

INTRODUCTION

To the owner or user: The service manual you are reading is intended to provide you, and the maintenance or service technician with the information needed to install, start up, clean, maintain, and service this ice maker-dispenser. The NDE750 is a combination nugget ice maker and countertop dispenser. A water station is standard.

The NDE750 ice making section is equipped with the following features: electronic controls for bin level and low water; thermostatic expansion valve; front service for most components; and R-404a (HP62) refrigerant. The ice dispensing section is a seamless plastic storage bin, with a stainless steel ice agitator at the bottom to sweep the ice into the dispensing chute.

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Keep it for future reference.

Note this symbol when it appears.



WARNING
It marks a possible hazard.

FOR THE INSTALLER

Location

This ice system is designed to be installed indoors, in a controlled environment.

	Minimum	Maximum
Air Temp	50°F.	100°F.
Water Temp	40°F.	100°F.
Water Pressure	20 psi	80 psi
Voltage	104	126

Operating the machine outside of the above limitations, or outdoors, is potentially damaging to the machine; also it is misuse of the machine which may void the warranty.

Service Limitations

Do not install in a location where the top of the machine is within 6" of a fixed ceiling. Air cooled models require a minimum of 6 inches to the left and right of the machine for air circulation. It is important that the machine be installed in a location where it has enough space above and behind it for service.

After uncrating and inspection, the unit is ready for installation.

Machine Stand Installation

Tip the stand on its back and install the legs, return the stand to the upright position. Adjust leg levelers so that the stand does not "rock".

Counter Top or Machine Stand Installation

The base of the icemaker-dispenser must be sealed to the object it rests upon. Food grade silastic sealant such as Scotsman part number 19-0529-01 is recommended.

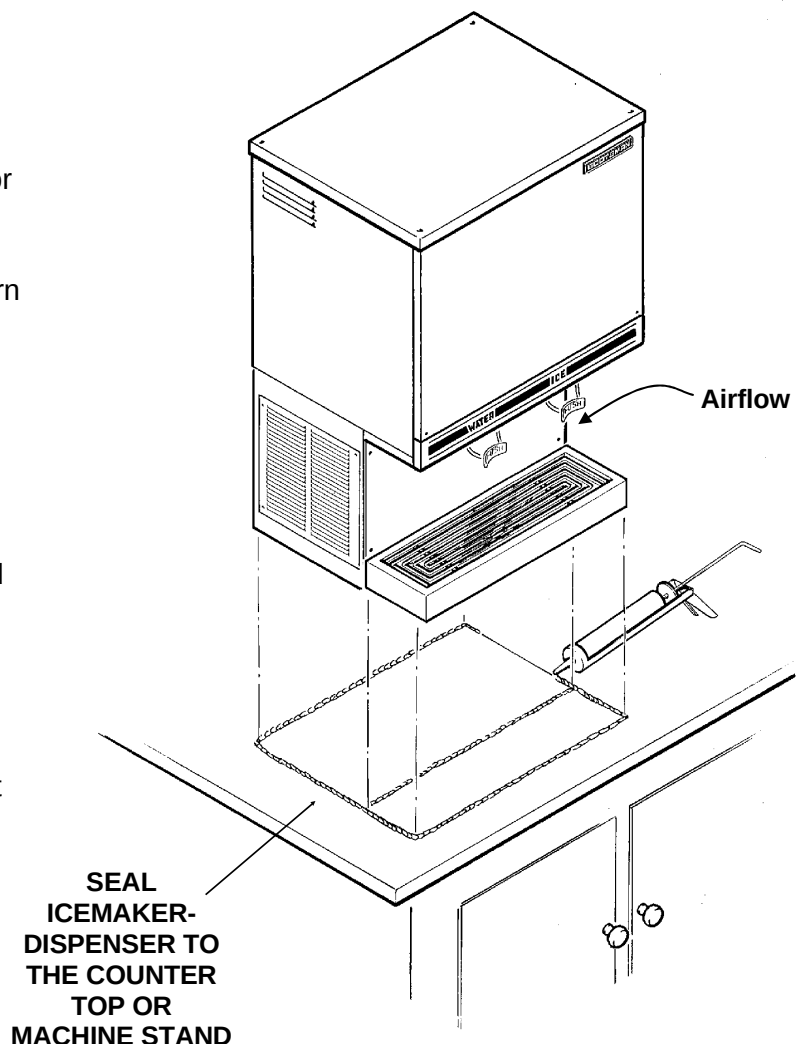
Place a bead of the sealant on the machine stand or counter top to match the outside edge of the cabinet base and sink.

The icemaker-dispenser is heavy: use of a mechanical hoist is recommended to lift it to the height required to install it.

The DMS machine stand has holes in the top that match up with threaded holes in the base of the machine. Secure the machine stand to the base with 4 5/16" bolts.

In both counter top and machine stand installations, wipe off and neatly smooth any excess sealant. Level the machine stand and cabinet.

Unpack and install the sink brackets. Fit the sink assembly onto the two sink brackets, and press onto the bead of sealant. Wipe off and neatly smooth any excess sealant from under the sink edge. Connect the sink drain to the dispenser drain system.



NDE750

FOR THE PLUMBER

CONFORM TO ALL APPLICABLE CODES

Water Inlet

Air Cooled Models: The recommended water supply is clean, cold water. Use 3/8" O.D. copper tubing, connect to the 3/8" male flare at the back of the cabinet. Install a hand valve near the machine to control the water supply.

Water Treatment: In most areas, a water filter of some type will be useful. In areas where the water is highly concentrated with minerals the water should be tested by a water treatment specialist, and the recommendations of the specialist regarding filtration and/or treatment should be followed.

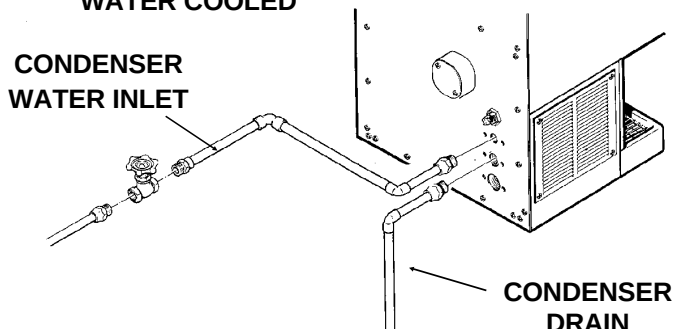
Water Cooled Models: A separate 3/8" O.D. copper line is recommended, with a separate hand valve to control it. It is connected to a 3/8" FPT condenser inlet at the back of the cabinet. The water pressure to all lines must always be above 20 psig, and below 120 psig.

Drains

Air Cooled Models: There is one 3/4" FPT drain

WATER COOLED

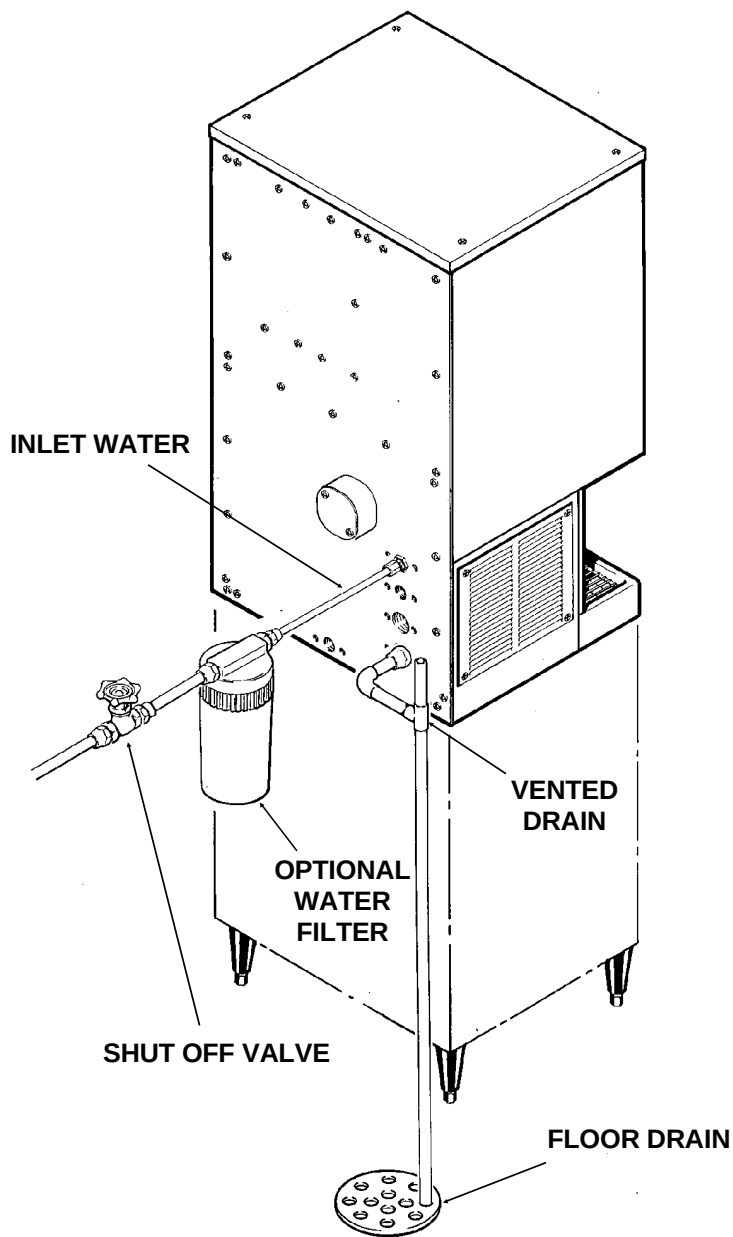
CONDENSER
WATER INLET



CONDENSER
DRAIN

at the back of the cabinet, the drain line is of the gravity type, and 1/4 inch per foot fall is an acceptable pitch for the drain tubing. There should be a vent at the highest point of the drain line, and the ideal drain receptacle would be a trapped and vented floor drain. Use only 3/4" rigid tubing.

Water Cooled Models: In addition to the above mentioned drain, a separate condenser drain must be installed. Connect it to the 1/2" condenser drain connection at the back of the cabinet.



FOR THE ELECTRICIAN

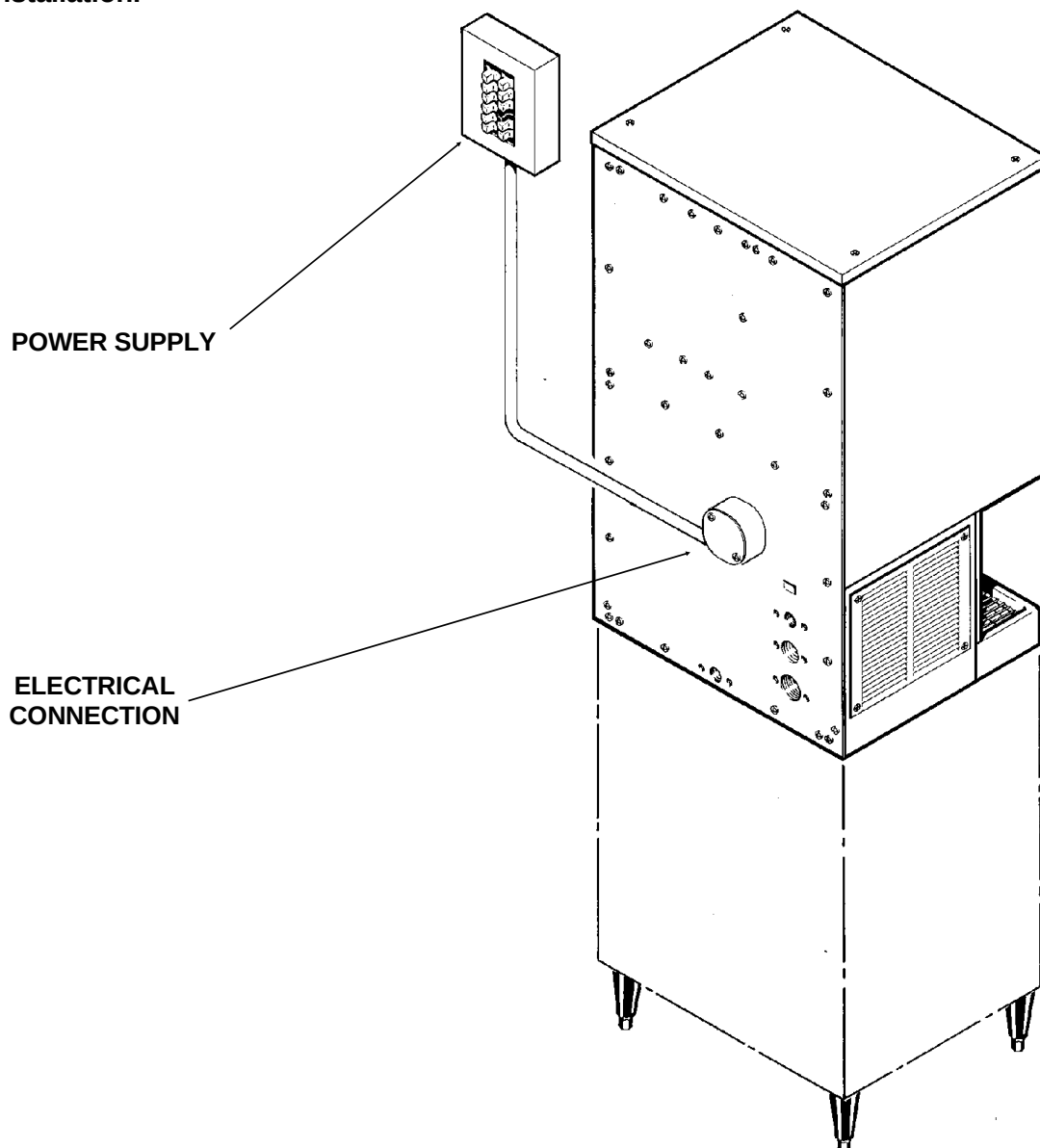
CONFORM TO ALL APPLICABLE CODES

The electrical power to the unit is supplied through the junction box at the rear of the machine.

Check the nameplate (located on the back panel) for the voltage requirements, and for the minimum circuit ampacity. The machine requires a solid chassis to earth ground wire.

The ice maker should be connected to its own electrical circuit so it would be individually fused. Voltage variation must remain within design limitations, even under starting conditions.

All external wiring must conform to national, state, and local electrical codes. The use of a licensed electrician is required to perform the electrical installation.



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FOR THE INSTALLER: Final Check List

1. Is the icemaker-dispenser installed indoors, in a location where the air and water temperatures are controlled, and where they do not go beyond design limitations?

2. Is there an electrical service disconnect within sight of the installed machine? Is the machine on a separate circuit? Has the voltage been checked and compared to nameplate requirements?

3. Have all of the plumbing connections been made and checked for leaks?

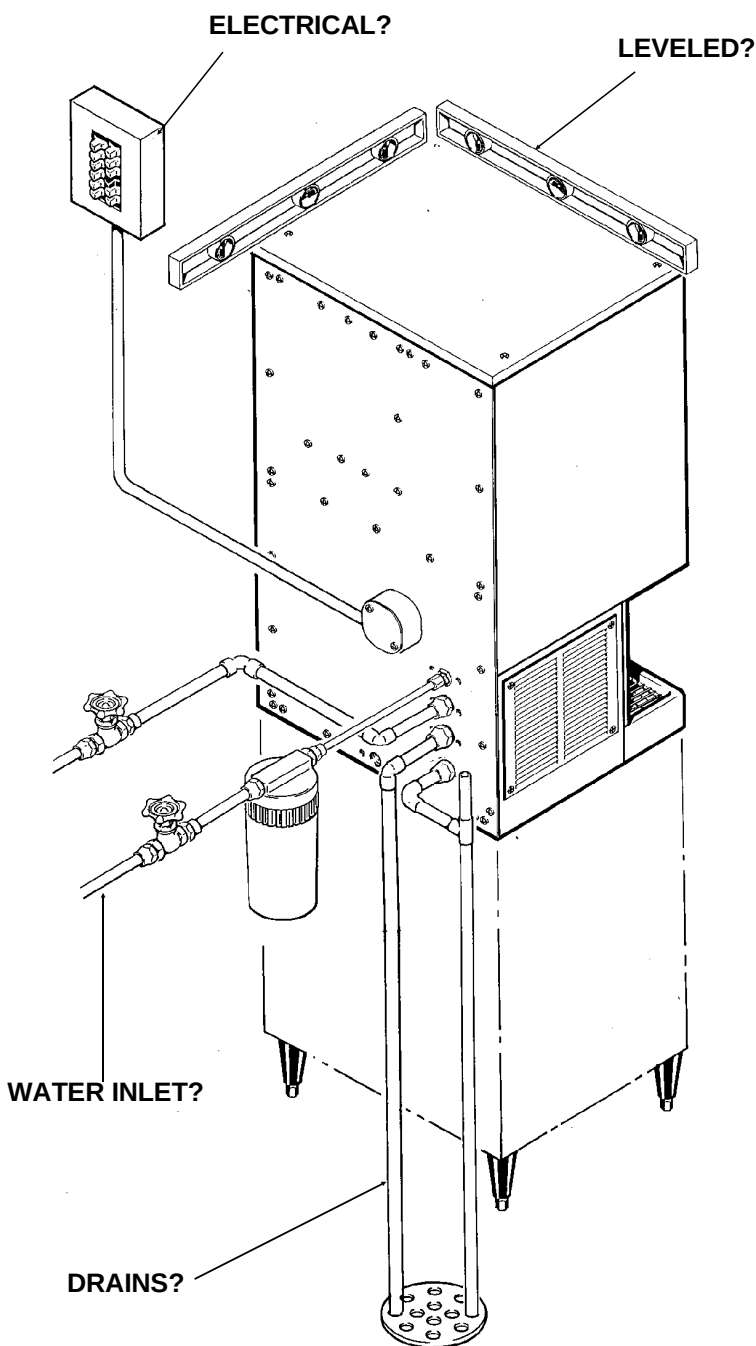
4. Has the machine been leveled?

5. Is there a minimum of 6 inches of clearance at the left and right sides of an air cooled machine?

6. Is there a minimum of 6 inches of clearance at the top and back of the machine for service and utility connections?

7. Is there a water shut off valve installed near the machine?

8. Have all of the shipping blocks been removed?



INITIAL START UP

Pre Start Inspection

1. Remove the two front panels.
2. Check that all shipping blocks have been removed.
3. Remove any and all packing tape (check inside the storage bin).
4. Inspect the interior of the machine for loose screws or wires. Check that no refrigerant lines are rubbing each other. Check that the fan blade on air cooled models turns freely.
5. Check that the machine is installed correctly according to the final check list.

Start Up

1. Go through the pre start inspection.
2. Open the water hand valve, observe that water enters the water reservoir, fills the tube from the reservoir to the evaporator and then shuts off. Check for leaks.
3. Switch the master switch on. The electrical start up sequence is now on automatic:
 - A. There will be a short (15 second) delay before the gearmotor starts.
 - B. After the gearmotor starts, the compressor will start.
4. On air cooled models, warm air will begin to flow from the condenser. Water cooled models will begin to discharge warm water down the drain.
5. The unit should soon be making ice. If desired, the low side pressure may be checked: it should be 38 PSIG + or - 4 PSIG.

The air cooled discharge pressure will depend upon air and water temperatures, but should be between 200 PSIG and 300 PSIG.

Water cooled discharge pressure should be about 245 PSIG. If needed, adjust the water regulating valve.

The above numbers are for new, clean machines. Field values may be somewhat higher or lower.
6. There are no adjustments to make, so replace the panels.
7. Check ice dispensing by pushing in on the glass filler lever. Ice dispenses are portion controlled; by turning a knob, the length of time the unit dispenses when the glass filler lever is pushed (and the amount of ice dispensed) is adjusted.
8. Switch off the icemaker-dispenser, remove the top panel and the top of the ice storage bin. Sanitize the interior of the ice storage bin by wiping it with a mixture of 1 ounce of household bleach to 2 gallons of water, allow to air dry. Replace all covers and panels. Switch the icemaker-dispenser back on.
9. Give the owner/user the service manual, instruct him/her in the operation and maintenance requirements of the unit. Make sure they know who to call for service.
10. Fill out the Customer Evaluation and warranty Registration form, and mail it in to Scotsman.

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COMPONENT DESCRIPTION

Evaporator: A refrigerated vertical tube filled with water and containing a water seal and auger.

Auger: A solid stainless steel double spiral auger, it pushes the ice crystals up to the top of the evaporator.

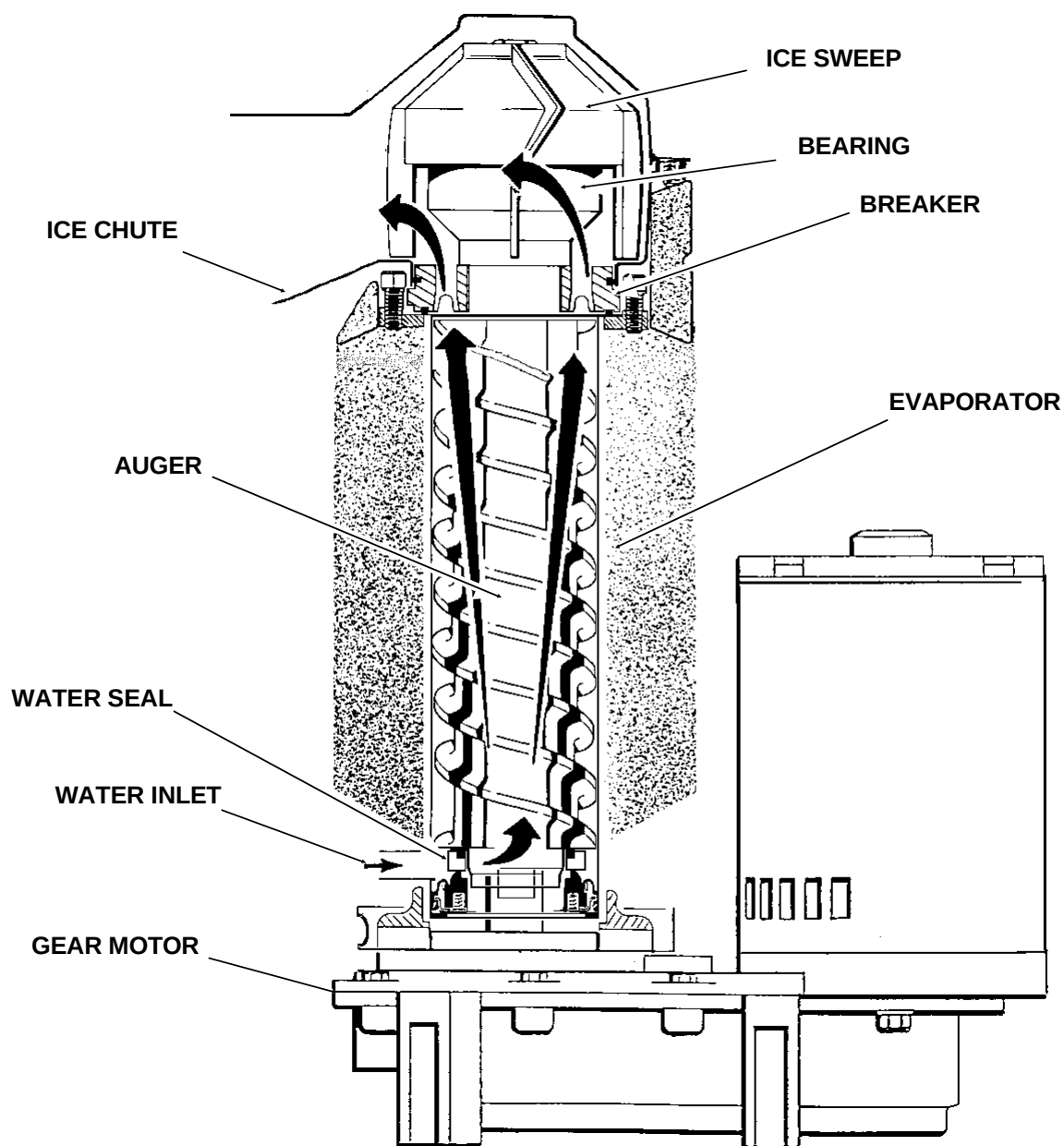
Water Seal: A two part "face" seal, the top half rotating with the auger, the bottom half stationary, the sealing action being where the two seal "faces" meet.

Ice Sweep: A plastic cap with "fingers". It revolves with the auger to "sweep" the ice into the ice chute.

Breaker: Where the ice is compressed and much of the extra water is squeezed out of it before it is discharged into the bin.

Motor: A split phase motor that drives the gear reducer.

Thrust Bearing: As the ice is pushed up the evaporator, the auger is thrust down, and pressure from the auger thrust is taken up by this bearing.



ELECTRICAL SEQUENCE

Refer the wiring diagram as needed.

If the machine is switched off at the master switch, but is otherwise ready to go, switching the master switch to on does the following:

- The bin empty light on the circuit board goes on
- There is a 15 second delay
- If there is enough water in the reservoir, the circuit board will allow the machine to start up.

Start up consists of:

- The compressor relay and auger motor relay become energized, connecting power to the windings of the auger motor.
- The auger motor starts, and the centrifugal switch closes, connecting power to the compressor contactor coil.
- The contactor is energized, connecting power to the compressor, and the compressor starts.
- As ice goes past the ice level sensors, the bin empty light will stay on, and the machine will continue to run, unless the ice stays between the sensors for more than 15 seconds (bin full). At that point, the bin empty light goes out, and the machine shuts down.

Shut Down consists of:

- The compressor relay opens.
- The compressor contactor opens
- The compressor stops
- The auger motor is run by the circuit board for 2 more minutes, clearing out ice in the evaporator, and then
- The auger motor relay opens, and the auger motor stops.

If the ice level sensor is clear (bin empty) for more than 15 seconds, the machine will start up again.

Another purpose of the circuit board is to turn the machine off if there is not enough water in the machine.

- When the water level in the reservoir falls below the water level sensor, the machine will "shut down"
- When the water refills the reservoir, the machine will start up again.

Separate from the circuit board:

- If the high pressure control (cut out switch) opens, the machine will stop immediately (through the relays on the circuit board). It must be manually reset .
- If the low pressure control (cut out switch) opens, the machine will stop immediately (through the relays on the circuit board). It must be manually reset.
- The master switch is the manual control for the complete machine, but it is not a service disconnect.

Ice Vending

- When the glass filler lever is pushed in the vend switch closes. That energizes the ice chute door solenoid, and the portion control module, which, depending upon the setting of the portion control knob, will power the agitator drive motor for a set length of time.
- Holding the glass filler lever in will not cause additional dispensing, unless the portion control is set for continuous dispensing. Releasing and re-pushing the glass filler lever will repeat the dispense cycle.

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OPERATION: Water

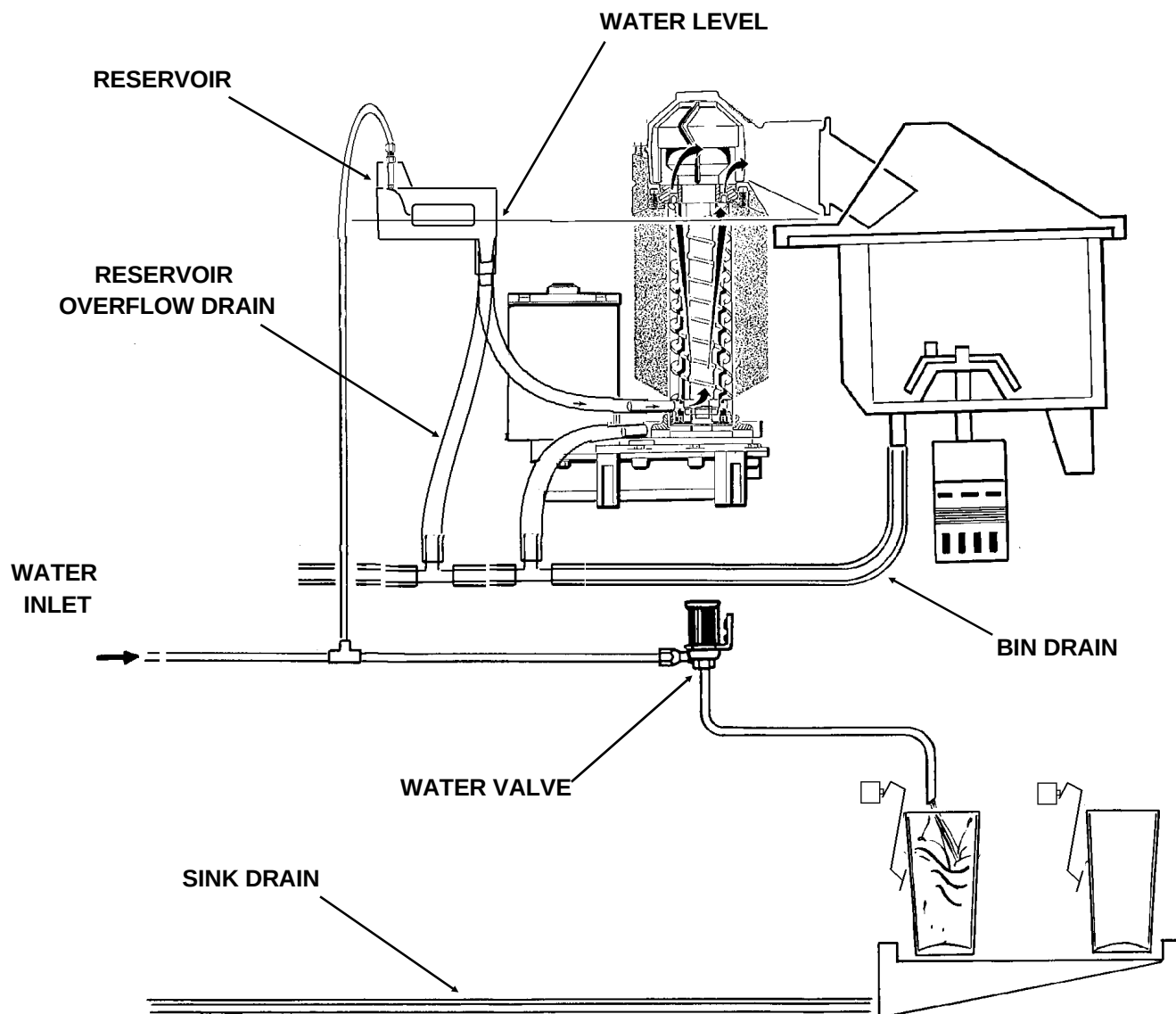
Water enters the machine through the 3/8" male flare at the rear of the cabinet, goes to a strainer and then to the water reservoir which it enters through the float valve. The water then goes out the bottom of the reservoir tank to the bottom of the evaporator.

Reservoir overflow, evaporator condensation and water in the sink are all routed to the drain. Water cooled models have a separate water circuit for the cooling water: it enters the fitting at the rear, goes to the water regulating valve, then to the water cooled condenser and down the drain.

The water dispensing station adds an additional water circuit. When the water station glass filler lever is pushed, a switch closes a circuit to an electric water valve, and water is dispensed.

Note: The correct water level is determined when the machine is operating. Check the water level and compare it to the line molded into the side of the reservoir. The water level should be between $\frac{1}{8}$ " above and $\frac{1}{4}$ " below the line.

If needed, adjust the water level by bending the float arm.



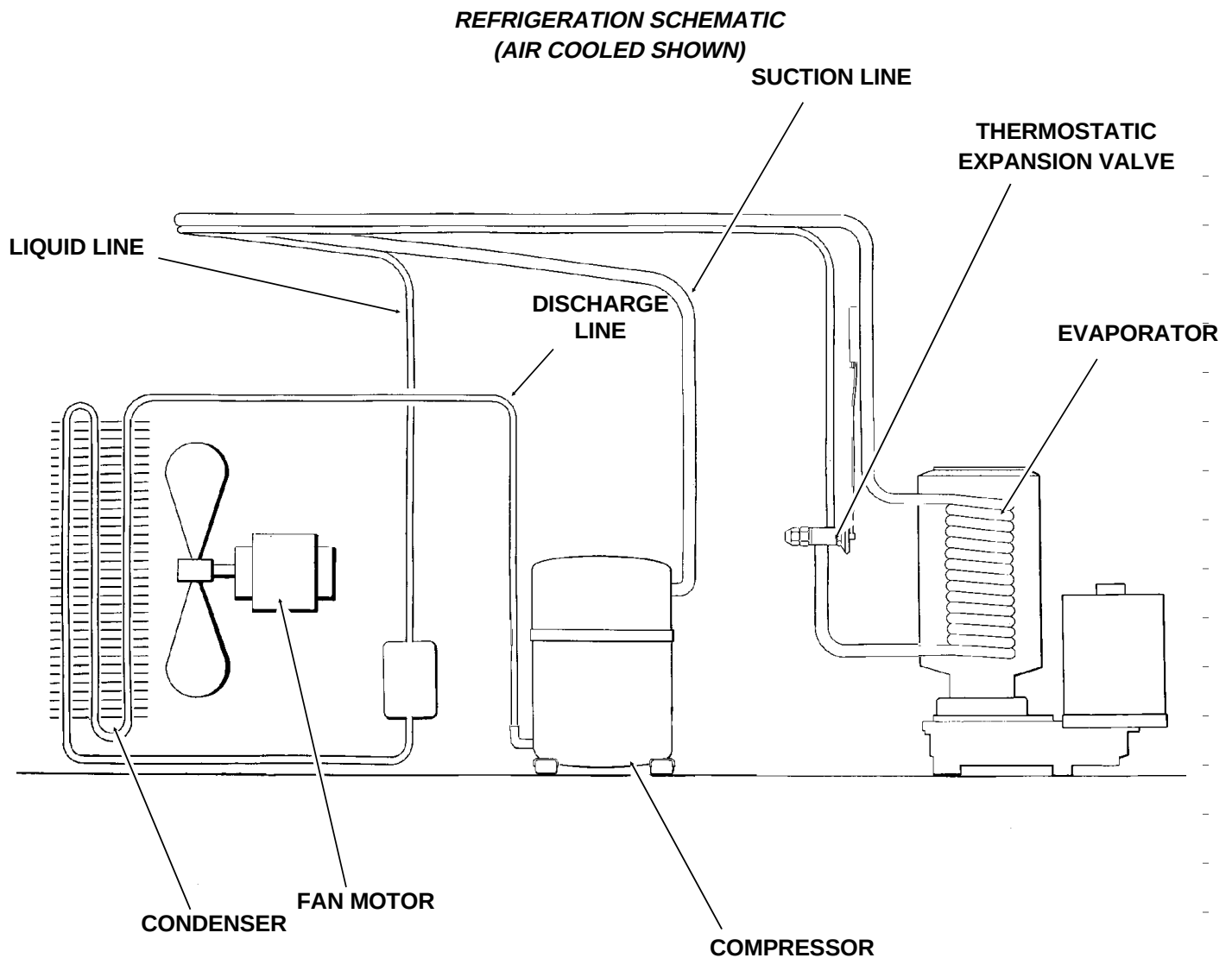
WATER SCHEMATIC

OPERATION: Refrigeration

Beginning at the compressor, the refrigerant is compressed into a high temperature gas. The discharge line directs this gas to the condenser. At the condenser (air or water cooled) the gas is cooled by either air or water and it then condenses into a liquid. This high pressure liquid then goes through the liquid line to the expansion valve.

The thermostatic expansion valve meters liquid refrigerant into the evaporator, the volume of liquid refrigerant depending upon the temperature of the evaporator; warmer evaporators get more refrigerant and colder evaporators get less.

At the evaporator, the refrigerant enters an area of relatively low pressure, where it can easily "boil off" or evaporate. As it evaporates, it absorbs heat from the evaporator and whatever is in contact with it (such as the water inside it). After the evaporator, the refrigerant, now a low pressure vapor, goes through the suction line back to compressor, where the cycle is repeated.

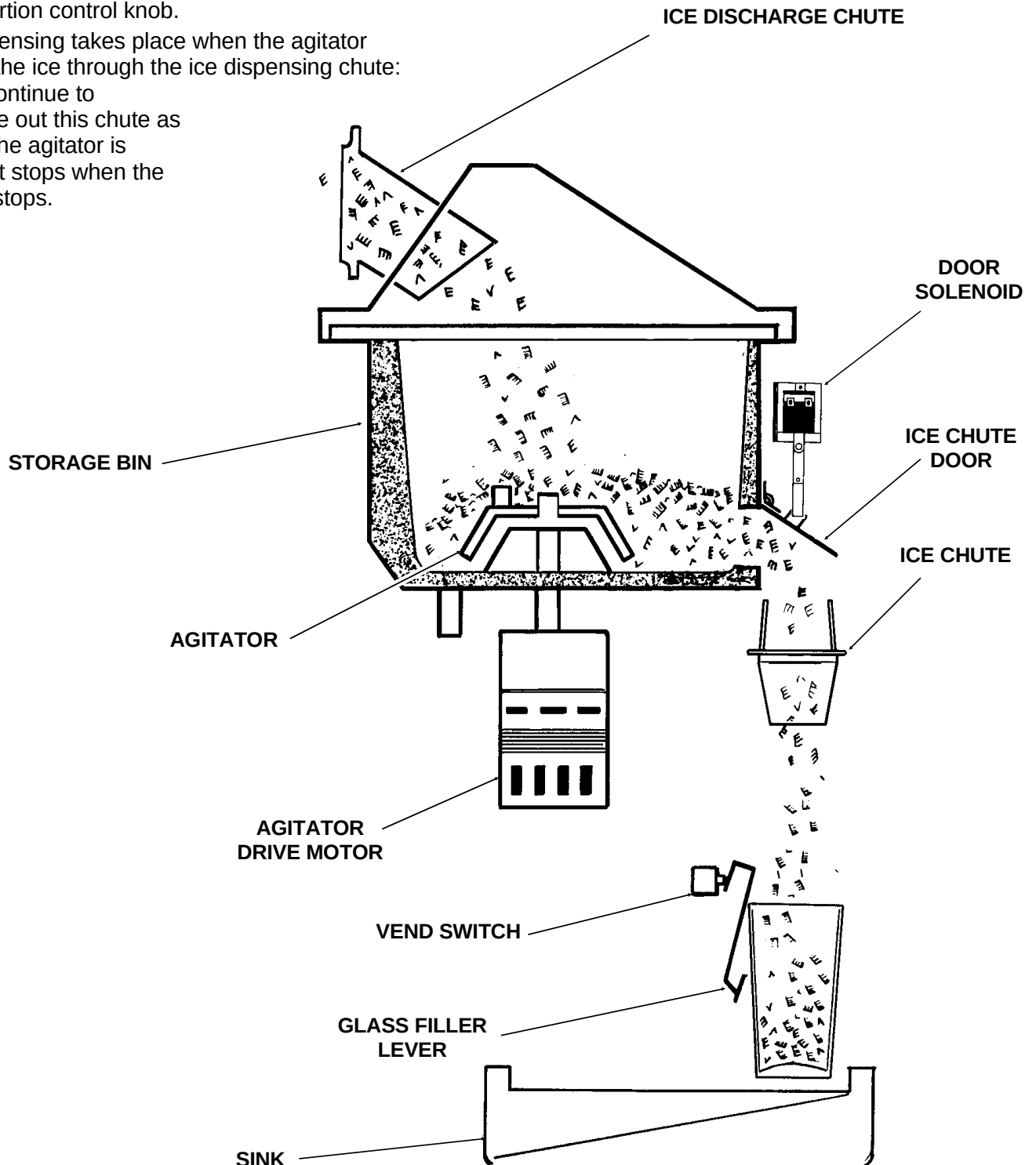


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OPERATION: Ice Vending

When the ice dispensing glass filler lever is pushed, an electrical circuit is made to the ice chute door solenoid causing the ice chute door to open. At the same time power is connected to the portion control module in the control box. That module will energize the agitator drive motor for a certain length of time, depending upon the setting of the portion control knob.

The dispensing takes place when the agitator sweeps the ice through the ice dispensing chute: ice will continue to discharge out this chute as long as the agitator is turning. It stops when the agitator stops.



CLEANING and SANITIZING

A Scotsman Ice System represents a sizable investment of time and money in any company's business. In order to receive the best return for that investment, it **MUST** receive periodic maintenance.

It is the **USER'S RESPONSIBILITY** to see that the unit is properly maintained. It is always preferable, and less costly in the long run, to avoid possible down time by keeping it clean; adjusting it as needed; and by replacing worn parts before they can cause failure. The following is a list of recommended maintenance that will help keep the machine running with a minimum of problems.

Cleaning should be scheduled at a **minimum of twice per year**.

Sanitizing of the ice storage bin should be scheduled for a **minimum of 4 times a year**.

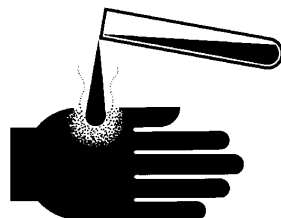
Electrical power will be ON when doing in place cleaning.

ICEMAKING SYSTEM: In place cleaning

1. Check and clean any water treatment devices, if any are installed.
2. Remove screws and remove the upper front panel.
3. Move the ON-OFF switch to OFF.
4. Remove the cover to the ice storage bin, and remove the ice.
5. Remove the cover to the water reservoir and block the float up.
6. Drain the water reservoir and freezer assembly using the drain tube attached to the freezer water inlet. Return the drain tube to its normal upright position and replace the end cap.

Scotsman Ice Machine Cleaner contains acids. These compounds may cause burns. If swallowed, **DO NOT** induce vomiting. Give large amounts of water or milk. Call Physician immediately. In case of external contact, flush with water. Keep out of the reach of children.

⚠ WARNING



7. Prepare the cleaning solution: Mix eight ounces of Scotsman Ice Machine Cleaner with three quarts of hot water. The water should be between 90-115 degrees F.

8. Slowly pour the cleaning solution into the water reservoir until it is full. Wait 15 minutes, then switch the master switch to ON.

9. As the ice maker begins to use water from the reservoir, continue to add more cleaning solution to maintain a full reservoir.

10. After all of the cleaning solution has been added to the reservoir, and the reservoir is nearly empty, switch the master switch to OFF.

11. After draining the reservoir, as in step 6, wash and rinse the water reservoir.

To Sanitize:

Repeat steps 8-11, except substitute sanitizer solution for the cleaning solution.

A possible sanitizer solution may be made by mixing 1 ounce of household bleach and 2 gallons of warm (95°F. - 115°F.) potable water.

12. Remove the block from the float in the water reservoir.

13. Switch the master switch to ON

14. Continue ice making for at least 15 minutes, to flush out any cleaning solution. Check ice for acid taste - continue icemaking until ice tastes sweet.

DO NOT USE any ice produced from the cleaning solution.

Be sure no ice remains in the bin.

15. Remove all ice from the storage bin.

16. Add warm water to the ice storage bin and thoroughly wash and rinse all surfaces within the bin.

17. Sanitize the bin interior, cover, door and agitator with an approved sanitizer using the directions for that sanitizer.

18. Replace the ice storage bin cover, and the front panel.

