

# FD4

## TABLE OF CONTENTS

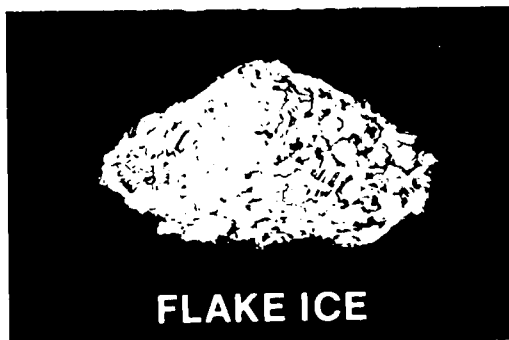
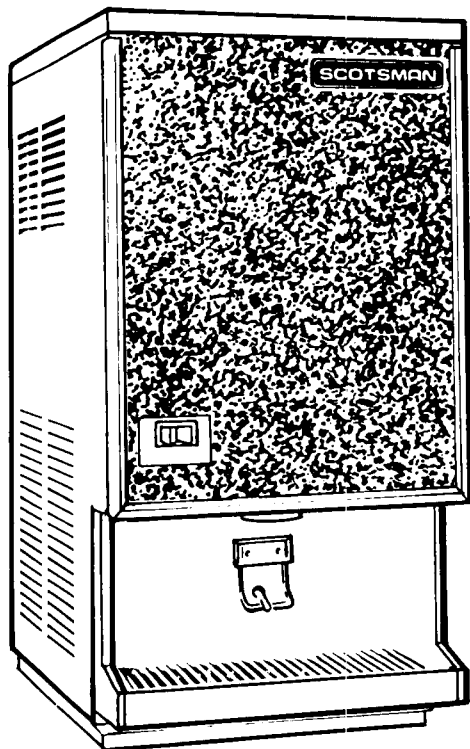
<b>GENERAL INFORMATION &amp; INSTALLATION</b>	
Introduction .....	2
For the Installer .....	3
Location and Leveling .....	5
KDE1 Sink Extension Kit .....	6
KWB1 Wall Mount Kit .....	7
For the Electrician .....	8
For the Plumber .....	9
Final Checklist .....	10
<b>OPERATING INSTRUCTIONS</b>	
Start-Up .....	11
Icemaker Operation .....	12
Electrical Operation .....	13
<b>COMPONENT DESCRIPTION</b> .....	15
<b>MAINTENANCE AND CLEANING INSTRUCTIONS</b>	
Cleaning Instructions .....	19
Maintenance Instructions .....	19
Sanitizing .....	21
<b>SERVICE DIAGNOSIS</b> .....	22
<b>REMOVAL AND REPLACEMENT PROCEDURES</b>	
Ice Breaker and Auger .....	25
Water Seal Installation .....	25
Compressor Assembly .....	27
Safety Controls, High Pressure, Low Pressure and Auger Delay .....	27
Condenser Assembly - Air-Cooled .....	27
Freezing Assembly .....	27
Drier .....	28
Bin Drivemotor Assembly .....	28
Fan Motor Assembly .....	28
Cylindrical Ice Storage Bin .....	28
Water Pressure Switch Assembly .....	29
Water Reservoir Assembly .....	29
Re-building 1/10 Horsepower Drivemotor Gear Reducer Assembly .....	30
Drivemotor Assembly .....	30

## LIST OF ILLUSTRATIONS

Specifications .....	3
Component Location .....	4
Location and Leveling .....	5
Sink Extension Kit .....	6
Wall Mount Kit .....	7
Electrical Connections .....	8
Water and Drain Connections .....	9
Final Checklist .....	10
Start-Up .....	11
Operation .....	12
Component Description .....	14
Maintenance and Cleaning .....	20
Removal and Replacement .....	25
<b>PARTS LIST AND WIRING DIAGRAMS</b> .....	1
(Printed in yellow)	
<b>PARTS LIST:</b>	
Component Location .....	2
Cabinet Assembly .....	3
Major Components .....	4
Freezer Assembly .....	5
Drivemotor Assembly .....	6
Bin Top Assembly .....	7
Potable Water and Drainage System .....	8
Control Box Assembly .....	9
KDE1 Sink Extension Kit .....	10
KWB1 Wall Mount Kit .....	10
<b>WIRING DIAGRAMS:</b>	
FD4A-1D (115/60/1) .....	11

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# FD4 GENERAL INFORMATION AND INSTALLATION



## INTRODUCTION

These instructions provide the specifications and the step-by-step procedures for the installation, start up and operation for the Scotsman Model FD4 Flaker Dispenser.

The FD4 Flaker Dispensers are quality designed, engineered and constructed, and are thoroughly tested icemaking systems, providing the utmost in flexibility to fit the needs of a particular user.

The FD4 Flaker Dispenser is a counter or table-top type of dispenser with a flaked ice freezer, storage bin and automatic dispensing mechanism and a sealed refrigeration system to provide quiet, efficient operation of the icemaker. The compressor motor is internally spring-mounted. The compressor motor is covered by a five-year parts warranty.

The purpose of this machine is to fill water or drink glasses with water and ice or just ice by actuating a control arm with the glass.

Press the actuator arm and a continuous flow of ice can be obtained. By pushing a water switch to "ON" water will be dispensed with the ice or as long as the glass actuator arm is energized.

The sink or area in which the ice is dispensed is constructed of plastic. The drain grill is 100% nylon coated steel wire. The cabinet is of stainless steel or steel with a baked-on enamel finish.

The Scotsman FD4 Flaker Dispenser has been designed with sanitation and ease of cleaning emphasized. The complete dispensing unit can be dismantled for cleaning without the need of tools.

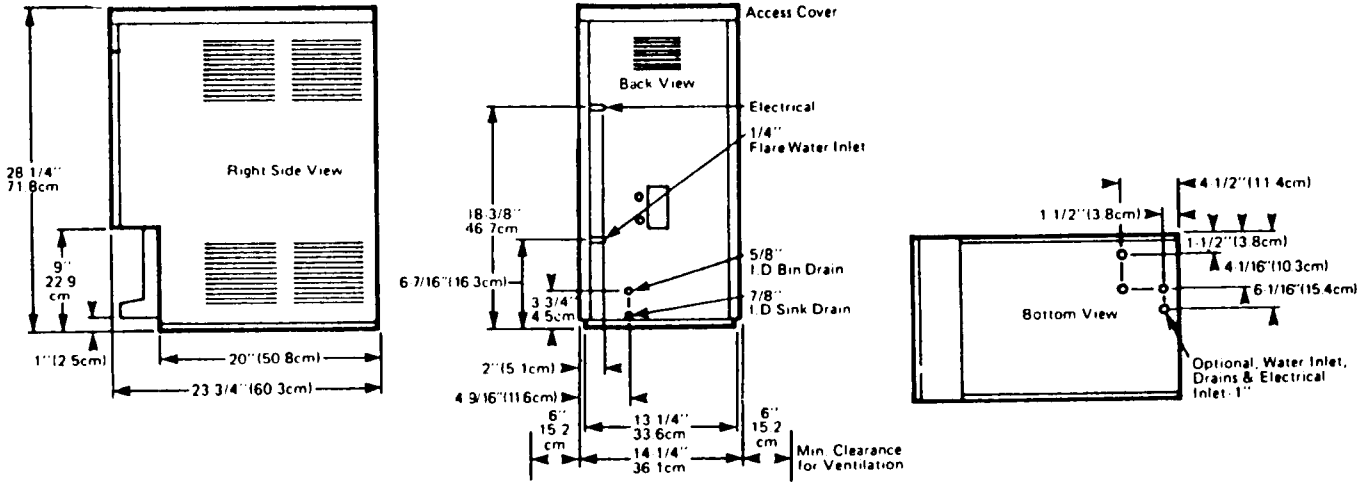
The base of the machine contains a sealing gasket which will seal the machine tight against the table or counter top, eliminating sanitation problems.



This icemaker has been engineered to our own rigid safety and performance standards. The National Sanitation Foundation (NSF) seal, signifies that it is listed with the NSF and that it complies with the materials and construction standards of the NSF. In addition, the Underwriters Laboratories, Inc., (UL) Listing Mark and the Canadian Standards Association (CSA) Monogram, both signify that its construction and design have been inspected and tested by them. NSF, UL and CSA inspectors also periodically examine production icemakers at the factory, to assure continued compliance.

To retain the safety and performance built into this icemaker, it is important that installation and maintenance be conducted in the manner outlined in this manual.

# FD4 FOR THE INSTALLER



INSTALLATION NOTE: Allow 6" minimum space at sides and back for ventilation and utility connections.

This product qualifies for the following listings:



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

## SPECIFICATIONS

Model Number	(Height - w/o Legs) Dimensions H" x W" x D"	Bin Cap.	Cond. Unit	Finish **	Basic Electrical	Comp. H.P.	No. of Wires	Min. Circuit Ampa- city †	Max. Fuse Size	Ship. Wt. lbs./kg.
FD4AE-1D	28 1/4 x 14 1/4 x 23 1/4	8 lbs	Air	ES	115/60/1	1/2	2	15.9	20	194/88

\*\* (ES) Sandalwood, Leathergrain embossed steel with high gloss baked enamel finish.  
 † Use this value to determine minimum wire size as per National Electric Code Standards.

## IMPORTANT OPERATING REQUIREMENTS

	MINIMUM	MAXIMUM
Air Temperatures . . . . .	50°F (10.0°C)	100°F (38°C)
Water Temperatures . . . . .	40°F (4.4°C)	100°F (38°C)
Water Pressures . . . . .	20 lbs. gauge	120 lbs. gauge
Electrical Voltage Variation		
Voltage rating specified		
on nameplate . . . . .	-10%	+ 10%

Extended periods of operation exceeding these limitations constitutes misuse under the terms of Scotsman Manufacturer's Limited Warranty, resulting in a loss of warranty coverage.

SEE NAMEPLATE for electrical and refrigeration specifications. Locate the NAMEPLATE on the left side shelf forward of the freezer and drivemotor assembly.

Refrigerant . . . . . R12

## SPKFD3C/FD4C STAINLESS STEEL PANEL KIT:

Contains stainless steel sides, back, top and front to replace enameled cabinet. Not factory installed.

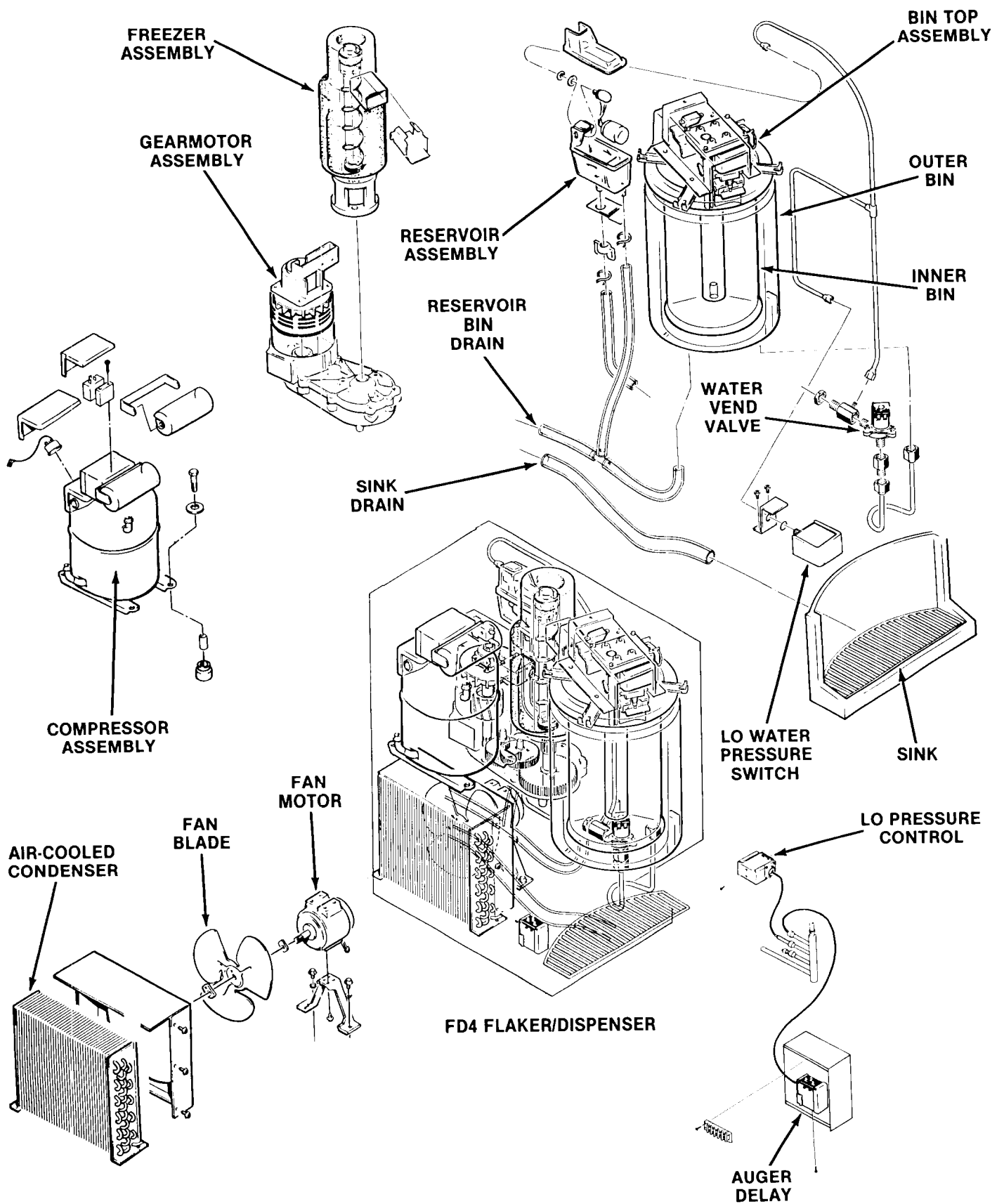
## DRAIN EXTENSION KIT

Permits convenient access to flake ice and water for larger than normal containers, such as pitchers and tall glasses. Adds 5-1/2" to unit height. Installation Instructions on page 8.  
 KDE1 Enamel finish  
 KDE1SS Stainless Steel finish

## KWB1 WALL MOUNTING KIT

Wall mounting brackets are made of strong tempered steel. Wall mounted units are easy to install where adequate counter space is not available or above an existing sink. Holes are provided at the bottom of the icemaker for water and electrical connections.  
 Installation Instructions on pages 8 and 9.

# FD4 FOR THE INSTALLER



# FD4 FOR THE INSTALLER

## LOCATION AND LEVELING

//////////////////// **WARNING** //////////////////////

This icemaker is **NOT** designed for outdoor installations where air temperature is below 50° F. or above 100° F.

Inlet water temperature must not drop below 40° F. or exceed 100° F.

Extended periods of operation at temperatures exceeding these limitations will constitute misuse under the terms of the SCOTSMAN Manufacturer's limited warranty, resulting in **LOSS** of warranty coverage.

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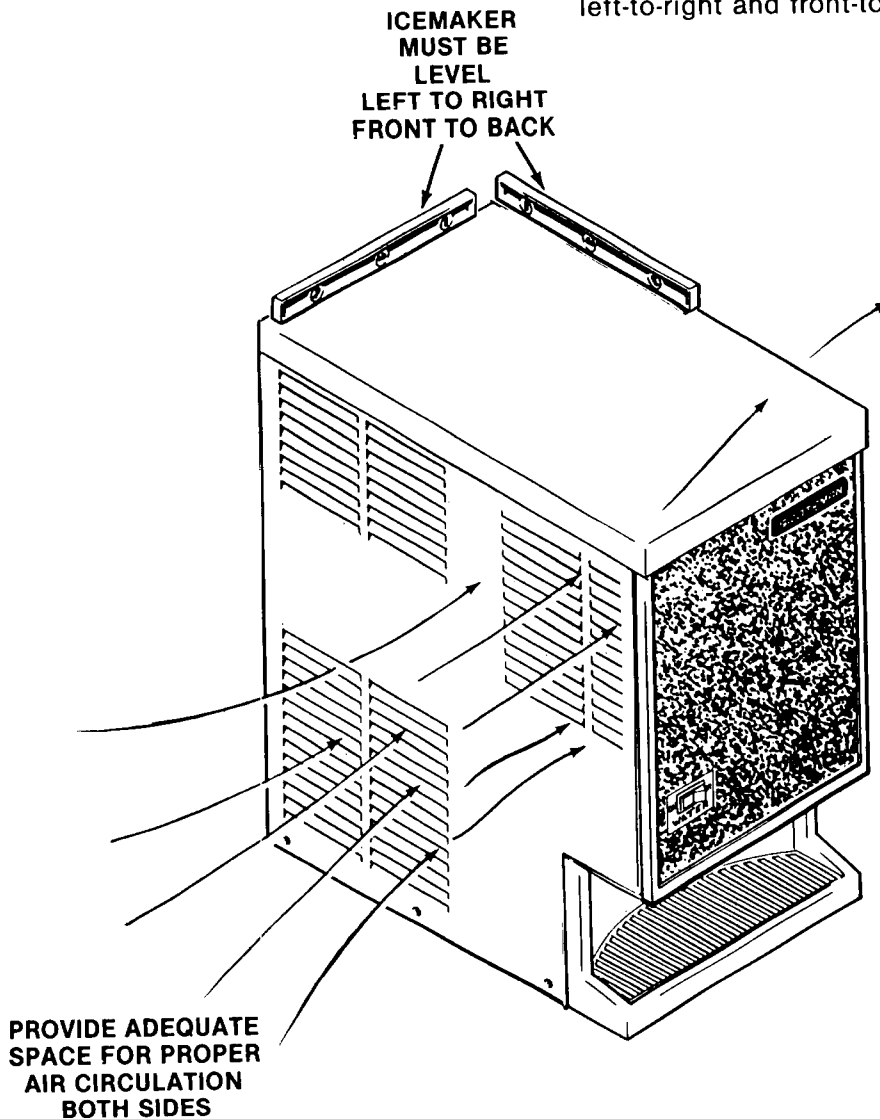
## SERVICE ACCESS

Adequate space for all service connections, located at the rear or bottom of the cabinet. When the KWB1 Kit is used to mount the FD4 to the wall, service access may be through the holes provided in the base.

A six-inch minimum clearance at both side panels for air circulation, to maintain air circulation through the air-cooled condenser for best icemaking performance.

Avoid sliding the unit on the rubber sealing base.

1. Position the FD4 flaker dispenser in the permanent location installed at a convenient height for filling glasses.
2. Level the FD4 flaker dispenser in both the left-to-right and front-to-back directions.



# FD4 FOR THE INSTALLER

## SINK EXTENSION KITS

KDE1 — Painted Finish

KDE1-SS — Stainless Steel

An option for the FD4 dispenser to increase the distance between the discharge spout and the sink to twelve inches and to provide a faster sink drainage.

## FEATURES:

With the use of the KWB1 Wall Mount Kit and the splash plate, the FD4 model can be mounted on a wall over an existing sink.

As a counter-top model, the dispenser is mounted on the six-inch base. The splash plate, sink and grill replace the standard sink on the FD4 icemaker dispenser.

## INSTALLATION:

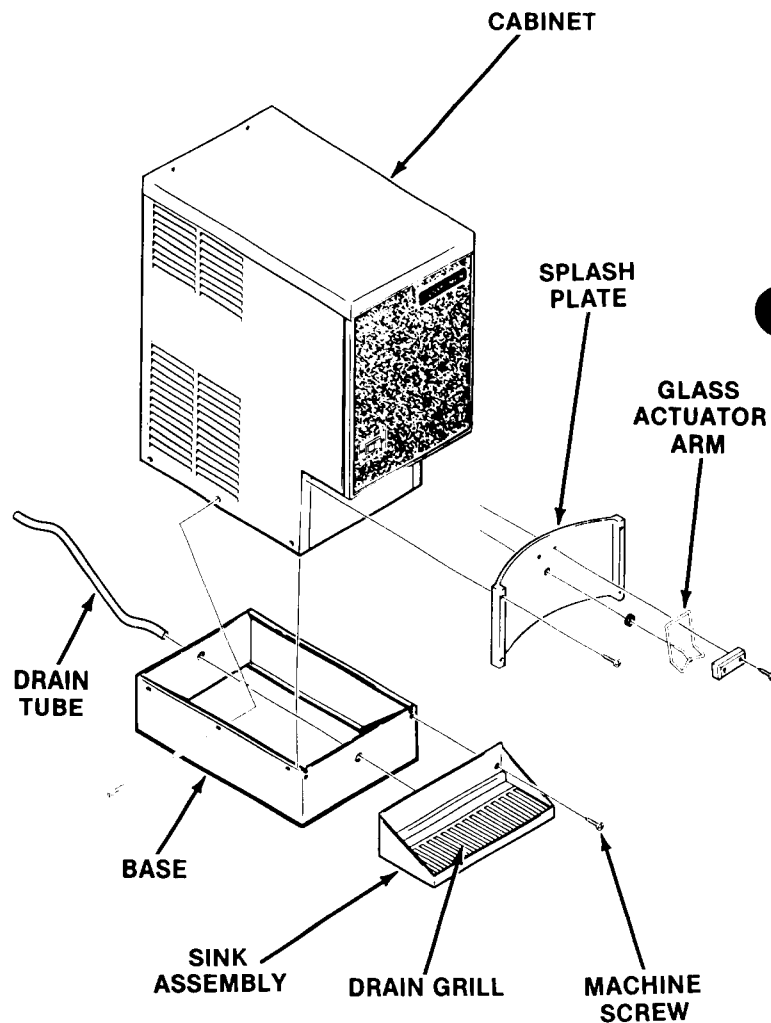
1. Remove conventional sink from cabinet.
2. Remove glass actuator arm and holder from sink.
3. Remove drain tube from original sink.
4. Install drain tube to replacement sink.
5. Remove rubber seal from base of the dispenser.
6. Mount the dispenser on the base. The flange of the dispenser base fits in slots provided in the base extension. Secure with the 3 screws on the front side panel.
7. Mount sink in place and secure with two machine screws.
8. Install splash plate to cabinet with four machine screws, furnished. The splash plate fits over top of sink.
9. Install glass actuator arm and holder to splash plate. The plunger on the arm must operate freely through hole in splash plate.
10. Install grill.

## KIT CONTENTS:

02-1699-00  
03-1403-06  
02-1828-00  
03-1403-29  
02-1701-00  
A21538-000  
A21538-001

03-1403-07  
03-1406-01  
17-0905-00  
13-0617-11  
02-2809-01  
A18331-000

Sink Assembly  
Screws (2)  
Splash Plate  
Screws (4)  
Drain Grill  
Base, Enamel (W/KDE1)  
Base, Stainless Steel  
(W/KDE1-SS)  
Screws (6)  
Nuts (6)  
Decal  
O-ring  
Drain Top  
Drain Fitting



# FD4 FOR THE INSTALLER

## KWB1 WALL MOUNT KIT COMPONENT DESCRIPTION

### KIT CONTENTS

1. **Top Case Hanger Bracket.** Attach to inside of frame of the dispenser.
2. **Top Wall Bracket.** Mounts to wall and engages top case hanger bracket to support dispenser.
3. **Bottom Wall Bracket.** Mounts to wall and supports bottom of dispenser.
4. **Bottom Fittings Cover.** Fastened to bottom wall bracket to conceal electrical and plumbing fittings from view.

### INSTALLATION, KWB1 WALL MOUNT KIT TOP HANGER BRACKET:

1. Remove back cover and save four screws for mounting bracket.
2. Remove top cover.
3. Drill out threads of weld nuts in back of frame with 3/16 dia. drill as indicated in illustration.
4. Place top hanger bracket on the inside of frame and fasten solidly with four screws, saved from Step 1, through drilled out holes.

### TOP WALL BRACKET:

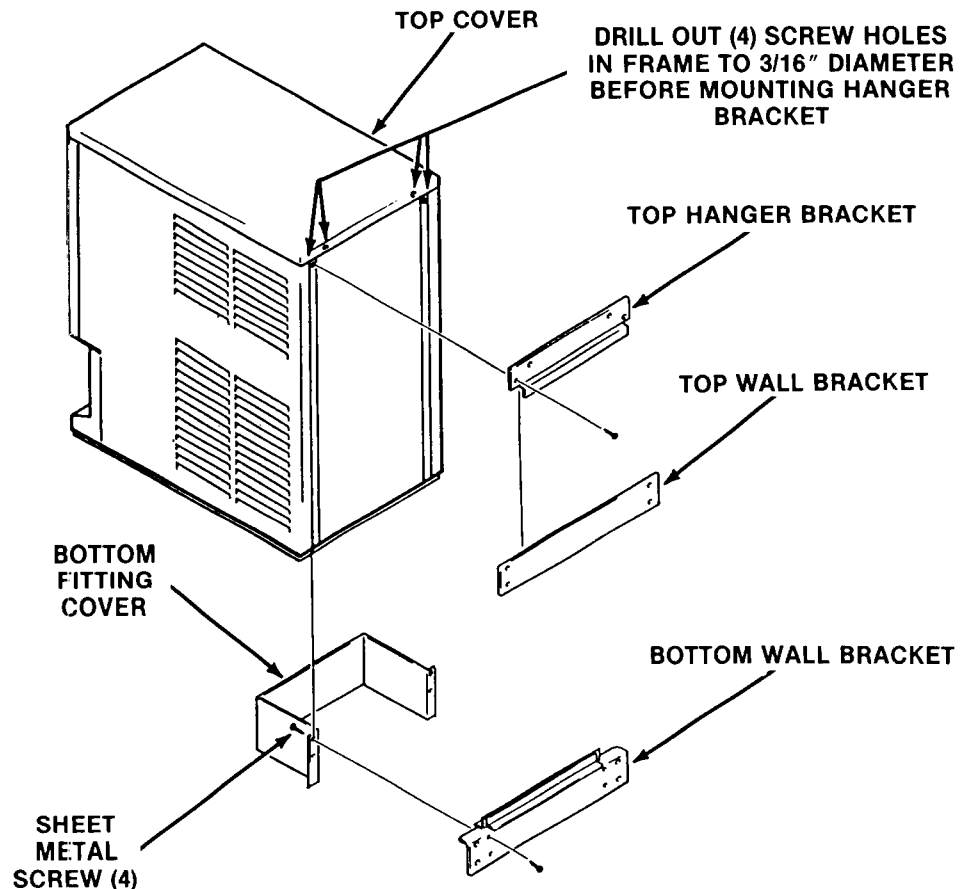
1. Position bracket in desired location.
2. Secure to wall with fasteners of any suitable type for that particular wall through the four holes in bracket. These fasteners or lag screws are not furnished. Be sure to secure bracket rigidly.

### BOTTOM WALL BRACKET:

1. Hang the dispenser on top wall bracket.
2. Position bottom bracket so that moulding on dispenser base bottoms in channel of the bracket.
3. Secure bracket to wall through the four large holes with suitable fasteners. Fasteners not furnished.

### BOTTOM FITTING COVER:

1. Connect water inlet, bin drain and sink drain of dispenser through bottom of case. Also run electrical cable in from bottom.
2. Secure bottom fitting cover to bottom wall bracket with the four sheet metal screws provided in this kit.





# FD4 FOR THE ELECTRICIAN

## ELECTRICAL CONNECTIONS

SEE NAMEPLATE for current requirements to determine wire size to be used for electrical hookup. The FD4 Icemaker requires a solid earth ground wire. See wiring diagram.

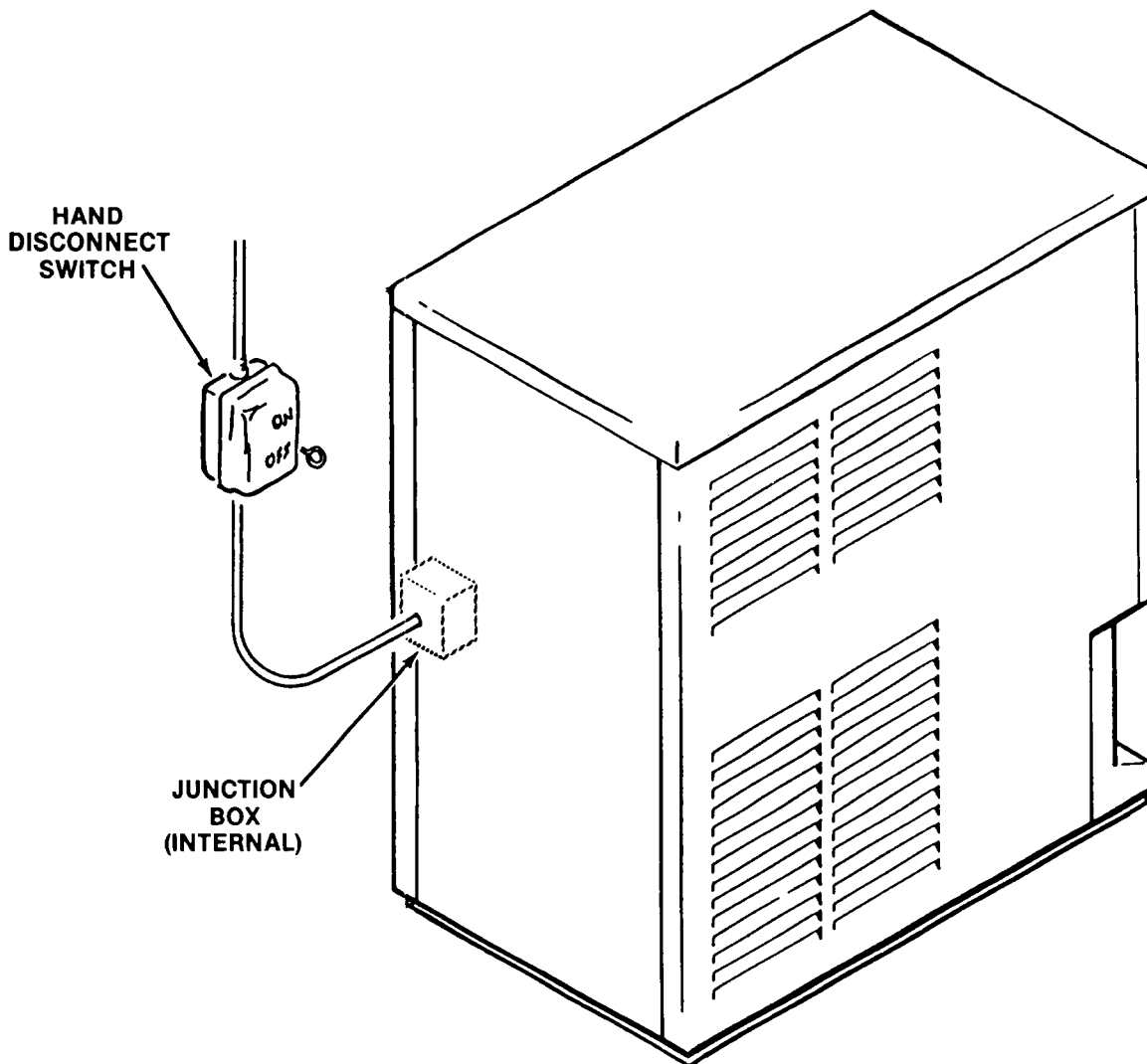
Be certain the icemaker is connected to its own electrical circuit and individually fused. The maximum allowable voltage variation should not exceed ten percent of the nameplate rating, even under starting conditions. Low voltages can cause erratic operation and may be responsible for serious damage to the compressor and motor windings.

All external wiring should conform to the national, state and local electrical codes and the services of a licensed electrician may be required.

Knockouts in cabinets are made for cord connectors.

Remove screws and remove back and right side panels to gain access for service connections.

Make electrical connections in the junction box located inside the back of the icemaker.



# FD4 FOR THE PLUMBER

## WATER SUPPLY

Remove screws and remove back and right side panels to gain access for service connections. The recommended potable water supply line is a 3/8 inch O.D. copper tubing with a minimum pressure of 20 psig.

The icemaker is equipped with a low water pressure safety device which in the event of low water pressure, will automatically stop the icemaker to prevent damage. The icemaker will automatically restart with increased water pressure.

A 1/4-inch S.A.E. flare fitting is provided internally. Route the inlet water line through the cabinet back panel to the flare fitting provided for potable inlet water connection. Connect the cold potable water supply line with standard plumbing fittings, with a shut-off valve installed in an accessible place between the water supply and the cabinet.

It is recommended a strainer or water purification system be installed between the shut-off valve and the icemaker connection.

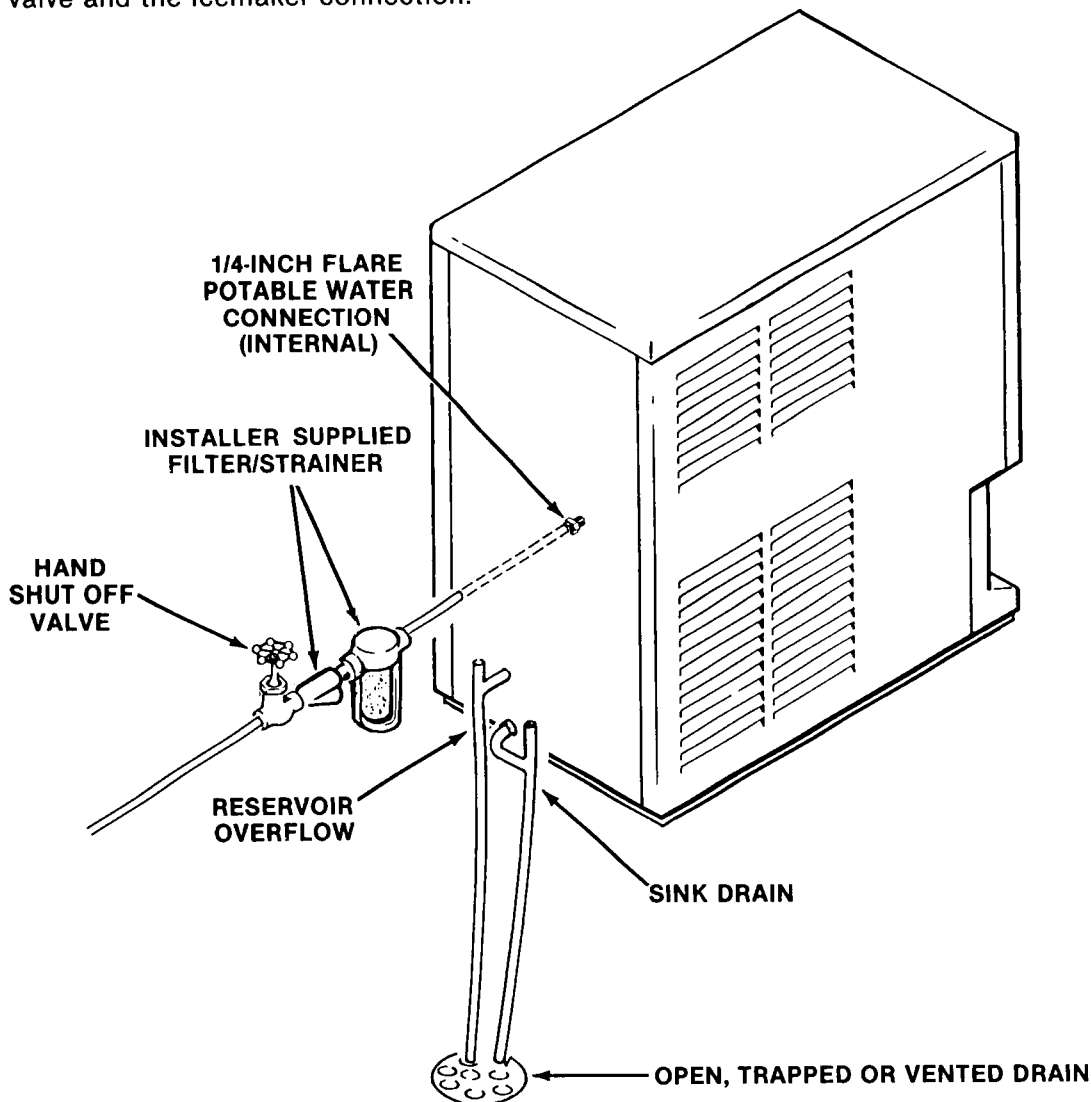
## DRAIN CONNECTIONS

All drains are gravity type and must be a minimum of 1/4-inch fall per foot on horizontal runs. Drainage must be installed to conform with the local plumbing codes. Install a vertical open vent on drain line to insure good venting. The drain receptacle should be an open, trapped or vented construction.

The FD4 icemaker has two drains. The reservoir overflow, a 5/8-inch I.D. tube and the sink drain, a 7/8-inch I.D. tube. The two drain tubes may be routed through the holes provided in the back panel or through the holes provided in the base.

Pull each drain tube through the back panel or the base and connect using standard plumbing fittings and practices.

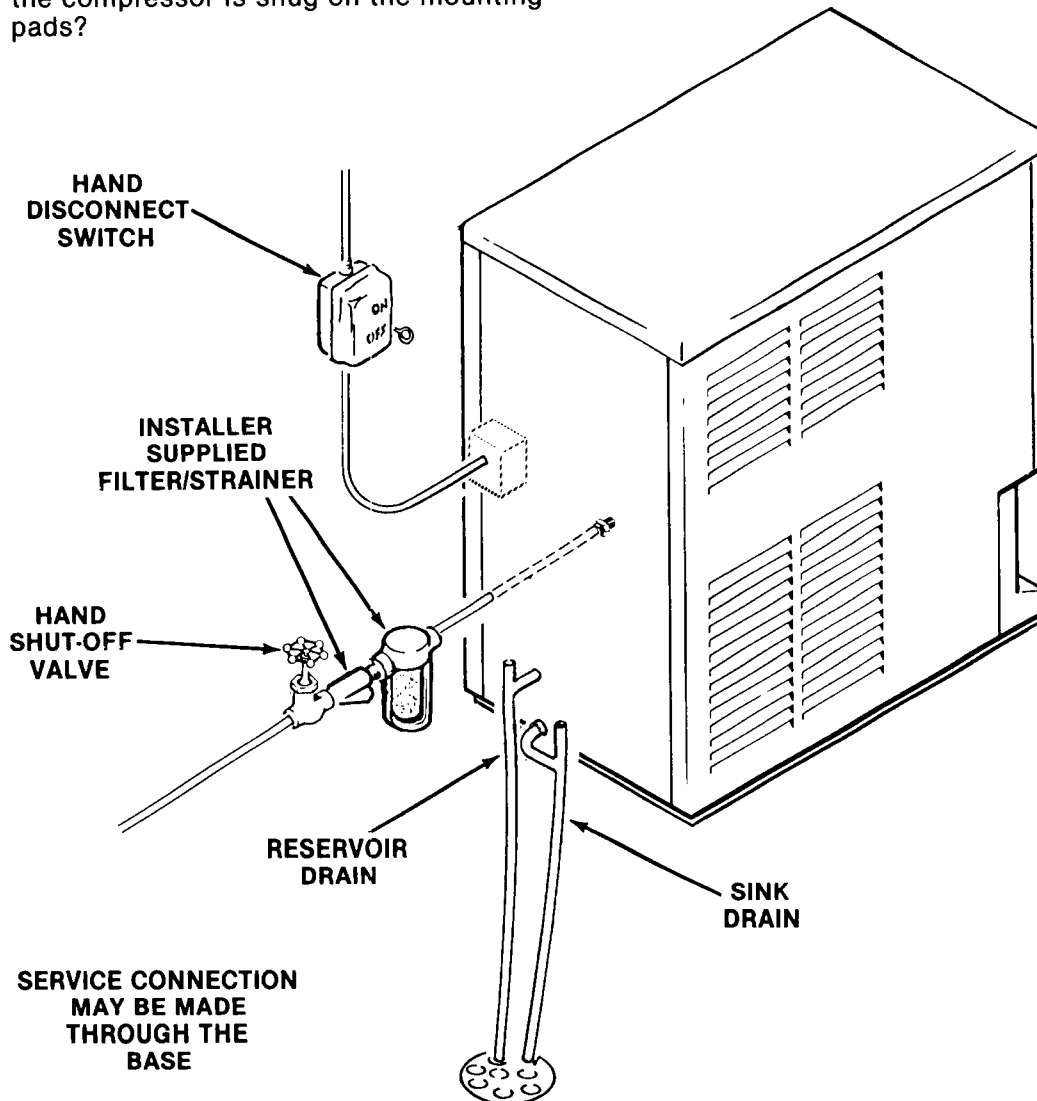
In some cases, a plumbing permit and services of a licensed plumber will be required.



# FD4 GENERAL INFORMATION AND INSTALLATION

## FINAL CHECK LIST

1. Is the cabinet in a room where ambient temperatures are within the minimum and maximum temperatures specified?
2. Is there at least six inches clearance at both sides of the cabinet for proper air circulation?
3. Has water supply pressure been checked to insure a minimum of 20 PSIG and a maximum of 120 PSIG operating pressure?
4. Is the cabinet level?
5. Have all electrical and piping connections been made?
6. Is the water supply line shut-off valve installed and electrical wiring properly connected?
7. Has the shipping block been removed from under the compressor. Have the compressor hold-down nuts been checked to be sure the compressor is snug on the mounting pads?
8. Check all refrigerant lines and conduit lines, to guard against vibration or rubbing and possible failure.
9. Have the bin and cabinet been wiped clean?
10. Has the Manufacturer's Registration Card been properly filled out? Check for correct model and serial numbers from Serial nameplate, then mail the completed card to the SCOTSMAN factory.
11. Has the owner/user been given the Service Manual and instructed how to operate and maintain the icemaker?
12. Has the owner been given the name and telephone number of the authorized SCOTSMAN Service Agency serving him?

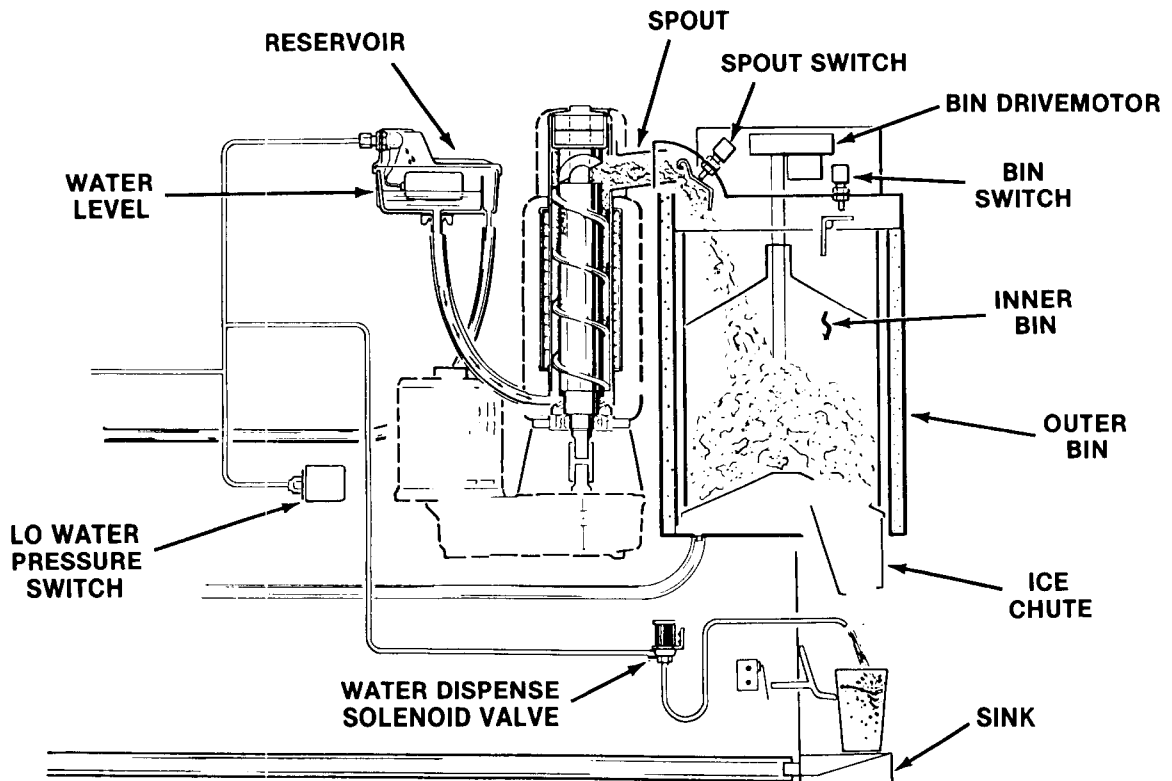


# FD4 START-UP

## OPERATING INSTRUCTIONS

### START-UP

1. Remove screws and the top and side panels.
2. OPEN the water supply line shut-off valve.
3. Observe the water filling operation, see the Water Schematic illustration.
  - a. Water flows into water reservoir.
  - b. Water flows through water feed line to the bottom of the freezer assembly.
  - c. Float rises until the water supply is sufficient to shut off. Float valve adjustment may be required to maintain the correct water level.
4. Check all internal water connections to be sure they do not leak.
5. Plug unit in or turn on electrical power to start the automatic icemaking process.
6. Let the system operate. Check for any excess noises beyond normal compressor noise:
  - a. Fan noises, blades touch other surfaces, blades bent or out-of-balance.
  - b. Vibrating type, from touching lines.
  - c. Chattering, lack of water in freezer.
  - d. Compressor loose.After the unit has been started and a supply of ice has accumulated in the bin:
7. Using a container, push the water filler lever in and dispense ice into the container. Release pressure from the water filler lever and ice dispensing stops.
8. Move water dispense switch to the ON position. Use a container to test that water and ice are dispensed simultaneously.
9. Thoroughly explain to the owner/user the significant specifications of the icemaker, the start-up and operation, going through the procedures of the operating instructions. Answer all questions about the icemaker.  
Inform the owner of the name and telephone number of the authorized SCOTSMAN Distributor or Service Agency serving him.



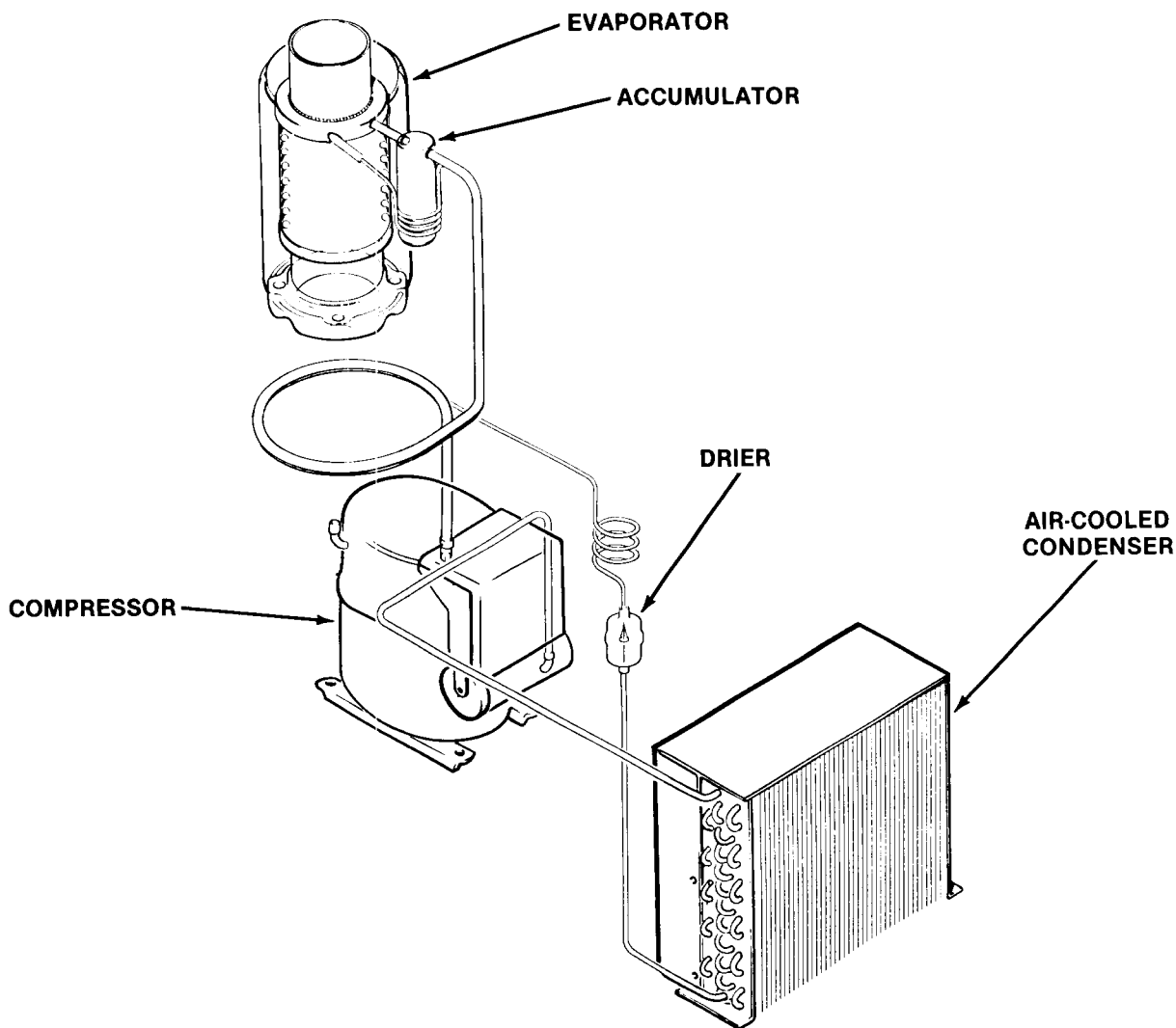
# FD4 OPERATING INSTRUCTIONS

## ICEMAKER OPERATION

The water supply flows from the building source through the optional inline water strainer, enters at the inlet fitting and on to the water reservoir. The water reservoir functions to maintain a constant water level inside the freezer assembly. Water from the water reservoir enters at the bottom of the freezer assembly and is changed into ice by low temperatures inside the freezer.

Move building source power switch to the ON position or plug into electrical outlet to start the automatic icemaking process.

A stainless steel auger within the freezer is powered by the drivemotor assembly, a direct-drive gearmotor, and the rotating auger carries the ice upward to the end of the auger, see Water Schematic Illustration, and pushed out through the ice chute and into the ice storage bin. When the ice storage bin has been filled with ice, up to the level of the bin control actuator, icemaking processes shut OFF.



# FD4 OPERATING INSTRUCTIONS

## ELECTRICAL OPERATION

The Model FD4 icemakers are designed to operate on standard electrical supply 115 volts, 60 Hertz, single phase. Other voltage requirements are available on special order. Therefore, always CHECK NAMEPLATE for electrical information BEFORE proceeding with wiring connection to the icemaker.

Cold ambient temperatures and interruptions in water supply are conditions that can cause excessively hard ice and overloads within the freezer assembly, which is directly transmitted to the drivemotor; and in turn, will cause speed reduction or ultimate freezeup.

When the drivemotor is slowed to a pre-determined RPM, a sensing switch mounted on top of the motor is designed to open the electrical circuit to the compressor. The compressor stops operating, no more ice is produced, and the drivemotor continues to operate rotating the auger to clear the overload and gradually build up to full speed.

At a pre-determined higher RPM drivemotor speed, the speed sensing switch closes the electrical circuit to the compressor, causing the normal icemaking process to resume.

The bin top has two mechanically operated switches. The one next to the freezer discharge spout is known as the spout switch. The other switch, the bin switch, is in series with the spout switch. If either one is open, (because of high ice level inside the bin) the icemaker will not run.

There are two safety controls. The low pressure control, an automatic reset, non-adjustable control, is set to electrically open at zero to four PSIG to stop the compressor. The auger delay switch, a single-pole double-throw (SPDT) switch, functions as a control device to allow the drivemotor to rotate the auger to clear the freezing chamber while the compressor circuit is OFF.

Refer to the appropriate wiring diagram and trace circuitry and control functions, as described in the following paragraph.

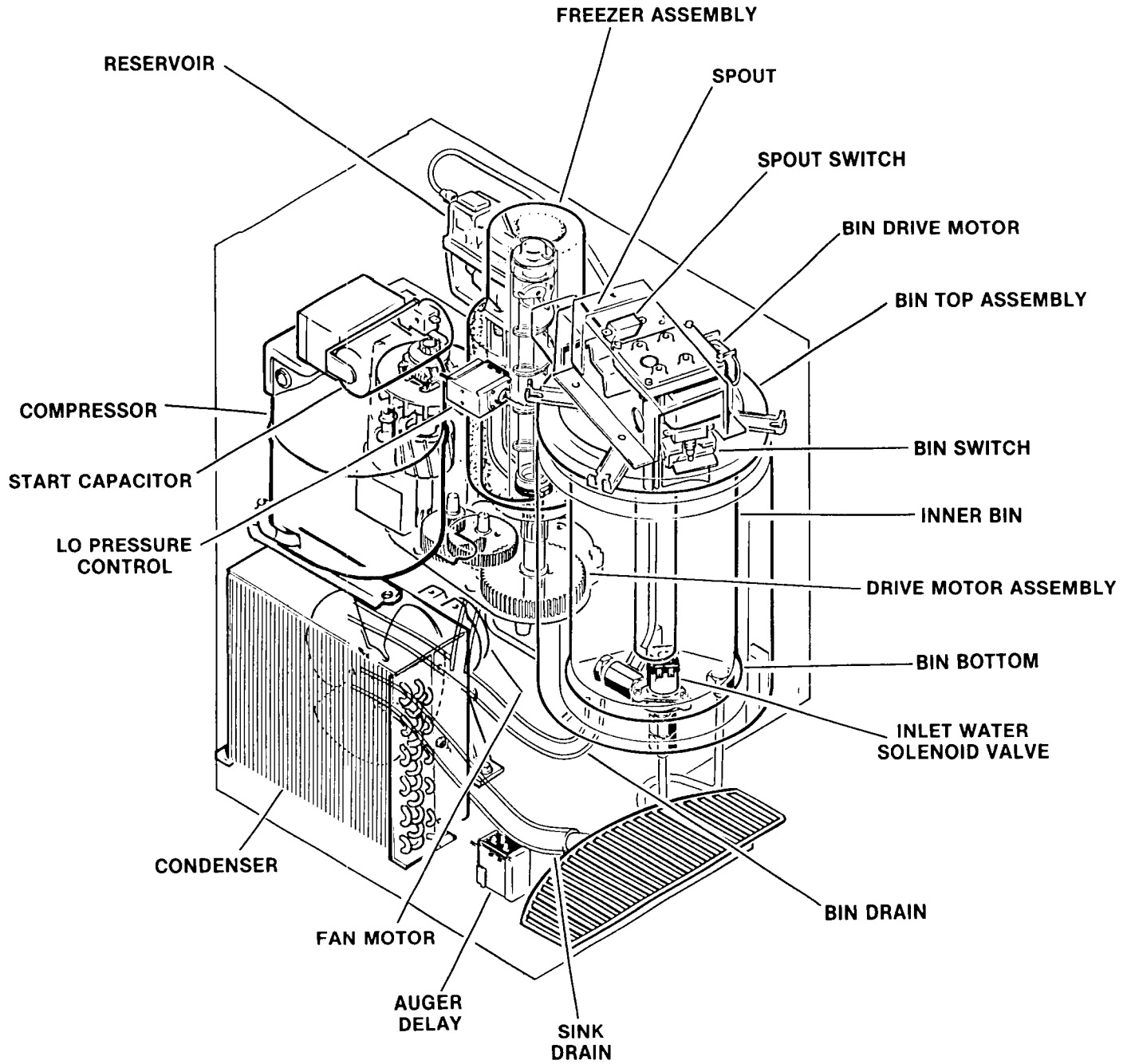
As shown on all SCOTSMAN wiring diagrams, the controls are in the ICEMAKING MODE. Thus, the 1-2 contacts are CLOSED, At START-UP, the 1-2 contacts are OPEN and the 3-2 contacts are CLOSED. As the icemaker begins to operate, the low side pressure starts to decrease from the stabilized or at-rest pressure. As soon as the pressure is reduced to 20 PSIG, the 3-2 contacts OPEN and the 1-2 contacts CLOSE. This removes the operating controls, such as the bin control, from the drivemotor circuit. If one of the operating controls OPENS, it will SHUT OFF the compressor circuit. The drivemotor will operate until the low side pressure increases to 32 PSIG. Then, the 1-2 contacts OPEN and SHUTS OFF the drivemotor, usually within one to two minutes, depending upon ambient conditions. This brief period of time allows the auger to transport all the ice out of the freezing chamber. Consequently, when called on to START-UP again, there is no ice load to start up against. Again, on STARTUP, the 1-2 contacts are OPEN and the 3-2 contacts are CLOSED.

On all models, a low-water pressure switch functions to discontinue the icemaking process whenever inlet water pressure is reduced to below 20 PSIG. The switch will automatically restart the icemaking process when the water pressure is increased to 20 PSIG.

Suction pressure should be 14 PSIG with proper refrigerant charge. Suction pressure will vary about two PSIG plus or minus, depending upon ambient temperatures and inlet water supply temperatures to the freezer assembly.

When charging the system with refrigerant, always CHECK NAMEPLATE for specific refrigeration charge for individual icemaker.

# FD4 COMPONENT DESCRIPTION



# FD4 COMPONENT DESCRIPTION

## FREEZER ASSEMBLY

Evaporator coils surround a cylindrical tube which is filled with water. As ice forms on the interior wall, it is lifted by a rotating auger which moves the ice to the ice breaker at the top of the cylinder where it is compacted and forced through the ice delivery chute.

## ICE BREAKER ASSEMBLY

The ice breaker assembly, bolted to the top of the freezer, contains the bearing and seal for the top of the auger. Flaked ice created by the freezer is carried by the auger to the ice breaker assembly and the flaked ice is pushed by the auger through the hole in the side of the freezer and falls into the bin.

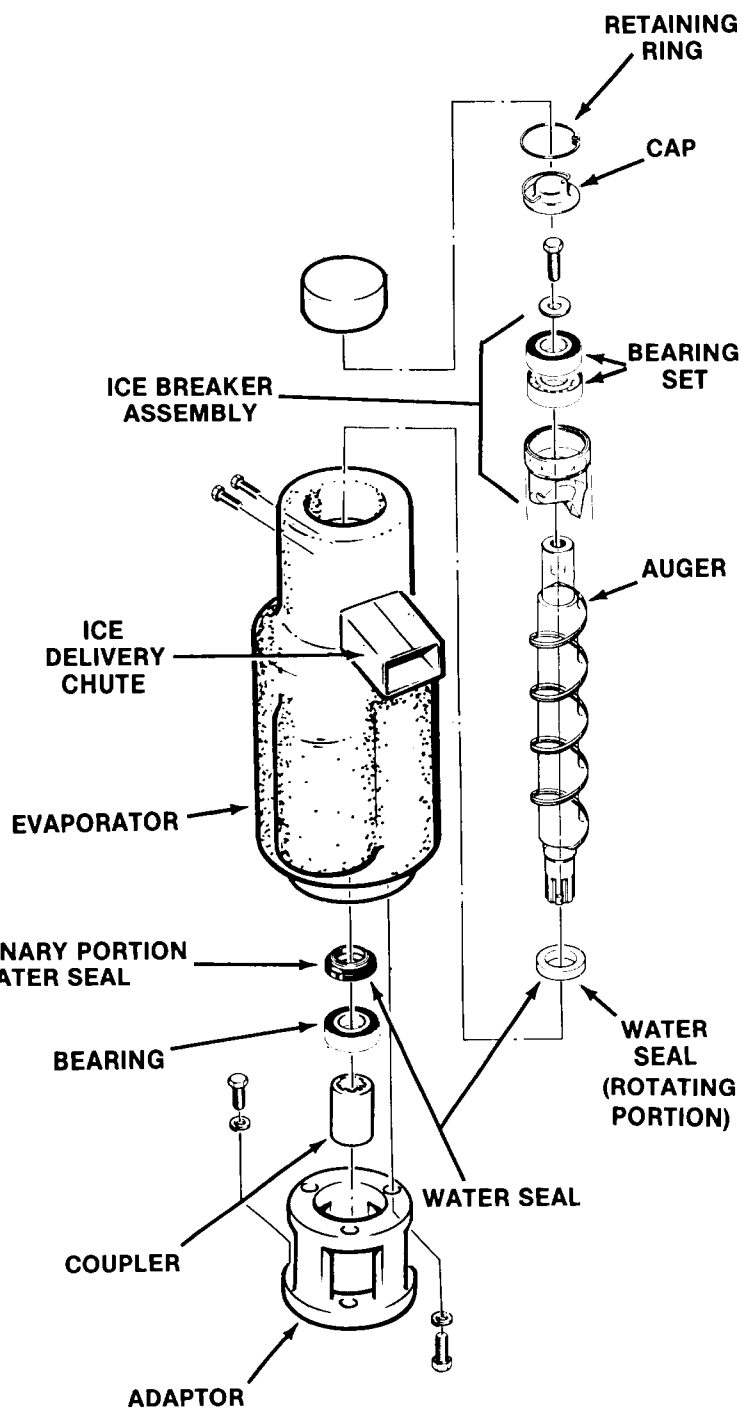
## AUGER

The highly-polished stainless steel auger inside the freezer assembly, is rotated by the gearmotor and pushes ice to the top of the freezer.

## LOWER WATER SEAL

The highly precision two-part water seal located at the bottom of the freezer, seals the bottom of the freezer assembly to contain water. The rotating part of the lower water seal is attached to the bottom of the auger and the stationary part of the seal is pressure fit into the bottom of the freezer assembly tube. Anytime condition of the lower water seal is in question, replace the seal.

## FREEZER ASSEMBLY



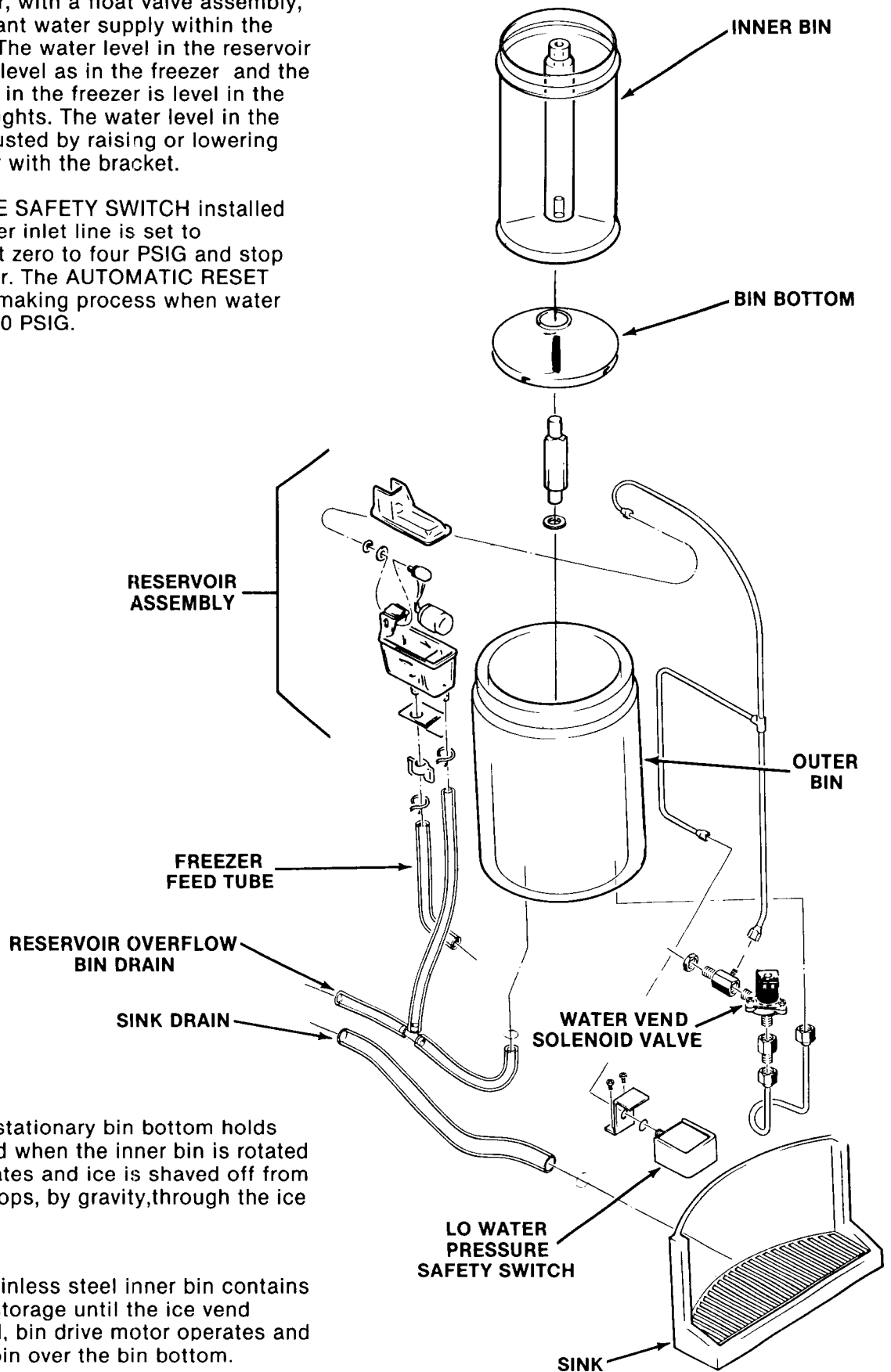


# FD4 COMPONENT DESCRIPTION

## WATER RESERVOIR

The water reservoir, with a float valve assembly, maintains a constant water supply within the freezer assembly. The water level in the reservoir is the same water level as in the freezer and the correct water level in the freezer is level in the top of the auger flights. The water level in the freezer can be adjusted by raising or lowering the water reservoir with the bracket.

**WATER PRESSURE SAFETY SWITCH** installed in the potable water inlet line is set to electrically open at zero to four PSIG and stop the entire icemaker. The **AUTOMATIC RESET** will restart the icemaking process when water pressure rises to 20 PSIG.



## BIN BOTTOM

The cone shaped stationary bin bottom holds the ice supply, and when the inner bin is rotated the ice supply rotates and ice is shaved off from the bottom and drops, by gravity, through the ice dispense spout.

## INNER BIN

The cylindrical stainless steel inner bin contains the ice supply in storage until the ice vend switch is activated, bin drive motor operates and rotates the inner bin over the bin bottom.

# FD4 COMPONENT DESCRIPTION

## BIN TOP

The bin top assembly protects the ice supply and provides a mount for the bin ice level switch and the bin ice level safety switch.

## SPOUT SWITCH

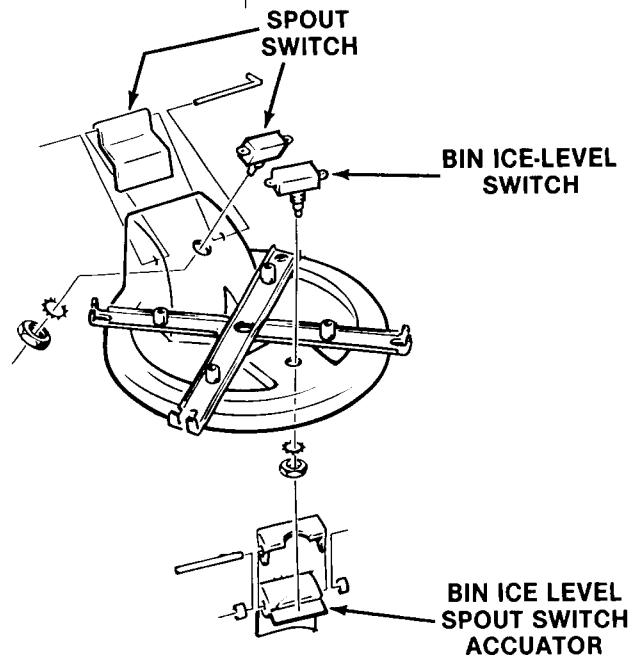
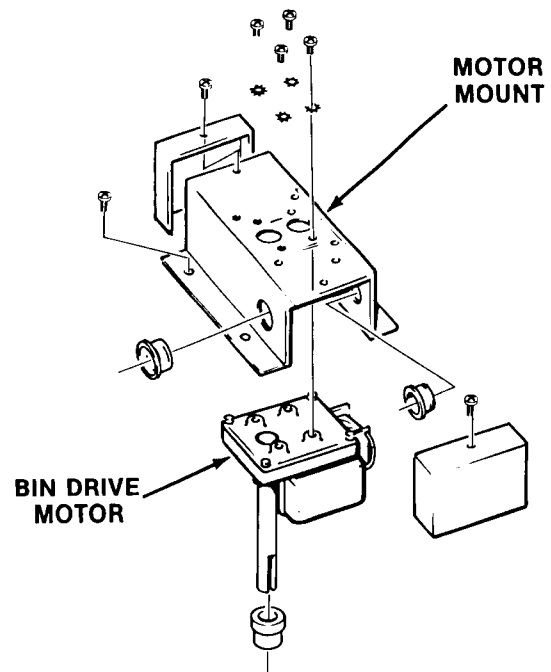
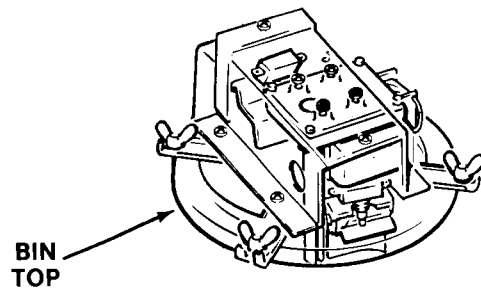
The spout switch is an ON-OFF switch, that shuts OFF the compressor to stop icemaking, while the freezer assembly drivemotor continues to operate, and clear all ice from the auger. When the refrigerant pressure equalizes, the refrigerant lo-pressure control will shut OFF the drivemotor. When the ice flow pushes the actuator arm of the switch IN, the compressor is shut OFF and when the action of the melting or dispensed ice releases the actuator arm, the switch CLOSSES the circuit and RESTARTS the compressor and the icemaking process.

## BIN ICE LEVEL SWITCH

The bin ice level switch is mounted on the opposite side of the bin top to the spout switch and is actuated by the movement against the switch actuator. The switch acts as a differential switch, keeping the unit OFF until the ice level has dropped on both sides of the inner bin.

## BIN DRIVE MOTOR

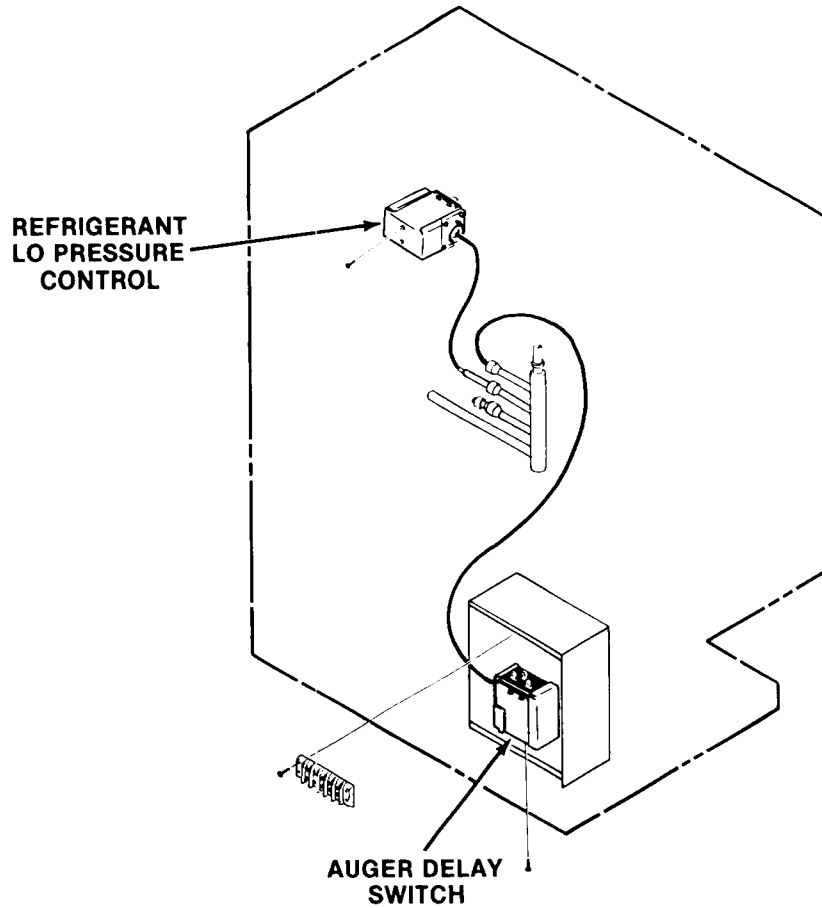
The bin drive motor and reduction gear assembly, located above the bin, is controlled with the ice vend switch. The bin drive motor rotates the inner bin and ice supply to vend ice into a container.



# FD4 COMPONENT DESCRIPTION

AUGER DELAY SWITCH, a single-pole double throw (SPDT) switch, allows the gearmotor to rotate the Auger and clear the freezing chamber after the bin ice level switch circuit to compressor is OFF. When the icemaker restarts, the gearmotor starts in a no load condition, preventing excessive loading of gearmotor and bearings.

REFRIGERANT LO PRESSURE CONTROL is factory set to automatically SHUT DOWN the icemaker if the low-side pressure drops below 4 PSIG or low ambient or water temperatures exist.



# FD4 MAINTENANCE AND CLEANING INSTRUCTIONS

////////////////////////////////////  
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 USERS 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 your machine running with a minimum of problems.

Maintenance and Cleaning should be scheduled at a MINIMUM of twice per year.  
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## **CLEANING INSTRUCTIONS FOR SCOTSMAN ICE MACHINE MODEL FD4**

1. Depress ice actuator arm and vend until bin is empty. Disconnect or unplug electrical supply to the icemaker.
2. Remove top cabinet cover.
3. Remove storage bin cover and spout extension.
4. Move both ice control flippers in the bin top, movement should be free and operate switches.
5. Remove inner bin and bin bottom.
6. Replace bin cover.
7. Turn *off* water supply or block float. Drain reservoir by disconnecting tube between reservoir and freezer. After draining, reconnect tubing.
8. Plug unit in and pour cleaning solution into reservoir. (Use 4 oz. of Scotsman cleaner and 1 qt. of hot water.) Do not fill above overflow tube. Do not allow unit to operate with less than 1 inch of solution in reservoir.
9. Remove drain grate and ice vend lever from sink. Wash and sanitize these parts and parts removed from storage bin in accordance with local health department regulations.
10. Disconnect or unplug electrical power supply to icemaker. Wash and rinse reservoir, turn water on or remove float block.
11. Reconnect or plug icemaker electrical supply and operate for at least 15 minutes to flush out any cleaning fluid. Taste ice for acid taste and make ice until ice tastes sweet.
12. Disconnect or unplug unit and remove bin cover. Add hot water to ice in bin, using this melt water thoroughly wash and rinse the underside of the storage bin top, rubber ice spout and all surfaces within the storage bin.
13. Using solution from step #8, thoroughly wash and rinse sink and grill.

14. Re-assemble storage bin and sink parts.
15. Replace cabinet cover. Plug in and unit is ready for normal operation.

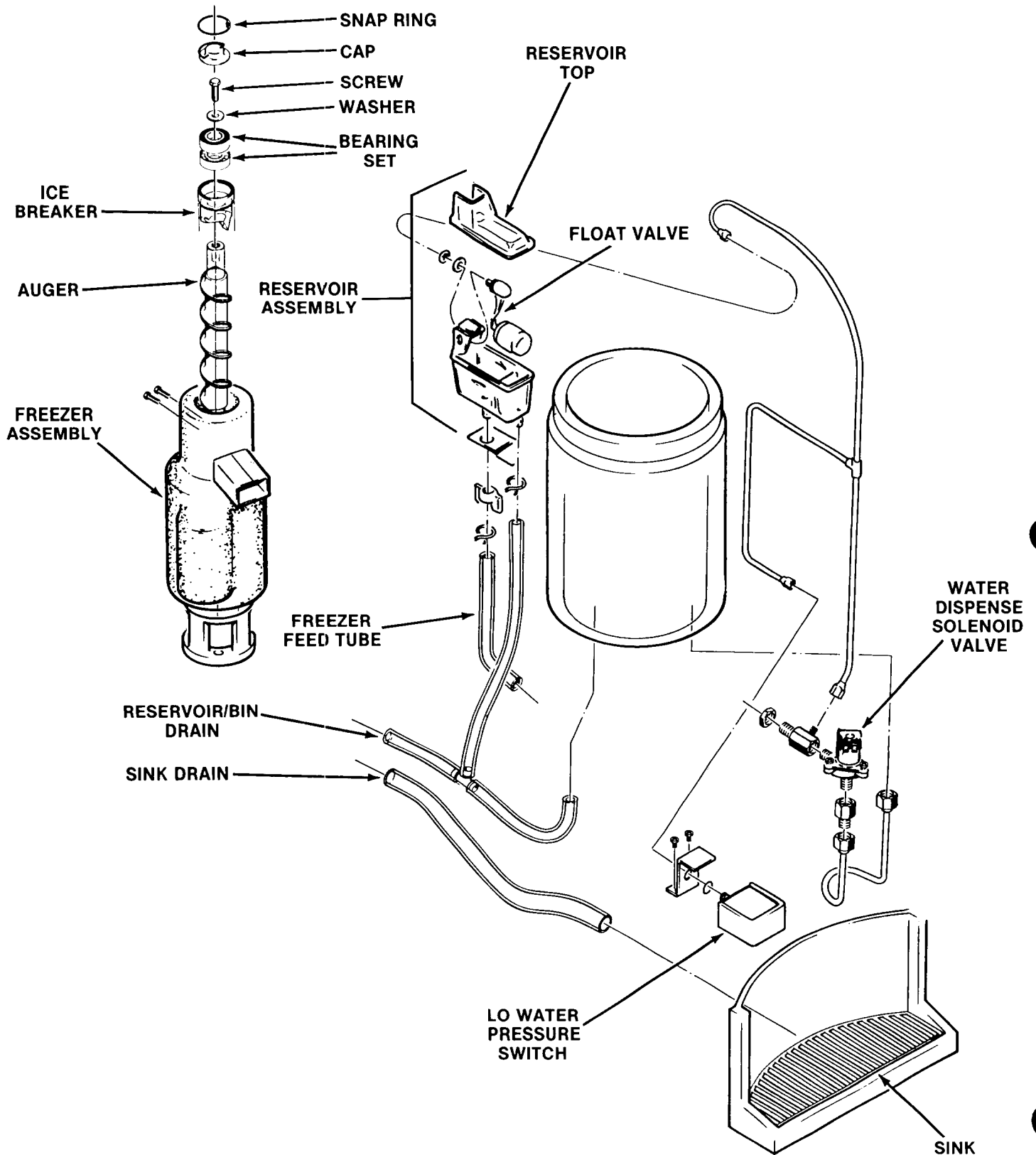
## **MAINTENANCE INSTRUCTIONS — FLAKER SECTION**

1. Check and clean optional water strainers and float valve. Depress float valve to insure full stream of water.
2. Check water level and machine level. Keep water level below overflow, but as high as possible and still not run out of spout opening with machine off. Water should come out of spout with ice at all times. Adjust as required.
3. Remove auger. See page 25. Check top bearing for wear and auger for mineral build-up. Auger may need to be cleaned outside of the freezer chamber.

**NOTE:** Cleaning requirements vary according to local water conditions. Visual inspection of the auger before and after cleaning will indicate best procedure to be followed in local area.

4. Clean reservoir and interior of freezer assembly using SCOTSMAN Ice Machine Cleaner. See Cleaning Instructions.
5. Clean air cooled condenser. Always shut off machine when cleaning.
6. Oil condenser fan motor when possible.
7. Check for refrigerant leaks and proper frost line. Should frost out of accumulator at least one-half way to compressor, and in some areas, back to service valve.
8. Check for water leaks. Tighten drain line connections. Run water down drain line to make sure it is open.
9. Check quality of ice. Ice should be wet when formed, but will cure rapidly to normal hardness in the bin.

# FD4 MAINTENANCE AND CLEANING INSTRUCTIONS



# FD4 MAINTENANCE & CLEANING INSTRUCTIONS

## SANITIZING

Sanitizing is an important phase of the icemaking and dispensing operation. The following sanitizing procedure should be performed after every repair or replacement of parts in the FD4 in/or through which water flows or drains and ice is made, spouted, stored or dispensed. Additional requirements for performing the sanitizing procedure should be following in accordance with the requirements.

### ////////// WARNING //////////

Read **WARNING** thoroughly **BEFORE** preparing sanitizing solution, in next stop.

#### 1. STERILAX 3-Q SANITIZING TABLETS.

**DANGER: KEEP OUT OF REACH OF CHILDREN.** Tablets may be harmful or fatal if swallowed. May cause skin irritation or eye damage. Avoid prolonged skin contact. Do not get in eyes. In case of contact, flush with plenty of water. If irritation persists get medical attention. Avoid contamination of food.

**FIRST AID:** If tablets are swallowed, drink promptly a large quantity of milk, egg whites or gelatin solution. Avoid alcohol.

**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulator shock, respiratory depression and convulsion may be needed.

Rinse empty carton container thoroughly with water and discard. Always follow your health department regulation.

#### 2. MIKRO-QUAT

**DANGER:** Causes eye damage and skin irritation. Do not get into eyes, or on skin, or on clothing. Protect eyes when handling concentrated product. Harmful if swallowed. Avoid contamination of food.

**FIRST AID:** In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. For eyes, call a physician. Remove and wash contaminated clothing before reuse. If swallowed, drink promptly a large quantity of milk, egg whites or gelatin solution, or if these are not available, drink a large quantity of water. Call physician immediately.



**NOTE:** Contact your local Health Authorities and obtain their approval of the sanitizer you intend to use when sanitizing the FD4.

Prior to performing the sanitizing procedure, it is assumed the cleaning procedure has been performed.

1. Prepare one gallon of sanitizing solution composed of 450 PPM active quaternary ammonium germicide solution, using a quaternary ammonium sanitizing solution.

**NOTE:** Carefully follow directions and observe all precautions on the container of the compound.

Three \*Sterilax 3-Q sanitizing tablets per gallon of water; or, 2/3 ounce of \*Mikro-Quat per gallon of water will yield a solution of about 450 PPM active quaternary.

2. Immerse the parts in the sanitizing solution and wash the parts, flushing the solution thoroughly in, over and through all parts and surfaces of the FD4 parts being sanitized.
3. Allow the parts to drain and air dry.
4. Replace the sanitized parts in the reverse order of removal.

\*Sterilax 3-Q sanitizing tablets are distributed by Pittsburgh Chemical Laboratory, Inc., Pittsburgh, PA 15222, and may be obtained through most restaurant supply houses.

\*Mikro-Quat is manufactured by Economics Laboratory, Inc., Osborn Building, St. Paul, MN 55102, and may be obtained from them through their Magnus Division, The Klensade Division, or from restaurant supply houses.

# FD4 SERVICE DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Water Leaks.	Defective water seal. Gravity feed line leaking. Water level in reservoir too high.	Replace Check hose clamps. Adjust to 1/4 inch below overflow pipe.
Excessive noise or chattering	Mineral or scale deposit on auger and inner freezing chamber walls.  Low suction. Intermittent water supply.  Water level in reservoir too low. Gear reducer loose on frame. Motor compressor not solid on rubber mounts.	Remove and manually polish auger, polish inner chamber walls of freezer barrel.  For lighter concentration use Scotsman Ice Machine Cleaner periodically.  Add gas to raise suction pressure. Check and clean water strainer. Check gravity feed line for air lock. Remove air lock.  Adjust to 1/4 inch below overflow pipe. Tighten bolts. Repair or replace rubber mounts.
Gear motor noise.	Low on oil.	Remove case cover to check for proper oil level. See Removal & Replacement page 30.
Unit will not run.	Blown fuse.  Loose electrical connection. Inoperative master switch.	Replace fuse and check for cause of blown fuse.  Check wiring. Replace switch.

# FD4 SERVICE DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Compressor cycles intermittently.	Low voltage. Dirty condenser. Air circulation blocked. Inoperative condenser motor. Non-condensable gases in system.	Check for overloading. Clean. Move unit to correct. Replace. Purge off.
Making wet ice.	Surrounding air temperature. Under or over-charge of refrigerant. High water level in water reservoir. Faulty compressor.	Correct or move unit. Recharge with the proper amount. Lower to 1/2 inch below overflow pipe. Replace or repair.
Low ice production.	Loss of refrigerant, under or over-charge of refrigerant. Dirty or plugged condenser. Low water level in water reservoir. Partial restriction in capillary tube or drier.  Inlet water strainer partially plugged. Corroded or stained worm shaft due to water condition.	Check and recharge with proper amount of refrigerant. Clean condenser. Adjust to 1/2 inch below overflow pipe. Moisture in system. Overcharge of oil in system. Remove charge and drier. Replace and recharge system. Remove screen and clean.  Remove worm shaft and clean.
Machine runs but makes no ice	Loss or under-charge of refrigerant. Water not entering freezing chamber.  Moisture in system.  Water seal leaking. Water turned off while unit was operating.	Check for leaks and recharge.  Plugged strainer or supply line. Check and clean. Air lock in gravity feed line. Check and remove air lock. Check and remove charge and drier. Replace and recharge. Replace seal. Inlet water line froze shut. Unit must be turned off and defrosted.



# FD4 SERVICE DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Will not dispense.	Power off. Motor overload open. Spout jammed with ice. Unit not level or holding glasses against spout. Wires off dispensing switch.	Check line fuses and plug. See correction under motor overload. Remove ice and clear ice under removable bottom. Check reservoir possibly too high. Check switch terminals.
Motor hot—Overload Open.	Ice under removeable bottom. Wing nuts on cover turned down too tight. Rotating bin does not turn free. Ice too hard.	Remove ice. Keep wing nuts only slightly snug—never tight. Check and repair any drag. Raise freezer water level and check refrigerant charge.
Dispenser does not stop.	Brake on drive motor not working properly.	Brake must be free and stop the motor before 5 revolutions after the dispensing switch is released.
Water will not dispense.	Solenoid defective. Lines closed up.	Replace. Clean.
Water runs too slow.	Water line too small.	Increase size.

# FD4 REMOVAL AND REPLACEMENT PROCEDURES

## ICE BREAKER AND AUGER REMOVAL

1. Remove permagum and two screws from the side of the freezer.
2. Pull up on cap hook located in the top of the freezer assembly to remove ice breaker with bearing set, auger and the top portion of the lower water seal.
3. Remove snap ring and cap and remove the bolt from the ice breaker and auger assembly to separate the ice breaker assembly from the auger. The bearings may be replaced or the ice breaker and bearings may be replaced as an assembly.

## WATER SEAL INSTALLATION

Inspect the water seal in its package. Do not use if mating surfaces are scratched or cracked.

1. Remove auger, unbolt freezer from adaptor stand. Drive out old bottom bearing and water seal from the top down.
2. Remove old rotating half of water seal from auger and clean the auger at the seal mounting area.
3. Apply Scotsman part number 19-0529-01 RTV silicone rubber to the auger shoulder before pushing on the water seal. Place just enough silicone on to the auger, so that when the water seal is placed on the auger, the gap between the auger shoulder and water seal is completely filled with silicone.

The silicone must be allowed to "set-up" or dry on the surface before any water can be added to the freezer. (See illustration, page 26).

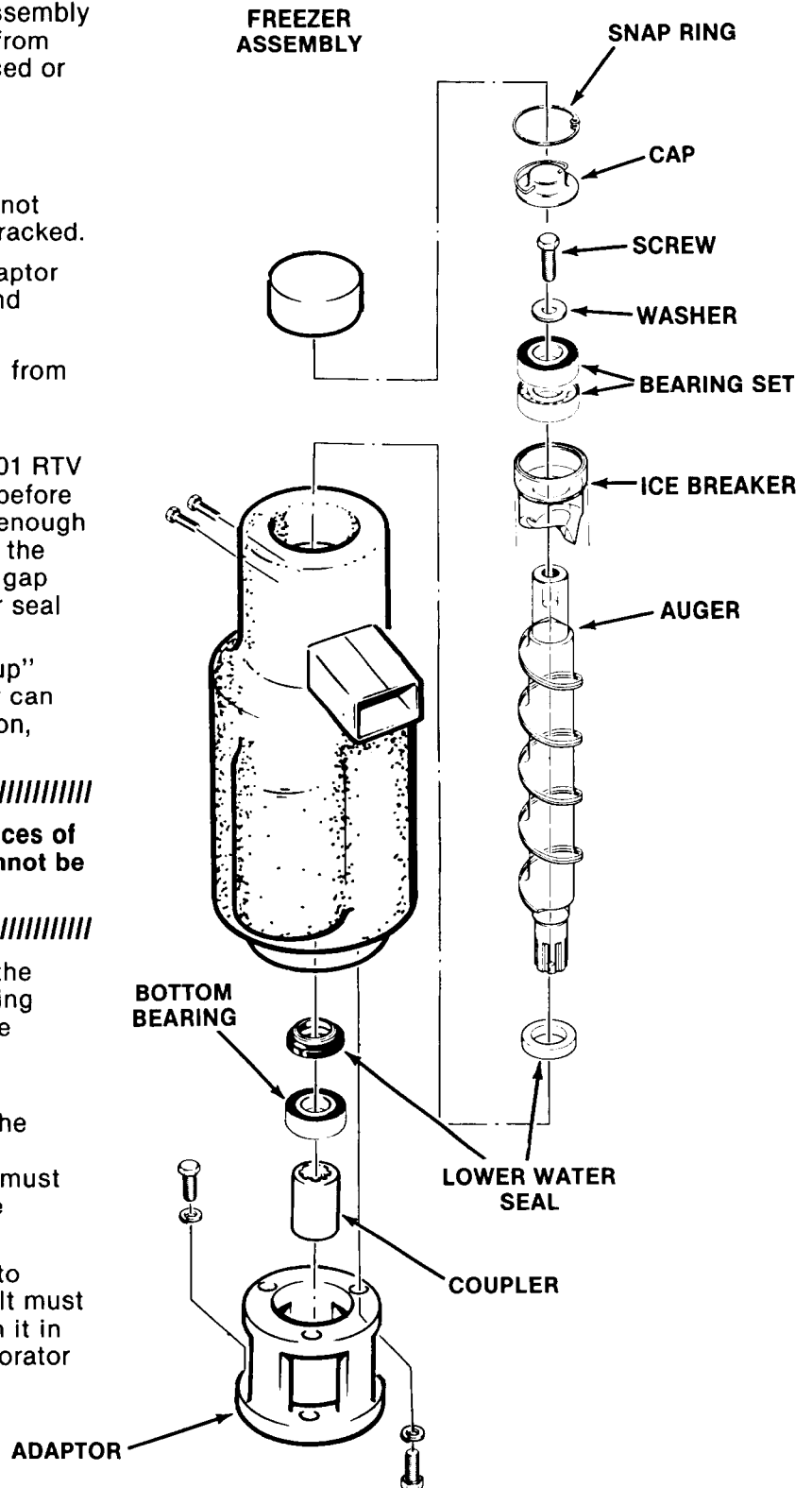
## WARNING

If any silicone gets onto the mating surfaces of the water seal, the seal is ruined, and cannot be used.

4. Clean the inside of the evaporator at the bottom bearing and water seal mounting area. Lubricate the outside edge of the stationary seal with food grade lubricant to aid installation.
5. Carefully push the stationary part of the water seal up into the bottom of the evaporator. It must go in straight and must not be pushed in beyond 1/4" past the bottom of the freezer.
6. Install new bottom bearing, push it into the freezer under the new water seal. It must be pushed in straight, but do not push it in past 1/8" from the bottom of the evaporator tube.

7. Mount the adaptor stand to the bottom of the freezer. Hand tighten the three cap screws until the stand flange is tight against the bottom bearing. Then, tighten the cap screws in a rotating pattern to insure proper alignment.

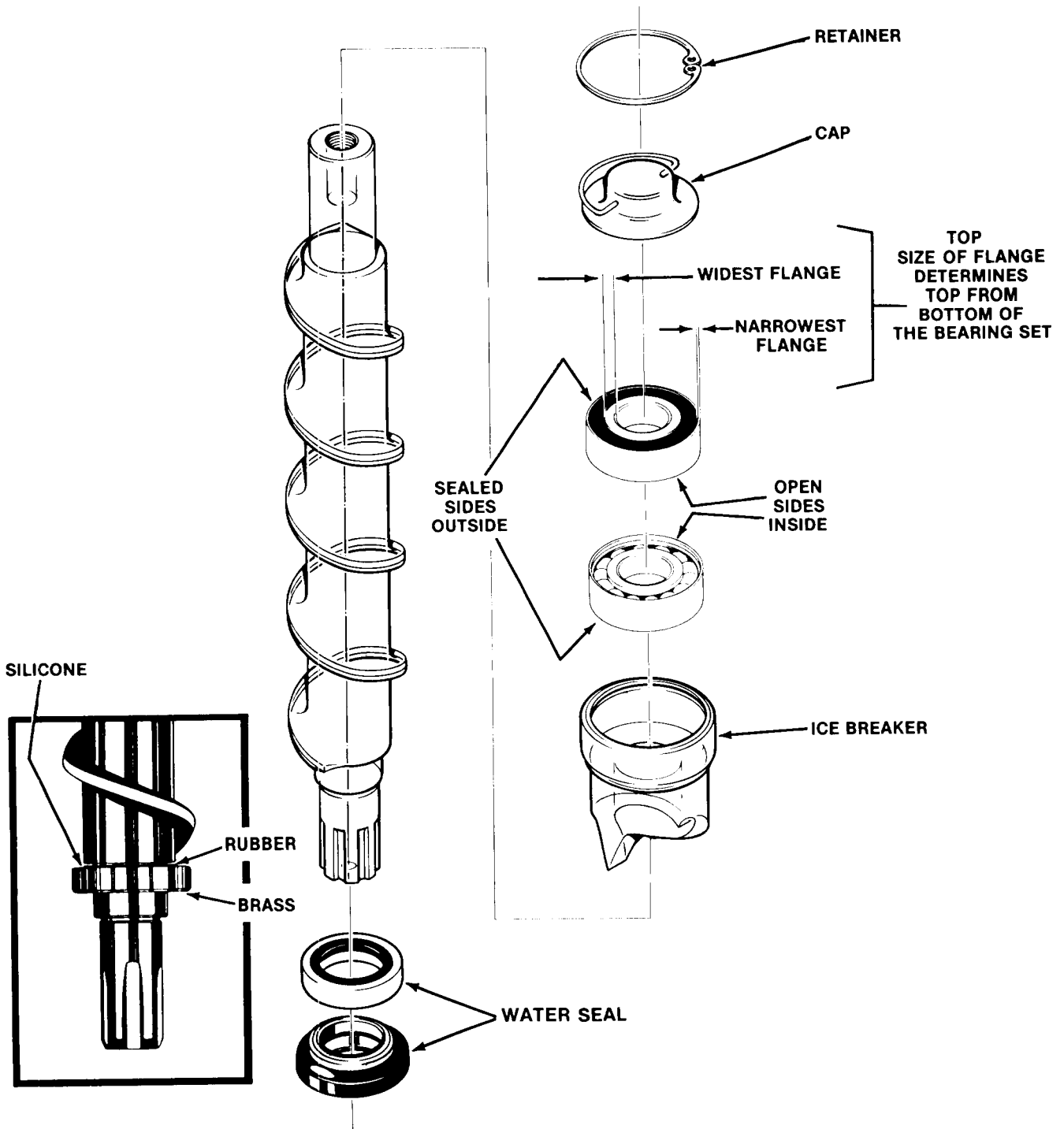
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# FD4 REMOVAL AND REPLACEMENT PROCEDURES

8. The top bearing should also be changed at this time. Be sure to mount the top bearing/bearing retainer assembly onto the auger **first** before installing the auger into the freezer tube.

9. Install the auger and test the unit.



# FD4 REMOVAL AND REPLACEMENT PROCEDURES

## ////////// WARNING //////////

Be sure the electrical power supply and the water supply are OFF, BEFORE starting any of the following REMOVAL AND REPLACEMENT procedures as a precaution to prevent possible personal injury or damage to equipment.

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### REMOVAL AND REPLACEMENT OF THE COMPRESSOR ASSEMBLY

To remove the compressor assembly:

1. Remove screws and remove top, back and left side panel.
2. Bleed off or blow the refrigerant charge through the schrader valve.
3. Remove the cover from the terminal box on the compressor; then, disconnect electrical leads from the compressor.
4. Unsolder and disconnect the refrigerant suction line and the discharge line from the compressor.
5. Unsolder the process header from the compressor and retain for installation on the replacement compressor.
6. Remove four bolts, washers, mounting sleeves and grommets and the compressor from the chassis base.

To replace the compressor assembly, reverse the removal procedure.

### REMOVAL AND REPLACEMENT OF THE SAFETY CONTROLS, HIGH PRESSURE, LOW PRESSURE, AND AUGER DELAY

To remove the controls:

1. Remove screws and remove top and left side panels.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Unsolder the control capillary tube from its corresponding process header.
4. Replace the control and solder the capillary tube to its corresponding process header.
5. Follow the removal and replacement procedure of the liquid line drier.

### REMOVAL AND REPLACEMENT OF THE CONDENSER ASSEMBLY — AIR-COOLED

To remove the condenser assembly:

1. Remove screws and remove top, back and
2. Bleed off or blow the refrigerant charge through the schrader valve.
3. Unsolder and disconnect refrigeration lines from the condenser.
4. Unsolder and remove the drier from the refrigerant line connected to the condenser.
5. Remove screws, lockwashers and air-cooled condenser from the chassis base.

To replace the air cooled condenser, reverse the removal procedure.

### REMOVAL AND REPLACEMENT OF THE FREEZER ASSEMBLY

To remove the freezer assembly:

1. Remove cabinet top and right side panels, to prepare for removal of the freezer assembly.
2. Remove Corbin clamp and Tygon tube from the freezer assembly that connects to the water reservoir assembly.
3. Bleed off or blow the refrigerant charge through the Schrader valve.
4. Unsolder the suction line from the compressor.
5. Unsolder the capillary line at the drier.
6. Remove three screws, lockwashers and washers which attach the adaptor to the drivemotor assembly.
7. Lift the freezer assembly up and off of the drivemotor procedure.

To replace the freezer assembly, reverse the removal procedure.

### NOTE

*Thoroughly evacuate the system to remove moisture and non-condensables.*

**NOTE:** Always install a replacement drier, anytime the sealed refrigeration system is opened. Do not replace the drier until all other repair or replacement has been completed.

# FD4 REMOVAL AND REPLACEMENT PROCEDURES

## //////////////////// WARNING //////////////////////

Be sure the electrical power supply and the water supply are OFF, BEFORE starting any of the following REMOVAL AND REPLACEMENT procedures as a precaution to prevent possible personal injury or damage to equipment.

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### REMOVAL AND REPLACEMENT OF THE DRIER

**NOTE:** Always install a replacement drier, anytime the sealed refrigeration system is opened. Do not replace the drier until all other repair or replacement has been completed.

To replace the drier:

1. Remove screws and remove back panel.
2. Bleed off or blow the refrigerant charge through the Schrader valve.
3. Remove attaching hardware and drier brace or strap from the drier.
4. Unsolder refrigeration lines at both ends of the drier.

To replace the drier:

//////////////////// CAUTION //////////////////////

1. If the factory seal is broken on the replacement drier, exposing it to the atmosphere more than a few minutes, the drier will absorb moisture from the atmosphere and lose substantial ability for moisture removal.
2. Be sure the replacement drier is installed with the arrow positioned in the direction of the refrigerant flow.

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1. Remove the factory seals from the replacement drier and install the drier in the refrigerant lines with the arrow positioned in the direction of the refrigerant flow.
2. Solder the drier into the lines, two places.
3. Secure drier with the drier brace or strap.
4. Purge the system and check for leaks.
5. Thoroughly evacuate the system to remove moisture and non-condensables.
6. Charge the system with refrigerant, by weight. SEE NAMEPLATE.

### REMOVAL AND REPLACEMENT OF THE BIN DRIVE MOTOR ASSEMBLY

To remove the drive motor:

1. Remove wing nuts and remove bin top.
2. Remove screws and remove switch cover.
3. Remove screws and separate bin drive motor from the switch cover.
4. Unplug electrical lead wires from connector.

### REMOVAL AND REPLACEMENT OF THE FAN MOTOR ASSEMBLY

To remove fan motor assembly:

1. Remove screws and remove back panel.
2. Disconnect electrical lead from the fan motor.
3. Remove two screws and lockwashers securing the fan motor bracket to the chassis base and remove the fan motor assembly and bracket from the cabinet.
4. Remove the nut from the end of the fan motor to the motor bracket and separate the motor from the bracket.

To replace the fan motor assembly, reverse the removal procedure.

### REMOVAL AND REPLACEMENT OF THE CYLINDRICAL ICE STORAGE BIN

1. Remove cabinet top.
2. Remove bin top wing nuts and remove bin top.
3. Pull UP and remove inner bin from insulated container.
4. Rotate counter-clockwise and remove inner bin bottom.
5. Remove hex nuts washers from bin base mounting bolts. Remove insulated ice storage bin.

# FD4 REMOVAL AND REPLACEMENT PROCEDURES

## REMOVAL AND REPLACEMENT OF THE WATER PRESSURE SWITCH ASSEMBLY

To remove the low water pressure switch assembly:

//////////////////// **WARNING** //////////////////////

**Be sure the electrical power supply and the water supply are OFF, BEFORE starting any of the following REMOVAL AND REPLACEMENT procedures as a precaution to prevent possible personal injury or damage to equipment.**  
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1. Remove screws and remove top, back and right side panel.
2. Disconnect electrical leads in the control box from the low pressure switch.
3. Unscrew the flare nut fitting and disconnect the low pressure control and washer from the bracket.

To replace the low water pressure control assembly, reverse the removal procedure.

## REMOVAL AND REPLACEMENT OF THE WATER RESERVOIR ASSEMBLY

To remove the water reservoir assembly:

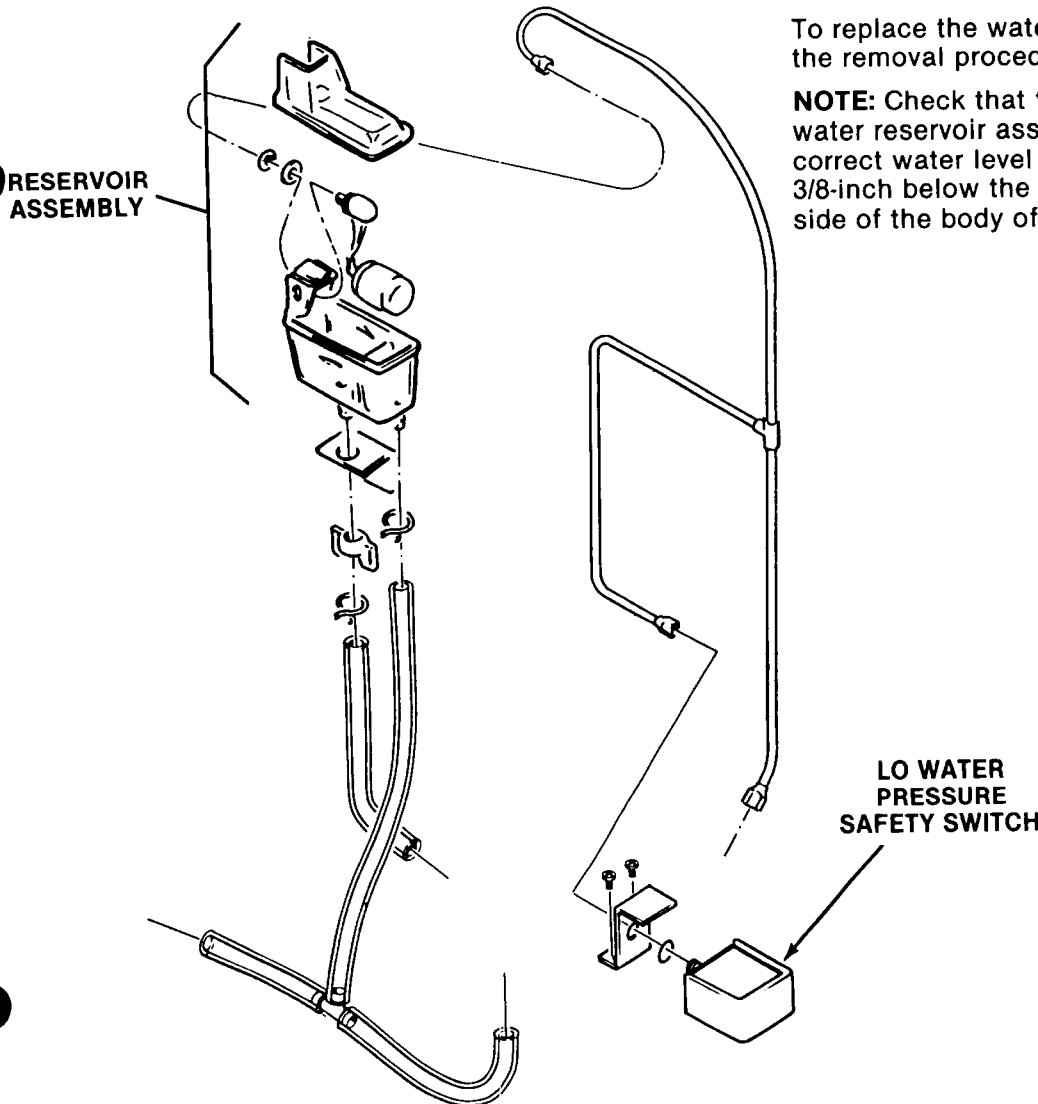
1. Remove screws and remove top, back and right side panel.
2. Turn OFF water supply to the icemaker at the hand shut-off valve.

**NOTE:** Be prepared with container or rags, to catch water left in lines, when lines are disconnected in next steps, to prevent draining water on parts, components, electrical lines, etc.

3. Disconnect the water inlet tube from the water reservoir assembly.
4. Remove two corbin clamps and two tubes from the bottom of the water reservoir assembly.
5. Unscrew and remove the plastic wingnut from the bottom of the water reservoir assembly.
6. Lift and remove the water reservoir assembly from the mounting bracket.

To replace the water reservoir assembly, reverse the removal procedure.

**NOTE:** Check that the installed replacement water reservoir assembly float moves freely. The correct water level in the water reservoir is 3/8-inch below the raised molded line, on the side of the body of the water reservoir.



# FD4 REMOVAL AND REPLACEMENT PROCEDURES

## REBUILDING THE 1/10 HORSEPOWER DRIVEMOTOR GEAR REDUCER ASSEMBLY

### DRIVEMOTOR PARTS

To replace the centrifugal switch and mechanism or the motor winding or the motor rotor, removal of the gearbox assembly is not necessary.

### ////////////////////// WARNING ////////////////////////

**Be sure the electrical power supply and the water supply are OFF, BEFORE starting any of the following REMOVAL AND REPLACEMENT procedures as a precaution to prevent possible personal injury or damage to equipment.**

### ////////////////////////////////////

1. Disconnect electrical power to the FD4. Remove top and right side panels.
2. Remove cover from the top of the centrifugal switch assembly and remove the electric wires from the microswitch. To replace just the centrifugal switch, remove two machine screws retaining the switch and remove the switch. To replace, reverse the procedure to this point.
3. If the motor is to be removed, the next step is to remove the four screws holding down the plastic switch assembly housing and lift the housing off of the motor top.
4. Remove the centrifugal switch mechanism from the rotor by unscrewing the machine screw at the top of the rotor.
5. The motor and housing may now be removed. Lift off the motor fan housing, and pull off the plastic fan. The next part to be removed is the motor winding. Disconnect the electrical leads of the motor from its control box location and lift off the winding.
6. The rotor is all that remains of the motor in the gear motor assembly. Use a pry bar to carefully pry up the rotor. (The only thing holding it in is the tight fit of the bottom rotor bearing into the top of the gear case.) To replace any of the above parts, reverse the disassembly procedure.

### REMOVAL OF THE DRIVEMOTOR ASSEMBLY

To remove the Drivemotor Assembly:

1. Remove top and right side panel.
2. Remove bin top assembly.
3. Unscrew three capscrews retaining freezer assembly to the gearmotor assembly.

4. Unscrew two capscrews under gearmotor chassis support retaining gearmotor to the frame.
5. Remove motor electrical leads from the connections.
6. Raise freezer assembly up enough that the output shaft clears the freezer adaptor.
7. Remove the gearmotor assembly by sliding it out from under the freezer.

### DRIVEMOTOR ASSEMBLY

After removal of the drivemotor gear reducer from the unit, inspect the internal parts of this gearmotor:

1. Place gearbox on a flat surface, covered with rags to absorb any spilled lubricant.
2. Using a punch, drive the roll pins out of the casing.
3. Remove the four capscrews on the top of the gear case and the two under the motor.
4. Pry the two cases apart.

When inspecting the internal parts, look for:

- \* Condition and quantity of lubricant. (The proper oil level is near the top of the output (biggest) gear.) (5 oz. capacity) Use Scotsman Gear Case Oil, P/N A25835-001.
- \* Bearing condition
- \* Gear and gear shaft condition
- \* Woodruff key between output gear and shaft.
- \* Grease seals, back to back
- \* Vent hole

Be sure to count and retain the spacer washers as they come out of the gearbox.

Replace the parts as required, using the part numbers found in the parts list section of this manual. Replace the gears into a CLEAN bottom gearcase, replacing the spacer washers in the same quantity as they were upon disassembly. If no count was kept, refer to the parts illustration.

### NOTE

*Some bearing grease should be placed in all bearings before assembly to insure proper lubrication upon start-up.*

# FD4 REMOVAL AND REPLACEMENT PROCEDURES

## DRIVEMOTOR ASSEMBLY

To reassemble:

1. Set top gearcase on gears and spacers and oil. Be sure O-ring is in place.
2. Drive rollpins back into locating holes.
3. Replace capscrews into gearcase covers and torque (8 capscrews) at 80-90 inch pounds.
4. Bench test the gearmotor assembly.

Test for noise, amp draw (must not be in excess of icemaker nameplate for gearmotor) and oil leaks.

Return gearbox to the unit. Be certain all mounting surfaces are clean and reassembly gearbox to chassis and freezer assembly.

If the freezer water seal begins to leak, removal of the auger is required in order to replace the top and bottom bearing and water seal. AT THE SAME TIME, it would be recommended to remove the gearmotor assembly, open it up and inspect it.

