



Manitowoc®



S1400M Model Ice Machines

Installation Use and Care Manual

Thank you for selecting a Manitowoc Ice Machine, the dependability leader in ice making equipment and related products. With proper installation, care and maintenance, your new Manitowoc Ice Machine will provide you with many years of reliable and economical performance.

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

Part Number 80-1631-3
05/2005

Safety Notices

As you work on an S Model Series Ice Machine, be sure to pay close attention to the safety notices in this manual. Disregarding the notices may lead to serious injury and/or damage to the ice machine.

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

Warning

PERSONAL INJURY POTENTIAL

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

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 ice machine. Be sure to read the Caution statement before proceeding, and work carefully.

Procedural Notices

As you work on an S Model Series Ice Machine, be sure to read the procedural notices in this manual. These notices supply helpful information which may assist you as you work.

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

Important

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

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

Read These Before Proceeding:

Caution

Proper installation, care and maintenance are essential for maximum ice production and trouble-free operation of your Manitowoc Ice Machine. Read and understand this manual. It contains valuable care and maintenance information. If you encounter problems not covered by this manual, do not proceed, contact Manitowoc Ice, Inc. We will be happy to provide assistance.

Important

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

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Section 1 General Information

Model Numbers

This manual covers the following models:

Self-Contained Water-Cooled
SD1403WM SY1405WM

NOTE: Model numbers ending in 3 indicate a 3-phase unit. Example: SY1405WM3

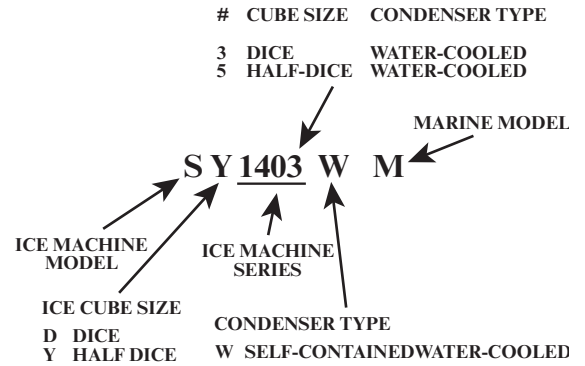
⚠ Warning
PERSONAL INJURY POTENTIAL

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

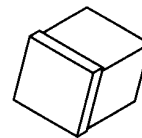
⚠ Warning
PERSONAL INJURY POTENTIAL

Remove all ice machine panels before lifting and installing.

How to Read a Model Number

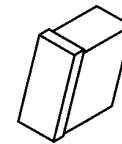


Ice Cube Sizes



Dice

7/8" x 7/8" x 7/8"
2.22 x 2.22 x 2.22 cm



Half Dice

3/8" x 1-1/8" x 7/8"
0.95 x 2.86 x 2.22 cm

Accessories

Contact your Manitowoc distributor for these optional accessories:

BIN CASTER

Replaces standard legs.

ICE BAGGER

Maximize profits from bagged ice sales with this convenient accessory. This sturdy unit rests on the bin door frame, and adapts for left or right side filling.

GUARDIAN™ SACHET PACKETS

Guardian sachet packets release chlorine dioxide on a controlled basis to inhibit the growth of bacteria and slime.

Guardian sachet packets are available through your local Manitowoc Ice Machine dealer.

ARCTIC PURE™ WATER FILTER SYSTEM

Engineered specifically for Manitowoc ice machines, This water filter is an efficient, dependable, and affordable method of inhibiting scale formation, filtering sediment, and removing chlorine taste and odor.

MANITOWOC CLEANER AND SANITIZER

Manitowoc Ice Machine Cleaner and Sanitizer are available in convenient 16 oz. (473 ml) bottles. These are the only cleaner and sanitizer approved for use with Manitowoc products.

Cleaner Part Number	Sanitizer Part Number
16 ounce Bottle - 94-0546-3	16 ounce Bottle - 94-0565-3
AuCS®-SO - 94-0546-3	AuCS®-SO - 94-0565-3
AuCS®-SI - 40-1326-3	AuCS®-SI - 40-1327-3

AUCS® AUTOMATIC CLEANING SYSTEM

This accessory reduces equipment cleaning expense. The AuCS® accessory monitors ice making cycles and initiates cleaning procedures automatically.

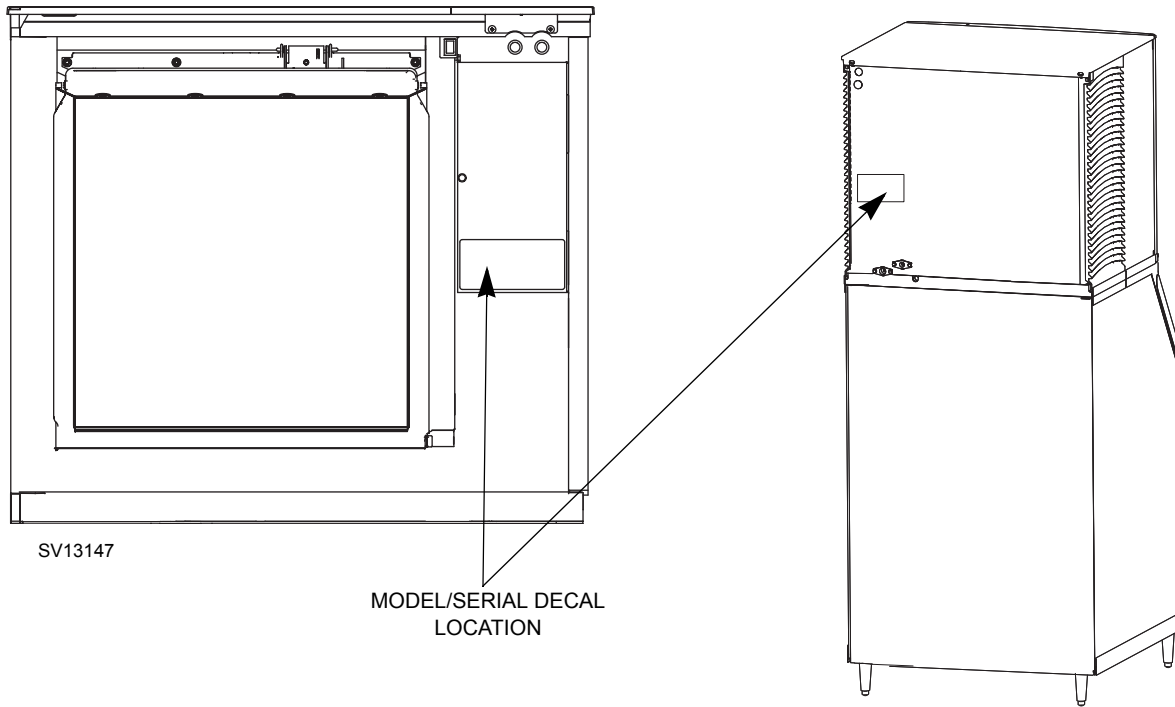
DISPENSER

A counter-top dispenser is ideal for cafeterias and many types of self-service facilities. Manitowoc auto-fill, floor-standing ice dispensers meet the strict sanitary requirements of the food service, lodging and health care industries.

Model/Serial Number Location

These numbers are required when requesting information from your local Manitowoc distributor, or Manitowoc Ice, Inc.

The model and serial number are listed on the MODEL/SERIAL NUMBER DECAL affixed to the ice machine, remote condenser and storage bin.



Model/Serial Number Location

Owner Warranty Registration Card

GENERAL

The packet containing this manual also includes warranty information. Warranty coverage begins the day your new ice machine is installed.

Important

Complete and mail the OWNER WARRANTY REGISTRATION CARD as soon as possible to validate the installation date.

If you do not return your OWNER WARRANTY REGISTRATION CARD, Manitowoc will use the date of sale to the Manitowoc Distributor as the first day of warranty coverage for your new ice machine.

Warranty Coverage

GENERAL

The following Warranty outline is provided for your convenience. For a detailed explanation, read the warranty bond shipped with each product.

Contact your local Manitowoc Distributor, Manitowoc Ice, Inc. or visit our website at www.manitowocice.com if you need further warranty information.

Important

This product is intended exclusively for commercial application. No warranty is extended for personal, family, or household purposes.

PARTS

1. Manitowoc warrants the ice machine against defects in materials and workmanship, under normal use and service for three (3) years from the date of original installation.
2. The evaporator and compressor are covered by an additional two (2) year (five years total) warranty beginning on the date of the original installation.

LABOR

1. Labor required to repair or replace defective components is covered for three (3) years from the date of original installation.
2. The evaporator is covered by an additional two (2) year (five years total) labor warranty beginning on the date of the original installation.

EXCLUSIONS

The following items are **not** included in the ice machine's warranty coverage:

1. **Normal maintenance, adjustments and cleaning.**
2. Repairs due to **unauthorized modifications** to the ice machine or **use of non-standard parts** without prior written approval from Manitowoc Ice, Inc.
3. Damage caused by **improper installation** of the ice machine, electrical supply, water supply or drainage, or damage caused by floods, storms, or other acts of God.
4. **Premium labor rates** due to holidays, **overtime**, etc.; travel time; flat rate service call charges; mileage and miscellaneous tools and material charges not listed on the payment schedule. Additional labor charges **resulting from the inaccessibility of equipment** are also excluded.
5. Parts or assemblies subjected to **misuse, abuse, neglect or accidents.**
6. **Damage or problems** caused by installation, cleaning and/or maintenance **procedures inconsistent with the technical instructions provided in this manual.**
7. **This product is intended exclusively for commercial application.** No warranty is extended for personal, family, or household purposes.

AUTHORIZED WARRANTY SERVICE

To comply with the provisions of the warranty, a **refrigeration service company qualified and authorized by a Manitowoc distributor, or a Contracted Service Representative must perform the warranty repair.**

NOTE: If the dealer you purchased the ice machine from is not authorized to perform warranty service, contact your Manitowoc distributor or Manitowoc Ice, Inc. for the name of the nearest authorized service representative.

Service Calls

Normal maintenance, adjustments and cleaning as outlined in this manual are not covered by the warranty. If you have followed the procedures listed on page 5-1 of this manual, and the ice machine still does not perform properly, call your authorized service company.

Section 2 Installation Instructions

General

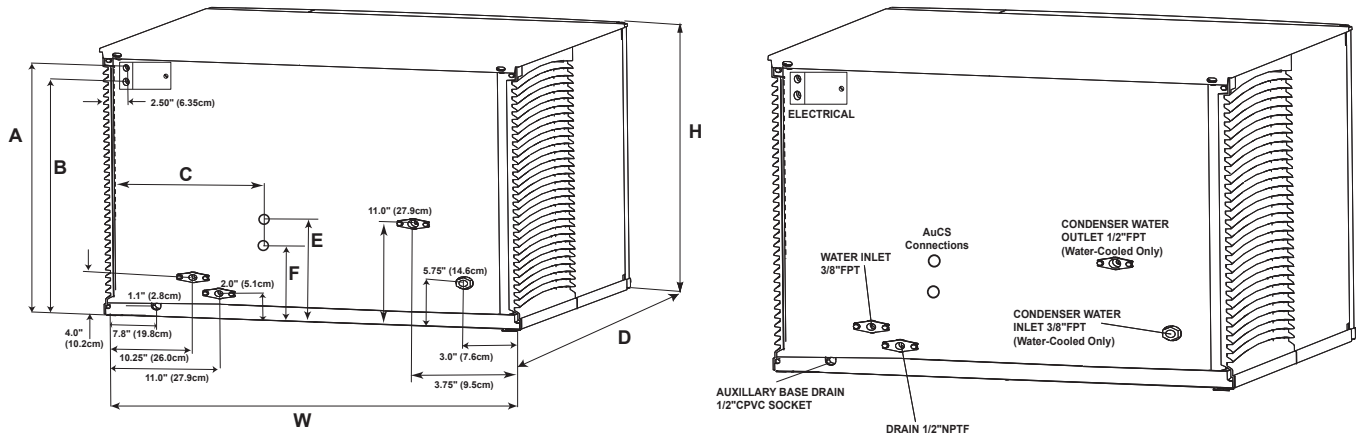
These instructions are provided to assist the qualified installer. Check your local Yellow Pages for the name of the nearest Manitowoc distributor, or call Manitowoc Ice, Inc. for information regarding start-up services.

Important

Failure to follow these installation guidelines may affect warranty coverage.

Ice Machine Dimensions

S1400M WATER-COOLED ICE MACHINES



Width, Depth, and Height Dimensions

Ice Machine	Dimension W	Dimension D	Dimension H
S1400M	48 in. (121.9 cm)	24.5 in. (62.2 cm)	29.5 in (74.9 cm)

Electrical and AuCS Dimensions

Ice Machine	Electrical		AuCS		
	Dimension A	Dimension B	Dimension C	Dimension E	Dimension F
S1400M	22.75 in (57.8 cm)	22.25 in (56.5 cm)	14.0 in (35.6 cm)	9.5 in (24.1 cm)	7.5 in (19.1 cm)

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 free of airborne and other contaminants.
- The air temperature must be at least 35°F (1.6°C), but must not exceed 110°F (43.4°C).
- The location must not be near heat-generating equipment or in direct sunlight and must be protected from weather.
- The location must not obstruct air flow through or around the ice machine. Refer to the chart below for clearance requirements.

S1400M	Water-Cooled*
Top/Sides	8" (20.3 cm)
Back	5" (12.7 cm)

*There is no minimum clearance required for water-cooled or remote ice machines. This value is 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".

Ice Machine Heat of Rejection

Series Ice Machine	Heat of Rejection	
	Air Conditioning	Peak
S1400M	19000	28000

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.

This information is also necessary when evaluating the benefits of using water-cooled or remote condensers to reduce air conditioning loads. The amount of heat added to an air conditioned environment by an ice machine using a water-cooled or remote condenser is negligible.

Knowing the amount of heat rejected is also important when sizing a cooling tower for a water-cooled condenser. Use the peak figure for sizing the cooling tower.

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 at ice machine start-up (when the electrical load is highest).

⚠ Warning

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

Important

Observe correct polarity of incoming line voltage.

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).

MINIMUM CIRCUIT AMPACITY

The minimum circuit ampacity is used to help select the wire size of the electrical supply. (Minimum circuit ampacity is not the ice machine's running amp load.)

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.

ELECTRICAL REQUIREMENTS

Refer to Ice Machine Model/Serial Plate for voltage/ amperage specifications.

S Series Ice Machines (* indicates preliminary data)

Ice Machine	Voltage Phase Cycle	Water Cooled	
		Maximum Fuse/Circuit Breaker	Minimum Circuit Amps
S1400M	208-230/1/60	30*	18.1*
	208-230/3/60	20*	11.6*
	230/1/50	30*	14.3*

Self-Contained Electrical Wiring Connections

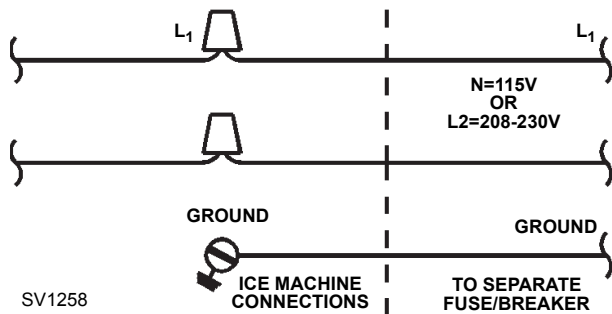
Warning

These diagrams are not intended to show proper wire routing, wire sizing, disconnects, etc., only the correct wire connections.

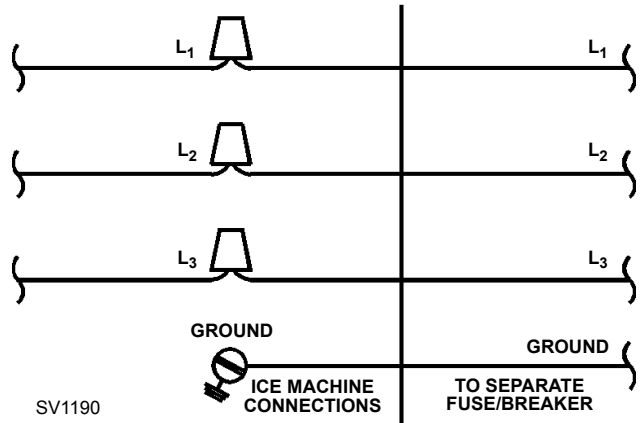
All electrical work, including wire routing and grounding, must conform to local, state and national electrical codes.

Though wire nuts are shown in the drawings, the ice machine field wiring connections may use either wire nuts or screw terminals.

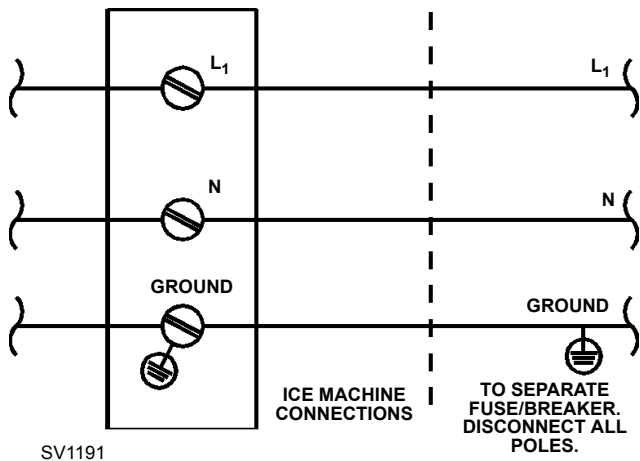
**SELF CONTAINED ICE MACHINE
115/1/60 OR 208-230/1/60**



**SELF CONTAINED ICE MACHINE
208-230/3/60**




**SELF CONTAINED ICE MACHINE
230/1/50**



For United Kingdom Only

As the colors of the wires in the mains lead of the appliance may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:

- The wire which is colored green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth ground symbol  or colored green or green and yellow.
- The wire colored blue must be connected to the terminal which is marked with the letter N or colored black.
- The wire colored brown must be connected to the terminal which is marked with the letter L or colored red.

Water Supply and Drain Requirements

WATER SUPPLY

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

Important

If you are installing a Manitowoc Arctic Pure™ 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 recommended pressure, obtain a water pressure regulator from your Manitowoc distributor.
- Install a water shut-off valve for both the ice making and condenser water lines.
- Insulate water inlet lines to prevent condensation.

Caution

Do not apply heat to water valve inlet fitting. This will damage plastic valve body.

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 ice machine drain lines. Insulate them to prevent condensation.
- Vent the bin and ice machine drain to the atmosphere. Do not vent the condenser drain on water-cooled models.

Cooling Tower Applications

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.

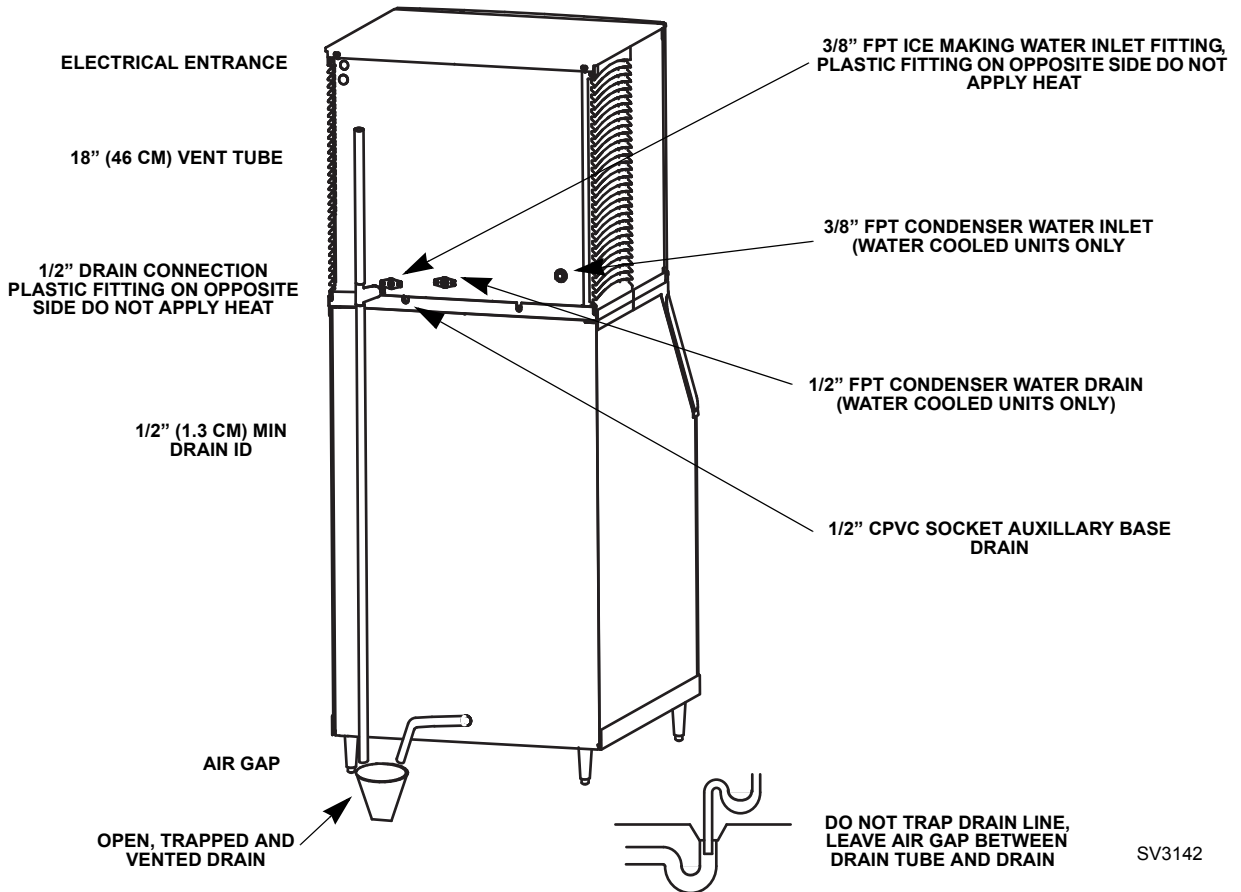
It is necessary to know the amount of heat rejection, and the pressure drop through the condenser and water valves (inlet and outlet) when using a cooling tower on an ice machine.

- Water entering the condenser must not exceed 90°F (32.2°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 (43.3°C).

WATER SUPPLY AND DRAIN LINE SIZING/CONNECTIONS

⚠ Caution
Plumbing must conform to state and local codes.

Location	Water Temperature	Water Pressure	Ice Machine Fitting	Tubing Size Up to Ice Machine Fitting
Ice Making Water Inlet	35°F (1.6°C) Min. 90°F (32.2°C) Max.	20 psi (137.9 kPA) Min. 80 psi (551.5 kPA) Max.	3/8" Female Pipe Thread	3/8" (.95 cm) minimum inside diameter
Ice Making Water Drain	---	---	1/2" Female Pipe Thread	1/2" (1.27 cm) minimum inside diameter
Condenser Water Inlet	40°F (4.4°C) Min. 90°F (32.2°C) Max.	20 psi (137.9 kPA) Min. 150 psi (1034.2 kPA) Max.	3/8" Female Pipe Thread	
Condenser Water Drain	---	---	1/2" Female Pipe Thread	1/2" (1.27 cm) minimum inside diameter
Bin Drain	---	---	3/4" Female Pipe Thread	3/4" (1.91 cm) minimum inside diameter



Installation Check List

- | | | | |
|--------------------------|---|--------------------------|--|
| <input type="checkbox"/> | Is the Ice Machine level? | <input type="checkbox"/> | Are the ice machine and bin drains vented? |
| <input type="checkbox"/> | Has all of the internal packing been removed? | <input type="checkbox"/> | Are all electrical leads free from contact with refrigeration lines and moving equipment? |
| <input type="checkbox"/> | Have all of the electrical and water connections been made? | <input type="checkbox"/> | Has the owner/operator been instructed regarding maintenance and the use of Manitowoc Cleaner and Sanitizer? |
| <input type="checkbox"/> | Has the supply voltage been tested and checked against the rating on the nameplate? | <input type="checkbox"/> | Has the owner/operator completed the warranty registration card? |
| <input type="checkbox"/> | Is there proper clearance around the ice machine for air circulation? | <input type="checkbox"/> | Has the ice machine and bin been sanitized? |
| <input type="checkbox"/> | Has the ice machine been installed where ambient temperatures will remain in the range of 35° - 110°F (1.6° - 43.3°C)? | <input type="checkbox"/> | Is the toggle switch set to ice? (The toggle switch is located directly behind the front panel). |
| <input type="checkbox"/> | Has the ice machine been installed where the incoming water temperature will remain in the range of 35° - 90°F (1.6° - 32.2°C)? | <input type="checkbox"/> | Is the ice thickness control set correctly? (Refer to Operational Checks to check/set the correct ice bridge thickness). |
| <input type="checkbox"/> | Is there a separate drain for the water-cooled condenser? | | |
| <input type="checkbox"/> | Is there a separate drain for the bin? | | |

Before Starting the Ice Machine

All Manitowoc 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.

AuCS® Automatic Cleaning System

This optional accessory monitors ice making cycles and initiates cleaning procedures automatically. The AuCS® accessory can be set to automatically clean or sanitize the ice machine every 2, 4 or 12 weeks. Refer to the AuCS® Installation, Use and Care Manual for details.



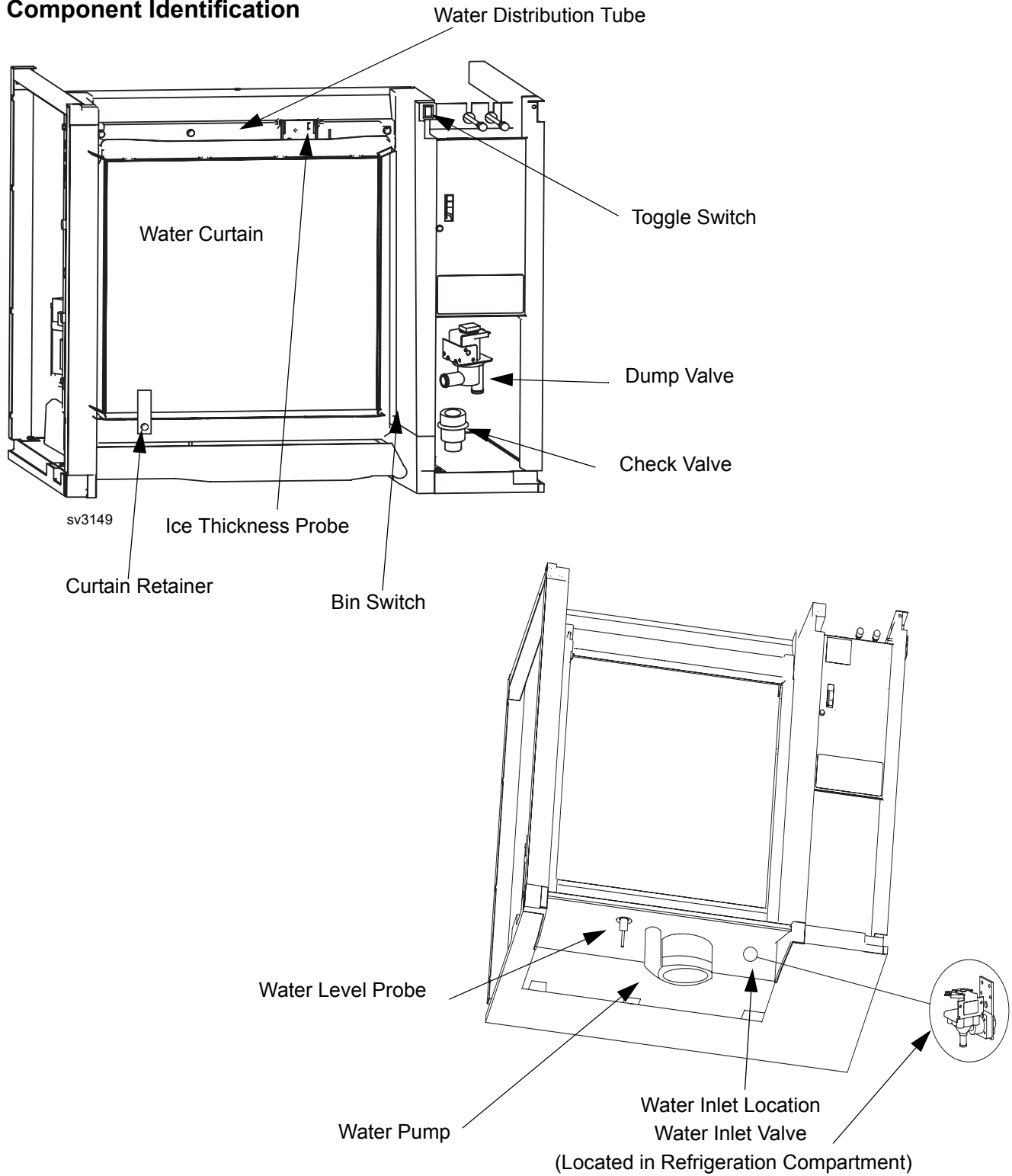
Warning

Potential Personal Injury Situation

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

Section 3 Ice Machine Operation

Component Identification



Sequence Of Operation

NOTE: The toggle switch must be in the ice position and the water curtain must be in place on the evaporator before the ice machine will start.

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

1. Water Purge

Before the compressor starts, the water pump and water dump solenoid are energized for 45 seconds, to completely purge the ice machine of old water. This feature ensures that the ice making cycle starts with fresh water.

The harvest valve(s) is also energized during water purge, although it stays on for an additional 5 seconds (50 seconds total on time) during the initial refrigeration system start-up.

2. Refrigeration System Start-Up

The compressor starts after the 45 second water purge, and it remains on throughout the entire Freeze and Harvest Sequences. The water fill valve is energized at the same time as the compressor. The harvest valve(s) 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 contactor. As a result, anytime the contactor coil is energized, the compressor and fan motor are supplied with power.)

FREEZE SEQUENCE

3. Prechill

The compressor is on for 30 seconds (60 seconds initial cycle) prior to water flow, to prechill the evaporator. The water fill valve remains on until the water level probe is satisfied.

4. Freeze

The water pump restarts after the prechill. An even flow of water is directed across the evaporator and into each cube cell, where it freezes. The water fill valve will cycle on and then off one more time to refill the water trough.

When sufficient ice has formed, the water flow (not the ice) contacts the ice thickness probe. After approximately 10 seconds of continual water contact, the harvest sequence is initiated. The ice machine cannot initiate a harvest sequence until a 6 minute freeze lock has been surpassed.

NOTE: Freeze lock is bypassed after moving the toggle switch from OFF to ICE position for the first cycle only.

HARVEST SEQUENCE

5. Water Purge

The harvest valve(s) opens at the beginning of the water purge to divert hot refrigerant gas into the evaporator.

The water pump continues to run, and the water dump valve energizes for 45 seconds to purge the water in the sump trough. The water fill valve energizes (turns on) and de-energizes (turns off) strictly by time. The water fill valve energizes for the last 15 seconds of the 45-second water purge.

After the 45 second water purge, the water fill valve, water pump and dump valve de-energize. (Refer to "Water Purge Adjustment" for details.)

6. Harvest

The harvest valve(s) remains open and 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 swings the water curtain out, 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 (Step 3 - 4.)

When Used - The air compressor energizes after 35 seconds and remains energized throughout the entire harvest cycle. The air compressor will automatically energize for 60 seconds when the harvest cycle time exceeded 75 seconds in the previous cycle.

AUTOMATIC SHUT-OFF

7. Automatic Shut-Off

When the storage bin is full at the end of a harvest sequence, the sheet of cubes fails to clear the water curtain and will hold it open. After the water curtain is held open for 30 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 water curtain. As the water curtain 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.

SAFETY TIMERS

The control board has the following non-adjustable safety timers:

- The ice machine is locked into the freeze cycle for 6 minutes before a harvest cycle can be initiated. Freeze lock is bypassed after moving the toggle switch from OFF to ICE position for the first cycle only.
- The maximum freeze time is 60 minutes at which time the control board automatically initiates a harvest sequence (steps 5 & 6).
- The maximum harvest time is 3.5 minutes at which time the control board automatically initiates a freeze sequence (steps 3 & 4).

WARM WATER RINSE CYCLE

Closing the back of the evaporator allows ice to build up on the rear of the evaporator and the plastic evaporator frame parts. After 200 freeze/harvest cycles have been complete the control board will initiate a warm water rinse.

After the 200th harvest cycle ends:

- The Clean and Harvest LED's energize to indicate the ice machine is in a warm water rinse.
- The compressor and harvest valve remain energized.
- The water pump energizes.
- The water inlet valve energizes until water contacts the water level probe.
- The compressor and harvest valve warm the water for 5 minutes, then de-energize.
- The water pump remains energized for an additional 5 minutes (10 minute total on time) then de-energizes.

NOTE: The warm water rinse cycle can be terminated by moving the toggle switch to the OFF position, then back to ICE.

Operational Checks

GENERAL

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

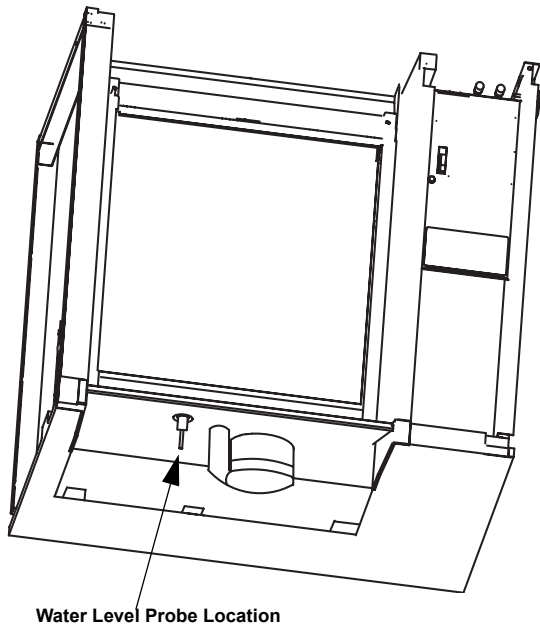
To ensure proper operation, always follow the Operational Checks:

- when starting the ice machine for the first time
- after a prolonged out of service period
- after cleaning and sanitizing

NOTE: Routine adjustments and maintenance procedures are not covered by the warranty.

WATER LEVEL

The water level sensor is set to maintain the proper water level above the water pump housing. The water level is not adjustable. If the water level is incorrect, check the water level probe for damage (probe bent, etc.). Clean the water level probe with ice machine cleaner, rinse thoroughly and re-check operation. Repair or replace the probe as necessary.

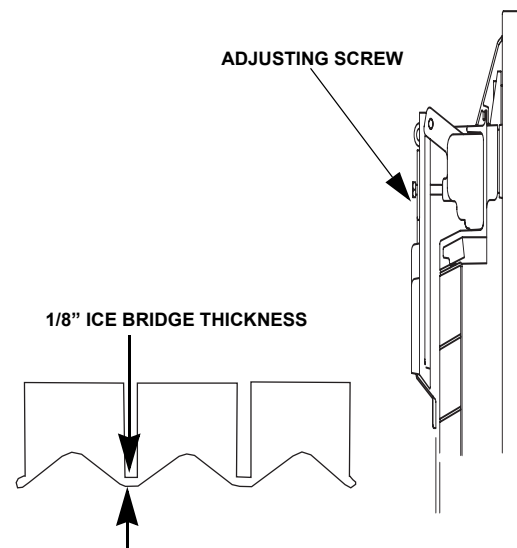


ICE THICKNESS CHECK

The ice thickness probe is factory-set to maintain the ice bridge thickness at 1/8" (.32 cm).

NOTE: Make sure the water curtain is in place when performing this check. It prevents water from splashing out of the water trough.

1. Inspect the bridge connecting the cubes. It should be about 1/8" (.32 cm) thick.
2. If adjustment is necessary, turn the ice thickness probe adjustment screw clockwise to increase bridge thickness, counterclockwise to decrease bridge thickness. Set at 1/4" gap between ice machine and evaporator as starting point, then adjust to achieve a 1/8" bridge thickness.



SV3132

Ice Thickness Check

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

HARVEST SEQUENCE WATER PURGE

The harvest sequence water purge adjustment may be used when the ice machine is hooked up to special water systems, such as a de-ionized water treatment system.

Warning

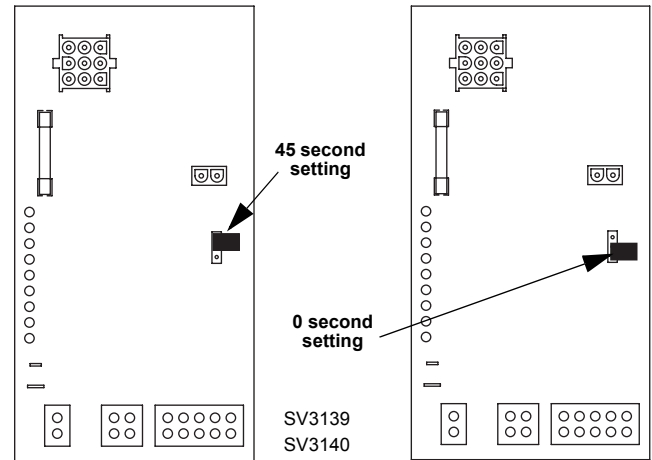
Disconnect electric power to the ice machine at the electrical disconnect before proceeding.

Important

The harvest sequence water purge is factory-set at 45 seconds. A shorter purge setting (with standard water supplies such as city water) is not recommended. This can increase water system cleaning and sanitizing requirements.

- The harvest sequence water purge is factory set for 45 seconds. Repositioning the jumper will set the harvest water purge to 0 seconds. This setting does not affect the SeCs or AuCs (cleaning) sequences.

- During the harvest sequence water purge, the water fill valve energizes and de-energizes by time. The water purge must be at the factory setting of 45 seconds for the water fill valve to energize during the last 15 seconds of the water purge. If it is set to less than 45 seconds, the water fill valve will not energize during the water purge.



Water Purge Adjustment

For your safety and to eliminate errors, we recommend that a qualified service technician make the harvest water purge adjustment.

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Section 4 Maintenance

General

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

 **Warning**

If you do not understand the procedures or the safety precautions that must be followed, call your local Manitowoc service representative to perform the maintenance procedures for you.

We recommend that you perform the following maintenance procedures a minimum of once every six months to ensure reliable, trouble-free operation and maximum ice production.

Ice Machine Inspection

 **Warning**

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

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.) on the sides or back 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. Use cleaners designed for use with stainless steel products.

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

Heavy stains should be removed with stainless steel wool. Never use plain steel wool or abrasive pads. They will scratch the panels.

Water-Cooled Condenser and Water Regulating Valve

Symptoms of restrictions in the condenser water circuit include:

- Low ice production
- High water consumption
- High operating temperatures
- High operating pressures

If the ice machine is experiencing any of these symptoms, the water-cooled condenser and water regulating valve may require cleaning due to scale build-up.

Because the cleaning procedures require special pumps and cleaning solutions, qualified maintenance or service personnel must perform them.

AlphaSan®

The goal of AlphaSan® is to keep the plastic surfaces of an ice machine cleaner, by reducing or delaying the formation of bio-film. The active ingredient in AlphaSan® is the element silver in the form of silver ions (Ag+). AlphaSan® slowly releases silver ions via an ion exchange mechanism. When AlphaSan® is compounded directly into a plastic part, a controlled release of silver ions from the surface is regulated to maintain an effective concentration at or near the surface of the plastic ice machine part. AlphaSan's® unique ability to effectively control the release of silver not only protects against undesired discoloration of the plastic, but also will last the life of the plastic part. Although AlphaSan® helps prevent bio-film build up it does not eliminate the need for periodic cleaning and maintenance. AlphaSan® has no adverse effect on the taste of the ice or beverage.

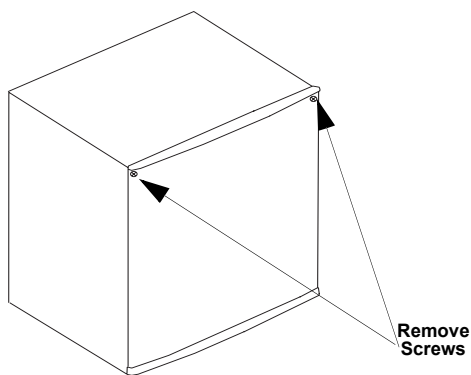
Guardian™

Slime is a leading cause of ice machine breakdowns and biological growth is a health concern. The Guardian™ system releases chlorine dioxide on a controlled basis to inhibit the growth of bacteria and fungi that form slime and cause malodors in the food zone of ice machines. The Guardian™ will not control mineral or other water borne buildup. Your water quality will determine the length of time before mineral buildup affects ice machine performance. Mineral buildup must be removed as often as necessary to ensure trouble-free operation of the ice machine.

INSTALLATION

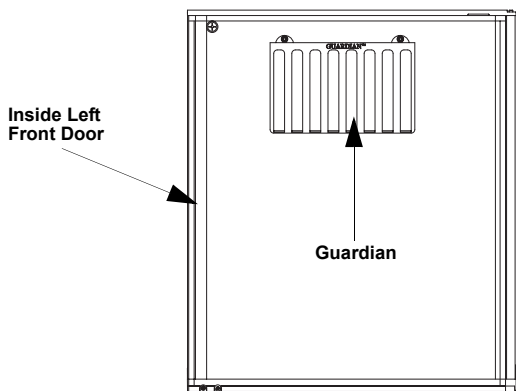
If the Guardian system has been ordered, install the sachet holder in the inside of the front panel.

1. Remove the two front panel screws and remove panel.



Screw Location

2. Inside the front panel there are two thumbscrew holes covered by stickers, pierce the sticker with a screwdriver.
3. Attach the sachet holder to the front panel by inserting the thumbscrews through the holes in the sachet holder and tightening the thumbscrews
4. Remove the new sachet packet from foil package and install into holder. Removing the foil package allows moisture in the air to activate the sachet contents.
5. Close the left front door and tighten the screw.



Guardian™ Location

SACHET REPLACEMENT FREQUENCY

Sachet packet(s) require replacement every thirty (30) days or whenever they come in direct contact with water. Refer to chart below for requirements.

Ice Machine	Sachet Use
S1400M	1 or 2*
*Although one sachet is recommended, extreme conditions may necessitate using two sachet packets.	

Guardian™ sachet packets are available through your local Manitowoc ice machine dealer.

SACHET REPLACEMENT PROCEDURE

1. Loosen the left screw and open the left front door. The right front panel does not need to be removed.
2. Remove and discard spent Guardian sachet packets.
3. Remove the new sachet packet from foil package and install into holder. Removing the foil package allows moisture in the air to activate the sachet contents.
4. Close the left front door and tighten the screw.
5. Discard the use sachet packet in the trash.


CLEAN UP PROCEDURE FOR DAMAGED PACKET

1. Remove all ice from bin/dispenser and discard.
2. Initiate a cleaning and sanitizing sequence on the ice machine (see next pages).
3. Clean the bin/dispenser. Flush the drain thoroughly to prevent future drain blockage.
4. Sanitize the bin/dispenser.
5. Install a replacement sachet packet and reinstall all panels.

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. An extremely dirty ice machine must be taken apart for cleaning and sanitizing.


 **Caution**

Use only Manitowoc 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 PROCEDURE

 **Caution**

Do not mix 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 or other mineral deposits. It is not used to remove algae or slime. Refer to the section on Sanitizing for removal of algae and slime.

Step 1 Remove top cover. This will allow easiest access for pouring cleaner.

Step 2 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 3 Remove all ice from the bin.

Step 4 To start cleaning, place the toggle switch in the CLEAN position. The water will flow through the water dump valve and down the drain. The Clean light will turn on to indicate the ice machine is in the Cleaning mode.

Step 5 Wait about two minutes or until water starts to flow over the evaporator.

Step 6 Add the proper amount of Manitowoc Ice Machine Cleaner to the water trough by pouring between the water curtain and evaporator.

Model	Amount of Cleaner
S1400M	9 ounces (266 ml)

Step 7 The ice machine will automatically time out a ten minute cleaning cycle, followed by six rinse cycles, and stop. The Clean light will turn off to indicate the Cleaning cycle is completed. This entire cycle lasts approximately 30 minutes.

Step 8 When the cleaning process stops, move the toggle switch to OFF position. Refer to “Sanitizing Procedure” on the next page.

Step 9

- A. The ice machine may be set to start and finish a self-cleaning procedure then automatically start ice making again.
- B. You must wait about one minute into the cleaning cycle (until water starts to flow over the evaporator) then move the switch from CLEAN to ICE position.
- C. When the self-cleaning cycle is completed, an ice making sequence will start automatically.


Important


After the toggle switch is moved to the ICE position, opening the curtain switch will interrupt the cleaning sequence. The sequence will resume from the point of interruption when the curtain switch closes.

SANITIZING PROCEDURE

Use sanitizer to remove algae or slime. Do not use it to remove lime scale or other mineral deposits.

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.

 Warning Disconnect electric power to the ice machine (and dispenser if applicable) at the electric switch box before proceeding.
--

Step 2 Remove all ice from the bin.

Step 3 Refer to Removal of Parts For Cleaning/ Sanitizing and remove ice machine parts.

Step 4 Mix a solution of water and sanitizer.

Solution Type	Water	Mixed With
Sanitizer	4 gal. (15 l)	3 oz (90 ml) sanitizer

Step 5 Use the sanitizing solution and a sponge or cloth to sanitize (wipe) all parts and interior surfaces of the ice machine. Sanitize the following areas:

- A. Side walls
- B. Base (area above water trough)
- C. Evaporator plastic parts
- D. Bin or dispenser

Step 6 Rinse all sanitized areas with clear water.

Step 7 Install the removed parts, restore power and place toggle switch in the ice position.

Step 8 To start a sanitizing cycle, move the toggle switch to the CLEAN position. The water will flow through the water dump valve and down the drain. The Clean light will turn on to indicate the ice machine is in the sanitizing mode.

Step 9 Wait about two minutes or until water starts to flow over the evaporator.

Step 10 Add the proper amount of Manitowoc Ice Machine Sanitizer to the water trough by pouring between the water curtain and evaporator.

Model	Amount of Sanitizer
S1400M	9 ounces (266 ml)

Step 11 The ice machine will automatically time out a ten minute sanitizing cycle, followed by six rinse cycles, and stop. The Clean light will turn off to indicate the sanitizing cycle is completed. This entire cycle lasts approximately 30 minutes.

Step 12 When the sanitizing process stops, move the toggle switch to ICE position.

REMOVAL OF PARTS FOR CLEANING/SANITIZING

1. Turn off the electrical and water supply to the ice machine (and dispenser when applicable).

⚠ Warning

Disconnect electric power to the ice machine (and dispenser if applicable) at the electric switch box before proceeding.

2. Remove all ice from the bin.
3. Remove the water curtain and the components you want to clean or sanitize. See the following pages for removal procedures for these parts.

⚠ Warning

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

4. Soak the removed part(s) in a properly mixed solution.

Solution Type	Water	Mixed With
Cleaner	1 gal. (4 l)	16 oz (500 ml) cleaner
Sanitizer	4 gal. (15 l)	3 oz (90 ml) sanitizer

5. Use a soft-bristle brush or sponge (NOT a wire brush) to carefully clean the parts.

⚠ Caution

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

⚠ Caution

Do not immerse the water pump motor in the cleaning or sanitizing solution.

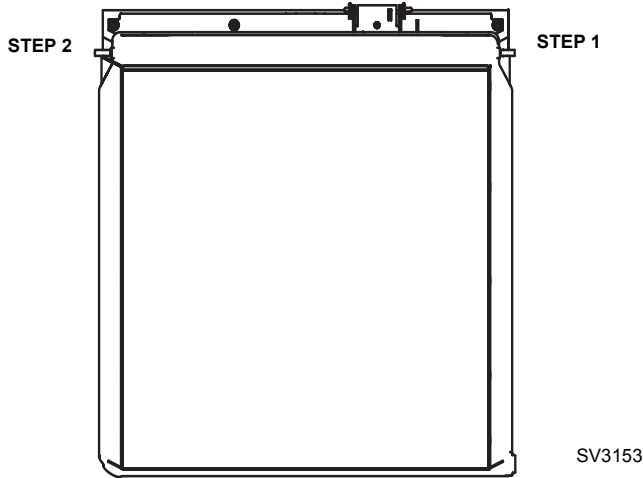
6. Use the sanitizing solution and a sponge or cloth to sanitize (wipe) the interior of the ice machine and the entire inside of the bin/dispenser.
7. Thoroughly rinse all of the parts and surfaces with clear water.
8. Install the removed parts.

NOTE: Incomplete rinsing of the ice thickness probe or water level probe may leave a residue. This could cause the ice machine to malfunction. For best results, brush or wipe the probes off while rinsing it. Thoroughly dry the probes before installing them.

9. Turn on the water and electrical supply.

1. Water Curtain

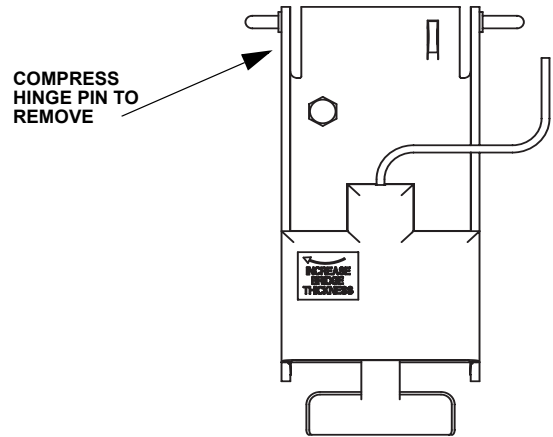
- A. Gently flex the curtain in the center and remove it from the right side.
- B. Slide the left pin out.



Water Curtain Removal

2. Ice Thickness Probe

- A. Compress the hinge pin on the top of the ice thickness probe.



Ice Thickness Probe Removal

- B. Pivot the ice thickness probe to disengage one pin then the other. The ice thickness probe can be cleaned at this point without complete removal. Follow Step C for complete removal.

⚠ Warning

Disconnect the electric power to the ice machine at the electric service switch box.

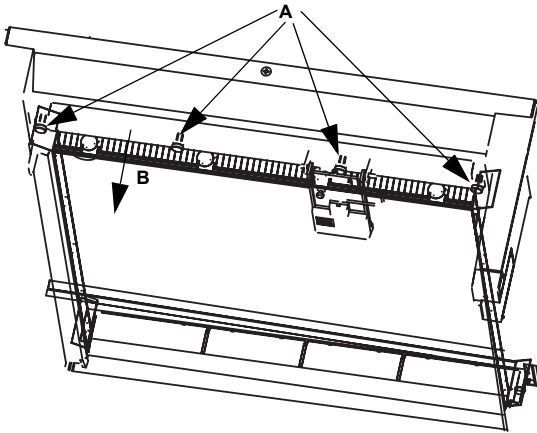
- C. Disconnect the ice thickness control wiring from the control board.

3. Water Distribution Tube

Warning

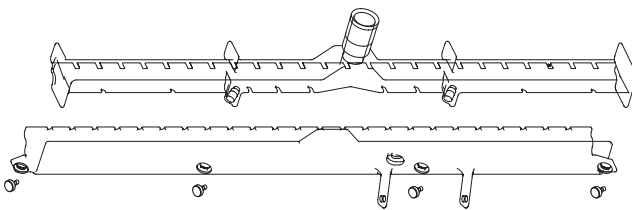
Removing the distribution tube while the water pump is running will allow water to spray from ice machine. Disconnect the electrical power to the ice machine and dispenser at the electric service switch box and turn off the water supply.

NOTE: Distribution tube thumbscrews are retained by o-rings to prevent loss. Loosen thumbscrews but do not pull thumbscrews out of distribution tube.



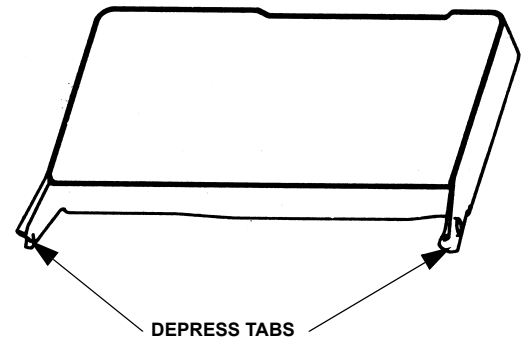
Water Distribution Tube Removal

- A. Remove outer half of distribution tube by loosening the four (4) thumbscrews (o-rings retain thumbscrews to distribution tube).
- B. Pull inner half of water distribution tube forward to release slip joint from water pump tubing connection.



4. Water Trough

- A. Depress tabs on right and left side of the water trough.
- B. Allow front of water trough to drop as you pull forward to disengage the rear pins.



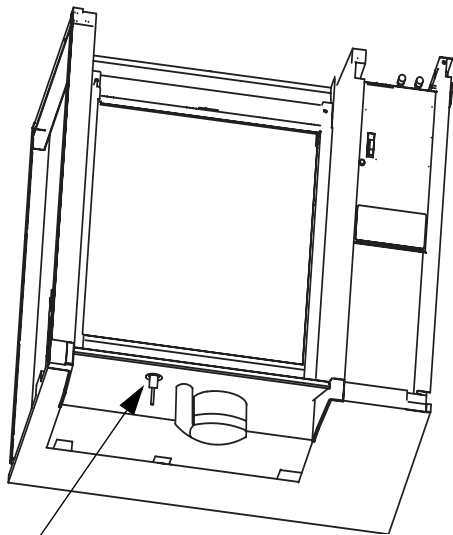
Water Level Probe

1. Remove the water trough.

Warning

Disconnect the electrical power to the ice machine at the electrical disconnect before proceeding.

2. The water level probe normally does not require removal for cleaning. The probe can be wiped and cleaned in place or proceed to step 3.
3. Pull the water level probe straight down to disengage.
4. Lower the water level probe until the wiring connector is visible. Disconnect the wire lead from the water level probe.
5. Remove the water level probe from the ice machine.



WATER LEVEL PROBE

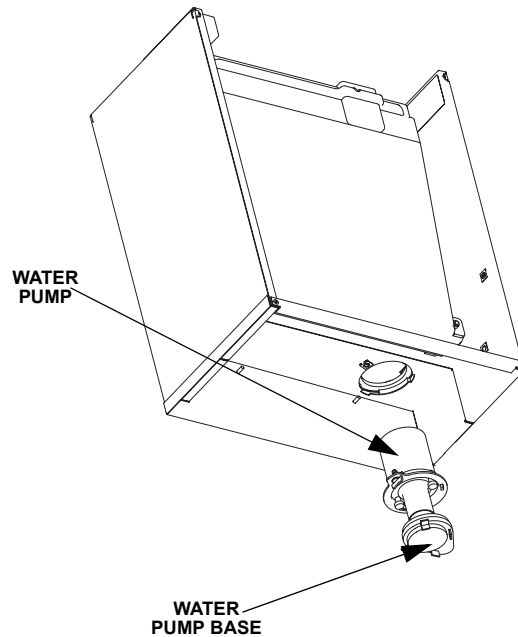
SV3141

Water Pump

Warning

Disconnect the electric power to the ice machine at the electric service switch box and turn off the water supply before proceeding.

1. Empty the water trough.
 - A. Move the toggle switch from OFF to ICE.
 - B. Wait 45 seconds.
 - C. Place toggle switch in OFF position.



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Water Pump Removal

2. Remove the water trough.
3. The water pump normally does not require removal for cleaning. The water pump base can be wiped and cleaned in place or proceed to step 4.
4. Grasp pump and pull straight down on pump assembly until water pump disengages and electrical connector is visible.
5. Disconnect the electrical connector.
6. Remove the water pump assembly from ice machine.
7. Do not soak the water pump in cleaner or sanitizer. Wipe the pump and ice machine base clean.

Water Dump Valve

The water dump valve normally does not require removal for cleaning. To determine if removal is necessary:

1. Locate the water dump valve.
2. Set the toggle switch to ICE.
3. While the ice machine is in the freeze mode, check the dump valve's clear plastic outlet drain hose for leakage.
 - A. If the dump valve is leaking, remove, disassemble and clean it.
 - B. If the dump valve is not leaking, do not remove it. Instead, follow the "Ice Machine Cleaning Procedure".

Follow the procedure below to remove the dump valve.

Warning

Disconnect the electric power to the ice machine at the electric service switch box and turn off the water supply before proceeding.

1. If so equipped, remove the water dump valve shield from its mounting bracket.
2. Lift and slide the coil retainer cap from the top of the coil.
3. Note the position of the coil assembly on the valve for assembly later. Leaving the wires attached, lift the coil assembly off the valve body and the enclosing tube.
4. Press down on the plastic nut on the enclosing tube and rotate it 1/4 turn. Remove the enclosing tube, plunger, and plastic gasket from the valve body.

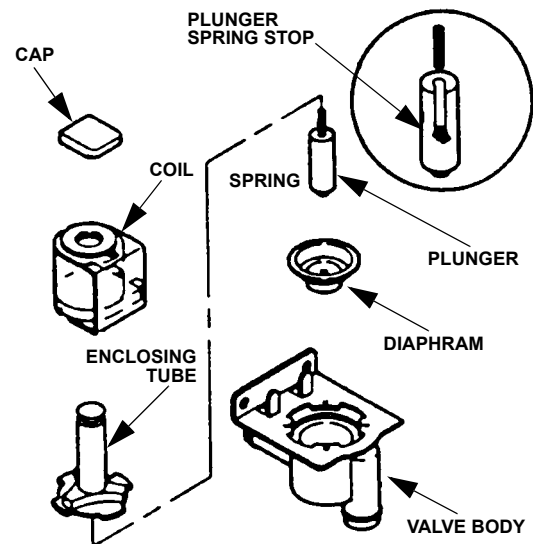
NOTE: At this point, the water dump valve can easily be cleaned. If complete removal is desired, continue with step 5.

Important

The plunger and the inside of the enclosing tube must be completely dry before assembly.

NOTE: During cleaning, do not stretch, damage or remove the spring from the plunger. If it is removed, slide the spring's flared end into the plunger's slotted top opening until the spring contacts the plunger spring stop.

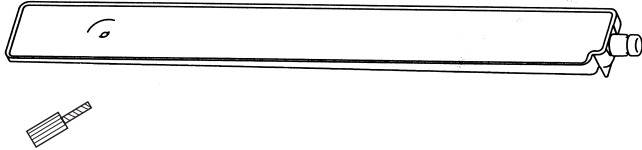
5. Remove the valve body.
6. Remove the tubing from the dump valve by twisting the clamps off.
7. Remove the two screws securing the dump valve and the mounting bracket.



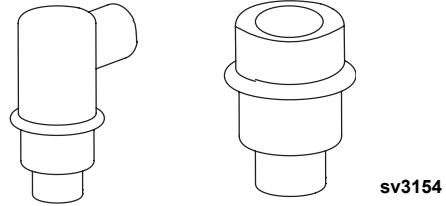
Dump Valve Disassembly

Evaporator Tray Removal

1. Remove the water trough.
2. Remove thumbscrew on left side of tray.
3. Allow left side of tray to drop as you pull the tray to the left side. Continue until the outlet tube disengages from the right side.

**Drain Line Check Valve**

The drain line check valve normally does not require removal for cleaning. Water loss from the sump trough will indicate removal and cleaning are required.



1. Remove check valve and tube assembly.
 - A. Tip assembly to right until tubing disengages.
 - B. Lift up on assembly to remove.
2. Remove insulation from check valve assembly.
3. Remove vinyl tubing from top of check valve.
4. Soak in cleaner solution 10 minutes, and then flush with water to remove debris.

Water Inlet Valve

The water inlet valve normally does not require removal for cleaning. Refer to Section 5 for a list of causes for “No Water Entering Water Trough” or “Water Overflows Water Trough.”

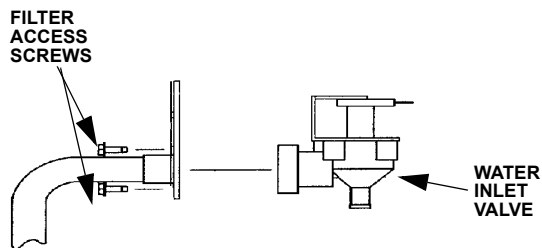
1. When the ice machine is off, the water inlet valve must completely stop water flow into the machine.
2. When the ice machine is on, the water inlet valve must allow the proper water flow through it. Set the toggle switch to ON. Watch for water flow into the ice machine. If the water flow is slow or only trickles into the ice machine, refer to Section 5.

Follow the procedure below to remove the water inlet valve.

Warning

Disconnect the electric power to the ice machine and dispenser at the electric service switch box and turn off the water supply before proceeding.

1. Remove the 1/4" hex head screws.
2. Remove, clean, and install the filter screen.



SV1622

Removal from Service/Winterization

GENERAL

Special precautions must be taken if the ice machine is to be removed from service for an extended period of time or exposed to ambient temperatures of 32°F (0°C) or below.

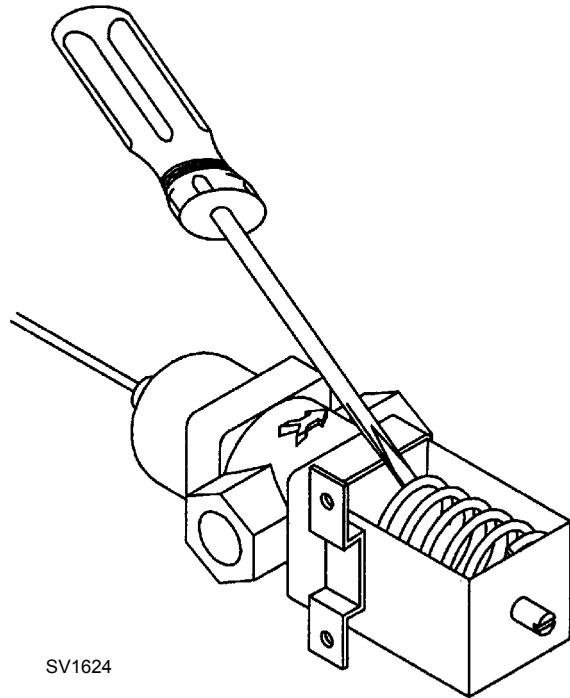
⚠ Caution

If water is allowed to remain in the ice machine in freezing temperatures, severe damage to some components could result. Damage of this nature is not covered by the warranty.

Follow the applicable procedure below.

SELF-CONTAINED WATER-COOLED ICE MACHINES

1. Disconnect the electric power at the circuit breaker or the electric service switch.
2. Turn off the water supply.
3. Remove the water from the water trough.
4. Disconnect and drain the incoming ice-making water line at the rear of the ice machine.
5. Blow compressed air in both the incoming water and the drain openings in the rear of the ice machine until no more water comes out of the inlet water lines or the drain.
6. Make sure water is not trapped in any of the water lines, drain lines, distribution tubes, etc.
7. Disconnect the incoming water and drain lines from the water-cooled condenser.
8. Insert a large screwdriver between the bottom spring coils of the water regulating valve. Pry upward to open the valve.
9. Hold the valve open and blow compressed air through the condenser until no water remains.



Pry Open the Water Regulating Valve

AUCS® Accessory

Refer to the AuCS® Accessory manual for winterization of the AuCS® Accessory.

Section 5 Before Calling For Service

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 and/or condensing unit.	Replace the fuse/reset the breaker/turn on the main switch.
	High pressure cutout tripping.	Clean condenser coil. (See Section 4)
	ICE/OFF/CLEAN toggle switch set improperly.	Move the toggle switch to the ICE position.
	Water curtain stuck open.	Water curtain must be installed and swinging freely. (See Section 4)
Ice machine stops, and can be restarted by moving the toggle switch to OFF and back to ICE.	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. (See Section 4)
	Ice machine is not level.	Level the ice machine. (See Section 2)
	Low air temperature around ice machine head section.	Air temperature must be at least 35°F (1.6°C).
Ice machine does not cycle into harvest mode.	The six-minute freeze time lock-in has not expired yet.	Wait for the freeze lock-in to expire.
	Ice thickness probe is dirty.	Clean and sanitize the ice machine. (See Section 4)
	Ice thickness probe is disconnected.	Connect the wire.
	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe. (See Section 3)
	Uneven ice fill (thin at the top of evaporator).	Verify sufficient water level in sump trough. Contact a qualified service company to check refrigeration system.
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. (See Section 4)
	Water dump valve is not working.	Disassemble and clean the water dump valve. (See Section 4)
	Water softener is working improperly (if applicable).	Repair the water softener.

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. (See Section 4)
	Water trough level is too low.	Check the water level probe for damage. (See Section 3)
	Water inlet valve filter screen is dirty.	Remove the water inlet valve and clean the filter screen. (See Section 4)
	Water filtration is poor.	Replace the filter.
	Hot incoming water.	Connect the ice machine to a cold water supply. (See Section 2)
	Water inlet valve is not working.	Replace the water inlet valve.
	Incorrect incoming water pressure.	Water pressure must be 20-80 psi (1.4 bar - 5.5 bar)
	Ice machine is not level.	Level the ice machine. (See Section 2)
Low ice capacity.	Water inlet valve filter screen is dirty.	Remove the water inlet valve and clean the filter screen. (See Section 4)
	Incoming water supply is shut off.	Open the water service valve.
	Water inlet valve stuck open or leaking.	Place toggle switch in OFF position, if water continues to enter water trough replace the water inlet valve.
	The harvest assist air compressor is not functioning.	Call for service.

Safety Limit Feature

In addition to the standard safety controls, such as the high pressure cutout, your Manitowoc 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 ICE/OFF/CLEAN switch to OFF and then back to ICE.
 - 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.

EC DECLARATION OF CONFORMITY

We hereby declare that our products, ice machines and Multiplex refrigeration equipment comply with all the essential requirements of the listed EC - directives.

Manufacturer:

*Manitowoc Ice, Inc.
2110 S. 26th Street, P.O. Box 1720
Manitowoc, Wisconsin 54221-1720 USA*

Representative Of Manitowoc Ice, Inc. :

Randy Haack, Engineering Manager

Randy Haack

European Distributor:

Representative Of European Distributor:

Model and Serial No.

Applied Standards:

EN60335-1 1988 Safety of household and similar electrical appliances
EN60335-2-24 1994 Particular requirements refrigerators, food freezers and ice makers
EN55014 1995 Electrical Motor Operated appliances (Emission)
EN55104 1993 Electro Magnetic Compatibility (Immunity)
EN378-1-4 Refrigeration Plants

Applied EC Directives:

*Low Voltage 73/23/EEC as amended by 93/68/EEC
EMC 89/336/EEC as amended by 92/31/EEC and 93/68/EEC
Pressure Equipment 97/23/EC*



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