

INSTALLATION

AND OPERATING INSTRUCTIONS



Display Freezers



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GENERAL INFORMATION

Introduction

The information contained in this manual pertains to the following Maximizer display freezer: RMZC30XL. This case is used for merchandising frozen food or ice cream. The RMZC30XL has 30-inch wide doors and utilizes the revolutionary new S-coil. Zero Zone, Inc. has made every effort to produce refrigeration equipment of the highest quality using state-of-the-art components.

This display freezer was designed to operate in an air-conditioned store where the temperature is maintained at 75°F or lower and the relative humidity is 55% or lower.

Inspection

This display freezer was carefully factory tested, inspected and properly packaged to ensure delivery in the best possible condition. The equipment should be uncrated and checked for damage immediately upon delivery.

ALL CLAIMS REGARDING SHIPPING DAMAGES MUST BE FILED WITH THE CARRIER/TRANSPORT COMPANY. DO NOT FILE CLAIMS WITH ZERO ZONE, INC.

(The carrier/transport company will supply the necessary report and claim forms.

Location

This freezer must not be installed where it will be exposed to direct sunlight or near a source of radiant heat.

Be certain that the floor under the installation is of sufficient strength to support a fully loaded case. Out

of level conditions will result in reduced performance, and will make the installation more difficult.

When located next to a wall, or backed up to another case line-up, the cases should be positioned to allow a minimum (4) inch space behind the back of a unit. This will allow necessary air to circulate behind the unit.

INSTALLATION

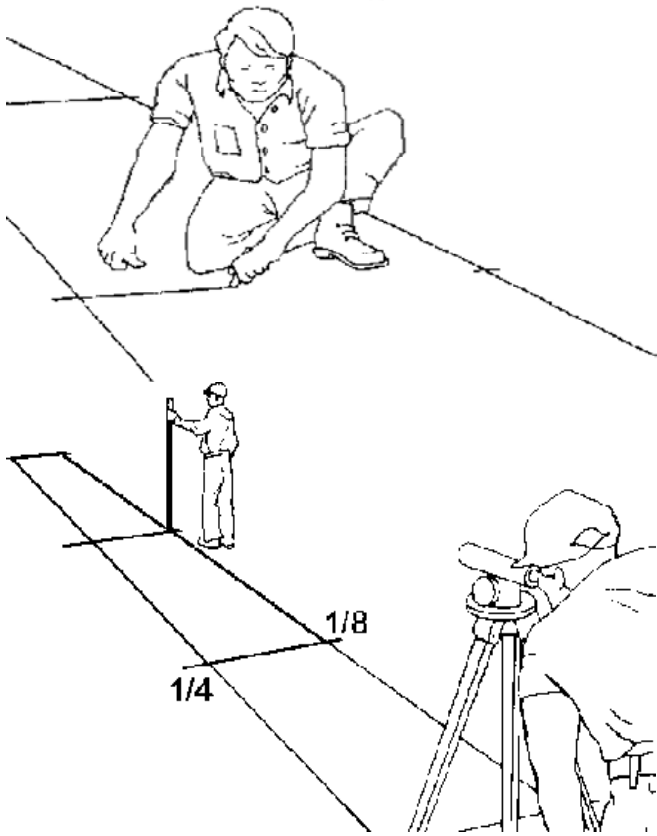
DISCLAIMER,

Installation of the case; including proper footings & stable support, leveling, drain plumbing, refrigeration and electrical tie-ins, application of local building codes, etc. are in whole the responsibility of the store and the contractor/s performing these jobs. Zero Zone, Inc. will not accept responsibility for improper installations.

Leveling

Refrigeration equipment must be installed level and plumb to allow efficient operation of the refrigeration coils and complete drainage of defrost condensate (water). Since a level area is seldom available, the following steps are recommended to insure a level installation.

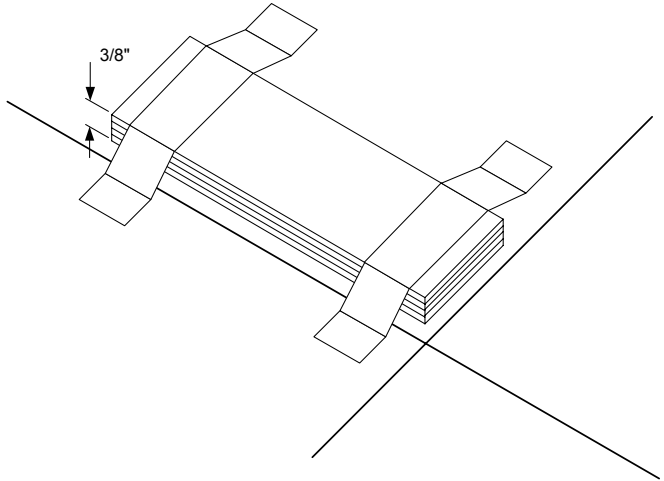
1. Carefully, measure off and mark on floor with the dimensions of the case line-up. (Check blueprints –See Figure 1A)
2. Snap a chalk line at the locations for the front and back positions of the base rails.



**FIGURE 1A
MARKING AND LAYOUT**

3. Mark locations of all joints (front and back).
4. Using a transit or laser, find the highest point along both base rail position lines. Using the high point as a reference, mark the difference directly on the floor to each joint (front and back).
5. If a transit or laser is not available, a water level can be used to mark reference elevation points. *Water levels can be purchased from a contractor supply house or hardware store for a minimal cost.*
6. A string level can also be used to mark elevation points. The string level should only be used on short line-ups to avoid problems with string sag.

7. Place the required number of shims (supplied) at each joint (front and back) to equal the highest point. Tape all shims in place (See Figure 1B).



**FIGURE 1B
LEVELING AND SHIMMING**

8. Be sure to place shims under all the bases where required. Do not leave a base unsupported.
9. Using a spirit (bubble) or laser level check the installation as you go. The case should be level from front to back and side to side. Install the case at the highest point first, if part of a line-up.

Joining Freezers

This reach-in freezer has been engineered for continuous line-up. This means that any number of cases can be joined together to create the desired length. Reach-In freezers are built on permanent steel skids to promote easy installation. The cases can be moved by using case jacks, with a fork truck (Telehandler) or with Johnson Bars.

To install Reach-Ins, perform the following steps:

1. Set the first Reach-In into the desired position and level it. Run two (2) 3/8 inch diameter beads of Butyl caulk 1/2 inch in from both the inner and outer surfaces of the case end. (See Figure 2A)

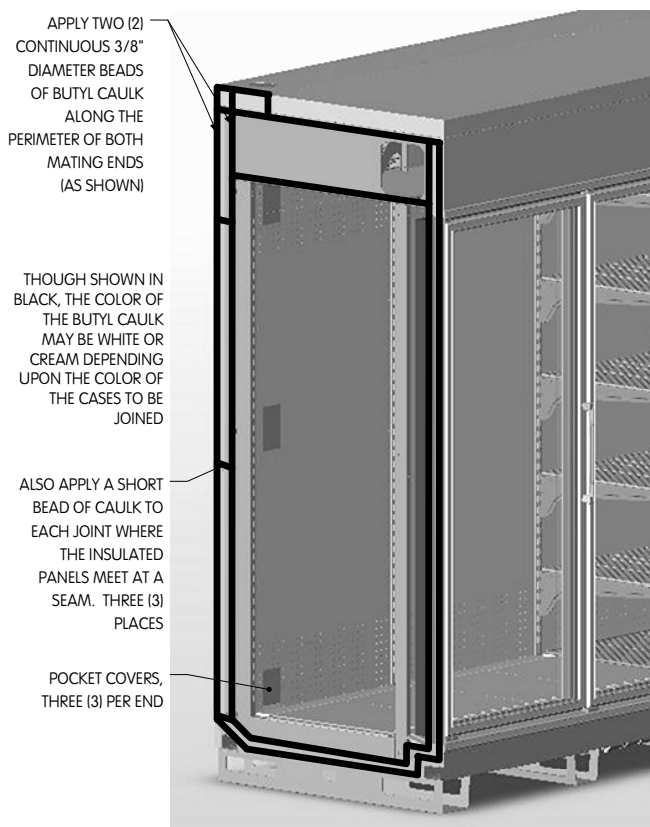


FIGURE 2A
CAULKING THE CASES

2. Push the second Reach-In against the end of the first. Level the second Reach-In. Remove the left and right end floor covers and the rectangular pocket hole covers, accessing the holes in the end panels of each freezer as shown (Figure 2A). Install tee strips between the doorframes at case joints (See Figure 2B) Use the special screws and nuts provided.

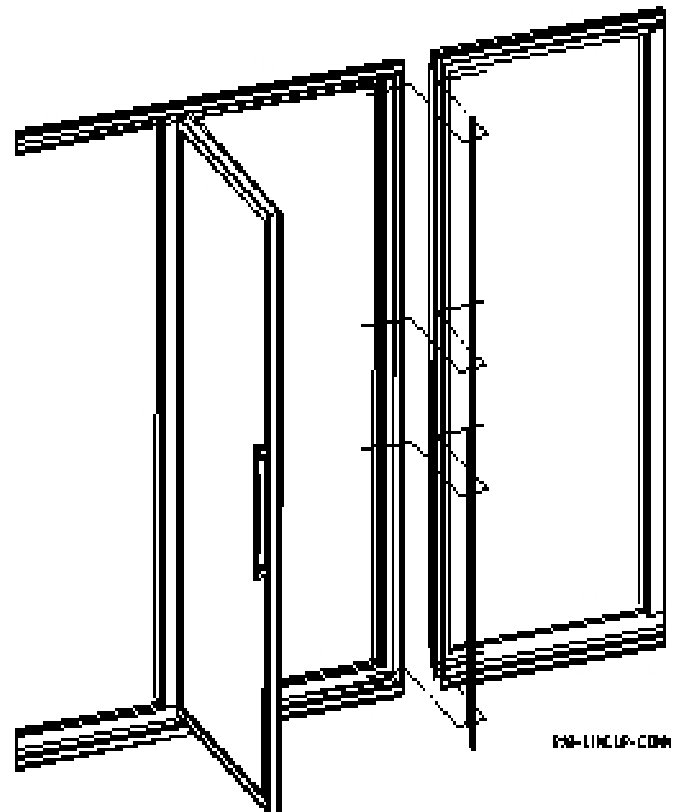


FIGURE 2B
INSTALLING TEE STRIPS

3. Start the joining bolts, but do not tighten them. Begin tightening the bolts at the top rear, working down the back of the case and up the front making sure that the front faces of the cases are flush (See Figure 2C). Pay attention to the alignment of the doorframes.

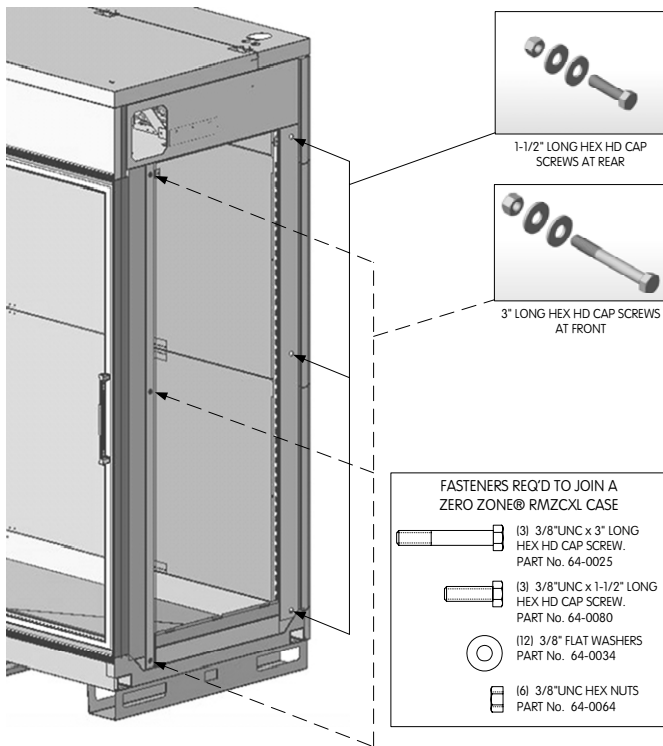


FIGURE 2C
INSTALLING JOINING BOLTS

- Each case joint at the top requires a 1-1/2 inch wide roof gasket to merge the seam between the two (2) cases. Installation of this gasket is very important. Place the gasket back to where the hinge panel begins and run it all the way forward to the edge of the front panel. Cut it flush with the front panel. (See Figure 2D)

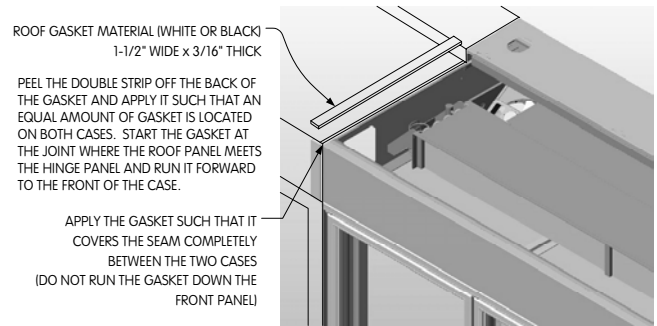


FIGURE 2D
INSTALLING ROOF GASKET

Drain Line

The drain is located at the center of the freezer in the floor pan. The drain can be reached by removing the center floor covers. The 1 inch PVC drain outlet is located at the center front of the freezer behind the kick plate. Figure 3A shows this location (the case is tilted backward to clearly illustrate).

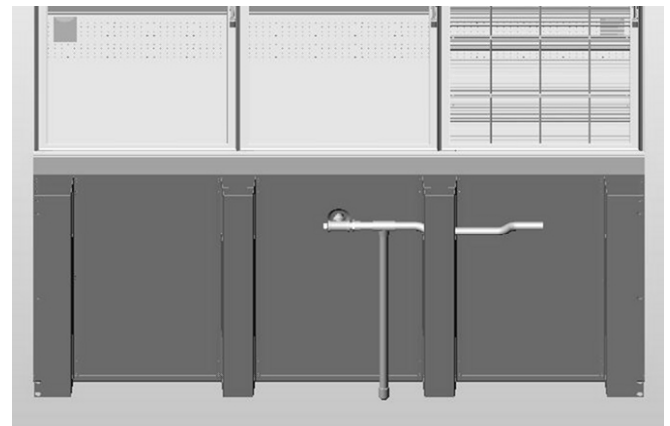
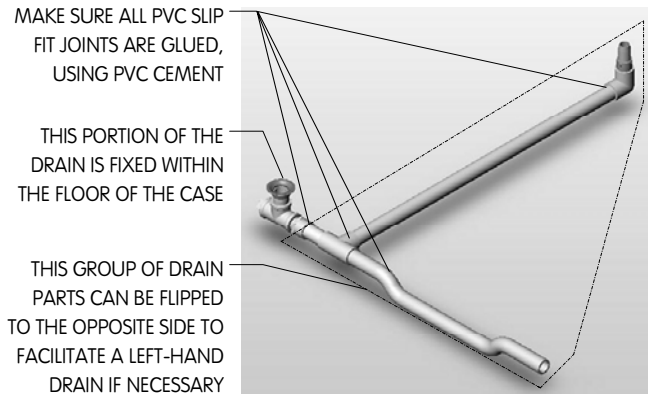


FIGURE 3A
DRAIN LOCATION

Install a tee to the outlet pipe. Next, connect the line that returns to the rear of the case to connect the defrost drain line. Then connect PVC drain trap to the tee. The drain line must be pitched a minimum of (1) inch per lineal foot. Connect the flexible defrost drain line to the barbed end of the lower drain assembly. Using the hose clamp, secure the flexible tubing to the barbed fitting. The tee, drain trap, and plug are

supplied standard with the case. The drain assembly is supplied such that it can be routed to either the right or left of the case. Dry fit all your drain parts first to ensure they are located properly. (See Figure 3B) DO NOT FORGET TO GLUE THE SLIP FIT PVC PARTS TOGETHER USING PVC CEMENT.



**FIGURE 3B
DRAIN ASSEMBLY**

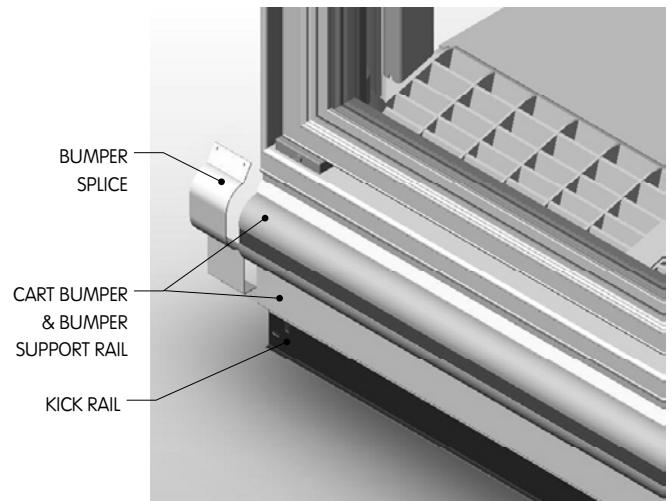
Cart Bumper

The cart bumper should be installed at the bottom front of the case. (See Figure 4A) The assembly is adjustable to compensate for uneven floors.

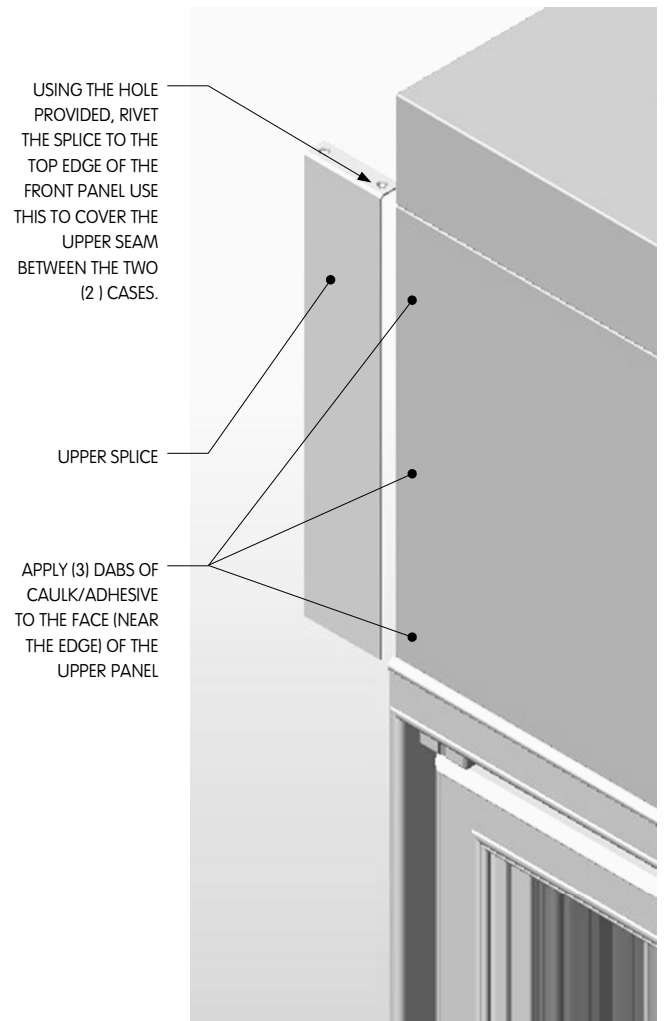
Center and hook the bumper assembly on the hangers provided.

In continuous line-ups, place a kick plate joint strip at each joint. On case ends, lineup an end kick plate with the front mounting holes. Fasten the rear of the end kick plate to the case using TEK screws.

A bumper and top splice joint strip can be installed over the bumper and the seam between the cases. (See Figures 4 A and 4B for details)



**FIGURE 4A
BUMPER JOINING STRIP**



**FIGURE 4B
UPPER JOINING STRIP**

REFRIGERATION

General

Unless otherwise specified, the liquid and suction line connections are made on the outside of the case at the top/rear of the case. If the case is an electric defrost, the connections will be on the left end of the case. If the case is hot gas defrost, the connections will be on the right end of the case.

Alternate locations are available depending on how the case was ordered from the factory. After all the connections have been made, all refrigeration egress holes (through the case) must be sealed completely. The holes should be filled using expanding urethane foam (i.e. Great Stuff®); and then covered with a layer of Perma-gum Strip Caulk to prevent moisture infiltration.

Refrigerant Piping

Correct refrigeration line sizing and installation is essential for proper system operation. ~~The following tables (Table 1) list R502, R404A, R507, and R-22 line sizes for different combinations of frozen food and ice cream freezers.~~ This information is also available by contacting Zero Zone, Inc. A P-trap must be installed at the bottom of all vertical suction risers.

When two or more freezer sections are connected to one compressor, the main liquid and suction line for the group should be run through the freezers and brought out through the refrigeration outlet of one freezer only. Standard installation procedures recommend one riser per circuit, per system, for hot gas defrost setup. This is available as a factory installed option. A piping chase allows the refrigerant lines to be run case to case out of the upper left or right of the end frames.

The compressor should be installed as close as possible to the freezers to reduce pressure drop. If the compressor is located above the freezer, check the refrigerant line size tables (Table 1) of this manual to determine the riser line size. Or contact Zero Zone, Inc. directly for correct sizing information. Install a trap at the bottom of the riser. Use a flexible connection (vibration eliminator) between the suction line and compressor.

The suction and liquid lines may be joined together to form an external heat exchanger. Insulate the refrigerant tubing for at least 20 feet from the freezer outlet.

The best location for the liquid line drier is inside the freezing compartment. However, it may be installed near the compressor for easy maintenance. Install a moisture indicating sight glass at the outlet end of the drier.

Temperature Control

A low pressure or temperature control can be used to control freezer temperature. The control should be selected with adequate contact capacity for the switching load. In rack systems, an evaporator pressure-regulating valve may be used to control the evaporating temperature.

CONDENSING UNIT PRESSURE SETTINGS					
	FROZEN FOOD				
	PRESSURE (psig)				RETURN AIR TEMPERATURE (°F)
	R-22	R502	R404A	R507	
CUT IN	21	23	30	31	-2
CUT OUT	11	16	18	18	-8
	ICE CREAM				
	PRESSURE (psig)				RETURN AIR TEMPERATURE (°F)
	R-22	R502	R404A	R507	
CUT IN	15	21	22	23	-10
CUT OUT	6	11	12	13	-16

FIGURE 5A
TEMPERATURE CONTROL

RACK EPR SETTINGS (SATURATED COIL TEMPERATURE)		
MODEL NUMBER	FROZEN FOOD	ICE CREAM
RMZC30XL	-15° F	-23° F

FIGURE 5B
RACK EPR SETTINGS

The settings (See Figures 5A and 5B) are approximate due to variations in gauge accuracy, differences in compressor efficiency, line pressure drop and super heat settings. Before making adjustments for store or stocking conditions, **NOTE: (make sure the superheat is set between 6° F and 10° F).**

Temperature Control Adjustment

When factory installed, the temperature control is located toward the top right end of the freezer inside the freezer compartment and in front of the honeycomb (discharge air) case (in front of the coil).

The sensing bulb/probe is located under the coil cover inside the cabinet. It should be wired in series with the low-pressure (L.P.) control. The wiring diagram (Figure NN) shows use of the thermostat in a pump down system. (Figure NN) shows a standard type of temperature control.

Leak Check-Evacuation-Charging

After all of the refrigeration piping and system components have been assembled, the entire system must be pressurized and checked for leaks. Use nitrogen and refrigerant vapor to check for leaks. A Halide leak detector or an electronic leak detector is recommended.

If the system is sealed, evacuate with a deep vacuum pump. Triple evacuation to a minimum of 500 microns and nitrogen sweep is recommended. After the system has been thoroughly evacuated of all moisture and non-condensable gas, charge the system with the proper refrigerant, using " hi-side/low-side" charging techniques.

ELECTRICAL

Figure 13 shows the typical wiring diagram for a freezer equipped with electric defrost. Figure 14 shows the typical wiring diagram for a freezer equipped with hot gas defrost. Each case is provided with a wiring diagram located near the electric box that shows the exact wiring of the case.

There are many control options available for multiple case defrost systems. Wiring diagrams and instructions can be obtained by calling Zero Zone's Service Department.

External wiring should be sized according to the amperage rating stamped on the serial plate. The serial plate is located on the ceiling inside the left-hand door. All internal wiring has been done at the factory. It has been terminated in the electrical box located at the top and rear on the right end of the case. A terminal block has been used to simplify field connections.

The line side of the contactor/relay is energized with 115 volts at all times. The 115-volt loads in the freezer are energized at all times except during defrost and during post-defrost pulldown. For electric defrost the 208/230 volt defrost element is OFF at all times except during defrost. The time clock is in operation at all times. The drain line heater is wired at 115-volt and is on at all times. If a Hot Gas Solenoid and/or a roof mounted anti-sweat kit are installed, these too will run at all times on 115-volt.

Note: All wiring must comply with the National Electrical Code and all local codes.

DEFROSTING

General

Periodic defrosting to keep the coil free of frost is accomplished automatically by a time clock used in conjunction with an electric, hot gas, or reduced temperature gas injection defrost system. The most reliable and efficient defrost system for a single case uses a time clock that incorporates a defrost termination device. Time clocks can be purchased that terminate on coil temperature or case coil pressure. These clocks have the ability to match the defrost time to the frost load on the coil. Coil temperature is sensed by the defrost temperature termination thermostat supplied as standard on all Zero Zone freezers. Pressure terminating clocks

generally have the pressure switch built into the time clock. A time clock can be purchased from Zero Zone or from a local refrigeration supply house.

Temperature termination of defrost is strongly recommended on Zero Zone cases.

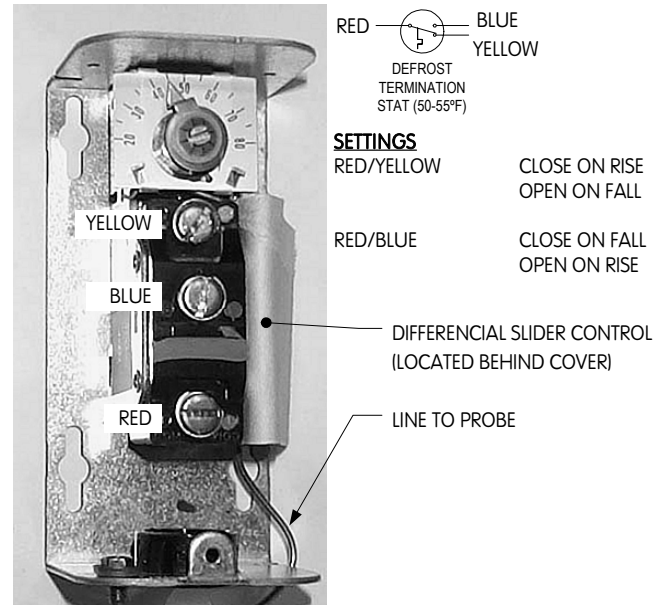


FIGURE 6
JOHNSON TYPE CONTROL

Electric Defrost

When the pin in the 24 hour dial reaches the TIME arrow, the clock will trip and the defrost cycle will start. At that time, the clock will stop the compressor, energize the 208/230 volt defrost heater, and energize the **normally closed** 208/230 volt contactor or relay. This de-energizes the 115-volt fans, lights, and door set anti-sweat heaters.

After the defrost period, the compressor will operate. When the coil temperature drops below +5°F, the fan, light and anti-sweat heater limit thermostats will close, starting the fans, lights and anti-sweat heaters.

Gas Defrost

Several types of gas defrost methods in conjunction with time actuated, time or temperature terminated defrost timers can be used to defrost the evaporator.

The refrigeration system designer and installer are responsible for correct line sizing for effective gas defrost and liquid return from the freezers. Sizing and component selection depend on the type of defrost, size, and location of high side refrigeration system.

Zero Zone freezers equipped for hot gas defrost consist of a side port, distributor and check valve for coil defrost, and a check valve and serpentine coil attached to the bottom of the pan to ensure pan and drain defrost.

Liquid and suction line connections are made outside the case, through the refrigeration access hole located at the top right rear corner of the freezer.

The timer starts the gas defrost cycle by energizing a solenoid, reversing valve, or directional valve. The gas is injected from the source into the suction line of the evaporator to be defrosted. The gas flows into the serpentine coil attached to the floor of the case and into the evaporator. Condensed liquid leaves the evaporator through the side port distributor, through a check valve into the liquid line. Liquid condensed in the serpentine passes through a check valve into the liquid line. Refer to the defrost frequency and termination recommendations that follow on (Figure 9).

TEMPERATURE AND PRESSURE TERMINATION			
	REDUCED TEMPERATURE GAS DEFROST	HOT GAS DEFROST	ELECTRIC DEFROST
FREQUENCY	1	1	1
TEMPERATURE	55° F	55° F	55° F

PRESSURE	SATURATED SUCTION PRESSURE EQUAL TO 50° F		
	FAIL-SAFE TIME (minutes)	40	30
DRAIN/DRIP TIME (minutes)	3-5	3-5	0
TIME ONLY TERMINATION (not recommended)			
TIME (minutes)	14-22	12-20	40-45
DRAIN/DRIP TIME (minutes)	3-5	3-5	0

**FIGURE 9
DEFROST FREQUENCY & TERMINATION**

- ★ Temperature Termination Required
- ★ Refrigeration technician should recheck coil condition after one week of operation to be certain that the frequency and duration of defrost is adequate for the particular store and locality. For example, if defrost voltage is below 200 volts, additional fail-safe time may be required.
- ★ When using time terminated defrost, temperature terminated thermostat should be wired in series with the defrost heater.
- ★ Temperature termination thermostats may be wired in series for multiple evaporator installations.

Limit Thermostat

Each freezer has factory set limit thermostats (Klixons) attached to the return bends of the coil on the right end of the freezer to regulate the operation of the evaporator fans, freezer lights, and anti-sweat heaters.

OPERATION OF THE LIMIT THERMOSTATS CAUSES THE EVAPORATOR FANS, FREEZER LIGHTS, AND ANTI-SWEAT HEATERS TO REMAIN OFF UNTIL THE COMPRESSOR IS OPERATING AND THE COIL TEMPERATURE IS BROUGHT BELOW THE THERMOSTAT CUT-IN SETTING (+5°F). SUPERHEAT

MUST BE SET CORRECTLY FOR PROPER THERMOSTAT OPERATION

When the freezer first operates, the fans and lights may cycle on and off a few times until coil temperature stays below +5°F.

USER INFORMATION

Cleaning

The freezer should be thoroughly cleaned before start-up and routinely thereafter to maintain a clean appearance. Use mild detergent and warm water (never an abrasive cleaner) to wipe out the inside of the freezer. Wash down all glass doors with glass cleaner. Clean interior glass reduces fogging and increases visibility. The freezer will remain bright and sparkling with just a few minutes of cleaning each week. Internal components can be cleaned after removal of access panels. The case drain should be regularly cleared of debris and price tags.

Note: Do not use high-pressure water or steam to clean the interior.

Shelf Location

The shelves are adjustable in 1- 1/2inch increments and may be located in any position for best display advantage. The shelves also come with a tilt feature whereby the outer set of hooks can be used on the shelf brackets to angle the shelf downward. This may be a desired feature when product needs to roll /slide ahead for stocking.

Be sure shelf brackets are completely seated before installing the shelf.

Loading the Freezer

The freezer may be loaded with merchandise after it has been operated for at least 24 hours with correct

case temperature and proper control operation. While loading the shelves, leave at least 1-1/2 inch between the top of the merchandise and the shelf above it so the customer can remove the merchandise. The 1-1/2 inch space allows an air curtain on the top of the product. Product should not exceed load limits (see Figure 10).

GENERAL GUIDELINES FOR STOCKING A ZERO ZONE® RMZCXL CASE

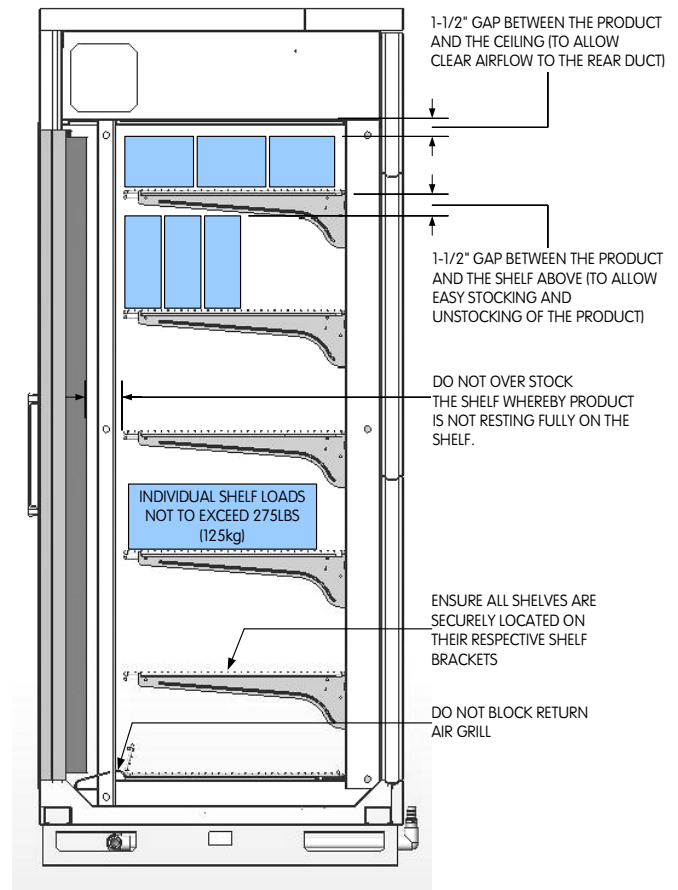


FIGURE 10
LOADING A FREEZER

Light Switch

The light switch is located on the mullion by the hinge side rightmost door. Turn the light switch off during the initial freezer temperature pull-down to prevent the freezer lights from cycling off and on. **Always turn the lights off when replacing lamps.**

Lighting

T8 lighting is standard on the RMZC30XL. These systems use a lens to direct the light output evenly across the shelves.

In order to access the lamp the lens cover must be removed. Details of this can be located in the door instruction booklet.

SERVICE

Cart Bumper

The cart bumper must be removed to gain access to the drain clean out. Disassemble the bumper and kick rail by removing the 2 or 3 metal screws located in the kick rail. The bumper assembly can be lifted up and removed from the case. The kick plate can be removed, exposing the drain. (Figure 4A shows the bumper assembly)

Evaporator

The evaporator coil, located at the top of the freezer, is factory assembled with distributor and expansion valve. Additional items (such as hand valves, air filter/dryers, sight glass, etc.) may be attached to the system depending upon the options selected. To inspect the entire coil, open the roof panel and the front of the coil should be directly visible.

Expansion Valve

Do not adjust the expansion valve, unless you are qualified to do so. Except where otherwise specified, an externally equalized thermostatic expansion valve with pressure limiting charge adjustable super-heat and thermal bulb is mounted to the evaporator coil. Adjust the super-heat setting for maximum coil

effectiveness. *Typical super heat settings are between 6°F and 10°F.* To adjust the expansion valve, open the roof panel. To the far left of the coil, the valve should be visible. Remove the cap from the bottom of the valve. When looking at the valve stem end, turn the valve stem counterclockwise to decrease super heat. Turn the valve stem clockwise to increase super heat. Measure the suction line temperature at the expansion valve-sensing bulb and compare it to the suction temperature corresponding to the saturated pressure at the coil.

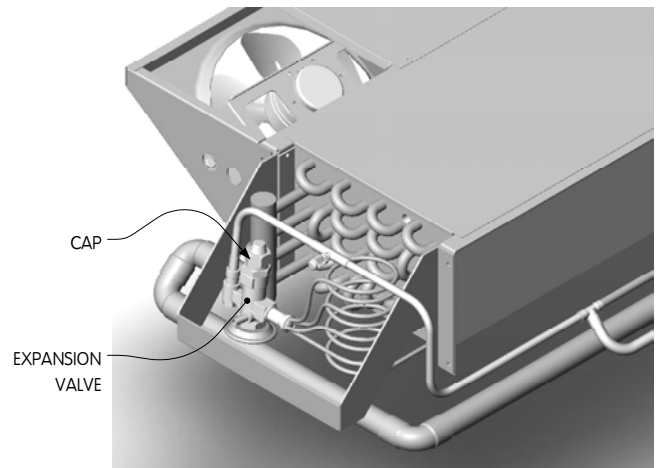


FIGURE 11
EXPANSION VALVE LOCATION

Turn the valve stem only 1/4 turn at a time and allow **sufficient time (20 to 30 minutes)** for the valve to settle before making any further adjustments. Replace the valve stem cap after the valve super-heat has been adjusted. BE CERTAIN THE VALVE STEM CAP IS WIPED DRY FIRST.

CAUTION!

DISCONNECT POWER TO THE CASE BEFORE
SERVICING ELECTRICAL COMPONENTS

Defrost Heater Element

The heater element is located under the coil. The electric wire leads are connected in the electrical box on the top right rear of the case.

RMZC30XL Heater Element Removal

Shut off the power to the case. Disconnect the leads of the defrost heater wire from the relay/coil inside the electrical box.

To remove the defrost element, open the roof of the case and expose the coil area. At either end of the coil there is a screw that locks the heater bracket, relative to the coil. Remove these screws. Once removed, the heater bracket should slide towards the front of the case. Once clear of the coil, the heater can be removed by unscrewing the clips that lock the heater to the heater bracket. Lift the heater free of the heater bracket and feed the wires back through the conduit at the top of the case.

Evaporator Fans

Air is circulated throughout the freezer with 115-volt low temperature fan motors. These motors must be all operating at all times except during defrost.

RMZC30XL Fan Removal

Shut off the power to the case. Open up the roof of the case and expose the coil area. At the rear of the coil, there is a fan shroud. This fan shroud may either show a hinged cover, or may consist of several slip covers. Remove any screws that hold down the covers. Once the cover is opened/removed the fan motors should now be exposed.

Unplug fan from fan power supply plug located on the rear face of the fan housing.

Remove the two (2) mounting screws on either side of the fan bracket and remove the fan assembly from the fan housing.

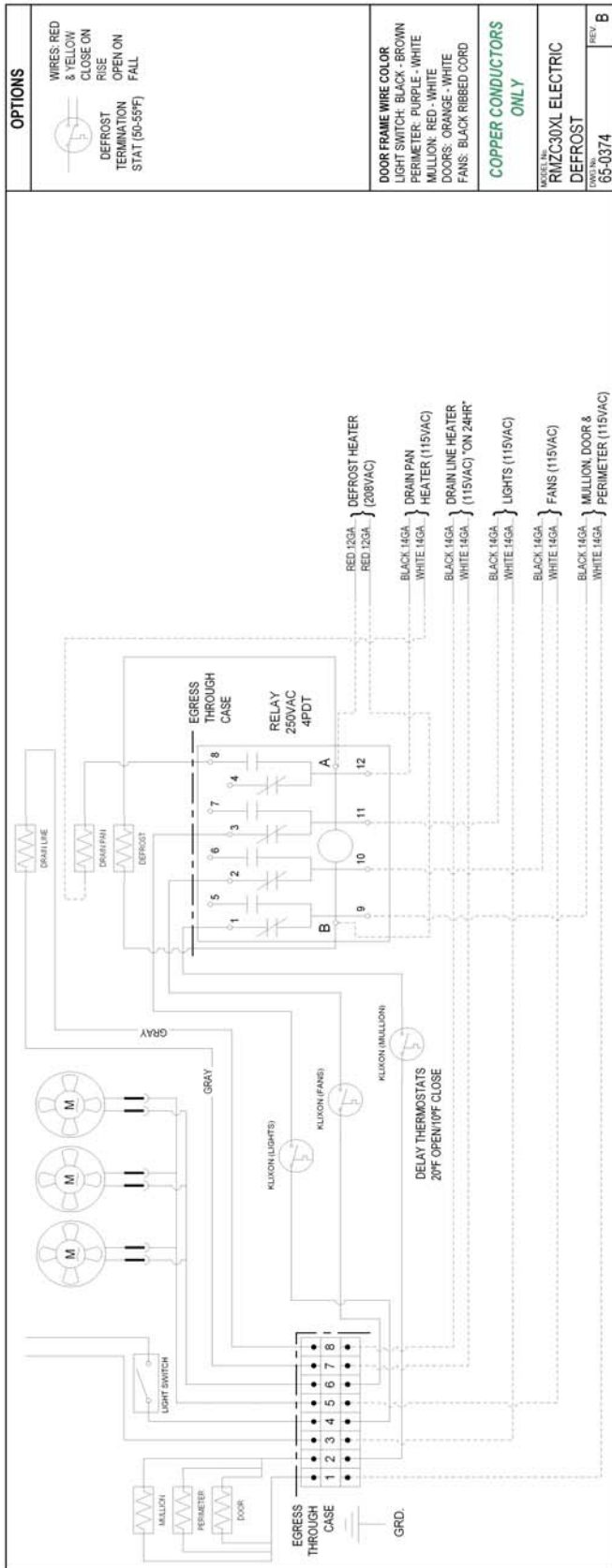


FIGURE 13
ELECTRICAL SCHEMATIC –ELECTRIC DEFROST

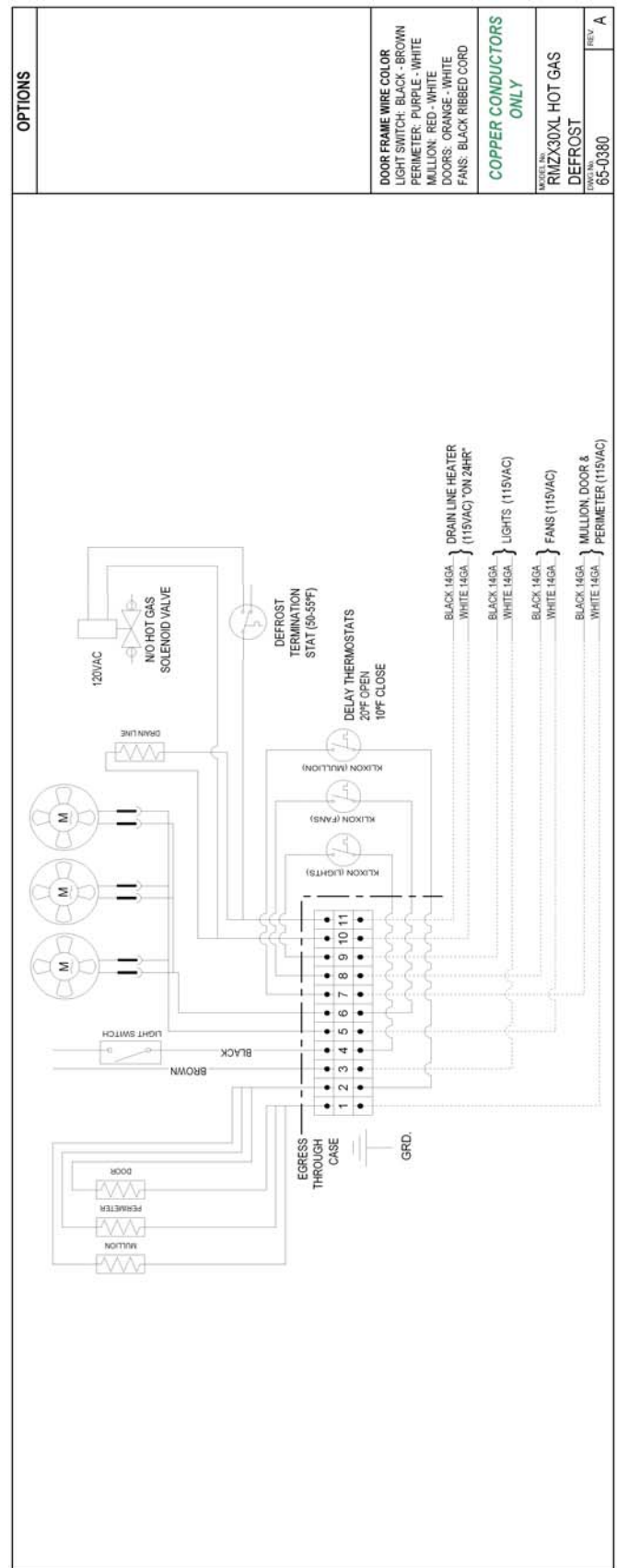


FIGURE 14
ELECTRICAL SCHEMATIC –HOT GAS DEFROST



PRELIMINARY RMZC30XL SPECIFICATION SHEET

CAPACITY SPECIFICATIONS		
CASE SIZE	CAPACITIES	
	USABLE CAPACITY	SHELF DEPTH
2RMZC30XL	66	25
3RMZC30XL	99	25
4RMZC30XL	131	25
5RMZC30XL	164	25

CASE SIZE	WEIGHT IN POUNDS*
2RMZC30XL	945
3RMZC30XL	1,315
4RMZC30XL	1,761
5RMZC30XL	2,244

*WEIGHT BASED ON UNCRATED CASES WITHOUT ENDS, AND FULLY SHELVED.
SINGLE END WEIGHT:
65 POUNDS

ELECTRICAL SPECIFICATIONS						
MODEL NUMBER	FAN AMPS	T-8 LIGHTS AMPS	ANTHONY ELM ANTI-SWEAT HEATER AMPS	ANTI-SWEAT HEATERS AMPS	DEFROST HEATER AMPS 208V / 1/60HZ.	DRAIN HEATER AMPS
ANTHONY DOORS						
2RMZC30XL	0.68	1.89	2.43	4.85	6.73	4.57
3RMZC30XL	1.36	2.50	3.34	7.05	10.10	6.25
4RMZC30XL	1.70	3.13	4.35	9.25	13.46	7.93
5RMZC30XL	2.04	3.75	5.37	10.86	16.83	9.62

*STANDARD FOR CASE IN A LINE-UP
VOLTAGE: 115 VOLTS 1 PHASE 60 HZ.

BTU/HR ENERGY REQUIREMENTS:			
MODEL NUMBER	BTU/HR FROZEN FOOD	BTU/HR ICE CREAM	BTU/HR RATING BASED ON T-8 LIGHTING AND PARALLEL RACK SYSTEM. MULTIPLY BY 1.04 FOR CONVENTIONAL SYSTEM.
2RMZC30XL	3,550	3,870	CASE DESIGNED TO OPERATE IN AN AMBIENT OF 75°F OR LOWER AND RELATIVE HUMIDITY OF 55% OR LOWER.
3RMZC30XL	5,325	5,805	
4RMZC30XL	7,100	7,740	
5RMZC30XL	8,875	9,675	
RMZC30XL W/OPTIONAL ELM DOORS	DEDUCT 275 BTUHR/DOOR	DEDUCT 325 BTUHR/DOOR	

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All specifications are subject to change without notice.