

# Compact Refrigerators & Freezers

## 400 & 4000 Series

### Original Instructions

## Installation, Operation and Maintenance Manual

This manual is updated as new information and models are released. Visit our website for the latest manual.



## Safety Notices

### **⚠ Warning**

Read this manual thoroughly before operating, installing or performing maintenance on the equipment. Failure to follow instructions in this manual can cause property damage, injury or death.

### **⚠ DANGER**

Do not install or operate equipment that has been misused, abused, neglected, damaged, or altered/modified from that of original manufactured specifications.

### **⚠ DANGER**

Keep power cord AWAY from HEATED surfaces. DO NOT immerse power cord or plug in water. DO NOT let power cord hang over edge of table or counter.

### **⚠ DANGER**

All utility connections and fixtures must be maintained in accordance with Local and national codes.

### **⚠ Warning**

Authorized Service Representatives are obligated to follow industry standard safety procedures, including, but not limited to, local/national regulations for disconnection / lock out / tag out procedures for all utilities including electric, gas, water and steam.

### **⚠ Warning**

Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance. Never use flammable oil soaked cloths or combustible cleaning solutions, for cleaning.

### **⚠ Warning**

This product contains chemicals known to the State of California to cause cancer and/or birth defects or other reproductive harm. Operation, installation, and servicing of this product could expose you to airborne particles of glasswool or ceramic fibers, crystalline silica, and/or carbon monoxide. Inhalation of airborne particles of glasswool or ceramic fibers is known to the State of California to cause cancer. Inhalation of carbon monoxide is known to the State of California to cause birth defects or other reproductive harm.

### **⚠ Warning**

Do not use electrical appliances or accessories other than those supplied by the manufacturer.

### **⚠ Warning**

Use caution when handling metal surface edges of all equipment.

### **⚠ Warning**

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision concerning use of the appliance by a person responsible for their safety. Do not allow children to play with this appliance.

### **Notice**

Proper installation, care and maintenance are essential for maximum performance and trouble-free operation of your equipment. Visit our website [www.mtwkitchencare.com](http://www.mtwkitchencare.com) for manual updates, translations, or contact information for service agents in your area.

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# Section 1

## General Information

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### Model Numbers

This manual covers standard units only.

NOTE: For custom units, consult Manitowoc KitchenCare at 1-844-724-CARE..

<b>Work Top Refrigerator Bases With Stainless Steel Top &amp; Backsplash</b>	
402	ST4048

<b>Undercounter Refrigerator Bases With Stainless Steel Top</b>	
406	UC4048

<b>Undercounter Refrigerator With Subtop And 3.75" Casters</b>	
406-CA	

<b>Work Top Freezer Bases With Stainless Steel Top &amp; Backsplash</b>	
403	ST4148

<b>Undercounter Freezer Bases With Stainless Steel Top</b>	
407	UC4148

<b>Undercounter Freezer With Subtop And 3.75" Casters</b>	
407-CA	

### Serial Number Location

The serial number on 400 series compact refrigerators and freezers is printed on the right side of the interior back wall.

The serial tag on 4000 series compact refrigerators and freezers is located either on the left upper sidewall inside the cabinet or under the top nosing directly above the door when the door is in the closed position (right hand door when there are two doors).

**Always have the serial number of your unit available when calling for parts or service.**

### Warranty Information

Visit

[http://www.delfield.com/minisite/service/warranty\\_info](http://www.delfield.com/minisite/service/warranty_info) to:

- Register your product for warranty.
- Verify warranty information.
- View and download a copy of your warranty.

### Regulatory Certifications

Models are certified by:

- National Sanitation Foundation (NSF)
- Underwriters Laboratories (UL)
- Underwriters Laboratories of Canada (ULC)

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## Section 2 Installation

### **⚠ DANGER**

Installation must comply with all applicable fire and health codes in your jurisdiction.

### **⚠ DANGER**

Use appropriate safety equipment during installation and servicing

### **⚠ Warning**

Remove all removable panels before lifting and installing.

### **⚠ Warning**

Do not damage the refrigeration circuit when installing, maintaining or servicing the unit.

### Location

#### **⚠ Warning**

This equipment must be positioned so that the plug is accessible unless other means for disconnection from the power supply (e.g., circuit breaker or disconnect switch) is provided.

#### **⚠ Warning**

Adequate means must be provided to limit the movement of this appliance without depending on or transmitting stress to the electrical conduit or gas lines.

#### **⚠ Warning**

To avoid instability the installation area must be capable of supporting the combined weight of the equipment and product. Additionally the equipment must be level side to side and front to back.

#### **⚠ Warning**

This equipment is intended for indoor use only. Do not install or operate this equipment in outdoor areas.

#### **⚠ Caution**

Do not position the air intake vent near steam or heat exhaust of another appliance.

The location selected for the equipment must meet the following criteria. If any of these criteria are not met, select another location.

- Units are intended for indoor use only.
- The location **MUST** be level, stable and capable of supporting the weight of the equipment.
- The location **MUST** be free from and clear of combustible materials.
- Equipment **MUST** be level both front to back and side to side.
- Position the equipment so it will not tip or slide.
- Front casters **MUST** be locked once positioned.
- Recommended air temperature is 41° - 86°F (5° - 30°C).
- Proper air supply for ventilation is **REQUIRED AND CRITICAL** for safe and efficient operation. Refer to Clearance Requirements chart on page 8.
- Do not obstruct the flow of ventilation air. Make sure the air vents of the equipment are not blocked.

- Do not install the equipment directly over a drain. Steam rising up out of the drain will adversely affect operation, air circulation, and damage electrical / electronic components.

**Weight of Equipment**

Model	Weight
402	176lbs (80kg)
403	184lbs (83kg)
406	176lbs (80kg)
406-CA	168lbs (76kg)
407	176lbs (80kg)
407-CA	168lbs (76kg)
ST4048	234lbs (106kg)
ST4148	242lbs (110kg)
UC4048	236lbs (107kg)
UC4148	236lbs (107kg)

**Clearance Requirements**

**⚠ DANGER**

Minimum clearance requirements are the same for noncombustible locations as for combustible locations. The flooring under the appliance must be made of a noncombustible material.

**⚠ DANGER**

Risk of fire/shock. All minimum clearances must be maintained. Do not obstruct vents or openings.

Back	Top / Sides
3.00" (76mm)	1.00" (25mm)

**Dimensions**

Model	Length	Depth	Height
402	27" (69cm)	28.5" (72cm)	39.5" (100cm)
403	27" (69cm)	28.5" (72cm)	39.5" (100cm)
406	27" (69cm)	28.5" (72cm)	35.5" (90cm)
406-CA	27" (69cm)	27.75" (70cm)	33.25" (84cm)
407	27" (69cm)	28.5" (72cm)	35.5" (90cm)
407-CA	27" (69cm)	27.75" (70cm)	33.25" (84cm)
ST4048	48" (122cm)	28.5" (72cm)	39.5" (100cm)
ST4148	48" (122cm)	28.5" (72cm)	39.5" (100cm)
UC4048	48" (122cm)	28.5" (72cm)	35.5" (90cm)
UC4148	48" (122cm)	28.5" (72cm)	35.5" (90cm)

Model	Volume	Shelf Space
402 403 406 406-CA 407 407-CA	5.7Ft <sup>3</sup> (161L)	4.6Ft <sup>2</sup> (43dm <sup>2</sup> )
ST4048 ST4148 UC4048 UC4148	10.80Ft <sup>3</sup> (306L)	8.0Ft <sup>2</sup> (74dm <sup>2</sup> )

**Electrical Service**

**⚠ DANGER**

Check all wiring connections, including factory terminals, before operation. Connections can become loose during shipment and installation.

**⚠ DANGER**

Units with two power cords must be plugged into individual branch circuits. During movement, cleaning or repair it is necessary to unplug both power cords.

**⚠ Warning**

This appliance must be grounded and all field wiring must conform to all applicable local and national codes. Refer to rating plate for proper voltage. It is the responsibility of the end user to provide the disconnect means to satisfy the authority having jurisdiction.

**VOLTAGE**

All electrical work, including wire routing and grounding, must conform to local, state and national electrical codes.

The following precautions must be observed:

- The equipment must be grounded.
- A separate fuse/circuit breaker must be provided for each unit.
- A qualified electrician must determine proper wire size dependent upon location, materials used and length of run (minimum circuit ampacity can be used to help select the wire size).
- The maximum allowable voltage variation is  $\pm 10\%$  of the rated voltage at equipment start-up (when the electrical load is highest).
- Check all green ground screws, cables and wire connections to verify they are tight before start-up.

**RATED AMPERAGES, HORSEPOWER, VOLTAGE & POWER CORD CHART**

Units with plugs are supplied with approximately 6ft (183cm) cords.

Models 406 and 407 may be stacked using a stacking collar. In this case two 6ft (183cm) long grounded supply cords and plugs are standard.

Model	Amps	HP	Voltage, Cycle, Phase	NEMA Plug
402	4.0	1/5	115/60/1	5-15P
403	5.8			
406	4.0			
406-CA	4.0			
407	5.8			
407-CA	5.8			
ST4048	4.0			
ST4148	5.6	1/3		
UC4048	4.0	1/5		
UC4148	5.6	1/3		

**Drain Connections**

**⚠ Warning**

If a refrigerated base does not have a condensate evaporator supplied, you must connect the condensate line to a suitable drain. Otherwise, water will collect on the floor, causing a potentially hazardous situation.

**⚠ Warning**

Moisture collecting from improper drainage can create a slippery surface on the floor and a hazard to employees. It is the owner's responsibility to provide a container or outlet for drainage.

**Heat of Rejection**

Model	BUT/Hour
402	1430
403	1092
406	1430
406-CA	1430
407	1092
407-CA	1092
ST4048	1430
ST4148	1404
UC4048	1430
UC4148	1404

## Caster Or Leg Installation

### **⚠ DANGER**

Legs or casters must be installed and the legs or casters must be screwed in completely to prevent bending. When casters are installed the mass of this unit will allow it to move uncontrolled on an inclined surface. These units must be tethered/secured to comply with all applicable codes.

### **⚠ Warning**

The unit must be installed in a stable condition with the front wheels locked. Locking the front casters after installation is the owner's and operator's responsibility.

### **⚠ Warning**

Use a jack to lift the refrigeration unit off the ground just far enough to remove the leg/caster. Place blocking underneath the unit. Do not work underneath a raised unit without proper blocking. Do not lift the unit more than necessary to remove the leg/caster. Lifting the unit too far can make the unit unstable.

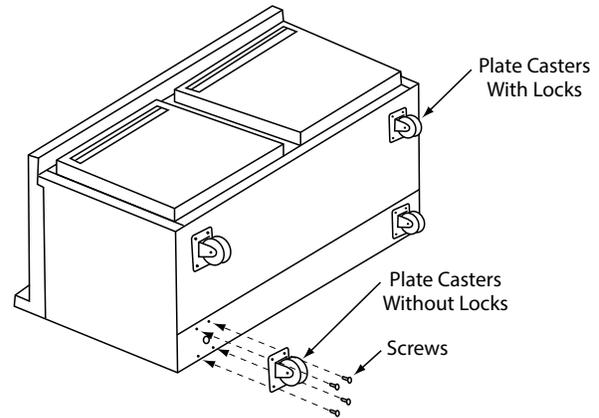
### **⚠ Caution**

All single-section units require that the swivel casters be mounted on the front and rigid casters be mounted on the rear.

1. Carefully place the unit on its back.
2. Located at each caster mounting location are 4 Phillips head screws, for a total of 16 screws. Remove them.
3. Place a locking plate caster or leg over one of the front holes, matching the 4 mounting holes to the pre-drilled holes in the underside of the unit. Insert 4 Phillips head screws and tighten. Repeat with the other locking front caster or leg.
4. Repeat step 3 with the non-locking casters or legs in the rear of the unit.
5. Carefully lift the unit upright.

### **⚠ Caution**

After installing casters, the unit must stand upright for twenty-four (24) hours before being powered up to assure oil return to the compressor sump.

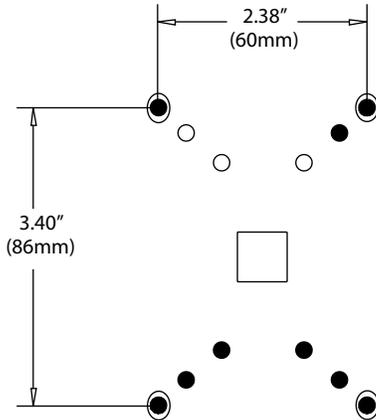


### **LEG LEVELING**

All four legs are adjustable. Adjust each leg until the unit is stable and level left to right. If necessary adjusting the front legs slightly higher than the rear by about 1/8" (3mm) will help the door remain closed.

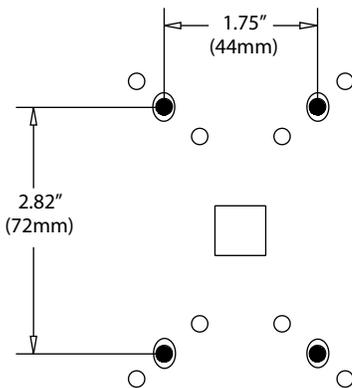
**CASTER AND LEG MOUNTING DETAIL**

A universal bolt hole pattern is provided on the bottom of the cabinet. It will accommodate any leg or caster. Simply line up the plate holes with the corresponding cabinet holes.



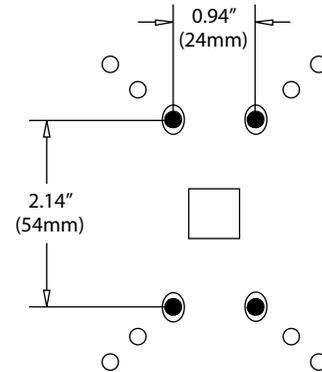
NOTE: If hole pattern on caster/leg matches the one above mount in outer set of holes.

- 6" Leg - 3234569



NOTE: If hole pattern on caster/leg matches the one above mount in middle set of holes.

- 3" Caster - 3234024
- 5" Caster - 3234161
- 6" Leg - 3234791



NOTE: If hole pattern on caster/leg matches the one above mount in inner set of holes.

- 2" Caster - 3234148

**Loosen Freezer Compressor Bolts**

Semi hermetic models should be loosened before operating. Loosen (but do not remove) the bolts on the compressor. If not done the freezer may vibrate excessively when the compressor is running,

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## Section 3 Operation

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### **DANGER**

The on-site supervisor is responsible for ensuring that operators are made aware of the inherent dangers of operating this equipment.

### **DANGER**

Do not operate any appliance with a damaged cord or plug. All repairs must be performed by a qualified service company.

### **DANGER**

Never stand on the unit! They are not designed to hold the weight of an adult, and may collapse or tip if misused in this manner.

### **Warning**

Do not contact moving parts.

### **Warning**

All covers and access panels must be in place and properly secured, before operating this equipment.

### **Warning**

Do not use electrical appliances inside the food storage compartment of this appliance.

### **Warning**

The operator of this equipment is solely responsible for ensuring safe holding temperature levels for all food items. Failure to do so could result in unsafe food products for customers.

### **Warning**

Overloading shelves can damage equipment or cause bodily injury.

### **Warning**

Damp or wet hands may stick to cold surfaces.

### **Caution**

Do not block the supply and return air grills or the air space around the air grills. Keep plastic wrappings, paper, labels, etc. from being airborne and lodging in the grills. Failure to keep the air grills clear will result in unsatisfactory operation of the system.

### **Caution**

Do not throw items into the storage area. Failure to heed this recommendation could result in damage to the interior of the cabinet or to the blower coil.

## Controls/Programming/Settings

### REFRIGERATORS

After the unit is connected to power it will automatically begin operating. With the doors closed, the temperature of the cabinet should reach 36°F to 40°F (2°C to 4°C) on refrigerators in about one hour.

A thermostat located in the evaporator housing on interior rear of the unit, controls the temperature in the box. The factory setting for the control is 4 and maintains about 38°F (3°C) in the box. Set toward 1 for higher temperatures and toward 7 for lower temperatures.

Refrigerators defrost automatically with every cycle of the compressor. The water generated is routed to a pan on the rear of the unit and is evaporated by the heat given off by the compressor.

**During normal operation the evaporator fan may cycle and/or pulse independently of the compressor. Consult the service manual or contact Technical Support at 1-844-724-CARE if you are unsure of the proper function.**

### FREEZERS

After the unit is connected to power it will automatically begin operating. With the doors closed, the temperature of the cabinet should reach 0°F (-18°C) on freezers in about one hour. The electronic temperature control constantly monitors box temperature as well as evaporator coil temperature to maintain consistent product temperatures. As an added energy-saving feature, the electronic controller will switch the evaporator fan motor on and off with the compressor and condenser fan motor.

At initial start-up or anytime power is disconnected, then reconnected to the unit, the control will delay all operations for a short time (up to 10 minutes.) While in this delay period, the control initializes the control parameters and confirms that the temperature sensors and circuits are operational.

**During normal operation the evaporator fan may cycle and/or pulse independently of the compressor. Consult the service manual or contact Technical Support at 1-844-724-CARE if you are unsure of the proper function.**

#### Important Note

After initializing, the control will immediately enter a DEFROST mode. The compressor and condenser fan as well as the evaporator fan will remain off until initial defrost is complete. This initial defrost cycle may take up to 15 minutes to complete, at which time the freezing cycle will begin.

Whenever the freezer is plugged in, and the control has completed initializing including the initial defrost cycle (see above), the electronic temperature control will cycle the compressor, evaporator fan motor, and condenser fan motor to maintain box temperature at the control setting.

#### Freezer Automatic Defrost

The control also monitors compressor total running time and will enter a defrost cycle after total compressor running time is greater than five hours since the last defrost cycle OR if evaporator coil temperature drops below -34°F (-37°C) (indicating excessive frost on the coil).

#### Freezer Manual Defrost

If a manual defrost is desired, simply unplug the unit for several seconds, then plug unit back in. This will cause the control to re-initialize and then enter a defrost cycle.

When the control enters the defrost mode, whether manual or automatic, it switches off the evaporator fan motor, compressor and condenser fan motor, and switches on the defrost heater to warm the evaporator coil and melt all frost accumulated during the previous refrigeration cycle. The control will continue the defrost cycle for a MINIMUM of eight minutes and a MAXIMUM of 30 minutes depending

on the amount of frost accumulated on the evaporator coil. After the defrost cycle is complete, the control returns to a normal refrigeration cycle, however the evaporator fan motor will not switch on for two minutes AFTER the compressor and condenser fan motor have begun operating.

**Electronic Temperature Control Location & Adjustment**

**Never turn the knob more than one dial number and always allow eight hours for temperature stabilization before making any additional adjustments.** The control is located in the control box at the rear of the unit. It is factory set at mid-range to maintain about -3°F (-18°C) box temperature. To adjust for colder temperatures, turn the knob clockwise. For warmer temperatures, turn the knob counter-clockwise. Turn the knob fully counter-clockwise to turn the refrigeration system off.

**EVAPORATOR FAN OPERATION**

	Cooling Cycle				Defrost Cycle	
	Compressor On		Compressor Off		Compressor Off	
	Evap Fan On	Evap Fan Off	Evap Fan On	Evap Fan Off	Evap Fan On	Evap Fan Off
<b>Refrigerator</b>	X		X		X	
<b>Freezer</b>	X			X		X

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## Section 4 Maintenance

### ⚠ DANGER

It is the responsibility of the equipment owner to perform a Personal Protective Equipment Hazard Assessment to ensure adequate protection during maintenance procedures.

### ⚠ DANGER

Failure to disconnect the power at the main power supply disconnect could result in serious injury or death. The power switch DOES NOT disconnect all incoming power.

### ⚠ DANGER

Disconnect electric power at the main power disconnect for all equipment being serviced. Observe correct polarity of incoming line voltage. Incorrect polarity can lead to erratic operation.

### ⚠ Warning)

Never use sharp objects or tools to remove ice or frost. Do not use mechanical devices or other means to accelerate the defrosting process.

### Cleaning and Sanitizing Procedures

#### ⚠ Caution

Maintenance and servicing work other than cleaning as described in this manual must be done by an authorized service personnel.

#### GENERAL

#### ⚠ Warning

When using cleaning fluids or chemicals, rubber gloves and eye protection (and/or face shield) must be worn.

You are responsible for maintaining the equipment in accordance with the instructions in this manual. Maintenance procedures are not covered by the warranty.

Maintenance	Daily	Weekly	Monthly	After Prolonged Shutdown	At Start-Up
Interior	X			X	X
Gasket	X		X	X	X
Exterior	X			X	X
Drain		X		X	X
Condenser Coil			X	X	X
Casters			X	X	X

**INTERIOR CLEANING****Notice**

When cleaning interior and exterior of unit, care should be taken to avoid the front power switch and the rear power cord. Keep water and/or cleaning solutions away from these parts.

**Notice**

Never use a high-pressure water jet for cleaning or hose down or flood interior or exterior of units with water. Do not use power cleaning equipment, steel wool, scrapers or wire brushes on stainless steel or painted surfaces.

The interior can be cleaned using soap and warm water. If this isn't sufficient, try ammonia and water or a nonabrasive liquid cleaner.

**EXTERIOR CLEANING****Notice**

Never use an acid based cleaning solution on exterior panels! Many food products have an acidic content, which can deteriorate the finish. Be sure to clean the stainless steel surfaces of ALL food products.

Clean the area around the unit as often as necessary to maintain cleanliness and efficient operation.

Wipe gasket and surfaces with a damp cloth rinsed in water to remove dust and dirt from the outside of the unit. Always rub with the "grain" of the stainless steel to avoid marring the finish. If a greasy residue persists, use a damp cloth rinsed in a mild dish soap and water solution. Wipe dry with a clean, soft cloth.

Never use steel wool or abrasive pads for cleaning. Never use chlorinated, citrus based or abrasive cleaners.

Stainless steel exterior panels have a clear coating that is stain resistant and easy to clean. Products containing abrasives will damage the coating and scratch the panels. Daily cleaning may be followed by an application of stainless steel cleaner which will eliminate water spotting and fingerprints. Early signs of stainless steel breakdown are small pits and cracks. If this has begun, clean thoroughly and start to apply stainless steel cleaners in attempt to restore the steel.

## DRAIN

Each unit has a drain located inside the unit that removes the condensation from the evaporator coil and routes it to an external condensate evaporator pan. Each drain can become loose or disconnected during normal use. If you notice water accumulation on the inside of the unit, be sure the drain tube is connected to the evaporator drain pan. If water is collecting underneath the unit, make sure the end of the drain tube is in the condensate evaporator. The leveling of the unit is important as the units are designed to drain properly when level. Be sure all drain lines are free of obstructions.

## CLEANING THE CONDENSER COIL

In order to maintain proper refrigeration performance, the condenser fins must be cleaned of dust, dirt and grease regularly. It is recommended that this be done monthly. If conditions are such that the condenser is totally blocked in a month, the frequency of cleaning should be increased. Clean the condenser with a vacuum cleaner or stiff brush. If extremely dirty, a commercially available condenser cleaner may be required.

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

## CASTERS

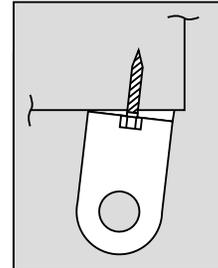
Wipe casters with a damp cloth monthly to prevent corrosion.

## DOORS/HINGES

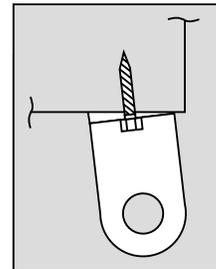
Over time and with heavy-use doors, the hinges may become loose. If this happens, tighten the screws that mount the hinge brackets to the frame of the unit. Loose or sagging doors can cause the hinges to pull out of the frame, which may damage both the doors and the hinges. In some cases this may require qualified service agents or maintenance personnel to perform repairs.

### Door Adjustment

If the door needs lowering at the handle, use a 5/16" (8mm) wrench to loosen the hinge screws and install a spacer outside of the hinge. Tighten the screws.



If the door needs to be higher at the handle, use a 5/16" (8mm) wrench to loosen the hinge screws and install a spacer inside of the hinge. Tighten the screws.



## PREVENTING BLOWER COIL CORROSION

To help prevent corrosion of the blower coil, store all acidic items, such as pickles and tomatoes, in seal-able containers. Immediately wipe up all spills.

## FIELD INSTALLATION

Over shelves and other items mounted to the top of the counters should never be installed in the field due to the potential damage to the refrigeration system.

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## Section 5 Troubleshooting

### Problem -> Cause -> Correction Chart

Problem	Cause	Correction
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).
Refrigerator is freezing product	Thermostat is set too low.	Set thermostat to higher temperature.
	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.
Compressor will not start	Low voltage to cabinet.	Check and correct incoming voltage to cabinet.

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DELFIELD  
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