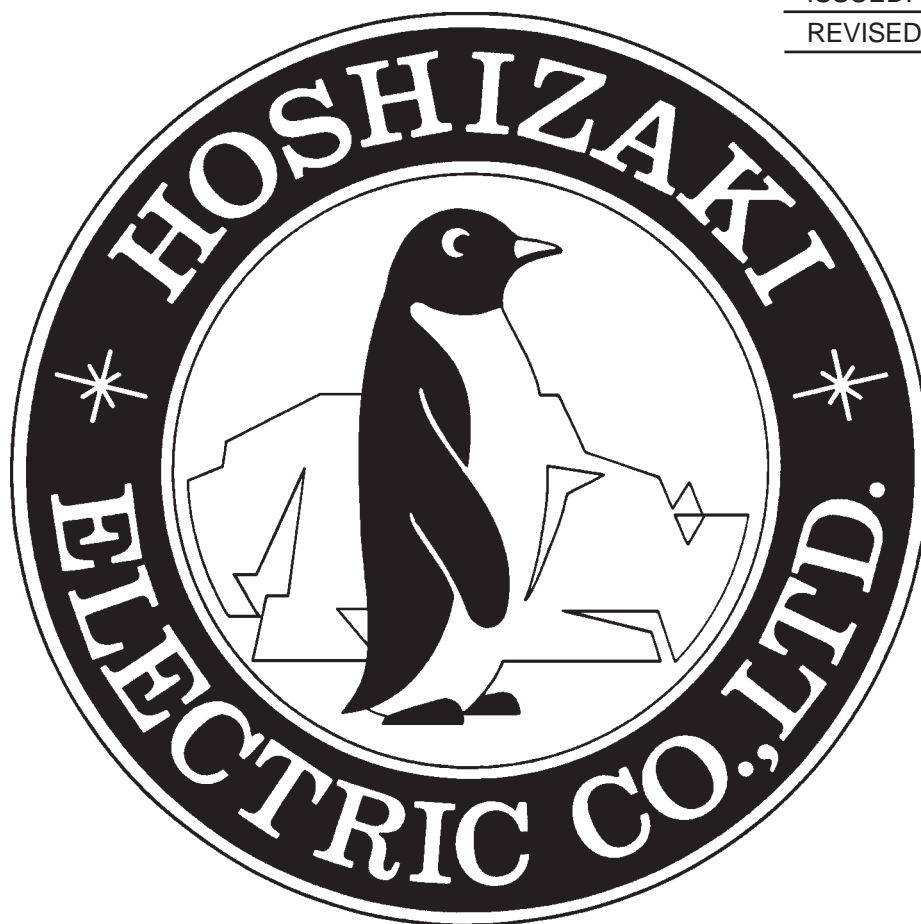

NO. 24HE-632

ISSUED: JUL. 11, 2003

REVISED: _____



**HOSHIZAKI
CUBE ICE DISPENSER**

MODEL DIM-30AE

SERVICE MANUAL

CONTENTS

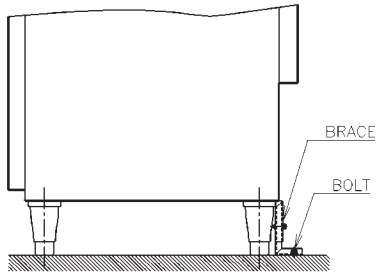
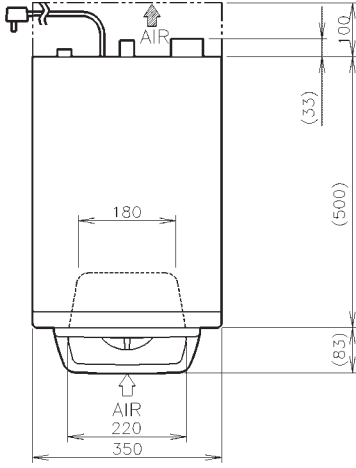
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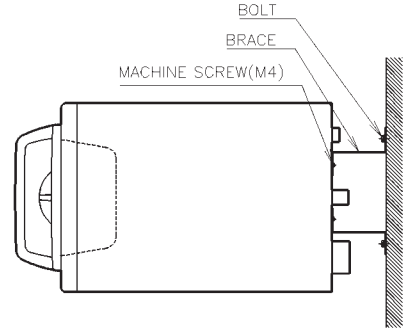
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I. SPECIFICATIONS

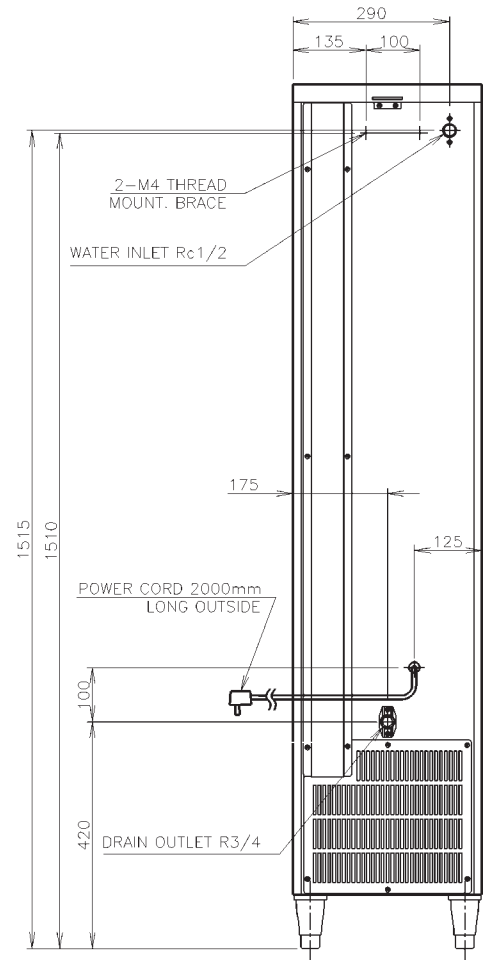
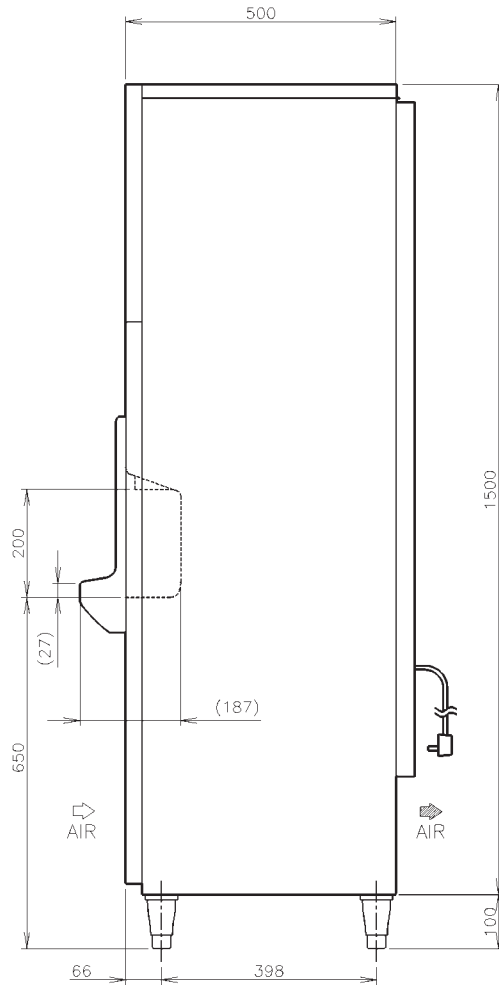
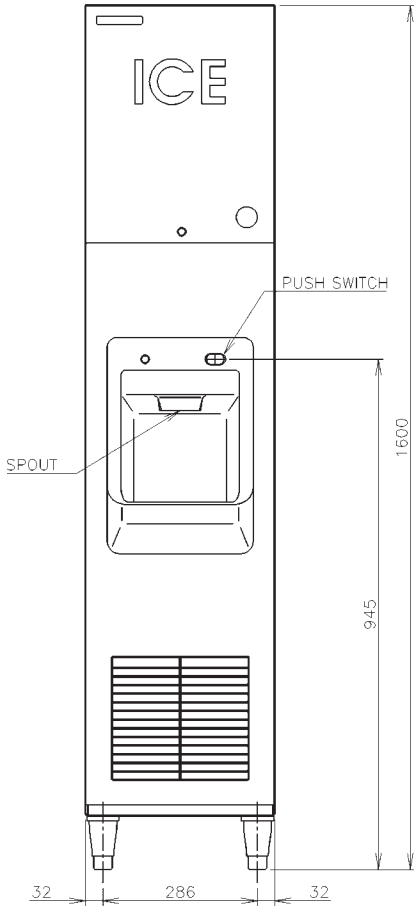
1. DIMENSIONS/CONNECTIONS



SAFETY BRACKET INSTALLATION(FLOOR MOUNTING)



SAFETY BRACKET INSTALLATION(WALL MOUNTING)



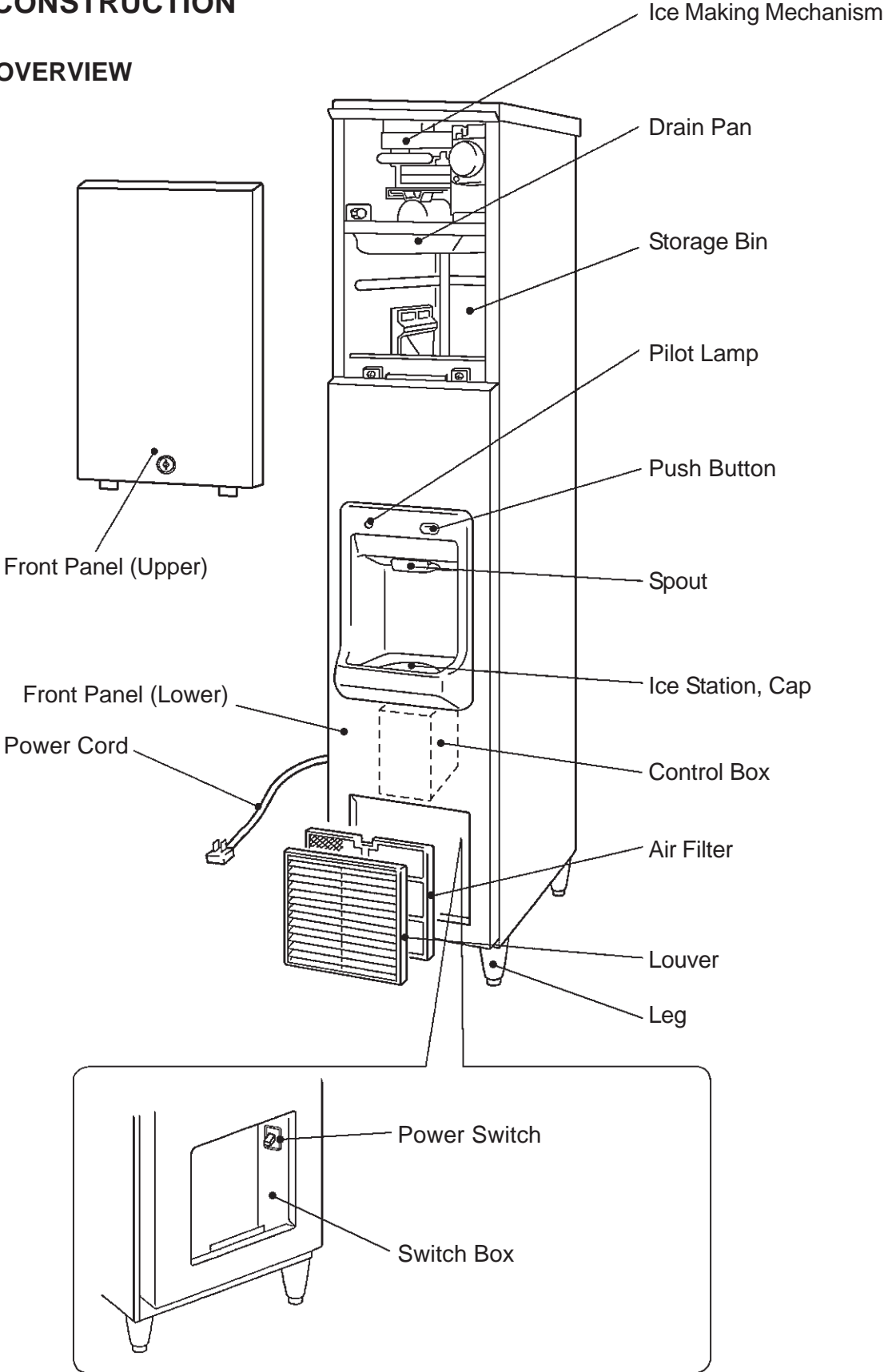
2. SPECIFICATIONS

AC SUPPLY VOLTAGE AMPERAGE STARTING AMPERAGE ELECTRIC CONSUMPTION POWER FACTOR POWER SUPPLY CAPACITY	1 PHASE 220 - 240V 50Hz 2.1A (Ambient temp. 32°C, Water temp. 21°C) 13A 320W (Ambient temp. 32°C, Water temp. 21°C) 63% Min. 0.86kVA (3.6A)
ICE PRODUCTION PER 24h	Approx. 32kg (Ambient temp. 10°C, Water temp. 10°C) Approx. 33kg (Ambient temp. 21°C, Water temp. 15°C) Approx. 27kg (Ambient temp. 32°C, Water temp. 21°C)
WATER CONSUMPTION PER 24h	Approx. 0.20m ³ (Ambient temp. 10°C, Water temp. 10°C) Approx. 0.21m ³ (Ambient temp. 21°C, Water temp. 15°C) Approx. 0.17m ³ (Ambient temp. 32°C, Water temp. 21°C)
SHAPE OF ICE FREEZE CYCLE TIME ICE PRODUCTION PER CYCLE MAX STORAGE CAPACITY ICE RELEASE CAPACITY	Cube Approx. 28 x 28 x 32mm Approx. 23 min (Ambient temp. 21°C, Water temp. 15°C) Approx. 0.6kg/27pcs Approx. 15kg Approx. 1700g/min
DIMENSIONS (DRAWING No.) EXTERIOR STORAGE BIN CONNECTIONS - ELECTRIC - WATER SUPPLY - DRAIN	350mm(W) x 500mm(D) x 1600mm(H) (3X5452) Plastic (Delivery stage, Louver), Acrylic Painted Steel (Front), Colored Steel (Top, Side), Galvanized Steel (Rear) ABS Plastic, Insulation: Polyurethane Foam Y-type Con. (with UK Plug) Inlet Rc 1/2 (Connected at rear side) Outlet R 3/4 (Connected at rear side)
ICE MAKING SYSTEM HARVESTING SYSTEM	Cell type Hot Gas Defrost
COMPRESSOR CONDENSER HEAT REJECTION EVAPORATOR REFRIGERANT CONTROL REFRIGERANT CHARGE	Hermetic 215W Model FR8.5G Air-cooled, Fin and Tube type 600W (520kcal/h) (Ambient temp. 32°C, Water temp. 21°C) Tin-plated copper tube on sheet Capillary Tube R-134a 190g
ICE MAKING CONTROL SYSTEM HARVESTING CONTROL SYSTEM ICE MAKING WATER CONTROL SYSTEM BIN CONTROL SYSTEM	Thermistor, Timer Thermistor Timer, Water Pan's movement Microswitch with time delay } Controller Board
ELECTRICAL PROTECTION COMPRESSOR PROTECTION	Class I Appliance, 5A Fuse Auto-reset Overload Protector
WEIGHT PACKAGE	Net weight 65kg / Gross weight 71kg Carton 449mm(W) x 694mm(D) x 1670mm(H)
ACCESSORIES	Mounting Brace, Installation Kit
OPERATION CONDITIONS AMBIENT TEMP. WATER SUPPLY TEMP. WATER SUPPLY PRESSURE	1 - 40°C 5 - 35°C 0.5 - 8bar (0.05 - 0.78MPa)
We reserve the right to make changes in specifications and design without prior notice.	

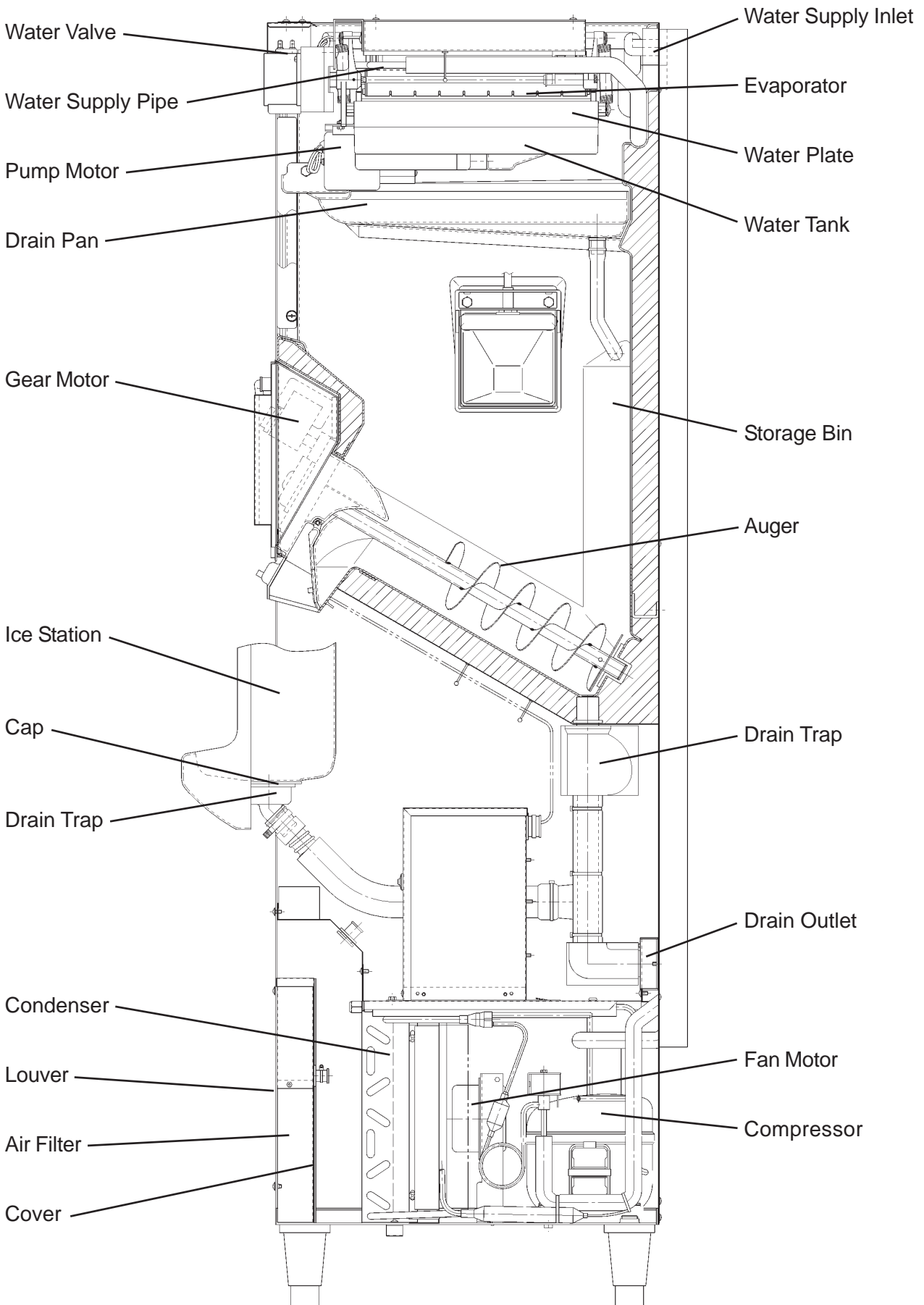
II. GENERAL INFORMATION

1. CONSTRUCTION

[a] OVERVIEW



[b] WATER CIRCUIT AND MACHINE COMPARTMENT



2. CONTROLLER BOARD

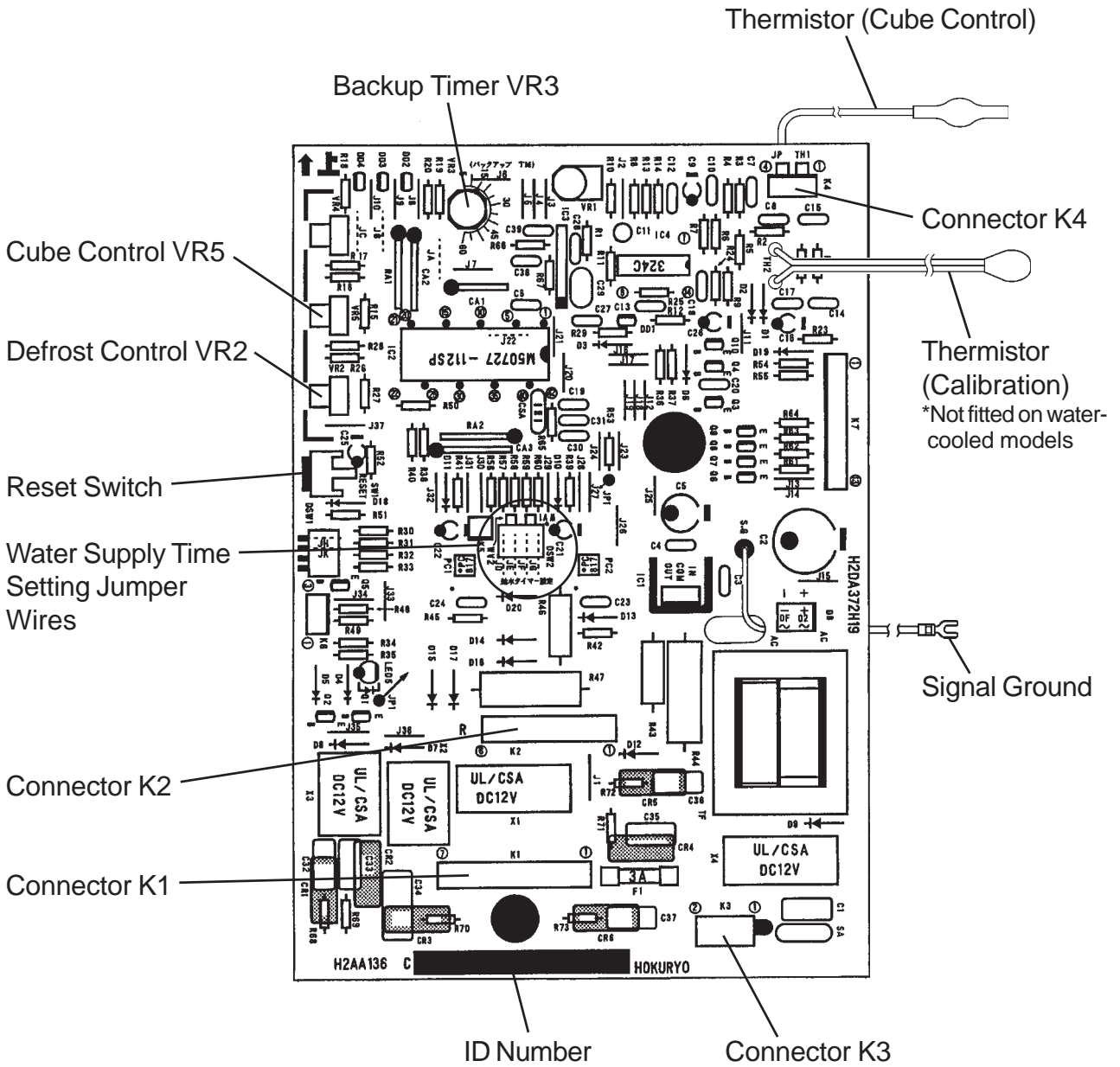
IMPORTANT

If receiving a service call, ask the user to turn off the power to the ice dispenser and turn it on again, while watching the ice dispenser. This will reset the controller, and in some cases normal operation will resume.

CAUTION

1. Check that the ice dispenser has been earthed properly. If not, the Controller Board will not work properly.
2. Do not change wiring and connections, or the Controller Board will not work properly.
3. Do not touch the reverse side of the Controller Board and tiny electronic devices on it.
4. Do not repair the electronic devices and parts on the Controller Board in the field. Replace the whole board assembly when it fails.
5. To get static free, always touch the metal part of the ice dispenser before servicing. Electrostatic Discharge will cause severe damage to the Controller Board.
6. The Signal Ground Wire must be connected to the Shield Plate when replacing the Controller Board after service.
7. The Controller Board is fragile. Handle with care.
 - * Do not drop the board on the floor.
 - * Make sure that the board is placed correctly into the guides in the Control Box. Mis-alignment could cause breakage when replacing the Control Box Cover.
 - * Handle the board by the edges only. Do not touch the electric parts and devices except the Transformer.

[a] CONTROLLER BOARD LAYOUT

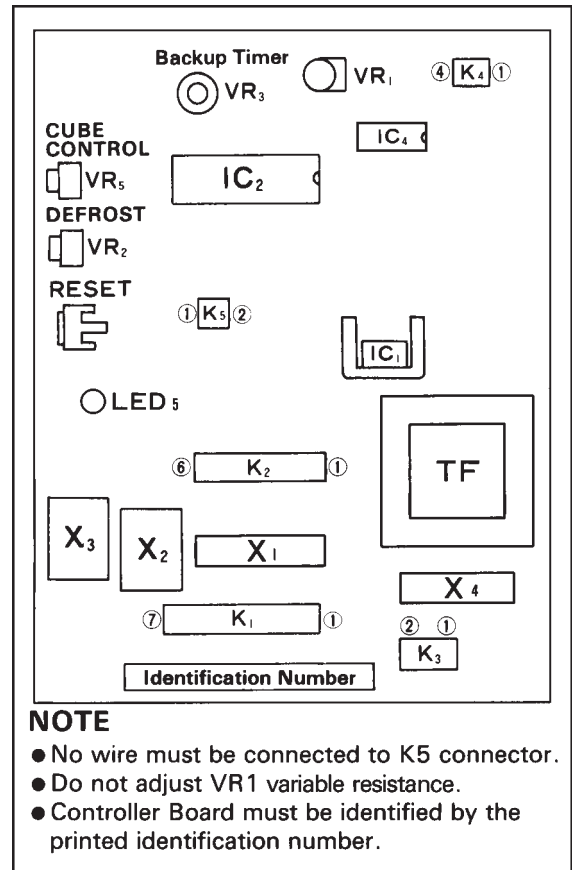


Model	ID No.	Thermistor (Calibration)
DIM-30AE	C10	Yes

See the diagram on the right for layout of the Controller Board.

- VR: Variable Resistor
No. 2 through No. 5 adjustable
- K: Connector
- IC: Integrated Circuit Chip
- LED: Light Emitting Diode
Indicator Lamp
- TF: Transformer
- X: Relay
- RESET: Reset Button

To check the operation of the board, push the Reset Button only during the freeze cycle.



Relay

- X1 - Actuator Motor and Pump Motor
- X2 - Hot Gas Valve and Fan Motor
- X3 - Water Valve
- X4 - Compressor

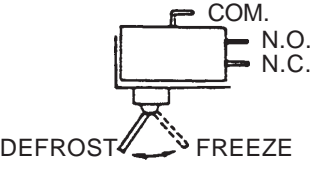
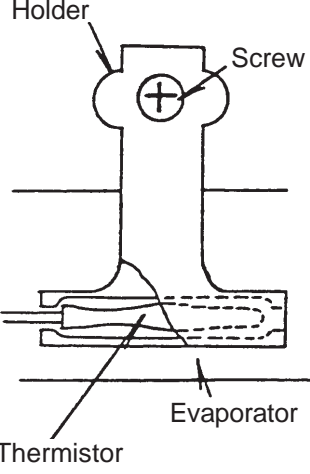
Control

- VR2 - Defrost Control
- VR3 - Backup Timer
- VR5 - Cube Control

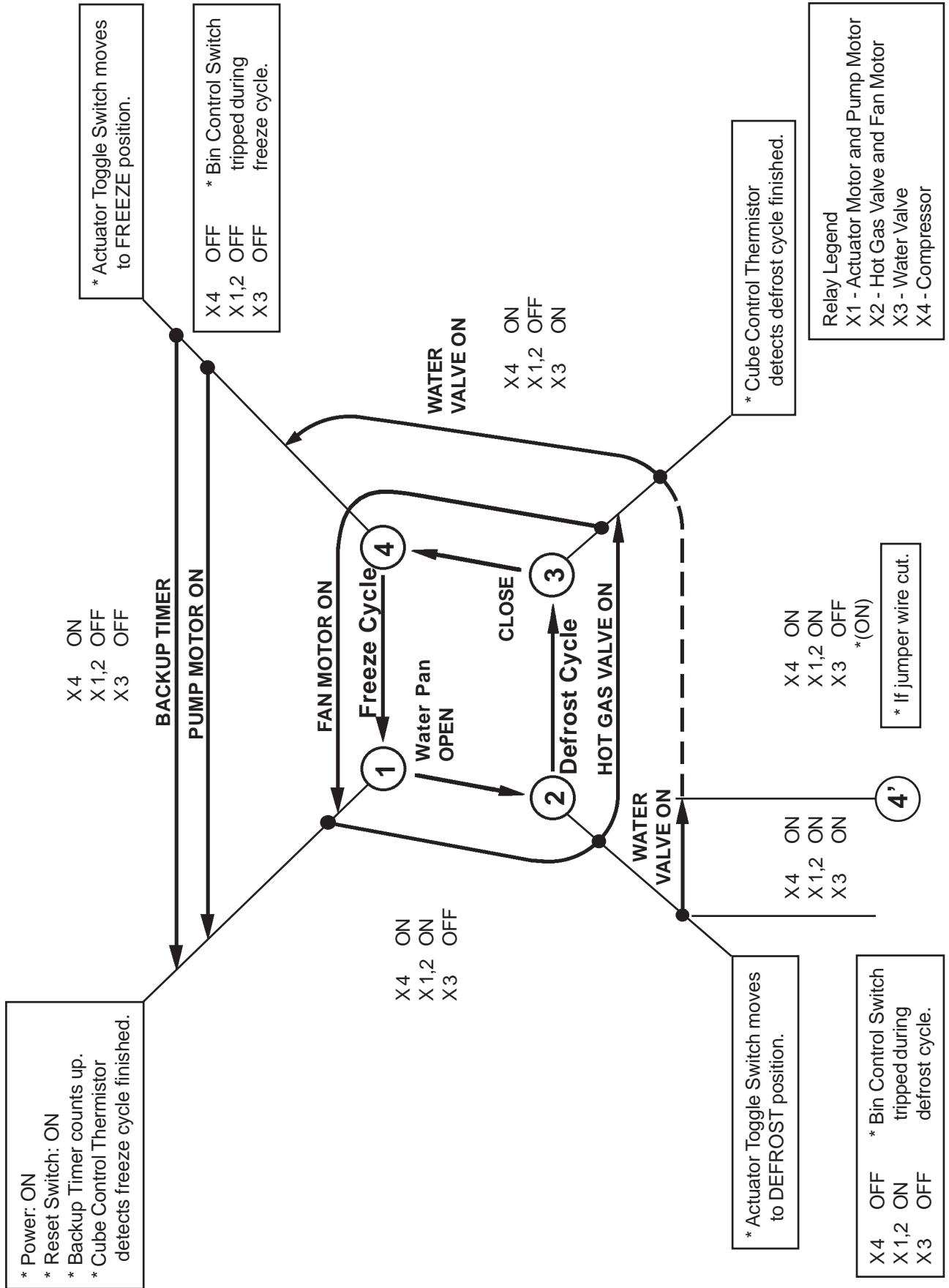
All the controls are factory-adjusted. Do not change setting except when replacing the board or if the setting has changed. Refer to “[e] CONTROLS AND ADJUSTMENT.”

[b] BEFORE CHECKING CONTROLLER BOARD

Check the power source voltage and the components as shown in the table below.

Component	Procedure	Normal
<p>1. Actuator Toggle Switch</p> 	<p>Manually set the switch in the FREEZE and DEFROST positions, and check the continuity.</p>	<p>DEFROST COM-NO Open COM-NC Closed</p> <p>FREEZE COM-NO Closed COM-NC Open</p>
<p>2. Thermistor (on Evaporator)</p> 	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <p>CAUTION</p> <p>Thermistor Sensor part is fragile, glass sealed. Handle with care.</p> </div> <ul style="list-style-type: none"> * Disconnect the Connector K4 on the board. * Remove the screw and the Thermistor Holder on the Evaporator. * Immerse the Sensor part in a glass containing ice and water for 5 minutes. * Check the resistance between K4 Connector Pins. * Replace the Thermistor in its correct position. * Connect K4. 	<p style="text-align: center;">5 -7 kilohms</p>
<p>3. Bin Control Switch</p>	<p>Manually set the Micro Switch in the TRIP and RESET positions, and check the period.</p>	<p>Approx. TRIP(Closed) 10 sec. RESET(Open) 80 sec.</p>

[c] SEQUENCE - LED INDICATORS ON/OFF PATTERN



[d] FAULT DIAGNOSIS

Check the status of the Service Lamp on the Controller Board (LED-5, See “[c] SEQUENCE”) by removing the Control Box Cover.

Lamp ON - Water Plate closed

This tends to indicate the Back-up Timer has stopped machine operation during the freeze cycle. High ambient and water temperatures are an obvious cause. But check out each component that could result in an extended freezing time (See guide below).

Lamp ON - Water Plate open


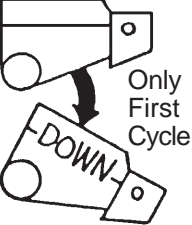

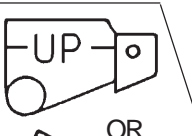
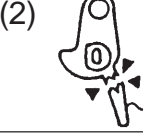
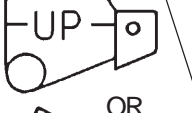
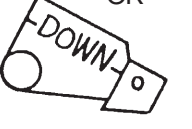

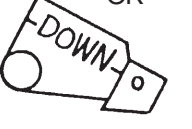

The Timer has stopped the machine because of an excessive defrost time. See the guide below to check out the probable cause.




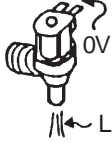
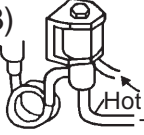





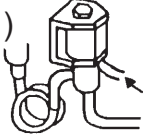





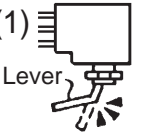




Lamp flashing ON/OFF

If on the first cycle, check out the Cam operation and/or Toggle Switch. If the machine has been in service for some time, the Controller Board may be at fault.

REMEMBER: Hoshizaki controllers are very reliable. They also control every component’s operation. So if a component malfunctions, the controller will respond. Do not replace controllers in an attempt to shorten the diagnostic process and not before carefully checking the actual fault and possible cause.

When the ice dispenser stops, the Controller Board Interlock Indicator shows possible faults.

PATTERN	INTERLOCK INDICATOR	WATER TANK POSITION	POSSIBLE CAUSE	REMEDY
1	 <p>Flashing</p>	 <p>Only First Cycle</p>	(1)  Actuator Toggle Switch Lever bent	Replace Actuator Toggle Switch
			(2)  Cam Arm (A) broken Cam Arm	Replace
		 <p>OR</p> 	(3)  Defective Actuator Motor	Replace
			(4)  Defective Controller Board	Replace

PATTERN	INTERLOCK INDICATOR	WATER TANK POSITION	POSSIBLE CAUSE	REMEDY
2		 Freeze Cycle	(1)  Clogged Air Filter and/or Condenser	Clean or replace
			(2)  Water leak from Water Solenoid Valve	Replace
			(3)  Gas leak from Hot Gas Solenoid Valve	Replace
			(4)  Fan Motor stopped	Replace
			(5)  Gas leak	Check for leak
			(6)  Compressor stopped	Replace Comp. Starting Capacitor
3		 Defrost Cycle	(1)  Hot Gas Solenoid Valve closed and will not open	Replace
			(2)  Gas leak	Check for leak
			(3)  Compressor stopped	Replace Comp. Starting Capacitor
4		 OR 	(1)  Actuator Toggle Switch Lever bent	Replace Actuator Toggle Switch
			(2)  Cam Arm (A) broken	Replace
			(3)  Defective Actuator Motor	Replace
			(4)  Cam Pin damaged	Replace Cam Pin and Cam Arm (A)
			(5)  Defective Cube Control Thermistor	Replace

[e] CONTROLS AND ADJUSTMENT

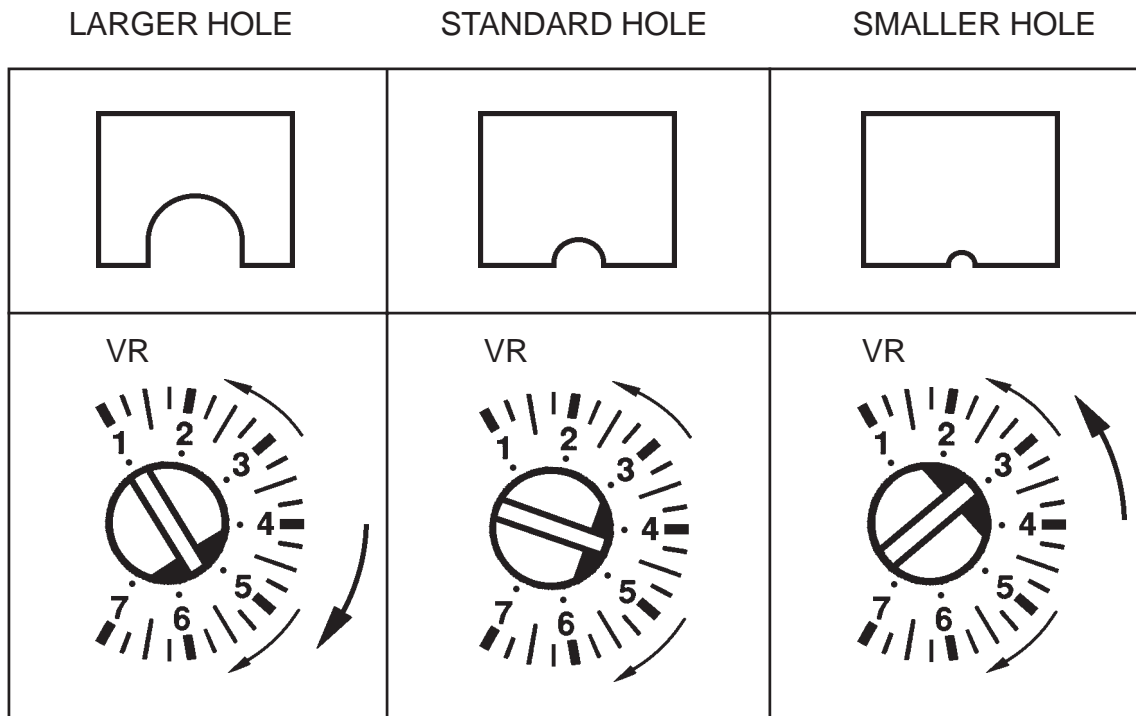
1) Cube Control (VR5)

A cube control on the Controller Board is factory adjusted to produce constant cubes all year around.

When the user needs ice cubes with smaller or larger diameter holes, adjust the Variable Resistor VR5 (Cube Control) using a miniature flat blade screwdriver.

CAUTION

When adjusting the Variable Resistor VR5 for smaller dimple cubes, it may be necessary to also increase the water supply time to melt away fragments of ice obstructing the Water Plate which could prevent cubes falling into the Bin.

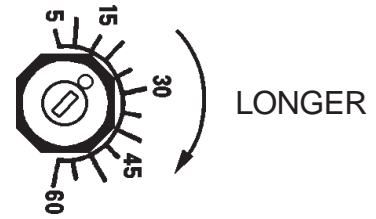


2) Freeze Cycle Time

Ambient Temp.	30°C		20°C		10°C	
Water Temp.	25°C		15°C		5°C	
Frequency	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Freeze Cycle Time	32 min	29 min	25 min	23 min	20 min	18 min

3) Backup Timer (VR3)

A backup timer is set to stop the freezing process when the freeze cycle time extends beyond approx. 45 minutes (high ambient or water temperature). Adjustment will not be required under normal use.



4) Defrost Control (V2)

The defrost control regulates the time period between ice-drop and actuator motor restart. Any adjustment will not be required for normal operation. Factory setting is shown in the table below. When servicing or replacing the controller board, adjust the Variable Resistor VR2 using a miniature flat blade screwdriver.

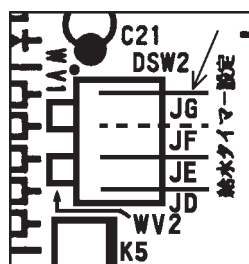
Ambient Temp.	Approximate Period (sec.)
30°C	20
20°C	30
10°C	60



5) Water Supply Control

When adjusting the Variable Resistor VR5 (Cube Control) for smaller dimple cubes, it may be necessary to adjust the water supply time setting as well, following the instruction below.

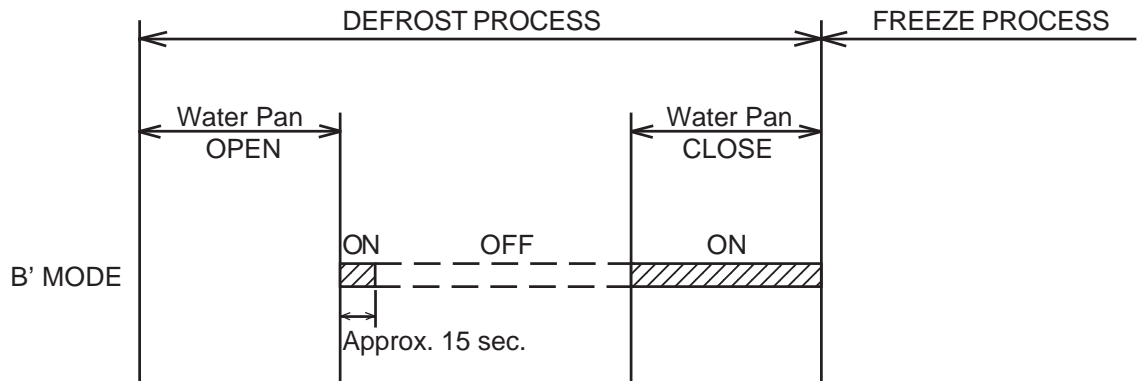
- Note: 1. See “II. 2. [a] CONTROLLER BOARD LAYOUT” for location of the Jumper Wires.
 2. Any adjustment will not be required under normal use. If an insufficient water supply results in production of cloudy ice, check to see if the Filter of the Water Valve is clogged or water pressure is reduced.



Cut the jumper wire JG (marked by arrow) by a nipper. Water supply time will be continuous when the Water Plate is open.

Normal setting = 15 sec. with Water Plate open

Controller Board	Mode
C10	B'



III. INSTALLATION INSTRUCTIONS

WARNING

The installation must be carried out by qualified personnel, in accordance with current regulations, according to the manufacturer's instructions.

1. UNPACKING

WARNING

Children should not be allowed in reach of the packaging elements (plastic bags and expanded polystyrene) as they are potential sources of danger.

CAUTION

Remove shipping carton, tape(s) and packing. If packing material is left in the ice dispenser, it will not work properly.

- 1) After removing the packaging, make sure that the ice dispenser is in good condition. If in doubt, please do not use the equipment but apply to professionally qualified personnel.

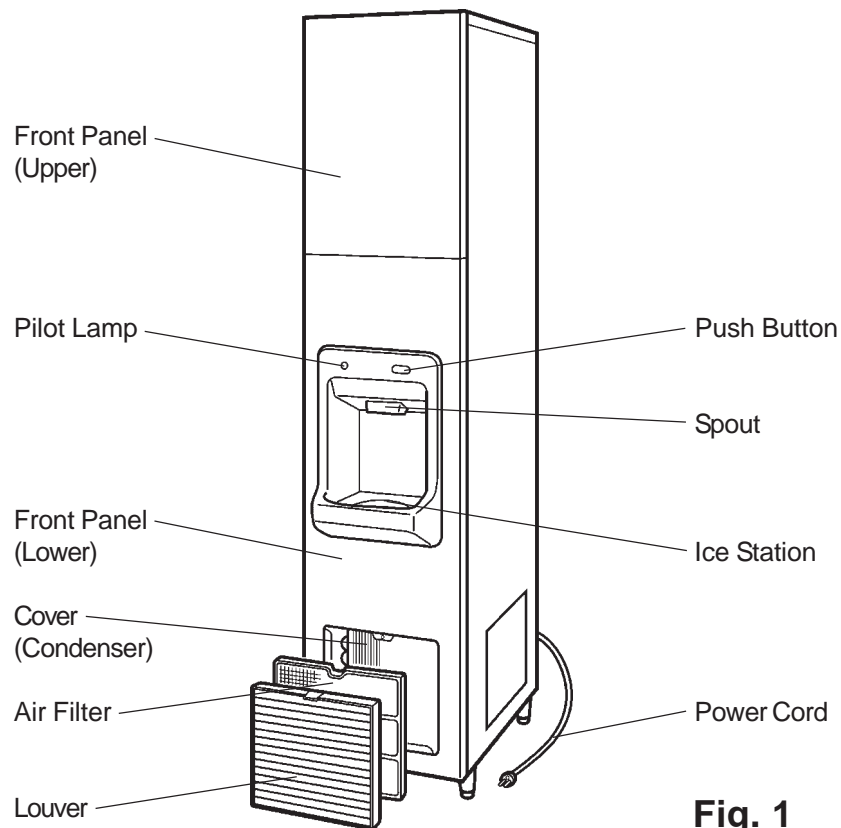


Fig. 1

2) Remove shipping tapes holding the package of accessories, and check the contents:

- a) Installation Kit
 - Inlet Hose 1
 - Outlet Hose 1
 - 1/2-3/4 Nipple 1
- b) Brace for wall mounting 2
- c) Machine Screw 2

3) Remove tapes holding the power cord.

4) Remove the protective plastic film from the panels. If the ice dispenser is exposed to the sun or to heat, remove the film after the ice dispenser cools.

2. LOCATION

IMPORTANT

1. This ice dispenser is not intended for outdoor use. Normal operating ambient temperature should be within 1°C to 40°C. Normal operating water temperature should be within 5°C to 35°C. Operation of the ice dispenser, for extended periods, outside of these normal temperature ranges may affect production capacity.
2. The ice dispenser should not be located next to ovens, grills or other high heat producing equipment.
3. The location should provide a firm and level foundation for the equipment.
4. Allow 10 cm clearance at rear and 20 cm at top for proper air circulation and ease of maintenance and/or service should they be required.
5. This appliance is not suitable for installation in an area where a water jet could be used and where dripping is not allowed.
6. Do not place anything on top of the ice dispenser or in front of the Louver.

3. INSTALLATION

- * Incorrect installation can cause harm to people, animals or things, for which the manufacturer cannot be held responsible.
- * Adjust the four legs on the bottom (adjustable up to 4.5 cm) to have the ice dispenser perfectly horizontal. Use a spirit level.
- * Secure the ice dispenser to the wall by using the braces (accessories) and mounting screws (not supplied). Bend the braces according to the installation condition. See Fig. 2.

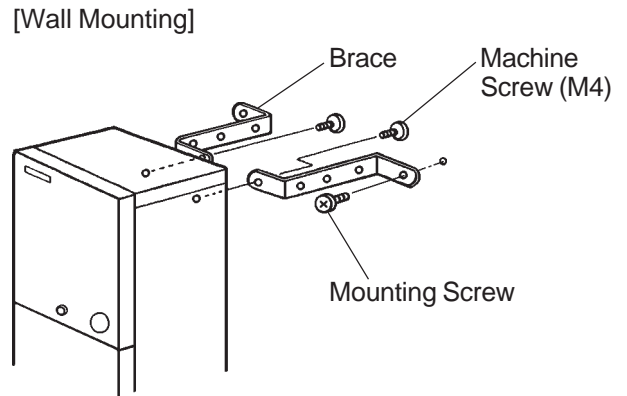


Fig. 2

4. ELECTRICAL CONNECTIONS

WARNING

THIS APPLIANCE MUST BE EARTHED

This ice dispenser requires an earth that meets the national and local electrical code requirements. To prevent possible severe electrical shock to individuals or extensive damage to equipment, install a proper earth wire to the ice dispenser. Remove the plug from the mains socket before any maintenance, repairs or cleaning is undertaken.

- * This ice dispenser must have a separate power supply or receptacle of 220 - 240V.
- * The main control box fuse is rated at 5A and should only be replaced by a qualified service engineer.
- * Usually an electrical permit and services of a licensed electrician are required.
- * If the supply cord and the plug should need to be replaced, it should only be done by a qualified service engineer.

For the U.K. and the Republic of Ireland only

- * The wires in the mains lead are coloured in accordance with the following code:

Green & Yellow = Earth
Blue = Neutral
Brown = Live

As the colours of the wire in the mains lead of this appliance may not correspond with the

coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured Green-and-Yellow must be connected to the terminal in the plug which is marked with the letter E or by the symbol $\frac{\perp}{\equiv}$ or coloured Green or Green-and-Yellow. The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Black. The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Red.

- * Should the socket outlets in the installation site not be suitable for the plug supplied with your product, the plug must be removed (cut off if it is moulded on plug) and an appropriate plug fitted.

If the non-rewirable plug has been cut from the power supply cord, it must be disposed of. There should be no attempt to reuse it. Inserting such a plug into a socket elsewhere presents a serious risk of electrical shock.

- * The non-rewirable plug must never be used without a fuse cover being fitted.

The correct replacement for the detachable fuse cover is identifiable from the manufacturer's reference number stamped on the plug.

Supply of replacement fuse covers can be obtained from Hoshizaki Parts/Service Centres.

Fuses should be rated at 13A and approved to BS 1362.

5. WATER SUPPLY AND DRAIN CONNECTIONS

(For the U.K. only, the connections must be in accordance with current requirements of the Model Water Byelaws 1986 SI No. 1147)

- * Only potable water should be used for this ice dispenser.
 - * Water supply pressure should be minimum 0.5 bar and maximum 8 bar. If the pressure exceeds 8 bar, use a pressure reducing valve. Do NOT throttle back the supply tap.
 - * A plumbing permit and services of a licensed plumber may be required in some areas.
 - * The water supply and drain pipes should not block the air ventilation slots on the rear panel.
 - * The ice dispenser drain is gravity flow, so ensure drain pipe has an adequate pitch or fall.
 - * Water should drain into an open trap.
- 1) By means of a suitable spanner or wrench, tighten the 1/2-3/4 nipple (accessory) into the Rc1/2 fitting on the rear of the ice dispenser as indicated. P.T.F.E. tape and/or a suitable sealing compound should be used to obtain a leak free joint.

Note: Jointing compounds should be approved and suitable for potable water use.

- 2) Attach angled end of white flexible inlet hose (accessory) to free end of 1/2-3/4 nipple ensuring rubber sealing washer is correctly positioned. Hand tighten sufficiently to provide leak free joint.
- 3) Attach the other end of inlet hose to the water tap, noting washer is correctly positioned before hand tightening as above.
- 4) Attach grey flexible outlet hose (accessory) to the R3/4 fitting as indicated, confirming fitment of rubber washer before finally hand tightening the joint. This pipe can be cut to length as necessary to suit position of main drain.

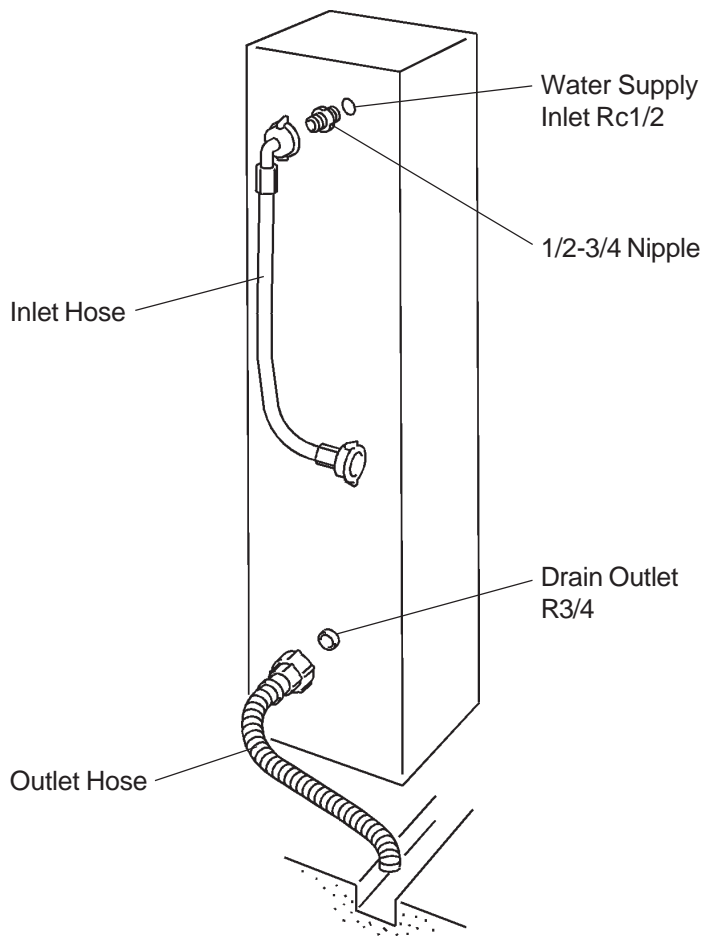


Fig. 3

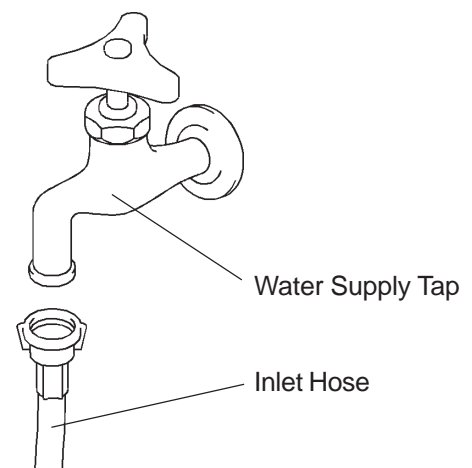


Fig. 4

IV. OPERATING INSTRUCTIONS

WARNING

1. This ice dispenser is designed to produce and store edible ice. To keep the ice dispenser hygienic:
 - * Keep the Ice Station clean. Clean it by using a neutral cleaner and rinse thoroughly.
2. The use of any electrical equipment involves the observance of some fundamental rules. In particular:
 - * Instances of high humidity and moisture increase the risk of electrical short circuits and potential electrical shocks. If in doubt, disconnect the ice dispenser.
 - * Do not pull the power cord in order to disconnect the ice dispenser from the feed network.
 - * To prevent possible electric shock caused by accidental contact with the attachment plug, the ice dispenser must be plugged in tightly.
 - * Appliance must be positioned so that the plug is accessible.
3. All parts are factory-adjusted. Improper adjustments may result in failure.
4. If the unit is turned off, wait for at least 5 minutes before restarting the ice dispenser to prevent damage to the Compressor.

1. START UP

- 1) Open the water tap.
- 2) Plug in the ice dispenser.
- 3) Remove the Louver, and turn on the Power Switch to start operation.
- 4) Refit the Louver in its correct position.
- 5) Press the Push Button and check for proper ice dispensing action after 30 - 60 minutes.

IMPORTANT

When water supply is off or water pressure is too low, the ice dispenser will produce no ice or abnormal ice. Always ensure proper water supply.

2. IN CASE OF LOW WATER

- 1) Remove the Louver, and turn off the Power Switch.
- 2) Close the water tap.
- 3) Unlock the Front Panel (Upper) by turning the Hook counterclockwise with a flat blade screwdriver. Lift off the Front Panel (Upper). See Fig. 5.
- 4) Wait for 5 minutes, and turn on the Power Switch.
- 5) When a click sound is heard 40 seconds after the icemaking compartment starts operation, turn off the Power Switch immediately to drain the Water Tank.
- 6) Refit the Front Panel (Upper), and push down its top while turning the Hook clockwise. See Fig. 6.
- 7) When water supply is resumed, open the Drain Valve first. Then, gradually open the water tap to completely drain out red water.
- 8) Close the Drain Valve.
- 9) Turn on the Power Switch to restart the ice dispenser.

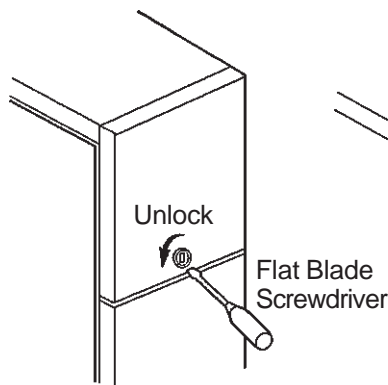


Fig. 5

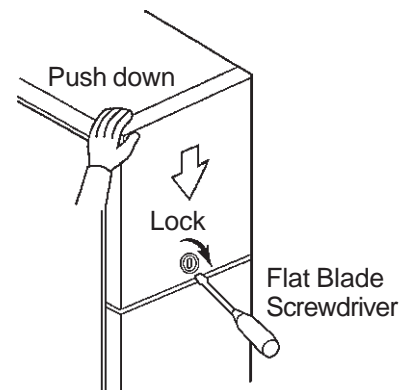


Fig. 6

3. PREPARING THE ICE DISPENSER FOR LONG STORAGE

- 1) Press the Push Button to dispense all ice from the Storage Bin.
- 2) Follow the steps 1) to 5) in “2. IN CASE OF LOW WATER”.
- 3) Unplug the ice dispenser.
- 4) Clean the Storage Bin liner, Spout, Drain Pan and Ice Station, and dry them thoroughly.
- 5) Refit the Front Panel (Upper), and push down its top while turning the Hook clockwise.

V. MAINTENANCE

WARNING

1. Before carrying out any cleaning or maintenance operations, unplug the ice dispenser from the electrical supply network.
2. A trained service person should clean and sanitize the ice dispenser water system at least twice a year. The Condenser should be checked and cleaned at least once a year.
3. This appliance must not be cleaned by use of a water jet.

1. SPOUT, ICE STATION, PUSH BUTTON

Wipe the exterior and Ice Station at least once per week with a clean, soft cloth. Use a damp cloth containing a neutral cleaner to wipe off grease or dirt.

2. AIR FILTER

A plastic mesh Air Filter removes dirt or dust from the air, and keeps the Condenser from getting clogged. As the Filter gets clogged, the ice dispenser's performance will be reduced. Remove and clean the Air Filter at least twice per month:

- 1) Remove the screw, push down the Lock and take off the Louver.

Note: Do not put your hand inside the machine compartment.

- 2) Remove the Air Filter by pushing it down.
- 3) Clean the Air Filter by using a vacuum cleaner. When severely clogged, use warm water and a neutral cleaner to wash the Air Filter.
- 4) Rinse and dry the Air Filter thoroughly, and place it in position.

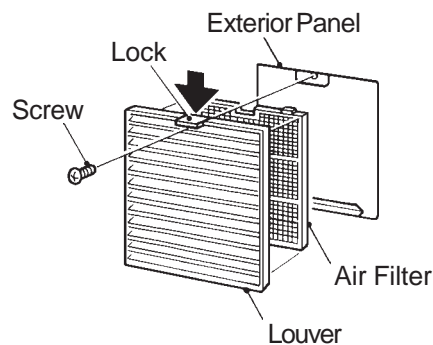


Fig. 7

3. DRAIN PAN, STORAGE BIN, FRONT PANEL (UPPER)

- 1) Follow the steps 1) to 3) in “IV. 3. PREPARING THE ICE DISPENSER FOR LONG STORAGE.”
- 2) Pull out the Drain Pan Hose from the drain hole in the Storage Bin.
- 3) Remove the Thumbscrew at the front, and take out the Drain Pan from the Storage Bin.
- 4) Soak the Drain Pan in warm water containing a neutral cleaner for at least 3 minutes. Rinse thoroughly with clean water.
- 5) Wipe the backside of the Front Panel (Upper) with a damp cloth containing a neutral cleaner. Use a clean damp cloth to wipe off the cleaner.
- 6) Wash the Storage Bin liner with clean water.
- 7) Refit the Drain Pan and Front Panel (Upper) in their correct position. Run the Bin Control Switch lead through the recess in the Drain Pan.

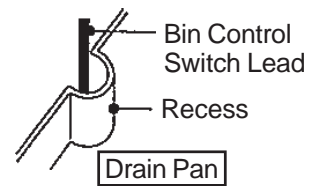


Fig. 8

4. ICE STATION DRAIN TRAP

- 1) Lightly lift the Cap at the center of the Ice Station and turn it counterclockwise.
- 2) Lift the Cap straight off.
- 3) Soak the Cap in warm water containing a neutral cleaner for at least 3 minutes. Rinse thoroughly with clean water.
- 4) Wipe the notches in the Ice Station with a damp cloth containing a neutral cleaner. Use a clean damp cloth to wipe off the cleaner.
- 5) Refit the Cap in the Ice Station by fitting the tabs in the notches.
- 6) Turn the Cap tightly clockwise.

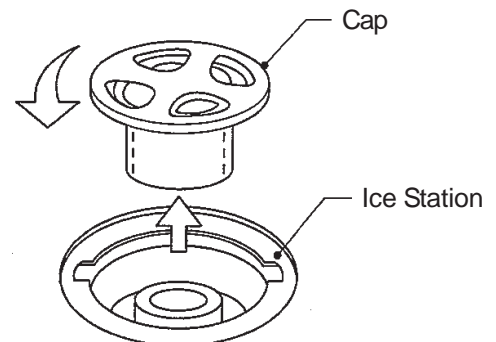


Fig. 9

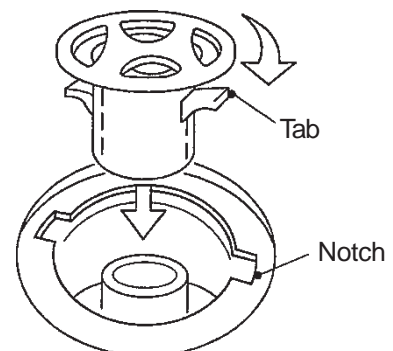


Fig. 10

5. WATER VALVE

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Close the water supply tap.
- 3) Remove the Top Panel and Front Panel (Upper).
- 4) Disconnect the Fitting Nut from the Water Valve.
- 5) Remove the Mesh Filter from the Water Valve.
- 6) Clean the Mesh using a brush.
- 7) Replace the Mesh and Fitting Nut in their correct positions.
- 8) Open the water supply tap.
- 9) Plug in the ice dispenser or connect the power source.
- 10) Check for leaks.
- 11) Replace the panels in their correct positions.

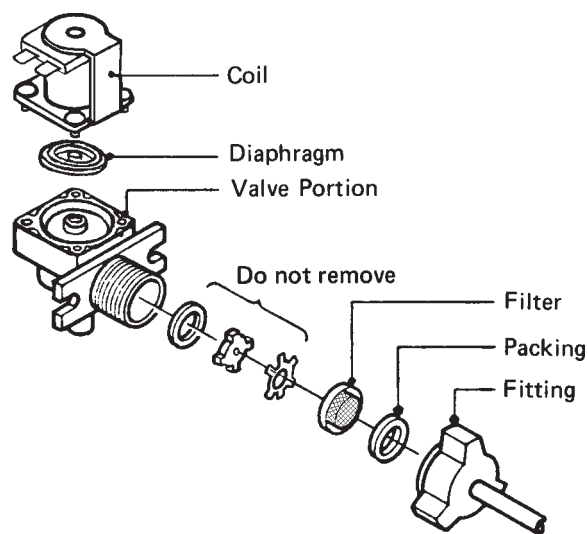
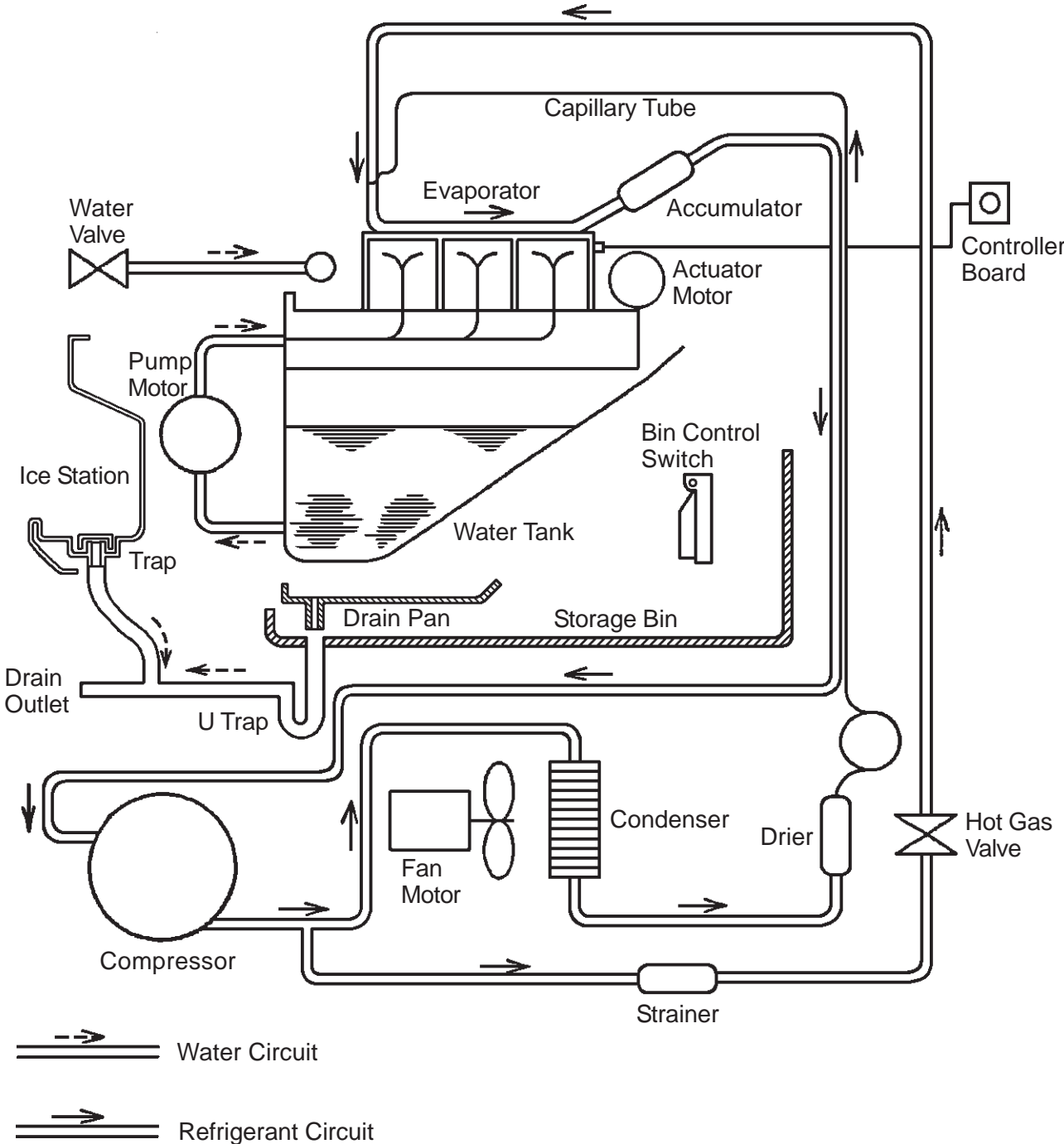


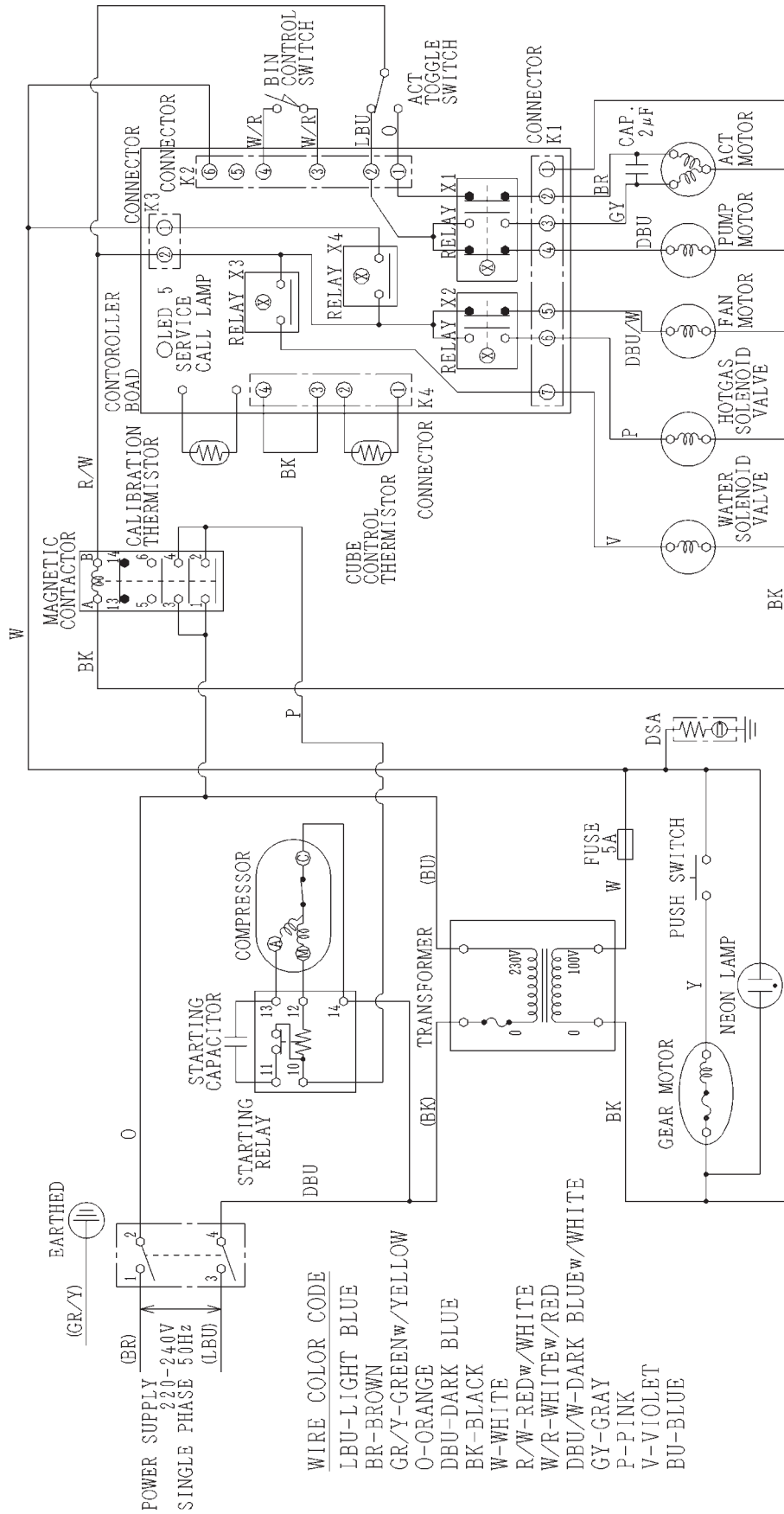
Fig. 11

VI. TECHNICAL INFORMATION

1. WATER CIRCUIT AND REFRIGERANT CIRCUIT

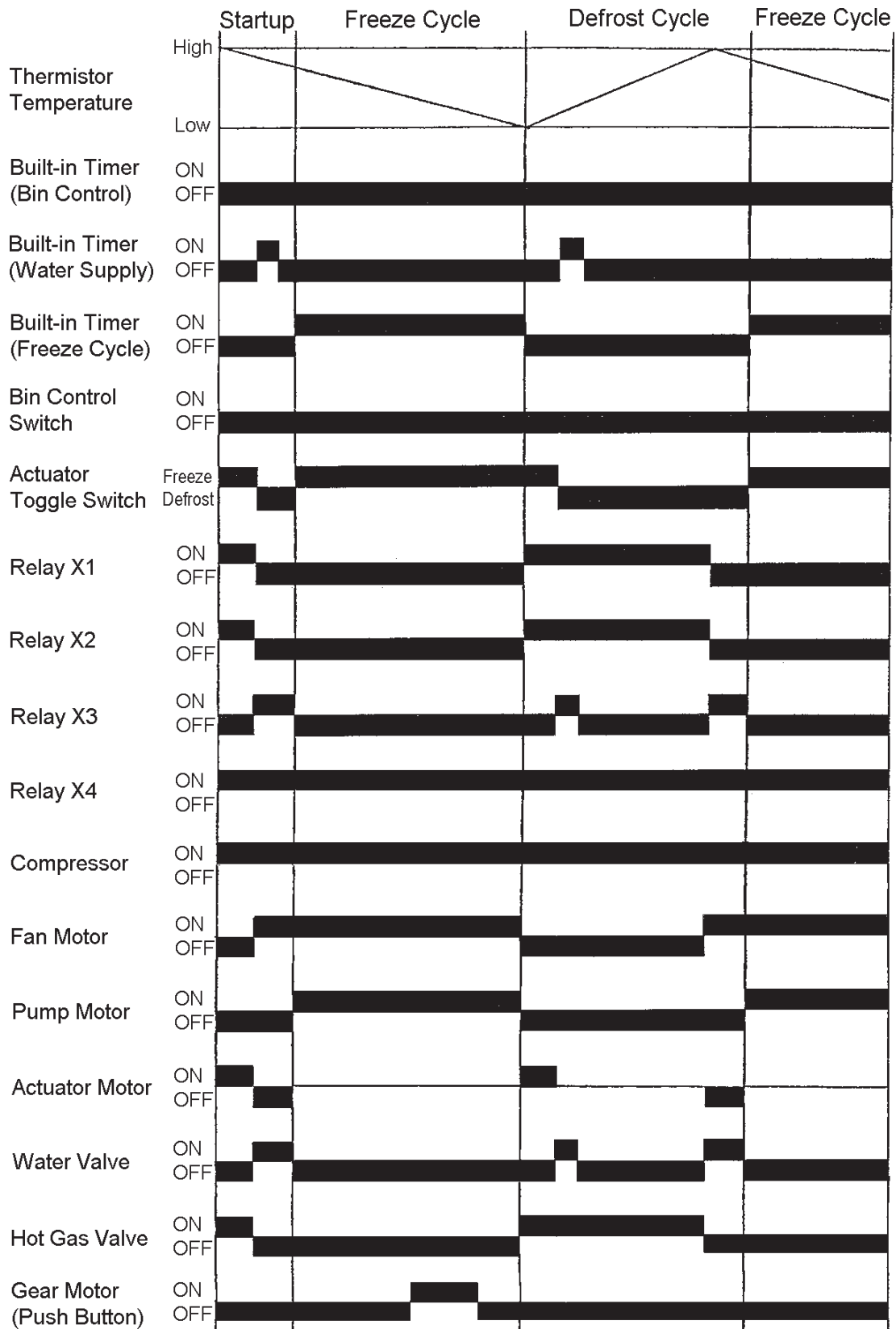


2. WIRING DIAGRAM



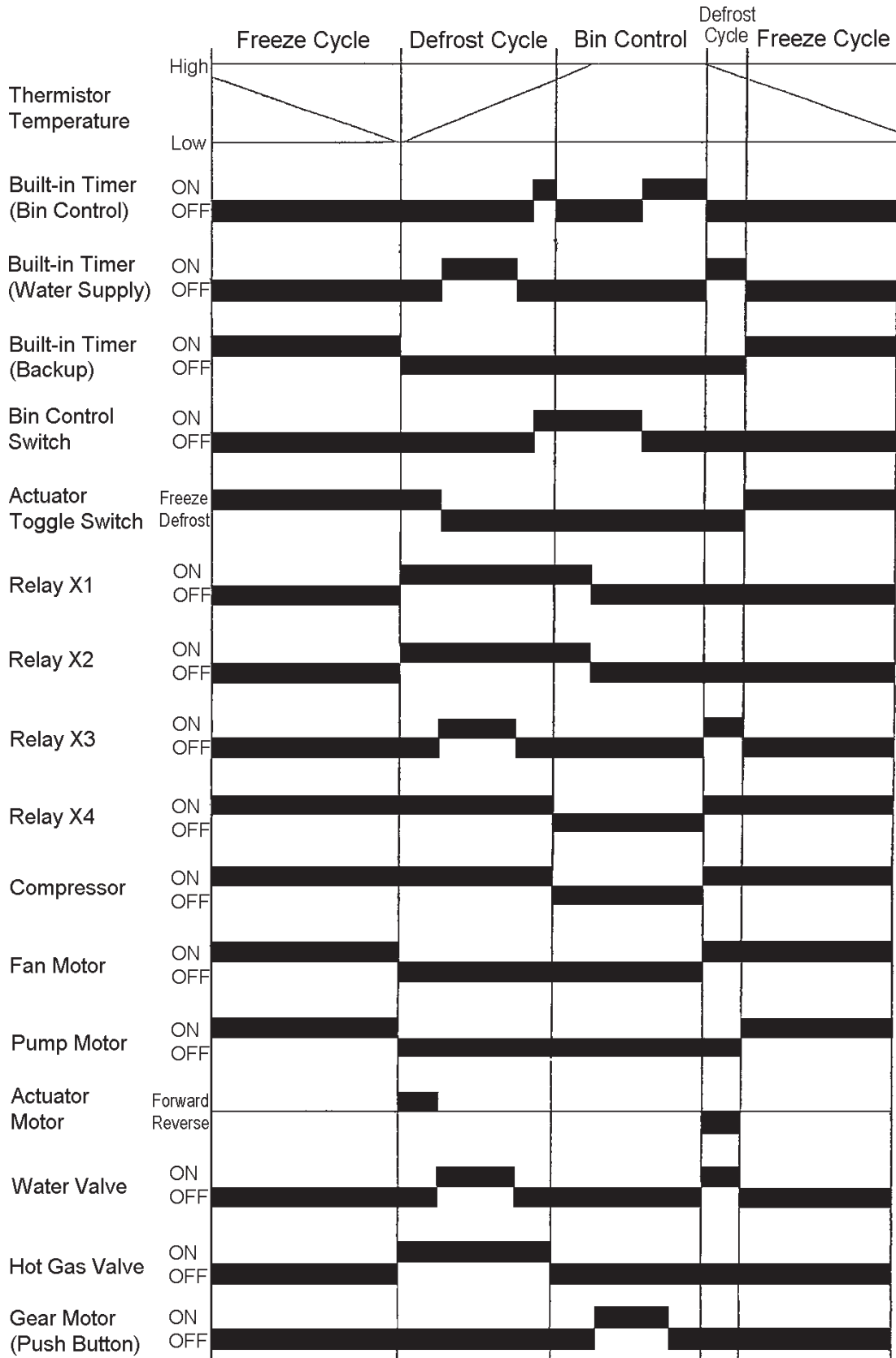
3. TIMING CHART

[a] NORMAL OPERATION



* Gear Motor operates at any time while Push Button is pressed.

[b] BIN CONTROL



* Gear Motor operates at any time while Push Button is pressed.

4. SEQUENCE

- 1) When the water supply tap is opened and the unit is energized, the Hot Gas Valve opens to let hot gas flow and the Actuator Motor starts to open the Water Pan.
When the Cam pushes down the Actuator Toggle Switch Lever to the left, the Hot Gas Valve closes and the Actuator Motor starts to turn in the reverse direction. Meanwhile the Water Valve opens to supply ice making water and the Water Pan closes to start a freeze cycle.
The ice making water supplied to the Water Pan runs through the return hole into the Water Tank. The Actuator Toggle Switch trips to close the Water Valve and stop the water supply. When the water in the Water Tank reaches a specific level (approx. 1.3L), it drains out into the Drain Pan.
- 2) The ice making water is pumped up by the Pump Motor from the bottom of the Water Tank into the Water Pan and jets out of the tiny holes in the branch pipes. Ice starts to form gradually from outside to inside in the refrigerated Evaporator Cells.

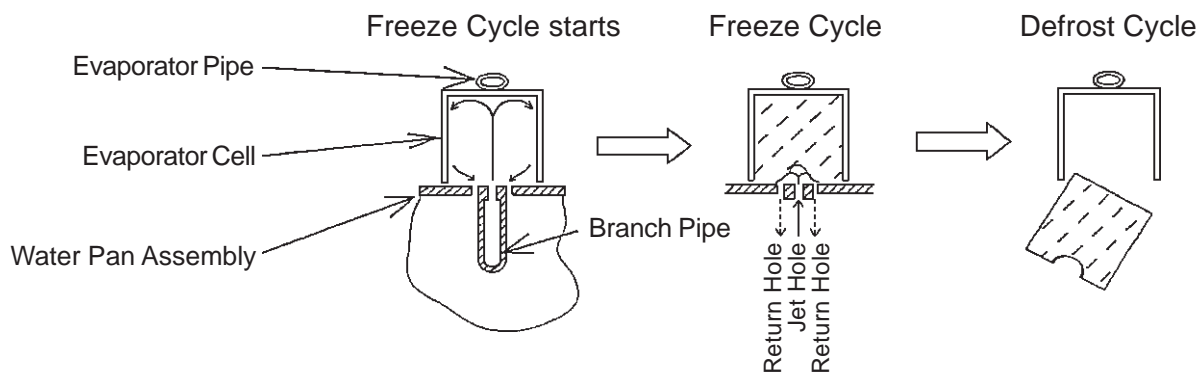


Fig. 12

When ice has formed completely and the Evaporator temperature goes down to a specific level, the Thermistor detects the completion of the freeze cycle to stop the Pump Motor and start the Actuator Motor in the direction to open the Water Pan.

- 3) When the freeze cycle completes, the Hot Gas Valve opens immediately to let hot gas flow and the Actuator Motor starts to open the Water Pan.
When the Cam pushes down the Actuator Toggle Switch Lever to the left, the Actuator Motor stops. Meanwhile the Water Valve opens, and the supplied water washes the Water Pan top surface for approx. 15 seconds and drains out into the Drain Pan.
The ice formed in the Evaporator Cells is slightly melt by hot gas and drops by gravity onto the Water Pan surface, then slides down into the Storage Bin.
After all the ice cubes have dropped, the Thermistor senses the Evaporator temperature to start the Actuator Motor in the direction to close the Water Pan, while the Water Valve opens. When the Cam goes back to the original position to trip the Actuator Toggle Switch, the Actuator Motor stops and the Pump Motor starts for another freeze cycle. The Water Valve closes to stop the water supply.

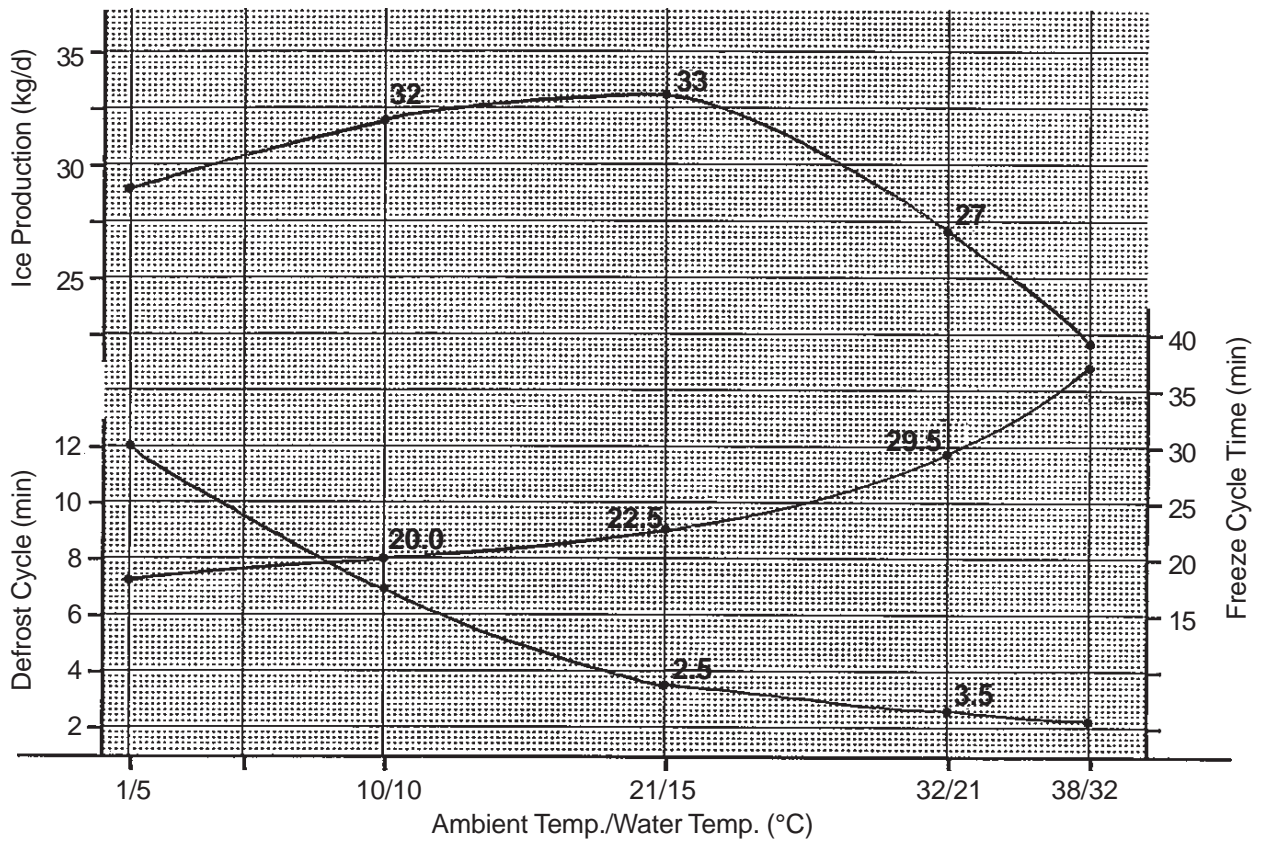
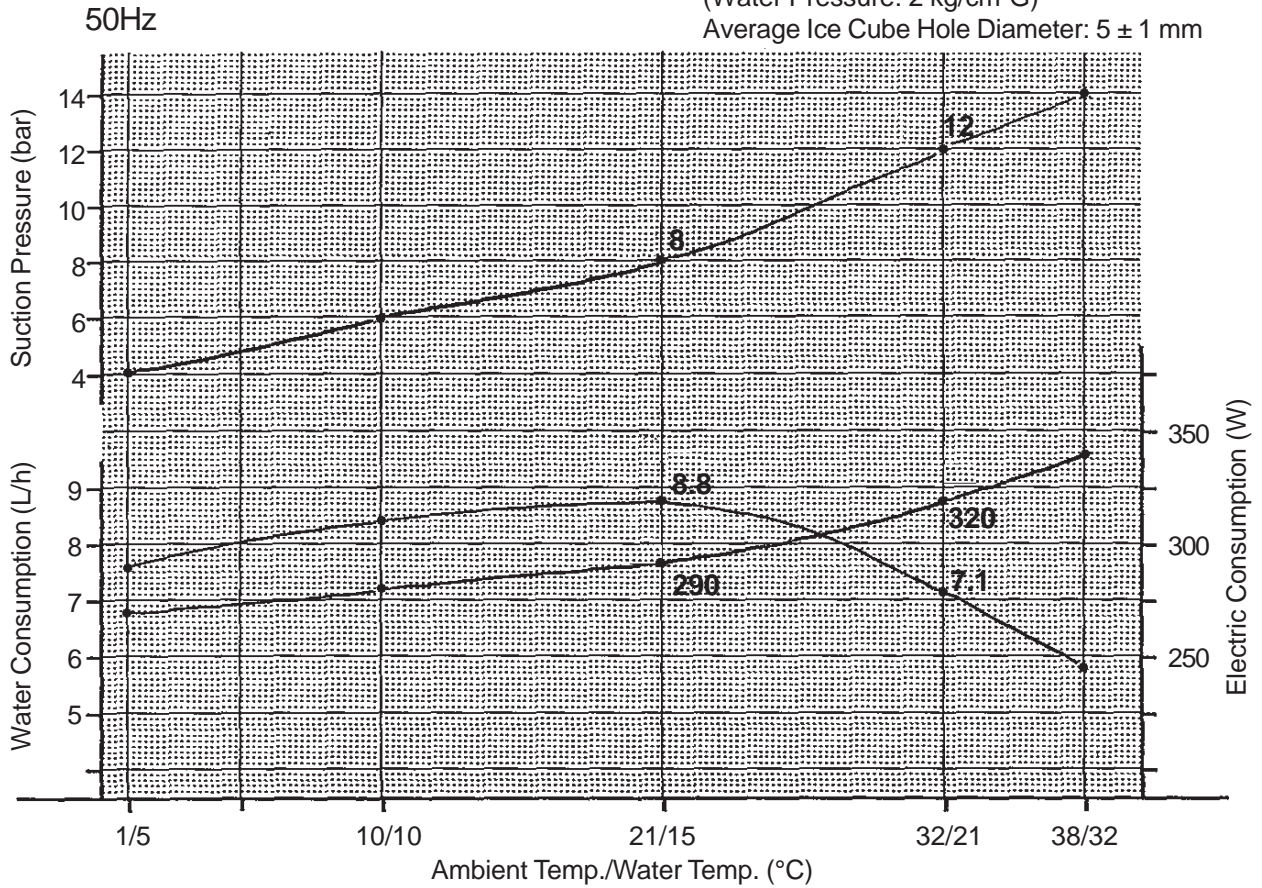
4) As the unit repeats the above freeze and defrost cycles, the Storage Bin is gradually filled with ice. When a certain level is reached, the Bin Control Switch (microswitch to shut off the circuit) detects the ice cubes to shut down the unit. When the storage level decreases, another freeze cycle starts.

The freeze cycle time depends on conditions such as ambient and water temperatures. But the unit is capable of producing 27 pieces of 28 x 28 x 32mm ice cubes (approx. 0.6kg) in approx. 25 minutes.

5) When the Push Button Switch is pressed, the Gear Motor starts the Auger to dispense ice from the Spout.

5. PERFORMANCE DATA

Standard Ice Production Capacity: 600 g/cycle
 Standard Water Valve Flow Rate: 3.8 L/min
 (Water Pressure: 2 kg/cm²G)
 Average Ice Cube Hole Diameter: 5 ± 1 mm



VII. SERVICE DIAGNOSIS

1. NO ICE PRODUCTION

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[1] The ice dispenser will not start.	a) Power Source	1. OFF position.	1. Move to ON position.
		2. Loose connections.	2. Tighten.
		3. Bad contacts.	3. Check for continuity and replace.
	b) Power Cord	1. Loose connection.	1. Tighten.
		2. Open circuit - damaged.	2. Repair or replace.
	c) Fuse	1. Blown out.	1. Replace.
	d) Bin Control	1. Tripped with Bin filled with ice.	1. Remove ice.
		2. Out of position.	2. Place in position.
		3. Fused contacts.	3. Check for continuity and replace.
	e) Transformer	1. Coil winding opened.	1. Replace.
	f) Wiring to Controller Board	1. Loose connections or open.	1. Check for continuity and repair or replace.
	g) Thermistor	1. Leads short-circuit or open and High Temperature Safety (Backup Timer) operates.	1. See "II. 2. [b] BEFORE CHECKING CONTROLLER BOARD".
	h) Hot Gas Solenoid Valve	1. Continues to open in freeze cycle and High Temperature Safety (Backup Timer) operates.	1. Check for power OFF in freeze cycle and replace.
i) Water Solenoid Valve	1. Mesh filter or orifice gets clogged and water supply cycle does not finish.	1. Clean.	
	2. Coil winding opened.	2. Replace.	
	3. Wiring to Water Valve.	3. Check for loose connection or open, and replace.	
j) Controller Board	1. Defective.	1. See "II. 2. CONTROLLER BOARD".	
[2] Compressor will not start, or operates intermittently.	a) Overload Protector	1. Bad contacts.	1. Check for continuity and replace.
		2. Voltage too low.	2. Check for recommended voltage.
		3. Refrigerant overcharged or undercharged.	3. Recharge.
	b) Starter	1. Defective.	1. Replace.
	c) Start Capacitor or Run Capacitor	1. Defective.	1. Replace.
	d) Power Relay	1. Bad contacts.	1. Check for continuity and replace.
		2. Coil winding opened.	2. Replace.
	e) Compressor	1. Wiring to Compressor.	1. Check for loose connection or open, and repair or replace.
		2. Defective.	2. Replace.

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[2] (Continued)	f) Air Filter, Condenser	1. Clogged.	1. Clean.
[3] Compressor runs, but other components will not start.	a) Control Circuit	1. Loose connection or broken wire.	1. Repair or replace.
[4] Fan Motor will not run.	a) Wiring	1. Loose connection or broken wire.	1. Repair or replace.
	b) Actuator Toggle Switch	1. Defective.	1. Replace.
	c) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".	
[5] Water continues to be supplied in freeze cycle.	a) Water Solenoid Valve	1. Diaphragm does not close.	1. Check for water leaks with ice dispenser OFF.
	b) Controller Board	1. Defective.	1. See "II. 2. CONTROLLER BOARD".
[6] Water does not circulate.	a) Water Supply Line	1. Water pressure too low and water level in Water Tank too low.	1. Check for recommended pressure.
		1. Dirty mesh filter or orifice and water level in Water Tank too low.	1. Clean.
	c) Water System	1. Water leaks.	1. Check connections for water leaks, and repair.
		2. Clogged.	2. Clean.
	d) Pump Motor	1. Motor winding opened.	1. Replace.
		2. Bearing worn out.	2. Replace.
		3. Wiring to Pump Motor.	3. Check for loose connection or open, and replace.
		4. Defective or bound impeller.	4. Replace and clean.
	e) Controller Board	1. Defective.	1. See "II. 2. CONTROLLER BOARD".
	f) Actuator Toggle Switch	1. Defective.	1. Replace.
g) Discharge Tube	1. Clogged.	1. Clean.	
	2. Out of position.	2. Place in position.	
[7] All components run, but no ice is produced.	a) Refrigerant	1. Undercharged.	1. Check for leaks and recharge.
		2. Air or moisture trapped.	2. Replace Drier, and recharge.
	b) Compressor	1. Defective valve.	1. Replace Compressor.
c) Hot Gas Solenoid Valve	1. Continues to open in freeze cycle.	1. Check and replace.	
[8] Water Pan will not open.	a) Wiring	1. Loose connection or broken wire.	1. Repair or replace.
	b) Actuator Toggle Switch	1. Defective.	1. Replace.
	c) Actuator Motor, Run Capacitor	1. Defective.	1. Replace.
	d) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".	

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[9] Water Pan will not close.	a) See [8] above.		
	b) Hot Gas Valve	1. Defective.	1. Replace.

2. LOW ICE PRODUCTION

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[1] Freeze cycle time is too long.	a) Water Supply	1. Low pressure.	1. Check for recommended pressure.
	b) Water Temperature	1. Too high.	1. Check for recommended water temperature.
	c) Water Quality	1. High hardness or contains impurities.	1. Install a water filter or scale treatment.
		2. Lime is deposited inside Cooling Water Tubing.	2. Clean.
	d) Refrigerant Charge	1. Overcharged or undercharged.	1. Recharge correctly and check for leaks.
	e) Refrigerant Circuit	1. Excessive moisture.	1. Replace Drier and recharge correctly.
	f) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".	
g) Air Filter, Condenser	1. Clogged.	1. Clean.	
[2] Takes too long for Water Pan to close.	a) Evaporator	1. Scaled up.	1. Clean or remove scale.
	b) Refrigerant Charge	1. Undercharged.	1. Check for leaks and recharge correctly.
	c) Hot Gas Valve	1. Defective.	1. Replace.
	d) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".	
	e) Fan Motor	1. Runs during defrost cycle.	1. Check wiring and Actuator Toggle Switch.

3. ABNORMAL ICE

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[1] Large-hole cubes.	a) Water Supply Line	1. Low pressure.	1. Check for recommended pressure.
	b) Ambient or Water Temperature	1. Too high.	1. Check for recommended temperatures.
	c) Air Filter, Condenser	1. Clogged.	1. Clean.
	d) Water Valve	1. Clogged.	1. Clean.
	e) Pump Motor	1. Leaks.	1. Repair or replace.
	f) Refrigerant Charge	1. Undercharged.	1. Check for leaks and recharge correctly.
	g) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".	
[2] Cloudy cubes.	a) Water Supply Line	1. Low pressure.	1. Check for recommended pressure.
		2. Clogged.	2. Check Strainer and clean.

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[2] (Continued)	b) Water Quality	1. High hardness or contains impurities.	1. Install a water filter or scale treatment.
		2. Lime is deposited inside Cooling Water Tubing.	2. Clean.
	c) Water Valve	1. Clogged.	1. Clean.
	d) Water System	1. Scaled up.	1. Clean or remove scale.
	e) Water Plate	1. Jet hole clogged.	1. Clean.
	f) Pump Motor	1. Leaks.	1. Replace.
		2. Bearings worn out.	2. Replace.
g) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".		
[3] Slab does not break into separate cubes.	a) Extension Spring	1. Over-extended.	1. Replace.
	b) Clearance between Evaporator and Water Plate	1. Too much.	1. Readjust.
	c) Evaporator	1. Dirty or scaled up.	1. Clean or remove scale.
	d) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".	

4. OTHERS

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[1] Ice dispenser will not stop when Bin is filled with ice.	a) Bin Control Switch	1. Out of position.	1. Place in position.
		2. Bad contacts.	2. Check for continuity and replace.
	b) Controller Board	1. See "II. 2. CONTROLLER BOARD".	
[2] Abnormal noise	a) Pump Motor	1. Bearing worn out.	1. Replace.
	b) Actuator Motor	1. Gears worn out.	1. Replace.
	c) Fan Motor	1. Bearings worn out.	1. Replace.
		2. Fan Blade deformed.	2. Replace Fan Blade.
		3. Fan Blade does not move freely.	3. Replace.
d) Compressor	1. Mounting pad out of position.	1. Reinstall.	
e) Refrigerant Lines	1. Rubbing or touching on other surfaces.	1. Secure or reset pipes.	
[3] Ice in Storage Bin often melts.	a) Bin Drain	1. Plugged.	1. Clean.

VIII. REMOVAL AND REPLACEMENT OF COMPONENTS

1. PANELS

[a] LOUVER

- 1) Push the Tab to unlock the Louver, and pull it off toward you.
- 2) To refit the Louver, put it back in position and push the top to relock.

[b] FRONT PANEL (UPPER)

- 1) Unlock the Front Panel (Upper) by turning the Hook counterclockwise with a flat blade screwdriver. Lift off the Front Panel (Upper). See Fig. 5.
- 2) To refit the Front Panel (Upper), push down the top while turning the Hook clockwise. See Fig. 6.

[c] FRONT PANEL (LOWER)

- 1) Remove the Louver, and turn off the Power Switch.
- 2) Remove the Front Panel (Upper).
- 3) Remove the two screws securing the top of the Front Panel (Lower).
- 4) Tilt the top of the Front Panel (Lower) slightly toward you, and lift it off.
- 5) Disconnect the Drain Hose from the Ice Station.
- 6) Remove the connectors from the Front Panel (Lower).
- 7) To refit the Front Panel (Lower), reconnect the connectors and Drain Hose, put the bottom into the unit base, and secure the top with the screws.

[d] TOP PANEL

- 1) Remove the Front Panel (Upper).
- 2) Unhook the rear of the Top Panel, and lift it off.
- 3) To refit the Top Panel, check that the Insulation Panel is securely in place before hooking the backside square hole of the Top Panel on the rear of the cabinet.

[e] AIR GUIDE

The Air Guide fitted with a vibration damper on backside is located at the front of the Condenser to prevent noise from the machine compartment.

- 1) Remove the four machine screws securing the Air Guide to the cabinet and Switch Box.
- 2) To refit the Air Guide, reverse the above procedure.

[f] REFRIGERATOR COVERS

The Refrigerator Covers (A) and (B) are located on top of the machine compartment as partitions and fitted with the Control Box.

- 1) Remove the Air Guide.
- 2) Remove the four machine screws securing the Refrigerator Cover (A), and take it off.
- 3) Remove the machine screw securing the Control Box, and pull out the Control Box.
- 4) Remove the two machine screws securing the Refrigerator Cover (B), and take it off.
- 5) To refit the Refrigerator Covers, reverse the above procedure.

[g] SWITCH BOX

The Switch Box is located at the front right side of the Condenser to enclose the Power Switch.

- 1) Remove the four machine screws securing the Switch Box.
- 2) To refit the Switch Box, reverse the above procedure.

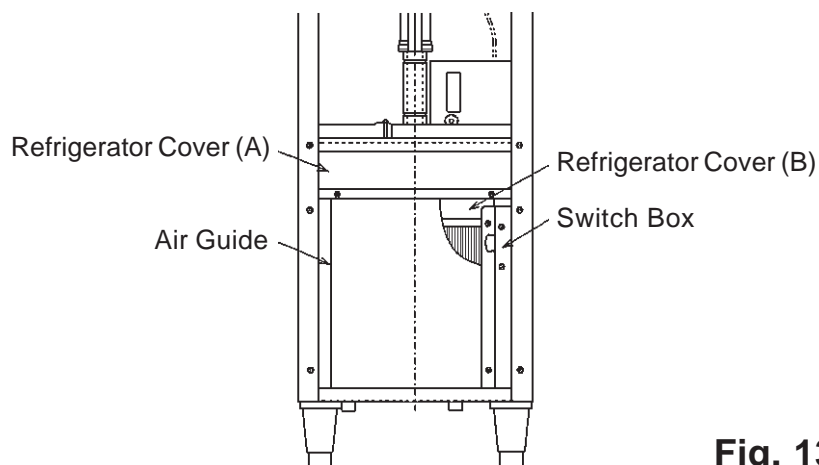


Fig. 13

2. SERVICE FOR REFRIGERANT LINES

[a] SERVICE INFORMATION

1) Allowable Compressor Opening Time and Prevention of Lubricant Mixture [R134a]

The compressor must not be opened more than 30 minutes in replacement or service. Do not mix lubricants of different compressors even if both are charged with the same refrigerant, except when they use the same lubricant.

2) Treatment for Refrigerant Leak [R134a]

If a refrigerant leak occurs in the low side of an ice maker, air may be drawn in. Even if the low side pressure is higher than the atmospheric pressure in normal operation, a continuous refrigerant leak will eventually lower the low side pressure below the atmospheric pressure and will cause air suction. Air contains a large amount of moisture, and ester oil easily absorbs a lot of moisture. If an ice maker charged with R134a has possibly drawn in air, the drier must be replaced. Be sure to use a drier designed for R134a.

3) Handling of Handy Flux [R134a]

Repair of the refrigerant circuit needs brazing. It is no problem to use the same handy flux that has been used for the current refrigerants. However, its entrance into the refrigerant circuit should be avoided as much as possible.

4) Oil for Processing of Copper Tubing [R134a]

When processing the copper tubing for service, wipe off oil, if any used, by using alcohol or the like. Do not use too much oil or let it into the tubing, as wax contained in the oil will clog the capillary tubing.

5) Service Parts for R134a

Some parts used for refrigerants other than R134a are similar to those for R134a. But never use any parts unless they are specified for R134a because their endurance against the refrigerant have not been evaluated. Also, for R134a, do not use any parts that have been used for other refrigerants. Otherwise, wax and chlorine remaining on the parts may adversely affect R134a.

6) Replacement Copper Tubing [R134a]

The copper tubes currently in use are suitable for R134a. But do not use them if oily inside. The residual oil in copper tubes should be as little as possible. (Low residual oil type copper tubes are used in the shipped units.)

7) Evacuation, Vacuum Pump and Refrigerant Charge [R134a]

Never allow the oil in the vacuum pump to flow backward. The vacuum level and vacuum pump may be the same as those for the current refrigerants. However, the rubber hose and gauge manifold to be used for evacuation and refrigerant charge should be exclusively for R134a.

8) Refrigerant Leak Check

Refrigerant leaks can be detected by charging the unit with a little refrigerant, raising the pressure with nitrogen and using an electronic detector. Do not use air or oxygen instead of nitrogen for this purpose, or rise in pressure as well as in temperature may cause R134a to suddenly react with oxygen and explode. Be sure to use nitrogen to prevent explosion.

[b] REFRIGERANT RECOVERY

The refrigerant must be recovered if required by an applicable law. No refrigerant Access Valve is provided in the unit. Install a proper Access Valve on the low-side line (ex. Compressor Process Pipe). Recover the refrigerant from the Access Valve, and store it in a proper container. Do not discharge the refrigerant into the atmosphere.

When replacing the Drier, take the opportunity to also fit a High-side Access Valve for ease of charging liquid refrigerant.

[c] EVACUATION AND RECHARGE

- 1) Attach Charging Hoses, a Service Manifold and a Vacuum Pump to the system. If possible, use Quick Release Connectors onto the Access Valves (especially on the high side).
- 2) Turn on the Vacuum Pump.
- 3) Allow the Vacuum Pump to pull down to a 760 mmHg vacuum. Evacuating period depends on the pump capacity.
- 4) Close the Low-side and High-side Valves on the Service Manifold.
- 5) Disconnect the Vacuum Pump, and attach a Refrigerant Charging Cylinder to accurately weigh in the liquid charge. Remember to purge any air from the Charging Hose. See the Nameplate for the required refrigerant charge.
- 6) Open the High-side Valve on the Gauge Manifold, and accurately measure in the liquid charge. Close the valve on the Charging Cylinder before closing the High-side Manifold Valve. Any remaining liquid in the line can be charged into the low side.

Note: Always charge in the liquid stage, as many refrigerants are blends and vapour charging will affect the blend consistency.

- 7) Turn on the ice dispenser. Release the High-side Access Connector, and allow pressure in the charging line to slowly enter the low side of the system. Cap off the High-side Access Valve. When pressure reduces on the low side, disconnect the low side charging line and cap off the Access Valve.
- 8) Always cap the Access Valves to prevent a refrigerant leak.
- 9) Always thoroughly leak test all joints and valve caps.
- 10) Avoid charging large quantities of liquid into the low side in case of damage to the Compressor.

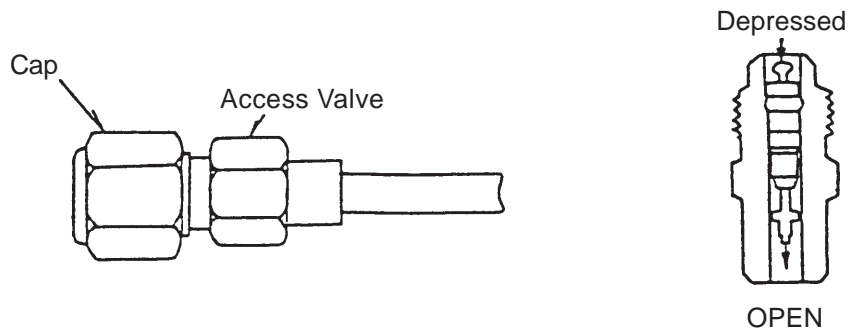


Fig. 14

3. COMPRESSOR

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Front Panel (Lower) and Rear Mesh.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "2. [b] REFRIGERANT RECOVERY").
- 4) Remove the Terminal Cover on the Compressor, and disconnect Solderless Terminals.
- 5) Disconnect the Discharge and Suction Pipes using brazing equipment.
- 6) Remove the Hold-down Bolts, Washers and Rubber Grommets.
- 7) Slide and remove the Compressor. Unpack the new Compressor package.
- 8) Attach the Rubber Grommets of the previous Compressor.
- 9) Clean the Suction and Discharge Pipes with an abrasive cloth/paper.
- 10) Place the Compressor in position, and secure it using the Bolts and Washers.
- 11) Remove Plugs from the Compressor Suction and Discharge Pipes.

- 12) Braze or solder the Access, Suction and Discharge lines (Do not change this order), with nitrogen gas flowing at a pressure of 0.2 - 0.3 bar.
- 13) Install the new Drier (See "4. DRIER").
- 14) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 15) Evacuate the system and charge it with refrigerant (See "2. [c] EVACUATION AND RECHARGE").
- 16) Connect the Solderless Terminals and replace the Terminal Cover in its correct position.
- 17) Replace the Front Panel and Rear Mesh in their correct positions.
- 18) Plug in the ice dispenser or connect the power source.

Note: Hoshizaki recommends that Compressor starting electrics are always replaced at the same time as the Compressor.

4. DRIER

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Rear Mesh.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "2. [b] REFRIGERANT RECOVERY").
- 4) Remove the Drier Holder, if any, and pull the Drier toward you for easy service.
- 5) Remove the Drier using brazing equipment.
- 6) Braze or solder the new Drier, with the arrow on the Drier in the direction of the refrigerant flow. Use nitrogen gas at a pressure of 0.2 - 0.3 bar when brazing tubings. Braze in an Access Valve using a tee if necessary.
- 7) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 8) Evacuate the system and charge it with refrigerant (See "2. [c] EVACUATION AND RECHARGE").
- 9) Replace the Rear Mesh in its correct position.
- 10) Plug in the ice dispenser or connect the power source.

Note: Always use a Drier of the correct capacity and refrigerant type.

5. EVAPORATOR

IMPORTANT

Always install a new Drier every time the sealed refrigeration system is opened. Do not replace the Drier until after all other repair or replacement has been made.

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Top, Front (Upper) and Rear Mesh Panels.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See “2. [b] REFRIGERANT RECOVERY”).
- 4) Remove the Water Pan Assembly, referring to “8. WATER PAN ASSEMBLY.”
- 5) Disconnect the solder connections on the Evaporator using brazing equipment.
- 6) Remove the four nuts holding the Evaporator.
- 7) Install the new Evaporator, and secure it with the Bolts, Collars (Spacers) and Nuts.
- 8) Remove and replace the Drier (See “4. DRIER”).
- 9) Braze pipes, with nitrogen gas flowing at a pressure of 0.2 - 0.3 bar.
- 10) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 11) Evacuate the system and charge it with refrigerant (See “2. [c] EVACUATION AND RECHARGE”).
- 12) Replace the panels in their correct positions.
- 13) Plug in the ice dispenser or connect the power source.

6. HOT GAS VALVE

IMPORTANT

Always install a new Drier every time the sealed refrigeration system is opened. Do not replace the Drier until after all other repair or replacement has been made.

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Rear Mesh Panel.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "2. [b] REFRIGERANT RECOVERY").
- 4) Disconnect the Hot Gas Valve leads.
- 5) Remove the screw and the Solenoid Coil.
- 6) Remove the valve and Drier using brazing equipment.
- 7) Braze the new Hot Gas Valve with nitrogen gas flowing at a pressure of 0.2 - 0.3 bar.

WARNING

Always protect the valve body by using a damp cloth to prevent the valve from overheating. Do not braze with the valve body exceeding 120°C.

- 8) Install the new Drier (See "4. DRIER").
- 9) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 10) Evacuate the system and charge it with refrigerant (See "2. [c] EVACUATION AND RECHARGE").
- 11) Attach the Solenoid Coil to the valve body, and secure it with the screw.
- 12) Connect the leads.
- 13) Replace the panels in their correct positions.
- 14) Plug in the ice dispenser or connect the power source.

7. WATER PAN ASSEMBLY

- 1) Remove the Top Panel and Front Panel (Upper).
- 2) Remove the Front Panel (Lower), and push the Reset Switch on the Control Box to open the Water Pan.
- 3) Unplug the ice dispenser or disconnect the power source.
- 4) Disconnect the Pump Motor leads in the Wiring Channel.
- 5) Remove the two Extension Springs from the Cam Arms.
- 6) Remove the Water Pan Brackets and the Water Pan Assembly.
- 7) Remove the two Spring Hook Screws from the Water Tank.
- 8) Remove the screws and the Water Pan Brackets.
- 9) Remove the Pump Suction and Discharge Tubings.
- 10) Remove the Pump Motor Bracket from the Water Plate.
- 11) Install the new Water Plate or Water Tank in the reverse order of the removal procedure.
- 12) Replace the panels in their correct positions.
- 13) Plug in the ice dispenser or connect the power source.

INDEX NO.	DESCRIPTION
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1	Water Plate
2	Water Tank
3	Drain Guide
4	Spring Hook Screw
5	Water Pan Bracket (A)
6	Water Pan Bracket (B)
7	Pump Motor
8	Suction Tubing
9	Discharge Tubing
10	Lubrication Plate
11	U-packing
12	Tie

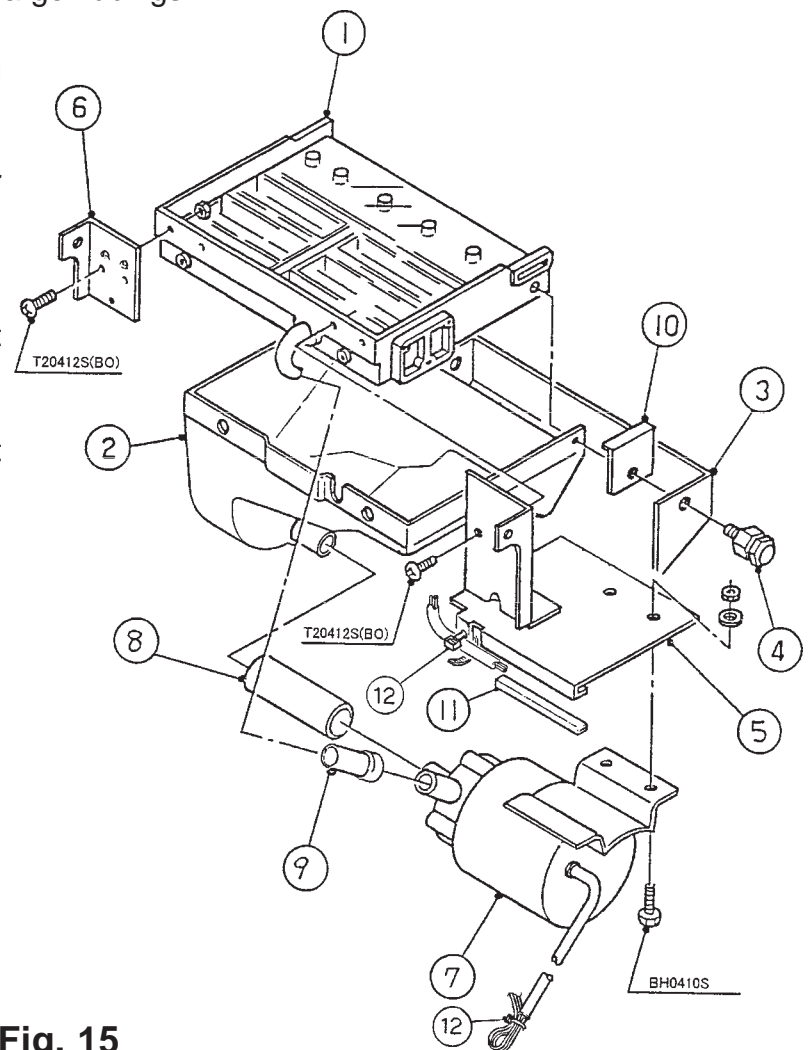


Fig. 15

8. PUMP MOTOR

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Top Panel and Front Panel (Upper).
- 3) Disconnect the Pump Motor leads in the Wiring Channel.
- 4) Remove screws and the Pump Motor from the Bracket.
- 5) Disconnect the Pump Suction and Discharge Tubings.
- 6) Disassemble the Pump Motor and check the Motor or parts.
- 7) Install the new motor or parts in the reverse order of the removal procedure.
- 8) Plug in the ice dispenser or connect the power source, and check for leaks.
- 9) Replace the panels in their correct positions.

9. WATER VALVE

- 1) Close the water supply tap.
- 2) Unplug the ice dispenser or disconnect the power source.
- 3) Remove the Top Panel.
- 4) Disconnect the Receptacle (leads) from the Water Valve.
- 5) Remove the Valve Outlet tubing by releasing the Clamp.
- 6) Remove the Inlet Hose and Water Valve.
- 7) Install the new valve in the reverse order of the removal procedure.
- 8) Open the water supply tap.
- 9) Plug in the ice dispenser or connect the power source.
- 10) Check for leaks.
- 11) Replace the Top Panel in its correct position.

Note: When replacing parts, disassemble as shown in Fig. 11 (page 24) and replace the defective parts.

10. ACTUATOR MOTOR

- 1) Remove the Top Panel and Front Panel (Upper).
- 2) Remove the Front Panel (Lower), and push the Reset Switch on the Control Box to open the Water Pan.
- 3) Unplug the ice dispenser or disconnect the power source.
- 4) Remove the Extension Spring (Actuator Motor side) from the Cam Arm.
- 5) Disconnect the Actuator Motor leads in the Wiring Channel.
- 6) Remove the Actuator Motor Bracket.
- 7) Remove the Spring Pin securing the Shaft to the Cam Arm.
- 8) Remove the Actuator Motor.
- 9) Install the new Actuator Motor in the reverse order of the removal procedure.
- 10) Check and adjust so that the Cam Arm normally moves the Actuator Toggle Switch to the "FREEZE" and "DEFROST" positions (See "II. 2. [b] BEFORE CHECKING CONTROLLER BOARD").
- 11) Replace the panels in their correct positions.
- 12) Plug in the ice dispenser or connect the power source.

11. CAM ARM

[a] CAM ARM (A) - ACTUATOR MOTOR SIDE

Refer to "10. ACTUATOR MOTOR."

[b] CAM ARM (B) - REAR SIDE

- 1) Remove the Top Panel and Front Panel (Upper).
- 2) Remove the Front Panel (Lower), and push the Reset Switch on the Control Box to open the Water Pan.
- 3) Unplug the ice dispenser or disconnect the power source.
- 4) Remove the Extension Spring from the Cam Arm (B).

- 5) Remove the Split Pin from the Cam Shaft.
- 6) Remove the Cam Arm (B).
- 7) Install the new Cam in the reverse order of the removal procedure.
- 8) Replace the panels in their correct positions.
- 9) Plug in the ice dispenser or connect the power source.

12. ACTUATOR TOGGLE SWITCH

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Top Panel and Front Panel (Upper).
- 3) Remove the Hex Nut holding the Actuator Toggle Switch.
- 4) Cut off the Nylon Tie holding the Vinyl Cover Bag.
- 5) Disconnect the Receptacle of the leads.
- 6) Install the new Actuator Toggle Switch in the reverse order of the removal procedure.

Note: Be sure to secure the Vinyl Cover Bag.

- 7) Replace the panels in their correct positions.
- 8) Plug in the ice dispenser or connect the power source.

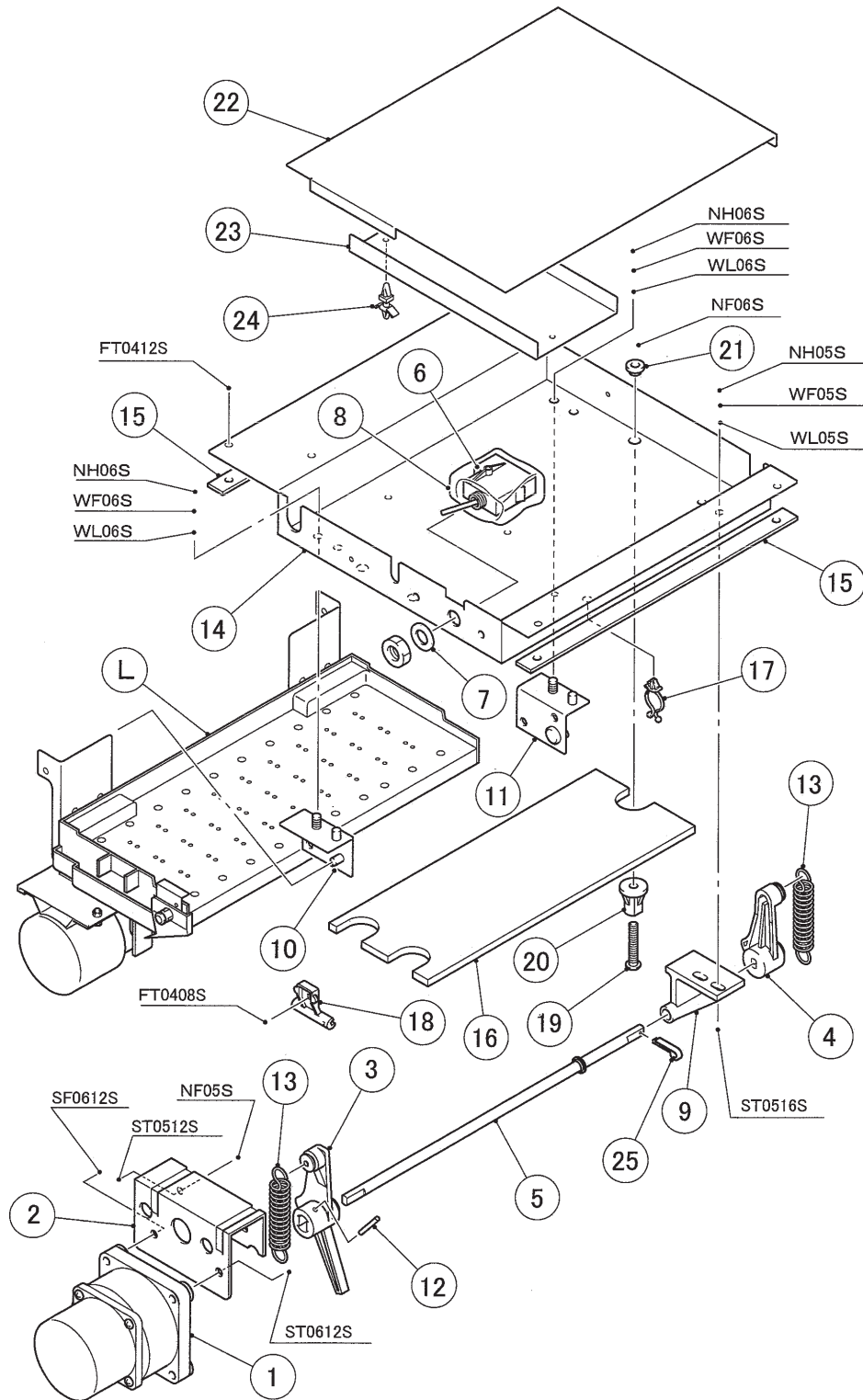


Fig. 16

ICEMAKING ASSEMBLY AND CAM MECHANISM

INDEX NO.	DESCRIPTION
L	Water Pan Assembly
1	Actuator Motor
2	Actuator Motor Bracket
3	Cam Arm (A)
4	Cam Arm (B)
5	Cam Shaft
6	Actuator Toggle Switch
7	Switch Washer
8	Switch Cover
9	Cam Shaft Holder
10	Water Pan Hanger Bracket (A)
11	Water Pan Hanger Bracket (B)
12	Spring Pin
13	Extension Spring
14	Bracket
15	Spacer
16	Insulation
17	Clamp
18	Thermistor Holder
19	Evaporator Mounting Screw
20	Spacer
21	Washer
22	Cover
23	Connector Guide
24	Board Support
25	Split Pin

13. CONTROLLER BOARD

IMPORTANT

A single type Controller Board is supplied as a Service Board. Some modifications and adjustment will be required to fit the ice dispenser models. Do not repair any parts and electronic devices on the Controller Board in the field. Replace the whole board with a new Service Board.

[a] MODIFICATION

1) Check that the Service Board package includes:

Controller Board	1 pc.
Label	1 pc.
Instruction Sheet	1 pc.

2) Modify the Service Board referring to the Instruction Sheet attached.

[b] REPLACEMENT

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Front Panel (Lower).
- 3) Remove screws and the Control Box Cover.
- 4) Pull the Shield Plate slightly toward you, and disconnect the Signal Ground wire.
- 5) Pull out the Controller Board half way, and disconnect the Connectors K1, K2, K3 and K4.
- 6) Pull out and remove the Controller Board from the Control Box.
- 7) Install the new Controller Board and reassemble the Control Box in the reverse order of the removal procedure.
- 8) Replace the panel in its correct position.
- 9) Plug in the ice dispenser or connect the power source.

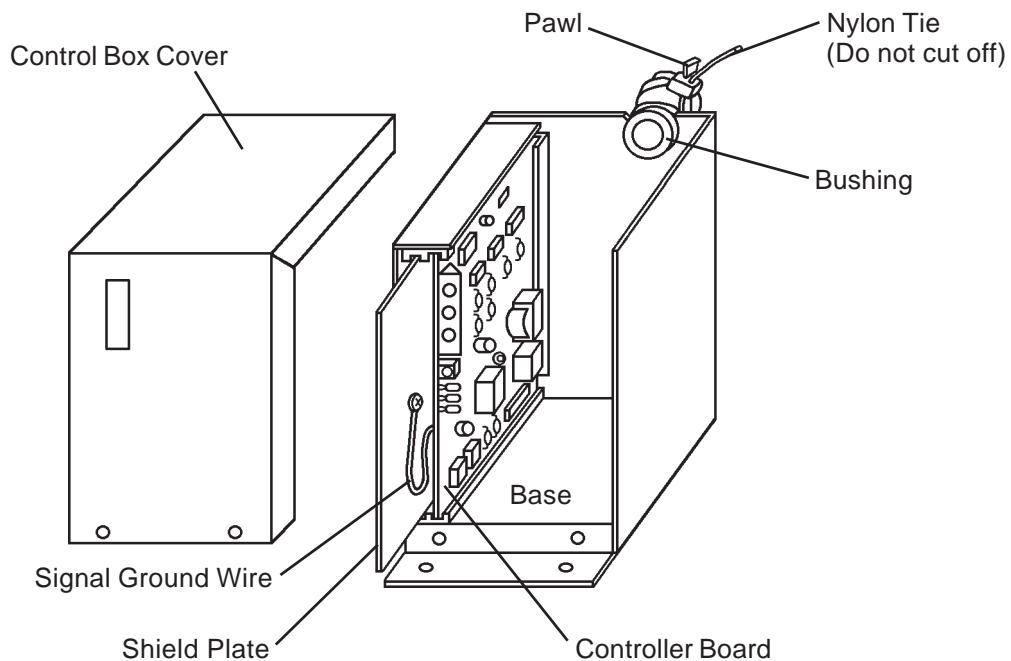
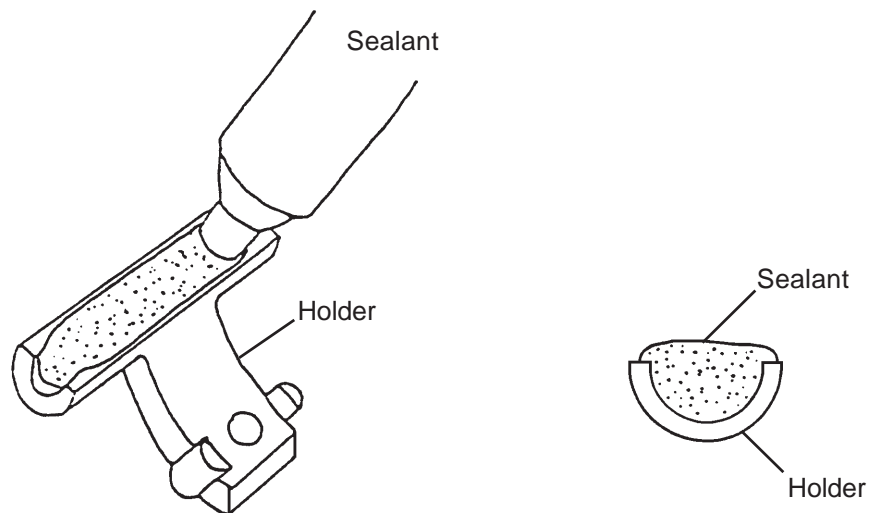


Fig. 17

14. THERMISTOR FOR CUBE CONTROL

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Top Panel, Front Panel and Pipe Cover (Rear).
- 3) Remove the Connector K4 on the Controller Board, referring to “13. [b] REPLACEMENT.”
- 4) Unscrew and remove the Thermistor Holder and Thermistor, located on the Evaporator (Front Side).
- 5) Install the new thermistor in the reverse order of the removal procedure, by using a sealant (High-thermal Conduct Type). See Fig. 18.

Note: Recommended sealant is KE4560RTV, manufactured by SINETSU SILICON. When other type of sealant used, the cube size and performance will be changed. Do not use silicone sealant as this will insulate the Thermistor.



* Thermistor and Leads are FRAGILE.
HANDLE WITH CARE.

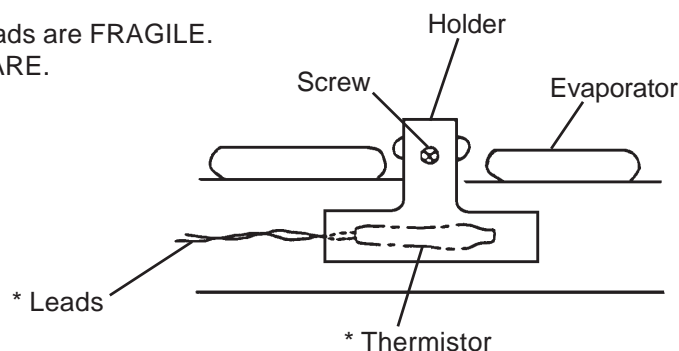


Fig. 18

15. SURGE ABSORBER

- 1) Turn off the Control Switch or disconnect the power source.
- 2) Remove the Front Cover.
- 3) Remove two screws at the front bottom of the Control Box, and remove the Control Box Cover.
- 4) Remove the Quick Disconnect Terminal from the Surge Absorber.
- 5) Remove the screw securing the Surge Absorber.
- 6) Remove the Surge Absorber.
- 7) Install the new Surge Absorber in the reverse order of the removal procedure.

Note: Function of Surge Absorber

By-passes a surge coming through the power supply line, caused by a thunderbolt, in order to protect the electronic components.

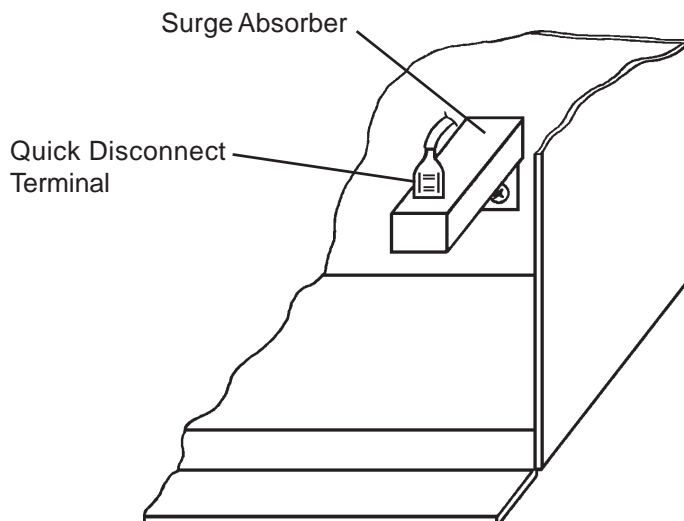


Fig. 19

16. FAN MOTOR

- 1) Unplug the ice dispenser or disconnect the power source.
- 2) Remove the Front Panel (Lower).
- 3) Remove the Control Box and Air Guide.
- 4) Disconnect the Connector of the Fan Motor.

- 5) Remove the Fan Motor Bracket and the Fan Motor.
- 6) Cut the leads of the Fan Motor allowing enough lead length to reconnect using closed end connectors.
- 7) Install the new Fan Motor in the reverse order of the removal procedure.
- 8) Replace the panels in their correct positions.
- 9) Plug in the ice dispenser or connect the power source.

17. GEAR MOTOR

- 1) Press the Push Button to dispense all the ice in the Storage Bin.
- 2) Remove the Front Panels (Upper) and (Lower), and turn off the Power Switch.
- 3) Remove the four machine screws securing the Motor Bracket, and take off the Gear Motor together with the Auger.
- 4) Take off the Motor Cover, and remove the three machine screws securing the Ice Guide.
- 5) Move the Ice Guide toward the Auger, and remove the Spring Pin connecting the Auger and Joint.
- 6) Remove the four machine screws securing the Gear Motor, and pull out the Gear Motor.
- 7) To refit the Gear Motor, reverse the above procedure. Check for proper operation.

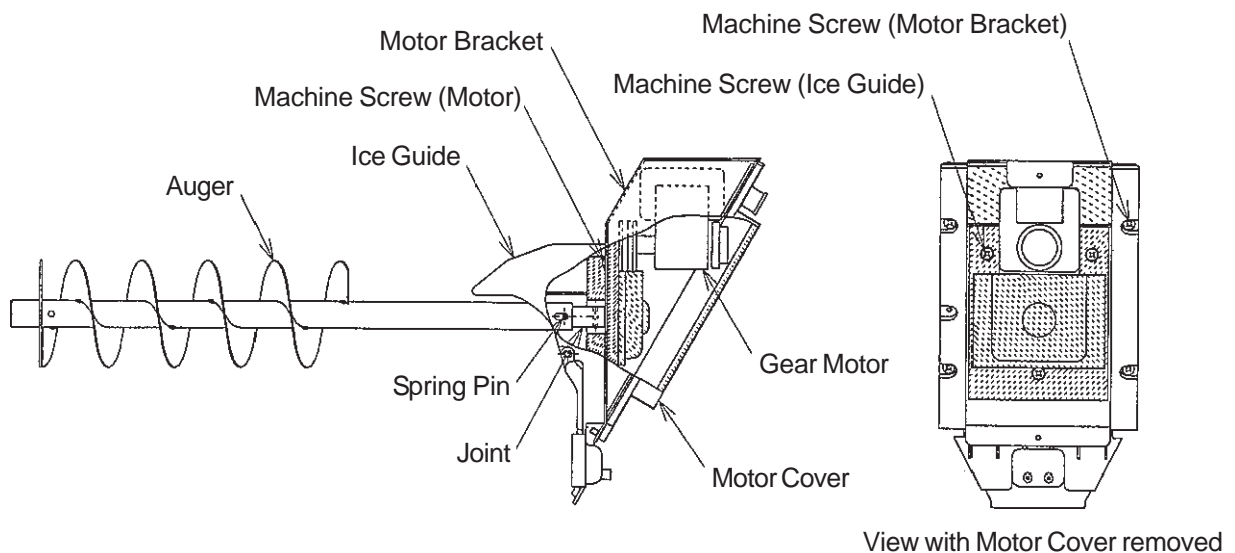


Fig. 20

18. BIN CONTROL SWITCH

- 1) Insert a flat blade screwdriver between the Switch Case and Switch Base, and lightly pry the Switch Case off.
- 2) Use a Phillips screwdriver to loosen the screw securing the Microswitch and remove the U-nut.
- 3) To refit the Microswitch, fit the mounting holes of the Microswitch and Switch Base, and secure them with the U-nut.
- 4) To refit the Switch Base, put the Switch Case Shaft (left) into the left side mounting hole in the Switch Base. Use the U-notch on the Switch Base to thrust the Switch Case Shaft (right) into the right side mounting hole in the Switch Base.

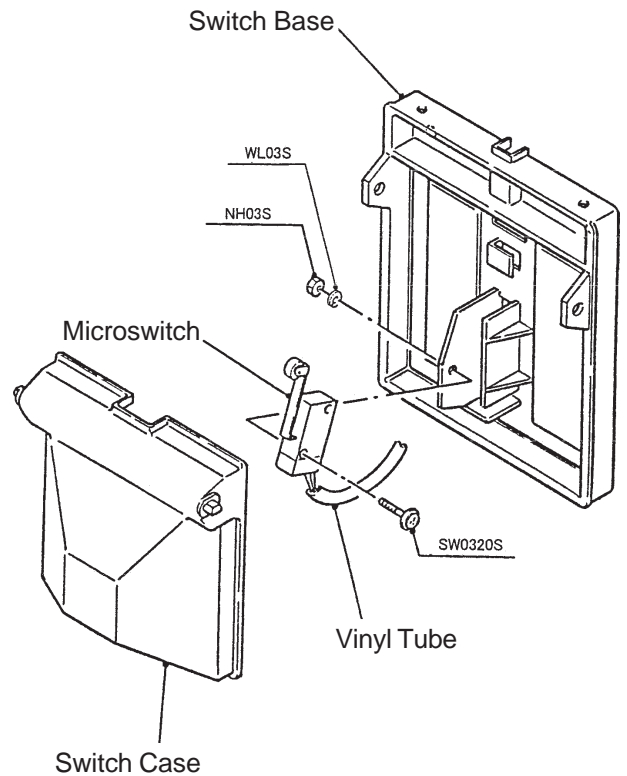


Fig. 21

19. TRANSFORMER

- 1) Unplug the ice dispenser.
- 2) Remove the Transformer Cover and the Transformer.
- 3) Cut the Transformer leads at the wire connectors.
- 4) Install the new Transformer.
- 5) Assemble the removed parts in the reverse order of which they were removed.
- 6) Plug in the ice dispenser.

20. POWER SUPPLY CORD

- 1) Unplug the ice dispenser.
- 2) Remove the Front Panel (Upper) and Front Panel (Lower).
- 3) Remove the Bushing securing the Power Supply Cord.
- 4) Cut the Power Supply Cord leads at the wire connectors. Remove the Earth Screw.
- 5) Install the new Power Supply Cord.

- 6) Assemble the removed parts in the reverse order of which they were removed.
- 7) Plug in the ice dispenser.

21. PUSH BUTTON SWITCH AND PILOT LAMP

- 1) Unplug the ice dispenser.
- 2) Remove the Front Panel (Upper) and Front Panel (Lower).

If the Push Button Switch does not require replacement, skip 3) - 11).

- 3) Remove the connectors to the Push Button Switch.
- 4) Loosen the Nut on the Housing Screw.

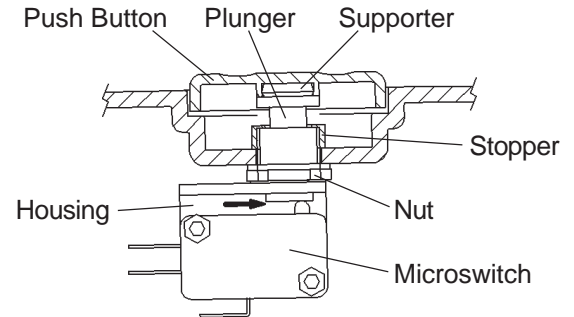


Fig. 22

- 5) Turn the Push Button Switch counterclockwise, and remove the Push Button.
- 6) Remove the Supporter on the back of the Push Button.
- 7) Turn the Stopper counterclockwise, and remove it from the Housing Screw. Detach the Push Button Switch from the Ice Station.
- 8) Remove the Supporter from the new Push Button Switch. Fit the Housing Screw into the hole on the Ice Station, and attach the Stopper to the end of the Housing Screw.
- 9) Loosen the Nut on the Housing Screw.
- 10) Attach the Supporter to the end of the Plunger.
- 11) Fit the Push Button while retaining the Plunger in place between the Plunger and the Microswitch with a flat blade screwdriver or the like.

If the Pilot Lamp does not require replacement, go to 12) - 14).

- 12) Cut the Pilot Lamp leads at the wire connectors.
- 13) Remove the Pilot Lamp.
- 14) Install the new Pilot Lamp.
- 15) Assemble the removed parts in the reverse order of which they were removed.
- 16) Plug in the ice dispenser.

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