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MECHANICAL SPECIFICATIONS

	SF1 Air Cooled	SF1W Water Cooled
Compressor	1/2 HP Copelaweld	Same
Condenser	Air Cooled	Water Cooled
Refrigerant	20 oz. R 12	18 oz. R 12
Refrigerant Control	Capillary Tube	Same
Power Consumption - Compressor	11.0 Amps.	Same
Power Consumption - Gear Motor	4.0 Amps.	Same
Current	115 V, 60Hertz, 1 Ph.	Same
Gear Motor Drive	1/10 HP	Same
Worm-R.P.M.	10.5	Same
Water Consumption - Freezer	2.5 Gallons per hour	Same
Water Consumption - Condenser		Varies from .75 to 2 G.P.M.
CABINET DIMENSIONS	SF1	SF1W
Width	38 1/2"	38 1/2"
Depth	24 1/2"	24 1/2"
Height	40"	40"
Height With 6" legs	46"	46"
SHIPPING WEIGHT		
Approx. shipping weight	312	312

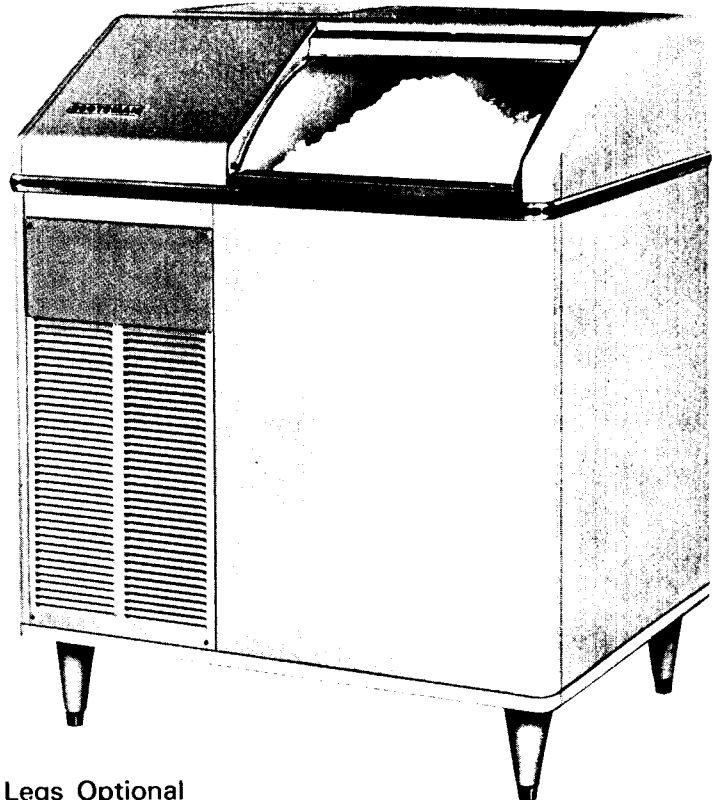


PRODUCT NAME:

SCOTSMAN
FLAKER MODEL
SF1 SERIES

MANUFACTURER:

QUEEN PRODUCTS DIVISION
KING-SEELEY THERMOS CO.
ALBERT LEA, MINNESOTA 56007



Legs Optional

KLP2E Leg Kit
KLP2S Leg Kit

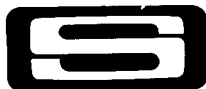
ice making capacity

Daily Ice Capacity is directly related to condenser air inlet temperature, water temperature, and age of machine.

NOTE: To keep your SCOTSMAN FLAKER performing at it's maximum capacity, it is necessary to perform periodic maintenance as outlined in this maual.

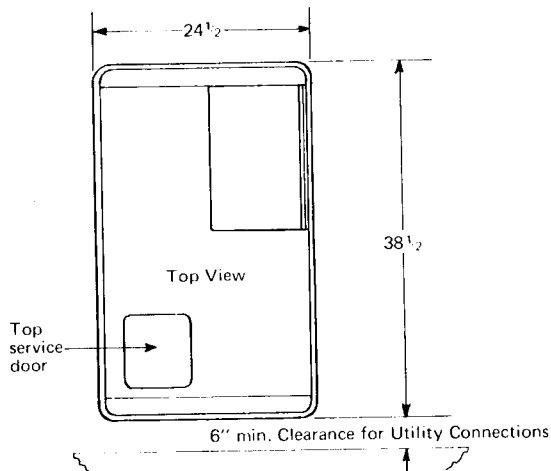
MANUFACTURER:

QUEEN PRODUCTS DIVISION
KING-SEELEY THERMOS CO.
ALBERT LEA, MINNESOTA 56007



SCOTSMAN

SF1 SERIES



Capacity: Refer to production chart.

Storage Bin: 200 lbs. Stainless Steel Lined

Height: (with legs) 46-1/4"
(without legs) 40-1/4"

Width: 38-1/2"

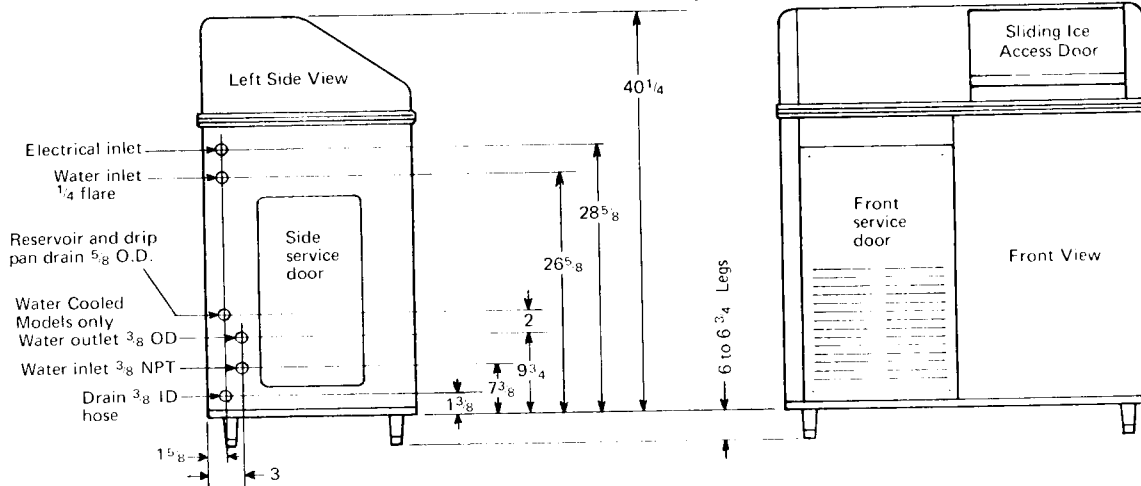
Depth: 24-1/2"

IMPORTANT OPERATING REQUIREMENTS

ELECTRICAL VOLTAGE: Machine requires voltage indicated on rating nameplate. Failures caused by improper voltage are not considered factory defects

Ambient Temperature: Machine is not designed for outdoor installation. Machine will not operate when air temperature is below 50° F. or above 100° F.

Water Pressure & Temperature: Requires 20 lbs. flowing water pressure, without interruption. Machine will not operate when water supply temperature is below 40° F. or above 100° F.



SPECIFICATIONS:

Model	Condensing Unit	Compressor Horsepower	Finish (P-painted) (SS-Stainless Steel)	Shipping Weight (lbs.)	Basic Electricals	Minimum Wire Sizes (w-wire) (g-gauge)	Total Amperages
SF1WSJ	Air	1/2	P	312	Air Cooled 115/60/1	2w 12g	16.5
SF1WSJSS	Air	1/2	SS	312			
SF1WWSJ	Water	1/2	P	312	Water Cooled 115/60/1	2w 12g	16.0
SF1WWSJSS	Water	1/2	SS	312			

SPECIFICATIONS

SCOTSMAN Flakers are designed for restaurants, super markets, soda fountains, hospitals, bakeries, fish markets, poultry stores, packing plants, etc. It is the finest Ice Maker on the market today. It will work 24 hours a day for you, or only as needed. It produces the highest quality ice available at any price.

Approximately 500 pounds of SCOTSMAN crushed ice is delivered each 24 hours to the storage bin for immediate use.

SCOTSMAN Flakers are easily installed requiring only standard water, drain and electrical connections.

ATTRACTIVE COMPACT CABINET. Sandlewood or stainless steel finish with chrome trim, rounded corners, and removable panels for easy access to mechanical parts. Adjustable and removable legs are under cabinet.*

SEALED REFRIGERATION SYSTEM. Provides quiet, efficient operation of the machine. Compressor motor is internally spring mounted for quiet operation. Compressor is covered by a full 5-Year Parts Only Warranty.

HOW IT WORKS. An exclusive patented ice-making system, wherein water in the constant level float reservoir is fed to the bottom end of the freezing cylinder and turns to ice on the inside of this cylinder. Ice from the refrigerated walls of this cylinder is extruded past the ice breaker at the top of the cylinder through a side opening by means of a stainless steel auger driven by a gearmotor drive.

ALL SCOTSMAN SF1 series are completely automatic. A manual switch on the front starts the machine, and from then on, produces flakes automatically. When the storage bin fills, the machine automatically shuts off and starts up again when ice is taken from the storage compartment.

*Accessory Item

SCOTSMAN SUPER FLAKERS PREPARATION FOR INSTALLATION

1. UNCRATING

The entire unit comes in one cardboard carton. Upon delivery a visual inspection of the carton should be made and any severe damage noted should be reported to the delivering carrier and a concealed damage claim filed subject to internal inspection with carrier representative present. Remove carton by pulling staples driven through sides of carton into the bottom skid and lift carton straight up and off. Next remove (4) four bolts from underside of skid which connect to complete unit base. Unit now free from all crating.

2. Remove all service doors and panels.
3. NOTE: Standard models SF1 are complete without legs. If you wish to mount your machine on standard 6" legs, this may be accomplished by ordering the optional leg kit, KLPE for painted models or KLPS for stainless steel models.
4. Check motor compressor hold down nuts to insure motor compressor rides snug on mounting pads.
5. Remove water strainer from storage bin for installation on unit or in water supply line feeding unit.
6. Open electrical control box and prepare for hook up, use knock outs, cord connectors etc. Then check unit nameplate voltage against building source voltage and make sure they correspond. Caution - Improper voltage supplied to units will void your warranty protection.
7. Select unit location prior to hook up of water drain and electricals in accordance with local and national codes. Minimum room temperatures is 50° Fahrenheit. On air cooled models, select well ventilated location.
8. Remove warranty card in Users manual from storage bin, then wipe bin clean with damp cloth.
9. Fill out warranty card completely including model and serial numbers as taken from aluminum plate found behind front service panel and forward to Scotsman Factory using self mailing card.
10. Level unit with adjustable legs.*

*Accessory Item

SELECTING LOCATION

UNDER BAR INSTALLATIONS: Locate, if possible, so left end panel is accessible. Locate so proper circulation can be attained around the unit and behind it at least four inches.

KITCHEN INSTALLATIONS: As a rule, the kitchen is not the most practical place to install an air-cooled condensing unit, as grease is almost always present and makes cleaning of the condensing unit difficult. Do not locate near range or steam table or other heating devices that may be used in the kitchen.

STOREROOM INSTALLATIONS: Be sure storeroom is of adequate size and properly ventilated. A small, poorly ventilated room will greatly impair the efficiency of the unit. The storeroom must be kept above 50 degrees in the winter months.

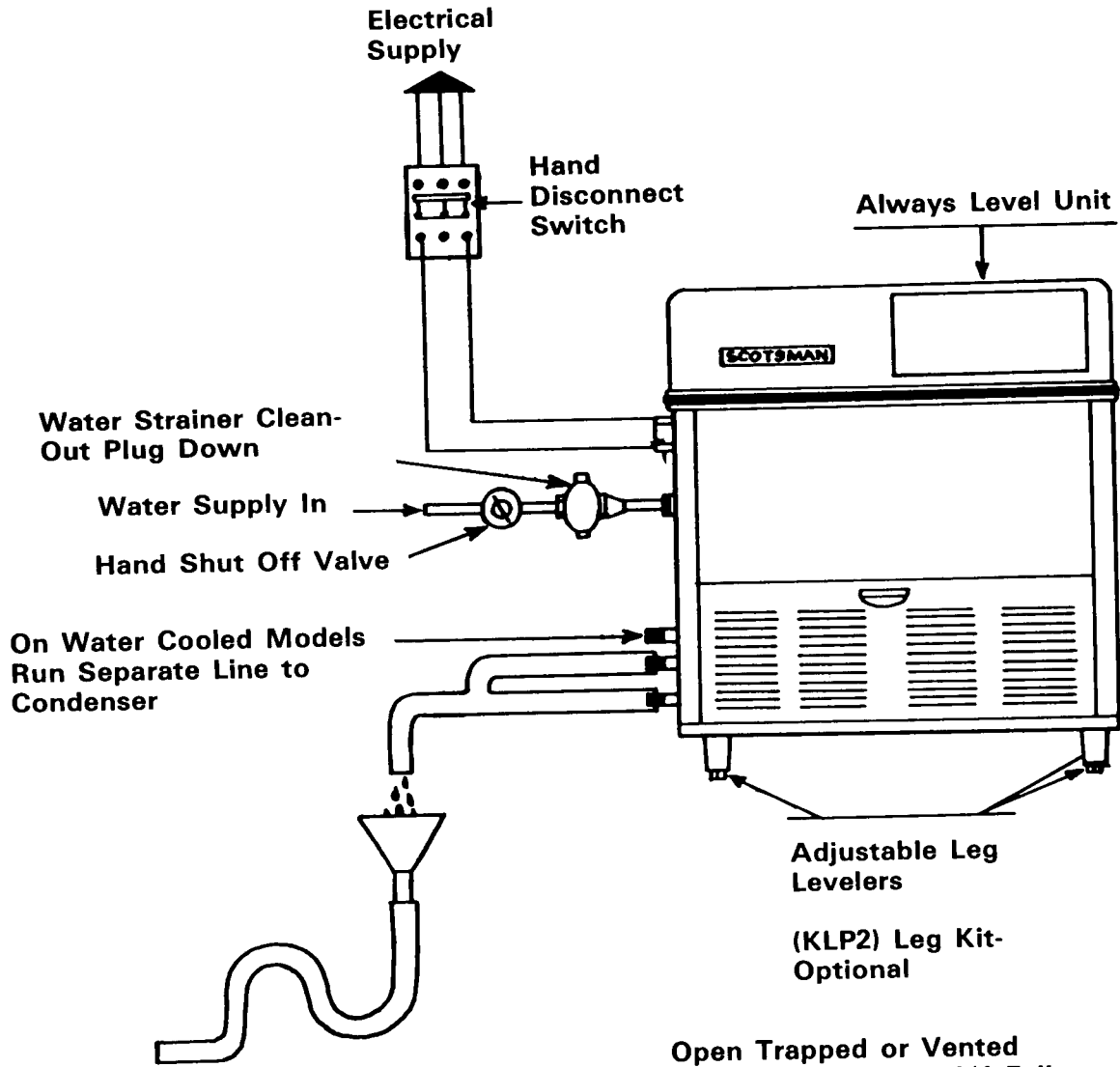
BASEMENT INSTALLATIONS: Locate machine in the coolest place. Locate machine in a dry place. Keep away from furnace and boiler room. Keep away from service chutes and runways; also coal or other dust of any kind. If the machine is set over a floor drain, block the machine up enough to level it. If there is any chance of basement flooding, block the machine up enough to eliminate any possible damage to the machine.

WATER SUPPLY: The recommended water supply line is 1/4 inch I.D. copper tubing for SF-1. Connect to cold water supply line with regular plumbing fittings, with a shut-off valve installed in a accessible place between supply line and machine. A water strainer must be installed with the unit and mounted with clean-out plug down. Locate the strainer next to the machine with the arrow in the direction of the flow. Most plumbing codes also call for double check valves in the supply water line, particularly for water-cooled models. Minimum temperature of inlet water 40° F.

On air-cooled models the water supply line connects to the 1/4 inch flare fitting on the machine. On water-cooled models connections are made to a 3/8 inch male pipe nipple inside of the machine compartment. Incoming water goes through the water regulating valve first and then to the water-cooled condenser. Observe arrow on water regulating valve. Water supply must be installed to conform with local code. In some cases a licensed plumber and/or a plumbing permit will be required.

DRAIN: The recommended drain from the bin is 5/8 inch OD copper tubing. Must be run to an open trapped and vented drain. If drain is a long run, allow 1/4 inch pitch per foot. Drain must be installed to conform with local code. Run separate line for condenser discharge water on water-cooled models.

INSTALLATION PRACTICE



Open Trapped or Vented
Drain. Recommend 1/4 Fall
per foot of run on drain lines.

INSTALLATION LIMITATIONS

Electrical

1. Scotsman, like most manufacturers, purchases electrical motors that are rated to operate within 10% variance above or below nameplate ratings.
2. Improper voltages applied to Scotsman equipment can cause premature failures and burnouts. Failures of this type are not considered as factory fault or defect.

Ambient

WARNING — This machine is not designed for outdoor installations. This machine will not operate when air temperatures are below 50° F. or above 100° F.

This unit was not fabricated nor intended to be installed outdoors.

Water

3. Scotsman Ice Systems require 20 pounds flowing water pressure to operate satisfactorily. Pressures lower than 20 pounds or interruptions in the water supply can cause serious mechanical damage to this product.

This machine will not operate when water supply temperatures are below 40° F. or above 100° F.

INSTALLATION

ELECTRICAL CONNECTIONS:

SF1 SERIES

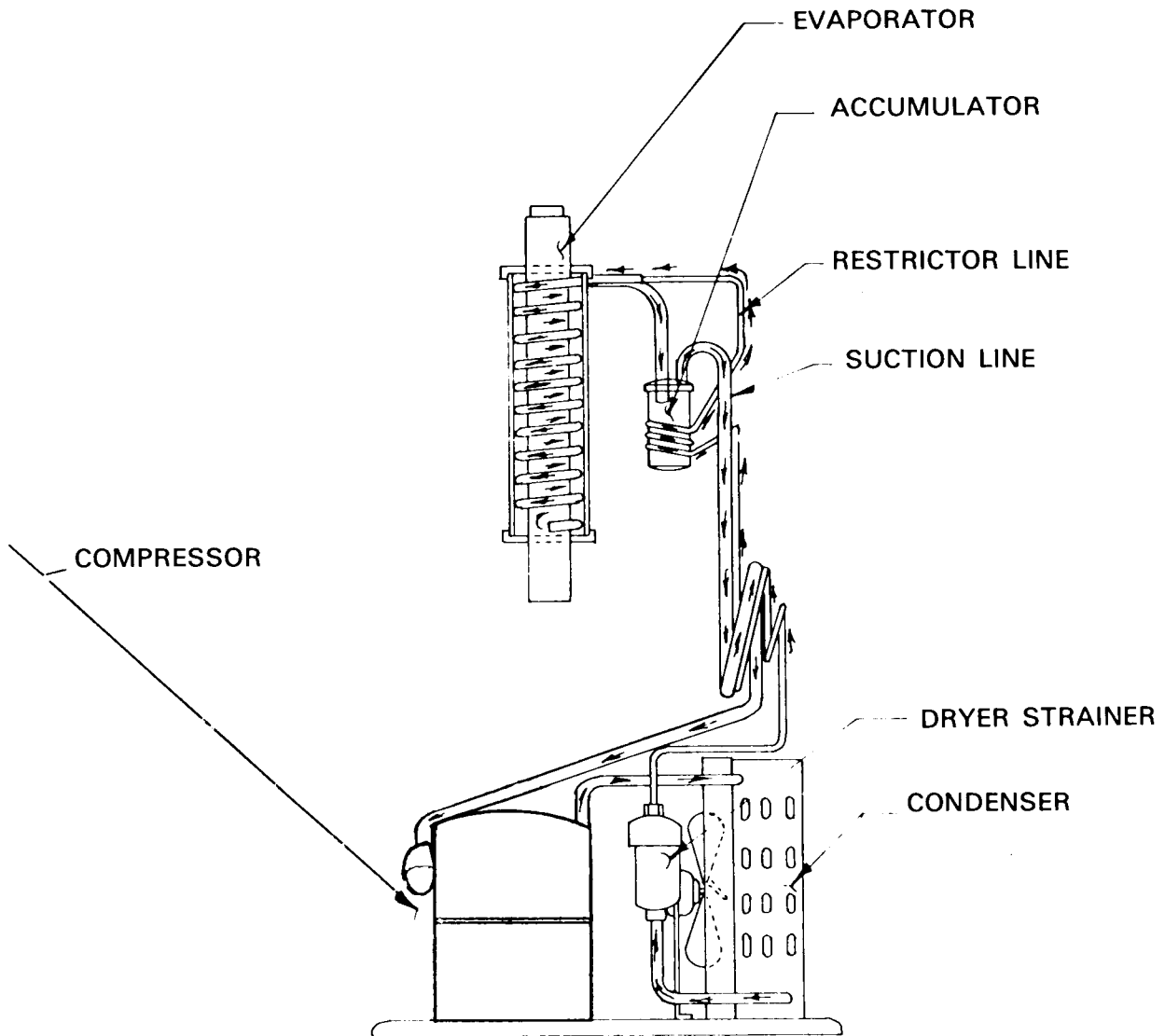
SF1

Basic Electricals		Total Amps	No. of Wires	Max. Fuse Size
Air-Cooled:	115/60/1	16.5	2	20
Water-Cooled	115/60/1	16.0	2	20

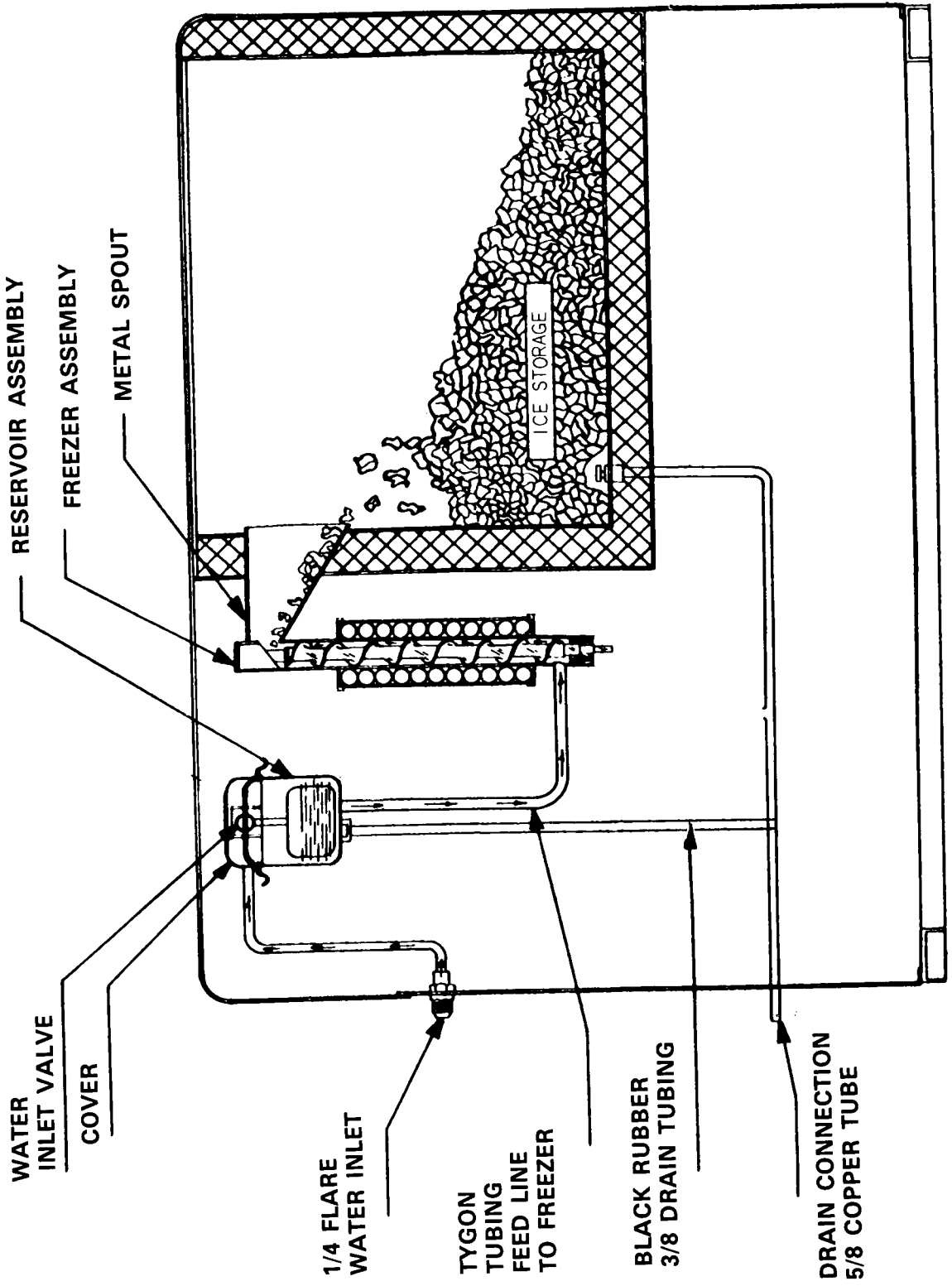
Be certain that the Flaker is on its own circuit and individually fused. The maximum allowable voltage variation should not exceed 10 per cent of the nameplate rating even under starting conditions. Low voltage can cause erratic operation and may be responsible for serious damage to the overload switch and motor windings.

All external wiring should conform to the National Underwriters and local Electrical Code requirements. Usually an electrical permit and the services of a licensed electrician will be required.

Compressor	1/2 HP	Copelaweld: RSN2-0050-1AA-207
	Voltage	2 pole, 3500 RPM 115
	Amp. rating F.L.A.	12.0
	Hertz	60
	Phase	Single
Gear Drive Motor	1/10 HP	Queen Products
	Voltage	115
	Amp. rating	4.0
	Hertz	60
	Phase	Single Thermally Protected

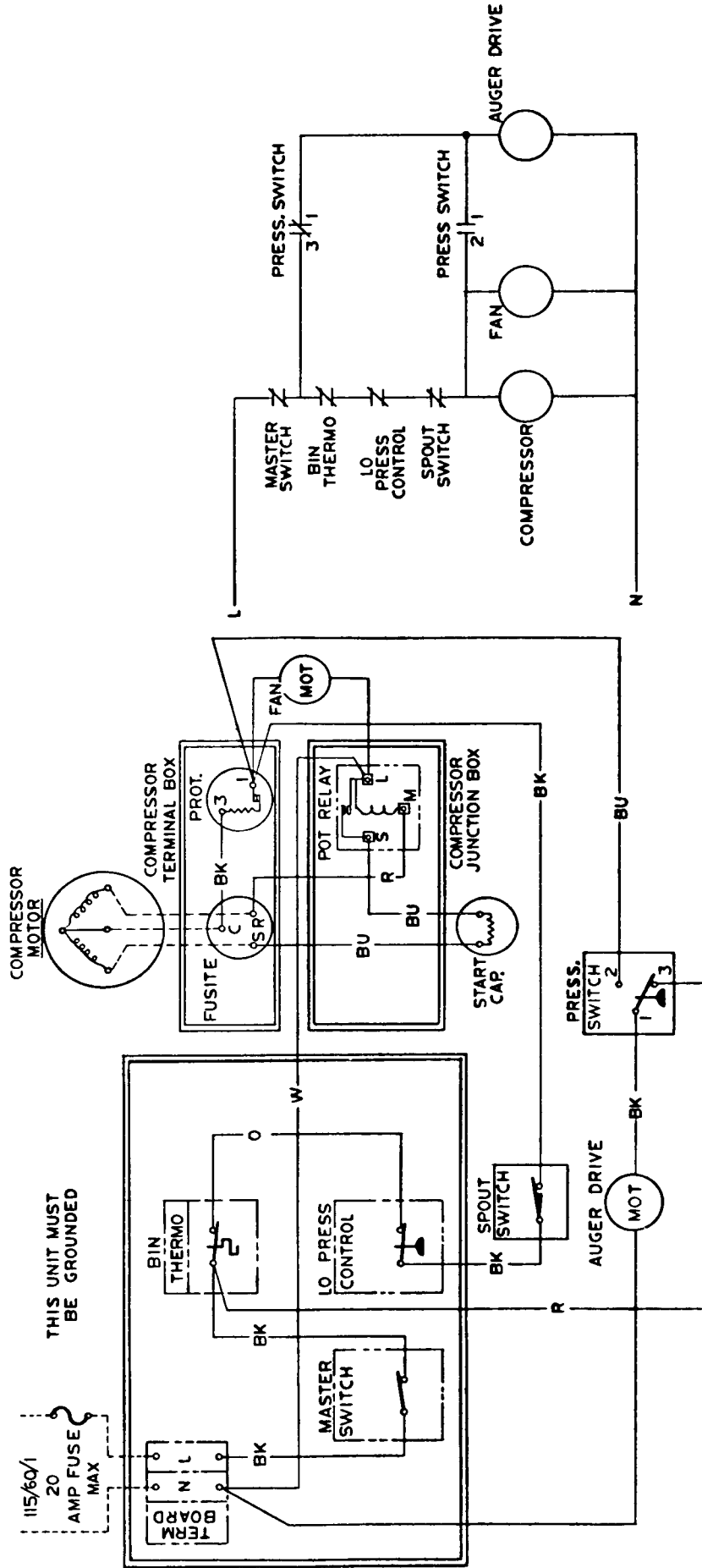


REFRIGERATION CYCLE SF1 ALL MODELS



WATER SCHEMATIC
SF1 SERIES

A27038-001



WIRING DIAGRAM

Air Cooled SF1 Series

115/60/1

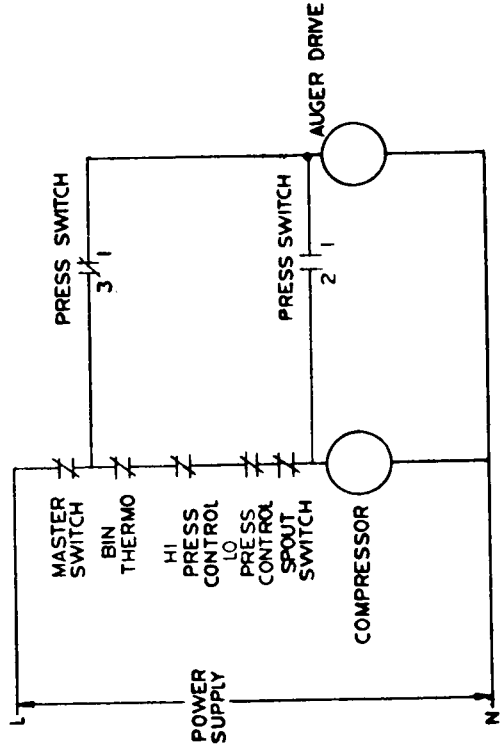
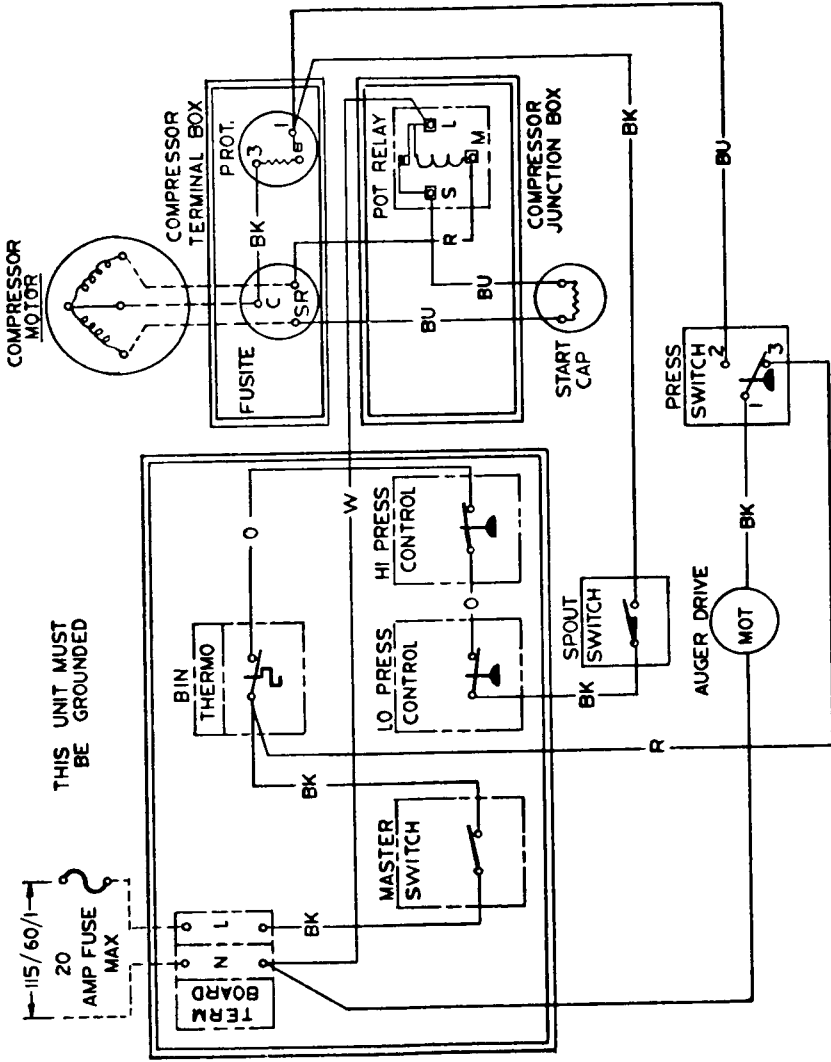
ALL CONTROLS SHOWN IN NORMAL ICE MAKING MODE

WIRING DIAGRAM

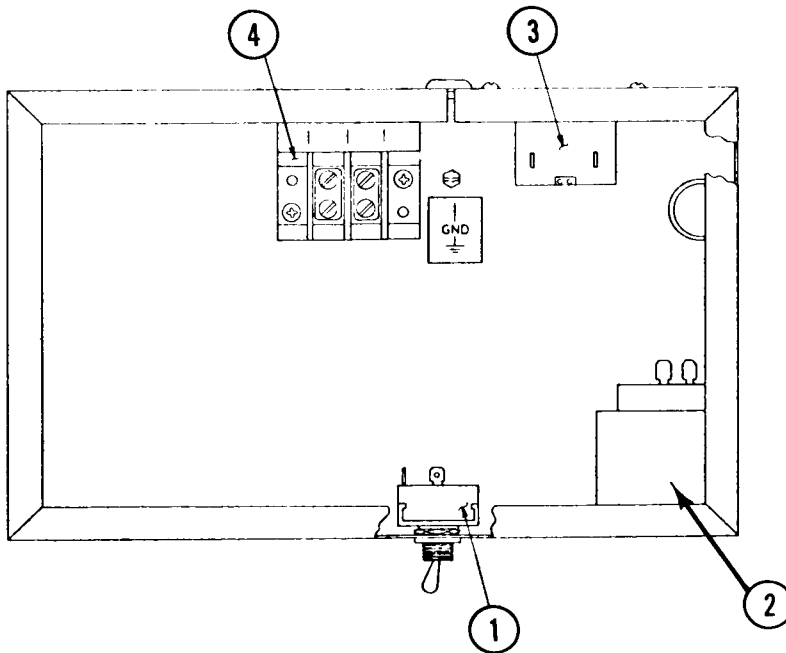
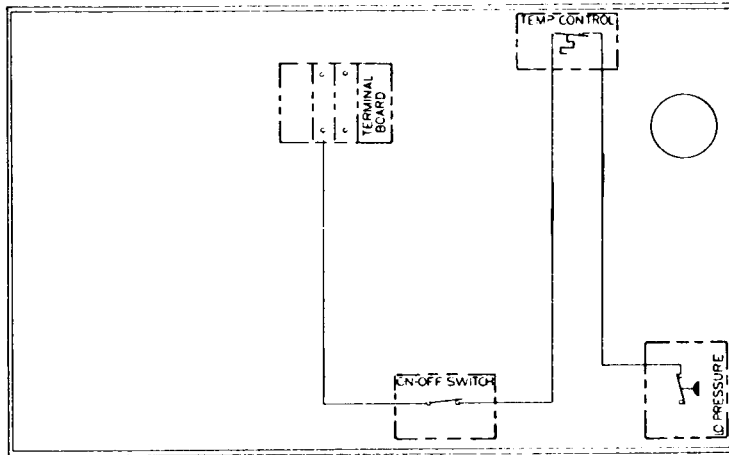
Water Cooled

SF1W Series

A26006-001

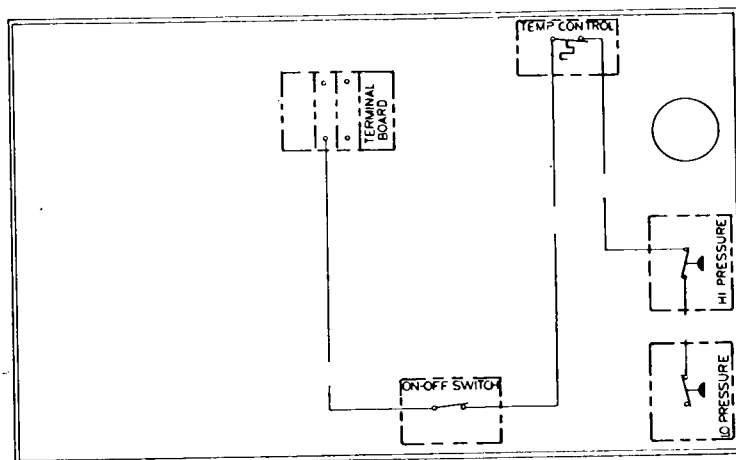


ALL CONTROLS SHOWN IN NORMAL ICE MAKING MODE

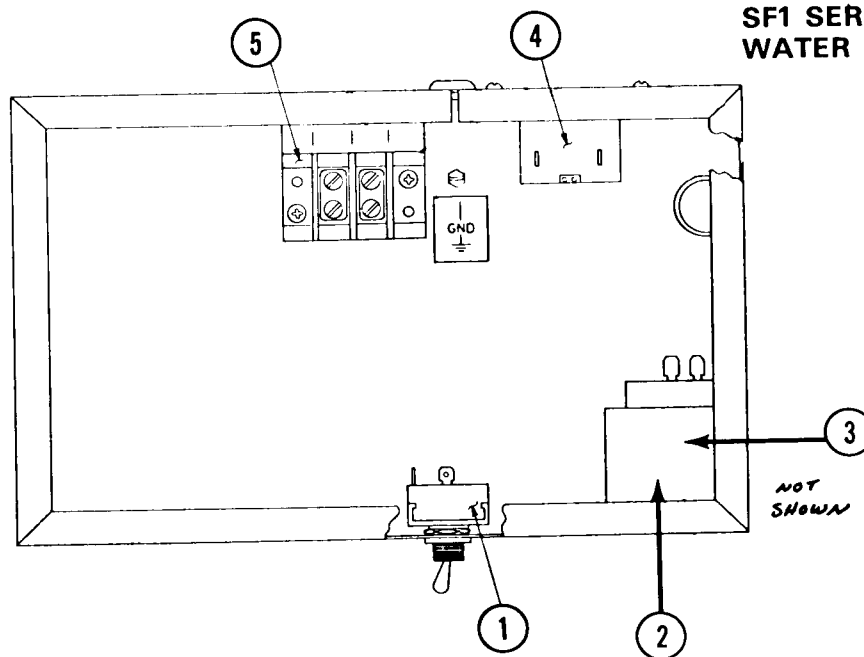


**CONTROL BOX
SF1 SERIES
AIR COOLED 115/60/1**

ITEM NO.	PART NO.	DESCRIPTION
1.	12-0426-01	Switch
2.	11-0358-01	Lo-Pressure Control
3.	11-0354-00	Temp Control
4.	12-0813-04	Terminal Board



**CONTROL BOX
SF1 SERIES
WATER COOLED 115/60/1**



ITEM NO.	PART NO.	DESCRIPTION
1.	12-0426-01	Switch
2.	11-0358-01	Lo-Pressure Control
3.	11-0388-02	Hi-Pressure Control (Water Cooled Only)
4.	11-0354-00	Temp Cont
5.	12-0813-04	Terminal Board

FINAL CHECK LIST

1. Is the unit level? (IMPORTANT)
2. Have all electrical and piping connections been made?
3. Has the voltage been tested and checked against the nameplate rating?
4. Is the water supply valve open and the electric power on?
5. Is the water reservoir filled and shut off?
6. Have unit and bin been wiped clean?
7. Has user been given the Owners manual, and has he been instructed on how to operate the machine?
8. Have the installation warranty card been filled out and mailed to the factory?
9. Check all refrigerant and conduit lines to guard against vibration and possible failure.
10. Installed in a well ventilated room where ambient temperatures do not fall below 50° Fahrenheit.
11. Is unit installed with a minimum 4" air space around side and back?
12. Minimum inlet water temperature 40° F.

SERVICE

STARTING THE MACHINE: When the machine is placed and inspected as per instructions and all plumbing and electrical connections are completed and tested, turn on the water supply. Be sure the float cover is removed to check on the float operation and water level in the water reservoir. Be sure the water reservoir is filled before starting the machine. Water level should be 1/4 inch below the reservoir overflow.

When this is completed, turn on the manual switch on the front of the cabinet and the machine is in automatic operation. In two to three minutes ice will start dropping off the worm shaft and out the ice chute. Let the machine operate for at least 30 minutes and check for any excess noise other than the normal compressor noise. Test the ice storage control bulb by holding a handful of ice around the bulb until the machine shuts off. One minute should be normal for the control to function. Within minutes after the ice is removed, the bulb will warm up and the machine will automatically start up. The control is factory set and should not be reset until this test is made. Normal setting of this control should be approximately 35 degrees cut-out and 45 degrees cut-in.

Check pressure settings at the time of start-up. On the water cooled models set the head pressure at 135 PSI. On the air-cooled models the head pressure will vary between 130 and 145 PSI head pressure. The frost line should extend out of the accumulator if properly charged with refrigerant and suction pressure will range between 14 and 16 PSI with 50° F inlet water.

Service gauge connections are available on both high and low side service valves on water cooled and air cooled models.

To install gauges to any of these connections, use lines with tire type service valve adapter. Purge free of any non-condensable gases before starting any test operation.

REFRIGERANT CHARGE: The below refrigerant charge is approximate. When charging, set at 135 PSI head pressure and charge so that the frost line extends out of the evaporator and into the accumulator after fifteen minutes of operation.

Model	Charge
Air-Cooled	20 oz. R-12
Water-Cooled	18 oz. R-12

LOW PRESSURE CONTROL SWITCH

- b. On all Scotsman units using a 1/15 or 1/10 H.P. gear motor, the centrifugal switch mechanism, mounted on top of the motor, was removed and replaced, in the system, with a low pressure control switch. This is a single pole double throw (SPDT) switch manufactured by Texas Instruments. (Queen Products Part No. 11-0396-01*).

*Refer to a typical wiring diagram, showing contacts, for description of switch function.

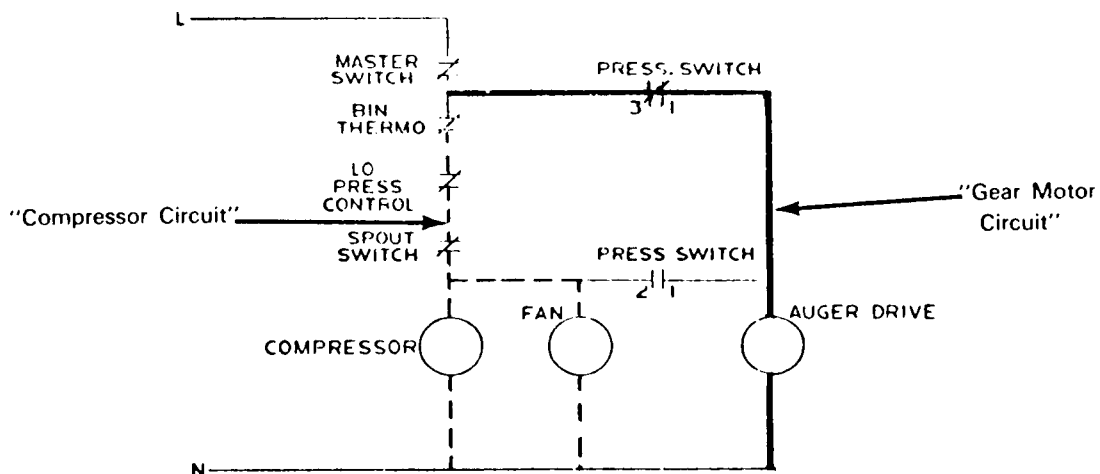
On all Queen Products wiring diagrams, the controls are shown in the ice making mode. Thus, the 1-3 contacts are shown as closed. On machine start up the 1-3 contacts are open and the 1-2 contacts are closed. As the unit begins to run, the low side pressure starts to fall from the stabilized or "at rest" pressure. As soon as the pressure drops to 21 Psig, the 1-2 contacts open and the 1-3 contacts close. This removes the operating controls, such as the bin thermostat, from the "gear motor circuit". If one of the operating controls opens, it will shut off the "compressor circuit". The gear motor will run until the low side pressure rises to 29 Psig. At this point the 1-3 contacts open and turns the gear motor off. This usually takes 1-3 minutes depending on ambient conditions. This length 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 load to start up against. On start up, again, the 1-3 contacts are open and the 1-2 contacts closed.

*Function 11-0396-01 Low Pressure Control Switch

1-3 Contacts - Open on Pressure Rise
Opens at 29 Psig
Closes at 21 Psig

1-2 Contacts - Open on Pressure Fall
Opens at 21 Psig
Closes at 29 Psig

ALL CONTROLS SHOWN IN NORMAL ICE MAKING MODE



SERVICE

WATER SYSTEM: A water level is maintained in the water reservoir by a float operated valve. Water is piped from the water reservoir to the freezing chamber by a gravity feed line maintaining an equal water level.

The water reservoir is equipped with an air gap to prevent back siphoning and meet all health codes.

The water level in the water reservoir is adjusted by bending float arm. The water level should be set 1/4 inch below the moulded in overflow well.

A water strainer must be installed in the supply line. Use strainer sent with machine.

ELECTRICAL SYSTEM: The Flaker Model SF1 is designed to work on standard electrical supply 115 volts, 60 Hertz single phase.

Supply voltage should not vary more than plus or minus 10 percent over nameplate rating.

Special voltage requirements are available on special order. Therefore, always check nameplate for this information before connecting electrical supply.

The electrical circuit consists of condensing unit, freezer gear motor, storage bin thermostat ON and OFF switch and spout micro (safety) switch.

A. **CONDENSING UNIT:** The starting capacitor and starting relay are housed and fastened to the motor compressor.

B. STORAGE BIN THERMOSTAT: Thermostat control body is located in electrical control box. The thermostat sensing tube is threaded into the ice storage bin where it automatically stops the icemaker when ice bin fills to sensing tube level and restarts icemaker when ice is removed. Factory settings are 35° cut out, 45° cut in.

Altitude correction begins at 2,000 feet, cut in and cut out screws should be adjusted equally, not more than 1/4 turn at a time.

C. MICRO SAFETY SWITCH: The micro switch is located in the top of the ice chute. The switch is operated by a pressure plate inside the ice chute. Ice backs up in the chute if the storage bin thermostat fails. Micro switch will shut off the condensing unit only, when operated.

D. ON-OFF SWITCH: A manual on-off switch is located in control box.

E. SAFETY CONTROL: High head pressure. On water cooled models only. Factory set to stop entire icemaker if head pressure reaches 190# PSIG. Manual reset, adjustable.

F. SAFETY CONTROL: Low back pressure. Used on both models, this control is set to electrically "open" at 2# PSIG, stopping entire icemaker. Manual reset, non adjustable.

CABINET TOP (HOOD)

1. Remove two back end screws of chrome strip.
2. Pull out tape concealing screws.
3. Remove balance of screws in chrome strip.
4. Lift off hood.

HOOD SERVICE DOOR TOP

1. Remove screws from edges.
2. Lift out door.

CABINET SIDE SERVICE DOOR

1. Remove four screws on edges.
2. Lift out door.

CABINET FRONT SERVICE DOOR

1. Front door pulls out. 4 screws

CABINET REAR SERVICE DOOR

1. Remove four screws on corners of rear service door.
2. Pull door out.

ICE STORAGE DOOR

1. Lift door up, slide back 6". Remove thumb screw that attaches safety lanyard to back of door.
2. Door will now slide out. Lift front edge slightly to clear hood lip.

ICE STORAGE DOOR FRAME

1. Remove six screws at bottom and sides.
2. Remove screw in frame back.
3. Frame will now lift out.

MOTOR COMPRESSOR

1. Remove gas charge.
2. Disconnect wiring from the compressor.
3. Loosen suction and discharge lines and cap off.
4. Remove the compressor hold-down nuts and lift compressor out of the unit.
5. Reverse steps 1 through 4 in replacing compressor.

SERVICE

FREEZER ASSEMBLY

1. In most instances, it will be faster to remove freezer by first removing cabinet top or hood. (See Removing and Installing Cabinet Parts.) Assembly can be changed if necessary through hood top panel.
2. Shut off water supply to unit, remove top and left side service panels.
3. Disconnect water inlet line at reservoir. Remove water supply tube at freezer and drain freezer.
4. Purge off refrigerant, unsweat section line, disconnect capillary line at drier. Cap off all lines so no moisture can enter system.
5. Remove insulation pieces around spout, also the spout proper.
6. Remove 3 bolts holding adapter base to gearmotor top cover, lift freezer out of cabinet.
7. Remove adaptor spout front and back plates from old freezer and install on new replacement.
8. Re-install in reverse of above.

FREEZER WORM SHAFT

1. Turn unit off, before removing worm shaft.
2. Shut off water supply to unit.
3. Remove hood service doors.
4. Remove top and bottom straps around spout insulation pieces, remove pieces.
5. Remove two slotted head screws which fit through top chamber wall into ice breaker.
6. Tap spline coupling loose on bottom end of freezer worm shaft.
7. Complete worm shaft with ice breaker attached will now come out by lifting up on freezer cap pull ring. NOTE: Top half of water seal will come with worm shaft.
8. To remove ice breaker from shaft, first remove retainer ring in top of ice breaker.
9. Remove freezer cap and pull ring from ice breaker.
10. Remove cap screw holding shaft through bearing and pull worm shaft free from ice breaker and bearing.
11. If shaft is defective, remove water seal top half and put on new worm shaft before reassembling—when reassembling, by reversing above, put a small amount of Vaseline on shaft end. This will allow shaft to slide smoothly through rubber bottom half of water seal without tearing it.

WATER SEAL

1. To replace water seal, follow steps 1 through 7 under Worm Shaft Removal.
2. Remove 3 bolts holding freezer to mounting adapter.
3. Lift freezer off adapter just high enough to allow bottom bearing and bottom half of water seal to be removed from bottom of freezer tube.
4. Lightly grease bottom half of new water seal and insert face up approximately 1/2" in bottom of freezer tube.
5. Insert bottom bearing in bottom of freezer tube, force approximately 1/8" past bottom tube end. This will allow the positioning ring on adaptor to properly position freezer tube when tightening up the three mounting bolts.
6. After securing mounting bolts, put new top half of water seal on worm shaft the same way as the old seal was removed.
7. Carefully insert worm shaft assembly in freezer tube and into spline coupling on bottom.
8. Replace ice breaker screws, insulation pieces and unit is ready to resume operation.

SERVICE

STORAGE BIN THERMOSTAT:

1. Disconnect electrical supply.
2. Remove bin thermostat bulb from bin location along with its capillary tube.
3. Remove control box cover.
4. Disconnect two spade type electrical leads.
5. Loosen two screws in control mounting bracket.
6. Replace with new control and reassemble in reverse of above.
7. CAUTION: Always check new control power element charge before installation to assure receiving an operative control. A handful of ice on bulb will register an audible 'click' at cut off.

WATER RESERVOIR

1. Remove service panel in cabinet hood.
2. Turn off water supply and drain reservoir.
3. Remove 1/4 inch inlet water line.
4. Remove 1/2 inch plastic feed line to freezer.
5. Remove wing nut holding reservoir to bracket.
6. Lift out reservoir.
7. To replace, reverse procedure.

SERVICE

MICRO SWITCH IN SPOUT

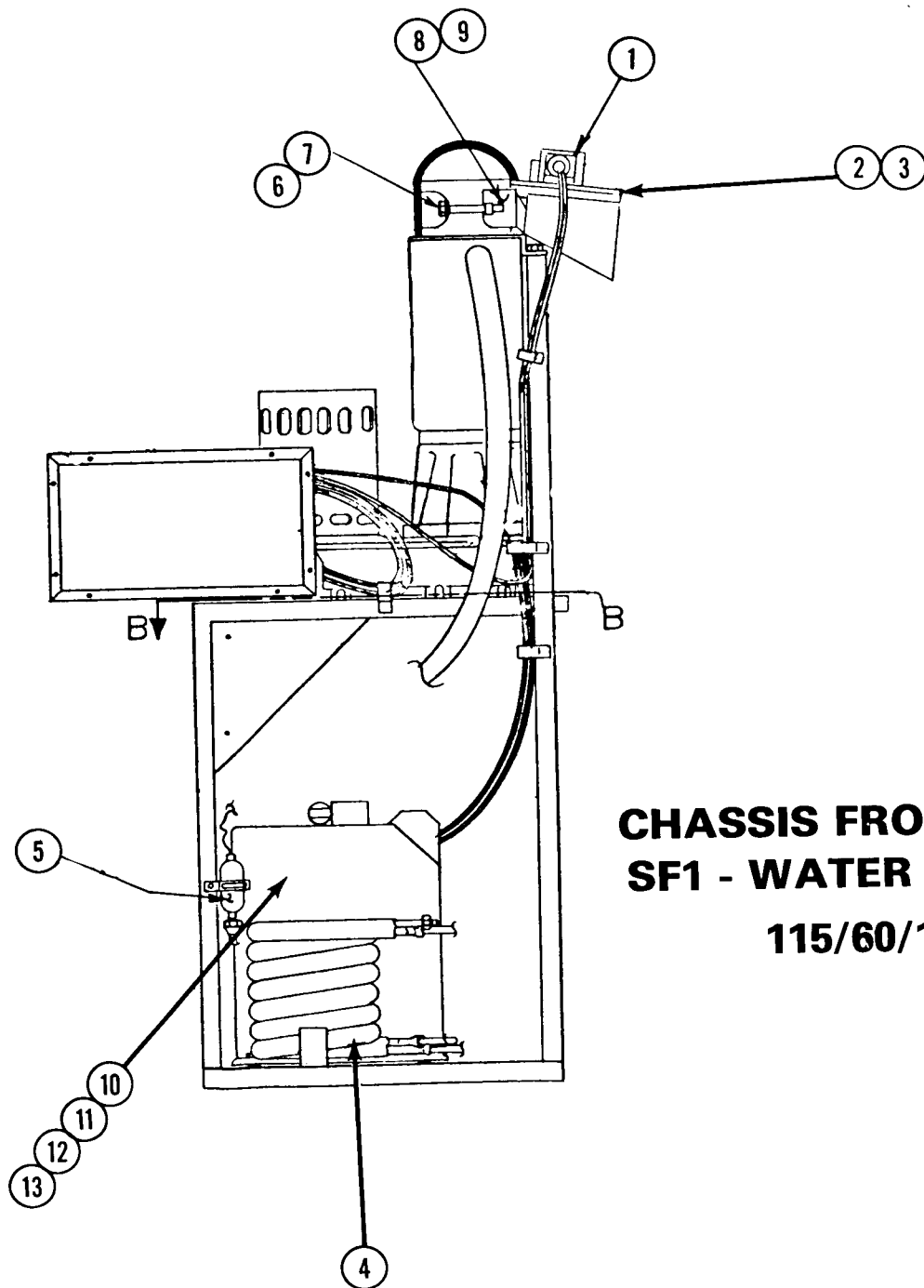
1. Remove hood service panel.
2. Remove insulation pieces around freezer spout.
3. Remove micro box cover, loosen two screws at rear of box holding switch in place, lift up.
4. Disconnect electric leads.
5. Reassemble with new micro switch.

MANUAL ON AND OFF SWITCH

1. Remove front service door.
2. Remove two screws holding switch to bracket.
3. Disconnect electrical leads from switch.
4. Remove switch.
5. To replace, reverse procedure.

FREEZER GEARMOTOR

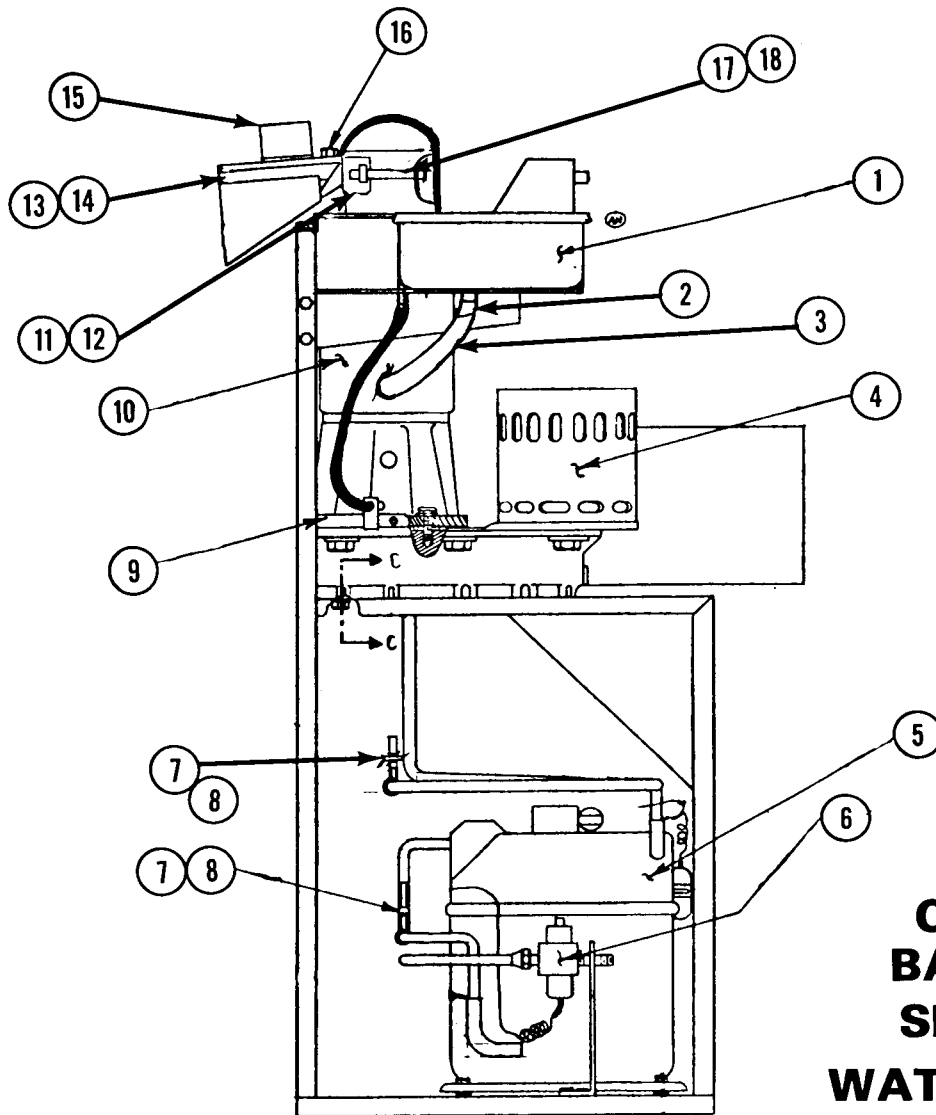
1. The easiest way to change the gearmotor is to remove complete cabinet hood as explained earlier in this section. If necessary because of location you can change by removing top service panel.
2. Pull off left side service panel and look up on underside of left side cabinet panel: 4 screws secure this gearmotor to frame.
3. Remove the four wire leads (2 on micro switch on top of motor, 2 from motor into control box.)
4. Remove 3 bolts thru adapter into gearmotor cover and the 4 bolts holding gearmotor to mounting base.
5. Lift freezer adapter assembly off gearmotor and pull gearmotor out thru left side.



**CHASSIS FRONT VIEW
SF1 - WATER COOLED**

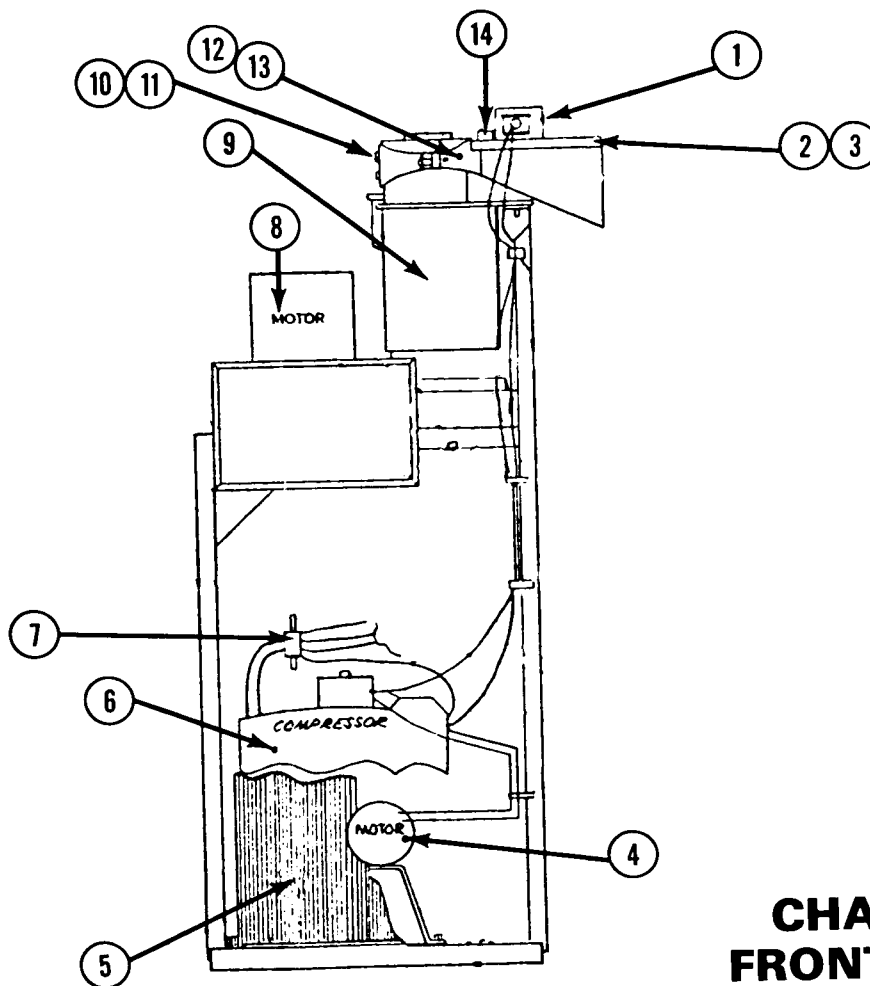
115/60/1

ITEM NO.	PART NO.	DESCRIPTION
1.	12-1018-00	Spout Micro Switch
2.	A16360-000	Spout Pressure Plate
3.	02-1321-00	Spring
4.	18-3303-02	Condensor Water Cooled
5.	02-0831-00	Refrigerant Drier
6.	03-1403-35	Screws (2)
7.	03-1417-07	Lockwasher (2)
8.	A14254-000	Spout Casting
9.	13-0679-00	Gasket
10.	18-2200-01	Compressor
11.	18-2200-26	Compressor Relay
12.	18-1901-10	Start Capacitor
13.	18-2200-25	Compressor Overload



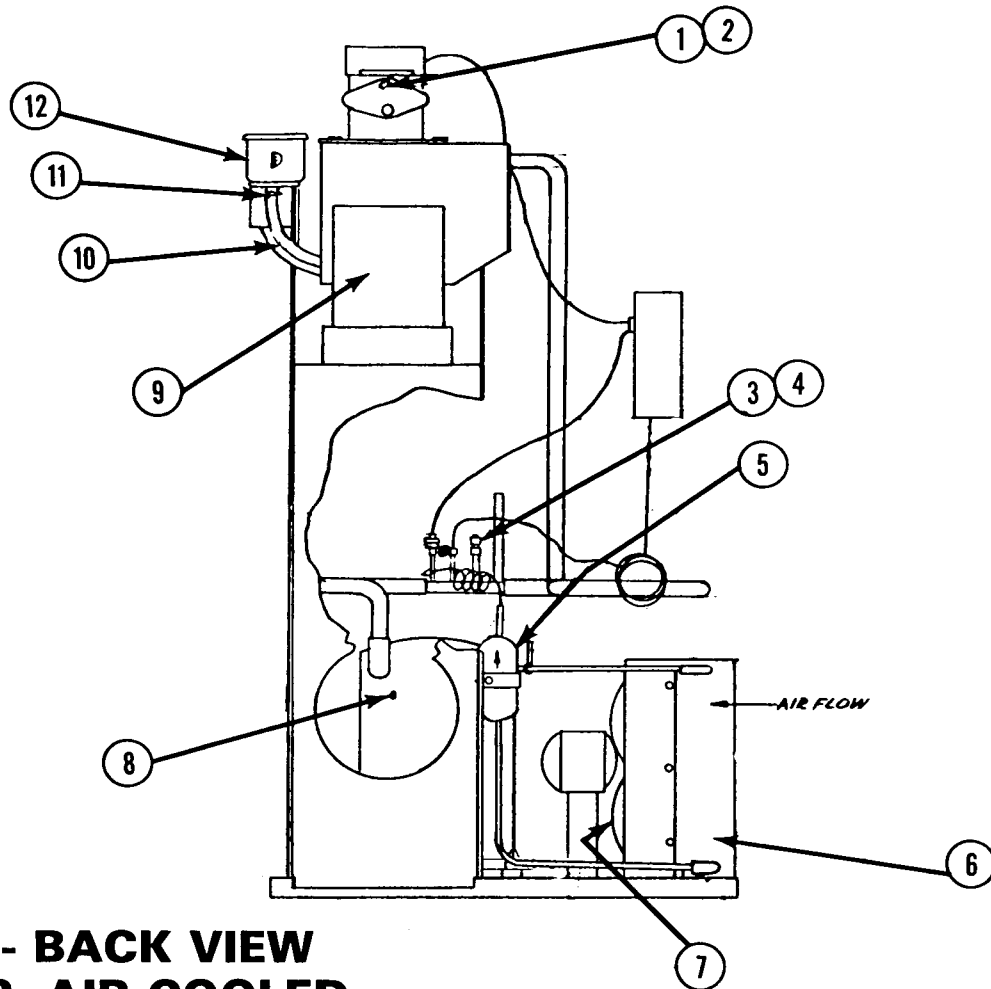
**CHASSES
BACK VIEW
SF1 SERIES
WATER COOLED
115/60/1**

ITEM NO.	PART NO.	DESCRIPTION
1.	02-2217-01	Reservoir (Complete)
2.	02-0535-00	Hose Clamp
3.	A21574-018	Plastic Tube (Water)
4.	A25995-021	Gear Motor Assy.
5.	18-2200-01	Compressor
6.	11-0198-00	Water Regulator Valve
7.	16-0560-00	Valve Core
8.	16-0563-00	Valve Cap
9.	A18153-000	Drip Pan
10.	See Page 31	Evaporator
11.	A14254-000	Spout Casting
12.	13-0679-00	Gasket
13.	A16360-000	Spout Pressure Plate
14.	02-1321-00	Spring
15.	12-1018-00	Spout Micro Switch
16.	A14256-000	Mounting Nut
17.	03-1403-35	Screws (2)
18.	03-1417-07	Lockwasher (2)



**CHASSIS
FRONT VIEW
SF1 SERIES
AIR COOLED
115/60/1**

ITEM NO.	PART NO.	DESCRIPTION
1.	12-1018-00	Spout Micro Switch
2.	A16360-000	Spout Pressure Plate
3.	02-1321-00	Spring
4.	12-1575-01	Fan Motor
5.	18-0234-00	Condensator Air Cooled
6.	18-2200-01	Compressor
7.	11-0396-01	Low Pressure Switch
8.	A25995-021	Gear Motor Assy.
9.	See Page 31	Evaporator
10.	03-1403-35	Screws (2) Req.
11.	03-1417-07	Lockwasher (2) Req.
12.	A14254-000	Spout Casting
13.	13-0679-00	Gasket
14.	A14256-000	Mounting Nut



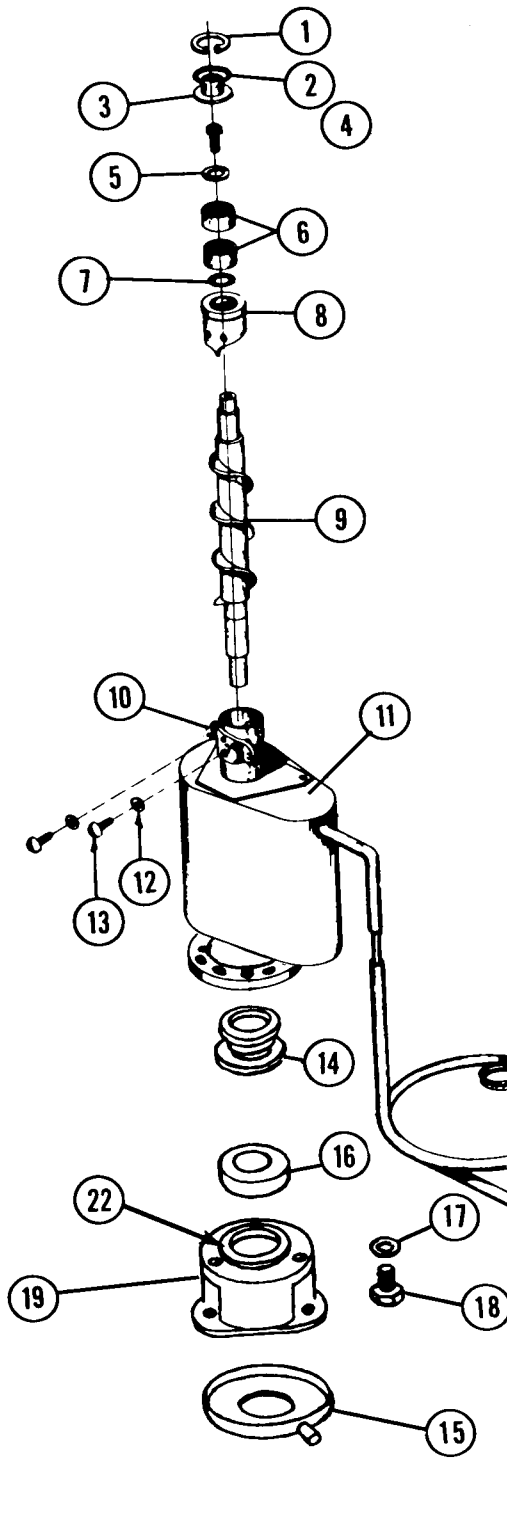
**CHASSIS - BACK VIEW
SF1 SERIES AIR COOLED**

115/60/1

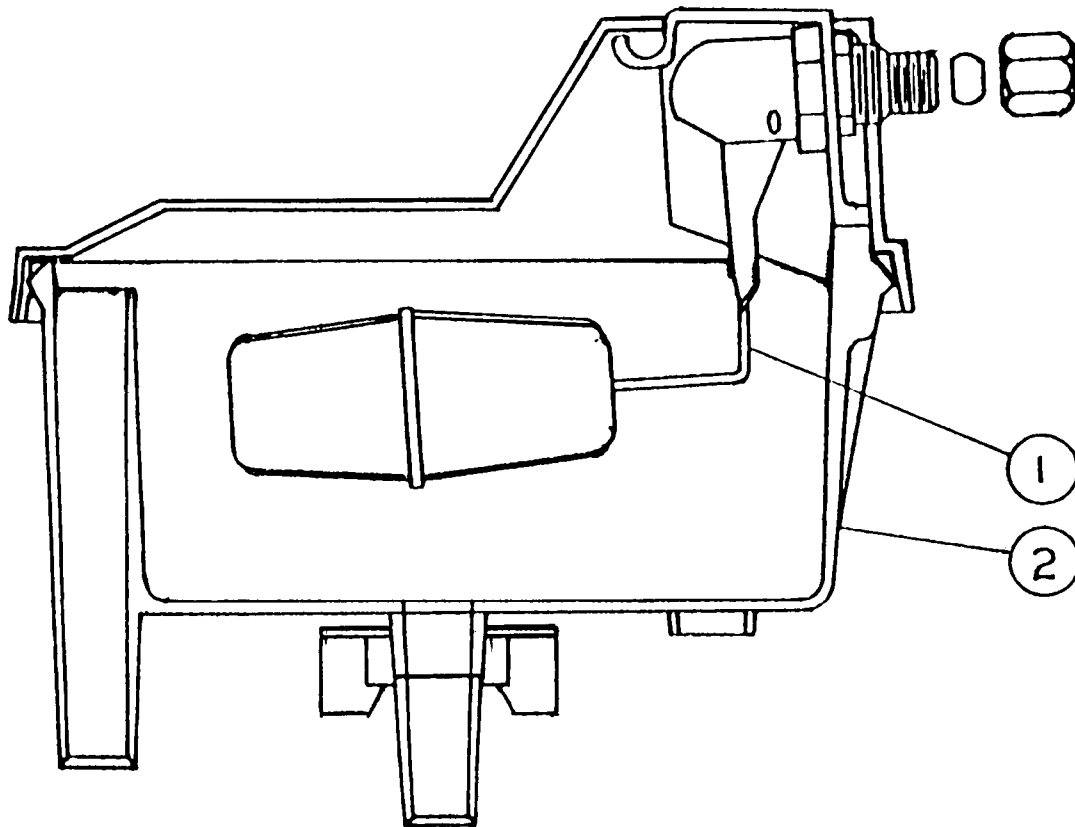
ITEM NO.	PART NO.	DESCRIPTION
1.	03-1403-35	Screws (2) Req.
2.	03-1417-07	Lockwasher (2) Req.
3.	16-0560-00	Valve. Core
4.	16-0563-00	Valve Cap
5.	02-0831-00	Refrigerant Drier
6.	18-0234-00	Condensor Air Cooled
7.	18-0231-00	Fan Blade
8.	18-2200-01	Compressor
9.	See Page 31	Evaporator
10.	A21574-018	Plastic Hose (Water)
11.	02-0535-00	Hose Clamp
12.	02-2217-01	Reservoir (Complete)

FREEZER ASSEMBLY

SF-1 MODELS

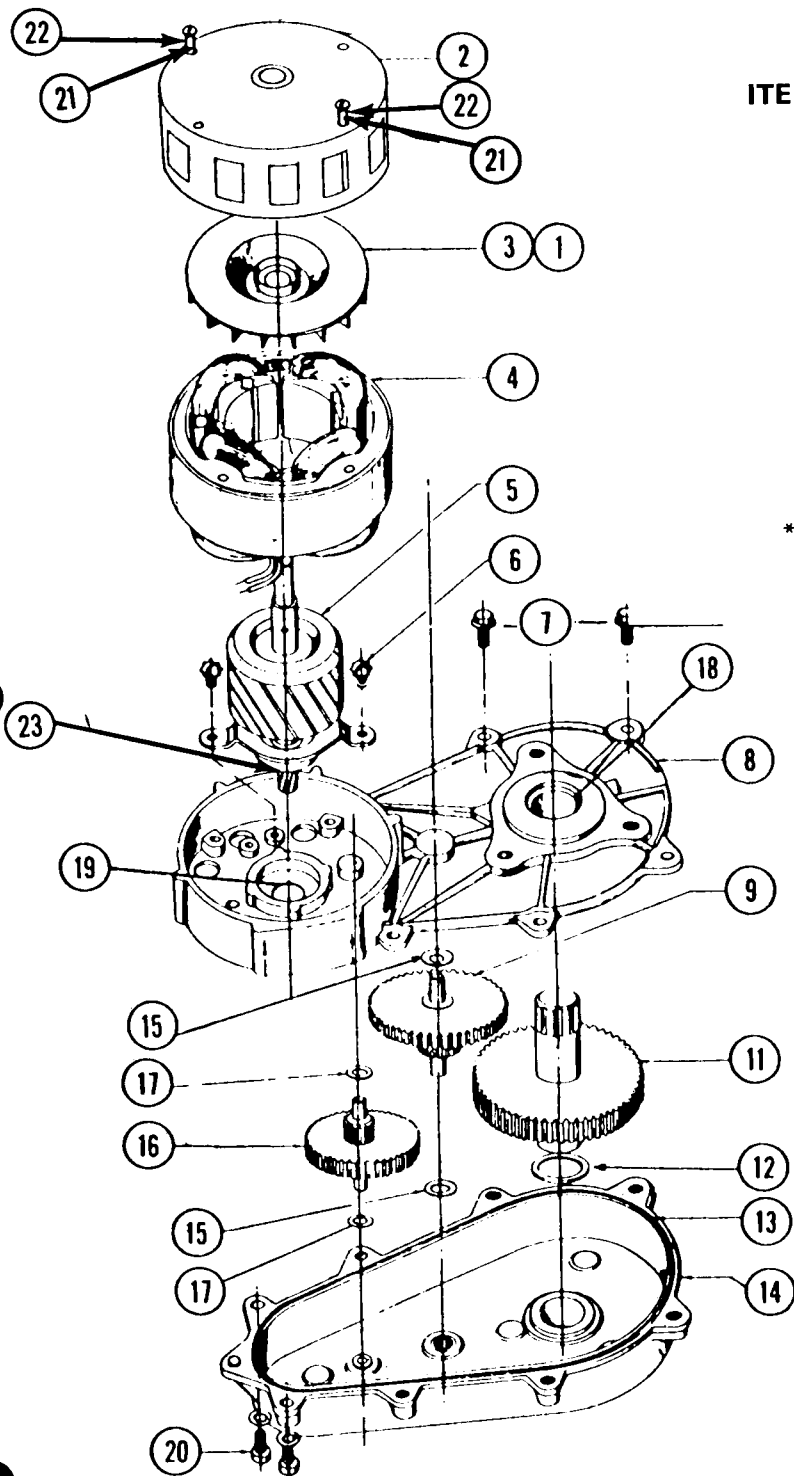


ITEM NO.	PART NO.	DESCRIPTION
1.	03-1558-03	Snap Ring
2.	A08162-000	Cap Hook
3.	A07701-000	Cap
4.	03-0758-00	Cap Screw
5.	A07699-000	Washer
6.	02-1412-00	Bearing
7.	13-0617-16	"O" Ring
8.	A14678-000	Breaker With Bearing and "O" Ring
9.	02-1538-00	Auger
10.	A18430-000	Spout Plate
11.	A26657-020	Worm Tube—Suction Line
12.	03-1410-03	Washer
13.	03-1403-48	Screws
14.	A18945-000	Water Seal
15.	A18153-000	Drip Pan
16.	02-0417-00	Lower Bearing
17.	03-1410-04	Washer
18.	03-1405-42	Screw
19.	08-0595-01	Adapter
20.	15-0575-01	Spline Drive Coupling
21.	02-1347-00	Shaft Drip Shield Rubber
22.	03-1505-00	Gasket - Freezer to Adaptor



RESERVOIR ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION
1.	02-2217-02	Valve Assy
2.	02-2217-01	Reservoir Complete



ITEM NO. PART NO. DESCRIPTION

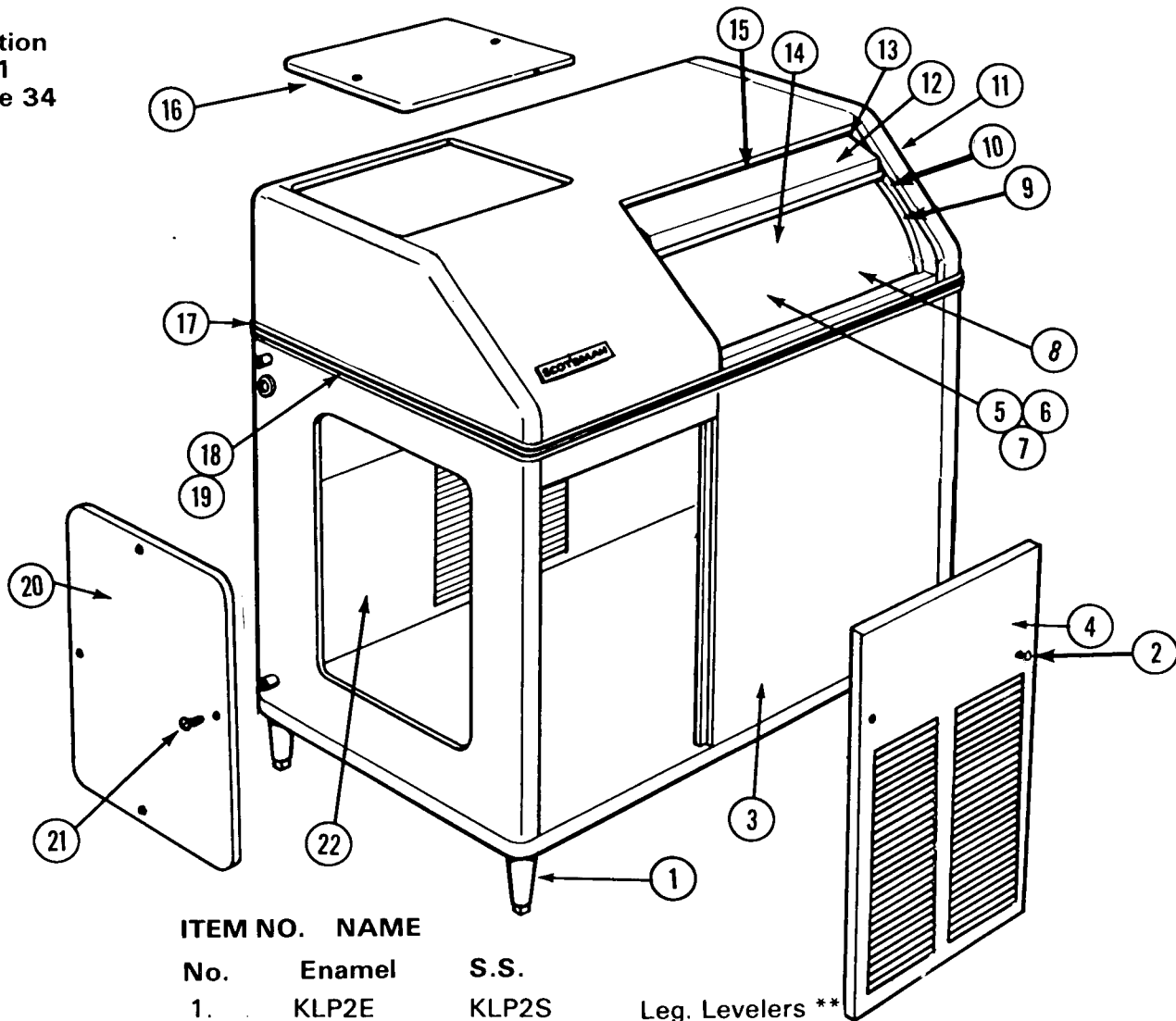
1.	03-1246-00	Set Screw (2)
2.	A17047-000	Motor Housing
3.	A16915-000	Cooling Fan
4.	12-1400-01	Stator Assy
5.	A25605-002	Rotor Assy & First Gear
6.	03-1245-00	Screws (2)
7.	03-1251-00	Flange Screws (6)
8.	A16920-021	Gear Case Cover
9.	02-1521-00	Gear and Pinion
11.	A26650-001	Gear and Output Shaft
12.	03-1408-21	Washer (2)
13.	02-1505-00	"O" Ring
* 14.	A24184-001	Gear Case Assy Kit
15.	03-1408-06	Washer (3)
16.	A26454-001	1st Gear and Pinion
17.	03-1408-19	Washer (2)
18.	02-1503-00	Grease Seal
19.	02-1504-00	Grease Seal
20.	03-1252-00	Screw (2)
21.	03-1417-05	Star Washer
22.	03-1403-43	Motor Bolts
23.	13-0617-04	Slinger Ring

* Includes Items #8-13-15-17-18-19 (1) can oil

GEAR MOTOR ASSEMBLY

1/10 H.P.

115/60/1



ITEM NO. NAME

No.	Enamel	S.S.	
1.	KLP2E	KLP2S	Leg. Levelers **
2.	03-1419-09	Same	Screw
3.	A20586-008	A20586-002	Case Assembly
4.	A15791-008	A15791-002	Front Door
5.	02-1741-00	Same	Drain Top*
6.	02-1742-00	Same	Drain Bottom *
7.	13-0617-11	Same	O-Ring (Drain) *
8.	A19046-000	Same	Storage Bin Assy.
9.	03-0640-00	Same	Door Glidees (Door)*
10.	03-1195-00	Same	Door Glidees (Hood) *
11.	A20924-008	A20924-001	Case Hood Assy.
12.	02-1735-01	A15559-000	Sliding Door
13.	A16208-000	Same	Door Track
14.	03-1415-00	Same	Bulb Holder *
15.	02-1736-00	Same	Door Stop *
16.	A07676-008	A07676-00S	Top Door
17.	A05796-000	Same	Rear Trim
18.	15-0324-00	Same	Plastic Moulding - Trim
19.	S03646-000	Same	Front Moulding Strip
20.	S06713-008	S06713-00S	Side Door
21.	03-1419-09	Same	Screws
22.	A08740-008	A08740-00S	Rear Door
23.	15-0156-00	Same	Emblem
24.	03-0271-00	Same	Speednuts *

* Not Shown

** Optional

SERVICE ANALYSIS

Section
SF-1
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SYMPTOM	POSSIBLE CAUSE	CORRECTION
Unit will not run	Blown Fuse Thermostat set too high Loose electrical connection Switch in OFF position Inoperative master switch	Replace fuse and check for cause of blown fuse. Adjust thermostat. 35° cut-out and 45° cut-in. Check wiring. Turn switch to ON. Replace switch.
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 to cooler location Recharge with the proper amount. Lower to 1/4 inch below overflow pipe. Repair or replace.
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 1/4 inch below overflow pipe. Moisture in system. Over-charge 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 Drive gearmotor or drive coupling stripped. Water not entering freezing chamber Moisture in system Water seal leaking Water supply to unit off	Check for leaks and recharge Check. Repair and/or replace 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. Restore water supply to icemaker

SERVICE ANALYSIS

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Water Leaks	<p>Defective water seal Gravity feed line leaking "O" Ring in spout casting leaking</p> <p>Storage bin drain & connecting fittings leaking. Water level in reservoir too high</p>	<p>Replace Check hose clamps Remove spout casting and install new "O" ring Check and repair.</p> <p>Adjust to 1/4 inch below overflow pipe.</p>
Excessive noise or chattering	<p>Mineral or scale deposit on auger and inner freezing chamber walls.</p> <p>Low suction</p> <p>Intermittent water supply</p> <p>Water level in reservoir too low</p> <p>Gear motor loose on frame</p> <p>Gear motor end-play or worn bearings.</p>	<p>Remove and manually polish auger, polish inner chamber walls of freezer barrel.</p> <p>For lighter concentrations use Scotsman Ice Machine Cleaner periodically. Add gas to raise suction pressure. Check & clean water strainer. Check gravity feed line for air lock. Remove air lock. Adjust to 1/4 inch below overflow pipe.</p> <p>Tighten.</p> <p>Repair or replace.</p>
Machine continues to run with full storage bin	Storage bin thermostat not properly set	<p>Reset or replace. 35° Cut-out, 45° cut-in Check operation with handful of ice.</p>
Gearmotor	Low on oil.	<p>Remove case cover to check for proper oil level. Top of gears should be covered. Use 600 W or Equivalent.</p>

MAINTENANCE INSTRUCTIONS - FLAKERS

THE FOLLOWING MAINTENANCE SHOULD BE SCHEDULED THREE TIMES PER YEAR ON ALL SCOTSMAN FLAKERS. CALL YOUR AUTHORIZED SCOTSMAN SERVICE DEPARTMENT.

1. Check and clean 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 droplets come out of spout with ice at all times. Adjust as required.
3. Clean reservoir and interior of freezer using SCOTSMAN Ice Machine Cleaner.
 - A. If machine has been cleaned regularly and no problems such as dry ice or chatter are noticed, clean as per the following instructions:
 - a. Set main switch to OFF.
 - b. Remove all ice from storage bin.
 - c. Turn off water supply or block float. Drain reservoir by disconnecting tube between reservoir and freezer. After draining, reconnect tubing.
 - d. Set main switch to ON and pour cleaning solution into reservoir. Do not fill above overflow tube.

Models SF1— Use 4 oz. of Scotsman cleaner and 1 qt. hot water.
 - e. Continue to make ice on solution until the solution is used up and reservoir is empty.
 - f. Set main switch to Off. Remove overflow tube, wash and rinse reservoir, replace overflow tube, turn water on or remove float block.
 - g. Turn MAIN SWITCH to ON. Let unit run for at least (15) minutes to flush out any cleaning fluid. Check ice for acid taste.—run until ice tastes sweet.
 - h. Turn MAIN SWITCH to OFF. Add hot water to ice bin, using this melt water, thoroughly wash and rinse all surfaces within the storage bin.
 - i. Turn MAIN SWITCH to On. Replace Service Door. Unit is ready for normal operation.

MAINTENANCE INSTRUCTIONS (Continued)

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

4. Check high and low side pressures. On air-cooled models head pressures range between 130 and 145 PSI. Suction pressure should be above 12 PSI and will range up to 16 PSI depending upon water and ambient temperatures.
5. Check gearmotor operation. Normal running temperatures are in the area of 160° fahrenheit, which is hot to the touch.
6. Check top bearing of freezing tube. Remove retainer ring around edge of stamped brass cap. If moisture is around bearing, wipe up and remove grease. Add new grease. Use Beacon No. 325. Replace cap and retainer ring.
7. Clean air-cooled condenser. Inform customer to clean frequently. Always shut off machine when cleaning.
8. Oil condenser fan motor when possible.
9. 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.
10. Check for water leaks. Tighten drain line connections. Run water down bin drain line to make sure it is open.
11. Check quality of ice. Ice should be wet when formed, but will cure rapidly to normal hardness in bin.
12. Check thermostat and pressure plate cut off in spout. Micro switch cuts off only compressor. Bin thermostat should be set at 10° differential and should keep entire machine off at least twenty minutes in high ambients (longer in low) during normal operation. Settings are 35° cut out, 45° cut in.

CLEANING OF A STAINLESS STEEL BIN LINER

Because of the brown staining or rusting is due to expelled material during ice-making, **every bin liner should be cleaned periodically**, to prevent this staining from causing pitting of the stainless steel. The time between cleanings will depend on the water conditions, type of ice machine, etc. **It may be necessary only every 3 to 6 months.**

1. **General Cleaning** — When the staining is light, it can usually be removed by washing with ordinary cleaning powder, such as Bon-Ami, or Copper-Glo, and water. (Do not use cleaners that contain bleaching agents, as most of these are compounds of chlorine.) After cleaning, rinse thoroughly with clear water.

It may be necessary to use a **stainless steel wool** to remove bad stains. **DO NOT USE plain steel wool**, as the steel particles will get imbedded in the liner and cause more serious rusting.

2. **Cleaning of heavy deposits** — If the liner has not been cleaned for a long time, and heavy deposits and pitting have occurred, a chemical cleaner may be necessary. Several of these are as follows:

Oakite No. 33, Oakite Products, Inc., 19 Rector St., New York, N.Y. **Texo No. 12, and Texo-NY**, Texo Corp., 2200 Dana Ave., Cincinnati 7, Ohio. **Metalprep No. 10**, Nelson Chem. Co., 6564 Benson St., Detroit 7, Mich. **Dilac**, Diversey Corp., 1820 Roscoe St., Chicago 13, Illinois.

A solution of one part cleaner and two parts water is used. First, wash the bin liner thoroughly with water and soap as described above. Then simply swab the solution on the area to be cleaned, and allow to stand for about 20 minutes. Rinse with clear water. If this doesn't completely remove the deposit, repeat the procedure.

Synthetic rubber gloves should be used by the operator, and goggles and aprons are advisable even though the solution is relatively nonhazardous.

These cleaners may possibly harm paint, wood, or fabrics. They will probably cause a dull grey color on galvanized steel and should not be allowed to remain long in contact with rubber. Therefore, provision should be made to avoid contact with such materials when cleaning stainless.

3. **Protection of Stainless Steel against further staining** — After the stainless steel has been cleaned, installation where the staining is recurring so frequently, the surface should be rejuvenated. This process restores the characteristic to the surface of the stainless, that best prevents corrosion.

First, be sure that the liner is clean and is thoroughly rinsed with water. Then use a **nitric acid** solution of two parts water to one part nitric acid (by volume). Swab this on the liner and allow to stand for about 30 minutes. Rinse the liner with clean water. This will then provide maximum corrosion resistance.

CARE OF STAINLESS STEEL STORAGE BIN LINERS

All commercial grades of stainless steel will corrode or rust when in contact with certain chemicals or salts. **One element that attacks stainless steel readily, is chlorine**, and most compounds of chlorine, such as hydrochloric acid, and certain salts containing chlorine. The "speed" with which this corrosion takes place depends on the concentration of the chlorine, and the length of time it is left in contact with the stainless steel.

ICE BIN LINER RUSTING

In many ice bin applications, **a rust stain, or brown deposit, will appear at the top of the side and rear walls of the bin liner, and also on any exposed stainless parts inside the bin, which do not normally get covered with ice; such as stainless steel door back pans.** The lower portions of the liner walls usually stay clean if the bin is being used regularly, due to the "washing" action of the ice and meltage water draining down these walls. This brown staining on the liner may appear more rapidly in some installations than other, depending on the way the ice is being made in the ice machine, and the water conditions.

This staining or rusting, can come from basically two sources:

1. **Foreign materials** — For example, **many ice machine casings are made of painted steel. If this steel should be exposed at the joint where the ice machine sits on the bin, it could rust**, and the rust stain could "drip" down the liner walls. Also, particles of plain steel could fall down into the bin and, in turn, start rusting.
2. **Materials expelled during ice making** — Practically all icemakers produce a clear ice by "freezing out the impurities" normally found in tap water. Chlorine gas, other gases and solids, are expelled during the making of ice. Being heavier than air, these foreign materials drop down into the bin through the same opening that the ice enters the bin. (This oftentimes explains why this staining is more noticeable on an installation where the opening on the bottom of the ice machine is quite large). **The chlorine gas will combine with water vapor and condense on the liner wall as a mild hydrochloric acid.** Above the normal ice level, this never gets removed by the action of the ice, and will eventually form a brown stain.