

CME256, 506, 656, 806: AutoIQ™ Cubers

Introduction:

This product manual contains the information needed for the setup, installation, initial start up, sanitation and maintenance of this ice machine. Keep it for future reference.

All series of these 4 models are covered in this manual:

- CME256, a 115 volt, single evaporator machine
- CME506, a 115 volt, dual evaporator machine (115 volt if 60 Hz, 230 volt if 50 Hz)
- CME656 and CME806, 230 volt, dual evaporator machines

Be certain that the information applies to the model in question. If no model is listed, the information applies to all models, including A through H series.

This manual is organized in the same way as the expected use of the machine, it begins with specifications, goes thru unpacking and setup, shows where everything is; continues with initial start up, then describes how it works. After that is the sanitation section, followed by service diagnosis and repair.

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Specifications:

These ice machines are designed to be installed indoors, in a controlled environment. They can operate satisfactorily under a wide variety of conditions. However, Do NOT operate the machine where it has not been designed for. Do NOT operate the machine in temperatures it has not been designed for. Do NOT operate the machine above or below the voltage limits for the particular model. Do NOT operate the machine with too little or too much water pressure.

All models will fit a standard, 30" wide Scotsman Ice Storage Bin. Some examples are:

- BH550; HTB555; HTB350; HTB250

The CME256 and CME506 are the typical models used in hotel applications and they fit the Scotsman HD30 dispenser without an adapter. All models fit the ID200 or ID250 dispensers which require a KBT44 adapter. Check Scotsman's sales literature for other application information.

CME256 or CME506 Operational Limits

	Minimum	Maximum
Air Temperature	50°F.	100°F.
Water Temperature	40°F.	100°F.
Water Pressure	20 psi	80 psi
Voltage (115 volt model)	103	126
Voltage (208-230 volt mdl)	198	253
Voltage (230 volt model)	207	253

Note: These machines fill the bin very full, up to the base of the ice machine. Bin Model BH550 may need kit **KBaffle1**. In some cases the ice level in the bin may be too high for a customer's needs. A thermostat kit is available to lower the ice level, its part number is A37749-001.

A stacking kit, for like models, is **KSCME6-30**.

Scotsman reserves the right to make design changes and/or improvements at any time. Specifications and designs are subject to change without notice.

CME656 or CME806 Operational Limits

	Minimum	Maximum
Air Temperature	50°F.	100°F.
Water Temperature	40°F.	100°F.
Water Pressure	20 psi	80 psi
Voltage (60 Hz model)	198	253
Voltage (50 Hz model)	207	253

Scotsman assumes no liability or responsibility of any kind for products manufactured by Scotsman that have been altered in any way, including the use of any parts and/or other components not specifically approved by Scotsman.

BASIC INFORMATION

Current Model Number	Dimensions W" x D" x H" (w/o bin)	Basic Electrical	Condenser Type	Minimum Circuit Ampacity	Maximum Fuse Size	Refrigerant Charge (R-404A)
CME256AS-1H	30 x 24 x 27	115/60/1	Air Cooled	16	20	see page 27
CME256WS-1H	same	115/60/1	Water Cooled	16	20	
CME256AS-32H	same	208-230/60/1	Air Cooled	7.9	15	
CME506AS-1H	same	115/60/1	Air Cooled	19	20	see page 28
CME506WS-1H	same	115/60/1	Water Cooled	19	20	
CME506AS-6H	same	230/50/1	Air Cooled	7.9	15	
CME506WS-6H	same	230/50/1	Water Cooled	7.1	15	
CME506AS-32H	same	208-230/60/1	Air Cooled	8.9	15	
CME656AS-32H	same	208-230/60/1	Air Cooled	13.6	20	36 ounces
CME656WS-32H	same	208-230/60/1	Water Cooled	12.7	20	26 ounces
CME656AS-3H	same	208-230/60/3	Air Cooled	6.6	15	36 ounces
CME656WS-3H	same	208-230/60/3	Water Cooled	5.8	15	26 ounces
CME656AS-6H	same	230/50/1	Air Cooled	13.4	20	36 ounces
CME656WS-6H	same	230/50/1	Water Cooled	12.6	20	26 ounces
CME806AS-32H	same	208-230/60/1	Air Cooled	17.5	20	32 ounces
CME806WS-32H	same	208-230/60/1	Water Cooled	16.0	20	24 ounces
CME806AS-6H	same	230/50/1	Air Cooled	17.6	20	32 ounces
CME806WS-6H	same	230/50/1	Water Cooled	16.2	20	24 ounces

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Pre-Installation

Other Applications:

Models CME256 or CME506 may be placed on certain Ice Dispensers, including Scotsman models: HD30, ID200 and ID250.

Check with other dispenser manufacturers for recommendations regarding application.

Check the nameplate for electrical requirements. The nameplate is located on the back of the ice machine. While the model and serial number are on the nameplate, a serial number plate is located at the front of the machine, below the metal control box.

Water:

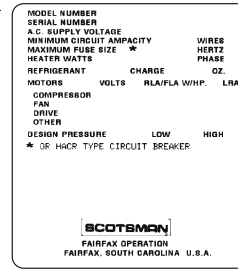
There is no such thing as pure water. There are two ways water can contain impurities: in suspension or in solution. Suspended solids can be filtered out. In solution or dissolved solids must be diluted or treated. Water filters are recommended to remove suspended solids. Some filters have treatment in them for suspended solids. Check with a water treatment service for a recommendation.

Cube Ice machines use more water than what ends up in the bin as ice. While most water is used during ice making, a portion is designed to “rinse” out the water system to keep hard water scale from clogging up the machine. That water rinse, combined with water filters, prolongs the times between needed water system cleaning.

Note: All Scotsman CM³ models, like those described in this manual, feature Scotsman’s AutoIQ™ control system and ReliaClean™ water system cleaning process.

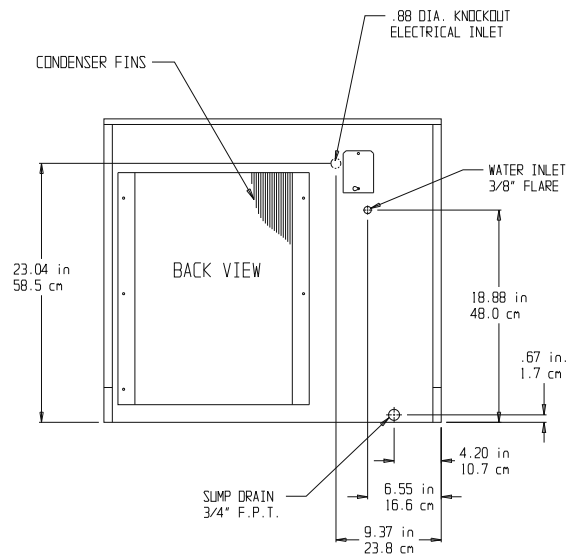
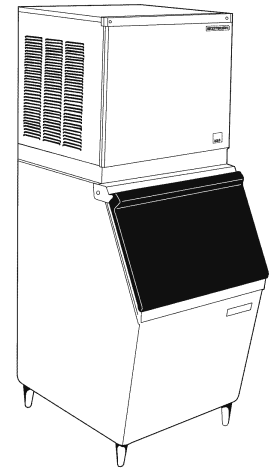
Service Technicians: All models are set by the factory at a “standard” water rinse, which is compatible with typical water conditions. The ReliaClean™ water system provides an adjustment method so to the amount of water rinsed per cycle can be changed. If the prior ice machine worked acceptably well with the local water conditions, leave the machine at the factory setting. If severe water conditions are present, and water filters do not solve the problem acceptably, adjust the machine to use more water. If water conditions are excellent, adjust the machine to use less water. See the Adjustments section.

Note: Water use adjustments are customer convenience adjustments; they are NOT factory defects and are NOT covered by warranty.

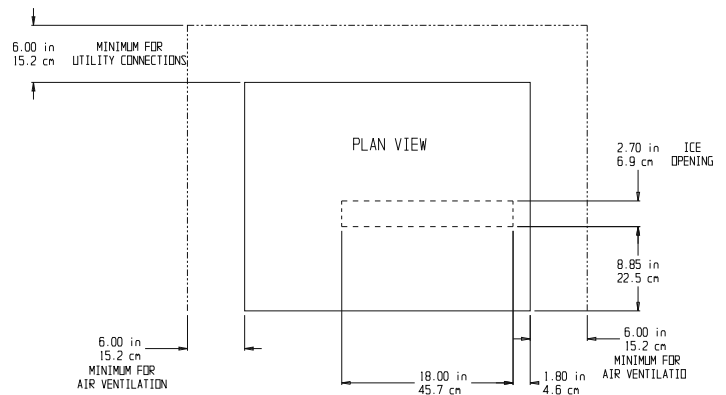


Nameplate

Location of Nameplate
(on the back, plus a serial plate is behind the front panel)



Back View Diagram (air cooled)



Top View Diagram

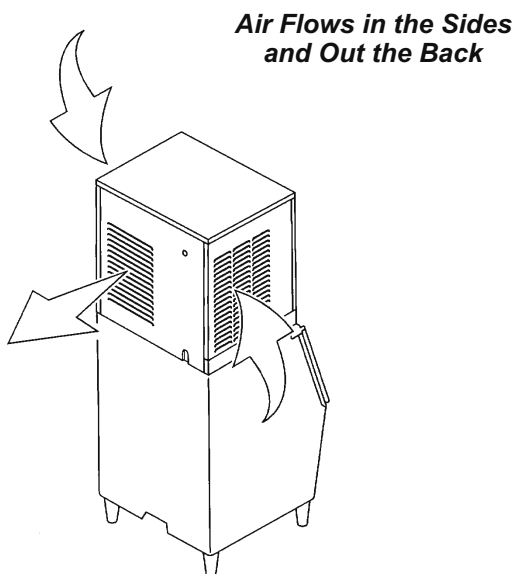
Note: Although the machine will function, ice capacity of air cooled machines will be significantly reduced with only 6 inches of clearance at the sides, back and top.

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Location & Assembly:

Air cooled models take room temperature air in from the left and right sides, and discharge warm air out the back. If installed in a corner or with another cabinet next to the right side, an air baffle could be installed on the back of the cabinet to minimize air re-circulation.

A 6 inch **minimum** clearance on the back, left and right sides is required for operation and service of this machine.



Note: Although the machine will function, ice capacity of air cooled machines will be **significantly** reduced with only 6 inches of clearance at the sides, back and top.

Unpacking and Assembly:

Begin with unpacking the ice storage bin. Remove the carton, and using part of the carton as a cushion, tip the bin on its back to remove the skid and attach the legs or casters. Note: Stacked applications may not use casters.

Return the bin to an upright position. Check the bin top gasket for gaps and tears, fill any in with food grade sealant prior to placing the ice machine on the bin.

If the ice machine has not been unpacked, do so now. Remove the carton from the skid. Lift the ice machine off the skid directly onto the bin.

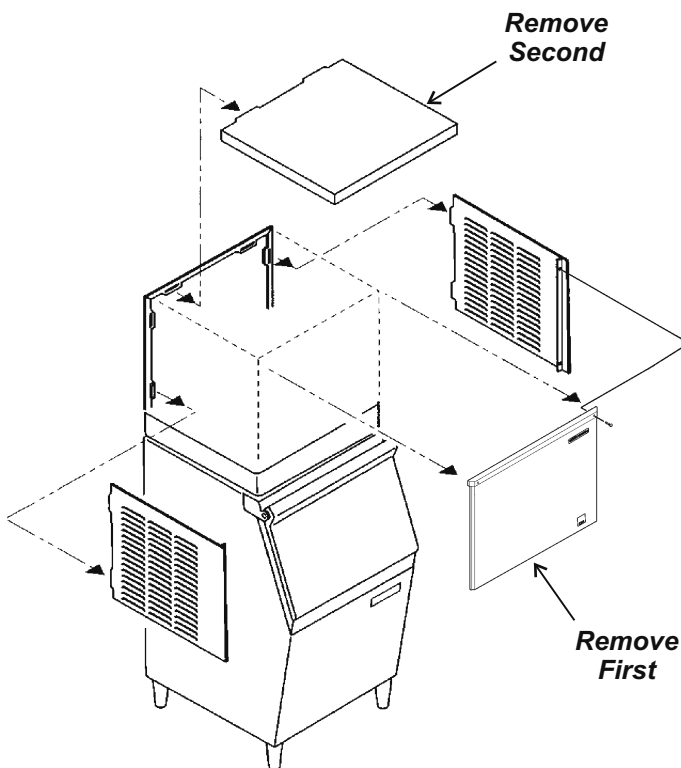
Note: The machine is heavy! Use a mechanical hoist if necessary.

Secure the ice machine to the bin with the hardware provided (two metal straps and 4 bolts).

Cabinet Panel Removal:

Note: The top panel holds the upper edges of the side panels in place.

1. Front Panel, "A" series: Remove the front panel by removing the four screws connecting the front panel to the left and right sides.




Removal of Panels

Front Panel "C thru H" Series: Remove top two screws, and pull the bottom of the panel away from the machine to unsnap it from the machine.

2. Remove 2 screws at the front edge of the top panel, and pull the top panel forward until it releases from the tabs connecting it to the back panel.

3. Remove the screws at the front edge of each side panel, and pull them forward until they release from the tabs connecting them to the back panel.

Stacking:

Models CME256, CME506, CME656 and CME806 may be stacked together in any combination. Use kit number KSCME6-30 

1. Remove the front, left side and top panels from the bottom machine. Discard the top panel.

2. Remove the front and left side panels from the top machine.

3. Place the upper machine onto the lower machine. Check that the tabs on the top of the freezing compartment in the lower machine engage the slot in the base of the upper machine (around the cube port).

4. Fasten the upper cabinet to the lower cabinet with the hardware (two metal straps and four bolts) provided with the machine.

5. Knock out 1 hole in the upper left (viewed from the front) corner of the lower unit's back panel. Knock out the hole in the lower left (viewed from the front) corner of the upper unit's back panel.

6. Position the strain reliefs over the wrapped portion of the stacking kit wire harness.

Route the Stacking Kit Wire Harness from the back to the top and bottom machines through the holes made in step 5. **The harness is marked which end goes to which machine.** Push the strain reliefs into place from the back of the machines.

Follow local electrical codes for 24 volt wire.

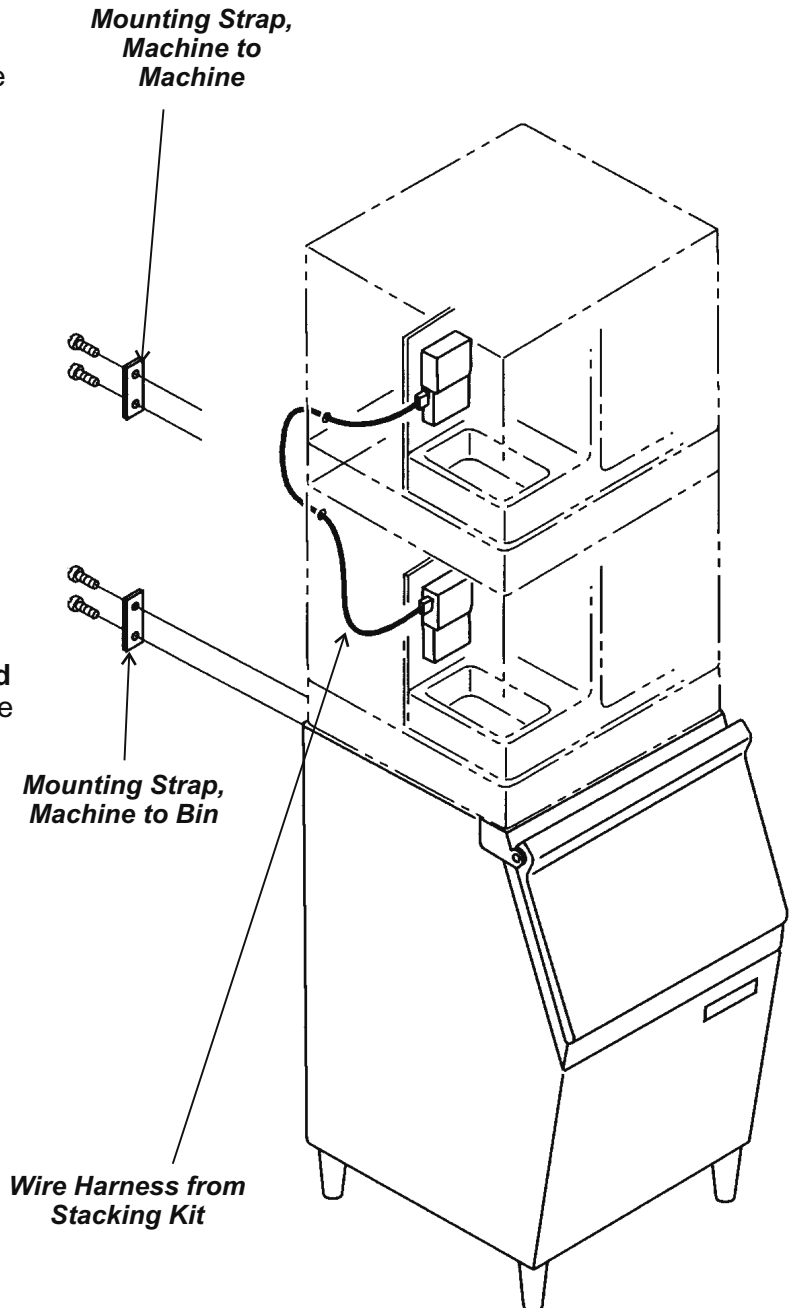
In the lower unit, route the wire behind the suction line and through the snap bushing just below the Controller. Tape any excess wire to the insulated suction line.

In the upper unit, route the harness through the snap bushing just below the System Controller.

Plug one end into each Controller connection number 7.

7. Place insulation pad from the kit over the reservoir drain tubing in the upper machine. Make certain that the insulation is in contact with the tubing.

8. Return all panels to their normal places.



Stacking Like Models

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Plumbing:

All models require an adequate potable water supply and a gravity drain. The recommendations for tubing are: Water supply to be $\frac{3}{8}$ " OD. Drain to be $\frac{3}{4}$ " OD.

Supply:

Air cooled models have 1 water supply connection, a $\frac{3}{8}$ " male flare at the back of the cabinet. Water cooled models have an additional $\frac{3}{8}$ " FPT condenser inlet connection at the back of the cabinet.

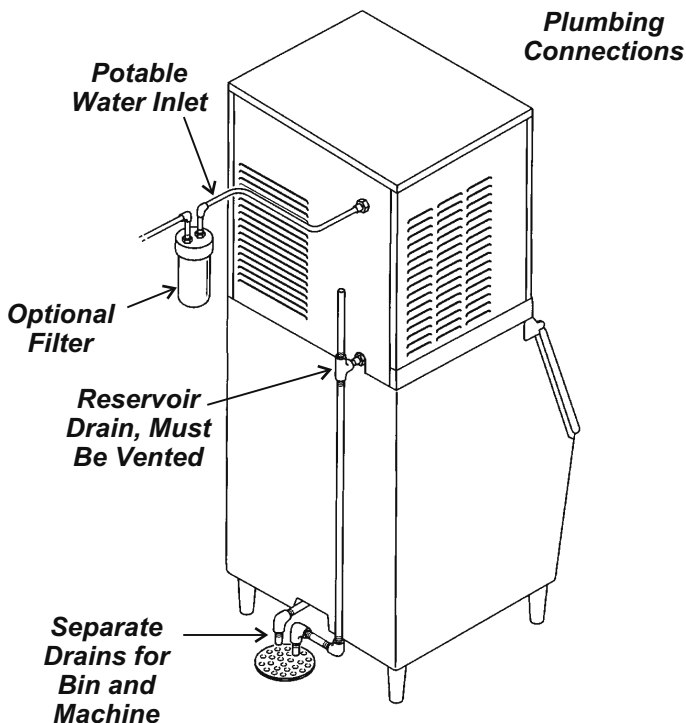
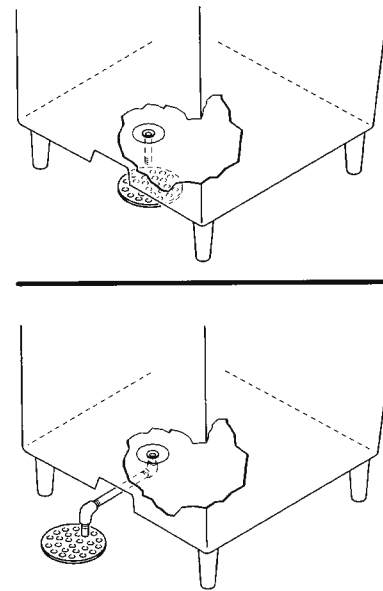
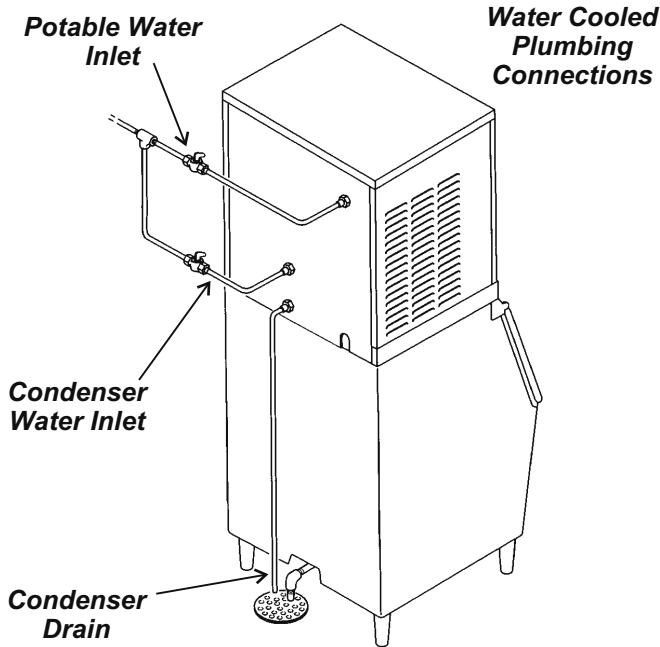
Drain:

Air cooled models have 1 gravity drain connection, a $\frac{3}{4}$ " FPT fitting at the back of the cabinet.

It must be **vented** at the back of the cabinet.

Water cooled models have an additional condenser drain, it is a $\frac{1}{2}$ " FPT fitting at the back of the cabinet. Do not vent this drain.

The ice storage bin will have a drain out the back or base, depending upon the model. Note: Scotsman HTB555 (shown in this manual) may be drained either out the back or the base.



Insulation is recommended for the ice machine reservoir and bin drains.

Follow all applicable codes

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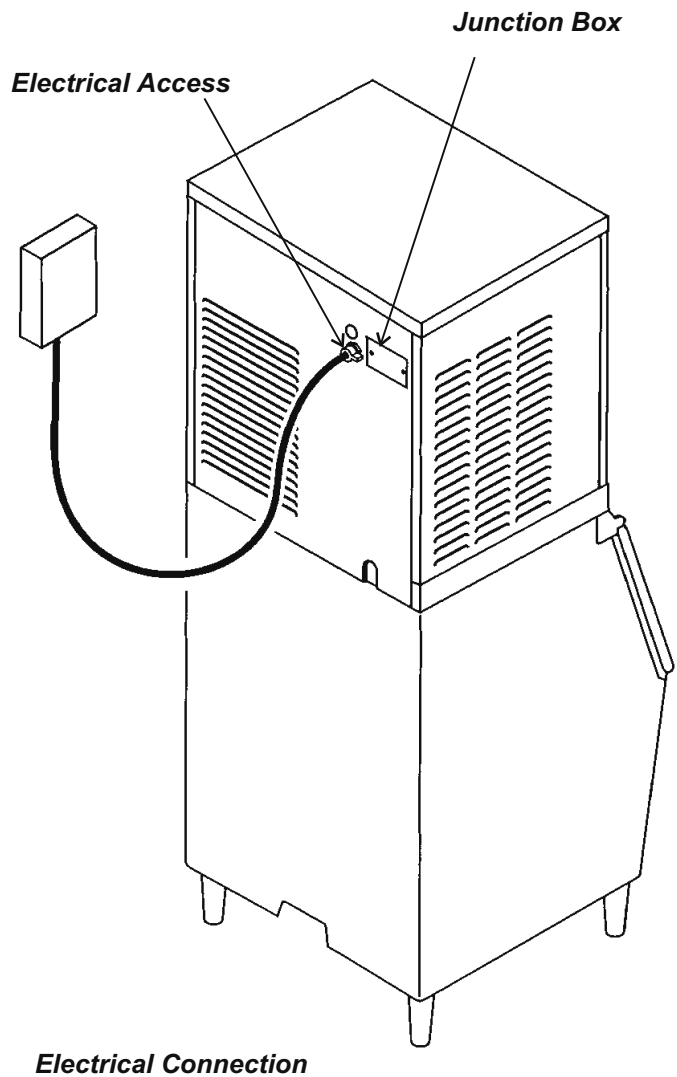
Electrical:

All models must be installed with the correct wire size and type per the National Electric Code. Locate the nameplate on the back of the cabinet and find the numbers for Voltage, Phase, Minimum Circuit Ampacity and Maximum Fuse Size. Either fuses or HACR type circuit breakers may be used.

Electrical connections are made in the junction box in the back of the cabinet.

1. Remove the junction box cover.
2. Knock out 1 hole for a field supplied strain relief.
3. Install wires and strain relief per code.
4. Connect to wires and secure ground wire to ground screw inside junction box.

Follow all Local, State and National codes.



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After Utility Connections:

1. Level the cabinet, use the leg levelers on the end of the legs to adjust the cabinet height.
2. Wash out the bin. If desired, the interior of the bin could be sanitized.
3. Locate the ice scoop (if supplied) and have it available for use when needed.

Final Check List:

1. Is the unit located indoors in a controlled environment?
2. Is the unit located where it can receive adequate cooling air?
3. Has the correct electrical power been supplied to the machine?
4. Have all the water supply connections been made?
5. Have all the drain connections been made?
6. Has the unit been leveled? The unit must be leveled at the water reservoir.
7. Have all unpacking materials been removed?
8. Is the water pressure adequate?
9. Have the drain connections been checked for leaks?
10. Has the bin interior been wiped clean or sanitized?
11. Have any water filter cartridges been replaced?

Component Location and Function:

Reservoir: Contains the water charge used for every batch of ice.

Water Inlet Valve: Opens to allow water into the reservoir.

Water Level Sensor: Controls the size of the ice cube by measuring how much water is used in a cycle. It consists of a float, stem and electric eye. The stem will move slightly when the pump is on, this is normal. As the machine makes ice the reservoir water level will fall and the visible portion of the stem will slide down thru the slot in the sensor body.

AutoIQ Controller: Controls the complete operation of the ice machine. Turns it on and off; switches it between cycles; shows information via indicator lights; and shuts the machine down if there is a problem.

Evaporators/Freezing Compartment: Location of the evaporators. Ice forms on the evaporators and is released when warmed up during the harvest cycle. The freezing compartment is fully insulated for maximum efficiency.

Cube Deflector: The slots in the inclined deflector let the water falling from the evaporators back into the reservoir, but when ice falls during harvest, the ice slides off into the bin.

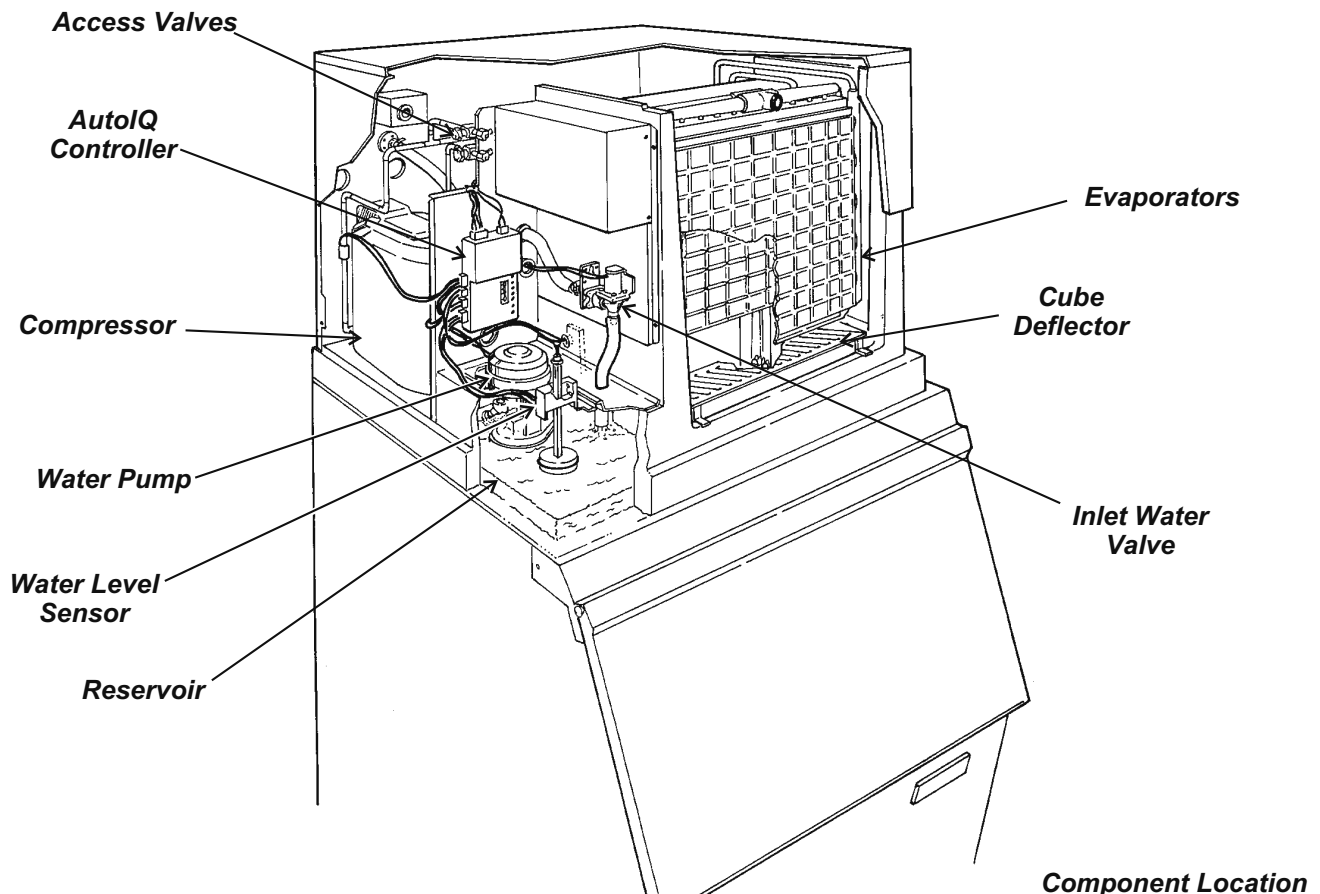
Refrigeration Service Access Valves: Only to be used by a certified technician. Allows access to the refrigeration system for diagnostic information.

Water Pump: Forces the water from the reservoir to the top of the evaporator(s). The motor is separated from the reservoir water to minimize contact with the water.

Compressor: The refrigerant vapor pump, it forces the refrigerant to flow thru the refrigeration system tubing.

Hot Gas Valve: Closed during freeze, it opens during harvest to divert hot discharge refrigerant gas into the inlet of the evaporators.

Condenser: Either air or water cooled, discharges the heat produced in ice making.



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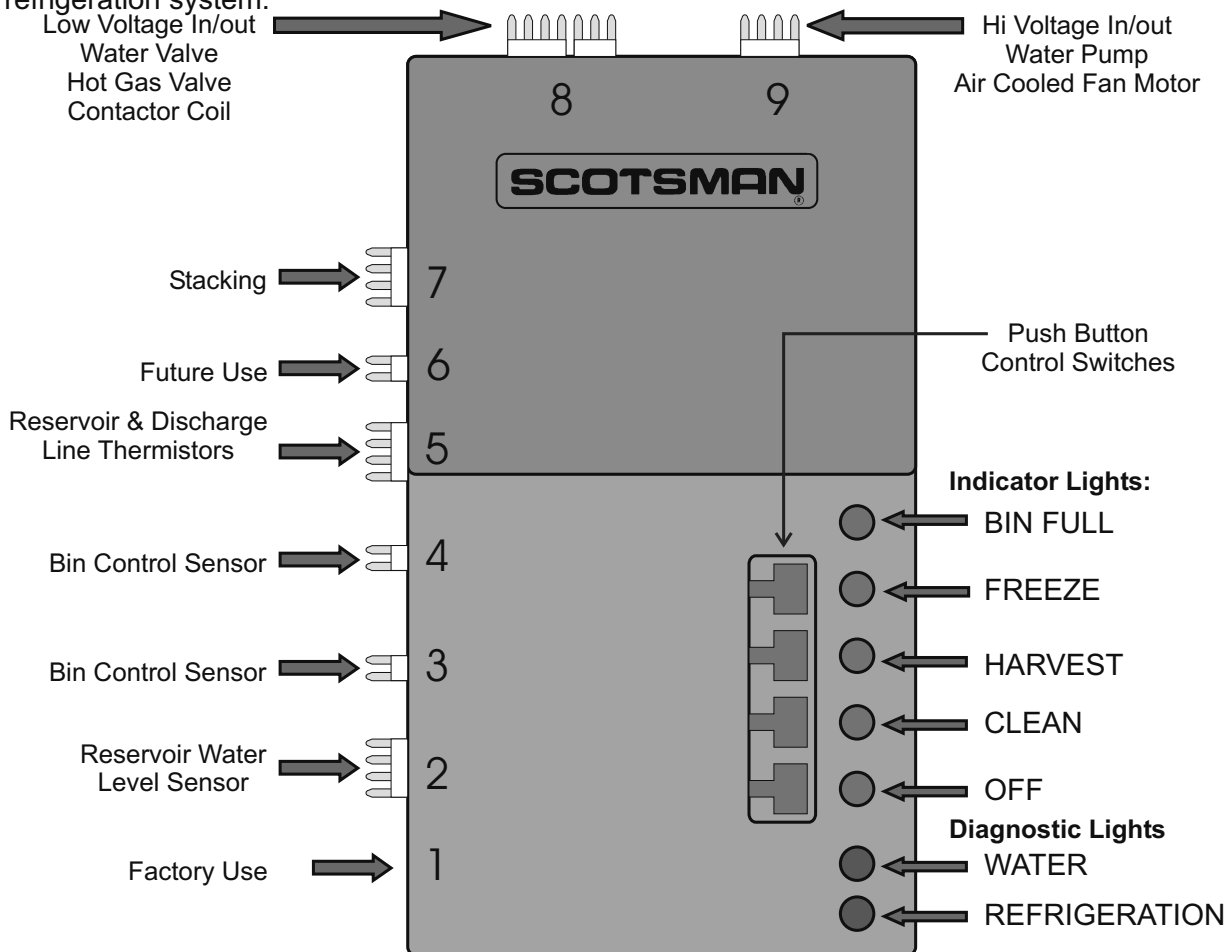
AutoIQ Controller:

Indicator Lights:

- **Bin Full:** On when bin is full, goes on and off as ice falls during a harvest cycle.
- **Freeze:** On when the unit is in the Freeze cycle, blinks when a freeze mode is pending.
- **Harvest:** On when the unit is in the Harvest cycle.
- **Clean:** On when the unit is in the Clean cycle, blinks when preparing for a clean mode.
- **Off:** On when the unit has been switched off, blinks when the machine is preparing to shut off.
- **Water Error:** On when the controller has identified a problem with the water system.
- **Refrigeration Error:** On when the controller has identified a problem with the refrigeration system.

Cycle Definitions:

- **Freeze:** The refrigeration system is operating to remove heat from the evaporators. The compressor, fan motor (if air cooled) and water pump are ON.
- **Harvest:** The refrigeration and water systems are operating to harvest the ice cubes. While the compressor is on for the full cycle, the water pump will be off at the beginning and inlet water valve will switch off before the end.
- **Clean:** The Inlet Water Valve opens to fill the reservoir, The Water Pump starts. The Clean indicator light is switched ON. A manually initiated rinse flushes the system.



AutoIQ Controller: Wire Connections, Push Buttons, and Indicator Lights

Initial Start Up:

1. Remove the front panel.
2. Locate the AutoIQ Controller.
3. Switch on the electrical power. Note that the indicator lights all flashed on briefly.
4. Open the water supply valve.
5. Push and release the Freeze cycle push button (the Freeze indicator light will blink until the compressor starts). The next several operations are automatic.

Initial Start Sequence

- The Freeze light is blinking.
- The Hot Gas Solenoid valve is open.
- The inlet water valve opens to fill the reservoir. The inlet water valve will shut off when the reservoir is full.
- The water pump starts to pump water.
- The inlet water valve opens again to refill the reservoir.
- After 30 seconds the compressor starts.
- After 5 seconds the hot gas valve closes.

Freeze Cycle:

- The Freeze indicator light will come on. The machine will stay in a Freeze cycle for many minutes. Slush may appear in the reservoir, it is temporary and normal.
- Under certain conditions, the pump may stop for a few seconds. After that the inlet water valve will refill the reservoir.
- The fan motor (of air cooled models) will begin to turn and soon warm air will be forced out the back of the cabinet.
- The freeze cycle will continue until the water level in the reservoir drops to its factory set point, then the Harvest Cycle will begin.

Harvest Cycle:

- The Harvest indicator light will be ON,
- The hot gas valve will open.
- The water pump will stop. It will restart in less than a minute.
- The Inlet water valve will open. The machine will fill the reservoir and overflow it for a specified number of seconds then shut off. The harvest cycle may still be in progress.
- The Bin Full indicator light will go on and off as ice falls from the evaporators.

6. Machines are shipped from the factory with the purge level set to accommodate average water conditions. See page 13 for purge adjustment instructions.

24 hours of run time may be need to attain full ice making capacity.

7. The machine's correct cube size should result in ice falling from the evaporator in vertical strips of 8 - 10 cubes; the top 2 cubes might fall individually.

8. After a few minutes the machine will return to a freeze cycle.

9. Fill out the Customer Evaluation and Warranty Registration. Send it to Scotsman.

10. Replace the front panel.

11. Inform the user of the location and telephone number of the local service company. Also inform the user of the required maintenance of the machine.

Notes On Operation:

1. The electric eyes signal the ice machine to shut off whenever the bin becomes full. After the eyes sense that there is ice between them, the ice machine will shut off at the end of the next harvest cycle. This last harvest cycle will be longer than the rest.

2. After the bin has filled the ice machine will not be able to restart for 4 minutes. However, if needed, the Freeze button may be pushed and the unit will restart.

For example: If ice is removed from the bin immediately after the machine has filled up and shut off, the machine will not restart for 4 minutes.

3. If the bin controls sense a bin full signal before any water is used (float stem up), the machine will shut off on bin full.

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Adjustments:

If there was a problem during Initial Start Up:

If an error light came on, check the following.

1. Water error.

A water error could have been determined by the System Controller if the inlet water valve does not fill the reservoir, or if the water pump does not start and lower the water level.

2. Refrigeration error.

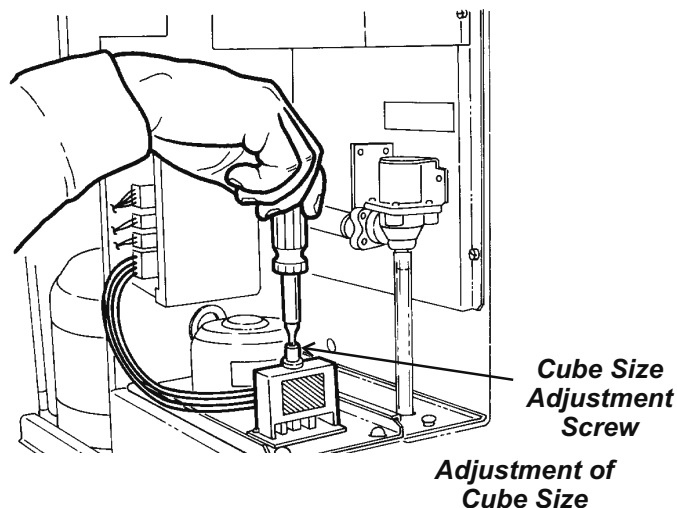
A refrigeration error could have been determined by the System Controller if the water temperature did **not** drop during the freeze cycle. The controller will next check the compressor discharge temperature, If the discharge temperature is too low, the refrigerant error light will be switched on, and the machine will Shut Down.

Note: Reset and restart the machine by pushing and releasing the Off push button switch, and then pushing and releasing the freeze push button switch.

How to Adjust Cube Size (Reference Only)

The adjustment is done by moving the long screw located in the floating stem at the front of the machine.

Note: Units manufactured beginning 3/97 do not have a cube size adjustment screw; their cube size is fixed.



1. Remove the front panel.

2. Locate adjustment screw, and

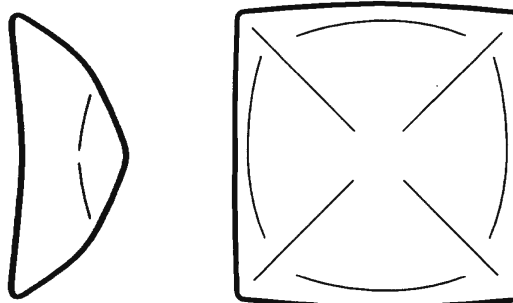
To increase the cube size, turn the screw out (counter clockwise)

To decrease the cube size, turn the screw in (clockwise)

Turn the screw 2 turns at a time.

3. Check cube size after the next freeze cycle, repeat step 2 if needed.

Cube Size Diagram



Side View, Cube should be 1/2" thick at the center

Front View, Cube is 1.5" x 1.4"

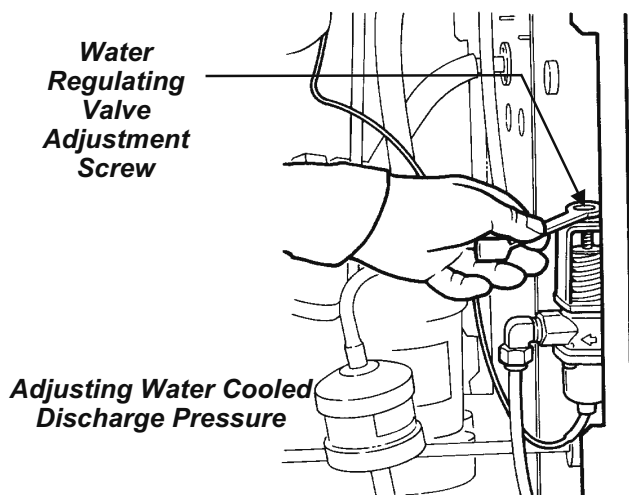
Adjustments:

How to adjust the water cooled discharge pressure

Water cooled models use a water regulating valve to control how much cooling water flows thru the water cooled condenser. At the top of that valve, located in the right rear corner of the ice machine, is an adjustment stem.

To Adjust:

1. Attach a refrigeration manifold gage to the discharge access valve.
2. While the unit is in the freeze cycle, determine the discharge pressure, it should be about 245 PSIG.
3. If needed, rotate the adjustment stem to increase or decrease the pressure:



A. To increase discharge pressure (reduce water flow) rotate the stem counter-clockwise.

B. To decrease the discharge pressure (increase water flow) rotate the stem clockwise.

Remove the manifold when done. Note: The water outlet temperature should be between 100-110 when the valve is properly set.

Thermostatic Expansion Valve:

The TXV is not adjustable, do not attempt to adjust it.

How to Adjust the Amount of Water Purge

Adjustment is done by use of the control buttons on the AutoIQ Controller. Examine the next section to become familiar with the Controller before beginning.

1. If the machine is on, push and hold the OFF button for more than 3 seconds, then release it. This switches the machine Off.
2. Push and hold the OFF button for more than 3 seconds (just until all lights flash on) then release it. Do not hold it in it too long.
3. Examine the green lights. They should have all flashed once, then certain ones will have turned on to indicate which purge level the machine is set at. There are 5 levels of purge available:

- 1. **Maximum Purge** is when All 5 lights are ON. Use for extreme water conditions. Note: This setting may extend the Harvest cycle and reduce capacity.
- 2. **Heavy Purge** is when these 4 lights are ON: Freeze, Harvest, Clean, Off. Use for severe water conditions.
- 3. **Standard Purge** (factory setting) is when these 3 lights are ON: Harvest, Clean, Off. Use for moderate to severe water conditions.
- 4. **Moderate Purge** is when these 2 lights are ON: Clean, Off. This is for typical water conditions.
- 5. **Minimum Purge** is when this light is ON: Off. For excellent water conditions.

Adjust by pushing and releasing the Freeze button. Pushing and releasing the Freeze button increases the purge one level up to the maximum, then it goes to the minimum.

4. The machine will automatically restart after 60 seconds of no switch inputs, or restart the machine by pushing in and holding the Off button for more than 3 seconds, then releasing it. The unit will then be Off. From there the machine may be placed in a freeze cycle by pushing and releasing the Freeze button.

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How To Operate The AutoIQ Controller

The AutoIQ Controller is a microprocessor based device that receives input from several sources and switches various components on and off.

Its manual control is thru the use of the Push Button Control Switches

1. **Freeze Button.** Pushing and releasing this button starts or restarts the machine. The System Controller remembers what cycle it was last in and returns to that cycle.

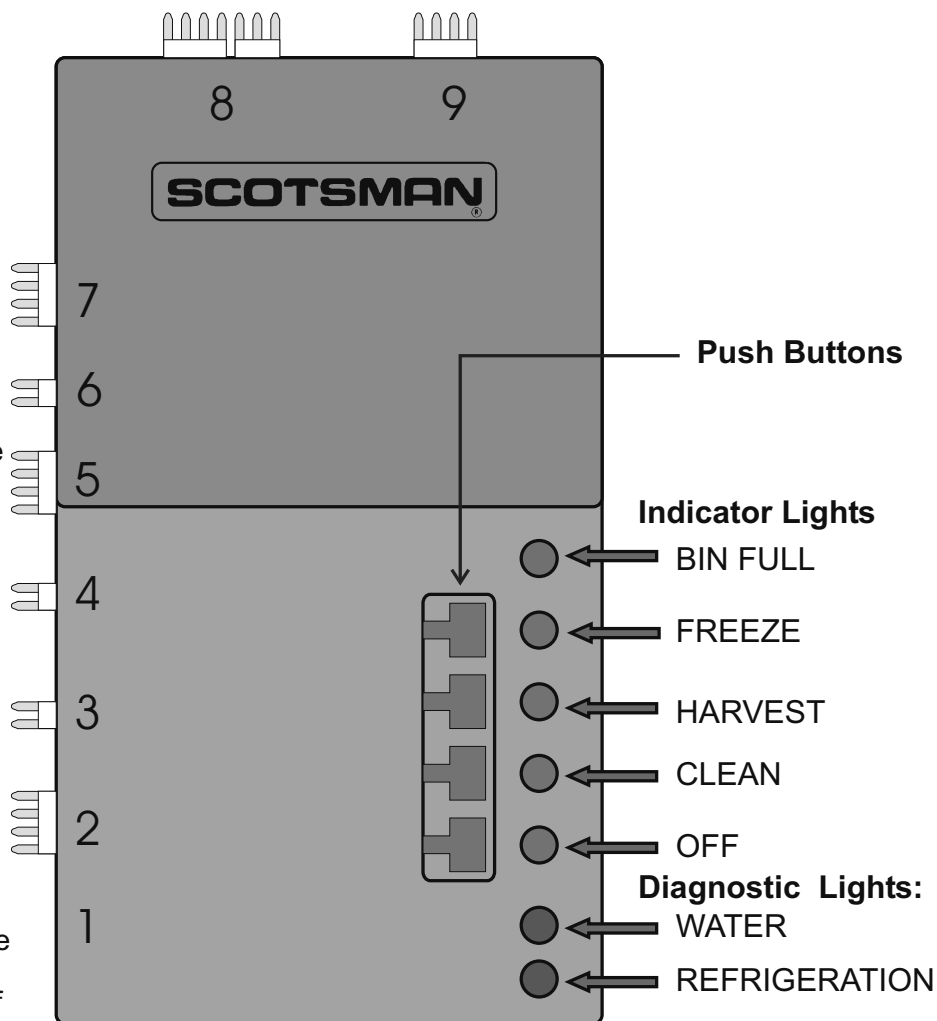
2. **Harvest Button:** Pushing and releasing this button will cause the machine to go directly to a Harvest Cycle. Can be done from Freeze or Off. The machine will switch Off at the end of the Harvest cycle.

3. **Clean Button:** Pushing and releasing this button will cause the machine to only power the water pump for circulation of ice machine cleaner. After the ice machine cleaner has circulated for about 10 minutes a second push of this button will switch on the rinsing system to flush out the dissolved scale and ice machine cleaner.

4. **Off Button:** Pushing and releasing this button will switch the machine OFF at the end of the next cycle. If the button is pushed and HELD for more than 3 seconds, the unit will switch off immediately.

To Reset Machine (machine off, error light on): First push and release the Off button, then push and release the Freeze button.

To Recall the last two diagnostic codes: Push and hold the Off button until the machine shuts off. Then push and hold the Off button again until the green lights flash on. Push and release the Harvest button to recall the most recent diagnostic code. Push and release the Harvest button again to recall the second to last diagnostic code (the bin full light will be on when the second to last code is displayed). If no code is displayed, there was none recorded. Push and release the off button again to return to the normal setting.



Controller Indicator Light Description

How The Electronic Cuber Works

This section is intended for the technician. It is not necessary for the normal operation and maintenance of the machine.

The AutoIQ Controller operates the ice machine by monitoring several input measures and switching various loads on and off.

Water System:

Water flows into the ice machine during the harvest cycle through the inlet water valve. The water valve will NOT be open the complete length of the harvest cycle. The water pump forces water to the top of the evaporators, both in the Freeze and Harvest cycles. Un-frozen water falls through the cube deflector and back into the reservoir. As water is turned into ice, the water level in the reservoir falls, and at the point where the cubes are fully formed, the Water Level Sensor indicates to the Controller that it is time to begin the Harvest cycle.

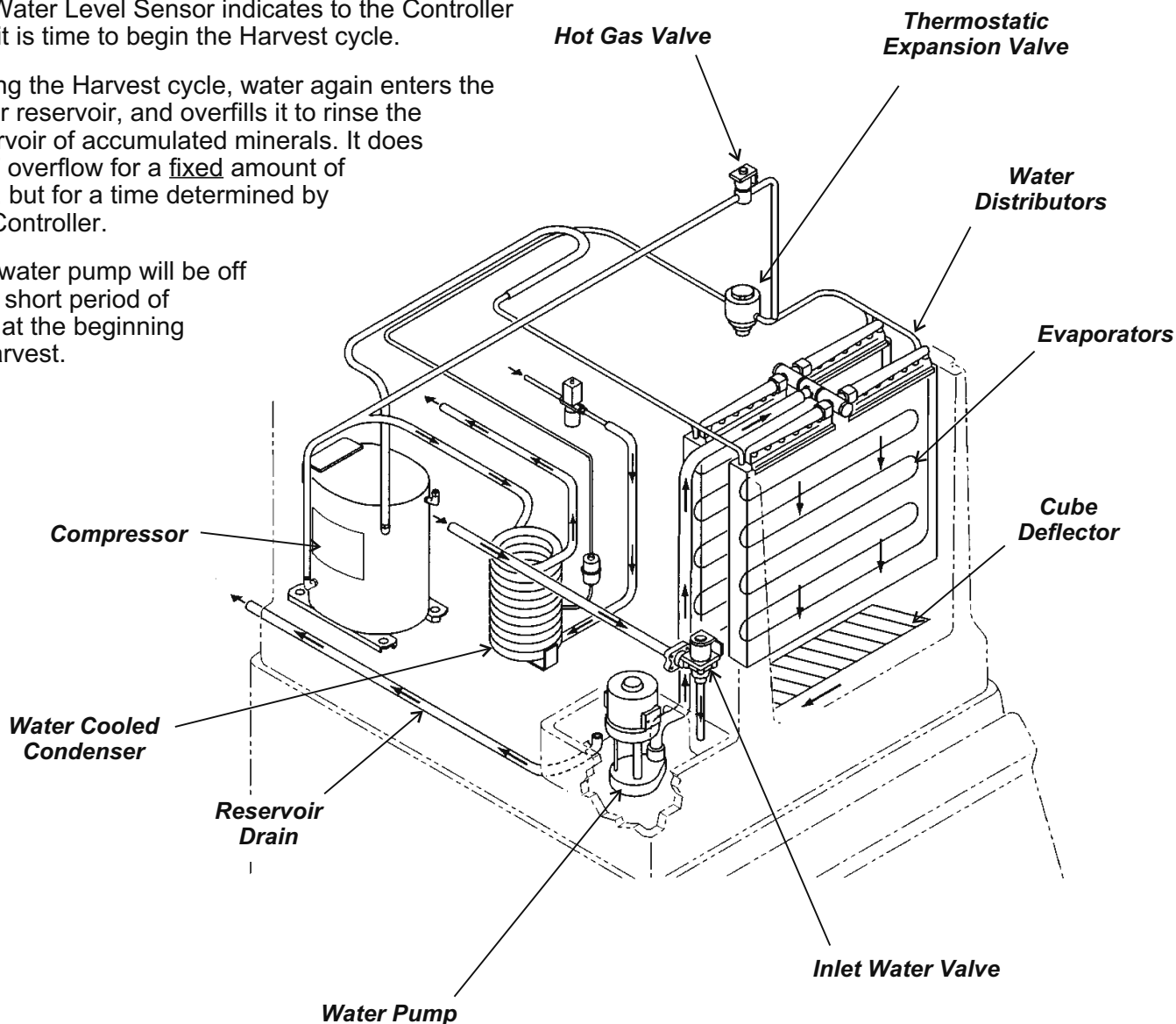
During the Harvest cycle, water again enters the water reservoir, and overfills it to rinse the reservoir of accumulated minerals. It does NOT overflow for a fixed amount of time, but for a time determined by the Controller.

The water pump will be off for a short period of time at the beginning of harvest.

Refrigeration System:

The refrigeration system is similar to that of most commercial cube ice machines. Heat is removed from the water and discharged out the condenser during the freeze cycle. As liquid refrigerant passes through the Thermostatic Expansion Valve(s), it enters the bottom of the evaporators, and will form on the bottom first. Later CME506 models have check valves to help direct the flow of refrigerant to the correct distributor.

When cubes need to be released (Harvest) the Hot Gas Bypass Valve is opened and hot discharge gas flows directly from the compressor to the evaporator inlets. This warms up the evaporators and the surface of the ice frozen to the evaporator surface melts. Ice then falls into the bin.



Water and Refrigeration Schematic - Note: CME506 E Has Two Expansion Valves

CME256, 506, 656, 806: AutoIQ™ Cubers

Technicians Only: Freeze Cycle Operational Sequence

Assuming the machine has been operational, the Freeze cycle begins with the end of the Harvest Cycle:

- Reservoir is full
- Condenser fan is OFF
- Water Inlet Valve is OFF
- Water Pump is ON
- Compressor is ON
- Hot Gas Valve is ON

Controller Operation, Beginning freeze:

1. Switches on the Freeze indicator light and shuts off the hot gas valve.

2. Measures and stores the discharge temperature.

3. Starts the fan motor (air cooled only). Some early units have a fan control switch, it shuts the fan off if the discharge pressure drops below 190 PSIG. Machines built beginning in August 1996 do not have a fan control switch, instead the Controller checks the discharge temperature and cycles the fan every 30 seconds if the temperature is low (below 125°F. or more than 3381 ohms).

If the discharge temperature exceeds the design maximum (250°F. or less than 377 ohms), shuts the machine down on a Refrigeration Error.

4. Checks for a "bin full" signal throughout the cycle.

5. Measures the reservoir water temperature. If the machine is operating correctly, the reservoir water temperature will fall at a standard rate. The Controller will be checking to see if the water temperature fall matches that rate.

If not, it re-checks the discharge line temperature. If too low, it Shuts Down on a Refrigeration Error. If the discharge temperature is acceptable, the water system is checked by shutting off the water pump and determining if the water level goes up enough. If it does not, it is assumed that there is a water pump problem and the machine Shuts Down on a Water Error.

If the water level does "measure up" the water pump is restarted and the controller then measures how long it takes to lower the water level. If the water level does not fall, the machine Shuts Down on a Water Error.

6. Once per cycle the machine may shut off the water pump. It **only** does this when the water temperature reaches a preset minimum (38°F. or 27835 ohms). The pump will only be off for a few seconds. After the pump restarts, the inlet water valve opens to refill the reservoir.

7. As the machine makes ice, the water level in the reservoir will ultimately fall to the Harvest Level (when the top electric eye in the water level sensor is disrupted by the adjustment screw).

Note: If the freeze cycle exceeds the preset Maximum (50 minutes), the Controller will Shut Down on a Refrigeration Error.

8. The end of Freeze cycle will see the machine in this state:

- Water level = below harvest position
- Condenser fan will be off
- Water inlet valve will be off
- Water pump will be ON
- Compressor will be ON
- Hot gas valve will be off

At this point Harvest begins and the Controller switches the Harvest indicator light ON.

Note: If there is a power interruption, the system controller will automatically restart the machine with a process that begins with getting the machine back to a normal state: water re-fills, the unit freezes for 30 seconds and then goes into a 4 minute harvest. It will then proceed to a new Freeze cycle. While in an electrical restart mode, the controller's Freeze light will be blinking - even when the machine is in harvest.

Technicians Only: Harvest Cycle Operational Sequence

Harvest

The (air cooled model) fan is off.

The water valve opens and fills the reservoir to the Full level.

The water pump shuts off, it will restart in less than a minute.

Note: Machines built after August 1996:

- If the machine remains in the harvest cycle for longer than between 6 to 9 minutes (depending upon the regular harvest cycle's length) the water pump will be switched off until the next freeze cycle.
- When the bin is full and the unit is in a harvest cycle, the pump will be switched off.

The Controller checks how long it takes to fill the reservoir and if it was too much time, the machine Shuts Down on Water Error.

Note: The machine will automatically attempt to restart after shutting down because of a lack of water. The time between restarts is about 20 minutes.

The inlet water valve will stay on and open for a predetermined fraction of the time it took to fill the reservoir. This overflows and rinses the reservoir water.

During the Harvest Cycle, ice will be falling from the evaporators and between the bin control's electric eyes. The Controller monitors the ice falling and stays in the Harvest Cycle until ice quits going thru the electric eyes.

The maximum harvest time is 10 minutes. The first Harvest after a restart will be a long one to establish a base line, then the actual time it took to release the ice is used to determine the length of the next harvest cycle.

If no cubes fall (or are sensed) by the end of Maximum Harvest Time, the machine senses a refrigeration error. If the next cycle also produces a refrigeration error, the machine Shuts Down.

Note: Machines built up to August 1996: The last Harvest cycle before shutting off on Bin Full will be 10 minutes long. **Machines built beginning August 1996 have a last harvest cycle that is 4-6 minutes long.**

Note: The machine will not restart for 4 minutes after switching off on Bin Full, unless the freeze button is pressed.

Stacked Units:

If the bottom unit is in harvest and receives a signal from the top unit that it is also in Harvest, the bottom unit will stay in harvest for its Maximum Harvest Time.

Diagnostic Lights and Manual Resets

The controller will shut the machine off if a malfunction is sensed. Controllers up to 17-1 will shut the machine off after the first malfunction. Controllers marked 17-1 and up will restart the machine 2 times, with a 50 minute interval between restarts.

If a malfunction is still present after the second restart, the machine will then shut off and must be manually reset. During the restart interval, the machine will be off and a diagnostic code indicated.

An exception to this is lack of water. When switched off because of lack of water, the machine will always try to re-fill the reservoir every 20 minutes.

Another exception is a harvest error. As before, there must be two consecutive harvest errors to trigger a machine shut-down. With this change, the controller will still shut down and restart the machine after two consecutive harvest errors. However, if the errors repeat two more consecutive times, the controller will shut down and restart the machine again. If the machine registers two more consecutive harvest errors, the machine will again shut down and must be manually reset.

Production of units with Controllers 17-1 began approximately March 1997. Higher numbers may be expected after that date.

CME256, 506, 656, 806: AutoIQ™ Cubers

Sanitation and Cleaning


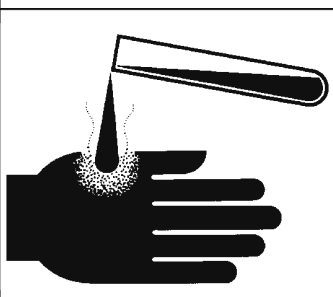
It is the User's responsibility to keep the ice machine and ice storage bin in a sanitary condition. Without human intervention, sanitation will not be maintained. Ice machines also require occasional cleaning of their water systems with a specifically designed chemical. This chemical dissolves mineral build up that forms during the ice making process.

Sanitize the ice storage bin as frequently as local health codes require, and every time the ice machine is cleaned and sanitized.

The ice machine's water system should be cleaned and sanitized a minimum of twice per year.

In Place Cleaning of the Ice Machine Water System:

1. Remove all ice from the bin. Either save it in a sanitary container or discard it. If the cleaning was planned, the ice machine could be switched off the night before to minimize waste.
2. Remove the front panel.
3. Push and release the Harvest button (this releases any ice that may be on the evaporators and warms them up).
4. Wait for the machine to finish the Harvest cycle (the machine will stop).
5. Remove the cube deflector, the evaporator cover, the cascading shield (if used) and the bin control sensors. Place the cascading shield and the cube deflector in a separate container. Place the bin controls in the reservoir.
6. Push and release the Clean button. The Clean indicator light will be blinking, and the pump will restart.
7. Pour 12 ounces of Scotsman Ice Machine Cleaner into the reservoir water. Return the evaporator cover to its normal position.

	Scotsman Ice Machine Cleaner contains acids. Acids may cause burns.
	If concentrated cleaner comes in contact with skin, flush with water. If swallowed, do NOT induce vomiting. Give large amounts of water or milk. Call Physician immediately. Keep out of the reach of children.

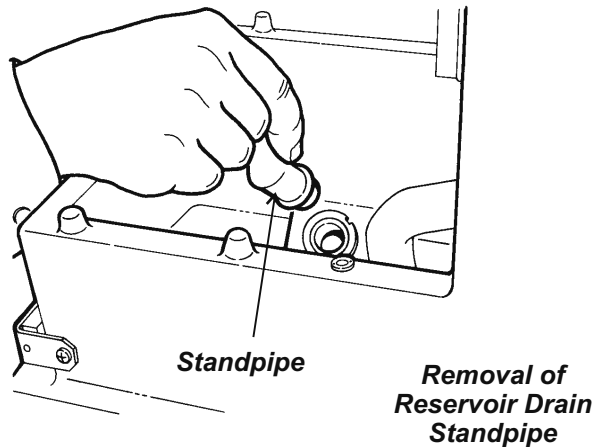
8. Mix a solution of 8 ounces of Scotsman ice machine cleaner and 1 gallon of warm (95-115°F.) water. Use the solution to scrub the cascading shield and cube deflector in the separate container.

9. After the ice machine cleaner has circulated for 10 minutes, push and release the Clean button. This starts the rinsing process. The Clean indicator light will be ON. Note: The rinse process flushes any residual cleaner out of the ice machine's water system.
 10. Continue the rinsing process for 20 minutes, then push the off button to switch the machine off.
 11. Go to the next step to sanitize the machine or go to step 19 to finish the cleaning process.
 12. Mix 2 gallons of Sanitizer solution. Follow local codes for Sanitizer.
- Note: A possible sanitizing solution may be made by mixing 1 ounce of liquid household bleach with 2 gallons of warm (95-115°F.) potable water.
13. Push and release the Clean button again.
 14. Pour 16 ounces of Sanitizer solution into the reservoir water.
 15. After the solution has circulated for 10 minutes push and release the Clean button. This starts the rinse process. Sanitize the ice storage bin while waiting.
 16. Continue the rinsing process for 20 minutes, then push the off button to switch the machine off.
 17. Remove the evaporator cover and spray or wash all interior surfaces of the freezing compartment including the evaporator cover with sanitizer solution.
 18. Thoroughly immerse the cascading shield and cube deflector in the sanitizing solution.
 19. Return the bin controls, cascading shield and cube deflector to their original positions.
 20. Return the evaporator cover to its original position. Push and release the Freeze button.
 21. Return the front panel to its normal position and secure it to the machine with the original screws.

Additional Maintenance

To drain reservoir completely (if desired):

1. Remove front panel.
2. Push and hold the Off button.
3. Remove screw holding reservoir cover, pull inlet tube out of reservoir cover, lift cover out of machine.
4. Unplug water pump connection, remove ground screw.
5. Remove float from float stem.
6. Unplug water level sensor.
7. Lift pump and sensor out of the machine.
8. Pull up on standpipe to release water.



9. Reverse steps 2-8 to reassemble.

Note: Be certain that the float is fully re-seated on the stem and the water pump bracket is positioned properly on the base.

For a proper reservoir rinse, the standpipe must be vertical and properly seated. There is a key tab and slot that positions the standpipe in the drain socket.

10. Push and release Freeze button.
11. Replace front panel.

To Sanitize the Ice Storage Bin

1. Remove all ice.
2. Remove baffle.
3. Switch ice machine OFF or wait for it to be in a cleaning cycle.
4. Mix a 1 gallon solution of warm (95-115°F.) water and sanitizer. Follow local codes for sanitizer.
5. Wash or spray the entire interior of the ice storage bin with the sanitizer solution. This includes the bottom of the ice machine and the inside of the door, the door gaskets (if any) and door frame.
6. Pour excess sanitizer into the bin to flush the drain system.
7. If the approved sanitizer requires a rinse, rinse all interior surfaces with potable water.

CME256, 506, 656, 806: AutoIQ™ Cubers

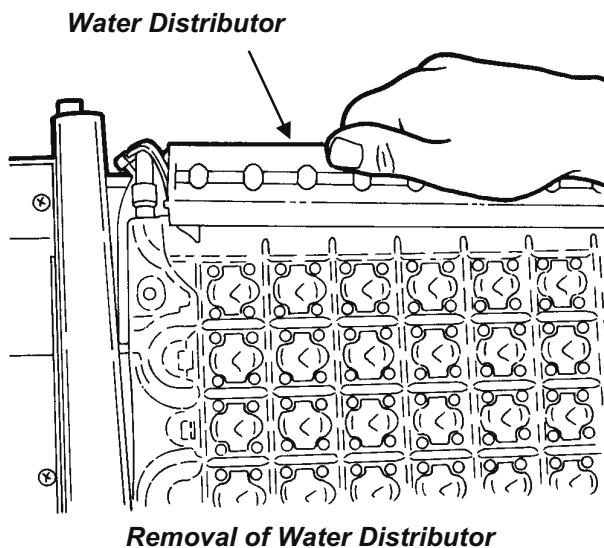
Additional Maintenance: Water Distributors

It may become necessary to remove the water distributors from the top of the evaporator and clean (de-mineralize) them outside of the ice machine.

1. Remove front panel.
2. Push and release the OFF button.

Single Unit Installation:

3. Remove the evaporator covers.
4. Reach over the water distributors and pull the hose off.
5. Push the two water distributors to the right until the left end clears its retaining slot, then pull the left end up.
6. If there are two evaporators, repeat for the back one.



7. Examine the top of the evaporators. The Water Distribution Channels must be free from mineral build up. If build up is evident, scrub the channels with Scotsman Ice Machine Cleaner and a plastic bristle brush.

8. Examine the water distributors. Although they are made of a material that is resistant to mineral build up, some may be present. Soak or scrub the distributors in or with a solution of Scotsman Ice Machine Cleaner and warm potable water.

9. Return the water distributors to their normal installed position.

9a. Snap the two distributors onto the water manifold. Place them on the back evaporator, right end first. Push the distributors far enough to the right until the left end clears the retaining slot, then release. Check that the distributors are seated properly.

9b. Place the water hose onto the back water distributors.

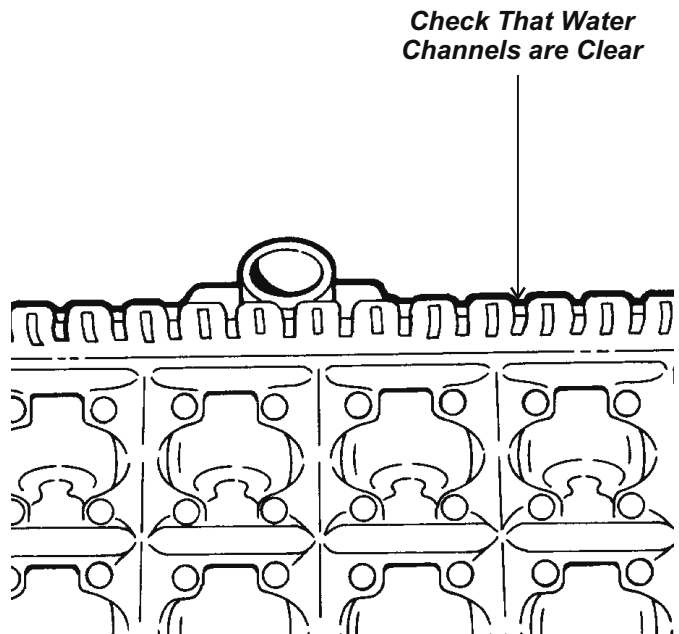
9c. Repeat for the front evaporator, if there is one.

10. Push and release the clean button to flush the water system.

11. After the machine stops, push and release the Freeze button.

12. Replace the evaporator cover.

13. Replace the front panel.



Additional Maintenance: Inlet Water Valve Screen

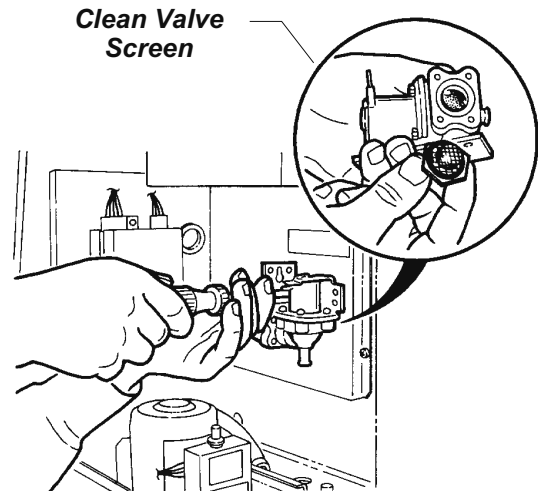
The inlet water valve has a screen on its inlet side to keep debris from flowing into the valve. In some cases, this screen may become clogged or restricted by debris build up. Check for the proper water flow:

Flow rate is 1.25 G.P.M.

1. Remove front panel.
2. Obtain a measuring cup and a watch.
3. Pull the water discharge tube out of the reservoir and place it in the cup.
4. Push and release the Harvest button.
5. If working properly, the water valve will fill an 8 oz cup in about 3-4 seconds. Be prepared to push the Off button. If it does not, the water valve inlet or other water device is restricted.

To Check the Inlet Water Valve Screen.

1. Disconnect the electrical power.
2. Shut off the water supply.
3. Remove the front panel.
4. Unplug the electrical connection of the inlet water valve.
5. Remove the screws holding the inlet water valve to the cabinet.
6. Remove outlet tube from inlet water valve.
7. Rotate inlet water valve from inlet fitting and remove valve from machine.
8. Examine the inlet screen, if dirty, brush off screen.



Note: Screen is not replaceable, and may only be removed by taking off the covering bracket. The bracket forms part of the inlet water system, and must be water tight to the valve body, removal is not recommended.

9. Reverse to reassemble.

CME256, 506, 656, 806: AutoIQ™ Cubers

Additional Maintenance: Bin Controls, Condenser

The bin controls use a system of infrared emitting and receiving components to sense the build up of ice in the bin. They are located at the bottom of the ice outlet port. They must be free of mineral build up to function properly. To check:

1. Remove front panel.
2. Push and release the off button.
3. Remove top and right side panels.
4. Remove the evaporator cover (on models with one)
5. Remove the cube deflector.
6. Pull up to remove the cascading shield (on models with one)

Air Filter Replacement

See Page 30 for an illustration of Air Filter Replacement.

To Clean the Air Cooled Condenser

1. Remove the front panel.
2. Push and release the Off button.
3. Remove the top panel.
4. Remove the right and left side panels.
5. Clean or replace the air filters.
6. Check the fan blade and condenser for grease or dust build up.

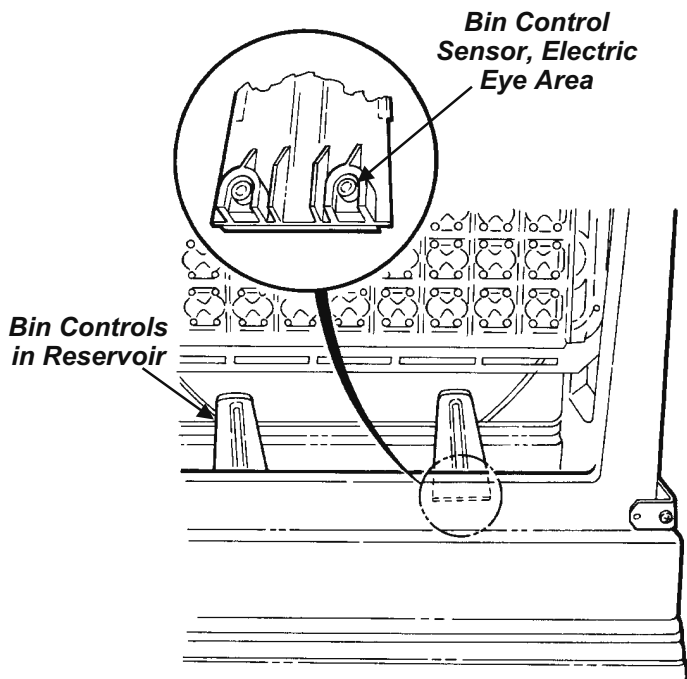
Because air flow is from the inside of the cabinet out, the inside of the condenser fins will have the most build up.

A. Place the inlet hose of a vacuum cleaner in the condenser shroud.

B. While the vacuum cleaner is on, blow compressed air from the back of the condenser thru the fins.

C. If grease is present, use coil cleaner on the condenser. Be sure to wipe up any excess coil cleaner.

7. Replace the top, left and right side panels.
8. Push and release the Freeze button.
9. Replace the front panel.



Cleaning of Bin Controls

7. Push into the freezing compartment the electric eye brackets.
8. Examine the bottom of the brackets, there are two sensors in each bracket, check that they are clear of mineral build up. They may be wiped clean with ice machine cleaner to assist in removal of the build up. Be sure to drain the reservoir or go thru a Clean cycle to remove residual cleaner.

Note: Do NOT use abrasive materials or cleaner on the bin sensor lenses. A soft toothbrush is an effective tool for cleaning these sensors.

CME256, 506, 656, 806: AutoIQ™ Cubers

Service Diagnosis: Controller Diagnostic Light Analysis

Problem or Symptom	Possible Cause	Probable Correction	
Machine is off	Bin is full, ice in cube port	Use some ice	
	Power is off, check controller lights.	If all lights are out, check power supply, restore power if off	
	Transformer is open	If all lights are out and there is power, check transformer output for 24 vac	
	Unit has been switched off Off lite is glowing	Push and release Freeze button to restart unit.	
	Compressor will not start	Not enough water or water not sensed.	
	Unit has Shut Down	Check for Refrigeration or Water Error	
Unit is off & Water diagnostic light is ON or BLINKING	Water inlet valve malfunction	Check water diagnostic light, if it blinks 2 times and repeats, check the water inlet valve for proper water flow.**	
	Water pump malfunction	Check that pump hose is attached and if pump is plugged in and working.	
	Water level not sensed or not high enough	Check harness from sensor. Check levelness, check standpipe height.	
Unit is off & Refrigeration diagnostic light is ON or BLINKING	Low discharge or long freeze cycle	If the Refrigeration light is glowing steadily, there is a probable refrigeration problem	
	Harvest problem	If the Refrigeration light blinks once and repeats, look for a harvest problem.** On controllers 17-1 and higher, this also indicates that cubes were "sensed" by the bin controls.	
	Hot Gas Valve failure	Check hot gas valve operation.	
	High Discharge Temp	If the refrigeration diagnostic light blinks 3 times and then repeats, check for a reason for high discharge temperatures.	
	Harvest problem	Controllers 17-1 and higher, if the lite blinks 2 times and repeats, check for a harvest error - no cubes sensed.	
	Unit does not go into harvest - exceeds maximum freeze time		Push and release Off button. Push and release Freeze button. Check operation.
			Push cube size float down and check operation.
Exceeds maxi harvest time		Check for cause of long harvest cycle**	
Unit runs and both Diagnostic lites are ON	Temperature sensors out of range	Replace the temperature sensor set (water and discharge).	
Same, but 1 light is on	Reservoir temp. wrong	Reset and check water temp and sensor.	

* Machine may be reset by pushing and releasing the Off button, then pushing and releasing the Freeze button. ** See following pages

CME256, 506, 656, 806: AutoIQ™ Cubers

Service Diagnosis

Problem or Symptom	Possible Cause	Probable Correction
Unit is off because of a "Harvest Problem"	Bin controls did not sense ice falling, unit stayed in harvest until the maximum harvest time ran out.	Check bin controls. The bin full light should be off. If it is on or blinking the bin controls may be dirty. Clean if dirty. The board and bin controls may also need to be checked. Push and release Off button. Push and release Freeze button. Check machine operation. Check if ice is made and harvests.
	Bin controls or System Controller may have failed.	See "Unit does not shut off" below..
	Other components may have failed	Check the next page
Cubes are too large	Cube size float sticking.	Check/clean
Cubes are too small	Not enough water	Check for leak in reservoir
Two plate models making ice thicker on one plate than another	A - D series - refrigerant distributor restricted	Change distributor
	CME506 E and higher series - expansion valve bulbs on wrong suction line	Switch bulbs to correct suction lines
	CME506 E and higher series - one TXV not metering	Check TXV, replace if there is poor ice formation on its plate
Low ice capacity	Dirty condenser or filter	Replace filters, clean condenser
	Recirculation of air	Block air re-circulation or move condenser
	Low refrigerant charge	Check system. If there is a low charge, find the leak, recover the refrigerant, repair the leak, replace the dryer, evacuate and weigh in the nameplate charge.
	Cube size set wrong	Re-adjust cube size
Unit does not shut off	Bin control system may have failed.	Check bin controls. Check bin full light, if off, place something between the electric eyes. The bin full light should begin to blink (after 20 seconds of continuous blockage it will glow steadily). If not, check operation of electric eyes by unplugging #4 and jumping out the two pins on the controller (first discharge any static electricity by touching the cabinet with the tool). If the bin full light blinks, replace the bin controls. If it does not blink, replace the controller. Note: Leaving #4 unplugged and jumped for 20 seconds will shut the machine down on a bin full (at the end of the harvest cycle). It will restart after 4 minutes or may be reset by pushing the Freeze button.

CME256, 506, 656, 806: AutoIQ™ Cubers

Service Diagnosis: Components

Problem or Symptom	Possible Cause	Probable Correction
Fan motor does not turn. Refrigeration light may be on steadily or blinks 3 times and repeats.	Open motor windings, or seized bearings	Replace fan motor
	No power to fan motor	Fan motor unplugged, check for voltage from controller. If none, replace controller.
		Some models have a fan control switch, check it for continuity above 240 PSIG.
Pump motor does not turn	Open motor windings, or seized bearings	Replace pump
	No power to pump	Check electrical connections. If the unit is in Freeze, Clean or Harvest the pump should have power to it. If not, replace the System Controller.
Hot Gas Valve does not open.	Open solenoid coil.	Replace hot gas valve
	Stuck valve	Replace hot gas valve
	No power to coil in Harvest	Check wire connections, if ok, replace System Controller
Hot Gas Valve leaks thru (warm tube temperatures on both sides of valve during freeze)	Mechanical problem in valve	Replace valve
Water Inlet Valve does not open	Open solenoid coil	Replace valve
	Stuck valve	Replace valve
	No power to valve (early part of harvest)	Check wire connections, if ok, replace System Controller
Water Inlet Valve does not flow enough water	Restriction in water supply	Check water filters and/or inlet screen.
Water Inlet Valve leaks thru	Mechanical problem in valve	Replace valve
Compressor does not work	Unit in Clean cycle	Push and release Freeze button.
	Contactors coil open	Replace contactor
	Open starting components	Check and replace
	Open windings	Check and replace compressor
	Internal valve failure	Replace compressor
	Water level too low or not sensed	Unit must be full of water before controller will start compressor. Check water level and sensor and harness.

CME256, 506, 656, 806: AutoIQ™ Cubers

PTCR Diagnosis

The **CME256, CME506, CME656 and CME806 “D**

and higher” series cubers use a PTCR (Positive Temperature Coefficient Resistor) in place of a conventional start relay and start capacitor.

- Power from the contactor connects to the PTCR and to the Run Capacitor.
- A wire connects the other terminal of the PTCR to the compressor’s Start winding.
- Another wire connects the run capacitor to the start winding.
- A parallel circuit connects power from the contactor to the Run winding of the compressor.

A PTCR changes resistance sharply when its temperature changes. When the PTCR is cold, it connects full current to the compressor’s start winding. After a very short time the PTCR heats up and shuts off the current flow. **Under normal operation, the PTCR’s case is at about 180°F.**

At that temperature the PTCR has very high resistance and will not allow current flow. It must cool down to 120°F. before current will pass through it again.

Diagnosis:

1. Disconnect electrical power.
2. Check if the PTCR is cool enough to handle safely. If not, wait 5 minutes for it to cool off.
3. Disconnect both leads to the PTCR and measure its resistance with an ohmmeter. If the PTCR reads less than 22 ohms or more than 40 ohms, replace it.

Operational Characteristics: CME256**Cycle Times (minutes):**

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	15 - 17	17 - 19
Harvest	1.5 - 2	1:30 - 2

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	13 - 15	17 - 19
Harvest	1:30 - 2	1:45 - 2:15

System Pressures (PSIG):

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	25 - 27	28 - 30
Suction: Peak in Harvest	95 - 105	95 - 110
Discharge: 5 minutes into Freeze	240 - 250	250 - 265
Discharge: Minimum in Harvest	165 - 185	175 - 195

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	24 - 26	26 - 28
Suction: Peak in Harvest	80 - 90	95 - 105
Discharge:	245 PSIG	245 PSIG
Discharge: Minimum in Harvest	125 - 135	145 - 155

A - E Series Refrigerant Charge, R-404A

- Air cooled: 24 ounces
- Water cooled: 14 ounces

F - H Series Refrigerant Charge, R-404A

- Air Cooled: 24 ounces
- Water Cooled: 13 ounces

Typical Compressor Amps

- Freeze: 7 - 9
- Harvest: 8

Typical Harvest Ice Weight

- 3.25 to 3.5 lb.

Water Cooled:

- Discharge Pressure: 245 PSIG
- Hi Pressure Cuts Out at: 450 PSIG

Fan Control Switch - for units so equipped:

- Cut In: 240 PSIG + - 20 PSIG
- Cut Out: 190 PSIG + - 10 PSIG

CME256, **506**, 656, 806: AutoIQ™ Cubers

Operational Characteristics: **CME506**



Cycle Times (minutes):

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	18 - 20	22 - 24
Harvest	2	1:30

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	20 - 22	22 - 24
Harvest	1.5 - 2.5	1.5 - 2

System Pressures (PSIG):

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	35 - 37	35 - 37
Suction: Peak in Harvest	115 - 120	120 - 125
Discharge: 5 minutes into Freeze	240 - 260	240 - 260
Discharge: Minimum in Harvest	155 - 165	165 - 175

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	30 - 34	30 - 34
Suction: Peak in Harvest	75 - 85	80 - 90
Discharge:	245 PSIG	245 PSIG
Discharge: Minimum in Harvest	150 - 160	175 - 185

A - D Series Refrigerant Charge, R-404A

- Air cooled: 32 ounces
- Water cooled: 20 ounces

E Series Refrigerant Charge, R-404A

- Air cooled: 23 ounces
- Water cooled: 14 ounces

F - H Series Refrigerant Charge, R-404A

- Air Cooled: 23 ounces
- Water Cooled: 13 ounces

Typical Compressor Amps

- Freeze: 10 - 11
- Harvest: 11 - 12

Typical Harvest Ice Weight

- 6.5 - 7 lb.

Water Cooled:

- Discharge Pressure: 245 PSIG
- Hi Pressure Cuts Out at: 450 PSIG

Fan Control Switch - for units so equipped:

- Cut In: 240 PSIG + - 20 PSIG
- Cut Out: 190 PSIG + - 10 PSIG

Operational Characteristics: CME656



Cycle Times (minutes):

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	14 - 15	15 - 16
Harvest	1:30	1:30

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	15 - 16	16 - 17
Harvest	3	2

System Pressures (PSIG):

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	25 - 27	24 - 26
Suction: Peak in Harvest	83 - 87	84 - 88
Discharge: 5 minutes into Freeze	215 - 225	290 - 300
Discharge: Minimum in Harvest	195 - 205	210 - 220

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	24 - 26	24 - 26
Suction: Peak in Harvest	85 - 90	80 - 85
Discharge:	245 PSIG	245 PSIG
Discharge: Minimum in Harvest	180 - 190	190 - 200

Refrigerant Charge, R-404A

- Air cooled: 36 ounces
- Water cooled: 26 ounces

Typical Compressor Amps

- Freeze: single phase = 6.5 - 8;
three phase = 4.5 - 5
- Harvest: single phase = 9 - 10; three phase
= 5.5 - 6

Typical Harvest Ice Weight

- 6.5 - 7 lb.

Water Cooled:

- Discharge Pressure: 245 PSIG
- Hi Pressure Cuts Out at: 450 PSIG

Fan Control Switch - for units so equipped:

- Cut In: 240 PSIG + - 20 PSIG
- Cut Out: 190 PSIG + - 10 PSIG

CME256, 506, 656, **806:** AutoIQ™ Cubers

Operational Characteristics: **CME806**

Cycle Times (minutes)



Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	9 - 11	12 - 14
Harvest	1:45	1:15

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Freeze	10 - 12	12 - 13
Harvest	1:45	1:15

System Pressures

Air Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	20 - 21	25 - 27
Suction: Peak in Harvest	89 - 91	115 - 125
Discharge: 5 minutes into Freeze	210 - 220	280 - 290
Discharge: Minimum in Harvest	155	205

Water Cooled	70°F. indoor air, 50°F. water	90°F. indoor air, 70°F. water
Suction: End of Freeze	24 - 26	24 - 26
Suction: Peak in Harvest	85 - 95	90 - 95
Discharge:	240 PSIG	240 PSIG
Discharge: Minimum in Harvest	155	165

Refrigerant Charge, R-404A

- Air cooled: 33 ounces
- Water cooled: 24 ounces

Typical Compressor Amps

- Freeze: single phase = 13
- Harvest: single phase = 14

Typical Harvest Ice Weight

- 6.5 - 7 lb.

Water Cooled:

- Discharge Pressure: 240 - 245 PSIG
- Hi Pressure Cuts Out at: 450 PSIG

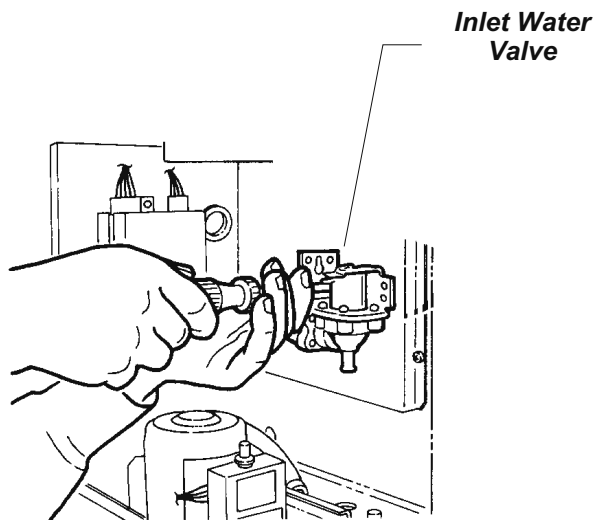
Fan Control Switch - for units so equipped:

- Cut In: 240 PSIG + - 20 PSIG
- Cut Out: 190 PSIG + - 10 PSIG

Removal and Replacement

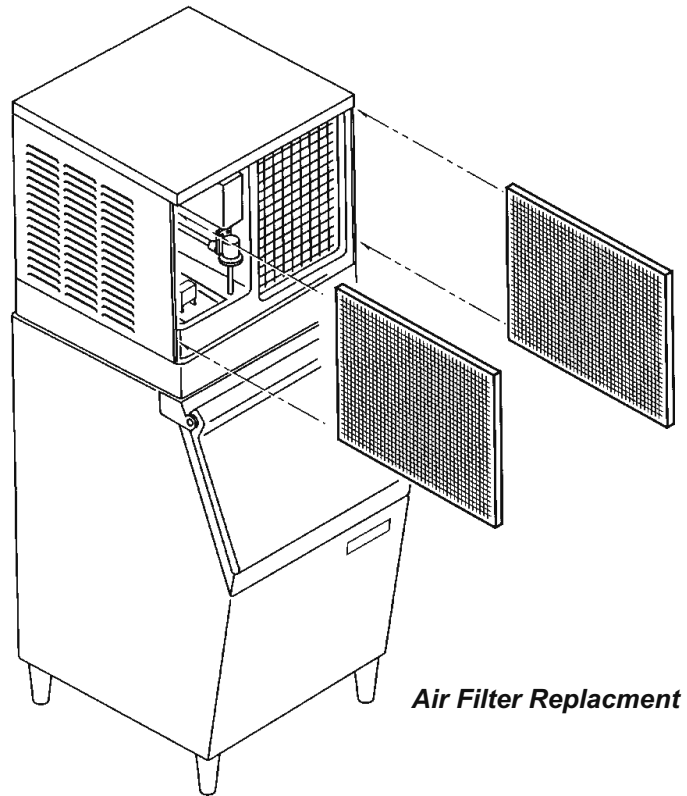
Inlet Water Valve

1. Remove the front panel.
2. Shut off the water supply.
3. Push and release the OFF button.
4. Pull the wire harness off the inlet water valve.
5. Remove screws holding the inlet water valve to the cabinet.
6. Pull the valve away from the cabinet and disconnect the outlet tube.
7. Unscrew the water valve from the water inlet tubing.
8. Reverse to reassemble.
9. Push and release the Freeze button.
10. Replace the front panel.



Air Filter Replacement

1. Remove the front panel.
2. Push and release the Off button.
3. Remove side panel retaining screws (2 for each panel).



4. Lift up or remove top panel.
5. Pull left panel to the left and remove filter.
6. Pull right side panel forward and remove the air filter.
7. Replace the air filters.

Note: Filter size is 20 x 20 x 1. Use a like replacement, equal to UL class 2, 377A.

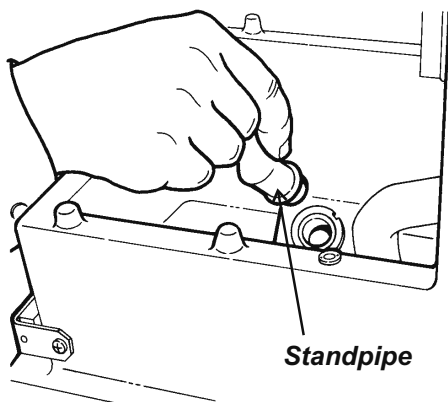
8. Check the fan blade and condenser for grease or dust build up. Clean as required.
9. Return the right side panel, mounting screws and top panel to their original positions.
10. Push and release the Freeze button.
11. Return the front panel to its original position. Secure it with the 4 original screws.

CME256, 506, 656, 806: AutoIQ™ Cubers

Removal and Replacement

Drain Tubing

1. Remove the front panel.
2. Push and release the Off button.
3. Remove bin baffle.
4. Remove 1 plastic bolt and the reservoir cover.
5. Unplug water pump, disconnect ground wire.
6. Unplug water level sensor.
7. Lift pump up slightly and pull discharge hose from pump.
8. Remove pump and water level sensor from ice machine.
9. Pull up and forward to remove standpipe.
10. Disconnect back of cabinet drain system.
11. Remove nut on inside of reservoir (where standpipe was).
12. From inside the bin, pull drain tube out of the reservoir and down. Remove from machine.
13. Reverse to reassemble.



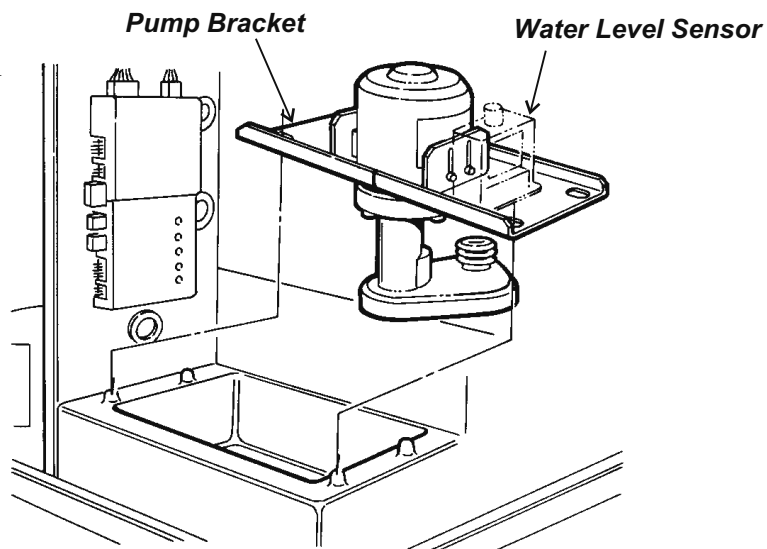
Note: The distance between the top edge of the standpipe and the top edge of the reservoir must be $2 \frac{5}{8}$ ".

If needed, adjust the distance by rotating the top end of the standpipe (it is threaded).

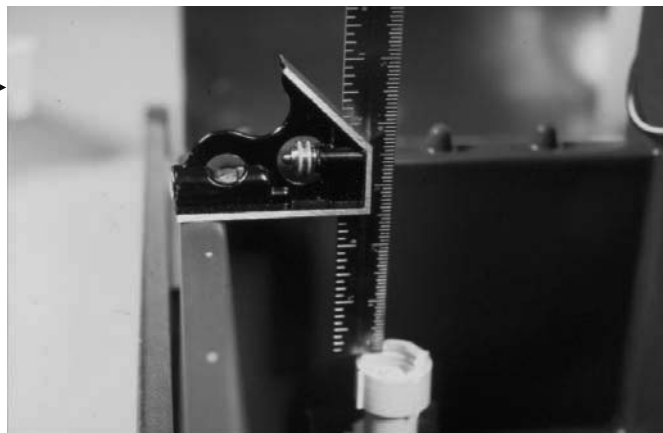
Observe machine for proper cube size after replacement/adjustment of the standpipe.

Water Pump

1. Disconnect the electrical power.
2. Remove the front panel.
3. Unplug water pump from its electrical connection.
4. Remove 1 plastic bolt and the reservoir cover.
5. Lift water pump up and disconnect outlet tube.



6. Pull float ball from float stem (it is a snap fit). Pull stem out.
7. Locate water level sensor mounting tabs, compress together to release sensor from bracket.
8. Remove water pump brackets from pump.
9. Reverse to replace.
10. Replace front panel.
11. Re-connect electrical power.



Removal and Replacement: Sensors

Electric Eyes (Bin Control / Ice Sensors)

These must be replaced as a set.

1. Remove front panel.
2. Push and release the Off button.
3. Remove top panel.
4. Remove left and right side panels.
5. Unplug both from the System Controller (#3 and #4).
6. Remove evaporator cover (on models so equipped).
7. Remove cascading shield (on models so equipped).
8. Remove cube deflector.
9. Push in at the wire inlets the bin controls.
10. Pull both into the freezing compartment. Pull wires thru the holes.
11. Remove both bin controls from the freezing compartment.
12. Reverse to reassemble.

Water Level Sensor

1. Remove front panel.
2. Push and hold the OFF button. Release it when the machine stops.
3. Trace wire harness from water level sensor to the Controller (#2). Unplug the harness from the controller.
4. Lift the pump and mounting plate up enough to remove the float from the stem.
5. Remove two screws holding the sensor to the pump bracket and lift the sensor up and out of the machine.
6. Reverse to reassemble.

Float Stem

1. Remove the front panel.
2. Remove the reservoir cover.
3. Pull up on float stem, reach under pump cover and pull the float off the stem.
4. Pull stem out and reverse to replace.

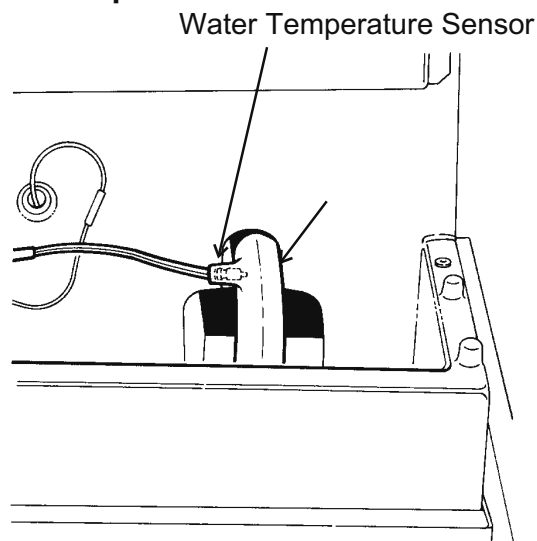
Note: Replacement float stems are factory set, but confirm the settings before installing the new stem:

CME256: Slot size should be between $1 \frac{7}{32}$ " and $1 \frac{3}{16}$ ".

CME506 or CME656 or CME806: Slot size should be 2".

Observe machine for proper cube size after replacement of the float stem.

Water Temperature Sensor



Note: This sensor is replaced as a set with the Discharge Temperature Sensor.

1. Remove front panel.
2. Push and release Off button.
3. Remove 1 plastic bolt and the reservoir cover.
4. Locate water temperature sensor (inserted into pump discharge hose).
5. Pull out to remove.
6. Trace back to controller, unplug from #5.
7. Remove the Discharge Line temperature sensor (see the next page).
8. Reverse to reassemble.

CME256, 506, 656, 806: AutoIQ™ Cubers

Removal and Replacement: Fan Blade and/or Fan Motor

1. Disconnect electrical power.
2. Remove front, top and side panels.
3. Remove the 4 cap screws holding the fan motor bracket to the condenser shroud.
4. Unplug the fan motor.
5. Carefully remove the fan motor, blade and brackets from the ice machine cabinet.
6. Replace the motor or blade as needed.

Note: The fan is properly on the motor shaft when the hub faces the condenser and the shaft is flush with the end of the hub.

Transformer and Compressor Starting Components

Single phase compressors use a start relay, start capacitor and run capacitor. All are located in a sheet metal box to the right of the system controller. The compressor contactor is also located in that box.

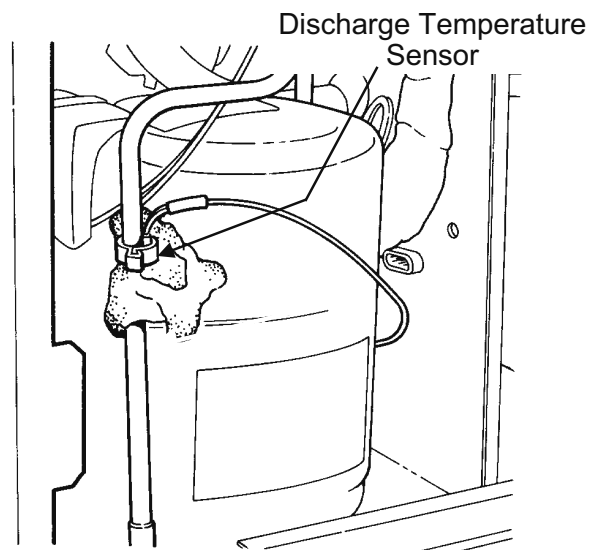
1. Disconnect electrical power.
2. Remove front panel.
3. Remove 2 screws at the front edge of the metal box, and pull the cover forward and out.
4. To check components, reconnect electrical power.

Note: The contactor coil is 24 volt.

Note: If the transformer is not supplying power, check the system controller for blacking at the top connections. If the connections appear to have blacked, replace the system controller before the transformer is replaced.

Discharge Line Temperature Sensor

1. Remove front panel, push and release the Off button.
2. Remove top and left side panels.
3. Locate discharge line sensor. It is attached to the discharge line of the compressor, 6" from the compressor discharge port.
4. Unwrap the insulation and un-snap the clip holding the sensor to the discharge line.
5. Trace the sensor wires back to the controller, they are plugged into #5 with the water temperature sensor, and must be replaced with it.



6. Reverse to replace, be sure that the discharge line sensor is 6" up from the compressor discharge port. Be sure to re-wrap the insulation.

Note: Route wires so they do NOT contact the discharge line.

The sensor for the Discharge line is marked with a small piece of yellow tape. Do not reverse the sensors.

Access Valves:

To use the access valves:

1. Be sure that the valve is closed. Remove the stem cap and insert a 3/16" allen wrench. Check that the valve is closed.
2. Remove the port cap and attach refrigerant manifold hoses.
3. Open the valve and purge the hoses.
4. When service is complete, shut the discharge access valve first. Then, with the machine running and the middle hose outlet securely fastened to the manifold or refrigerant tank (closed) open both manifold valves. This allows any liquid refrigerant in the discharge hose to flow thru the manifold and into the suction side.
5. After the gages have equaled, shut the manifold valves and the suction access valve.
6. Remove the gages and replace the stem and port caps. Make certain that they are tightly closed.

Refrigeration System Components

Due to the expected level of training and experience of a refrigeration mechanic, detailed instructions regarding the replacement of refrigeration components will not be presented. However, critical items will be noted here.

Refrigerant:

This ice machine uses R-404A or HP62 as a refrigerant. It has several unique characteristics.

A. It must use polyol ester refrigerant oil, and that oil is very water absorbent. The system must not be open for more than 15 minutes.

B. An electronic leak detector capable of locating HFC-134a type refrigerant must be used to locate refrigerant leaks.

C. A nitrogen sweep is required when brazing.

D. An HFC type liquid line dryer must be used.

E. When evacuating, use of an electronic micron gage is recommended. Evacuate to 300 microns.

F. It must be liquid charged:

1. Place a drum or cylinder of R-404A on a scale, in the direction to dispense liquid.

2. Attach the charging hose to the cylinder of R-404A. Open the cylinder's valve and purge the hose to the manifold.

3. Close the low side service access valve.

4. Open the discharge side manifold valve and weigh in the name plate charge. After the charge is weighed in, wait a moment and re-check the scale.

5. If all of the refrigerant charge has not been weighed into the discharge side, it must be carefully added thru the low side. Close the discharge service access valve.

6. With a sight glass or charge faster in the hose to the low side port, start the ice machine.

7. Open the low side service access valve.

8. Crack open the low side manifold valve and watch the scale and sight glass. Open and close the low side manifold valve to flow liquid into the manifold but flash off to vapor before it enters the suction side of the refrigeration system.

9. After the scale = the correct charge, shut off the valve on the refrigerant cylinder.

CME256, 506, 656, 806: AutoIQ™ Cubers

Before Calling for Service

Check the following:

1. Has the water supply to the ice machine or building been shut off? If it has, the ice machine will automatically restart within 25 minutes after water begins to flow to it.
2. Has power been shut off to the ice machine? If yes, the ice machine will automatically restart when power is restored.

To Manually Reset the machine:

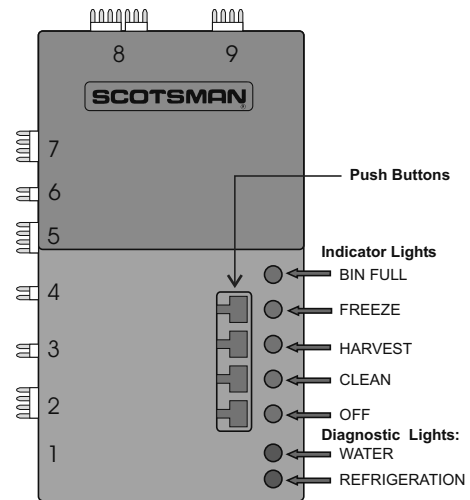
1. Remove the front panel.
2. Locate the AutoIQ Controller. If a red diagnostic light is glowing, note which one and its blink rate. Then push and release the off button.
3. Push and release the Freeze button.
4. The machine should begin to operate. If there is a lack of water it will shut off again soon.

5. Return the front panel to its normal position.

If the machine shuts down again, call for service.

To Shut the Machine Off:

1. Remove the front panel.
2. Locate the controller.
3. Push and hold the Off button for 3 seconds or until the machine stops.



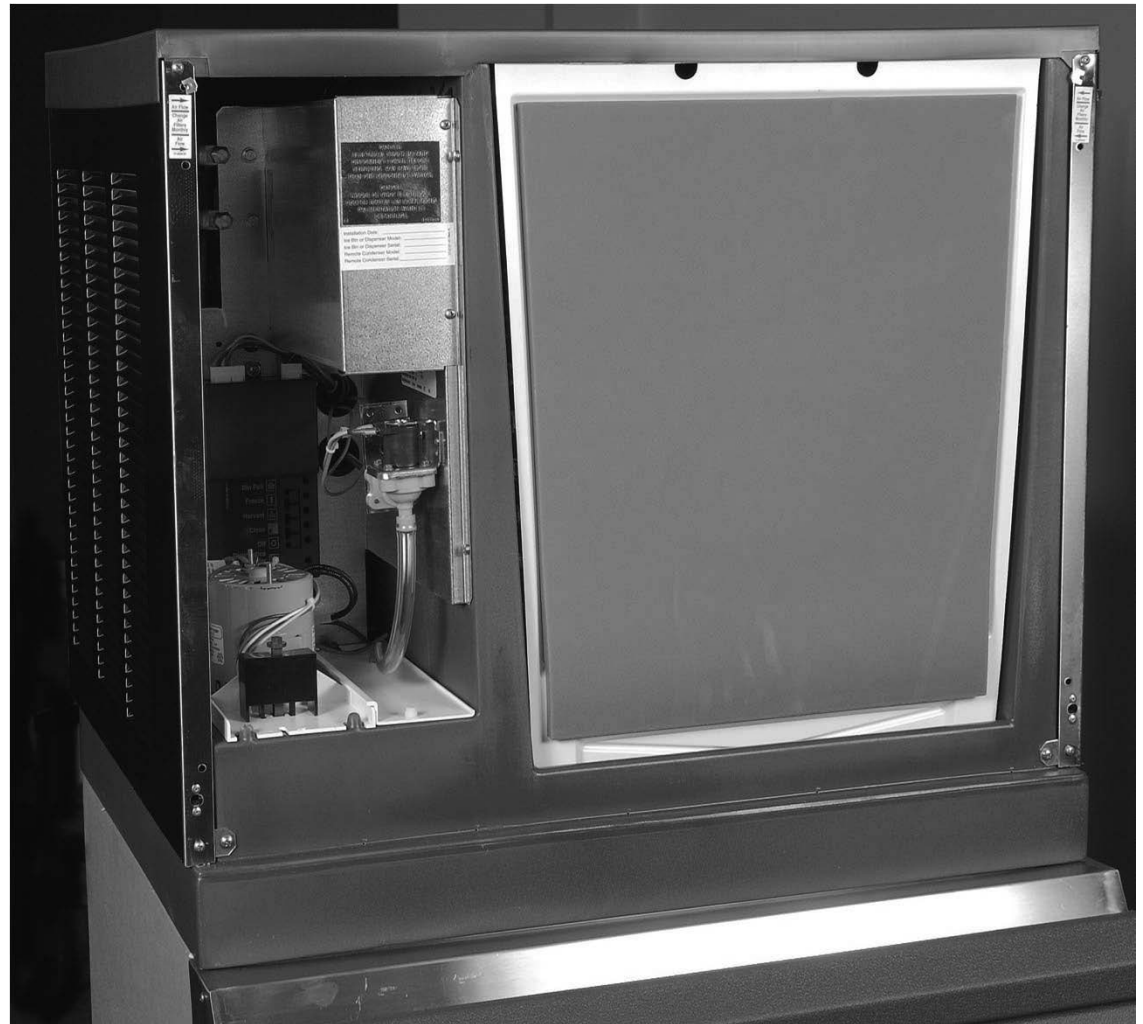


CM³ Photo-Eye Ice Sensor

Removal and Cleaning

Removal

- Remove Front Panel
- Harvest any ice
- Shut unit off



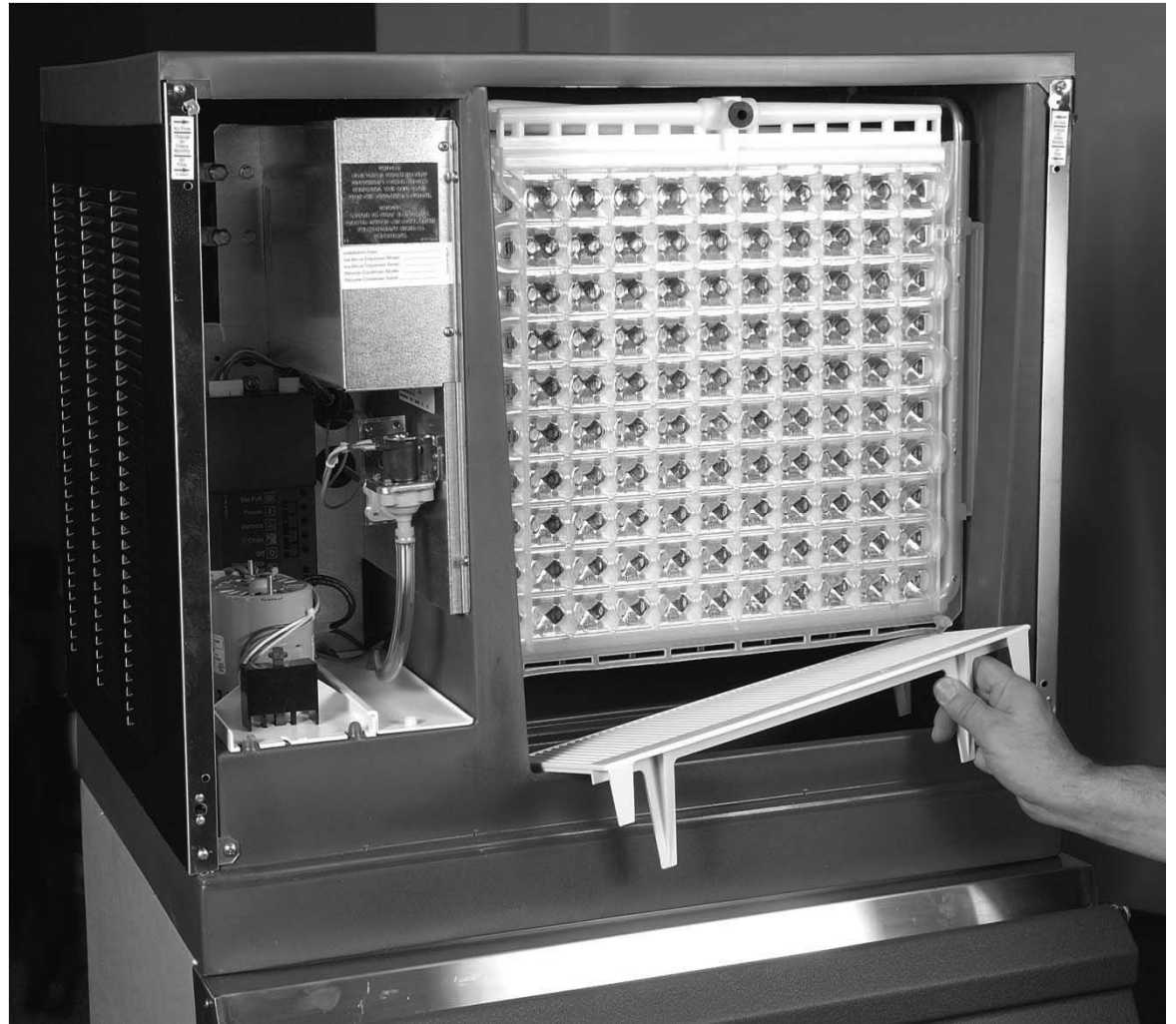
Removal

- Remove Evaporator Cover



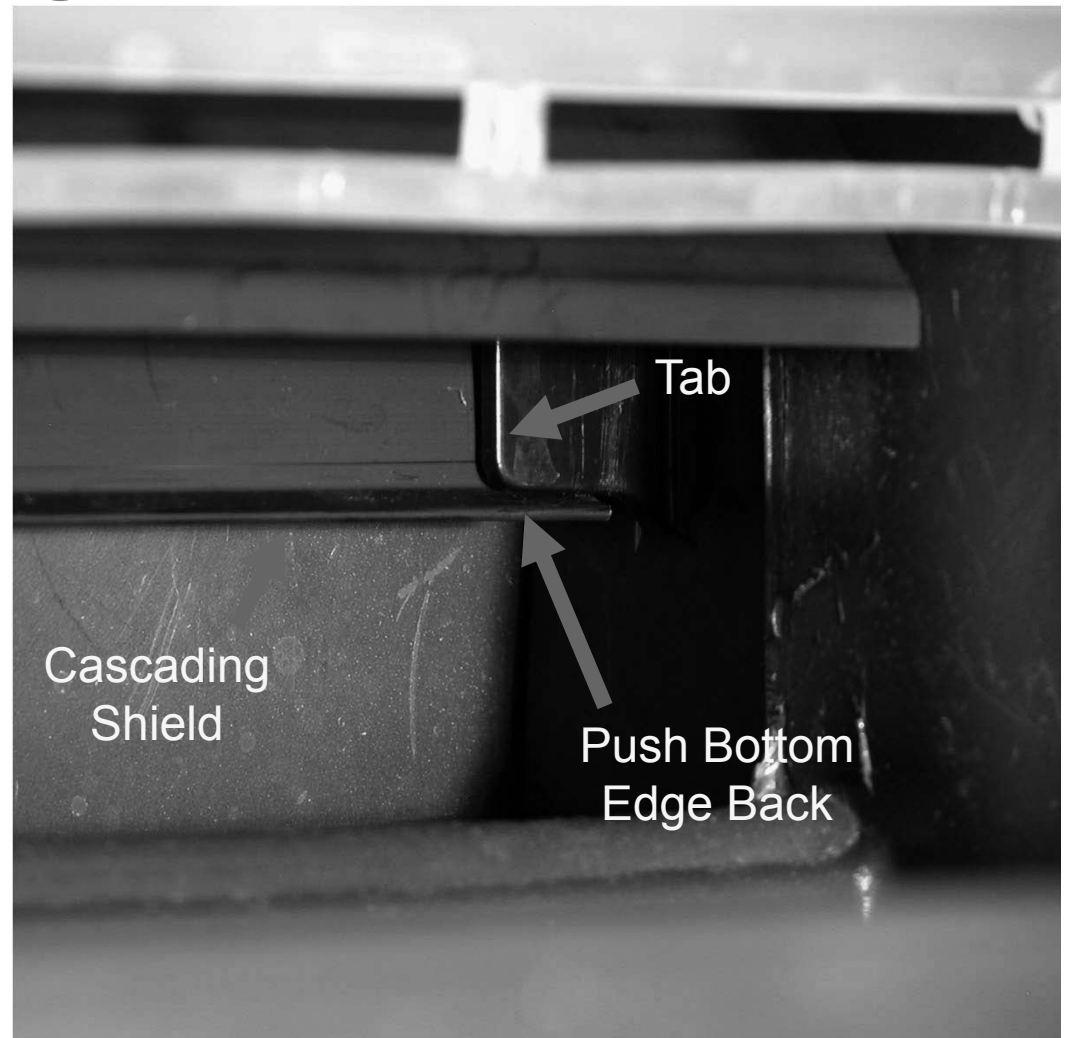
Removal

- Pull Cube Deflector Out From Under Evaporators



Removal Cascading Shield

- Locate Cascading Shield
- Push Bottom of Shield Back to Release From Tabs on Eye Holders



Remove Cascading Shield

- Lift the shield off the eye-holder tabs. Then pull forward and down, out from under the evaporators.



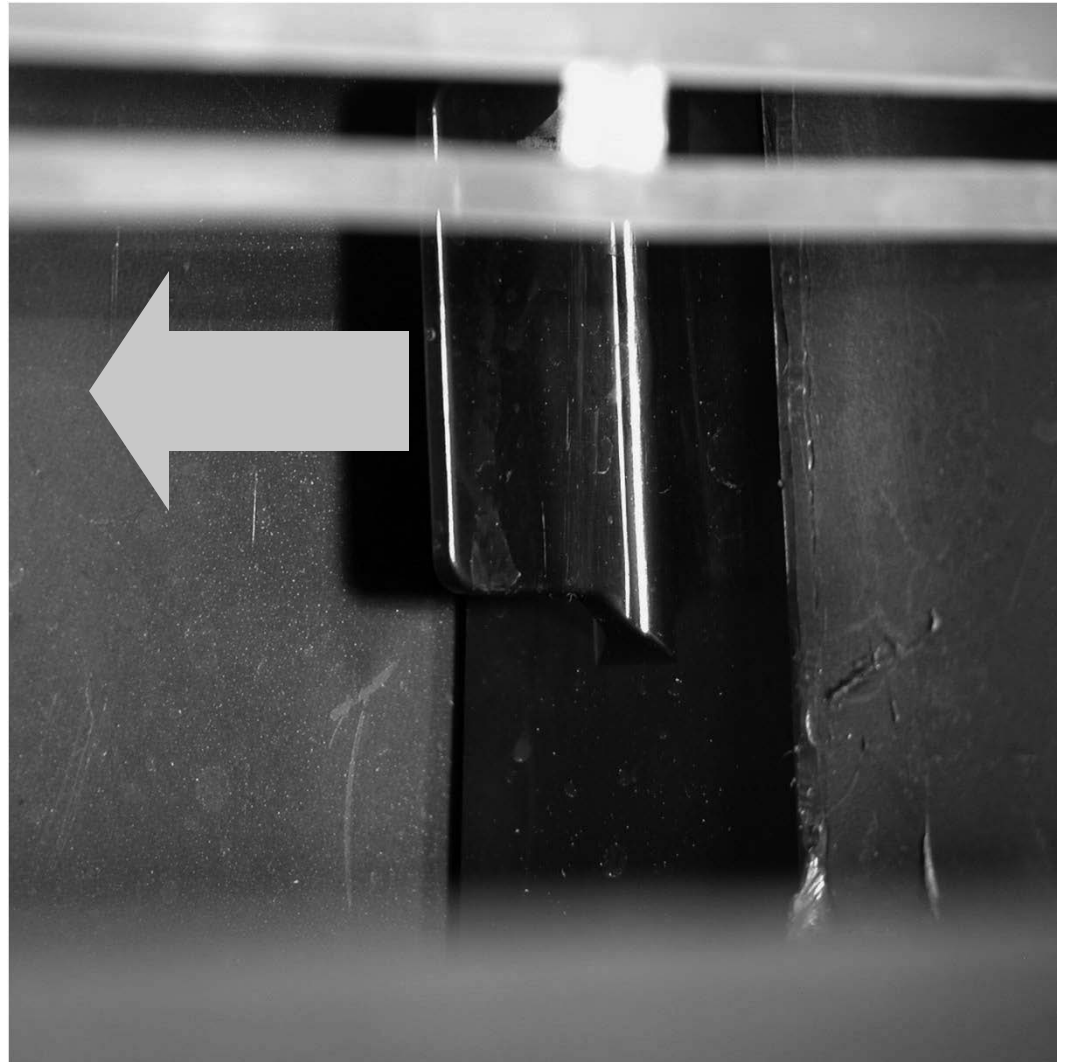
Un-Bundle Wires

- Photo-eye wires may be bundled together. Unbundle them to get slack so the eyes can be removed.



Remove Eye-Holders

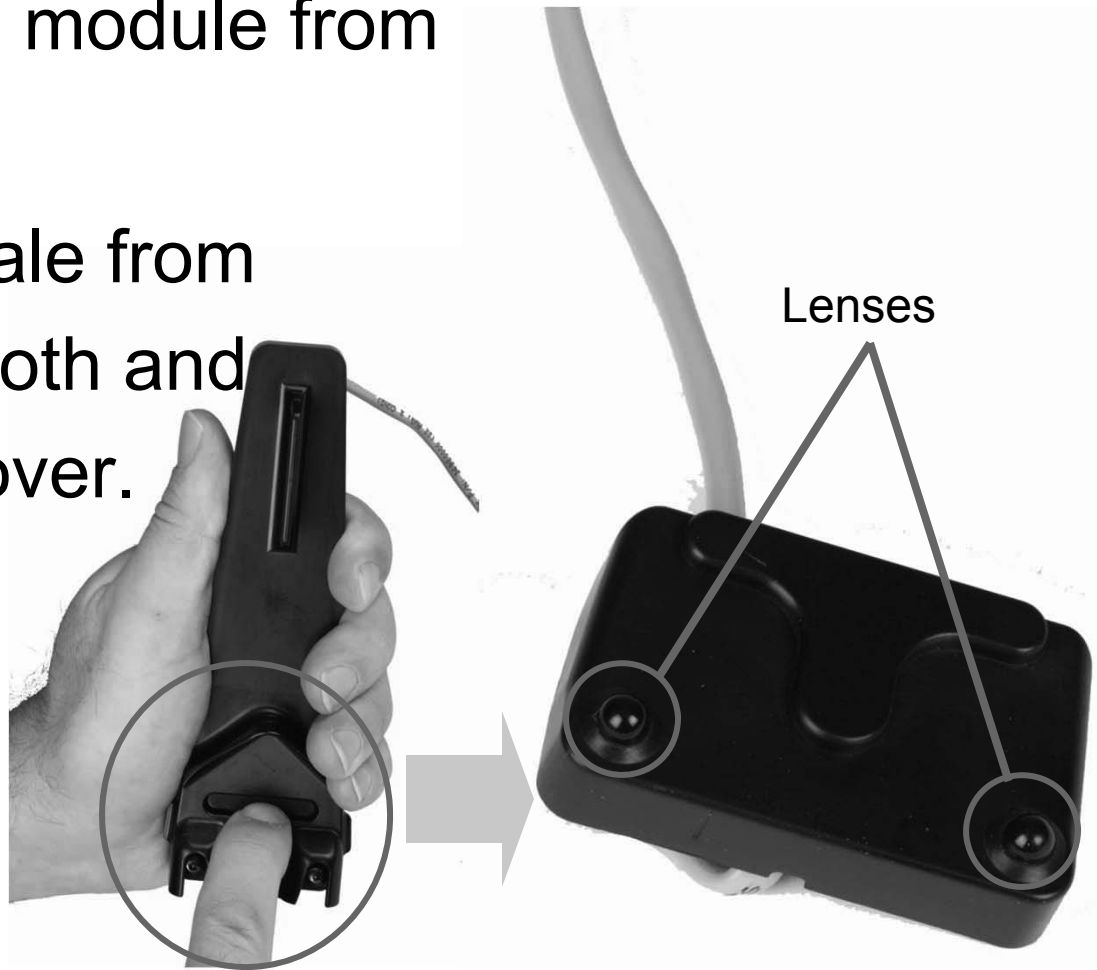
- Pull the holders out of the left and right walls by pulling on the tabs.



Clean the Photo-Eyes

- Push in to release module from holder
- Gently remove scale from lenses, use soft cloth and diluted scale remover.

Note: Prior design did not have separate module.



Reassembly

- Snap module back into holder
- Be sure wire is clipped as shown
- Insert holders into wall of freezing compartment
- Place cascading shield onto holder
- Snap onto tabs



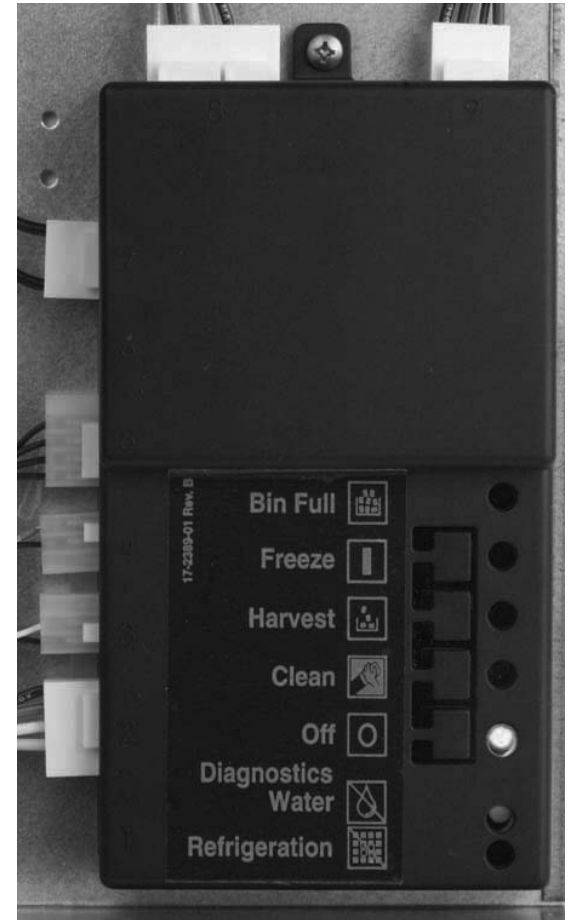
Reassembly

- Note how cascading shield snaps onto eye holder tab



Review – CM³

- No Ice
- Water in reservoir
- Two Blink Water Code
 - Code means Slow or No water fill; low water level
 - 4 Possible Causes:
 - Fills too slowly – restricted water supply
 - Water not high enough in sump
 - System did not sense full sump correctly
 - Water valve not opening

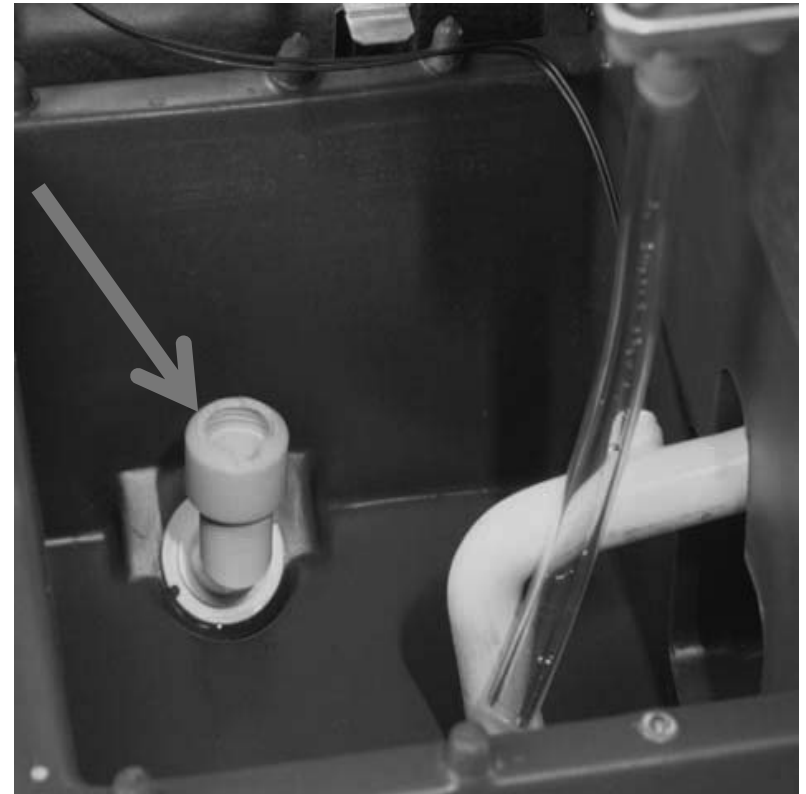


CM³ – Sump Fills Too Slowly

- Models up to 800 lb capacity: Controller allows 130 seconds to fill reservoir
 - About 1.5 GPM
 - Check water pressure
 - Check water filters

CM³ - Water Not High Enough

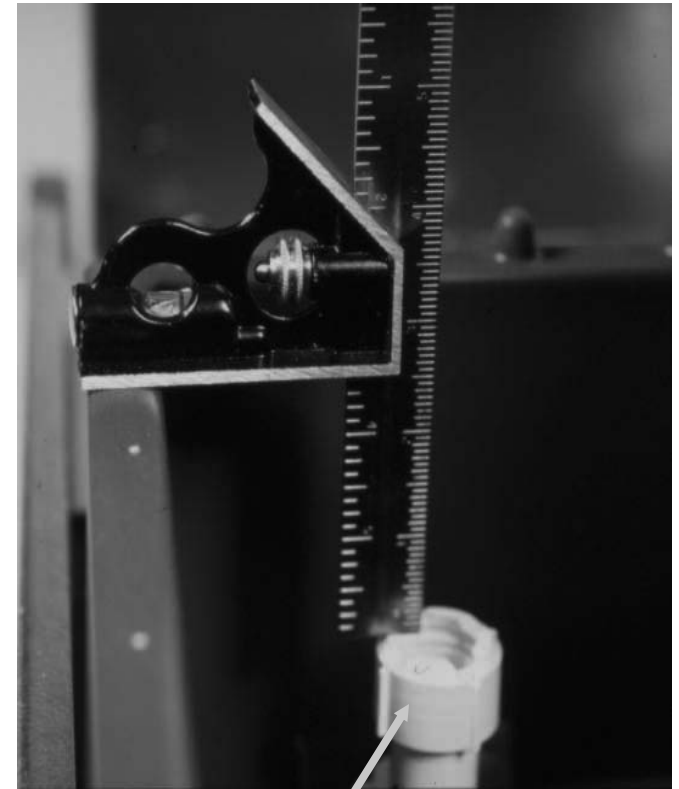
- Overflow Models
 - CME256, CME506, CME656 or CME806
 - Water drains out thru standpipe behind pump – Max water level is top of standpipe
 - If standpipe is too low, or water leaking out, sump cannot fill high enough
 - Unit **must be level**
 - Correct setting is 2 and 5/8 inches from top of adjustment nut to top of sump wall



Standpipe

- Measurement

- Height is factory set, should not need adjustment, but..
- Correct height is 2 and 5 eighths inches from the top of the standpipe adjustment nut to the top of the reservoir wall
- Set measuring device first, then adjust nut



Adjustment Nut

CM³ – not sensing water level – unit not starting

- Water Level Sensor and Float Stick
 - Rising water lifts float and stick
 - Slot in stick passes electric eyes
 - When bottom of slot rises and blocks bottom eye, signals Sump Full
- Test
 - **Must** have correct stick! Check PN
 - Lift stick slightly to simulate full sump
 - If unit starts, control system good but water level too low
 - Or test with DC voltmeter



CM³ Water Level Sensor Diagnostics

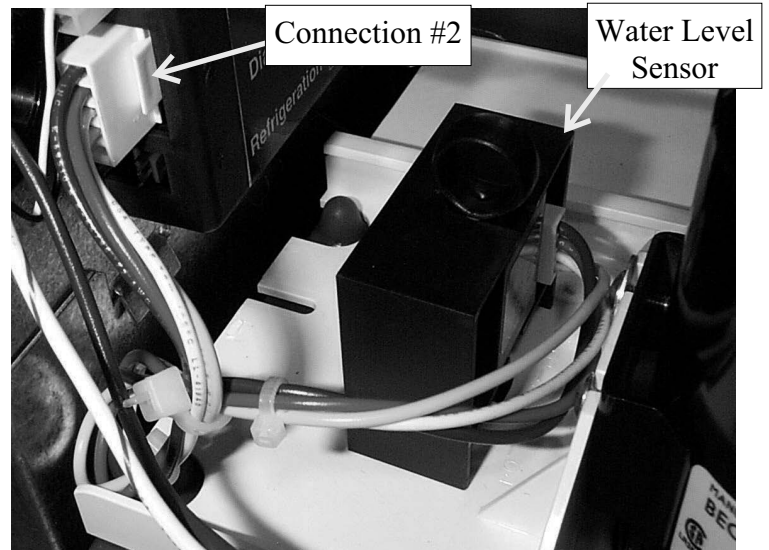
for use with Black or Blue Controllers

Tools Needed: Digital voltmeter that can read DC

Goal: To determine if the water level sensor is capable of normal operation.

Note: Ambient light can affect this test. Shade the sensor if needed.

1. Unplug water sensor harness from controller (connection #2).
2. Confirm that the power to the machine is ON and that there is at least one light on the board that is glowing. If not, check the transformer.
3. Set the voltmeter to DC and use a scale low enough to measure less than 40 Volts.



4. Measure the voltage between the top and the bottom pins on the controller at connection #2 (the bottom is ground or negative).

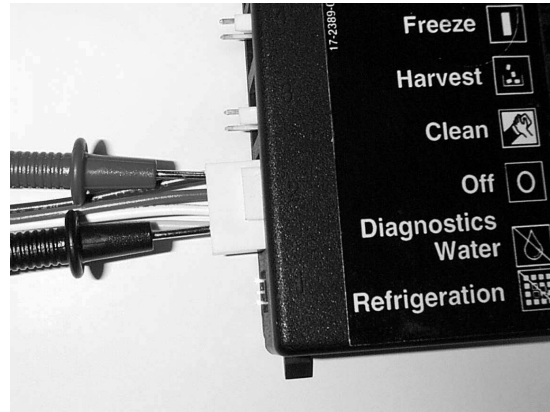
	Yellow (bottom) - Black Housing Controller	Yellow (bottom) - Blue Housing Controller
Blue - harness unplugged	24 to 30 VDC	.5 to 2 VDC

If it is much less than that, there is something wrong with either the power supply to the controller or the controller itself. If the voltage measures correctly proceed to the next step.

5. Reconnect the harness. Be SURE it is on properly and has a good connection. To confirm, unplug the harness from the water sensor and redo step #4 at the end of the harness. Then plug the harness back onto the sensor.

Harness Connected Voltage (DC)

6. At the controller, measure the voltage between the top and bottom pins on connection #2. This should be between the ranges in the table below. If it is outside this range there is a problem in the sensor and it should be changed out. If it is within this range, proceed to the next step.



	Yellow (bottom) - Black Housing Controllers	Yellow (bottom) - Blue Housing Controllers
Blue (top)	2 to 3.5 VDC	.4 to 2.0 VDC

7. Place negative voltmeter probe on the bottom terminal (yellow wire). Place the other on the one just above it (terminate freeze sender - white wire). Move the float stem/stick up and down and note the voltage changes. There should be a significant change between when it is blocked to when it is not blocked. If there is **NO change**, the sensor may be dirty or has failed. Remove the dust cover from the sensor to clean it.

Note: The sensor must be properly reassembled. When looking at the terminals of the sensor, they must be in the lower right corner. If they are in the upper left remove the sensor's dust cover and reverse the board. Later models have an UP arrow on the right side of the circuit board.

	Yellow (bottom) Black Housing Controllers	Yellow (bottom) Blue Housing Controllers
White - Blocked	5 VDC	about 5 VDC
White - Unblocked	<1 VDC	less than when blocked

8. With the voltmeter probe still on the bottom terminal (still in connection #2), place the other one on the second pin from the top (sump full sender - red wire). Move the float stick up and down, note the changes in voltage. It should react the same as in step 7.

	Yellow (bottom) Black Housing Controllers	Yellow (bottom) Blue Housing Controllers
Red - Blocked	5 VDC	about 5 VDC
Red - Unblocked	<1 VDC	less than when blocked

9. If all voltages check out, there is nothing wrong with the sensor or the voltage it receives from the controller.