NORLAKE®

ICE CREAM MERCHANDISING FREEZER

Installation, Operation and Maintenance Instructions

INSPECTION

When the equipment is received, all items should be carefully checked against the bill of lading to insure all crates and cartons have been received. All units should be inspected for concealed damage by uncrating the units immediately. If any damage is found, it should be reported to the carrier at once, and a claim should be filed with the carrier. This equipment has been inspected and tested in the Nor-Lake Manufacturing Facility and has been crated in accordance with transportation rules and guidelines. Manufacturer is not responsible for freight loss or damage.

INSTALLATION

GENERAL

After the crate and crate base have been removed, locate the legs or casters found inside the cabinet. Attach the legs or casters to the unit base by screwing them into the same threaded fittings that were used to secure the crate base to the cabinet. Insure that the legs or casters are screwed completely into the base or damage to the base may occur. This freezer should not be operated without legs or casters installed.

If the door is out of alignment on the cabinet, the door can be adjusted. Opening the door and loosening the screws that hold both the top and bottom hinges to the cabinet can accomplish this. After adjusting the door so that it is aligned correctly, tighten the screws to securely hold the hinges in place.

LOCATION

The refrigeration system located at the bottom of the cabinet requires free air access for proper operation. In order to assure proper airflow, make certain the flow of air under the cabinet and through the front louver panel is not blocked. Once the cabinet is moved to its permanent location it should be leveled side-to-side and front to back.

Unit Model	Exterior Dimensions Width x Depth x Height*	Refrigerant Type/Amount
ZF081	27" x 35" x 40-1/2"	See Serial Tag

* Note: Add 6 inches to the height for legs or 4-1/2 inches for casters.

ELECTRICAL

Check the proposed outlet to be used to insure that the voltage, phase, and current carrying capacity of the circuit from the electrical panel correspond to the requirements of the cabinet. NEVER use an extension cord to run power to the unit. All inter-wiring between the electrical panel and the unit must be done in accordance with the National Electric Code and all state and local codes. Refer to the Serial Tag for all pertinent electrical information.

Observe all warning labels. Disconnect power supply to eliminate electrical shock and injury from moving parts when servicing equipment.

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Electrical Data

Unit Model	Type of Connection	Voltage/Hz/Phase
ZF081	Cord	115/60/1

GENERAL OPERATION

This Ice Cream Merchandising Freezer employs a forced air unit cooler evaporator located inside the cabinet as the heat-removing source. During the refrigeration process, heat is captured in the evaporator, transferred to the condensing unit at the bottom of the cabinet, and is expelled to the surrounding outside air. It is extremely important to allow airflow under the cabinet and through the front louver panel.

Running these units in an unconditioned environment may result in frost build-up inside the topping rail of the cabinet.

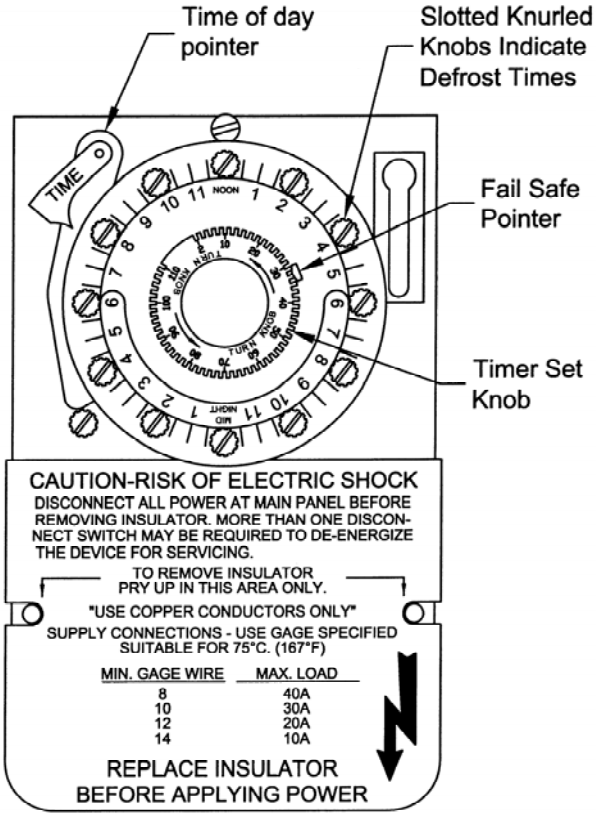
After shutting the door on the freezer, a short amount of time must be allowed before the door can be reopened. This is due to the tight seal maintained between the door and the cabinet. Waiting a few moments for the pressure to equalize permits the door to be opened easily.

With this freezer unit, a positive defrost is required to remove the frost from the coil. This is accomplished by energizing heaters positioned on the coil surface. The time clock is factory set to allow for four defrosts per day. Adjustment of the correct time of day will be required to maintain these defrost periods.

When the preset defrost time is reached, the time clock automatically terminates the refrigeration process by turning off the condensing unit and unit cooler fan motors, and energizes the defrost heaters. As the coil temperature increases, the frost begins to melt producing water which runs down the coil to the evaporator drain pan and exits through the drain tube to the vaporizer. After all the frost has been removed and the coil temperature reaches approximately 50°F, the defrost is terminated through the action of the defrost termination control located on the unit cooler, and the refrigeration process resumes. In order to insure that any excess water remaining on the coil is not sprayed into the cabinet interior, and all heat generated by the defrost is removed, **the unit cooler fans will not operate until the coil temperature reaches approximately 25°F.**

ADJUSTMENTS

The electromechanical timer used to actuate the defrost of the evaporator is located behind the louvered panel on the front of the cabinet. Disconnect power to the cabinet before removing the louvered panel to avoid possible electrical shock. To access the timer, remove the screw from the front of the slide mechanism the timer is mounted on and carefully slide the timer forward until the slide stops. After completing the adjustments as explained below, carefully slide the timer back into the cabinet and replace the screw.



1. **Time clock adjustments:**
   Setting the correct time of day - To set the correct time of day, simply rotate the small inner-dial counterclockwise until the correct time of day on the large dial is opposite the "time" indicator. In referring to the drawing of the time clock, the correct time of day shown is 7:30 a.m.

   Number of defrosts per day - The timer is factory set to defrost the evaporator at 2:00 a.m., 8:00 a.m., 2:00 p.m., and at 8:00 p.m.

The four settings should provide adequate

defrosting for even the most heavily used system. If more defrosts are required, remove a knurled slotted screw from the holder, insert the screw into the time slot on the large dial where a defrost is desired, and tighten. Insure that an equal time exists between each defrost pin. If experience shows that the four set defrost periods are more than necessary, one or more of the knurled setscrews may be removed. **At least one of the knurled setscrews must be located on the large lower dial at all times.**

Fail Safe Feature - On the small, upper dial there is a pointer that is used to set a 100% fail-safe feature. The fail-safe of the timer is factory set at 30 minutes, indicating that the system will revert to cooling thirty minutes after a normal defrost cycle began should a malfunction occur. The fail-safe feature is a safety mechanism and should never be used to control the length of the defrost period. This feature is provided to protect the contents of the freezer from damage should the system fail to revert to the cooling cycle because of mechanical difficulties. No adjustment of this device should ever be necessary. **Lengthening the fail-safe time will not lengthen the defrost cycle.**

2. **Cold control adjustment** - To increase or decrease the internal cabinet temperature, rotate the cold control dial located on the unit cooler. To make the interior storage temperature colder, the dial should be turned to the higher number. Make adjustments in small increments (i.e. 4 to 4.5) until the desired temperature is reached.

Caution: If the cabinet's door remains open for too long it could cause excessive frost to build up on the evaporator causing airflow through the coil to be restricted and the coil to not properly defrost.

GENERAL MAINTENANCE

PERIODIC CLEANING

Beginning with the initial installation, the interior surfaces of the cabinet should be periodically wiped down with a solution of warm water and baking soda. This solution will remove any odors from spillage that has occurred. The exterior of the cabinet should also be cleaned frequently with a commercial grade of glass cleaner. **Caution:** Do not use any abrasive or alkaline solution.

Observe all warning labels. Disconnect power supply to eliminate electrical shock and injury from moving parts when servicing equipment.

Important: Monthly cleaning of the condenser will aid the heat transfer characteristics of the refrigeration system and increase its efficiency. To accomplish this, remove the cover panel from the cabinet and use a stiff bristle brush to loosen any dirt particles that are attached to the fins. Once this is complete, use a vacuum cleaner to remove the loosened particles. **Failure to keep the condenser coil clean and clear of any obstructions could result in temperature loss and damage to the compressor.**

All moving parts have been permanently lubricated and will generally require no maintenance.

SERVICE

Any correspondence pertaining to these cabinets should be directed to the Service Department of Nor-Lake, Incorporated. Be sure to include the **cabinet model number** and **serial number** with any correspondence.

800-388-5253 Parts/Service

Nor-Lake, Incorporate
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MAINTENANCE SERVICE AND ANALYSIS GUIDE

REFRIGERATION SYSTEMS - ALL MODELS

MALFUNCTION	POSSIBLE CAUSE	SOLUTION
Compressor will not start - no hum	1. Service cord unplugged	1. Plug in service cord
	2. Fuse blown or removed	2. Replace fuse
	3. Overload tripped	3. Determine reasons and correct
	4. Control stuck open	4. Repair or replace
	5. Wiring incorrect	5. Check wiring against the diagram
Compressor will not start - hums but trips on overload protector	1. Improperly wired	1. Check wiring against the diagram
	2. Low voltage to unit	2. Determine reason and correct
	3. Starting capacitor defective	3. Determine reason and replace
	4. Relay failing to close	4. Determine reason, correct or replace
Compressor starts and runs, but short cycles on overload protector	1. Low voltage to unit	1. Determine reason and correct
	2. Overload defective	2. Check current, replace overload protector
	3. Excessive head pressure	3. Check ventilation or restriction in refrigeration system
	4. Compressor hot-return gas hot	4. Check refrigerant charge, fix leak if necessary
Compressor operates long or continuously	1. Short of refrigerant	1. Fix leak, add refrigerant
	2. Control contact stuck	2. Repair or replace
	3. Evaporator coil iced	3. Determine cause, defrost manually
	4. Restriction in refrigeration system	4. Determine location and remove restriction
	5. Dirty condenser	5. Clean condenser
Compressor runs fine, but short cycles	1. Overload protector	1. Check wiring diagram
	2. Cold control	2. Differential too close - widen
	3. Overcharge	3. Reduce charge
	4. Air in system	4. Purge and recharge
	5. Undercharge	5. Fix leak, add refrigerant
Starting capacitor open, shorted or blown	1. Relay contacts stuck	1. Clean contacts or replace relay
	2. Low voltage to unit	2. Determine reason and correct
	3. Improper relay	3. Replace
Relay defective or burned out	1. Incorrect relay	1. Check and replace
	2. Voltage too high or too low	2. Determine reason and correct
Refrigerated space too warm	1. Control setting too high	1. Reset control
	2. Refrigerant overcharge	2. Purge refrigerant
	3. Dirty condenser	3. Clean condenser
	4. Evaporator coil iced	4. Determine reason and defrost
	5. Not operating	5. Determine reason, replace if necessary
Standard temperature system freezes the product	1. Control setting is too low	1. Reset the control
	2. Control points stuck	2. Replace the control
Objectionable noise	1. Fan blade hitting fan shroud	1. Reform or cut away small section of shroud
	2. Tubing rattle	2. Locate and reform
	3. Vibrating fan blade	3. Replace fan blade
	4. Condenser fan motor rattles	4. Check motor bracket mounting, tighten
	5. General vibration	5. Compressor suspension bolts not loosened on applicable models - loosen them
	6. Worn fan motor bearings	6. Replace fan motor
Pan Area	1. No cooling	1. Make sure switch is in the "on" position
	2. Too cold	2. Adjust temperature control - see instructions under pan area
	3. Too warm	3. Adjust temperature control - see instructions under pan area