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 Manitowoc approved Ice Machine Cleaner and Sanitizer for this application (Manitowoc Cleaner part number 94-0546-3 and Manitowoc 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 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 top cover. This will allow easiest access for adding cleaning and sanitizing solutions.

Step 3 Remove all ice from the bin.

Step 4 Place the toggle switch in the CLEAN position. The water will flow through the water dump valve and down the drain. Wait until the water trough refills and water flows over the evaporator, then add the proper amount of ice machine cleaner.

Model	Amount of Cleaner
Q200/Q280/Q322/Q370	3 ounces (90 ml)
Q422/Q450/Q600/Q800	5 ounces (150 ml)
Q1000/Q1300/Q1400/Q1800	9 ounces (265 ml)

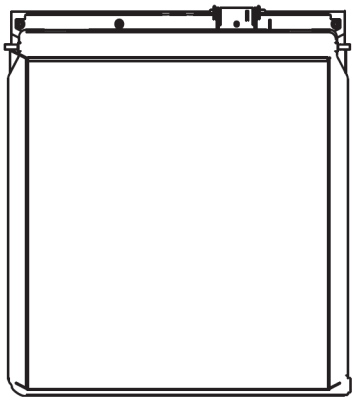
Step 5 Wait until the clean cycle is complete (approximately 30 minutes) then place the toggle switch in the OFF position and disconnect power to the ice machine (and dispenser when used).

> **⚠ Warning**
> Disconnect the electric power to the ice machine at the electric service switch box.

Step 6 Remove parts for cleaning and hand sanitizing.

A. Remove the water curtain

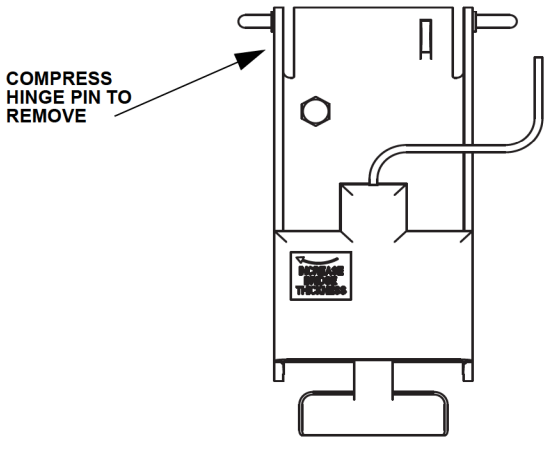
- Gently flex the curtain in the center and remove it from the right side.
- Slide the left pin out.



Water Curtain Removal

B. Remove the ice thickness probe

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

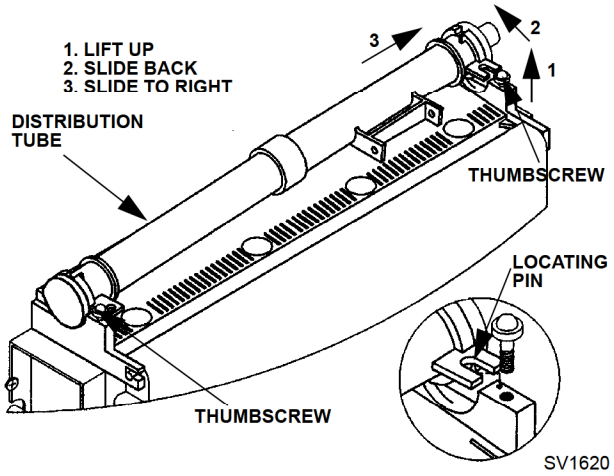


Ice Thickness Probe Removal

- Pivot the ice thickness probe to disengage one pin then the other. The ice thickness probe can be cleaned and sanitized at this point without complete removal. If complete removal is desired, disconnect the ice thickness control wiring from the control board.

C. Remove the water distribution tube

- Disconnect the water hose from the distribution tube.



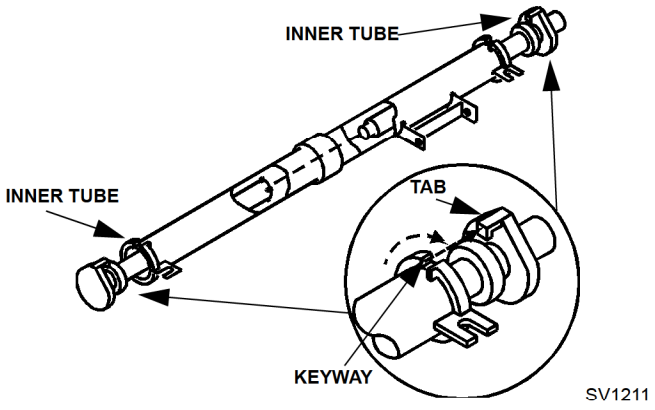
Water Distribution Tube Removal

- 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.

Disassemble for cleaning/sanitizing.

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



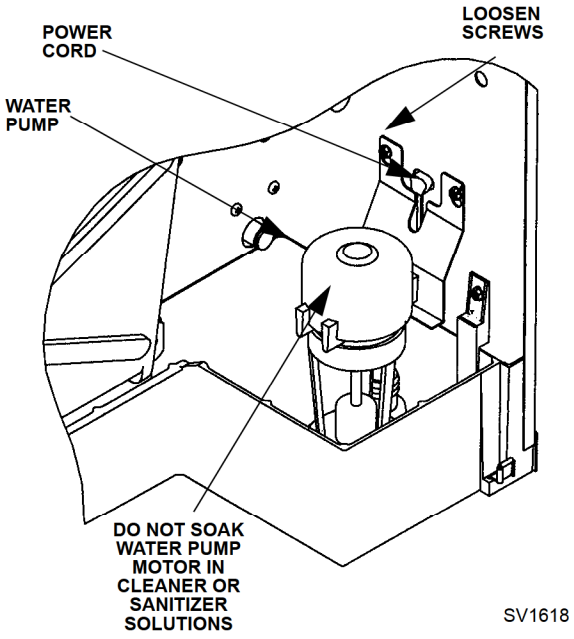
Water Distribution Tube Disassembly

D. Remove the white vinyl water distribution tubing

- Disconnect the hose from the water pump outlet.
- Disconnect the hose from the dump valve (the tubing pressure fits - pull tubing into evaporator compartment).

E. Remove the water pump

- Disconnect the water pump power cord.

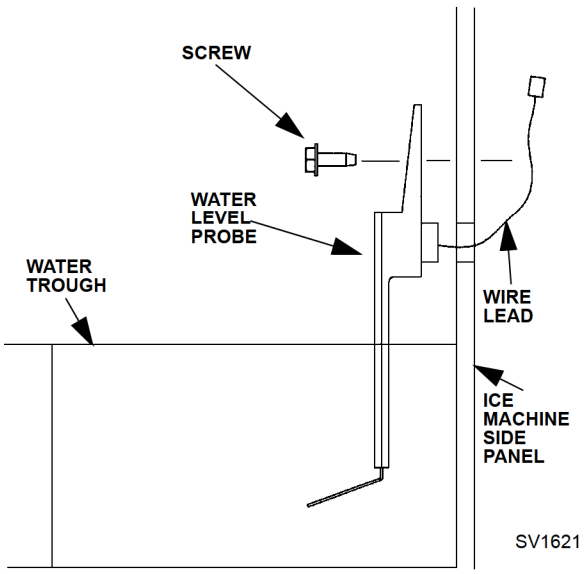


Water Pump Removal

- Loosen the screws securing the pump mounting bracket to the bulkhead.
- Lift the pump and bracket assembly off the screws.

F. Remove the water level probe

- Loosen the screw that holds the water level probe in place. The probe can easily be cleaned and sanitized at this point without proceeding to step 2.
- If complete removal is required, disconnect the wire lead from the control board inside the electrical control box.



Water Level Probe Removal

Step 7 Mix a solution of cleaner and warm water. Depending upon 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.

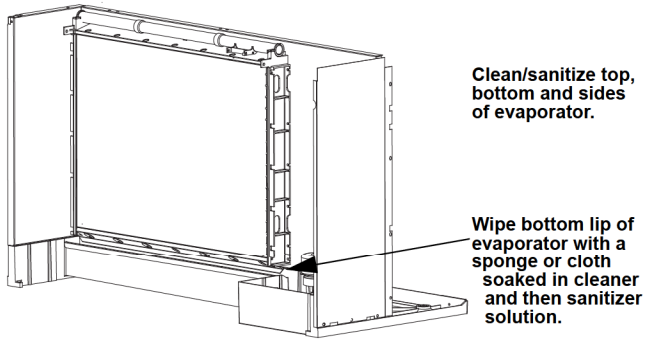
Solution Type	Water	Mixed With
Cleaner	1 gal. (4 l)	16 oz (500 ml) cleaner

Step 8 Use 1/2 of the cleaner/water mixture 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 nylon brush, sponge or cloth (NOT a wire brush) to carefully clean the parts. Soak parts for 5 minutes (15 - 20 minutes for heavily scaled parts). Rinse all components with clean water.

Step 9 While components are soaking, use 1/2 of the cleaner/water solution to clean all foodzone surfaces of the ice machine and bin (or dispenser). Use a nylon brush or cloth to thoroughly clean the following ice machine areas:

- Side walls
- Base (bottom of the water trough)
- Interior of the water trough
- Evaporator cells and evaporator plastic parts - including top, bottom, and sides
- Bin or dispenser
- Ice machine top cover

Remove water trough drain plug and rinse all areas thoroughly with clean water. Reinstall water trough drain plug.



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 (or dispenser). Use a cloth or sponge to liberally apply the solution. Wipe all surfaces twice to ensure complete coverage with sanitizer solution. When sanitizing, pay particular attention to the following areas:

- Side walls
- Base (bottom of the water trough)
- Interior of water trough
- Evaporator cells and evaporator plastic parts - including top, bottom and sides
- Bin or dispenser
- Ice machine top cover

Do not rinse the sanitized areas. Remove the water trough drain plug and wipe with solution. When the sanitizer solution has drained from the trough, reinstall the water trough drain plug.

Step 13 Replace all removed components.

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

Step 15 Wait about two minutes or until water starts to flow over the evaporator. 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
Q200 Q280 Q322 Q370 Q422 Q450 Q600 Q800 Q1000	3 ounces (90 ml)
Q1300 Q1600 Q1800	8.75 ounces (258 ml)

Step 16 The ice machine will stop after the sanitize cycle (approximately 30 minutes). Place the toggle switch in the OFF position and disconnect power to the ice machine.

> **⚠ Warning**
> Disconnect the electric power to the ice machine at the electric service switch box..

Step 17 Repeat step 6 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 (or dispenser). Use a cloth or sponge to liberally apply the solution. When sanitizing, pay particular attention to the following areas:

- Side walls
- Base (bottom of the water trough)
- Interior of water trough
- Evaporator cells and evaporator plastic parts - including top, bottom and sides
- Bin or dispenser
- Ice machine top cover

Do not rinse the sanitized areas. Remove the water trough drain plug and wipe with solution. When the sanitizer solution has drained from the trough, reinstall the water trough drain plug.

Step 21 Install the removed parts, restore power and place the toggle switch in the ICE position.

ADDITIONAL COMPONENT REMOVAL

The following components may be removed for easier access in some installations or they may need to be removed and cleaned to correct an operational problem.

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.

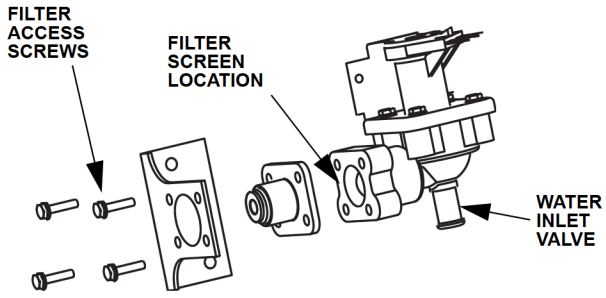
1. When the ice machine is off, the water inlet valve must completely stop water flow into the machine.
2. When the ice machine is on, the water inlet valve must allow the proper water flow through it. Set the toggle switch to ON. Watch for water flow into the ice machine. If the water flow is slow or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



Water Dump Valve

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

1. Set the toggle switch to ICE.
2. Verify the water trough fills with water at the beginning of the freeze cycle.
3. While the ice machine is in the freeze mode, check the water trough to determine if the dump valve is leaking. If there is no or little water in the water trough (during the freeze cycle) the dump valve is leaking.
   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

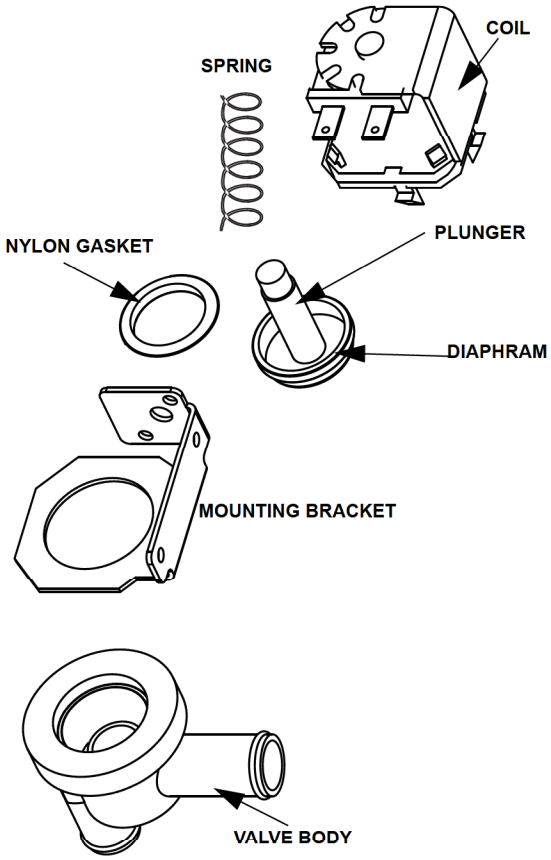
Disconnect the electric power to the ice machine at the electric service switch box and turn off the water supply before proceeding.

1. Leaving the wires attached, twist coil and rotate it counter-clockwise1/4 turn.
2. Lift the coil assembly off the valve body.
3. Remove the spring, plunger, and nylon 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 4.

NOTE: During cleaning, do not stretch or damage the spring.

4. Remove the tubing from the dump valve by twisting the clamps off.
5. Twist the valve body to remove from mounting bracket.



Dump Valve Disassembly

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.) 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.

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.

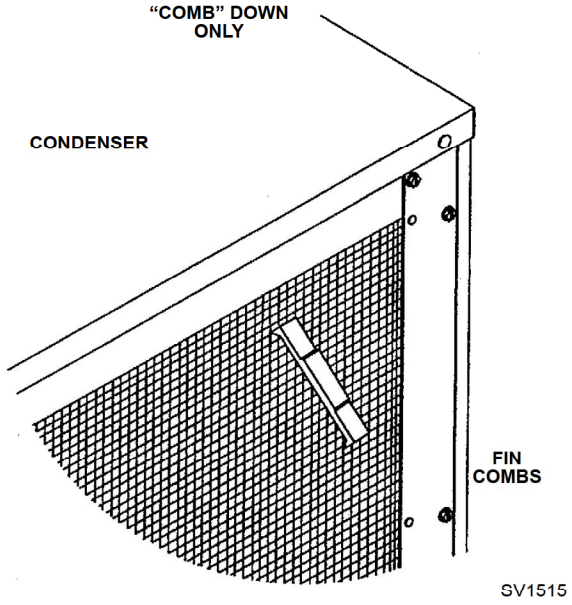
A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces ice production and shortens component life. Clean the condenser at least every six months. Follow the steps below.

⚠ 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. Clean the filter with a mild soap and water.
2. Clean the outside of the condenser with a soft brush or a vacuum with a brush attachment. Be careful not to bend the condenser fins.
3. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains:
   A. Blow compressed air through the condenser fins from the inside. Be careful not to bend the fan blades.
   B. 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.



Straighten Bent Condenser Fins

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 and disconnect electrical power.

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.

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.

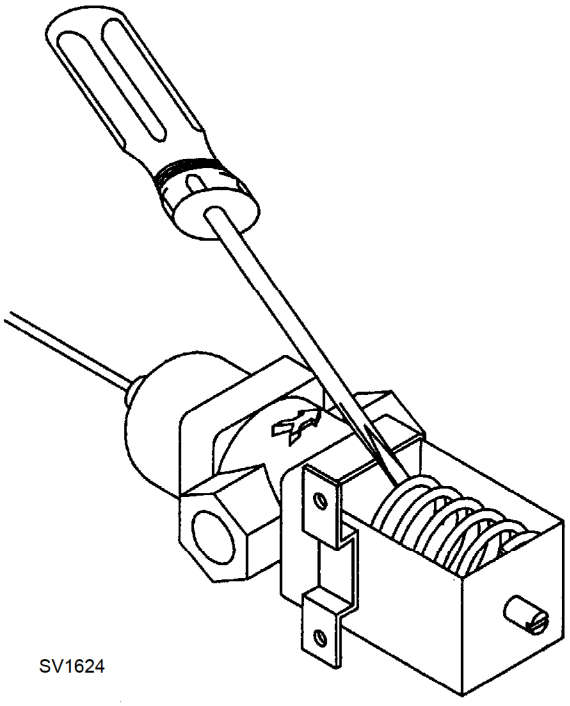
Follow the applicable procedure below.

SELF-CONTAINED AIR-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. Energize the ice machine and wait one minute for the water inlet valve to open.
6. 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.
7. Make sure water is not trapped in any of the water lines, drain lines, distribution tubes, etc.

WATER-COOLED ICE MACHINES

1. Perform steps 1-6 under “Self-Contained Air-Cooled Ice Machines.”
2. Disconnect the incoming water and drain lines from the water-cooled condenser.
3. Insert a large screwdriver between the bottom spring coils of the water regulating valve. Pry upward to open the valve.



Pry Open the Water Regulating Valve

4. Hold the valve open and blow compressed air through the condenser until no water remains.

REMOTE ICE MACHINES

1. Move the ICE/OFF/CLEAN switch to OFF.
2. “Frontseat” (shut off) the receiver service valves. Hang a tag on the switch as a reminder to open the valves before restarting.
3. Perform steps 1-6 under “Self-Contained Air-Cooled Ice Machines.”

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)
	Remote receiver service valve and/or Liquid/suction line shut off valves are closed.	Open the valve(s). (See Section 2)
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).
	Fan cycling control does not de-energize condenser fan motor.	Verify pressure is below cut-out setpoint, replace fan cycling control.
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 high or 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 is filter.
	Hot incoming water.	Connect the ice machine to a cold water supply. (See Section 2)
	Water inlet valve is not working.	Remove the water inlet valve and clean it. (See Section 4)
	Incorrect incoming water pressure.	Water pressure must be 20-80 psi (137.9 - 551.5 kPA)
	Ice machine head section is not level.	Level the ice machine head section. (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.	Remove the water inlet valve and clean it. (See Section 4)
	The condenser is dirty.	Clean the condenser. (See Section 4)
	High air temperature around condenser unit.	Air temperature must not exceed 130°F (43.3°C)

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.