

Koolaire Ice Machines ***UnderCounter Models***

Installation, Operation and Maintenance Manual



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Section 1

General Information

Safety Notices

As you work on Manitowoc equipment, be sure to pay close attention to the safety notices in this handbook. Disregarding the notices may lead to serious injury and/or damage to the equipment.

Throughout this handbook, 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 Manitowoc equipment, be sure to read the procedural notices in this handbook. These notices supply helpful information which may assist you as you work.

Throughout this handbook, 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 you are performing.

Read These Before Proceeding:

Caution

Proper installation, care and maintenance are essential for maximum performance and trouble-free operation of your equipment. Visit our website www.manitowocfsg.com for manual updates, translations, or contact information for service agents in your area.

Important

Routine adjustments and maintenance procedures outlined in this handbook are not covered by the warranty.

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.

Warning

Do not use electrical appliances or accessories other than those supplied by Manitowoc for your ice machine model.

Warning

Two or more people or a lifting device are required to lift this appliance.

Warning

This equipment contains high voltage electricity and refrigerant charge. Installation and repairs are to be performed by properly trained technicians aware of the dangers of dealing with high voltage electricity and refrigerant under pressure. The technician must also be certified in proper refrigerant handling and servicing procedures. All lockout and tag out procedures must be followed when working on this equipment.

Warning

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

 **Warning**

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

 **Warning**

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

 **Warning**

Do not obstruct machine vents or openings.

 **Warning**

Do not store gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

 **Warning**

Do not clean with water jet.

 **Warning**

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

 **Warning**

When using electric appliances, basic precautions must always be followed, including the following:

- a. Read all the instructions before using the appliance.
- b. To reduce the risk of injury, close supervision is necessary when an appliance is used near children.
- c. Do not contact moving parts.
- d. Only use attachments recommended or sold by the manufacturer.
- e. Do not use outdoors.
- f. For a cord-connected appliance, the following must be included:
 - Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
 - Unplug from outlet when not in use and before servicing or cleaning.
 - Do not operate any appliance with a damaged cord or plug, or after the appliance malfunctions or is dropped or damaged in any manner. Contact the nearest authorized service facility for examination, repair, or electrical or mechanical adjustment.
- g. Follow applicable lock out tag out procedures before working on equipment.
- h. Connect to a properly grounded outlet only.

 **Warning**

Objects placed or dropped in the bin can affect human health and safety. Locate and remove any objects immediately.


Important

The Commonwealth of Massachusetts requires that all water-cooled models must be connected only to a closed loop, cooling tower system.

Model Numbers

This manual covers the following models:

Self-Contained Air-Cooled
KYF0150A-161B
KDF0150A-161B
KYF0250A-161B
KDF0250A-161B

 **Warning**

PERSONAL INJURY POTENTIAL

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 allow children to perform cleaning or maintenance without adult supervision.

Accessories

Contact your local distributor for these optional accessories:

BIN CASTER

Replaces standard legs.

ARCTIC PURE WATER FILTER SYSTEM


Engineered specifically for ice machines, Arctic Pure water filters are an efficient, dependable, and affordable method of inhibiting scale formation, filtering sediment, and removing chlorine taste and odor.

CLEANER AND SANITIZER


Manitowoc Ice Machine Cleaner and Sanitizer are available in convenient 16 oz. (473 ml) and 1 gal (3.78 l) bottles. These are the only cleaner and sanitizer approved for use with these ice machines

Cleaner Part Number		Sanitizer Part Number	
16oz	94-0456-3	16oz	94-0565-3
1 Gallon	94-0580-3	1 Gallon	94-0581-3

These ice machines do not have a water curtain covering the evaporator. The ice damper performs the functions of the water curtain see Section 3 for details.

 **Warning**

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

 **Warning**

Do not use electrical appliances or accessories other than those supplied by Manitowoc for your ice machine model.

Section 2

Installation Instructions

Location of Ice Machine

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

- The location must be indoors.
- The location must be free of airborne and other contaminants.
- The air temperature must be at least 40°F (4°C), but must not exceed 110°F (43°C).
- The location must not be near heat-generating equipment or in direct sunlight.
- The location must be capable of supporting the weight of the ice machine and a full bin of ice.
- The location must allow enough clearance for water, drain and electrical connections in the **rear of the ice machine**.
- The location must not obstruct airflow through or around the ice machine (condenser airflow is in and out the front). Refer to the chart below for clearance requirements.

	Self-Contained Air-Cooled	Self-Contained Water-Cooled
Top/Sides	5" (127 mm)*	5" (127 mm)*
Back	5" (127 mm)*	5" (127 mm)*

NOTE: The ice machine may be built into a cabinet.

There is no minimum clearance requirement for the top or left and right sides of the ice machine. The listed values are recommended for efficient operation and servicing only.

Caution

The ice machine must be protected if it will be subjected to temperatures below 32°F (0°C). Failure caused by exposure to freezing temperatures is not covered by the warranty. See "Removal from Service/Winterization" Section 4.

Ice Machine Heat of Rejection

Series Ice Machine	Heat of Rejection*	
	Air Conditioning**	Peak
K150	2200	2600
K250	3800	6000

* B.T.U./Hour

** Because the heat of rejection varies during the ice making cycle, the figure shown is an average.

Ice machines, like other refrigeration equipment, reject heat through the condenser. It is helpful to know the amount of heat rejected by the ice machine when sizing air conditioning equipment where self-contained air-cooled ice machines are installed.

Leveling the Ice Machine

1. Screw the leveling legs onto the bottom of the ice machine.
2. Screw the foot of each leg in as far as possible.

Caution

The legs must be screwed in tightly to prevent them from bending.

3. Move the ice machine into its final position.

Warning

Do not obstruct ice machine vents or openings.

4. Level the ice machine to assure that the siphon system functions correctly. Use a level on top of the ice machine. Turn each foot as necessary to level the ice machine from front to back and side to side.

NOTE: An optional 2 ½" caster assembly is available for use in place of the legs on the K150 and K250. Installation instructions are supplied with the casters.

Electrical Service

GENERAL

⚠ Warning

All wiring must conform to local, state and national codes.

VOLTAGE

The maximum allowable voltage variation is ± 10% of the rated voltage on the ice machine model/serial number plate at start-up (when the electrical load is highest).

The 115/1/60 ice machines are factory pre-wired with a 8' power cord, and NEMA 5-15P-plug configuration.

FUSE/CIRCUIT BREAKER

A separate fuse/circuit breaker must be provided for each ice machine. Circuit breakers must be H.A.C.R. rated (does not apply in Canada).

⚠ Warning

The ice machine must be grounded in accordance with national and local electrical codes.

TOTAL CIRCUIT AMPACITY

The total circuit ampacity is used to help select the wire size of the electrical supply.

The wire size (or gauge) is also dependent upon location, materials used, length of run, etc., so it must be determined by a qualified electrician.

GROUND FAULT CIRCUIT INTERRUPTER

Ground Fault Circuit Interrupter (GFCI/GFI) protection is a system that shuts down the electric circuit (opens it) when it senses an unexpected loss of power, presumably to ground. Koolaire does not recommend the use of a GFCI/GFI circuit protection with our equipment. If code requires the use of a GFCI/GFI then you must follow the local code. The circuit must be dedicated, sized properly and there must be a panel GFCI/GFI breaker. We do not recommend GFCI/GFI outlets as they are known for more intermittent nuisance trips than panel breakers.

⚠ Warning

PERSONAL INJURY POTENTIAL

If the supply cord is damaged, do not operate the equipment until the cord is replaced by a service agent or similarly qualified person.

K150/K250 ICE MACHINE

Ice Machine	Voltage Phase Cycle	Air-Cooled		Water Cooled	
		Maximum Fuse/ Circuit Breaker	Total Amps	Maximum Fuse/ Circuit Breaker	Total Amps
K150	115/1/60	15	7.4	--	--
K250	115/1/60	15	11.8	--	--

* Indicates preliminary data

Water Service/Drains

WATER SUPPLY

Local water conditions may require treatment of the water to inhibit scale formation, filter sediment, remove chlorine, and improve taste and clarity.

 **Warning**
PERSONAL INJURY POTENTIAL

For ice making, connect to a potable water supply only.

Important

If you are installing a water filter system, refer to the Installation Instructions supplied with the filter system for ice making water inlet connections.

WATER INLET LINES

Follow these guidelines to install water inlet lines:

- Do not connect the ice machine to a hot water supply. Be sure all hot water restrictors installed for other equipment are working. (Check valves on sink faucets, dishwashers, etc.)
- If water pressure exceeds the maximum (80 psig-551.5 kPA) recommended pressure, obtain a water pressure regulator from your local distributor.
- Install a water shut-off valve and union for both the ice making and condenser water lines.
- Insulate water inlet lines to prevent condensation.

DRAIN CONNECTIONS

Follow these guidelines when installing drain lines to prevent drain water from flowing back into the ice machine and storage bin:

- Drain lines must have a 1.5 inch drop per 5 feet of run (2.5 cm per meter), and must not create traps.
- The floor drain must be large enough to accommodate drainage from all drains.
- Run separate bin and water-cooled condenser drain lines. Insulate them to prevent condensation.
- Vent the bin drain to the atmosphere. Do not vent the condenser drain on water-cooled models.

COOLING TOWER APPLICATIONS

(Water-Cooled Models)

A water cooling tower installation does not require modification of the ice machine. The water regulator valve for the condenser continues to control the refrigeration discharge pressure.

It is necessary to know the amount of heat rejection and the pressure drop through the condenser and water valves (inlet and outlet) when using a cooling tower on an ice machine.

- Water entering the condenser must not exceed 90°F (32°C).
- Water flow through the condenser must not exceed 5 gallons (19 liters) per minute.
- Allow for a pressure drop of 7 psi (48 kPA) between the condenser water inlet and the outlet of the ice machine.
- Water exiting the condenser must not exceed 110°F (43°C).

Water Supply and Drain Line Sizing/Connections

Location	Water Temperature	Water Pressure	Ice Machine Fitting	Tubing Size Up to Ice Machine Fitting
Ice Making Water Inlet	40°F (4°C) Min. 90°F (32°C) Max.	20 psi (137.9 kPA) Min. 80 psi (551.5 kPA) Max.	3/8" Female Pipe Thread	3/8" (9.5 mm) minimum inside diameter
Bin Drain	---	---	1/2" Female Pipe Thread	1/2" (12.7 mm) minimum inside diameter

Before Starting the Ice Machine

All ice machines are factory-operated and adjusted before shipment. Normally, new installations do not require any adjustment.

To ensure proper operation, follow the Operational Checks in Section 3 of this manual. Starting the ice machine and completing the Operational Checks are the responsibilities of the owner/operator.

Adjustments and maintenance procedures outlined in this manual are not covered by the warranty.

⚠ Warning
PERSONAL INJURY POTENTIAL

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

Installation Checklist

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><input type="checkbox"/> Is the ice machine level?</p> <p><input type="checkbox"/> Has all of the internal packing been removed?</p> <p><input type="checkbox"/> Have all of the electrical and water connections been made?</p> <p><input type="checkbox"/> Has the supply voltage been tested and checked against the rating on the nameplate?</p> <p><input type="checkbox"/> Is there proper clearance around the ice machine for air circulation?</p> <p><input type="checkbox"/> Is the ice machine grounded and polarity correct?</p> <p><input type="checkbox"/> Has the ice machine been installed where ambient temperatures will remain in the range of 40° – 110°F (4° – 43°C)?</p> <p><input type="checkbox"/> Has the ice machine been installed where the incoming water temperature will remain in the range of 40° – 90°F (4° – 32°C)?</p> <p><input type="checkbox"/> Is there a separate drain for the water-cooled condenser?</p> <p><input type="checkbox"/> Is there a separate drain for the bin?</p> <p><input type="checkbox"/> Are the ice machine and bin drains vented?</p> <p><input type="checkbox"/> Are all electrical leads free from contact with refrigeration lines and moving equipment?</p> | <p><input type="checkbox"/> Has the owner/operator been instructed regarding maintenance and the use of Cleaner and Sanitizer?</p> <p><input type="checkbox"/> Has the owner/operator completed the warranty registration card?</p> <p><input type="checkbox"/> Has the ice machine and bin been sanitized?</p> <p><input type="checkbox"/> Is the toggle switch set to ice? (The toggle switch is located directly behind the front panel).</p> <p><input type="checkbox"/> Is the ice thickness control set correctly? (Refer to Operational Checks to check/set the correct ice bridge thickness).</p> <p><input type="checkbox"/> Is the float valve in the OPEN position?</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Section 3 Operation

Ice Making Sequence of Operation

INITIAL START-UP OR START-UP AFTER AUTOMATIC SHUT-OFF

1. Pressure Equalization

Before the compressor starts the hot gas valve is energized for 15 seconds to equalize pressures during the initial refrigeration system start-up.

2. Refrigeration System Start-Up

The compressor starts after the 15-second pressure equalization, and remains on throughout the entire Freeze and Harvest Sequences. The hot gas valve remains on for 5 seconds during initial compressor start-up and then shuts off.

At the same time the compressor starts, the condenser fan motor (air-cooled models) is supplied with power throughout the entire Freeze and Harvest Sequences. The fan motor is wired through a fan cycle pressure control, therefore it may cycle on and off. (The compressor and condenser fan motor are wired through the relay. As a result, any time the relay coil is energized, the compressor and fan motor are supplied with power.)

FREEZE SEQUENCE

3. Prechill

The compressor energizes to prechill the evaporator prior to water flow.

4. Freeze

The water pump starts after the Prechill. An even flow of water is directed across the evaporator and into each cube cell, where it freezes.

When sufficient ice has formed, the water flow (not the ice) contacts the ice thickness probe. After approximately 7 seconds of continual water contact, the Harvest Sequence is initiated. The ice machine cannot initiate a Harvest Sequence until a 6-minute freeze time has been surpassed.

HARVEST SEQUENCE

5. Harvest

The water pump de-energizes stopping flow over the evaporator. The rising level of water in the sump trough diverts water out of the overflow tube, purging excess minerals from the sump trough. The hot gas valve also opens to divert hot refrigerant gas into the evaporator.

The refrigerant gas warms the evaporator causing the cubes to slide, as a sheet, off the evaporator and into the storage bin. The sliding sheet of cubes contacts the ice damper, opening the bin switch.

The momentary opening and re-closing of the bin switch terminates the Harvest Sequence and returns the ice machine to the Freeze Sequence (steps 3 - 4).

AUTOMATIC SHUT-OFF

6. Automatic Shut-Off

When the storage bin is full at the end of a Harvest Sequence, the sheet of cubes fails to clear the ice damper and will hold it down. After the ice damper is held open for 7 seconds, the ice machine shuts off. The ice machine remains off for 3 minutes before it can automatically restart.

The ice machine remains off until enough ice has been removed from the storage bin to allow the ice to fall clear of the damper. As the ice damper swings back to the operating position, the bin switch re-closes and the ice machine restarts (steps 1 - 2), provided the 3-minute delay period is complete.

Energized Parts Chart

	CONTROL BOARD RELAYS			RELAY		LENGTH of "ON" TIME
	1 WATER PUMP	2 HOT GAS VALVE	3 RELAY COIL	3A COMPRESSOR	3B CONDENSER * FAN MOTOR	
INITIAL START-UP/ START UP AFTER AUTO SHUT-OFF: 1. Pressure Equalization	OFF	ON	OFF	OFF	OFF	15 Seconds
2. Refrigeration System Start-up	OFF	ON	ON	ON	ON	5 Seconds
FREEZE SEQUENCE: 3. Pre-Chill	OFF	OFF	ON	ON	ON	30 Seconds
4. Freeze	ON	OFF	ON	ON	ON	Until 7 sec. water contact with ice thickness probe
HARVEST SEQUENCE: 5. Harvest	OFF	ON	ON	ON	ON	Bin switch activation
AUTOMATIC SHUT-OFF: 6. Auto Shut-Off	OFF	OFF	OFF	OFF	OFF	Until bin switch re-closes

* Condenser Fan Motor: The fan motor is wired through a fan cycle pressure control, therefore, it may cycle on and off.

Operational Checks

GENERAL

Your Koolaire ice machine was factory-operated and adjusted before shipment. Normally, a newly installed ice machine does not require any adjustment.

To ensure proper operation, always follow these Operational Checks when starting the ice machine:

- for the first time
- after a prolonged out of service period
- after cleaning and sanitizing

Routine adjustments and maintenance procedures outlined in this manual are not covered by the warranty.

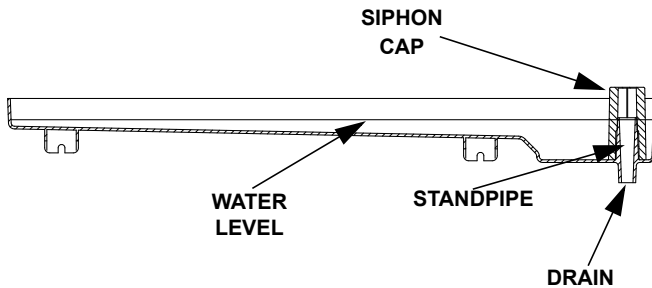
SIPHON SYSTEM

To reduce mineral build-up and cleaning frequency, the water in the sump trough must be purged during each harvest cycle.

When the water pump de-energizes the level in the water trough rises above the standpipe starting a siphon action. The siphon action stops when the water level in the sump trough drops. When the siphon action stops, the float valve refills the water trough to the correct level.

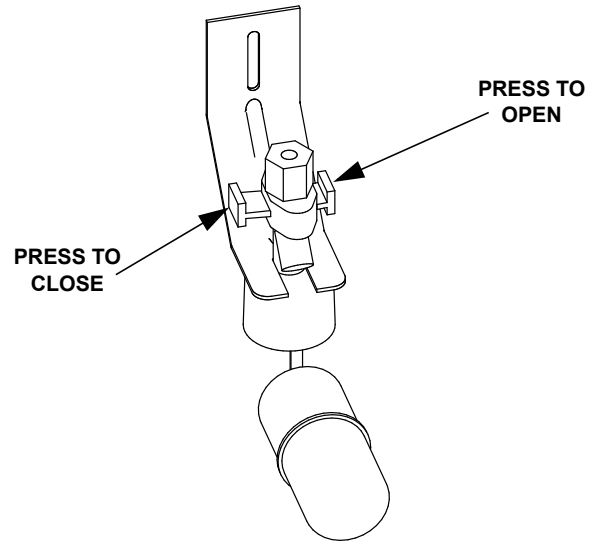
Siphon System Check

Follow steps 1 through 6 under water level check.



WATER FLOAT VALVE CHECK

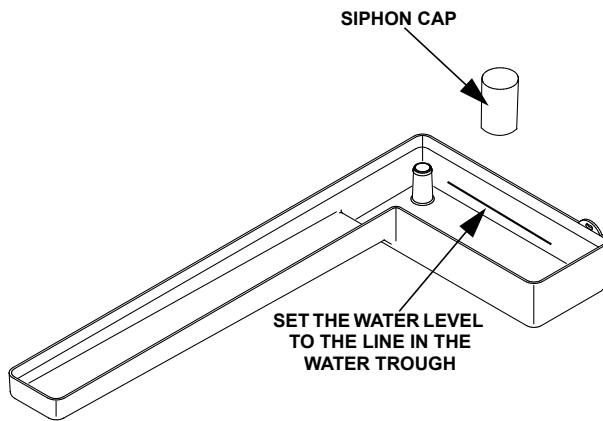
Before water will flow into the water trough the float valve shut-off must be in the OPEN position.



Water Level

WATER LEVEL CHECK

Check the water level while the ice machine is in the ice mode and the water pump is running. The correct water level is 1/4" (6.3mm) to 3/8" (9.5mm) below the top of the standpipe a line in the water trough indicates the correct level.



Water Level

The float valve is factory-set for the proper water level. If adjustments are necessary:

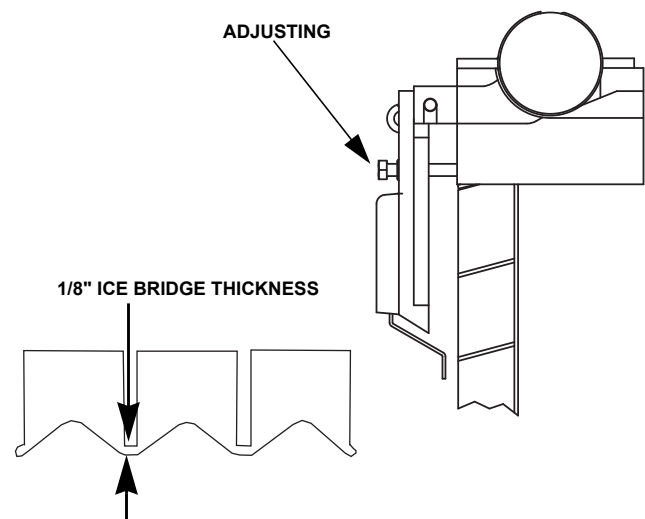
1. Verify the ice machine is level (see page 2-4).
2. Remove the siphon cap from the standpipe.
3. Place the main ON/OFF/WASH toggle switch to the ON position, and wait until the float valve stops adding water.
4. Adjust the water level to (1/4" to 3/8" (6.3 to 9.5 mm) below the standpipe) the line in the water trough:
5. Loosen the two screws on the float valve bracket.
6. Raise or lower the float valve assembly as necessary, then tighten the screws.
7. Move the main ON/OFF/ WASH toggle switch to the OFF position. The water level in the trough will rise above the standpipe and run down the drain.
8. Replace the siphon cap on the standpipe, and verify water level and siphon action by repeating steps 3 through 5.

ICE BRIDGE THICKNESS CHECK

The ice thickness probe is factory-set to maintain the ice bridge thickness at 1/8" (3.2 mm).

1. Inspect the bridge connecting the cubes. It should be about 1/8" (3.2 mm) thick.
2. If adjustment is necessary, turn the ice thickness probe adjustment screw clockwise to increase bridge thickness, or counterclockwise to decrease bridge thickness.

NOTE: Turning the adjustment 1/3 of a turn will change the ice thickness about 1/16" (1.5 mm).



Ice Thickness Check

Make sure the ice thickness probe wire and the bracket do not restrict movement of the probe.


Section 4 Maintenance

Interior Cleaning and Sanitizing

GENERAL


Clean and sanitize the ice machine every six months for efficient operation. If the ice machine requires more frequent cleaning and sanitizing, consult a qualified service company to test the water quality and recommend appropriate water treatment.

The ice machine must be taken apart for cleaning and sanitizing.


 **Caution**

Use only Koolaire approved Ice Machine Cleaner (part number 94-0546-3) and Sanitizer (part number 94-0565-3). It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling. Read and understand all labels printed on bottles before use.

CLEANING AND SANITIZING PROCEDURE

 **Caution**


Do not mix Ice Machine Cleaner and Sanitizer solutions together. It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling.

 **Warning**

Wear rubber gloves and safety goggles (and/or face shield) when handling Ice Machine Cleaner or Sanitizer.

Ice machine cleaner is used to remove lime scale and mineral deposits. Ice machine sanitizer disinfects and removes algae and slime.

Step 1 Set the toggle switch to the OFF position after ice falls from the evaporator at the end of a Harvest cycle. Or, set the switch to the OFF position and allow the ice to melt off the evaporator.

 **Caution**

Never use anything to force ice from the evaporator. Damage may result.


Step 2 Remove all ice from the bin.

Step 3 To start a cleaning cycle, move the toggle switch to the WASH position.

Step 4 Add the proper amount of Ice Machine Cleaner to the water trough.

Model	Amount of Cleaner
K150	2 ounces (60 ml)
K250	2 ounces (60 ml)

Step 5 Wait until the clean cycle is complete (approximately 22 minutes) then place the toggle switch in the OFF position, disconnect power and water supplies to the ice machine.

 **Warning**

Disconnect electric power to the ice machine at the electric switch box before proceeding.

Step 6 Remove parts for cleaning.

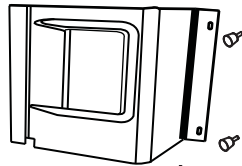
A. Remove Two Thumbscrews and Water Pump Cover (When Used).

B. Remove the Vinyl Hose Connecting the Water Pump and Water Distribution Tube

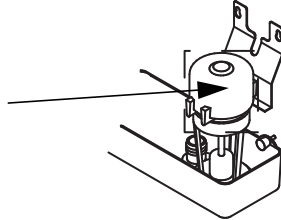
C. Remove Water Pump

- Disconnect the water pump power cord
- Loosen the screws securing the pump-mounting bracket to the bulkhead
- Lift the pump and bracket assembly off the mounting screws..

When Used - REMOVE THUMBSCREWS AND WATER PUMP COVER



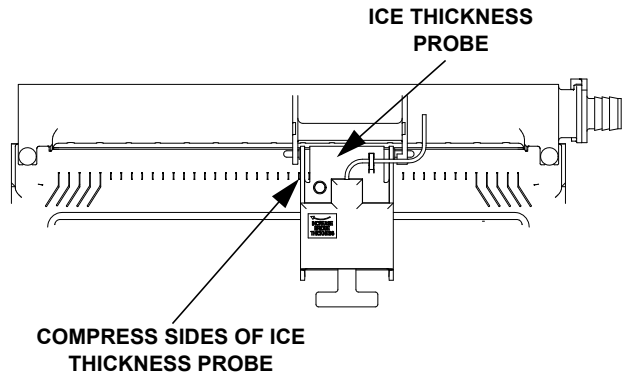
DO NOT SOAK WATER PUMP MOTOR IN CLEANER OR SANITIZER SOLUTIONS



Water Pump Removal

D. Remove the Ice Thickness Probe

- Compress the side of the ice thickness probe near the top hinge pin and remove it from the bracket.



Ice Thickness Probe Removal

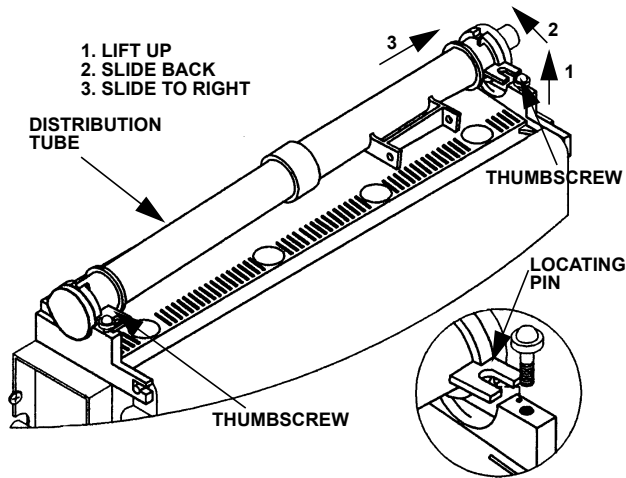
NOTE: At this point, the ice thickness probe can easily be cleaned. If complete removal is desired follow the ice thickness probe wire to the bulkhead grommet (exit point) in the back wall. Pop the bulkhead grommet out of the back wall by inserting fingernails or a flat object between the back wall and the grommet and prying forward. Pull the bulkhead grommet and wire forward until the connector is accessible, then disconnect the wire lead from the connector.

Ice Thickness Probe Cleaning

- Mix a solution of ice machine cleaner and water (2 ounces of cleaner to 16 ounces of water) in a container.
- Soak the ice thickness probe a minimum of 10 minutes.

Clean all ice thickness probe surfaces and verify the ice thickness probe cavity is clean. Rinse thoroughly with clean water, then dry completely. Incomplete rinsing and drying of the ice thickness probe can cause premature harvest.

E. Remove the Water Distribution Tube



K150/K250 Water Distribution Tube Removal

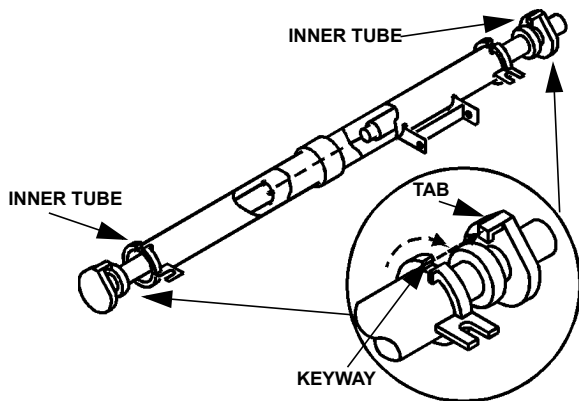
- Loosen the two thumbscrews, which secure the distribution tube.
- Lift the right side of the distribution tube up off the locating pin, then slide it back and to the right.

⚠ Caution

Do not force this removal. Be sure the locating pin is clear of the hole before sliding the distribution tube out.

Disassembly

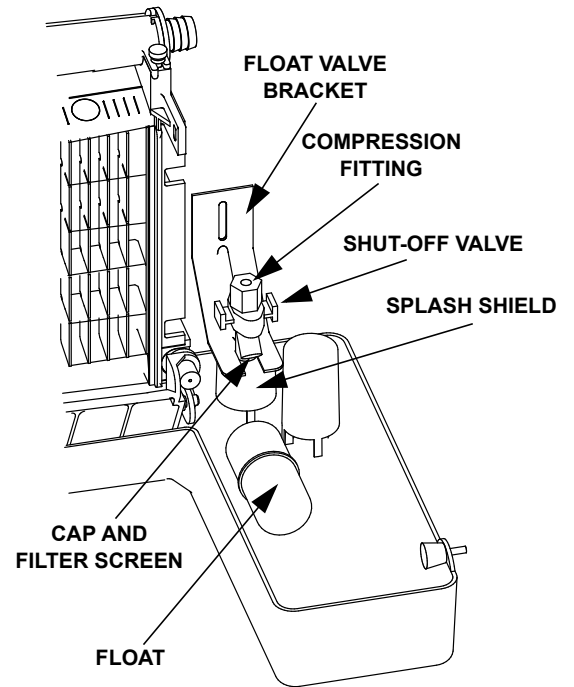
- Twist both of the inner tube ends until the tabs line up with the keyways.
- Pull the inner tube ends outward.



Water Distribution Tube Disassembly

F. Remove the Float Valve

- Turn the splash shield counterclockwise one or two turns.

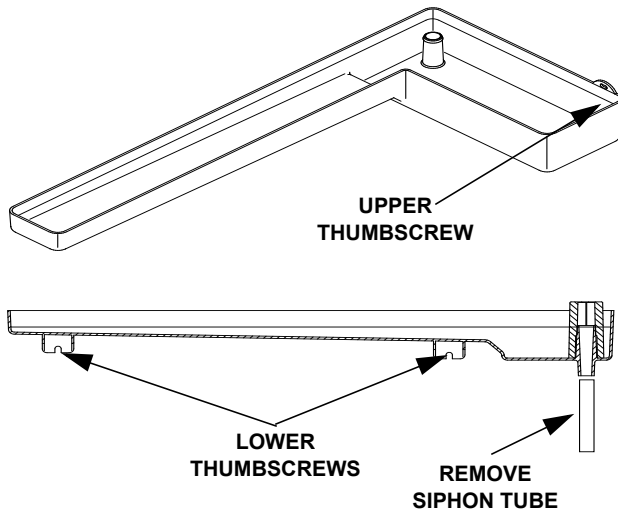


Float Valve Removal

- Pull the float valve forward and off the mounting bracket.
- Disconnect the water inlet tube from the float valve at the compression fitting.
- Remove the cap and filter screen for cleaning.

G. Remove the Water Trough

- Apply downward pressure on the siphon tube and remove from the bottom of the water trough.
- Remove the upper thumbscrew.
- While supporting the water trough remove the two thumbscrews from beneath the water trough.
- Remove the water trough from the bin area.

**H. Remove the ice damper.**

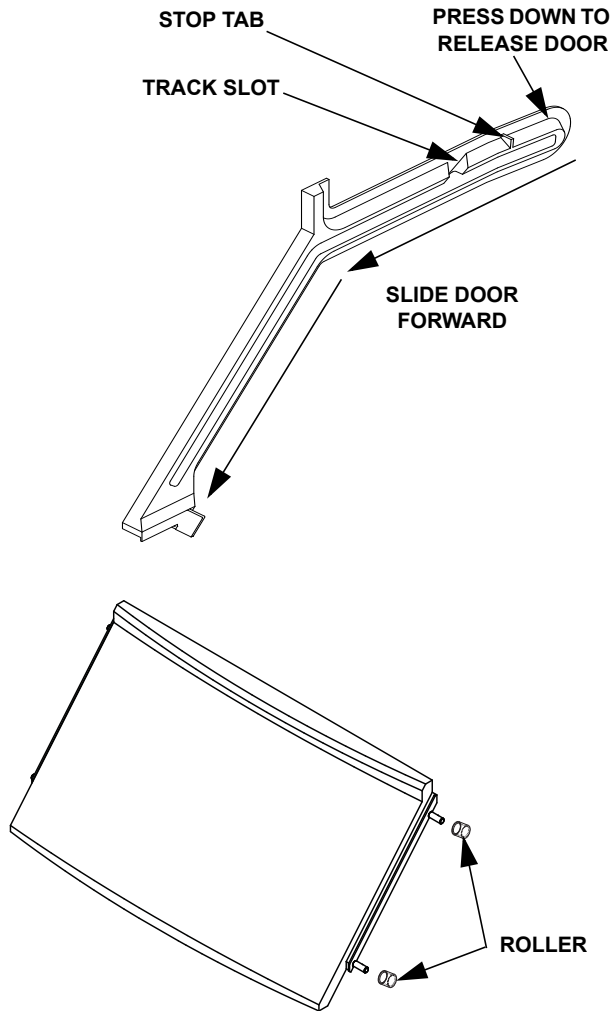
- Grasp ice damper and apply pressure toward the left hand mounting bracket.
- Apply pressure to the right hand mounting bracket with thumb.
- Pull ice damper forward when the right hand ice damper pin disengages.

Installation

- Place ice damper pin in left hand mounting bracket and apply pressure toward the left hand mounting bracket.
- Apply pressure to the right hand mounting bracket with thumb.
- Push ice damper toward evaporator until right hand damper pin engages.

I. Remove the Bin Door

- Grasp the rear of the bin door and pull bin door forward approximately 5".
- Slide bin door to the rear while applying upward pressure (The rear door pins will ride up into the track slot and slide backward to the stop tab).
- While applying pressure against the bin door pull down on the rear of each bin door track until the door pins clear the stop tabs.
- Slide the rear door pins off the end and then below the door track. Slide bin door forward allowing the back of the door to lower into the bin. Continue forward with the bin door until the front pins bottom out in the track.
- Lift right side of door until the front pins clear the track, then remove door from bin.
- Remove rollers (4) from all door pins.



Step 7 Mix a solution of cleaner and warm water. Depending on the amount of mineral buildup, a larger quantity of solution may be required. Use the ratio in the table below to mix enough solution to thoroughly clean all parts.

Solution Type	Water	Mixed with
Cleaner	1 gal. (4 l)	16 oz (500 ml) cleaner

Step 8 Use ½ of the cleaner/water solution to clean all components. The cleaner solution will foam when it contacts lime scale and mineral deposits; once the foaming stops use a soft bristle brush, sponge or cloth (not a wire brush) to carefully clean the parts. Soak the parts for 5 minutes (15 – 20 minutes for heavily scaled parts). Rinse all components with clean water.

Step 9 While components are soaking, use ½ of the cleaner/water solution to clean all foodzone surfaces of the ice machine and bin. Use a nylon brush or cloth to thoroughly clean the following ice machine areas:

- Evaporator plastic parts – including top, bottom and sides
- Bin bottom, sides and top

Rinse all areas thoroughly with clean water.

Step 10 Mix a solution of sanitizer and warm water.

Solution Type	Water	Mixed With
Sanitizer	6 gal. (23 l)	4 oz (120 ml) sanitizer

Step 11 Use 1/2 of the sanitizer/water solution to sanitize all removed components. Use a cloth or sponge to liberally apply the solution to all surfaces of the removed parts or soak the removed parts in the sanitizer/water solution. Do not rinse parts after sanitizing.

Step 12 Use 1/2 of the sanitizer/water solution to sanitize all foodzone surfaces of the ice machine and bin. Use a cloth or sponge to liberally apply the solution. When sanitizing, pay particular attention to the following areas:

- Evaporator plastic parts - including top, bottom and sides
- Bin bottom, sides and top

Do not rinse the sanitized areas.

Step 13 Replace all removed components.

Step 14 Reapply power and water to the ice machine and place the toggle switch in the WASH position.

Step 15 Add the proper amount of Ice Machine Sanitizer to the water trough.

Model	Amount of Sanitizer
K150	2.2 ounces (66 ml)
K250	1.9 ounces (57 ml)

Step 16 Wait until the sanitize cycle is complete (approximately 22 minutes) then place the toggle switch in the OFF position, disconnect power and water supplies to the ice machine.

 Warning Disconnect electric power to the ice machine at the electric switch box before proceeding.

Step 17 Repeat step 6 to remove parts for hand sanitizing.

Step 18 Mix a solution of sanitizer and warm water.

Solution Type	Water	Mixed With
Sanitizer	6 gal. (23 l)	4 oz (120 ml) sanitizer

Step 19 Use 1/2 of the sanitizer/water solution to sanitize all removed components. Use a cloth or sponge to liberally apply the solution to all surfaces of the removed parts or soak the removed parts in the sanitizer/water solution. Do not rinse parts after sanitizing.

Step 20 Use 1/2 of the sanitizer/water solution to sanitize all foodzone surfaces of the ice machine and bin. Use a cloth or sponge to liberally apply the solution. When sanitizing, pay particular attention to the following areas:

- Evaporator plastic parts - including top, bottom and sides
- Bin bottom, sides and top

Do not rinse the sanitized areas.

Step 21 Replace all removed components.

Step 22 Reapply power and water to the ice machine and place the toggle switch in the ICE position.

Ice Machine Inspection

Check all water fittings and lines for leaks. Also, make sure the refrigeration tubing is not rubbing or vibrating against other tubing, panels, etc.

Do not put anything (boxes, etc.) in front of the ice machine. There must be adequate airflow through and around the ice machine to maximize ice production and ensure long component life.

Exterior Cleaning

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

Sponge any dust and dirt off the outside of the ice machine with mild soap and water. Wipe dry with a clean, soft cloth.

A commercial grade stainless steel cleaner/polish can be used as necessary.

Cleaning the Condenser

GENERAL

Warning

Disconnect electric power to the ice machine head section and the remote condensing unit at the electric service switches before cleaning the condenser.

A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces ice production and shortens component life.

- Clean the condenser at least every six months.

Warning

The condenser fins are sharp. Use care when cleaning them.

- Shine a flashlight through the condenser to check for dirt between the fins.
- Blow compressed air or rinse with water from the inside out (opposite direction of airflow).
- If dirt still remains call a service agent to clean the condenser.

Removal from Service/Winterization

1. Clean and sanitize the ice machine.
2. Move the ICE/OFF/CLEAN switch to OFF.
3. Turn off the water supply, disconnect and drain the incoming ice-making water line at the rear of the ice machine and drain the water trough.
4. Energize the ice machine, wait one minute for the water inlet valve to open and blow compressed air in both the incoming water and the drain openings in the rear of the ice machine to remove all water.
5. Move ICE/OFF/CLEAN switch to OFF and disconnect the electric power at the circuit breaker or the electric service switch.
6. Fill spray bottle with sanitizer and spray all interior food zone surfaces. Do not rinse and allow to air dry.
7. Replace all panels.

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Section 5

Customer Support

Checklist

If a problem arises during operation of your ice machine, follow the checklist below before calling service. Routine adjustments and maintenance procedures are not covered by the warranty.

Problem	Possible Cause	To Correct
Ice machine does not operate.	No electrical power to the ice machine.	Replace the fuse/reset the breaker/turn on the main switch/plug power cord into receptacle.
	ON/OFF/WASH toggle switch set improperly.	Move the toggle switch to the ON position.
	Damper in open position (down).	Damper must be in upright position and capable of swinging freely.
Ice machine stops, and can be restarted by moving the toggle switch to OFF and back to ON.	Safety limit feature stopping the ice machine.	Refer to "Safety Limit Feature" on the next page.
Ice machine does not release ice or is slow to harvest.	Ice machine is dirty.	Clean and sanitize the ice machine.
	Ice machine is not level.	Level the ice machine.
	Low air temperature around ice machine (air-cooled models).	Air temperature must be at least 40°F (4°C).
	Water regulating valve leaks in harvest mode (water-cooled models).	Replace water regulating valve.
Ice machine does not cycle into harvest mode.	The six-minute freeze time lock-in has not expired yet.	Wait for freeze lock-in to expire.
	Ice thickness probe is dirty.	Clean and sanitize the ice machine.
	Ice thickness probe wire is disconnected.	Connect the wire.
	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe.
	Uneven ice fill (thin at top of evaporator).	See "Shallow or Incomplete Cubes" on the next page.
Ice quality is poor (soft or not clear).	Poor incoming water quality.	Contact a qualified service company to test the quality of the incoming water and make appropriate filter recommendations.
	Water filtration is poor.	Replace the filter.
	Ice machine is dirty.	Clean and sanitize the ice machine.
	Water siphon is not working.	Check the water siphon system.
	Water softener is working improperly (if applicable).	Repair the water softener.

Continued on next page...

Problem	Possible Cause	To Correct
Ice machine produces shallow or incomplete cubes, or the ice fill pattern on the evaporator is incomplete.	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe.
	Water trough level is too high or too low.	Check the water level.
	Water float valve filter screen is dirty.	Remove and clean the filter screen.
	Water filtration is poor.	Replace the filter.
	Hot incoming water.	Connect the ice machine to a cold water supply.
	Water float valve is not working.	Remove the water float valve and clean it.
	Incorrect incoming water pressure.	Water pressure must be 20-80 psi (137.9 - 551.5 kPA).
	Ice machine is not level.	Level the ice machine.
Low ice capacity.	Water float valve filter screen is dirty.	Remove and clean the filter screen.
	Incoming water supply is shut off.	Open the water service valve.
	Water float valve stuck open or leaking.	Remove the water float valve and clean it.
	The condenser is dirty.	Clean the condenser.
	High air temperature around ice machine (air-cooled models).	Air temperature must not exceed 110°F (43°C).
	Inadequate clearance around the ice machine.	Provide adequate clearance.
	Objects stacked around ice machine, blocking airflow to condenser (air-cooled models).	Remove items blocking airflow.

Safety Limit Feature

In addition to the standard safety controls, such as the high pressure cutout, your Koolaire ice machine features built-in safety limits which will stop the ice machine if conditions arise which could cause a major component failure.

Before calling for service, re-start the ice machine using the following procedure:

1. Move the ON/OFF/WASH switch to OFF and then back to ON.
 - A. If the safety limit feature has stopped the ice machine, it will restart after a short delay. Proceed to step 2.
 - B. If the ice machine does not restart, see "Ice machine does not operate" on the previous page.
2. Allow the ice machine to run to determine if the condition is recurring.
 - A. If the ice machine stops again, the condition has recurred. Call for service.
 - B. If the ice machine continues to run, the condition has corrected itself. Allow the ice machine to continue running.

Commercial Ice Machine Warranty

The Koolaire brand warranty is administered through Manitowoc Ice (hereinafter referred to as the "COMPANY") warrants for a period of thirty six (36) months from the installation date (except as limited below) that new ice machines manufactured by the COMPANY shall be free of defects in material or workmanship under normal and proper use and maintenance as specified by the COMPANY and upon proper installation and start-up in accordance with the instruction manual supplied with the ice machine.

The COMPANY's warranty hereunder with respect to the compressor shall apply for an additional twenty-four months, excluding all labor charges, and with respect to the evaporator for an additional twenty-four months, including labor charges.

The obligation of the COMPANY under this warranty is limited to the repair or replacement of parts, components, or assemblies that in the opinion of the COMPANY are defective. This warranty is further limited to the cost of parts, components or assemblies and standard straight time labor charges at the servicing location.

Time and hourly rate schedules, as published from time to time by the COMPANY, apply to all service procedures. Additional expenses including without limitation, travel time, overtime premium, material cost, accessing or removal of the ice machine, or shipping are the responsibility of the owner, along with all maintenance, adjustments, cleaning, and ice purchases. Labor covered under this warranty must be performed by a COMPANY Contracted Service Representative or a refrigeration service agency as qualified and authorized by the COMPANY's local Distributor. The COMPANY's liability under this warranty shall in no event be greater than the actual purchase price paid by customer for the ice machine.

The foregoing warranty shall not apply to (1) any part or assembly that has been altered, modified, or changed; (2) any part or assembly that has been subjected to misuse, abuse, neglect, or accidents; (3) any ice machine that has been installed and/or maintained inconsistent with the technical instructions provided by the COMPANY; or (4) any ice machine initially installed more than five years from the serial number production date. This warranty shall not apply if the Ice Machine's refrigeration system is modified with a condenser, heat reclaim device, or parts and assemblies other than those manufactured by the COMPANY, unless the COMPANY approves these modifications for specific locations in writing.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. In no event shall the COMPANY be liable for any special, indirect, incidental or consequential damages. Upon the expiration of the warranty period, the Company's liability under this warranty shall terminate. The foregoing warranty shall constitute the sole liability of the COMPANY and the exclusive remedy of the customer or user.

To secure prompt and continuing warranty service, the warranty registration card must be completed and sent to the COMPANY within five (5) days from the installation date.

Complete the following and retain for your record:

Distributor/Dealer _____
Model Number Serial Number _____
Installation Date _____

Manitowoc Foodservice-Ice Machine Division
2110 South 26th Street, P.O. Box 1720
Manitowoc, WI 54221-1720
Telephone: 920-682-0161
Fax: 920-683-7585 Website: www.kool-aire.com

Residential Ice Machine Limited Warranty

WHAT DOES THIS LIMITED WARRANTY COVER?

Subject to the exclusions and limitations below, Manitowoc Foodservice (“Manitowoc”) warrants to the original consumer that any new ice machine manufactured by Manitowoc (the “Product”) shall be free of defects in material or workmanship for the warranty period outlined below under normal use and maintenance, and upon proper installation and start-up in accordance with the instruction manual supplied with the Product.

HOW LONG DOES THIS LIMITED WARRANTY LAST?

<u>Product Covered</u>	<u>Warranty Period</u>
Ice Machine	Twelve (12) months from the sale date

WHO IS COVERED BY THIS LIMITED WARRANTY?

This limited warranty only applies to the original consumer of the Product and is not transferable.

WHAT ARE MANITOWOC ICE’S OBLIGATIONS UNDER THIS LIMITED WARRANTY?

If a defect arises and Manitowoc receives a valid warranty claim prior to the expiration of the warranty period, Manitowoc shall, at its option: (1) repair the Product at Manitowoc’s cost, including standard straight time labor charges, (2) replace the Product with one that is new or at least as functionally equivalent as the original, or (3) refund the purchase price for the Product. Replacement parts are warranted for 90 days or the balance of the original warranty period, whichever is longer. The foregoing constitutes Manitowoc’s sole obligation and the consumer’s exclusive remedy for any breach of this limited warranty. Manitowoc’s liability under this limited warranty is limited to the purchase price of Product. Additional expenses including, without limitation, service travel time, overtime or premium labor charges, accessing or removing the Product, or shipping are the responsibility of the consumer.

HOW TO OBTAIN WARRANTY SERVICE

To obtain warranty service or information regarding your Koolaire product, please contact:

MANITOWOC ICE
2110 So. 26th St.
P.O. Box 1720,
Manitowoc, WI 54221-1720
Telephone: 920-682-0161 Fax: 920-683-7585
www.kool-aire.com

WHAT IS NOT COVERED?

This limited warranty does not cover, and you are solely responsible for the costs of: (1) periodic or routine maintenance, (2) repair or replacement of the Product or parts due to normal wear and tear, (3) defects or damage to the Product or parts resulting from misuse, abuse, neglect, or accidents, (4) defects or damage to the Product or parts resulting from improper or unauthorized alterations, modifications, or changes; and (5) defects or damage to any Product that has not been installed and/or maintained in accordance with the instruction manual or technical instructions provided by Manitowoc. To the extent that warranty exclusions are not permitted under some state laws, these exclusions may not apply to you.

EXCEPT AS STATED IN THE FOLLOWING SENTENCE, THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY OF MANITOWOC WITH REGARD TO THE PRODUCT. ALL IMPLIED WARRANTIES ARE STRICTLY LIMITED TO THE DURATION OF THE LIMITED WARRANTY APPLICABLE TO THE PRODUCTS AS STATED ABOVE, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

IN NO EVENT SHALL MANITOWOC OR ANY OF ITS AFFILIATES BE LIABLE TO THE CONSUMER OR ANY OTHER PERSON FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND (INCLUDING, WITHOUT LIMITATION, LOSS PROFITS, REVENUE OR BUSINESS) ARISING FROM OR IN ANY MANNER CONNECTED WITH THE PRODUCT, ANY BREACH OF THIS LIMITED WARRANTY, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

HOW STATE LAW APPLIES

This limited warranty gives you specific legal rights, and you may also have rights that vary from state to state or from one jurisdiction to another.

REGISTRATION CARD

To secure prompt and continuing warranty service, this warranty registration card must be completed and sent to Manitowoc within thirty (30) days from the sale date. Complete the following registration card and send it to Manitowoc.

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