

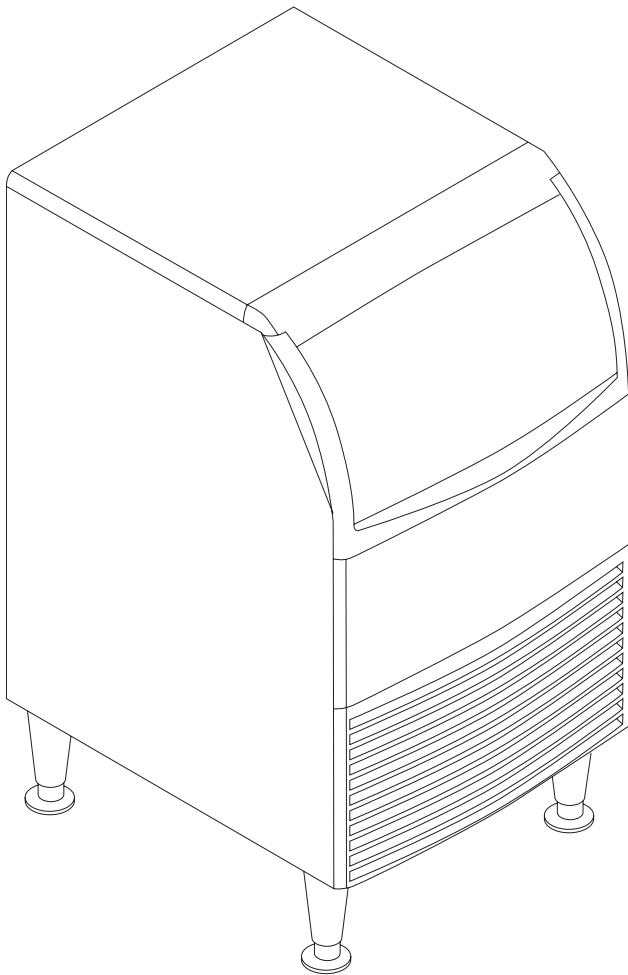


Service Manual for
Models

UN0815A-1A and UF0915A-1A

UN1215A-1A and UF1415A-1A

UN1520A-1A and UF2020A-1A



UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual

Introduction

The design of this product is the result of years of experience in developing commercial ice machines. It has been designed for simple operation in a wide range of locations. Please follow the instructions for installation and maintenance to get the most use from this ice machine.

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Important Details

The machine is designed for use indoors in a controlled environment. It must be kept dry, not overheated or subjected to excessive cold. The water and power supply must be maintained or the machine will stop making ice.

There are limits to how hot or cold the room it's in can be.

- Minimum air temperature: 50°F or 10°C
- Maximum air temperature: 100°F or 38°C

There are limits to the voltage supply to the unit, voltages vary by model:

Voltage

- Minimum 104
- Maximum 126

Water

Temperature

- Minimum water temperature: 40°F or 4.5°C
- Maximum water temperature: 100°F or 38°C.

Quality

- Water supply must be potable by the localities definition.

Water Pressure

- Maximum pressure, static: 80 psi or 5.5 bar
- Minimum pressure, dynamic: 15 psi or 1 bar

Water Conductivity

- The water supply must have a conductivity of at least 10 microSiemens/cm.

A drain will be needed for melted ice and rinse water

Warranty:

The warranty statement for this product is provided separately from this manual. Refer to it for applicable coverage. In general warranty covers defects in material or workmanship. It does not cover maintenance, corrections to installations, or situations when the machine is operated in circumstances that exceed the limitations printed above.

This is a commercial model, if installed in a residence some commercial service companies may not be able to service it on site.

The manufacturer has designed and produced this machine with the finest in materials. The manufacturer assumes no liability for units that have been altered in any way. Alterations or part substitutions will void the warranty. Specifications and designs are subject to change without notice.

Options:

There are two floor mounting kits available:

- KUFM15: for 15" models
- KUFM20: for 20" model

Observe the Caution and Warning notices. They are indicators of important safety information. Keep this manual for future reference.



WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

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Pre-Installation

This appliance is intended to be used in commercial applications including:

- Restaurant kitchens
- Bars
- Hotels

Dimensions and Electrical:

| Model | Electrical (volts/Hz/Phase) | Ice Form | Width (in / cm) | Depth (in/cm) | Height (w/o legs) (in/cm) | Power Cord |
|------------|--------------------------------|----------|--------------------|------------------|------------------------------|---------------|
| UN0815A-1A | 115/60/1 | Nugget | 15 / 38 | 23.7 / 60.3 | 31.94 / 81.1 | 5-15P |
| UN1215A-1A | 115/60/1 | Nugget | 15 / 38 | 23.7 / 60.3 | 31.94 / 81.1 | same |
| UN1520A-1A | 115/60/1 | Nugget | 20 / 51 | 23.7 / 60.3 | 31.94 / 81.1 | same |
| UF0915A-1A | 115/60/1 | Flake | 15 / 38 | 23.7 / 60.3 | 31.94 / 81.1 | same |
| UF1415A-1A | 115/60/1 | Flake | 15 / 38 | 23.7 / 60.3 | 31.94 / 81.1 | same |
| UF2020A-1A | 115/60/1 | Flake | 20 / 51 | 23.7 / 60.3 | 31.94 / 81.1 | same |

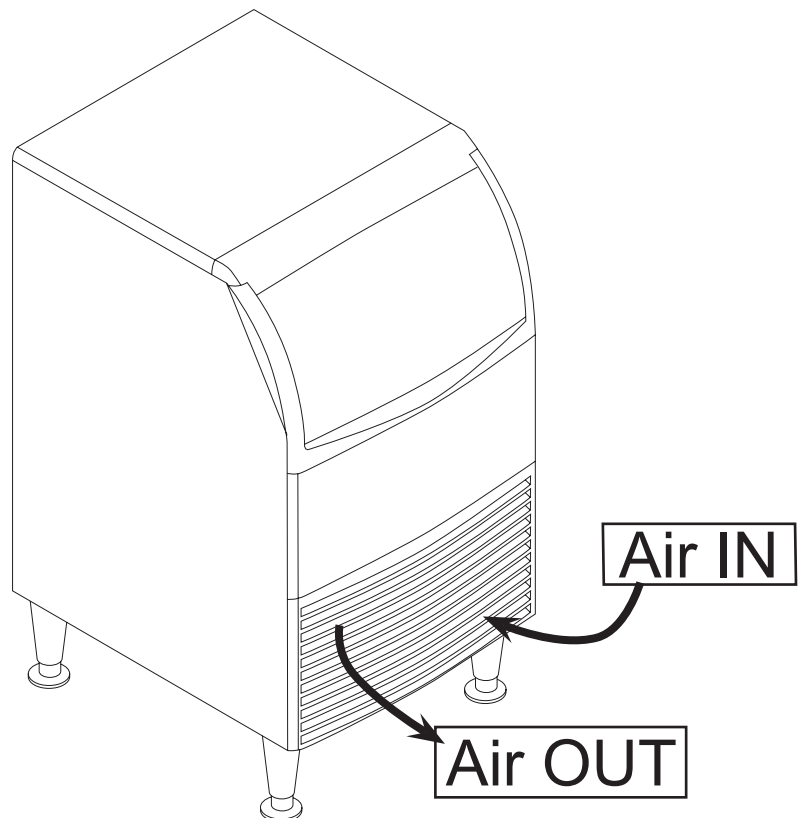
Location:

The unit can be built into a cabinet as the air flow is in and out the front. **The front of the machine must not be blocked.** Certain maintenance or repair procedures will require removal of the top, back and side panels, so plan ahead for service and maintenance needs.

Spacing:

No additional spacing is required at the top or sides. However, suggested minimum side clearance for installation is 1/8 inch or 3 mm and suggested minimum top clearance is 1/4 inch or 7 mm.

Allow 4 inches (100 mm) minimum space at the back for the utility connections. Do not block louvers at the front of the cabinet.



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Operational Data

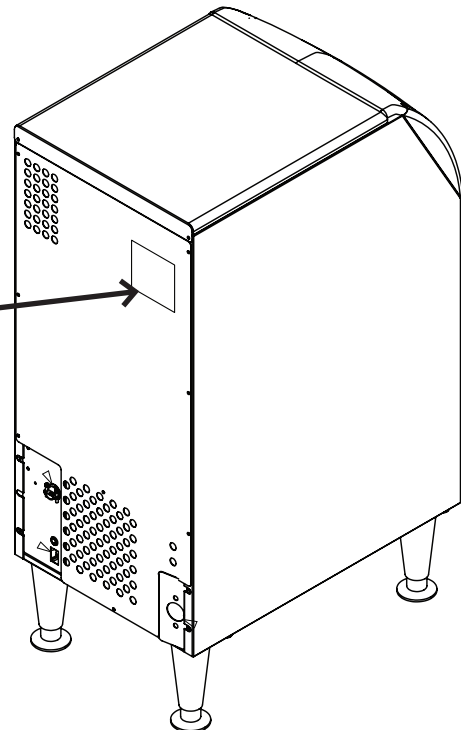
| Model | Electrical (Volts/Hz/Phase) | Condenser | Refrigerant Charge (R-134a) Ounces | Maximum Fuse Size or Breaker (Amps) |
|-------------------------|--------------------------------|-----------|---|--|
| UF0915A-1A / UN0815A-1A | 115/60/1 | Air | 4.5 | 15 |
| UF1415A-1A / UN1215A-1A | 115/60/1 | Air | 4.8 | 15 |
| UF2020A-1A / UN1520A-1A | 115/60/1 | Air | 5.0 | 15 |

| Model | Typical Watts | Typical Amps | Auger Motor Amps | Compressor Amps |
|-------------------------|---------------|--------------|------------------|-----------------|
| UF0915A-1A / UN0815A-1A | 170-175 | 2.2 - 2.4 | .4 - .5 | 1.6 - 1.8 |
| UF1415A-1A / UN1215A-1A | 210-220 | 2.8 - 3 | same | |
| UF2020A-1A / UN1520A-1A | 260-270 | 3.6 - 3.9 | same | |

Location of Dataplate
Model and Serial plate with
QR code located behind
front panel.



**Model
and Serial
Number
Dataplate**



UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual **Unpacking and Setup**

Remove all shipping and packing materials that may be in the ice storage bin.

The unit can be installed with or without legs. The cabinet is equipped with small bumpers on the base to allow placement without legs.

An optional floor mounting kit is also available to fill the gap between the machine and floor if not using legs.

If using legs, carefully tip the machine and install the legs by screwing them into the leg sockets in the bottom of the machine. For reference, the thread size is 5/8 – 11.

If the machine has been tipped onto its side or back allow 1 hour before starting the unit for the oil in the refrigeration system to return to the compressor.

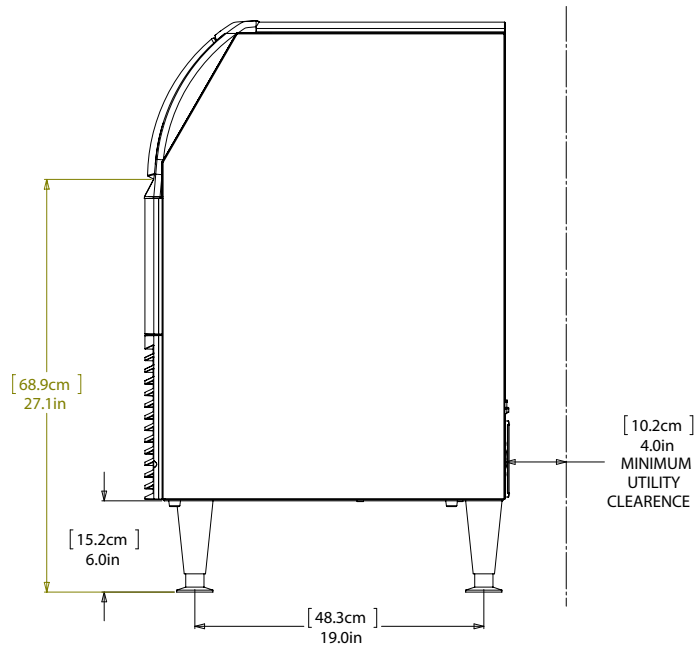
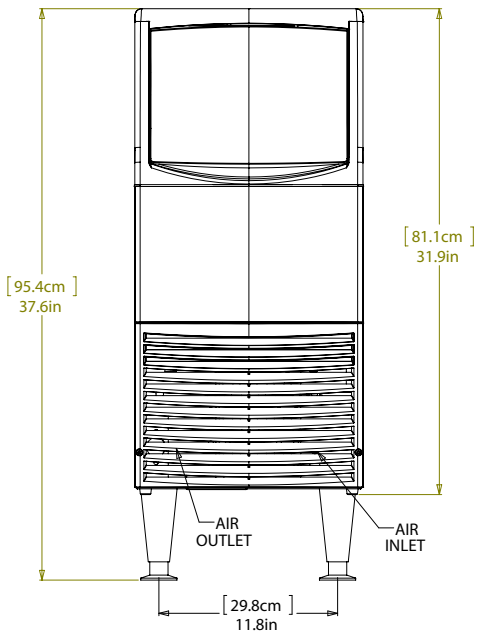
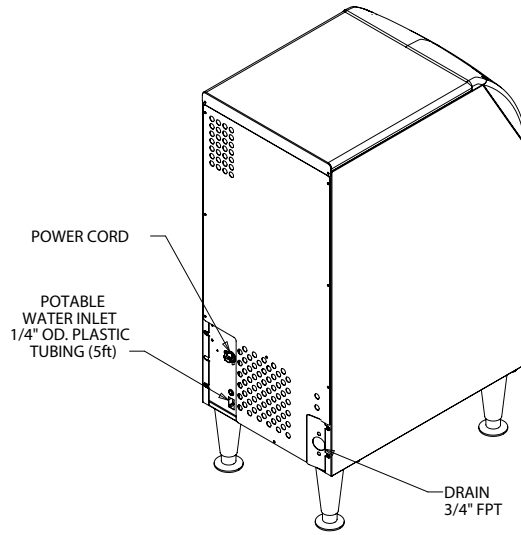
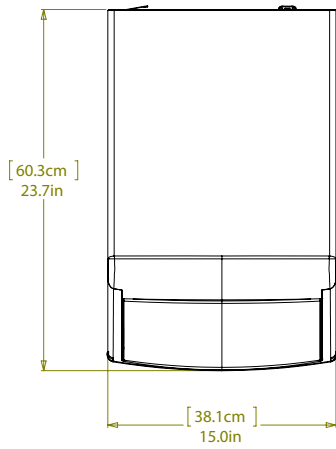
Place the machine in its intended location and level it front to back and left to right. If using legs, adjust their feet in and out to level the cabinet.

If legs are not used the bottom edges of the cabinet must be sealed to the floor to pass most codes.

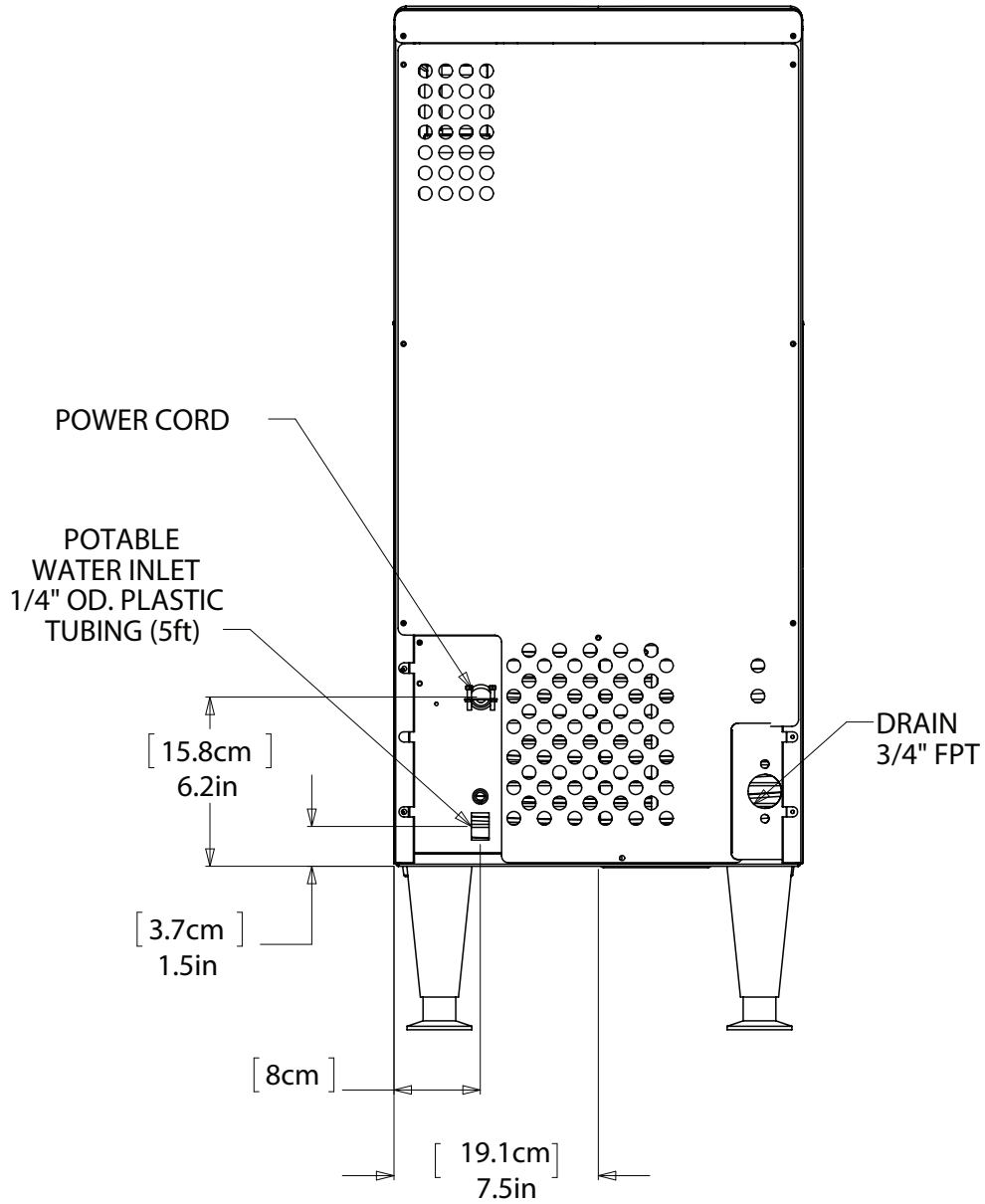
If built into a cabinet, the adjacent cabinet walls will provide the means for containment. There are no means for attachment to the cabinet.

Be sure to remove the plastic covering the exterior panels, if left on it will be much harder to remove later.

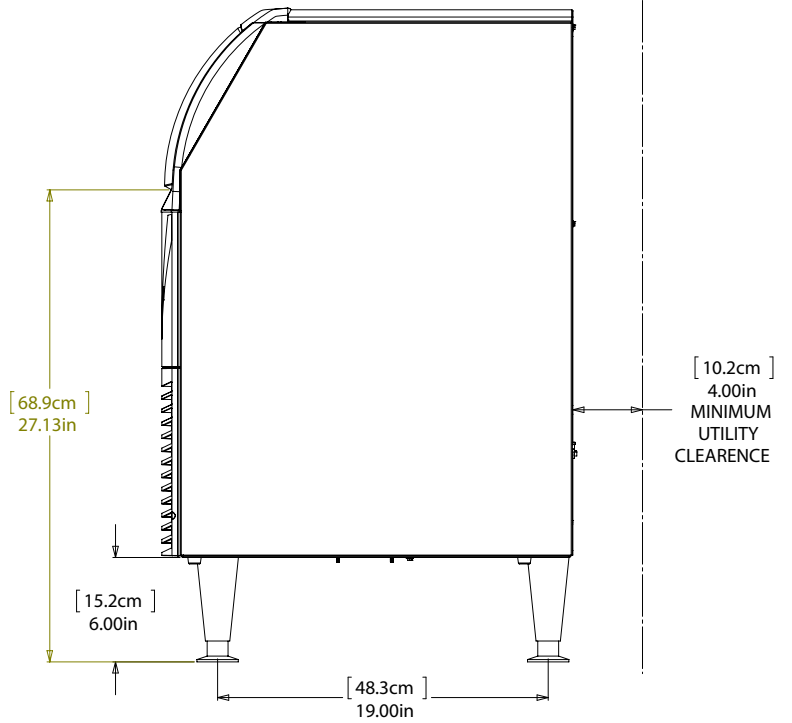
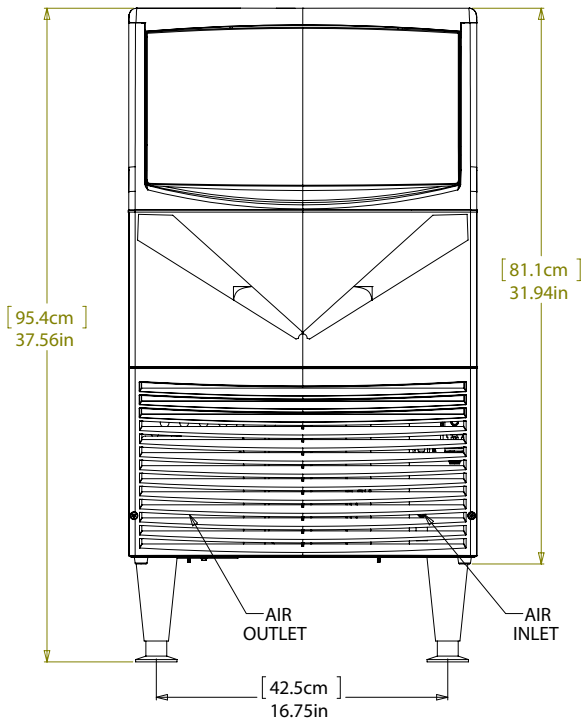
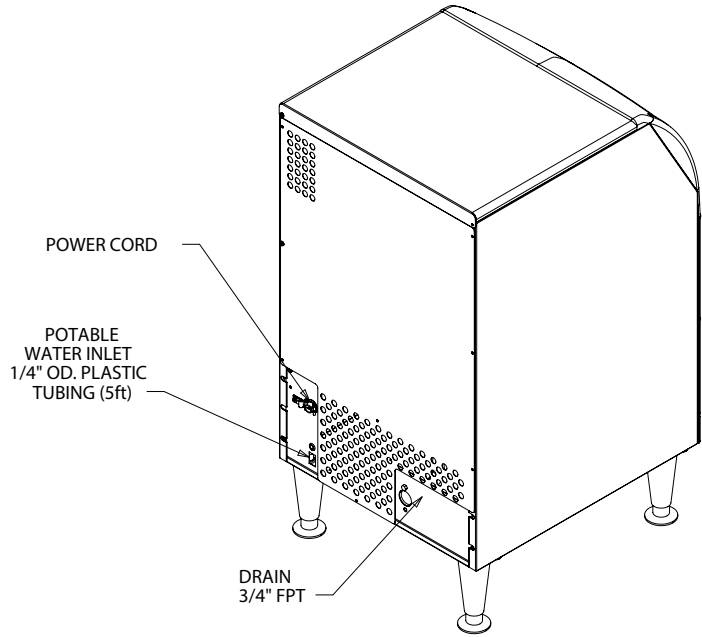
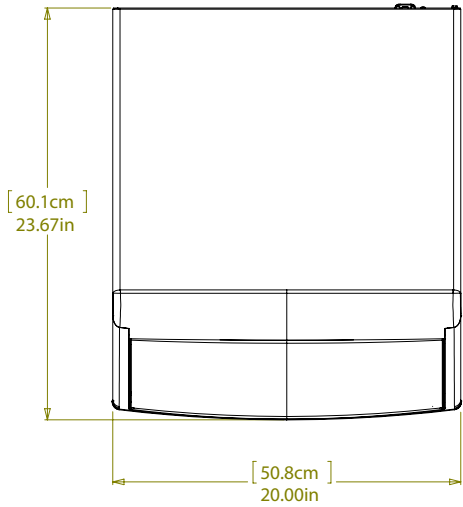
UF0915, 1415, 2020 and
 UN0815, 1215, 1520 Service Manual
Cabinet Layout, UN0815, UN1215, UF0915, UF1415



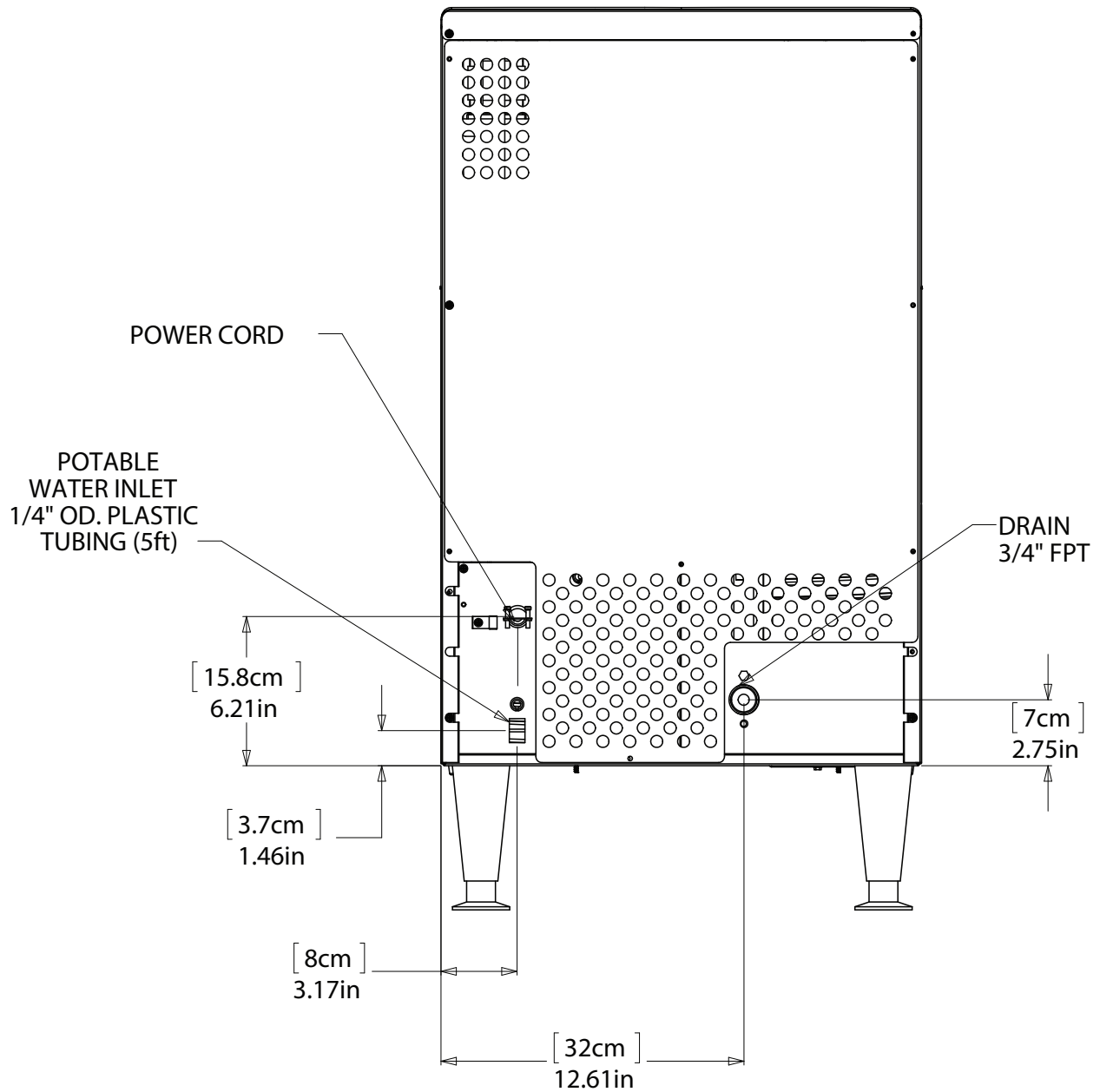
UF0915, 1415, 2020 and
UN0815, 1215, 1520 Service Manual
Back View, UN0815, UN1215, UF0915,
UF1415



UF0915, 1415, 2020 and
 UN0815, 1215, 1520 Service Manual
Cabinet Layout, UN1520, UF2020



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UN0815, 1215, 1520 Service Manual
Back View, UN1520, UF2020

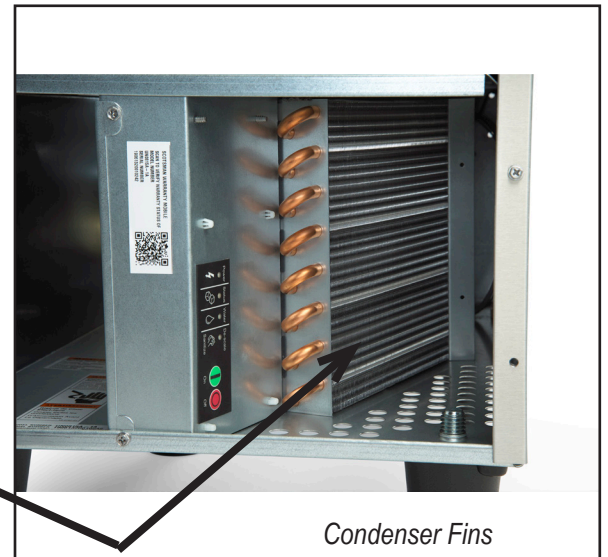
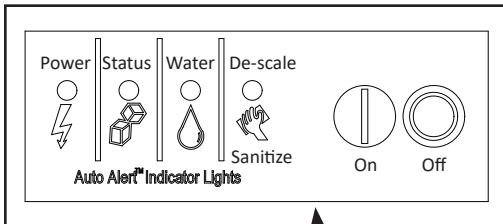
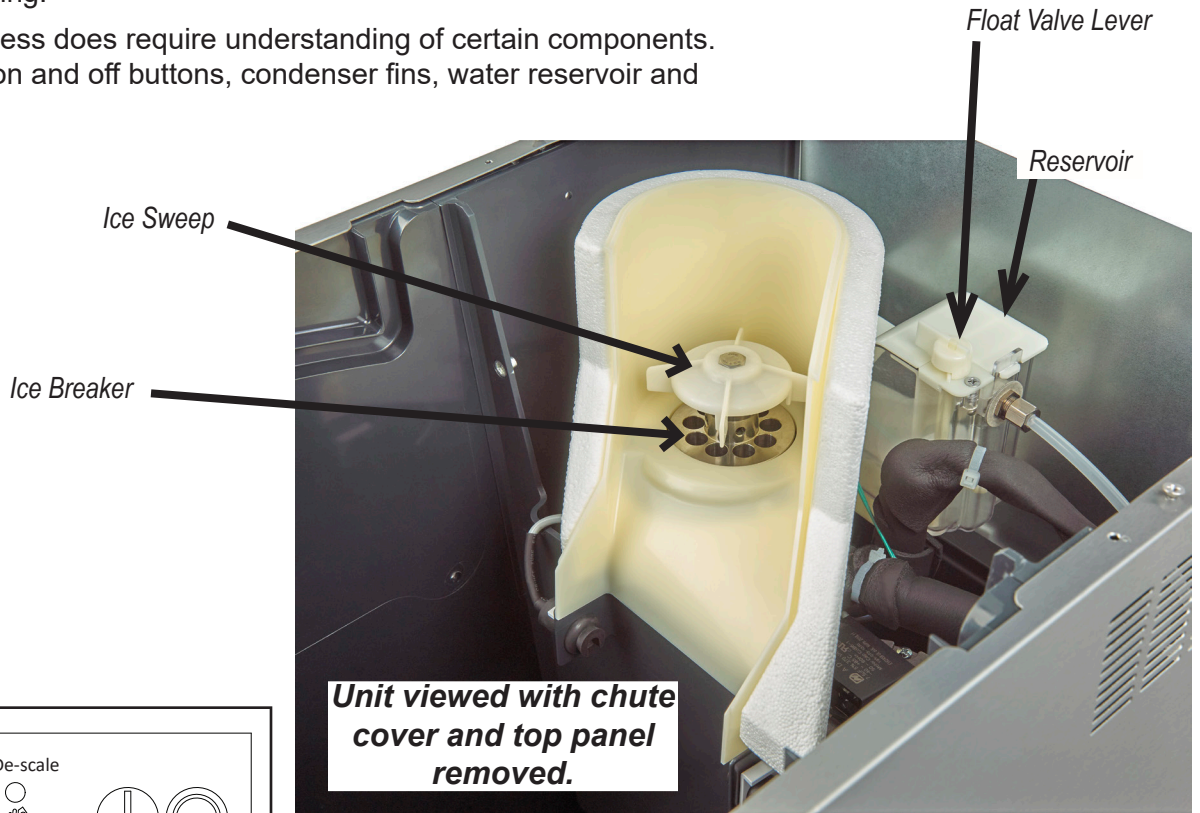


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Component Location

All models are essentially automatic and require very little contact other than routine cleaning.

The cleaning process does require understanding of certain components. They include the on and off buttons, condenser fins, water reservoir and ice breaker.



Front Panel Removed. On and Off Buttons and Indicator Lights

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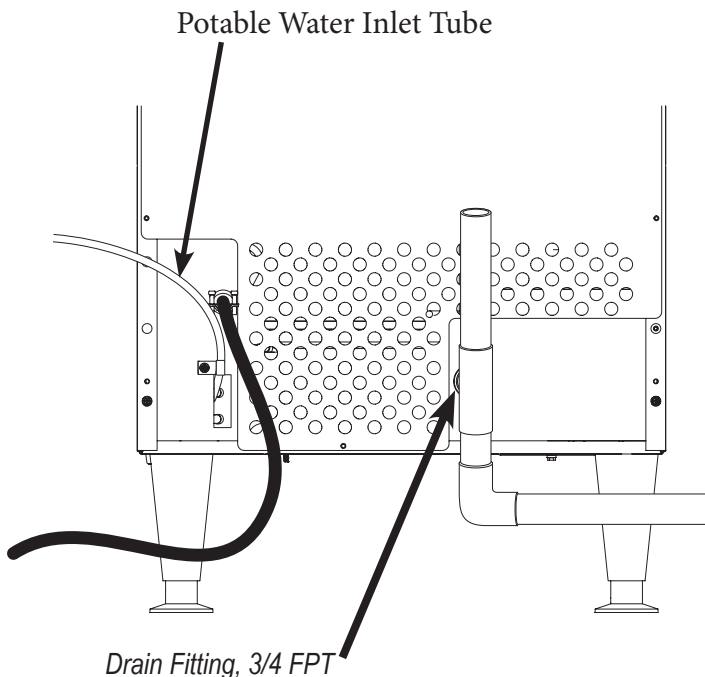
Connect the water supply

Plumbing information:

- The water supply connection is at the back panel. It is a 5' (1.5 meter) 1/4 inch (6.35 mm) OD plastic tube.
- A hand actuated valve within site of the machine is required to isolate the unit when it's being serviced.
- The machine has a built-in back flow preventer (an air gap between the water's entry point and the top of the reservoir water), no additional back flow preventer is needed.
- Water flow rate into machine is .125 gal/min

Units that are built into a cabinet:

Include a loop or coil of tubing between the water supply and the connection on the ice machine. When the machine is pushed back into the cabinet the tubing will coil and not kink.



Connection Information:

Important: connect to potable water supply only. Open the hand water valve to flush water through the connection point before connecting to the ice machine.

1. Cut cable ties securing hose and power cord to unit.
2. Connect to cold, potable water using the necessary adapters for the 1/4 inch OD plastic tube.
 - If using compression fittings they require a ferrule or sleeve and insert.
 - A female 3/8 compression x 1/4 OD compression adapter allows connection to a typical 3/8 OD compression angle valve.
 - Another connection method is by quick connect fittings.

Note: Do not use a piercing-type saddle valve to connect to the building's water supply. Valves of that type restrict water flow and clog easily.

Connect the drain

The drain connection is at the back panel. The fitting size is 3/4 FPT. **And it is plastic. Do not overheat.**

- Drain tube material must be rigid and meet local code.
 - Traps in the bin drain line without vents ahead of them will cause poor draining
 - The drain must be vented if there is a long horizontal run 5 feet or more. All drains are gravity and must have a minimum fall of 1/4" per foot of horizontal run.
1. Connect rigid tubing to this fitting and vent it at the machine, use an 8 inch or 200 mm vertical tube for the vent.
 2. Slope drain tubing down from the ice machine to the building drain and the slope must be at least 1/4 inch per foot or 20 mm per meter.
 3. Insulate the drain tubing to reduce condensation and is recommended for environments that have high humidity.

Due to the potential for leaks, condensate pumps are not recommended.

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Connect the power

This is a cord-connected unit, and must be connected to its own dedicated power supply. Check the dataplate on the back of the machine to confirm the voltage and per the dataplate use fuses or HACR circuit breakers.

Power Cord:

This 115 volt model is equipped with a cord and 5-15P plug.



Follow All Local Codes

- This Unit Must Be

Grounded. Do not use extension cords and do not disable or by-pass ground prong on electrical plug.

Plug the power cord into the proper power supply.

Note: Electrical outlets can become worn and the power supply can then be erratic. Have it replaced if the connection is loose.

After utility connections

1. Level the cabinet, use the leg levelers on the end of the legs to adjust to cabinet height. Legs should have been installed when the unit was unpacked.
2. Wash the bin and door. If desired, the interior of the bin could be sanitized.
3. Locate the scoop, wash it and have it available for use when needed.

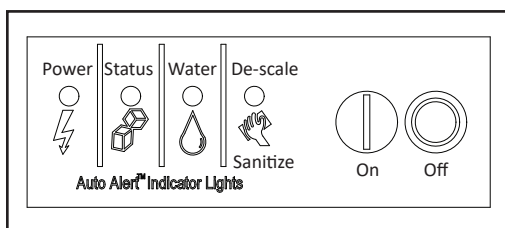
Installation check list

- Has the machine been installed indoors in an environment suitable for it?
- Have all of the shipping items and packaging been removed?
- Has the plastic covering the exterior panels been removed?
- Has the water supply been connected and confirmed to not leak?
- Has a properly sized and sloped drain tube been attached?
- Has the correct voltage power supply been connected?

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Initial Start Up

1. Remove the front panel by removing the two screws holding it to the cabinet and pulling the panel down and off the machine.
2. Turn on the water supply, correct any leaks.



3. Locate the On push button.
4. Confirm that the Power indicator light is on and that the Water indicator light is off.

If the Water indicator light is blinking red, the unit will not start as there is no water sensed and ice cannot be made. Correct any condition keeping water from filling the reservoir.

5. If not already operating, push and release the On button.
6. The Status indicator light will be on. Warm air will begin to blow out the left front of the machine and the auger drive motor will switch on. Within a few minutes or so the ice will fall down and slide into the ice storage bin. It is normal for a small amount of water to also drip from the ice making area.
7. Check for any unusual noises, such as fan motor vibration and correct as needed.
8. Return the front panel to its normal position.

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual **Use and Operational Notes**

To use, simply lift the door by its bottom edge and slide it up and into the top of the machine. Use the scoop to remove ice and close the door.

The machine will make the most ice if it has plenty of room to breathe. This is an air cooled product and it must be able to take in room air and discharge air heated by the ice making process.

Blockage of vents or exposure to excessive heat will reduce the ice making and storage capacity.

The storage bin is insulated but not refrigerated, so ice will melt during use. That is normal and assures that fresh ice is available in the bin.

The fan will make some noise during operation, however rattles and other vibrations are not normal and should be attended to.

If the machine is in a space colder than the minimums listed it can become damaged.

Caution: The cabinet is not designed to support anything placed on it. Do NOT step or stand on it.

On and Off

The On and Off buttons are located behind the louvered front panel. Remove that panel to access those buttons.

To Shut Off: Push and release the Off button and the unit will begin a shut down. Push and hold the Off button for an immediate shut off.

Power

Glows green when there is 12 volts AC (+3) supplied to the controller.

Status Indicator Light

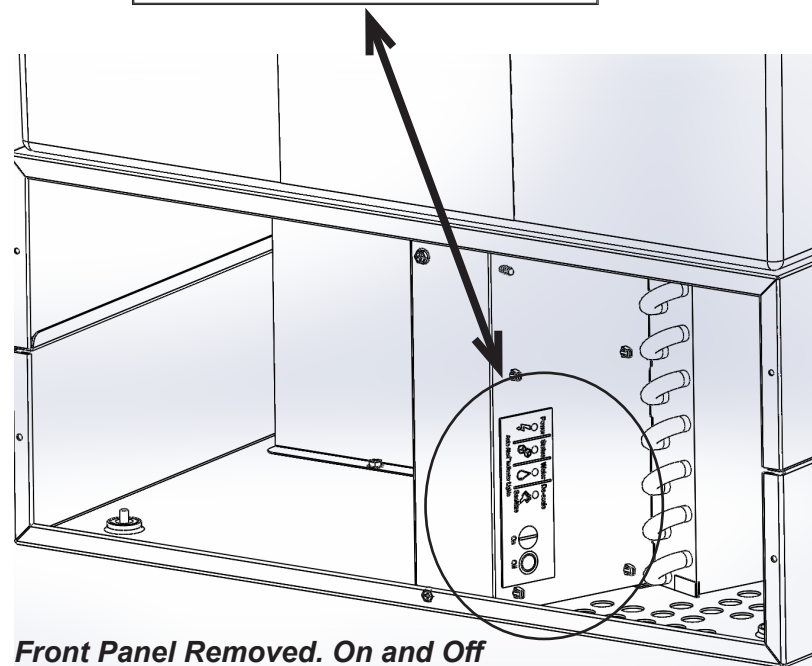
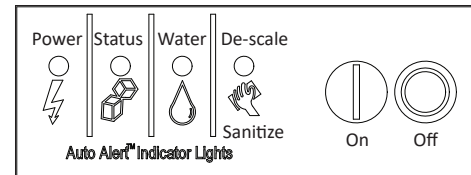
Glows green when either making ice or blinks when the bin is full of ice (optical sensors blocked by ice).

Clean Indicator Light

Serves as a reminder that it is time to have the unit cleaned. Normally off. This light glows after 6 months of power up time between cleanings. It will go out after the unit has been cleaned using the process in this manual and / or the one on the ice machine's cleaning label.

Water Indicator Light

Normally off. It blinks on and off when there is power to the unit but no water sensed in the reservoir. A lack of water will trigger a unit shut down. The unit will automatically restart after water has been restored.



**Front Panel Removed. On and Off
Buttons and Indicator Lights**

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual

Maintenance: Cleaning The Water System

Frequency: Recommended about twice a year. Units that are used heavily or are on highly mineralized water may require more frequent cleaning.

Cleaning this machine involves adding a solution of scale remover and water to the ice machine and continuing to add it as it makes ice. The scale remover must be diluted to the correct ratio. This is followed by sanitizing. The ice machine must be connected to power, water and drain during this process. Recommended tools: Rubber gloves, small scrub brush & scale remover.

1. Remove the top panel for reservoir access.

Note: If the unit must be pulled out to remove the panel and access the water reservoir, be sure that the water supply, drain and power remain connected

2. Remove the front panel for control access.

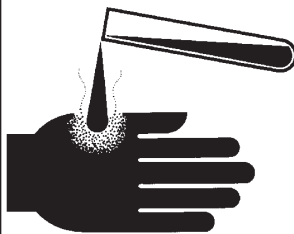
3. Scoop out and discard all of the ice.

4. Press and hold the Off button until the machine shuts off.

5. Locate float valve on/off lever. Rotate to shut water supply OFF.

6. Push tab on front edge of reservoir cover and remove the cover.

Note: Adjacent wires are low voltage and are not hazardous.

| | |
|---|---|
| ⚠ CAUTION | Ice machine scale remover contains acids. Acids can 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. |

7. Locate drain plug and pull the drain plug out to drain the reservoir and evaporator. When draining is complete, return the plug to its original position.

8. Mix a solution of Clear 1 scale remover with water: 2.5 ounces of Clear 1 with 1 quart (32 oz) of warm (90°F/32°C to 110°F/43°C) potable water.

Note: Take care not to spill any scale remover on any nearby surface. Immediately wipe any spill with baking soda and water.

9. Fill the reservoir with the scale remover solution. That will be about 8 ounces.

⚠ CAUTION 10. Unscrew (rotate CCW) and remove the ice sweep.

11. Wash the ice sweep and lower part of the breaker with the scale remover solution. Remove as much scale as possible.

Caution: Be SURE no scale remover contacts the bearing.

12. Return the ice sweep to its original position.

13. Press and HOLD the both the On and Off buttons for 5 seconds. The Time to Clean light will blink on and off.

⚠ CAUTION The auger motor will be operating for 20 minutes, after that the compressor will start and in about 5-8 minutes the machine will start to make ice. The Time to Clean light will

October 2019

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now glow steady until the clean cycle is complete.

Caution: Keep fingers away from moving parts.

14. After ice making starts, continuously add scale remover solution to the reservoir to keep it about half full.
15. When all remaining solution is used, rotate the float valve lever to the ON position. Ice will continue to be made.
16. After 40 minutes (20 of no ice making and 20 making ice) the ice machine and all the control panel lights will shut off.
17. Rotate float valve lever to Off and pull the drain plug again to drain the system, then replace it.
18. Pour a gallon of hot (95°F. – 115°F.) water into the bin to flush out the drain and melt all ice that was made during the cleaning process. Be sure all ice is melted.
19. Mix another solution of 2.5 ounces of Clear 1 Scale Remover and 1 quart of 90°F/32°C to 110°F/43°C potable water and clean the bin liner of mineral scale by using the scale remover solution to scrub the scale off of the liner.
20. Rinse the liner with hot water.

Sanitize Water System after scale removal to complete the Water System Cleaning process.

1. Create a solution of sanitizer.
2. Mix 4 oz/118ml of NuCalgon IMS and 2.5 gal/9.5L of (90°F/32°C to 110°F/43°C) potable water to create a 200 ppm solution.
3. Rotate the reservoir's water shut off valve to shut the water supply OFF. If water reservoir cover has been placed on reservoir, remove it.
4. Pour the sanitizing solution into the reservoir until it is full to but not over the overflow point (about 8 oz) and wait 2 minutes.
5. Press the On button to turn the ice machine ON.
6. Operate the machine for at least 15 minutes, adding sanitizer to the reservoir as needed to keep it at least half full, and then push and release the Off button to shut it OFF.

▲ CAUTION 7. Remove the ice sweep.

8. Wash the reservoir cover, ice sweep, breaker and the inside of the ice chute with the sanitizer solution.

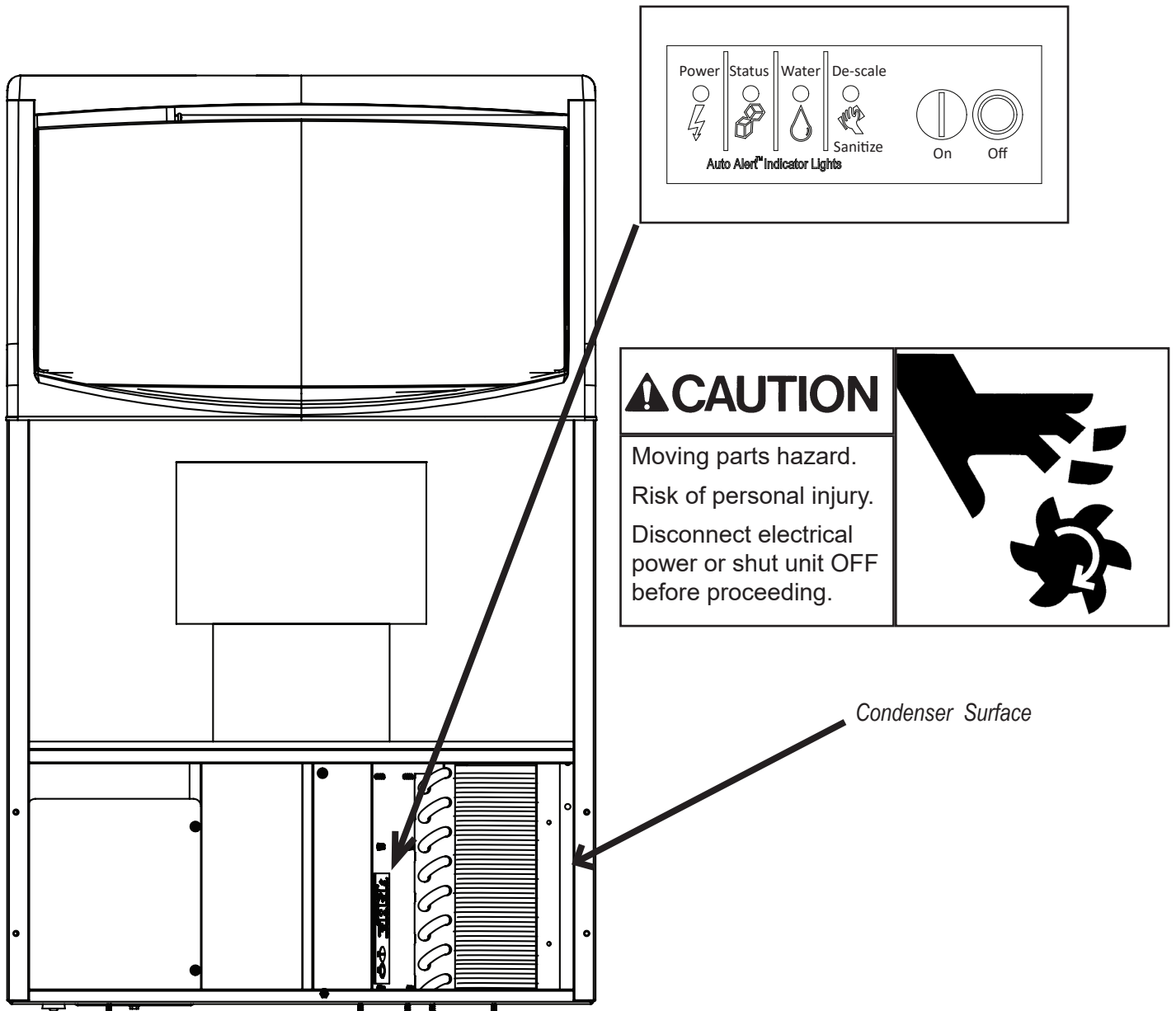
Caution: Do not allow sanitizer to contact the bearing.

9. Return the ice sweep to its normal position.
10. Return the reservoir cover to its normal position.
11. Drain the solution from the system by pulling the drain plug.
12. Return plug when drained.
13. Rinse bin liner with clean water. Be sure all ice has been melted.
14. Use sanitizer mix on all bin surface areas and areas that may contact the ice.
15. Rinse with clean water.
16. Rotate water shut off valve to turn the water supply ON.
17. Push and release the On button to restart ice making.
18. Operate the machine for 15 minutes and then pour water onto the ice in the bin until it has all been melted.
19. Return the top and front panels to their normal positions.

The ice scoop should be washed regularly, wash it just like any other food container

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Cleaning the Condenser

1. Remove the front panel.
2. Push and hold the OFF button until the machine stops and / or the Status light is not glowing.
3. Vacuum the surface of the condenser fins, carefully brush off any loose dirt. If grease is embedded use coil cleaner to wash it out.
4. Push and release the On button.
5. Return the front panel to its original position.



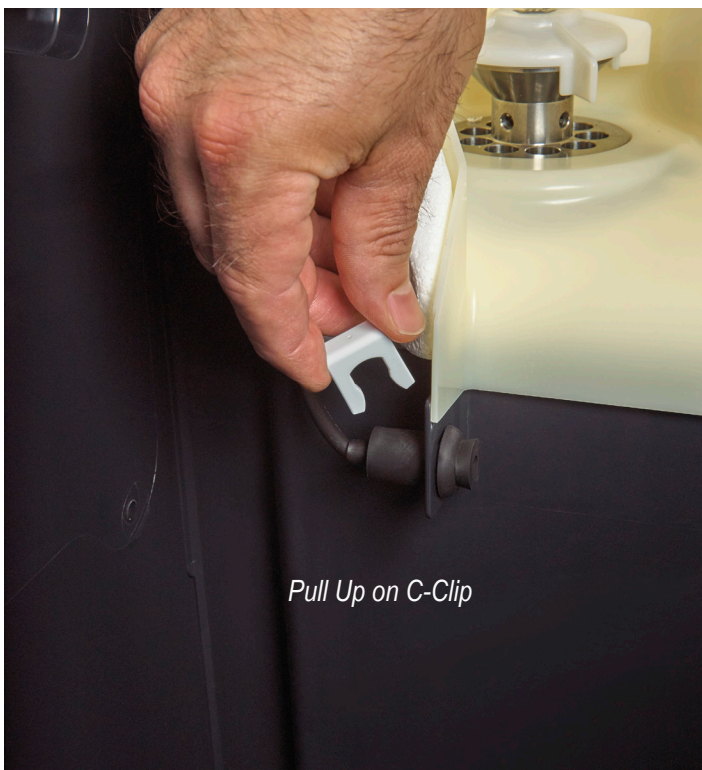
UF0915, 1415, 2020 and
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Other maintenance

Clean the optical sensors.

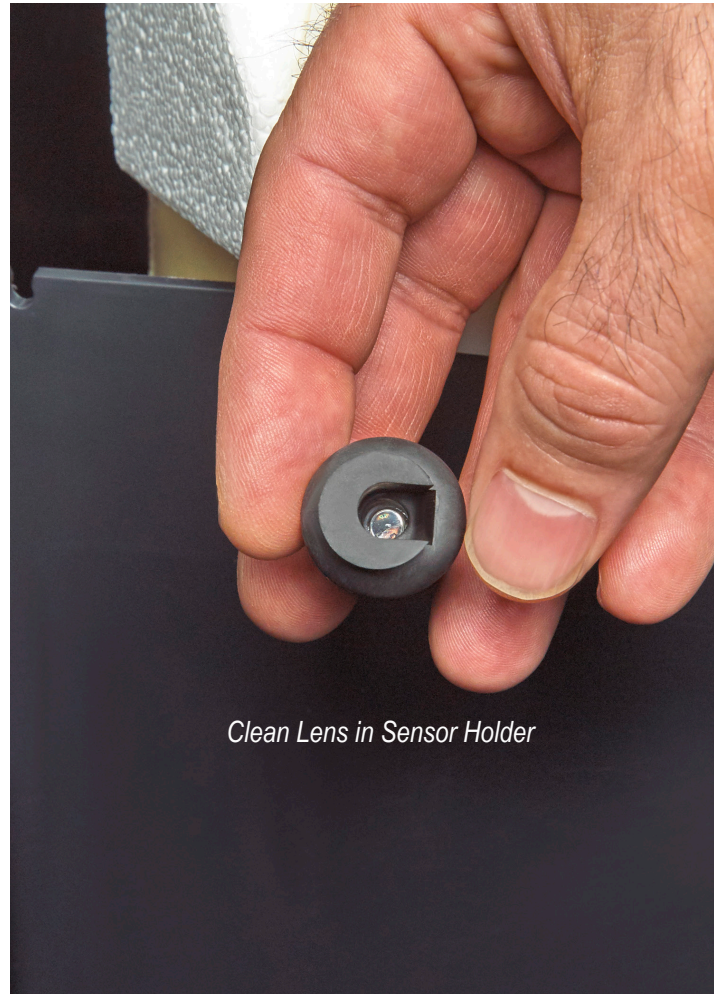
1. Mix solution of 4 ounces of Clear 1 Ice Machine Scale Remover and 1.5qt/1.4L of 90°F/32°C to 110°F/43°C water.
2. Remove chute cover from back of bin.



3. Remove sensors from inner cover by removing the white c-clip .



4. Use cotton swab and cleaning solution to thoroughly clean photo sensor lens



Note: Do not use sharp object to clean lens.

5. Rinse sensors with clean water.
6. Reinstall sensors in inner panel.

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual **Control System**

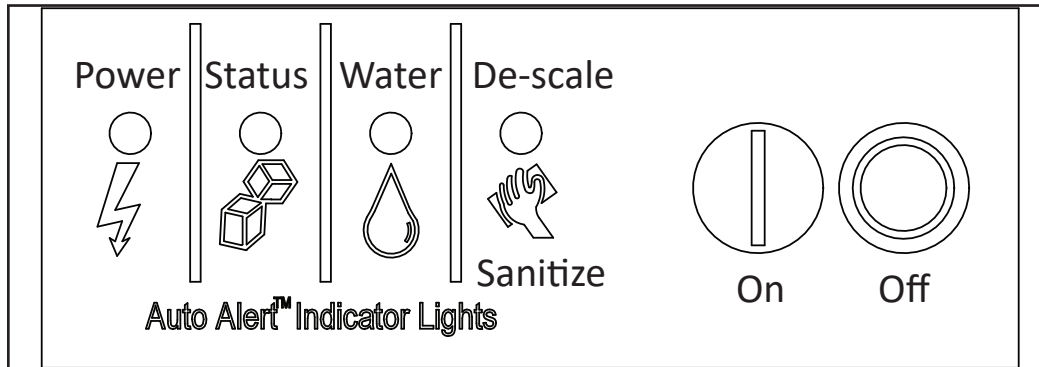
All models use the same control system.

The electronic controller operates the compressor (with fan motor), and auger drive motor, It monitors:

- Reservoir water availability
- Storage bin ice level - full or not full
- Auger motor current - for proper current draw

Many of these are used to insure that the machine does not damage itself during use. For example, it is critical that it not attempt to make ice without water, so if the water sensor is dry, the machine will not make ice.

Switches



- On - to switch the machine on
- Off - Holding it in to shut off will stop ice making immediately.

Indicators - there are four LEDs:

- Power - Glows green when controller is supplied with 12 volts AC.
- Status - Glows green when in ice making mode. If blinking red, the auger motor has failed to draw the proper current after repeated restarts.
- Water - Glows and blinks red when there is not enough water
- De-scale and Sanitize - glows yellow when it is time to clean and sanitize the machine

Status Light Blink Codes

| | |
|--|--|
| Off: | Not in ice making mode |
| On Steady: | Ice making mode |
| Blinking Green once a second: | Shutting down |
| Blinking Green every second: | Bin full |
| Blinking Red, one long, one short every five seconds: | Auger motor overcurrent, first notice |
| Blinking Red, one long, two short every five seconds: | Auger motor overcurrent, second notice |
| Blinking Red, one long, three short, every five seconds: | Auger motor overcurrent, third and final notice |
| Blinking Red, two long, one short, every five seconds: | Auger motor undercurrent, first notice |
| Blinking Red, two long, two short, every five seconds: | Auger motor undercurrent, second notice |
| Blinking Red, two long, three short, every five seconds: | Auger motor undercurrent, third and final notice |
| | |

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual Water System

The water system consists of a water inlet tube, float valve, water reservoir, evaporator inlet, overflow drain, condensate drain, bin drain and common drain fitting.

The float valve maintains a constant water level in the evaporator. It is contained in a reservoir tank, which also contains the water sensor probes.

Its outlet goes to the evaporator and to a plug. The evaporator and reservoir may be drained by disconnecting the tube from the plug.

As ice is made and forced up the evaporator, the auger is being pushed down. That thrust is supported by the bearings in the gear reducer. Those bearings also provide alignment for the bottom of the auger, keeping it centered in the evaporator tube. The top bearing provides auger alignment at the top.

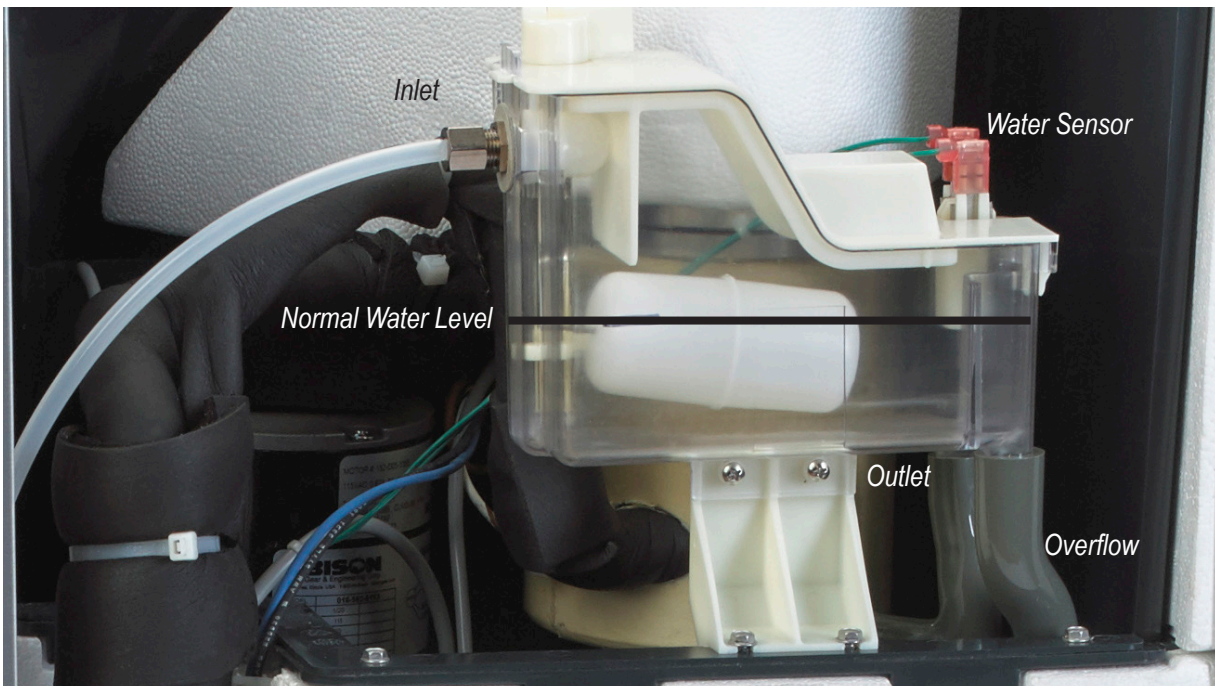
Water is kept from leaking out the bottom of the evaporator by the water seal. The water seal is the type of seal called a face seal, with the outside diameter of a stationary half pressed against the inside of the evaporator tube and a rotating half attached to the bottom of the auger. The sealing action takes place where the faces of the two halves rub together.

Water is the raw ingredient of ice and it enters this machine through the compression fitting in the back. That leads to the float valve and reservoir. When the

float is not supported by water, the float arm is down and the attached float valve is open. As water enters the reservoir, it also flows into the reservoir's outlet tubing which leads to the evaporator water inlet, filling the evaporator. The float rises as the water level is increased until it has lifted high enough to force the water valve to close, stopping the flow of water. When the machine is making ice, the water level will drop slightly and water will flow into the reservoir through the partially open float valve. It will flow in continually as ice is made.

Water quality. Nearly all water supplies contain some impurities or minerals. When ice is made those minerals can remain behind in the ice machine and coat its surfaces with a hard, stone like substance known as scale. This scale must occasionally be removed by scale remover. Scale remover is a food grade acid that will dissolve the scale so it can be washed away. Note: it is important to ALWAYS dilute the scale remover when using it on this machine. Never use undiluted scale remover.

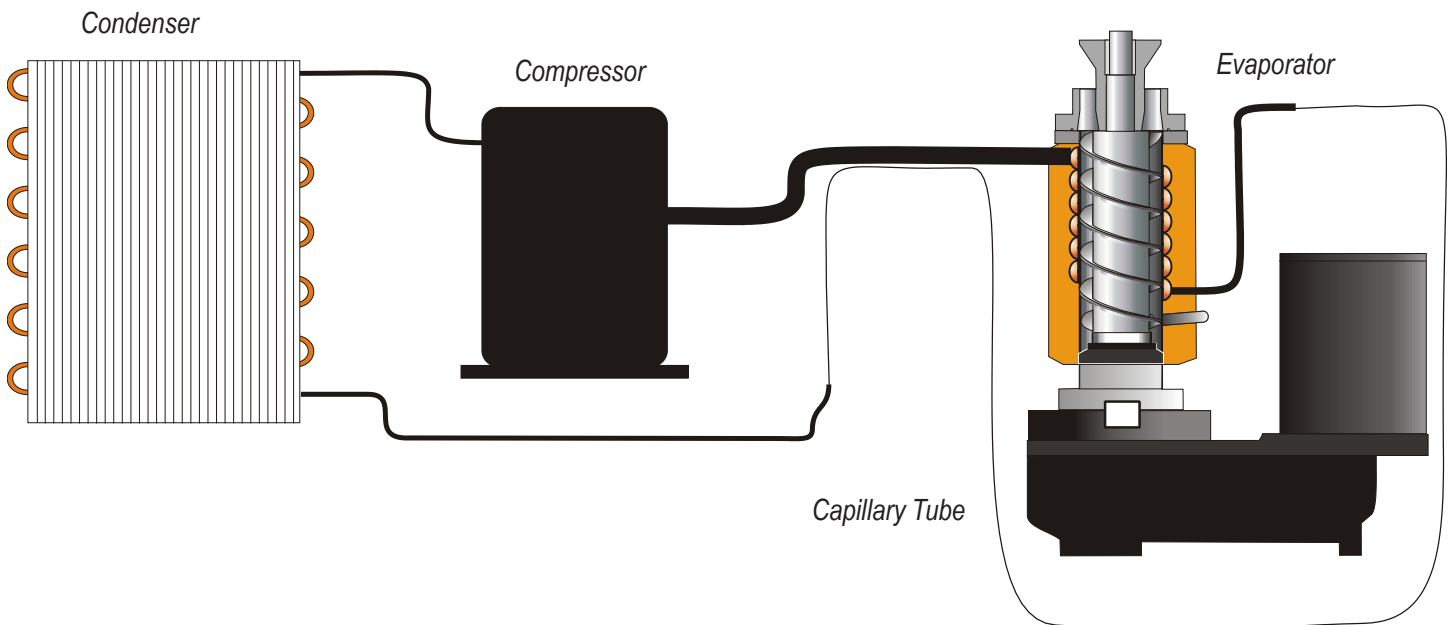
Some water treatment devices make very clean water, Reverse Osmosis is one of those and this machine may be used with RO water as long as the conductivity is greater than 10 microsiemens/cm. Use of de-ionized water is not recommended and will void the warranty.



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Refrigeration System

This is a continuous flow ice machine. When the control system senses that the storage bin's ice level is low, it turns on the compressor, fan motor and auger drive motor.

During ice making the refrigeration system takes heat from the evaporator. The evaporator is a vertical refrigerated stainless steel tube containing water and a slowly rotating auger. When the water gets to the freezing point, ice begins to form. That ice is very soft and is pushed up the evaporator tube by the auger. As ice is made more warm water enters at the bottom. The soft, mushy ice is forced up to the top of the evaporator's tube where it is forced through nine tapered holes. As the ice is pushed through the holes excess water is squeezed out. The ice comes out of the holes shaped as a rod of ice. The rods of ice are broken off by being pushed against the tapered flange above the holes, forming the irregular lengths of nugget ice. The ice sweep, rotating with the auger, moves the ice to the ice chute where it falls by gravity into the storage bin.



Refrigeration Schematic

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual

Sequence of Operation

At initial start up there is no ice in the ice storage bin, so there is nothing blocking the infrared sensors that are used to control the on or off mode of the machine. Connecting power or a push of the on button triggers the controller to begin ice making. Status light will be green.

Water Monitored

The controller continually checks for water using the continuity sensor in the reservoir. Electrical continuity is measured between the sensor's two probes. Water in the reservoir will be in contact with the probes and provide an electrical path between them. If that sensor indicates there is water the controller connects power to the compressor, fan motor and auger drive motor.

Auger Drive Monitored

The auger drive motor's current is continually checked by the controller. Either very high or very low current will trigger a shut down sequence. If correct, the auger drive, fan motor and compressor will start.

The compressor forces refrigerant to circulate causing the evaporator to become very cold, which takes heat from the water inside the evaporator's tube. That refrigerated space also contains the slowly rotating auger. Eventually enough heat is removed from the water to cause ice crystals to form. When enough ice crystals have formed the auger moves them vertically up the tube and the soft, wet ice is forced through the slots in the ice breaker. The limited area of the slots causes the soft ice to be forced together, forming either flaked or nugget ice, depending upon the design of the breaker. As ice exits the breaker or extruder, more water flows from the reservoir into the bottom of the evaporator tube.

Water replenishment by gravity fed water is the key element in this ice making process. It provides a continuous heat load to the refrigeration system so that, as ice is made, an equal amount of water re-enters the system, keeping the system in balance. A flaker then, is a unique refrigeration system in that it is steady-state. Once the machine has begun to make ice the evaporator's temperature does not change as the replenished water keeps adding heat.

Ice

The ice sweep pushes the ice away from the breaker and to the ice chute, where it slides down into the insulated bin. The bin is not refrigerated. There is a drain at the bin's floor to let melt water out. As it is made, ice will pyramid under the chute and form a pile that gradually increases to the point that the top of the pile enters the chute, blocking the infrared light between the ice sensor's emitter and receiver, which signals the controller to stop making ice. The ice level at the first shut off may be less than later when the bin temperature has stabilized. Ice storage bin capacities are calculated by the bin's internal volume, so the amount of available ice may not equal the calculated quantity unless ice is distributed to the sides during use.

The shut off process begins when the controller opens the compressor relay, cutting the power to the compressor. The auger motor continues to operate to clear the evaporator tube of any ice that was in it. Then it is shut off. In normal operation when the ice is used or melts enough to expose the emitted infrared light to the sensor's receiver, and the compressor has been off for the preset amount of time, ice making will restart.

Sound

The normal sounds of this machine are the compressor, fan blade, and auger drive motor. Occasionally there may be a slight crunching sound as ice is forced thru the extruder or breaker. A loud moaning noise could occur if ice is not sliding vertically up the evaporator tube. If it revolves with the auger, it will remain under refrigeration too long, and could even freeze to the evaporator wall. Then it becomes like chipped ice, which causes the gear reducer to be overloaded as it pushes the extra hard ice thru the extruder. That is known as a rotating freeze. The most likely cause of a rotating freeze is internal scale build up, especially on the auger.

UF0915, 1415, 2020 and
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Basic Troubleshooting

| Symptom | Possible Cause | Probable Correction |
|--|---|--|
| No ice in bin | Unit in off mode or off on error. | Remove front panel and check controller. If Power light is on but status light is off, push ON button to restart. |
| | False bin full. Power light on, Status light on, Water light off. | Unit not making ice and the bin is not full. Check photo eye set for scale build up, carefully clean them to remove any scale. Check that there is good connection from the controller to the photo eye set. Replace photo eye set if no other cause can be found. |
| | No power to unit | Check for the power light. If not illuminated restore power. Check transformer output. |
| | Compressor off, Auger motor off, status light green, water light on | Water not sensed. Check water supply to unit. |
| | Compressor off, Auger motor not operating, All lights blinking slowly. See next page. | Open windings. Check motor windings and replace if open. |
| | | Gear reducer or auger bearings seized, remove auger and check bearings. |
| | | Gear reducer seized, replace. |
| | Compressor not operating, auger motor is operating. | Compressor hot and overheated, check start relay and start capacitor. Check system charge. Check TXV for high superheat. |
| No power to compressor. Replace controller. | | |
| Compressor at room temperature, will not start. Check windings. If open, replace compressor. If not open, check/replace start relay and start capacitor. | | |
| Compressor operating, auger turning, no ice is made | Check refrigeration system, TXV may be set to too much superheat or the system is low on refrigerant. | |
| Excessive noise | Tubing contact | Check for tubes rattling and panels not tight |
| | Fan blade out of balance | Replace fan blade |
| | Compressor noisy | Replace compressor |
| Moaning noise when making ice | Water seal being compressed | Gear reducer bearing failure, replace gear reducer |
| Slow or Low production | Air filter is dirty | Clean air filter |
| | Condenser is dirty | Check and clean condenser |
| | Room and/or Water Temperature too high | Maximum production will be achieved at 70°F / 21°C air and 50° / 10°C water |
| | Restricted air flow to unit | Check and remove air flow restrictions |
| Unit cycles off and restarts | Loose electrical connection | Check power cord and outlet. Outlet may be worn, replace worn outlet. |

Note: A damaged power cord must be replaced by the identical, OEM service part.

UF0915, 1415, 2020 and
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Auger Motor Current Monitor

The auger motor's current is monitored by the controller. If the motor's current is too high or too low/non-existent the controller will STOP the ice machine's operation and attempt a restart sequence. There is NO external signal that the restart sequence is underway. The ice machine will appear to be operational but will not be making ice, even though the ice storage bin is not full.

If the motor's current draw is **too high**:

- Result: Immediate shut down and time out before a restart.
- Causes: Short term poor ice flow out of evaporator tube; bearing damage in evaporator, gear reducer or auger motor. Shorted auger motor.

If the motor's current is **too low**:

- Result: Immediate shut down and time out before a restart attempt.
- Causes: Open motor windings. No power to gear reducer motor from controller

A **Time Out** condition is nothing is operating.

A **Restart After Time Out** condition appears like normal operation, as the auger motor, compressor and fan motor will be operating. Failure during this time counts as one of the consecutive Time Outs. Proper operation throughout this time resets the consecutive Time Out counter back to zero.

A **Shut Down / Lock Out** requires a manual reset. It is indicated by the Status Light blinking red. The On and Off buttons will be inoperable until power is switched off and back on.

Motor Time Out Chart

| | Time Out | Restart After Time Out | Number of allowed consecutive Time Outs before shut down |
|------------------|------------|------------------------|--|
| Current Too High | 4 Minutes | 1 Minute | 3 |
| Current Too Low | 20 minutes | 1 Minute | 3 |
| | | | |

UF0915, 1415, 2020 and
 UN0815, 1215, 1520 Service Manual
Quick Reference for the Service Technician.

Refrigeration Components

- Compressor
- Access valves: None.
- Metering Device: cap tube
- Condenser - air cooled only
- Fan Motor
- Pressure controls: None.
- Temperature sensors: None.

Refrigeration System Pressures: Note No access valves

| Model | Charge | Discharge PSIG 70/50 | Suction PSIG 70/50 | Discharge PSIG 90/70 | Suction PSIG 90/70 |
|------------|--------|----------------------|--------------------|----------------------|--------------------|
| UN0815A-1A | 4.5 | 106-110 | 10-11 | 143-148 | 13 |
| UN1215A-1A | 4.8 | 189-191 | 8-9 | 225-230 | 11 |
| UN1520A-1A | 5.0 | 108-114 | 1-4 | 151-159 | 4-6 |
| UF0915A-1A | 4.5 | 106-110 | 10-11 | 143-148 | 13 |
| UF1415A-1A | 4.8 | 189-191 | 8-9 | 225-230 | 11 |
| UF2020A-1A | 5.0 | 108-114 | 1-4 | 151-159 | 4-6 |

Auger Drive

Output speed - 10 RPM, CCW

Amps

Note: The amps listed on the dataplate for most components are calculated and real world amps will be somewhat different.

Overall machine amp draw - varies by model

| Model | 70/50 | 90/70 |
|--------|-------|-------|
| UN0815 | 2.2 | 2.3 |
| UN1215 | 3 | 3.2 |
| UN1520 | 3.6 | 3.8 |
| UF0915 | 2.2 | na |
| UF1415 | 2.8 | 3 |
| UF2020 | 3.6 | 3.9 |

Compressor amp draw - varies by model

- UN0815 or UF0915 1.7

Auger motor amp draw about .4

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Quick Reference for the Service Technician

Control

- On/Off Bin Full / Bin Empty - photo electric “eyes” control ice making. Infrared light from the emitter is received by the detector and the make ice signal is provided to the controller. When the infrared light is blocked by ice, the make ice signal is removed and the controller stops ice making.
- After a power interruption the unit will automatically restart in the mode it was in before the interruption. However, two minutes must pass before it will restart.
- Any auger motor failure triggers an immediate shut down. The controller will auto restart three times from an auger error before shutting down and requiring a manual reset.
- An open Water Sensor (dry probes) will stop the machine. Because water can be restored at any time, whenever both Water Sensor probes are wet again AND the compressor has been off for at least two minutes, ice making will restart.
- The compressor will not restart until it has been off for at least 2 minutes.
- The Time to Clean indicator light glows when 6 months of power up time have elapsed. When it is on it does NOT stop ice making. It is cleared and reset when the Cleaning process has been completed.
- The Cleaning process, described in detail in the Maintenance section, is initiated by pressing and holding the ON and OFF buttons together for at least 5 seconds. The auger motor will be operating during the entire Clean mode, the compressor starts automatically to make ice with the scale remover solution. The scale is dissolved by the action of the scale remover solution and the auger’s motion.
- Manual reset: Switch power off and on.

| Code or Light Action | Condition | Suggested Action |
|--|---|--|
| Power light is on | Normal | None |
| Status light is on | Unit is in ice making mode | Normal, may not be making ice if bin is full |
| Water light is off | Normal. | None |
| Water light is blinking on and off | No water sensed | Check for water supply to unit shut off, possibly by clogged water filter. |
| Time to Clean light is on | Unit has not been cleaned for at least 6 months | Clean unit |
| Status light blinking red. See table on page 19. | Auger motor amp draw found to be out of spec | Reset controller and check auger motor amps. If out of spec but operational, clean water system and recheck. Replace motor or complete gear motor if auger motor amps are still out of spec. |
| All lights blinking rapidly - 10 times per second. | Controller self test failure | Rest controller and if test fails again, replace controller. |

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual **Component Access**

Most components require the machine to be removed from a built-in situation:

- Auger motor – top panel, back panel
- Ice sensor – top panel
- Top bearing – top panel
- Auger - top panel
- Ice sweep – top panel
- Water reservoir or float - top panel, back panel

Evaporator / Auger / Water Seal / Gear Reducer Service Access

Replacement of the evaporator, water seal or gear reducer will require that the refrigerant be recovered, and the suction line and evaporator refrigerant inlet be disconnected from the evaporator.

Replacement of the auger requires replacement of the water seal, which then requires that the suction line and evaporator inlet be disconnected from the evaporator.

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual Testing Compressor

The refrigeration system is steady-state. When in operation and stabilized, it will maintain nearly constant discharge and suction pressures.

Items that can affect that are:

- Irregular water flow
- Erratic thermostatic expansion valve
- Changes in room air temperature

Normally use of refrigeration gages is unnecessary. If the unit is making ice properly, it is highly likely that all is normal. Refrain from attaching gages, and then only use very short hoses to avoid changing the amount of refrigerant charge. See pressure information below.

The compressor gets its power from the controller. It must be working or the compressor will be off.

Compressor Starting

The compressor uses a current relay to provide starting power.

Current relay: The contacts of this relay are normally open and temporarily close to start the compressor.

Compressor starts but current too high, overheats. If the relay contacts do not open, there will be current to the start winding. Replace the relay.

Compressor does not start. Relay contacts open, check for continuity. Replace relay if open.

Compressor Testing

Because the compressor is the hermetic type, the available testing methods are limited. Some items that can be measured are winding resistance and amp draw.

If the compressor does not start with proper voltage to it and a check with an amp meter shows it does not draw any current, it is likely it has an open winding or overload. Those can be checked using a multimeter.

If the compressor is hot the overload may be open. An open overload is an indication of a worn compressor, defective starting components or high superheat.

Note: Normal operating temperature of the UN0815 compressor dome is 125 degrees F.

If the overload is open and the compressor is not hot, the overload itself could be the problem. Overloads also open due to high current and a shorted winding could cause that. Check for shorted or grounded windings with a multimeter.

High superheat is caused by lack of refrigeration, possibly from low charge

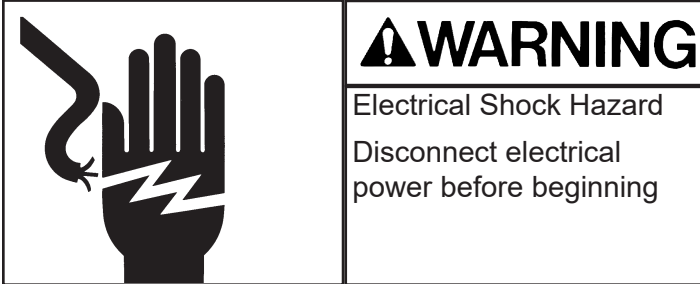
Refrigeration pressures are not provided, as there are no access valves.

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Replace Compressor

The compressor can be replaced from the back.

Note: Always check electrical information on new compressor to be sure it is the correct voltage and phase.

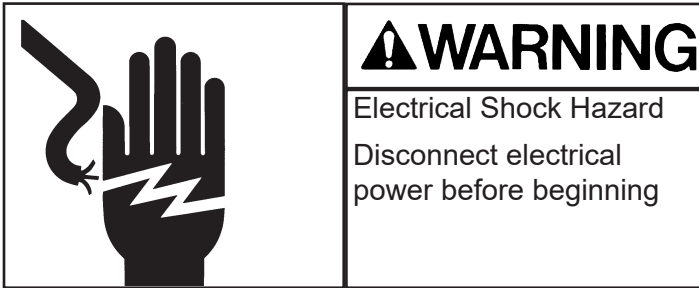
1. Disconnect electrical power.



2. Remove back panel.
3. Remove front panel.
4. Disconnect wires from compressor terminals.
5. Add access valves.
6. Recover refrigerant from the unit.
7. Remove hair pins holding compressor to chassis.
8. Disconnect suction, discharge and process tubes from compressor.
9. Remove compressor from unit.
10. Install new compressor in unit.
11. Reconnect suction, discharge and process tubes using the proper techniques of the refrigeration trade.
12. Remove and replace the dryer.
13. Attach a vacuum pump with micron gage to the system and evacuate it to 300 microns.
14. Reattach electrical wires to compressor terminals.
15. Weigh in the nameplate charge.

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual **Replace Fan Motor**

1. Unplug or disconnect electrical power.



2. Remove front panel.
3. Reach behind motor and disconnect electrical quick connect by squeezing the catch arms together.
4. Remove four screws holding fan motor to condenser shroud.
5. Remove fan motor and blade from unit.
6. Separate fan motor from mounting brackets.
7. Separate fan motor from blade.
8. Reverse steps to reassemble.



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Testing Sensors

Photo-Eye Bin Control

The sensors consist of an emitter and a receiver. The emitter shines infrared light in a certain pattern at the receiver. The receiver's signal is checked by the controller to confirm proper reception. If confirmed, the controller starts or continues the ice making process.

Remove front panel, top panel and back wall of bin.

False bin full: If the bin is not full and ice is not being made, all loads are off, Power light is on, status light is blinking:

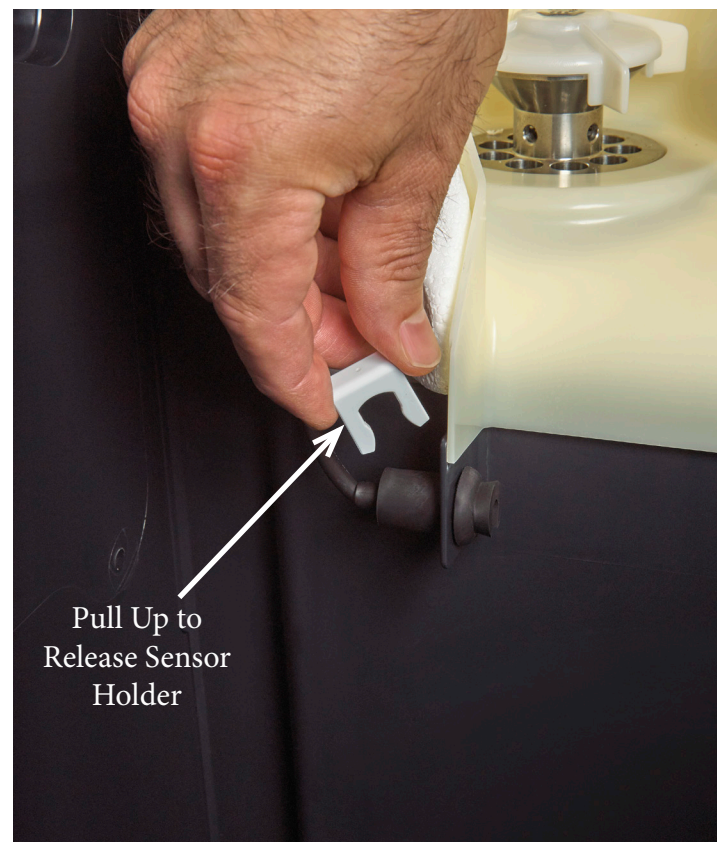
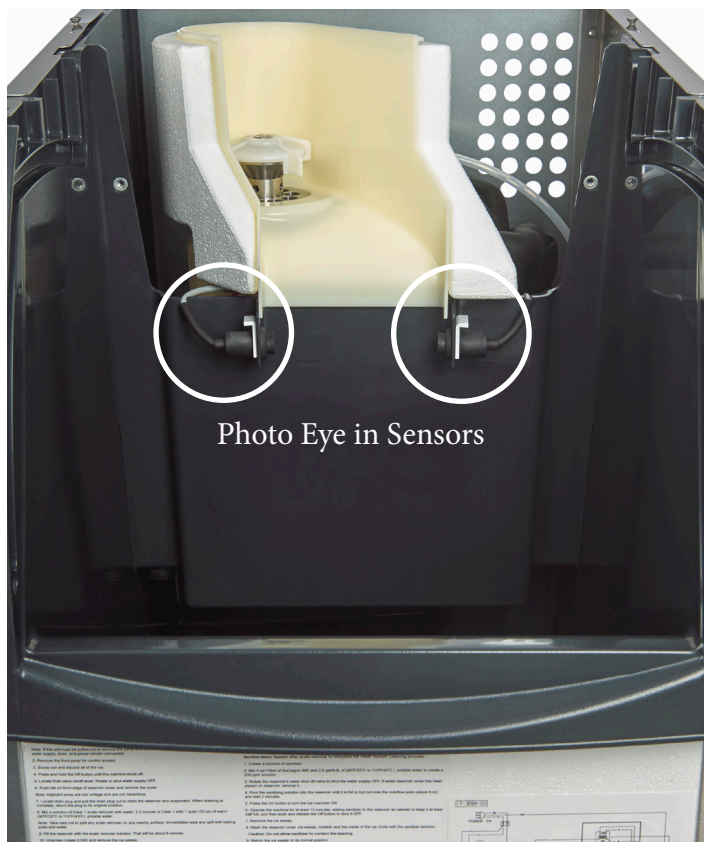
1. Check for loose connection at the harness to the photo eye sensors.
2. Check for broken wire at sensor.
3. Check for something blocking the sensors, which can include scale buildup.

Note: There is no back up for the bin control. If it fails to shut the machine off, the bin will overflow.

If no cause can be found, replace the photo eye set.

Replace Photo-Eye Bin Control

1. Remove top panel.
2. Disconnect photo eye bin controls from the quick connect at the top back of the machine.
3. Loosen two thumb screws holding storage bin back panel and remove the panel.
4. Lift up and remove both retaining clips holding sensor holders to bracket.
5. Push sensor holders out until free of the bracket.
6. Separate each photo eye sensor from its holder by pulling them apart.
7. Install new sensor into each holder. Push in until the rubber from the sensor meets the rubber sensor holder.
8. Return sensor holders to the chute and insert retaining clips.
9. Reconnect sensors to harness.
10. Return top panel to its normal position.

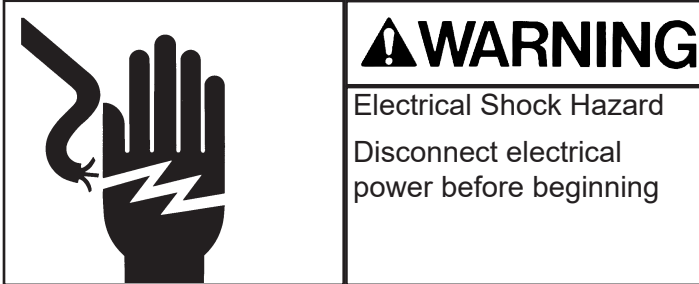


UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual Remove and Replace Gear Reducer

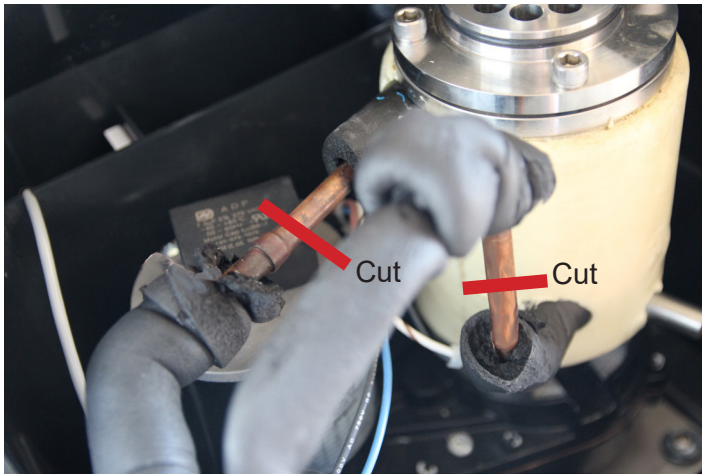
Removal

Remove or melt out all ice.

1. Disconnect electrical power to unit.

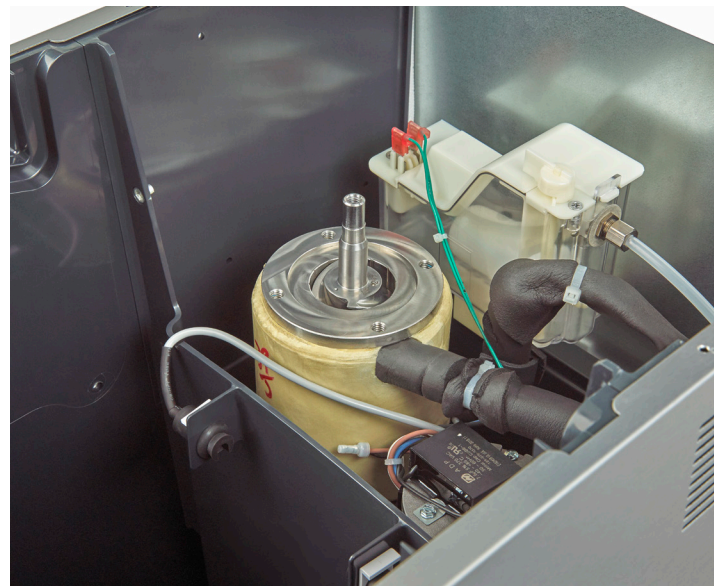
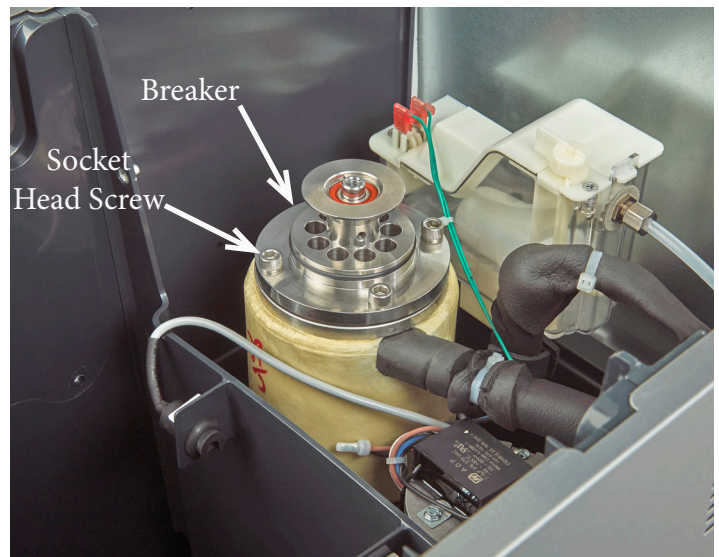


2. Remove back and top panels.
3. Shut water off to unit.
4. Drain the evaporator and disconnect water inlet.
5. Disconnect water inlet and outlet from reservoir, and remove the reservoir.
6. Attach access valves to the refrigeration system and recover the refrigerant.



7. Cut or un braze suction line in the recommended spot.
8. Cut evaporator inlet at the recommended spot.
9. Disconnect wires to auger motor.
10. Remove back panel of storage bin.
11. Remove ice sweep.
12. Remove chute.
13. Remove four phillips head screws holding gear reducer mounting plate to unit.
14. Lift gear reducer assembly from unit.

15. Remove four socket head screws holding breaker to evaporator.



16. Lift breaker off evaporator.
17. Lift auger out of evaporator.
18. Remove four socket head screws holding evaporator to gear reducer.
19. Lift evaporator off the gear reducer.
20. Remove three 1/4 hex socket head screws securing pan to gear reducer.
21. Separate gear reducer from pan (bolted from below).

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Remove Auger

Replacement

1. Attach new gear reducer to mounting plate.
2. Install new water seal into evaporator and onto auger. See water seal detailed instructions.
3. Attach evaporator to gear reducer.
4. Install auger into evaporator.
5. Attach breaker onto evaporator.
6. Place gear reducer and evaporator assembly into the unit, and secure it with the original screws.
7. Re braze suction line together.
8. Braze evaporator inlet together.
9. Evacuate the refrigeration system to 300 microns.
10. Weigh in the nameplate charge.
11. Reattach the water inlet.
12. Return ice chute to evaporator.
13. Attach the ice sweep to the auger.
14. Switch the water supply on.
15. Reconnect electrical power.
16. Restart unit, monitor operation.
17. Return back on top panels to their original positions and secure with the original screws.

Gear Reducer

The gear reducer is a sealed component. No gears or shaft bearings are available. A gear reducer without motor is available.

A properly operating gear reducer will operate quietly and draw a consistent amount of amps. It will not leak lubricant. Oil discharge is a strong indicator of water infiltration and is cause for replacement.

High amp draw could be caused by scale build up in the evaporator. Clean it first, then check amp draw. Confirm the top and lower bearings are not seized or rough.

A motor that rotates but the output shaft does not turn indicates a stripped gear and is cause for the gear reducer section to be replaced.

Auger

The auger must be clean and undamaged to work properly.

Remove it from the evaporator to confirm.

Note: A wet auger will appear clean - dry it to check for scale.

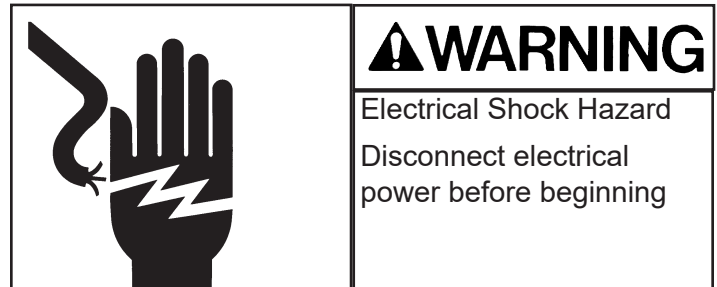
Damaged auger flight edges are not repairable and the auger must be then be replaced..

A reversed motor code (1) is a strong symptom of a motor that should be replaced.

Removal

Suggested tools include a 1/4 inch drive ratchet set.

1. Disconnect electrical power.



2. Remove top panel.
3. Close float valve or shut water off to unit.
4. Drain reservoir and evaporator.
5. Remove back panel of storage bin.
6. Remove ice sweep by rotating it counter clockwise.
7. Lift up and remove chute.
8. Remove the four socket head bolts at the top of the evaporator.
9. Return ice sweep and attach to auger.
10. Lift up on ice sweep to remove auger. and breaker together.

UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual

Replace Evaporator

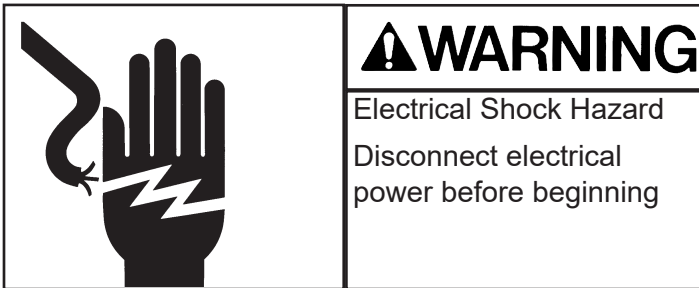
Evaporator construction

The evaporator is made up of a stainless steel tube, wrapped with a coil of copper and then heavily insulated. There is no refrigerant path to the water inside of the evaporator. The inside of the tube is polished and rifled with 12 vertical grooves that help guide the ice straight up the tube.

It is normal for mineral scale from the water to form on the inside of the evaporator tube. That scale must be removed by use of ice machine scale remover using the process described in Maintenance. Heavy scale build up will require the process to be repeated. The inside of the evaporator tube may be sanded vertically to remove tough build up. Do NOT hone or clean with a wire brush on a drill, as horizontal marks on the inside of the evaporator will restrict the flow of ice.

A damaged evaporator must be replaced.

1. Disconnect electrical power



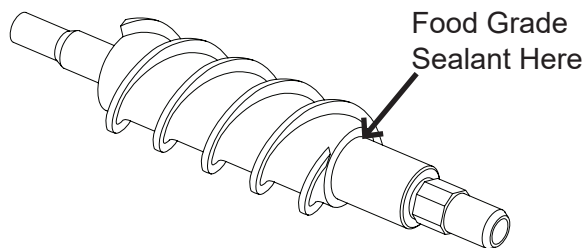
2. Go thru all steps to remove the gear reducer.
3. Lift the evaporator up and off the retainer. The stationary half of the water seal will be in the bottom of the tube. The rotating half is on the auger.
4. Confirm auger is un-damaged.
5. Install new water seal onto auger and in bottom of evaporator
6. Replace top bearing.
7. Attach new evaporator to adapter and gear reducer.
8. Place evaporator and gear reducer assembly into unit.
9. Secure assembly to unit.
10. Reconnect suction and evaporator inlet lines.
11. Replace the dryer and evacuate the system to at least 300 microns.
12. Weigh in the nameplate charge.

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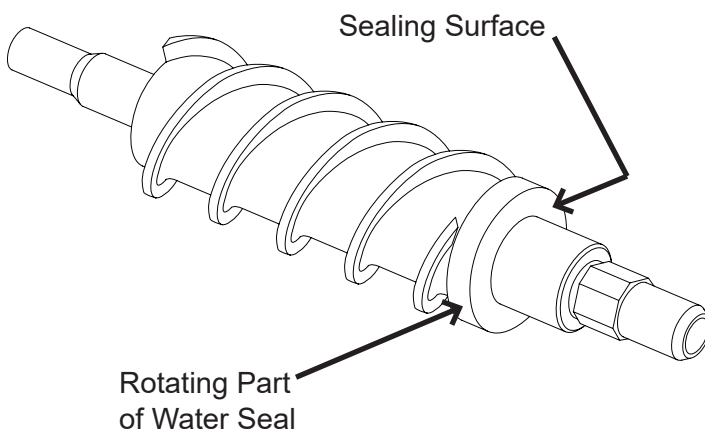
UF0915, 1415, 2020 and UN0815, 1215, 1520 Service Manual Replace Water Seal and Auger Bearing

Water Seal

1. Go thru all steps to remove the gear reducer.
2. Remove the 4 allen head screws at the bottom of the evaporator.
3. Lift the evaporator up and off the mounting adapter.
4. Push the water seal up on one side until it twists, grab it and pull it out.
5. Remove the rotating half from the bottom of the auger.

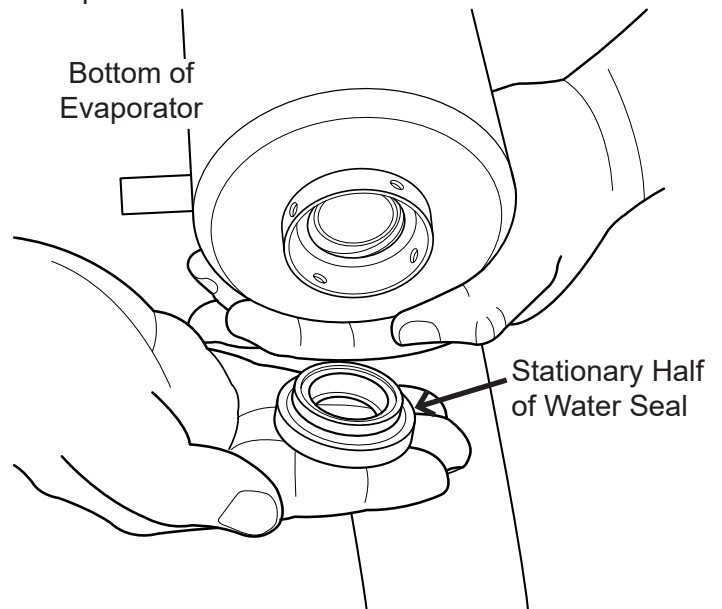


6. Clean the auger shoulder and add a very thin bead of food grade sealant to the bottom of the auger.



7. Carefully push the new rotating half of the water seal up against the sealant as far as possible. It should seat tightly and straightly against the auger shoulder. Do not put fingerprints on the sealing surface.

8. Wet the outside edge of the stationary half of the water seal and insert it into the bottom of the evaporator.



9. Slip the evaporator onto the mounting adapter, the adapter will push the water seal up into the correct position.
10. Secure the evaporator to the adapter with the original socket head screws. Be sure they are tight.

Top Bearing:

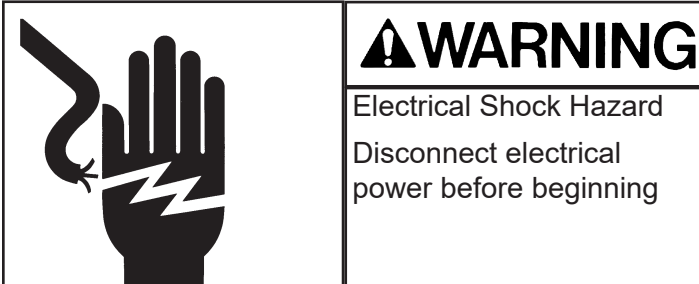
1. Go thru the process of removing the breaker.
2. Remove the clip holding the bearing.
3. Tap out the old bearing.
4. Use the old bearing as something to tap on and drive the new bearing into the breaker.
5. Reinstall the clip.

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Replace Electrical Components

Power Cord

1. Disconnect power

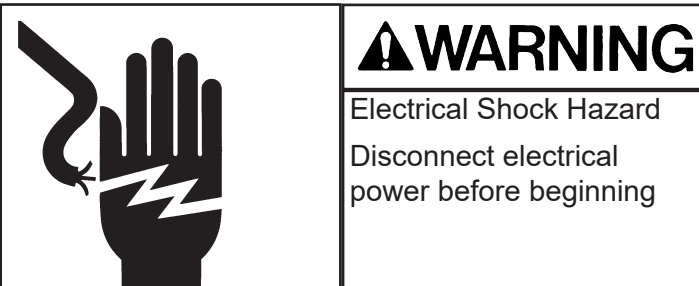


2. Remove back panel.
3. Disconnect from harness.
4. Loosen strain relief thru access hole in right side of chassis.
5. Pull cord thru back panel.

Note: It is critical that only a like OEM power cord be used as a replacement.

Controller

1. Disconnect electrical power.
2. Remove front panel.
3. Remove electrical box cover.

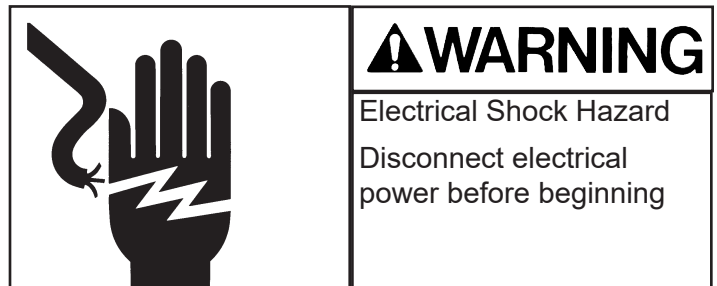


4. Squeeze each of 4 stand offs and push them back thru their mounting hole.
5. Pull controller to the left slightly and disconnect all of the wire harnesses.
6. Touch a metal surface of the unit before touching new controller.

7. Exchange stand offs from old controller to new one.
8. Connect the harnesses to the new controller.
9. Insert the stand offs into their mounting holes until secure.
10. Return electrical box cover to its normal position and secure with the two screws.
11. Reconnect electrical power.
12. Restart unit, check operation.
13. Return front panel to its normal position and secure with the original screws.

Transformer

1. Disconnect electrical power.
2. Remove front panel.
3. Remove electrical box cover.



4. Remove two screws holding transformer to electrical box.
5. Disconnect wires from transformer and remove it from the unit.
6. Reverse to reassemble.

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Quick Help

No ice – check water supply. Restore water supply to unit if shut off. Remove front panel and check water indicator light, if ON, the unit is not sensing water.

Note: Unit will automatically restart when the water supply is restored.

Note: Unit will NOT operate if connected to an ultra pure water supply. Conductivity must be above the listed limit (see page 3).

No ice – check power supply. Remove front panel, if there are no lights on the control panel there is no power to the controller. Confirm unit is plugged into a working outlet of the correct voltage.

Note: Unit will automatically restart when power is restored.

No ice - check for false bin full caused by mineral scale on the optical sensors, located at the top of the ice chute. Status light green with no ice being made is a sign of false bin full.

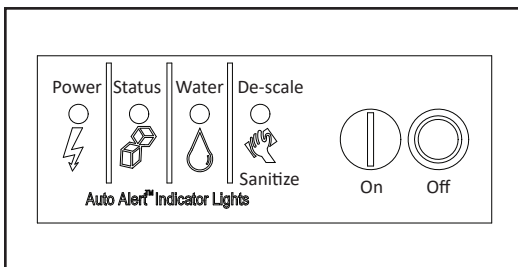
Carefully clean the optical sensors of accumulated scale. Do not scrape with a sharp object.

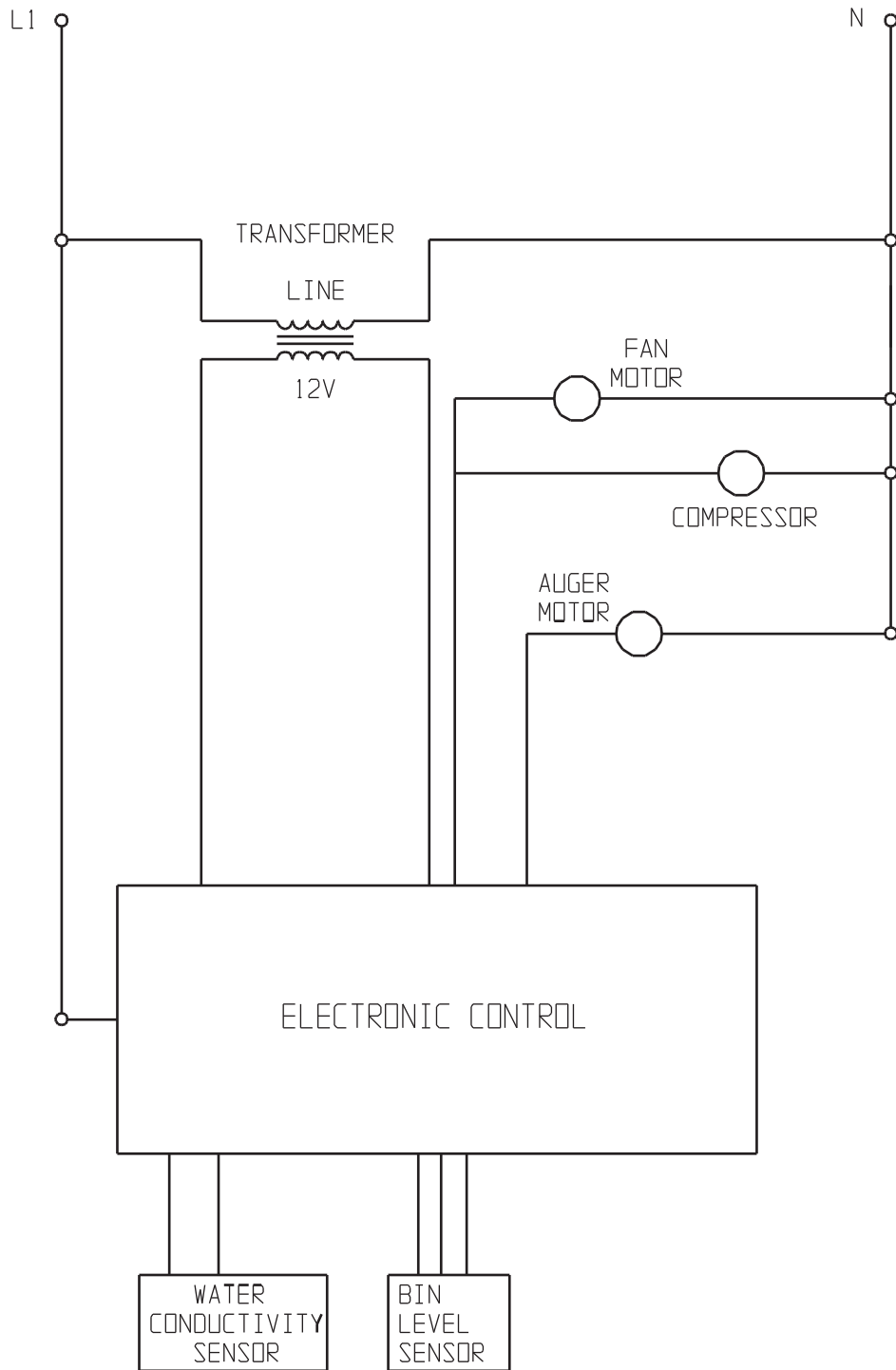
Slow production – check condenser for dirt, clean condenser.

Slow production – check temperature of cabinet, if the room is hot or air flow restricted, production will be slow.

All four indicator lights are blinking:

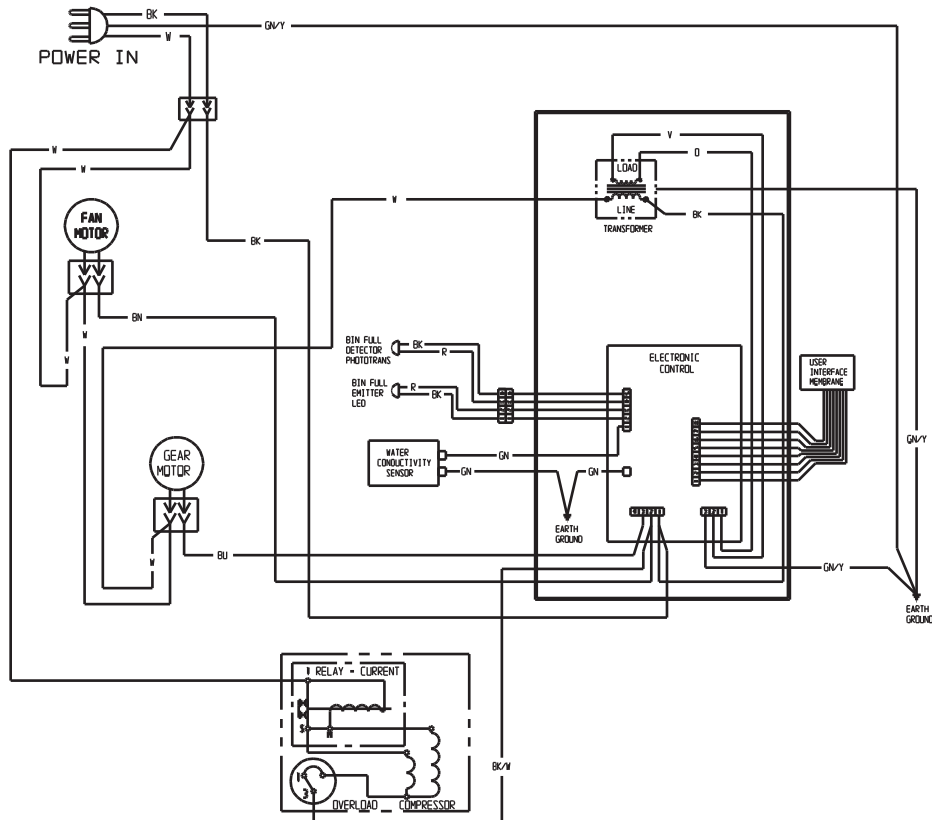
Controller failure





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Wiring Diagram

17-3684-01



THIS UNIT MUST
 BE GROUNDED

CAUTION:
 MORE THAN ONE DISCONNECT MEANS MAY BE
 REQUIRED TO DISCONNECT ALL POWER TO UNIT

SCOTSMAN ICE SYSTEMS

101 Corporate Woods Parkway

Vernon Hills, IL 60061

USA

847-215-4500

www.scotsman-ice.com