the cabinet.
2. Remove the right side blower panel by removing the (13) screws.

NOTE: Blower motor wiring may be disconnected to allow easier blower panel removal.

3. Disconnect the wiring leads to the element by loosening the nuts with a small wrench.
4. Replace the heater element.
5. Reverse steps 1-3 to re-install the wiring and blower panel.

Digital Thermometer Display and Probe

1. Remove the front louvered hatch cover by lifting straight up and pulling straight out.

2. Unplug the thermometer probe from the back of the digital display module.

3. Carefully pry the display module from the hatch cover back with a flat blade screwdriver or scraping tool (Figure 9.23).



Figure 9.23

4. Disconnect the (2) yellow wires from the probe harness. Remove the probe from the interior ceiling by loosening the mounting bracket screw (Figure 9.24)



Figure 9.24

5. Remove the Permagum sealant from the cabinet top where the probe wire penetrates the top. Carefully pull the probe wire through the cabinet top.

6. Feed the new probe wire through the top hole and reattach the probe and bracket to the interior ceiling.

7. Carefully, pull the wire taught and reseal the cabinet top hole with the Permagum.

8. Peel the paper from the mounting tape on the digital display module.

Continued next page…

9. Carefully align the module with the rectangle cutout in the hatch cover. Press the module firmly into place. (Figure 9.25)

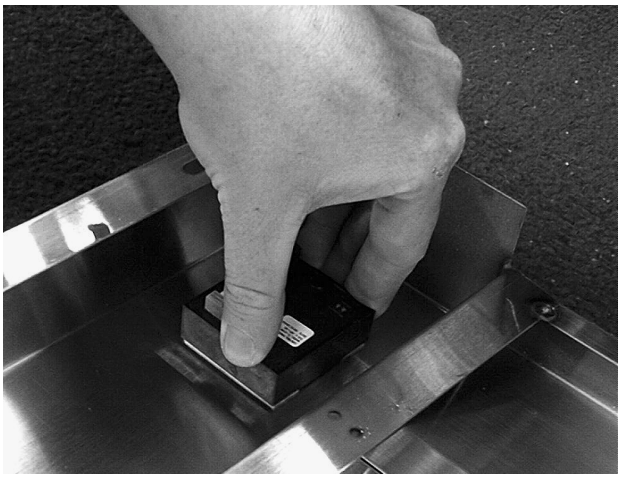


Figure 9.25

10. Plug the probe wire terminal onto the back of the display module, making sure that the plug lines up with the pins on the module (Figure 9.26)



Figure 9.26

11. Reconnect the (2) yellow wires from the transformer with the gray leads on the probe.
12. Reinstall the hatch cover and secure any excess wire with a wire tie.
13. Check operation and return to normal service.

Digital Thermometer Transformer

⚠ WARNING
Disconnect the electric power to the freezer before proceeding with the following steps.

1. Remove the front louvered hatch cover by lifting straight up and pulling straight out.

2. Remove the (6) screws from the wiring box front (Figure 9.27)

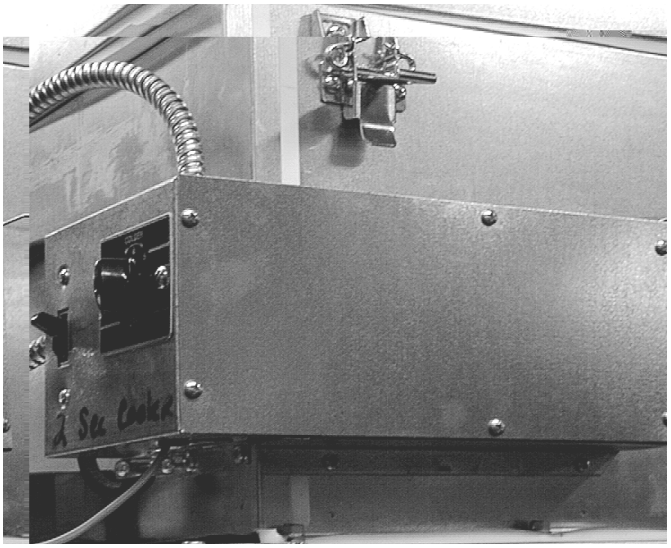


Figure 9.27

3. Disconnect the black and white wires on the transformer from the power and neutral wires in the wiring box. (Figure 9.28).

4. Disconnect the yellow wires on the transformer from the (2) gray wires on the transformer probe (Figure 9.28)

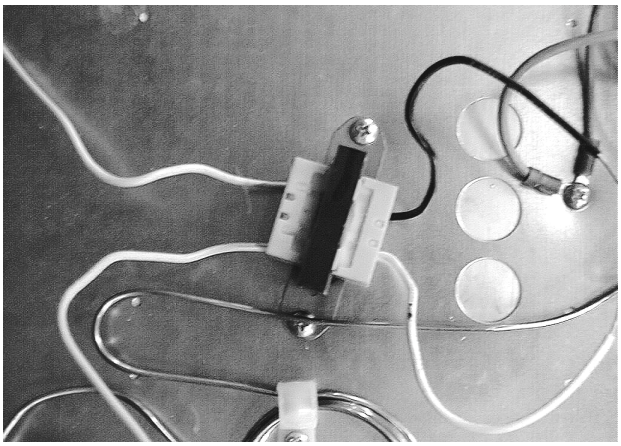


Figure 9.28

5. Remove the transformer from the evaporator housing and replace with the new transformer.
6. Reconnect all wiring.
7. Replace the top louvered hatch cover.
8. Power up the freezer.
9. Return to normal operation.

Door Handle (solid doors)

1. Remove the foot from the door lock assembly (Figure 9.29).



Figure 9.29

2. Pry off gray plug button (located in the rear center of the door) and a small section of the door gasket nearest the lock assembly (Figures 9.30 and 9.31).



Figure 9.30



Figure 9.31

3. Remove out the two mounting screws and remove the door handle (Figure 9.32).



Figure 9.32

4. Reverse steps 1-3 to install the new door handle.

Door Handle (glass doors)

1. Pry or lift off a small section of door gasket behind the door handle, exposing the (2) handle mounting screws (Figure 9.33).



Figure 9.33

2. Remove the two mounting screws to release the handle.
3. Replace door handle.
4. You may need a rubber mallet to re-install gasket.

Door Hinge (solid doors)

1. Remove the door by lifting straight up (Figure 9.34). Carefully set the door aside.



Figure 9.34

2. Pry off the hinge cover with a thin flat blade screwdriver (Figure 9.35).



Figure 9.35

Continued next page…

3. Remove the (3) three hinge mounting screws from each hinge on the cabinet front (Figure 9.36). Replace the hinge and reattach with the screws.



Figure 9.36

4. Remove the (3) three hinged mounting screws from each flange on the door (Figure 9.37) and replace hinge.



Figure 9.37

5. Install the door and check operation

Door Gasket (solid doors)

1. Remove the old gasket by pulling the gasket from the foamed in retainer in the door. (See figure 9.38)



Figure 9.38

2. Starting the upper left corner of the door, place the locking male lip into the retainer of the door.
3. Firmly press into place until the gasket locks.
4. If necessary, gently tap into place with a rubber mallet.

Door Gasket (glass doors)

1. Remove the old gasket by pulling the gasket from the foamed in retainer in the door. (See figure 9.39)



Figure 9.39

2. Starting the upper left corner of the door, place the locking male lip into the retainer of the door.
3. Firmly press into place until the gasket locks.
4. If necessary, gently tap into place with a rubber mallet.

Vinyl Breaker Strips (door jambs)

⚠ WARNING
Disconnect the electric power to the freezer before proceeding with the following steps.

1. Remove the flat vinyl breakers by gently prying off with a flat-blade screwdriver. (Figure 9.40)

⚠ WARNING
Door heater wires lie directly behind the front edge of the flat breaker strips. Take care not to damage the wires.



Figure 9.40

2. Remove the corner blocks as necessary by slipping the male tab from the flat breaker.

3. Replace the breakers by starting each end into the corner blocks and snapping into place.

4. Gently tap the breaker into place if necessary, using a rubber mallet. (Figure 9.41)



Figure 9.41

Anti-Condensate Door Heater Wires

⚠ WARNING
Disconnect the electric power to the freezer before proceeding with the following steps.

1. Remove the vinyl door breakers as described previously.
2. Carefully, pull the heater wire connections from the inside top corner.
3. Clip the connections, making sure to leave enough wire length to reconnect the new heater wire. (Figure 9.42)

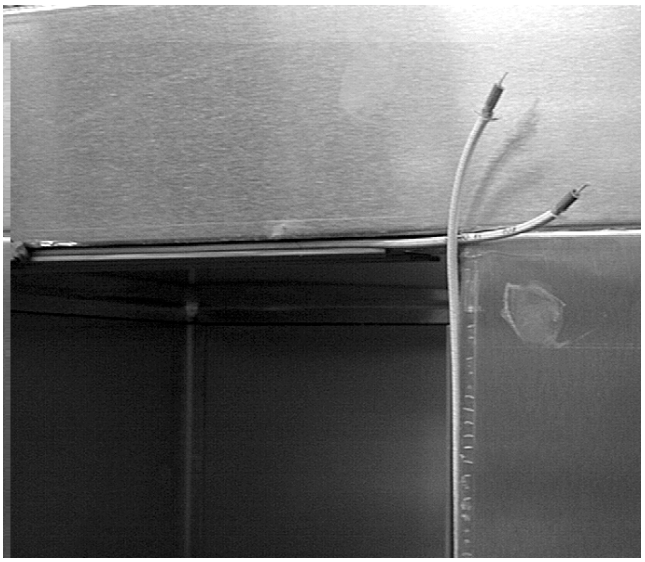


Figure 9.42

4. Remove the old heater wire.
5. Starting at the inside corner, carefully place the new heater wire around the door perimeter, fitting it into the space between the primary breaker retainer and the metal cabinet face.
6. Connect each end of the heater wire to the leads in the corner.
7. Replace the breaker strips as described previously.

Defrost Termination/Fan Delay Switch

⚠ WARNING
Disconnect the electric power to the freezer before proceeding with the following steps.

1. Remove the evaporator-housing lid. (Figure 9.43).



Figure 9.43

2. Locate the 3-wire defrost termination/ fan delay switch, clamped to the suction line. (Figure 9.44)

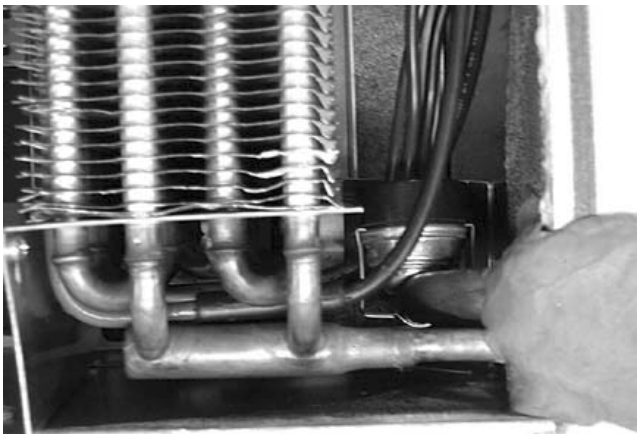


Figure 9.44

Continued next page…

3. Remove the wiring box cover on the front of the evaporator housing on 2 & 3 section cabinets (Figure 9.45). Wiring connections for 1 section cabinets are located inside evaporator housing (Figure 9.46)

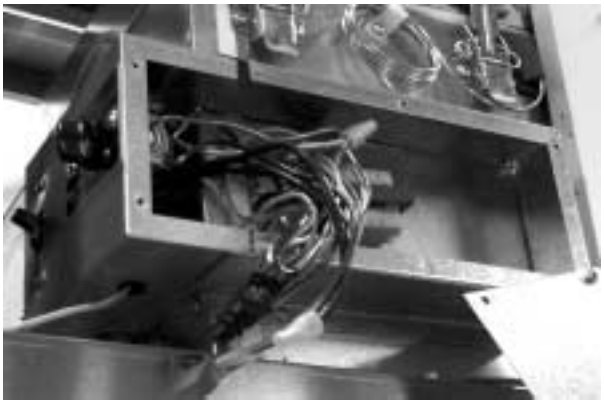


Figure 9.45



Figure 9.46

4. Trace and disconnect the defrost termination / fan delay switch from the wiring bundle. Re-connect the new switch.
5. Attach the new switch to the suction line.
6. Replace the evaporator-housing lid.
7. Connect the power and resume normal operation.

NOTE: The evaporator fan will not restart until the fan delay switch senses 32°F from the suction line.

THIS PAGE INTENTIONALLY LEFT BLANK

We reserve the right to make product improvements at any time.

Specifications and design are subject to change without notice.

MANITOWOC® Koolaire™
81 West Holly St.
Parsons TN. 38363
Phone: (887) 582-5086
Service Fax: (901) 847-5552
Web Site - www.manitowocice.com

©2000 Manitowoc® Koolaire™
Litho in USA