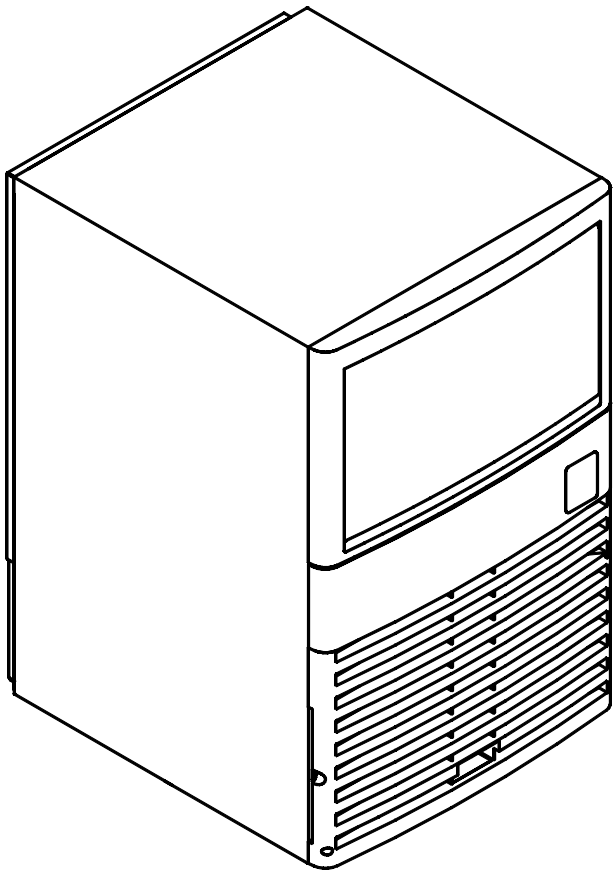
Manitowoc®



QM30 Series 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 care and maintenance, your new Manitowoc Ice Machine will provide you with many years of reliable and economical performance.

We reserve the right to make product improvements at any time.
Specifications and design are subject to change without notice.

Part Number000001772
10/06

Safety Notices

When using or servicing these Ice Machines, 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

Text in a Warning box alerts you to a potential personal injury situation. Be sure to read the Warning statement, and then proceed 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, and then proceed carefully.

Procedural Notices

When using or servicing these Ice Machines, be sure to read the procedural notices in this manual. These notices supply helpful and important information.

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

Important

Important boxes serve two functions.

They call the operator's attention to important information.

They also provide the service technician with information that may help perform a procedure more efficiently. Disregarding this information may slow down the work.

NOTE: Text set off as a Note provides you with simple, but useful, extra information.

⚠ CAUTION

Proper 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, feel free to contact Manitowoc Ice, Inc. We will be happy to provide assistance.

Warning

PERSONAL INJURY POTENTIAL

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

This manual covers the following model numbers:

Self-Contained Air-Cooled:

QM30A
QM30AE

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Section 2 - Installation Instructions

Section 3 - Ice Machine Operation

Section 4 - Maintenance

Section 5 - Before Calling for Service

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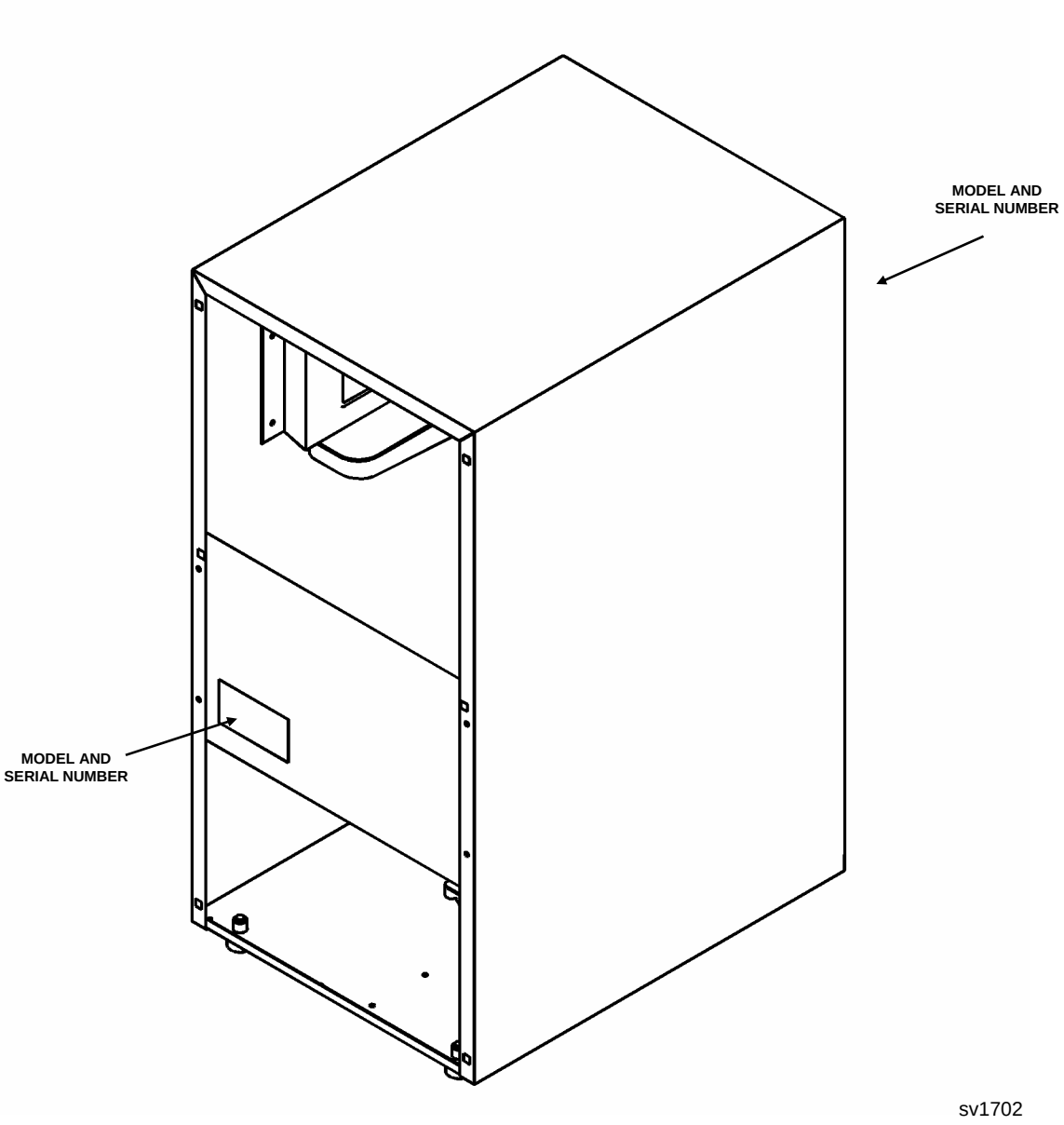
Section 1
General Information

Model/Serial Number Location

Record the model and serial number of your ice machine in the space provided below. These numbers are required when requesting information from your Manitowoc distributor, service representative, or the factory.

The model and serial number are listed on the OWNER WARRANTY REGISTRATION CARD. They are also listed on the MODEL/SERIAL NUMBER DECAL affixed to the ice machine.



Model/Serial Number Location

MODEL NUMBER: _____ **SERIAL NUMBER: _____**

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 representative or Manitowoc Ice, Inc. 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
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.

LABOR
Labor required to repair or replace defective components is covered for three (3) years from the date of original installation.

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

1. Normal maintenance, adjustments and cleaning as outlined in the Owner/Operator Use and Care Guide.
2. Repairs due to unauthorized modifications to the ice machine or the use of non-standard parts without prior written approval 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 the ice machine 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 the Installation Manual and the Owner/Operator Use and Care Guide.

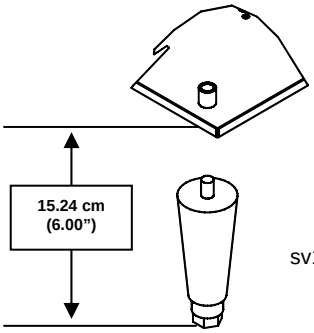
AUTHORIZED WARRANTY SERVICE
To comply with the provisions of the warranty, a refrigeration service company, qualified and authorized by a Manitowoc distributor, or a Contracted Service Representative must perform the warranty repair.

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

Service Calls
If you have followed the procedures listed in Section 5 of this manual, and the ice machine still does not perform properly, call your authorized service company.

Section 2
Installation Instructions

Legs



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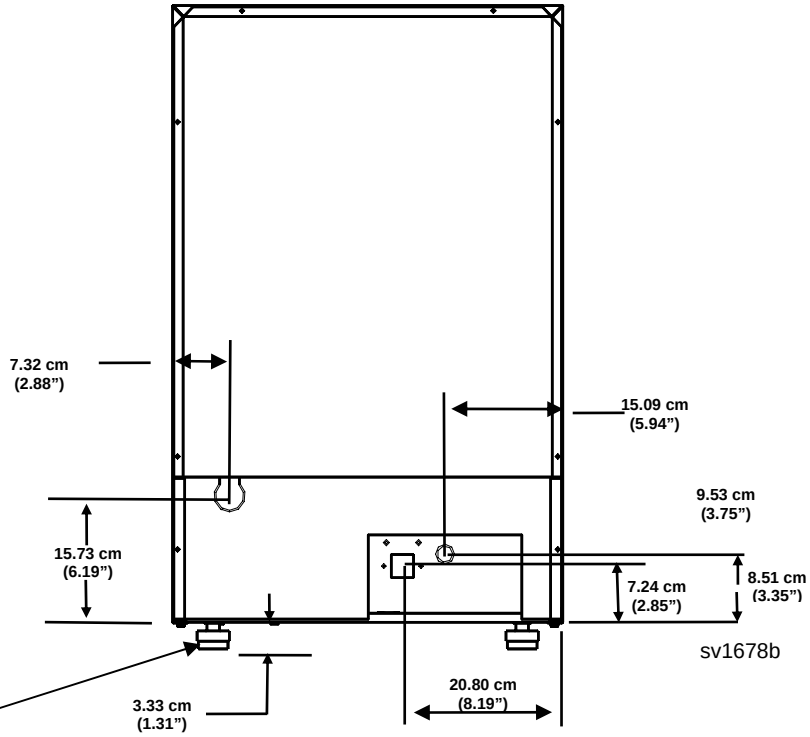

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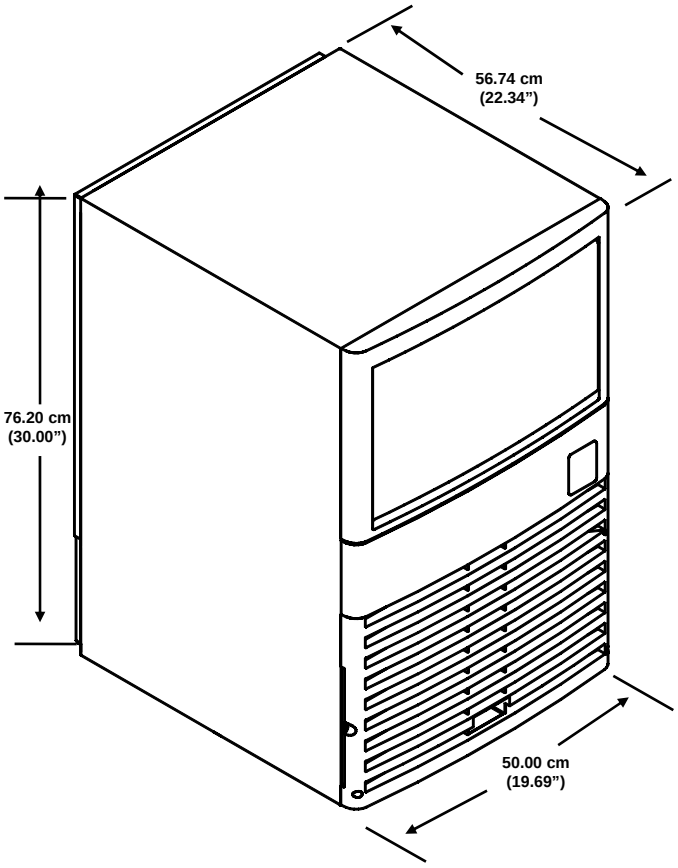
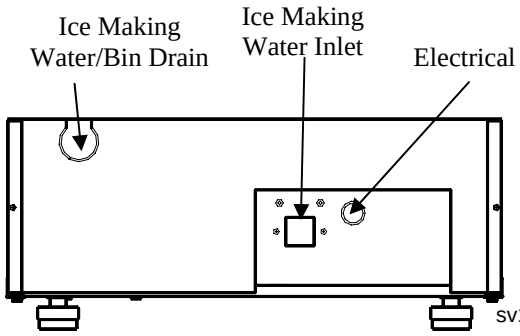
Levelers

International ONLY





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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 10°C (50°F), but must not exceed 45°C (113°F).
- The location must not be near heat-generating equipment or in direct sunlight.
- The counter top (or other resting surface) must be able to support 425 kg per square meter (0.6 lb. per square inch).
- The location must allow enough clearance for water, drain, and electrical connections in the **rear of the ice machine.**
- The location must not obstruct air flow to any portion of the **front of the ice machine.**

⚠ CAUTION

The ice machine must be protected if it will be subjected to temperatures below 0°C (32°F). Failure caused by exposure to freezing temperatures is not covered by the warranty. See "Removal from Service/Winterization" on page 4-8.

	Self-Contained Air-Cooled
Top/Sides	203 mm (5")*
Back	127 mm (5")*

NOTE: The ice machine may be built into a cabinet. There is no minimum clearance requirement for the top or the left and right sides of the ice machine

Ice Machine Heat of Rejection

Series Ice Machine	Heat of Rejection*	
	Air Conditioning**	Peak
QM30	1600	2350

* B.T.U./Hour

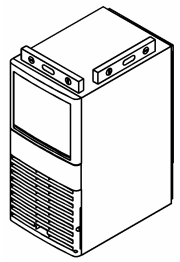
** Because the heat of rejection varies during the ice making cycle, the figure shown is an average.

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

After moving the ice machine into the installation location, it must be leveled for proper operation. Follow these steps to level the ice machine:

1. Check the level of the ice machine from front to back and from side to side.



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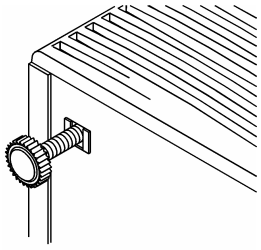
Checking for Level

2. If the ice machine is not level, adjust the leveling glides or legs on each corner of the base of the ice machine as necessary.
3. Check the level of the ice machine after each adjustment.
4. Repeat steps 2 and 3 until the ice machine is level from front to back and from side to side.



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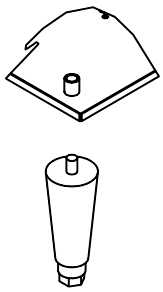
Levelers

International ONLY



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Legs

Electrical Service

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

Ice Machine Model	Voltage Phase Cycle	Air-Cooled Electrical Rating
QM30	230/50/1	.6 KW / 2.6 Amps
QM30	115/60/1	.6 KW/ 5.3 Amps

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.

⚠ WARNING
Never use an extension cord. If an outlet is not within reach of the ice machine's power cord, have a proper amperage outlet wired closer to the ice machine.

FUSE/CIRCUIT BREAKER
A separate fuse/circuit breaker must be provided for each ice machine.

NOTE: A means of disconnect must be provided for field wiring.

ELECTRICAL RATING
The electrical rating is used to help select the wire size of the electrical supply. The wire size (or gauge) also depends on location, materials used, length of run, etc., so it must be determined by a qualified electrician.

FOR UNITED KINGDOM ONLY

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

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

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Water Service/Drains

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 water filter system, refer to the Installation Instructions supplied with the filter system for ice making water inlet connections.

Follow these guidelines to install water inlet lines:

- Connect to potable water supply only.
- 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 the ice making water lines.
- Insulate water 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 2.5 cm (1 inch) drop per 1 meter (40 inches) of run, and must not create traps.
- The floor drain must be large enough to accommodate drainage from all drains.
- Insulate the bin drain line to prevent condensation.

WATER SUPPLY AND DRAIN LINE SIZING/CONNECTIONS

⚠ CAUTION

Plumbing must conform to state and local codes.

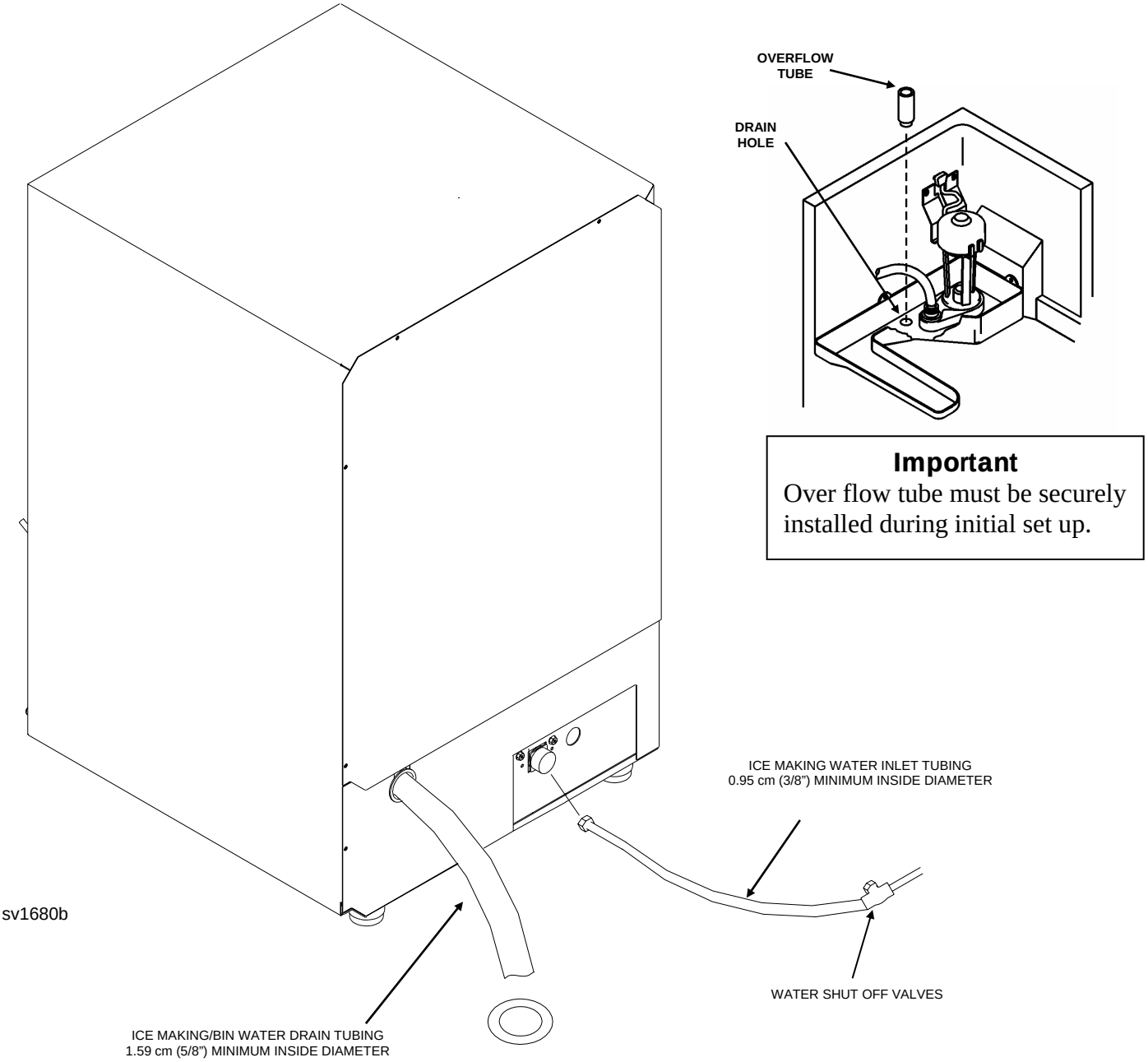
	Water Temperature	Water Pressure	Ice Machine Connection	Tubing Size Up to Ice Machine Fitting
Ice Making Water Inlet	10°C (50°F) Min.[1] 30°C (86°F) Max.[2]	2.4 bar (35 psi) Min.[1] 6.2 bar (90 psi) Max.[2]	3/4" male hose connection[3]	0.95 cm (3/8") minimum inside diameter
Ice Making/Bin Water Drain	---	---	1.59 cm (5/8") inside diameter flexible hose	1.59 cm (5/8") minimum inside diameter

[1] Min. = Minimum

[2] Max. = Maximum

[3] A 3/4" by 11-1/2 threads per inch to 14 threads per inch adapter is factory installed. Remove this adapter if 11-1/2 threads per inch connection is desired.

Typical Water Supply and Drain Line Sizing and Connections



Important
Over flow tube must be securely installed during initial set up.

Section 3
Ice Machine Operation

Sequence of Operation

Ice Making Sequence of Operation	Control Board Relays 1 Compressor	2 Hot Gas Valve Water Fill Valve	3 Water Pump Fan Motor	Length of "ON" Time
Start-Up[1] **1. Water Purge**	Off	On	Off	2.9 Minutes (175 Seconds)
2. Refrigeration System Start-Up	On	On	Off	5 Seconds
3. Freeze Cycle	On	Off	On	Automatically determined
4. Harvest Cycle	On	On	Off	Automatically determined
5. Auto Shut-Off	Off	Off	Off	Until bin thermostat re-closes

[1] Initial Start-Up or Start-Up After Automatic Shut-Off

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

1. Water Purge

The water fill valve and the hot gas valve are energized for 2.9 minutes (175 seconds). This ensures that the ice making cycle starts with fresh water, and that the refrigerant pressures are equalized prior to refrigeration system start-up.

2. Refrigeration System Start-Up

The compressor starts 2.9 minutes (175 seconds) after the water fill valve and hot gas valve are energized. (The water fill valve and hot gas valve remain energized for 5 seconds during compressor start-up, and then shut off.) The compressor remains on throughout the entire freeze and harvest cycles.

3. Freeze Cycle

The condenser fan motor and water pump are energized and remain on throughout the entire freeze cycle. An even flow of water is directed across the evaporator and into each cube cell, where it freezes.

The control system automatically determines the length of the freeze cycle by monitoring the temperature of the refrigeration system liquid line.

4. Harvest Cycle

The condenser fan motor and water pump de-energize. The water fill valve energizes to purge the water in the water trough. The hot gas valve also energizes at the beginning of the harvest cycle to divert hot refrigerant gas into the evaporator. The hot refrigerant gas warms the evaporator, causing the cubes to slide, as a sheet, off the evaporator and into the ice storage bin.

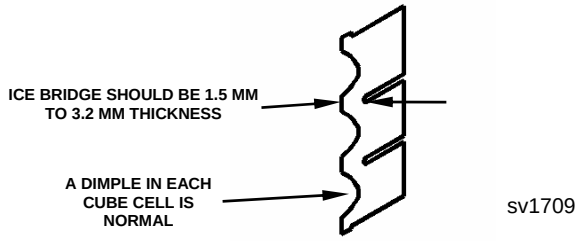
The control system automatically determines the length of the harvest cycle, based on the temperature of the refrigeration system liquid line at the end of the freeze cycle. At the end of the harvest cycle, the ice machine returns to another freeze cycle (step 3, above).

5. Automatic Shut-Off

The level of ice in the ice storage bin controls the ice machine shut-off. When the bin is full, ice cubes contact the bin thermostat bulb holder, which cools down and opens to stop the ice machine. The ice machine remains off until enough ice has been removed from the bin. This causes the thermostat bulb holder to warm and close, restarting the ice machine. When the ice machine restarts, it returns to the start-up sequence (steps 1 and 2, above).

Ice Thickness Adjustment

QM-30 dice ice cube formation is slightly different from our previous models. Manitowoc ice machines have a unique cube shape. It is normal to have a dimple in the ice cube (a concave indentation in the cube). Ice cubes from the QM-30 may appear to have a slightly larger dimple than other Manitowoc dice cube machines. Therefore, cube size for the QM-30 is determined by measuring the slab weight (the combined weight of all cubes from one harvest cycle). To determine proper slab weight follow the instructions listed below.



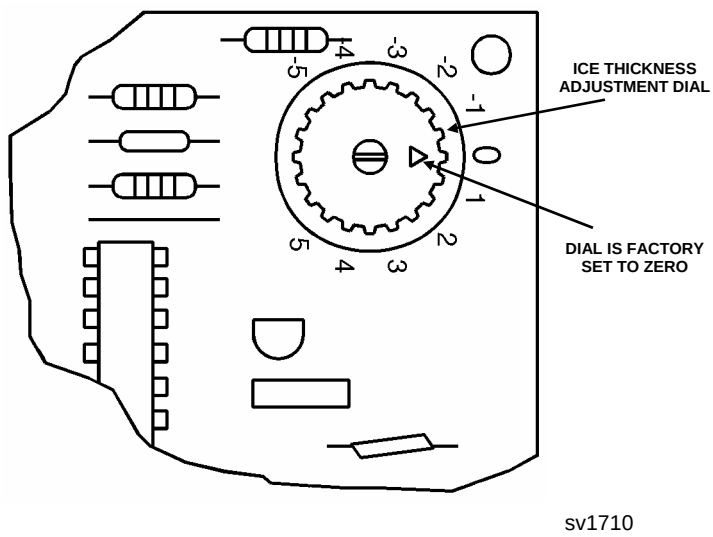
Correct Ice Bridge Thickness

1. Ensure the air filter, front, and back panels are installed properly and close the bin door.
2. During the **third** harvest cycle open the bin door and catch the entire slab of ice.
3. Weigh the ice slab. The combined weight of all cubes from one harvest should weigh between 200 - 270g (7 - 9-oz). If the slab weight is within this range, the ice machine is working properly and no further action is needed. If the slab weight is not within this range or you desire a slightly thicker or thinner cube, continue to step four.

⚠ WARNING

Do not touch electrical wires. Disconnect power to the ice machine before making any ice thickness adjustments.

4. Remove the air filter.
5. Remove the two screws holding the front panel in place and remove the front cover.
6. Locate the ice thickness control dial on the control board (see below). Turn the dial clockwise for a thicker cube or counter clockwise for a thinner cube.



Ice Thickness Adjustment Dial

7. Assure all of the panels and air filter are reinstalled properly and the bin door is closed. Repeat steps one through three.

After completing the procedure above, if you are unable to obtain a sheet of ice weighing 200 - 270g (7 - 9-oz) contact the Manitowoc Service Department for further assistance.

Section 4
Maintenance

Interior Cleaning and Sanitizing

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.

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 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 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 Wait until water flows over the evaporator (about three minutes) then add the proper amount of Manitowoc Ice Machine Cleaner to the water trough.

Model	Amount of Cleaner
QM30	45 ml (1.5 ounces)

Step 5 Wait until the clean cycle is complete (approximately 45 minutes) then place the toggle switch in the OFF position, disconnect power and water supplies to the ice machine.

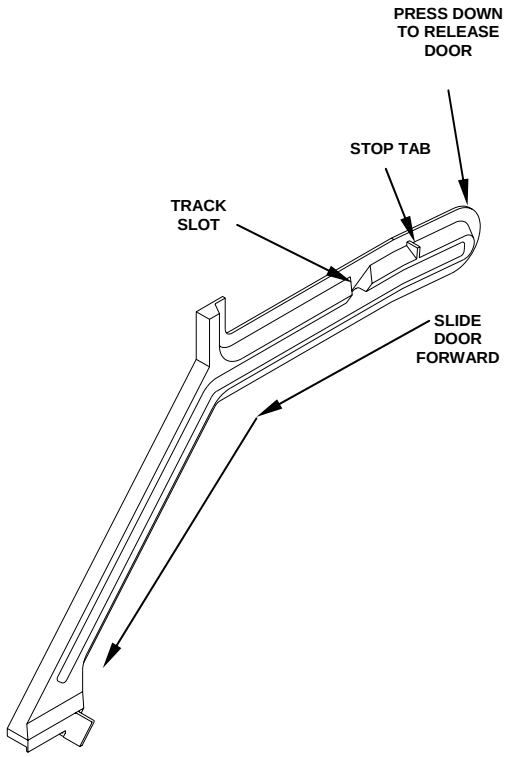
⚠ WARNING

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

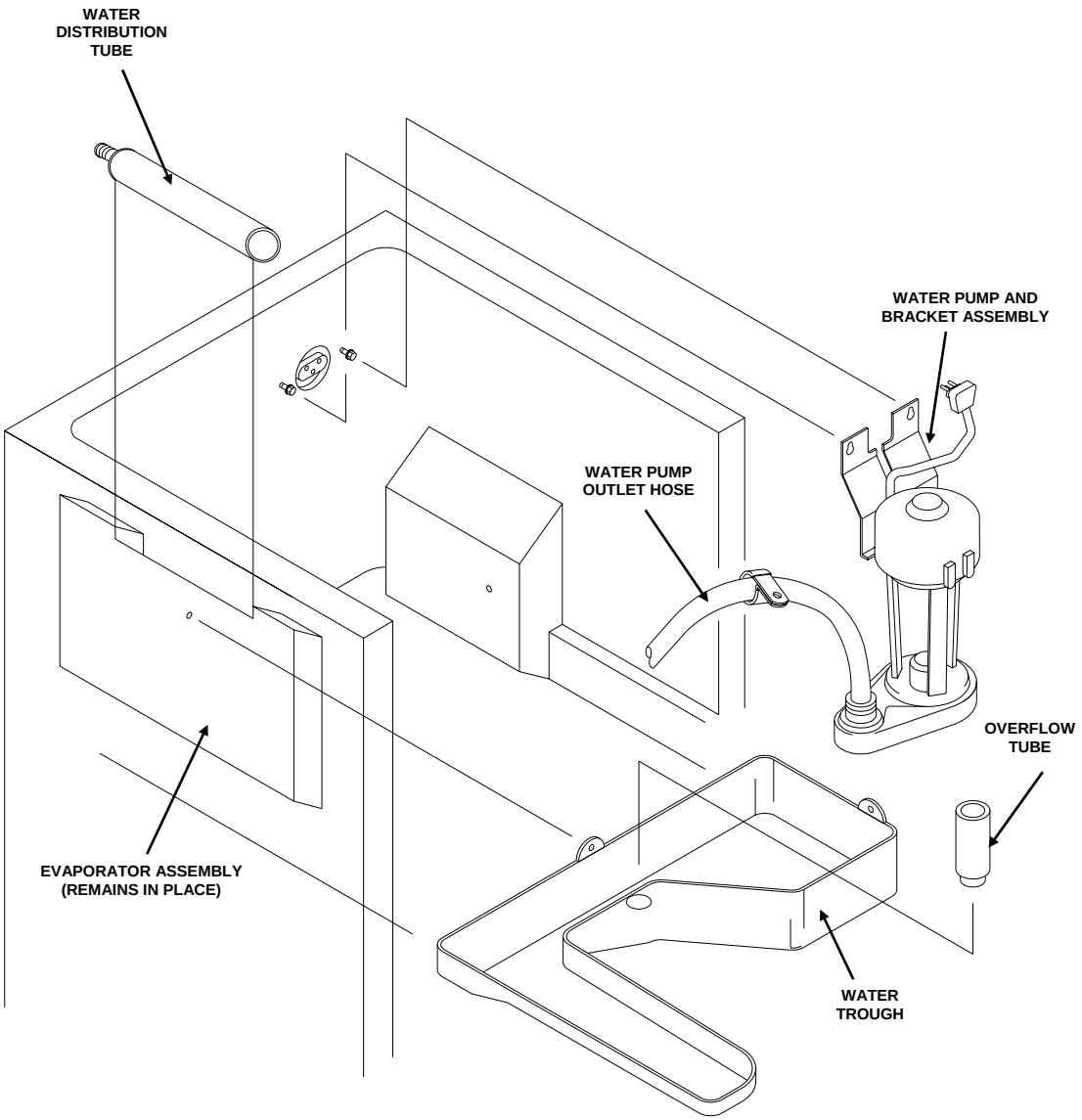
Step 6: Remove parts for cleaning.

A. Remove 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.



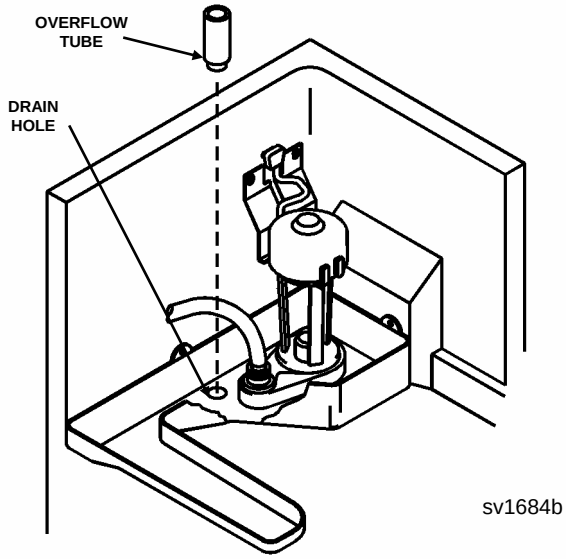
Parts Removal Overview



B. Remove the Overflow Tube

- To remove the tube, lift it up while using a slight back and forth motion to loosen it from the drain hole.

When installing the tube, be sure it is completely inserted into the drain hole to prevent water leakage during normal operation.



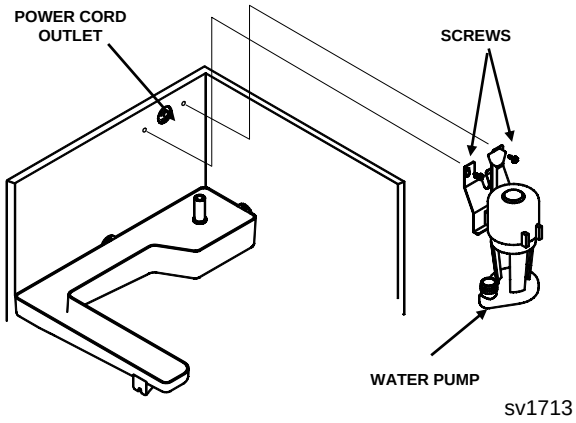
Removing the Overflow Tube

C. Remove the Vinyl Hose

- Disconnect the water pump discharge hose from the distribution tube and water pump.

D. Remove the Water Pump

- Disconnect the water pump power cord.
- Disconnect the water hose from the pump outlet.
- Loosen the screws that hold the water pump in place.
- Lift the water pump and bracket assembly up and off the screws.



Removing the Water Pump

E. Remove the Water Trough

- Remove the screws holding the water trough to the walls of the cabinet.

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	4L. (1 gal)	500 ml (16 oz) 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	23L. (6 gal)	120ml (4 oz) 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 Manitowoc Ice Machine Sanitizer to the water trough.

Model	Amount of Sanitizer
QM30	45 ml (1.5 oz)

Step16 Wait until the sanitize cycle is complete (approximately 45 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	23L. (6 gal)	120 ml (4 oz) 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.

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.

Treat all exterior stainless steel surfaces with a commercial grade stainless steel cleaner/polish.

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.

CLEANING THE CONDENSER

⚠ WARNING

Disconnect electric power to the ice machine at the electric service switch before cleaning the condenser.

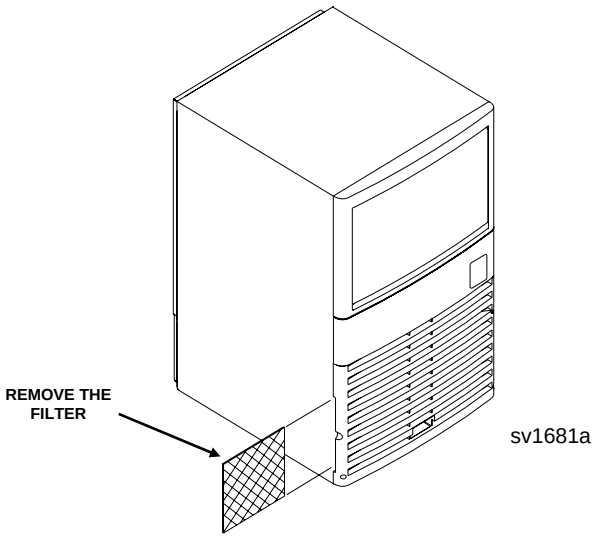
Air-Cooled Condenser

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. Follow the steps below.

⚠ WARNING

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

1. The washable aluminum filter on self-contained ice machines is designed to catch dust, dirt, lint and grease. This helps keep the condenser clean. Clean the filter with a mild soap and water solution.



Removing the Filter

Clean the outside of the condenser with a soft brush or a vacuum with a brush attachment. Clean from top to bottom, not side to side. Be careful not to bend the condenser fins.

2. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains: Blow compressed air through the condenser fins from the inside. Be careful not to bend the fan blades.
3. Use a commercial condenser coil cleaner. Follow the directions and cautions supplied with the cleaner.
4. Straighten any bent condenser fins with a fin comb.
5. Carefully wipe off the fan blades and motor with a soft cloth. Do not bend the fan blades. If the fan blades are excessively dirty, wash with warm, soapy water and rinse thoroughly.

⚠ CAUTION

If you are cleaning the condenser fan blades with water, cover the fan motor to prevent water damage.

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 0°C (32°F) 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.

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 the drain and the incoming ice-making water line at the rear of the ice machine.
5. Make sure no water is trapped inside the ice machine incoming water lines, drain lines, distribution tubes, etc. Blow compressed air through the line if necessary.

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We reserve the right to make product improvements at any time.

Specifications and design are subject to change without notice.