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NO. E1CG-488

ISSUED: MAR. 10, 1999

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**HOSHIZAKI  
MODULAR CUBER**

**MODEL      IM-240DME  
                 IM-240DWME  
                 IM-240DSME  
                 IM-240XME  
                 IM-240XWME  
                 IM-240XSME  
                 IM-240AME  
                 IM-240AWME**

**SERVICE MANUAL**

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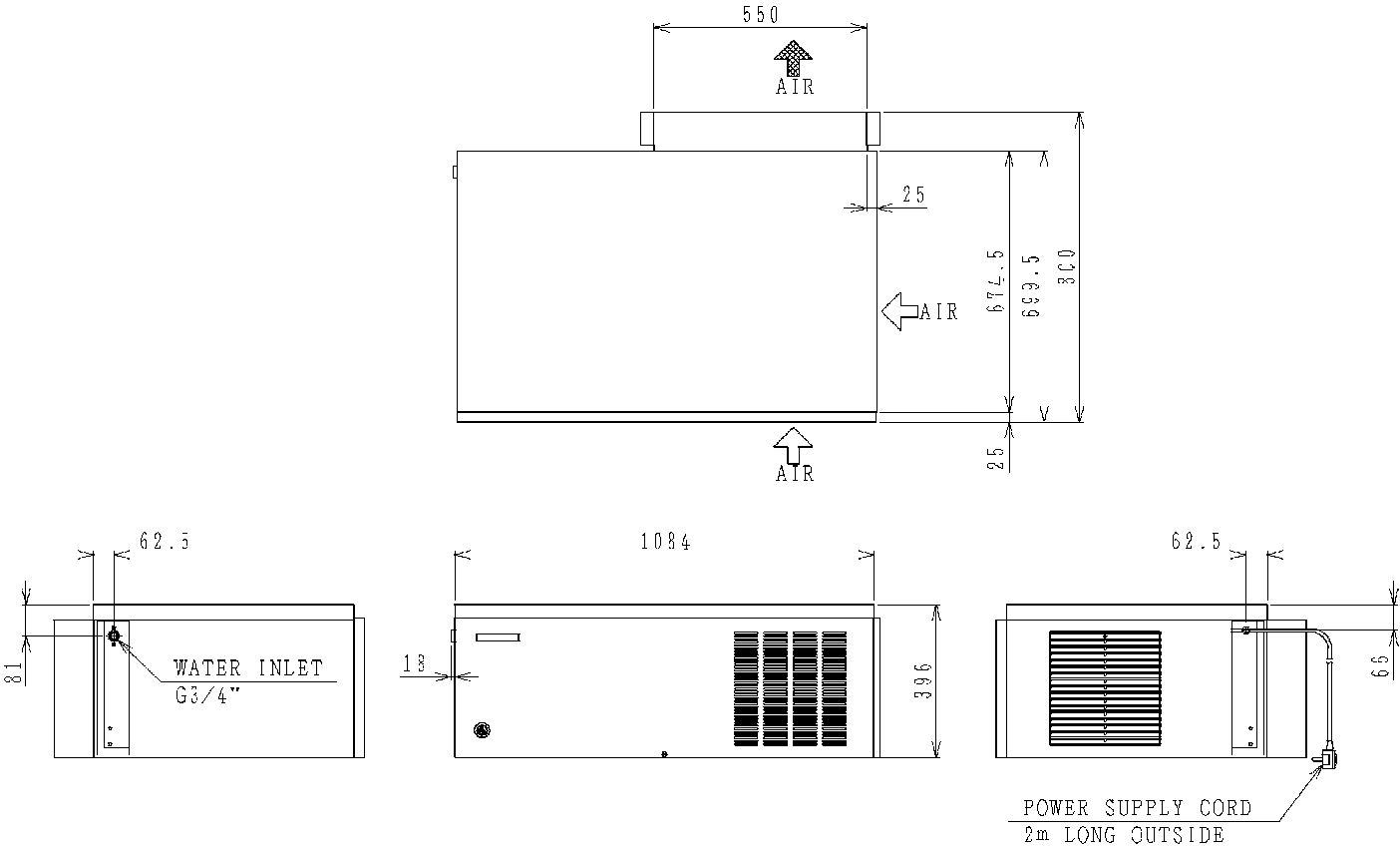
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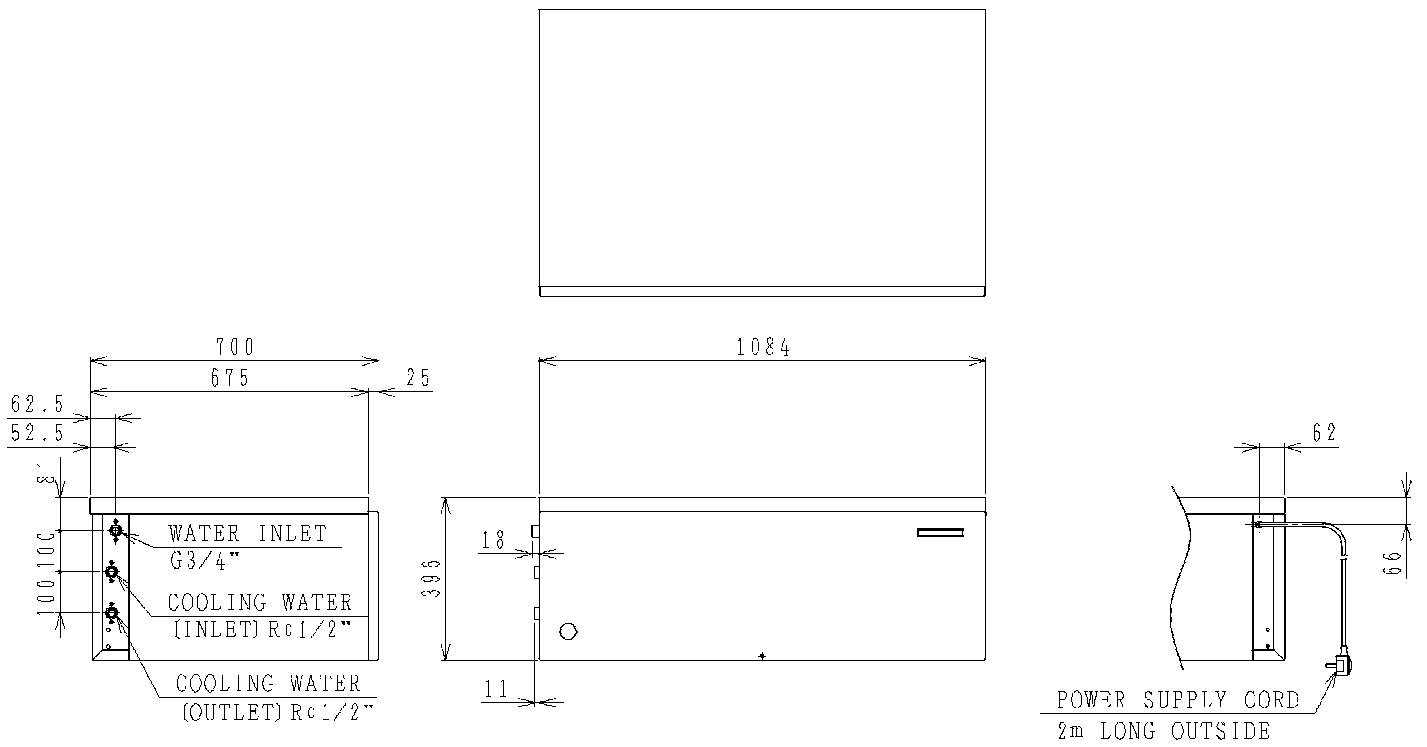
**I. SPECIFICATIONS**

**1. DIMENSIONS/CONNECTIONS**

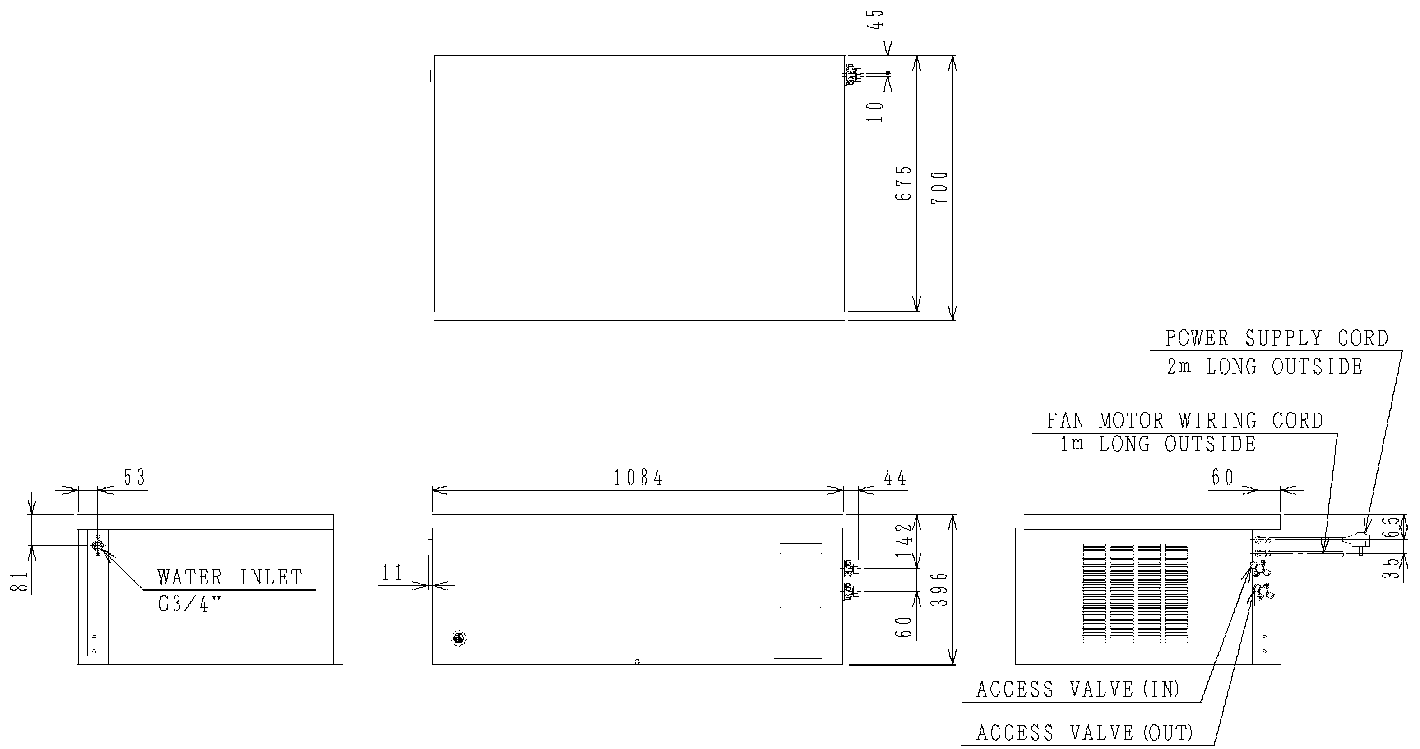
**[a] IM-240DME (Air-cooled)**



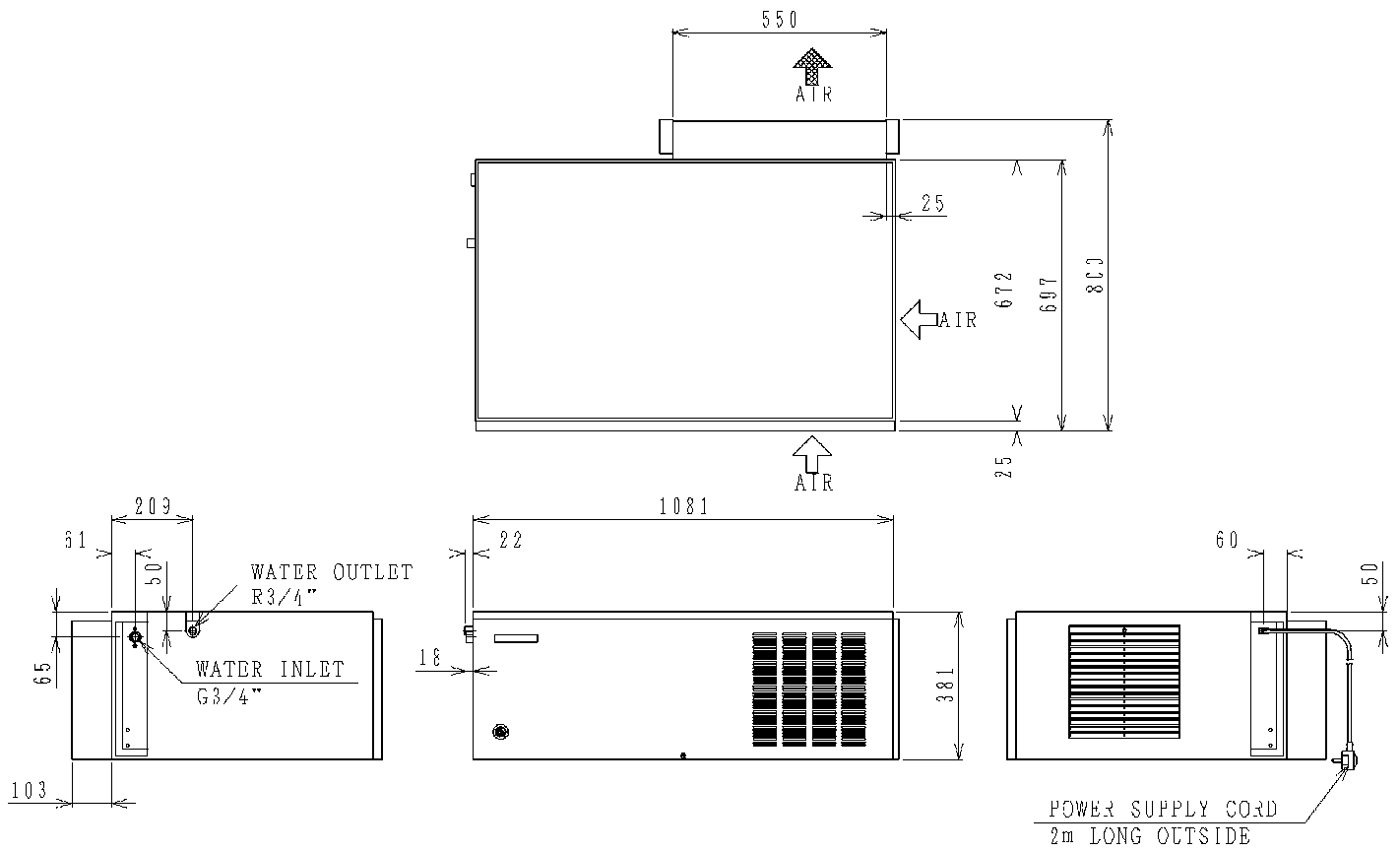
[b] IM-240DWME (Water-cooled)



[c] IM-240DSME (Remote Air-cooled)

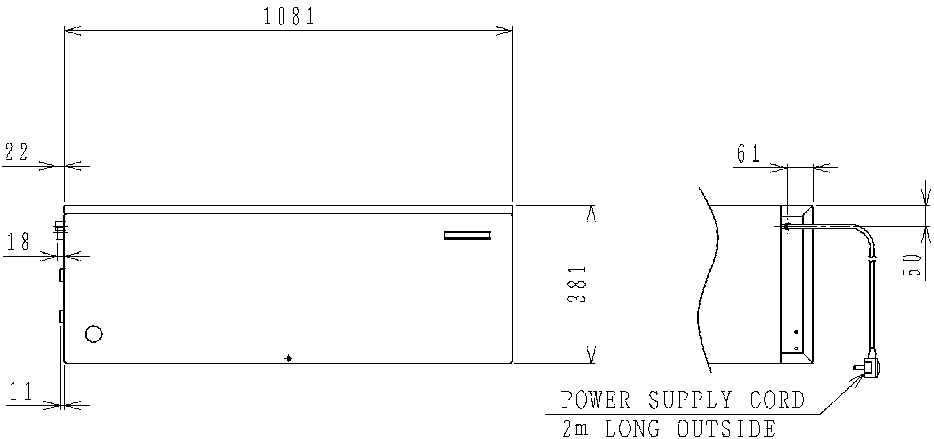
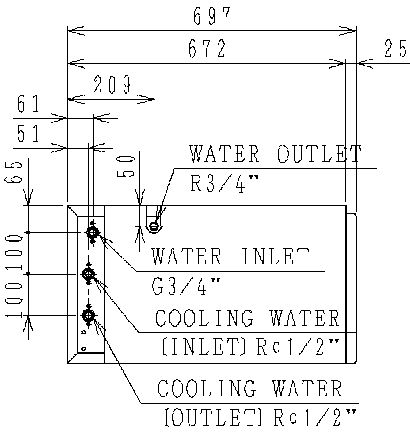
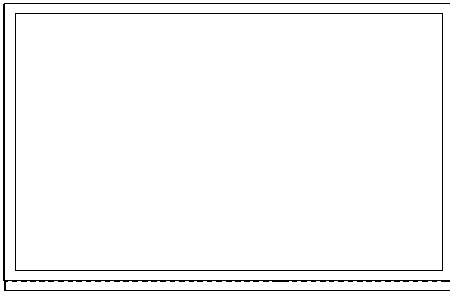


[d] IM-240XME (Air-cooled)

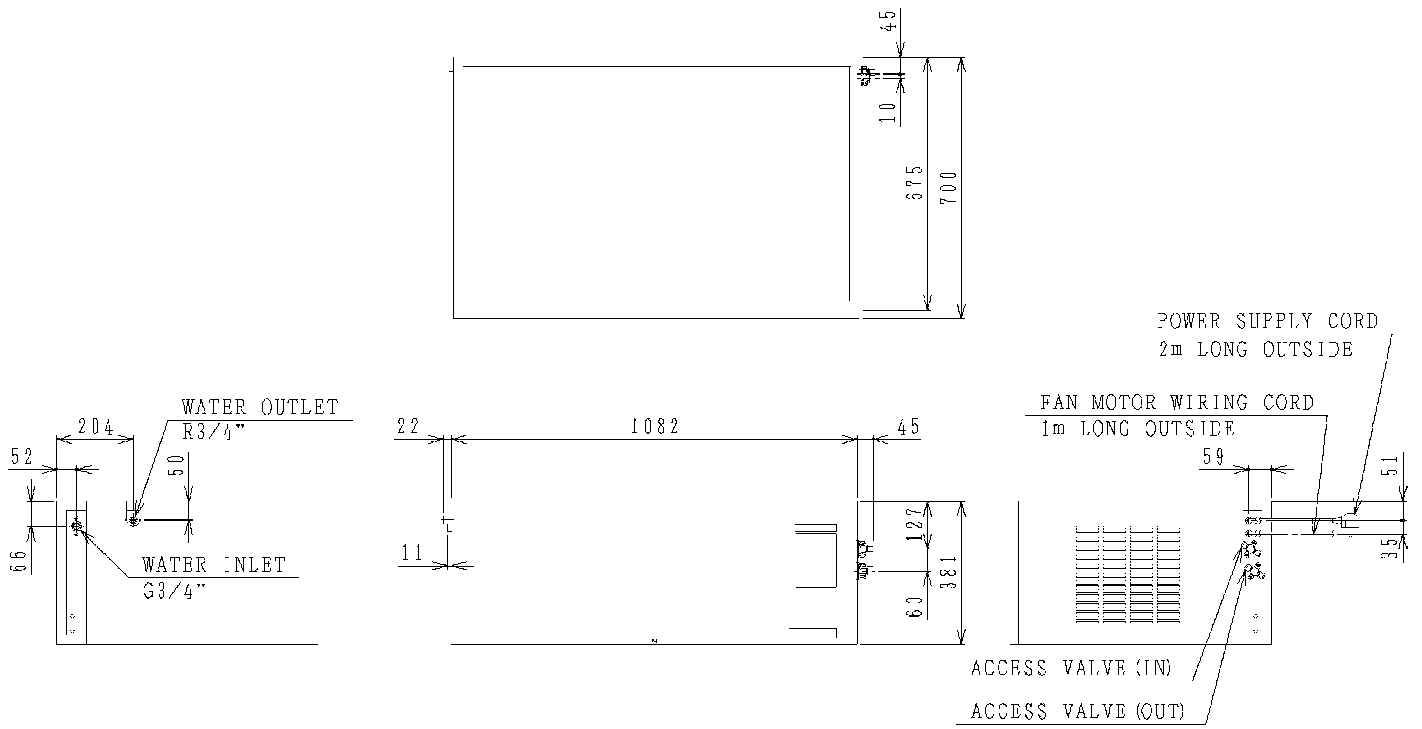




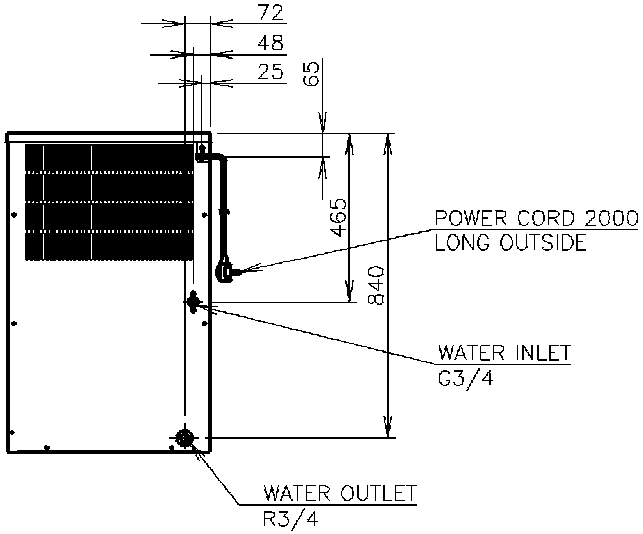
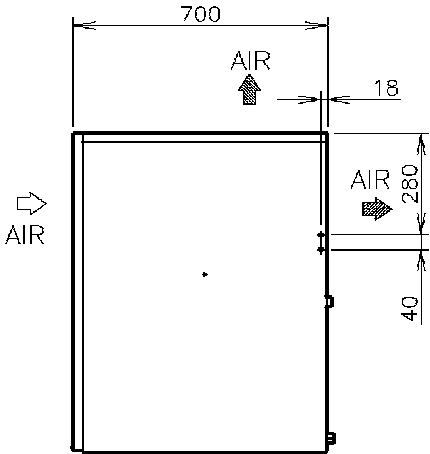
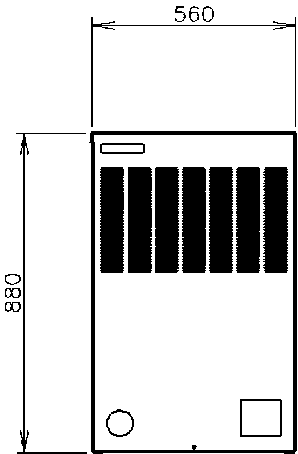
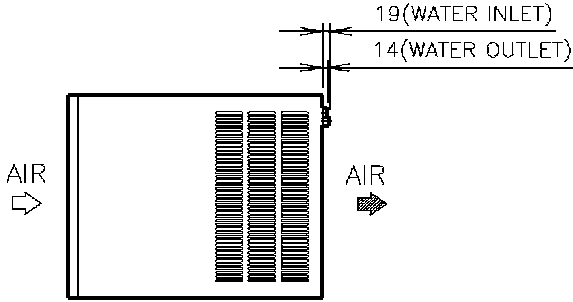
[e] IM-240XWME (Water-cooled)



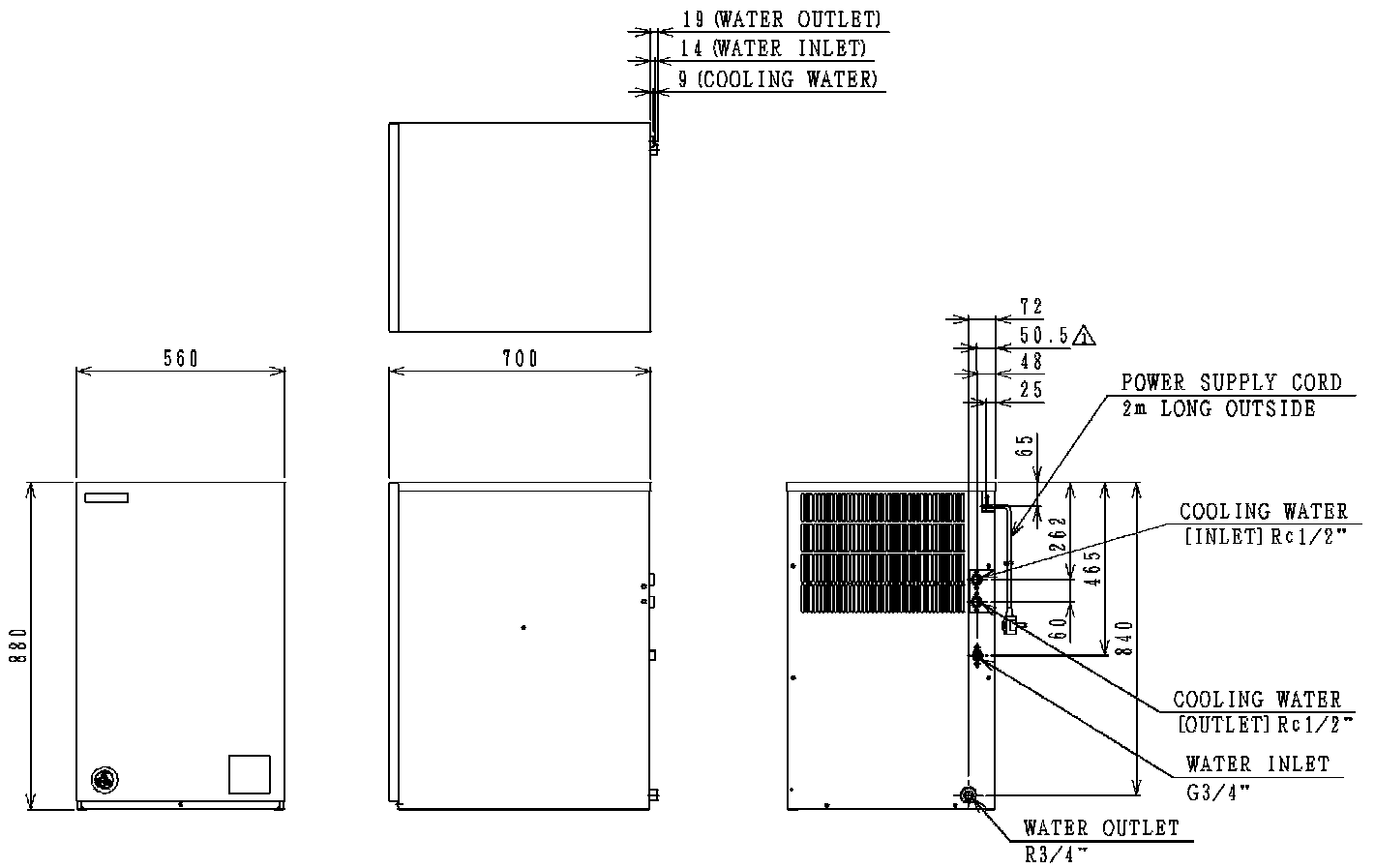
[f] IM-240XSME (Remote Air-cooled)



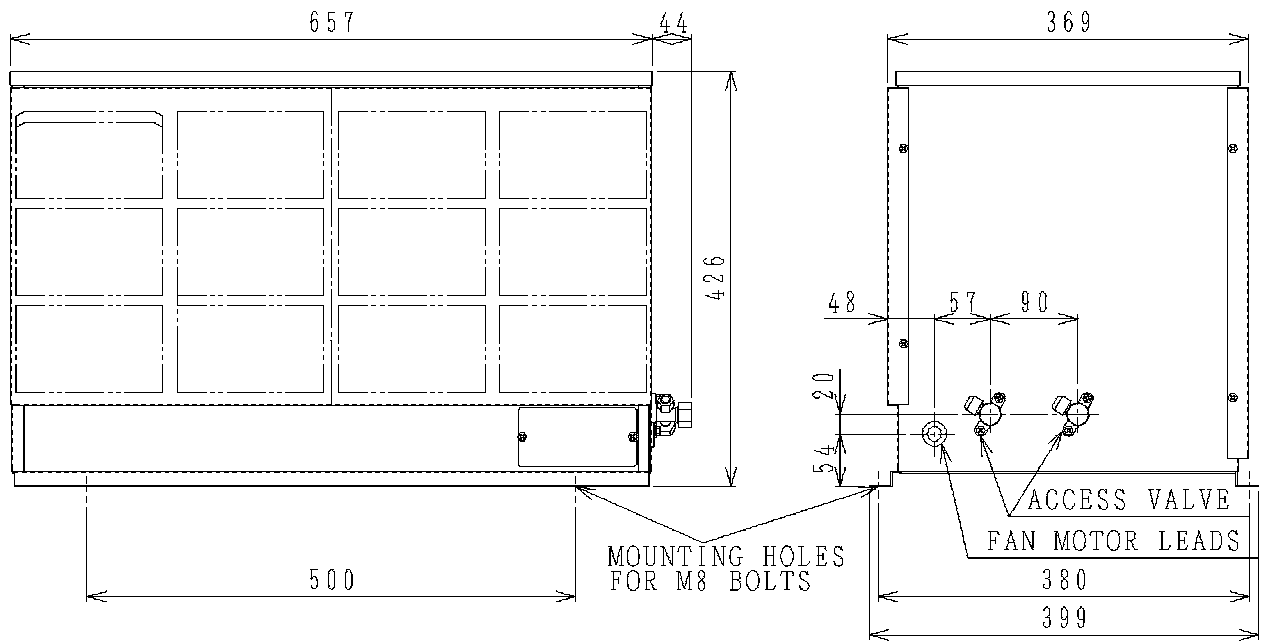
[g] IM-240AME (Air-cooled)



[h] IM-240AWME (Water-cooled)



## 2. CONDENSER UNIT URC-240C-E



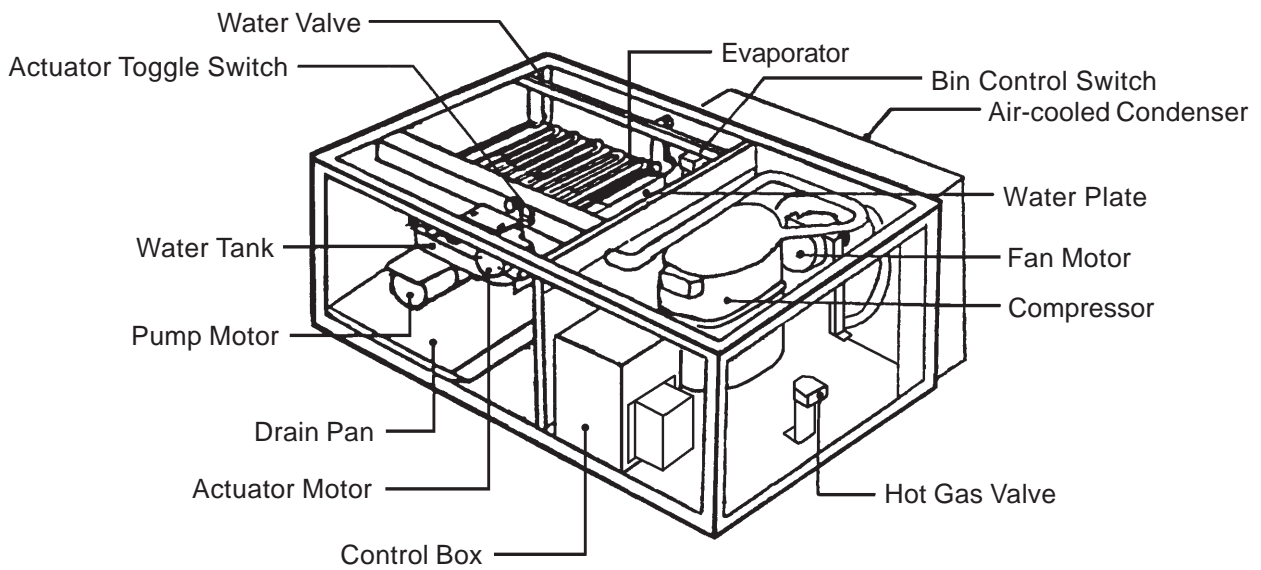
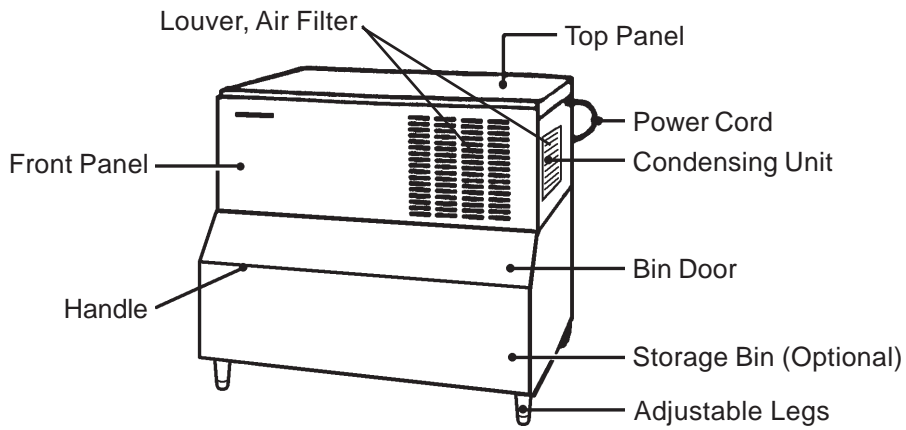
### SPECIFICATIONS

MODEL: URC-240C-E	
EXTERIOR	Painted Galvanized Steel
DIMENSIONS (W x D x H)	657 x 399 x 426 mm
REFRIGERANT CHARGE	R404A 1000 g
WEIGHT	Net 20 kg
CONDENSER	Air-cooled
HEAD PRESSURE CONTROL	Condensing Pressure Regulator
AMBIENT CONDITION	Min. 1°C to Max. +40°C Outdoor use

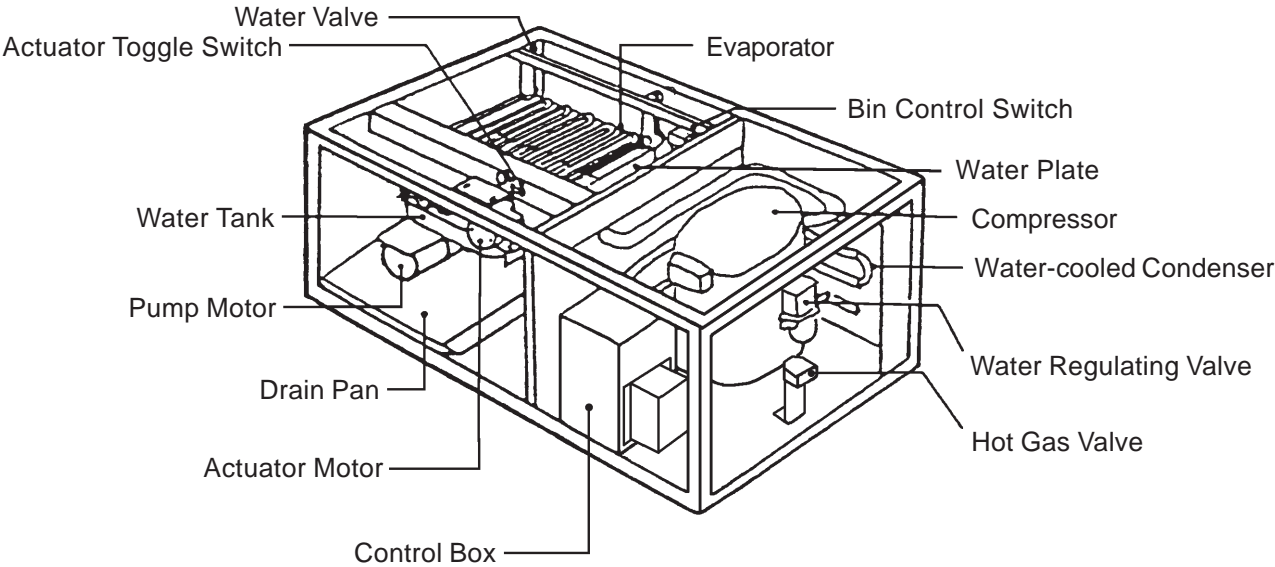
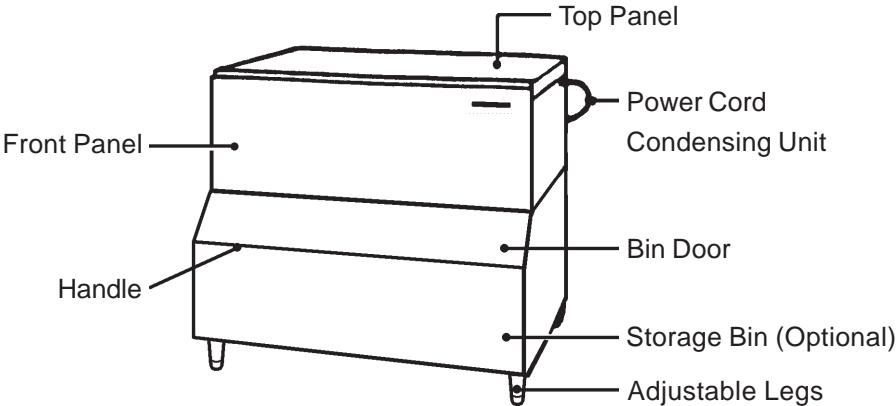
## II. GENERAL INFORMATION

### 1. CONSTRUCTION

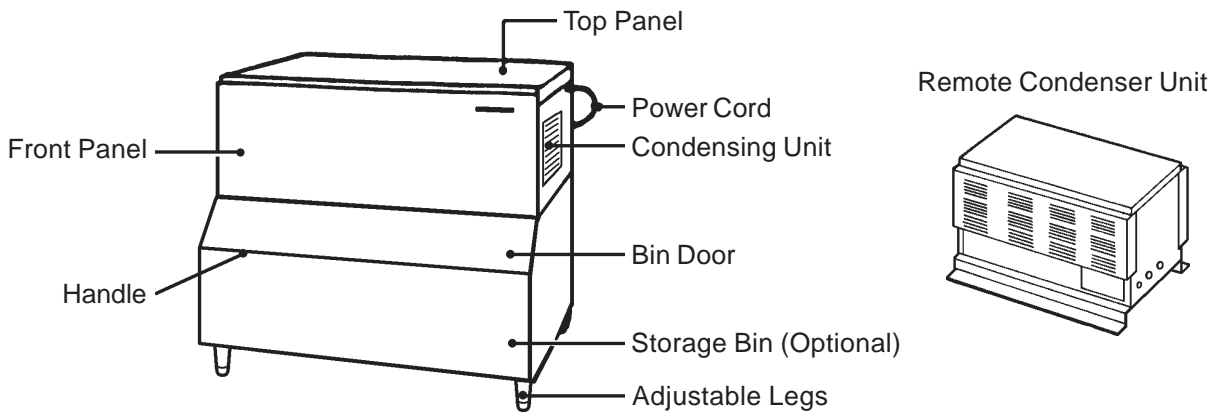
[a] IM-240DME, IM-240XME



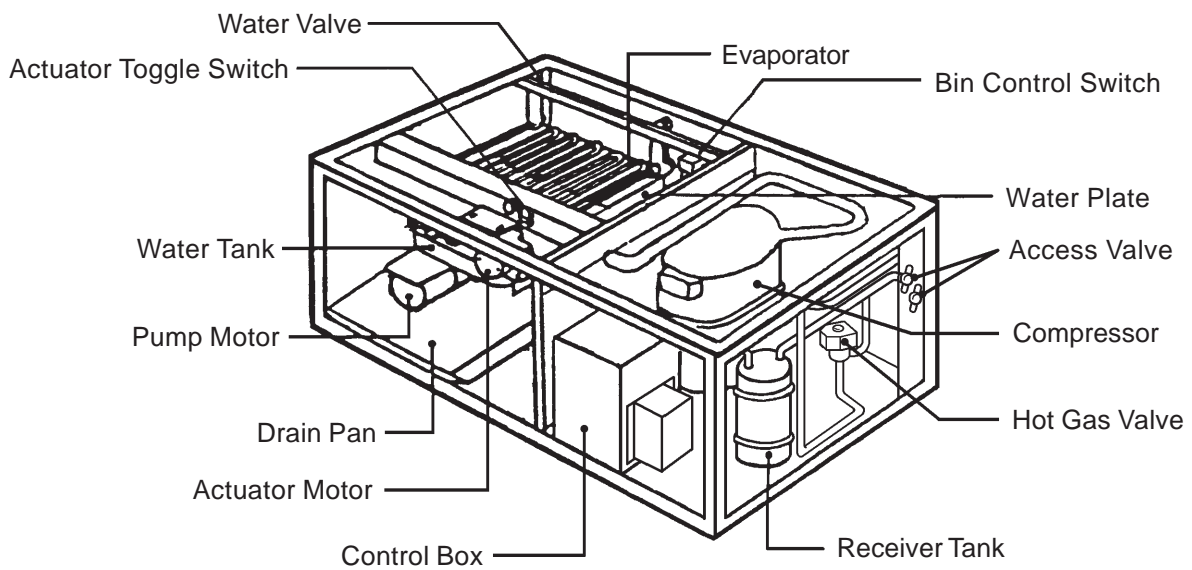
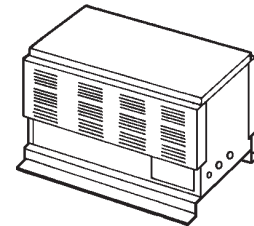
[b] IM-240DWME, IM-240XWME



**[c] IM-240DSME, IM-240XSME**

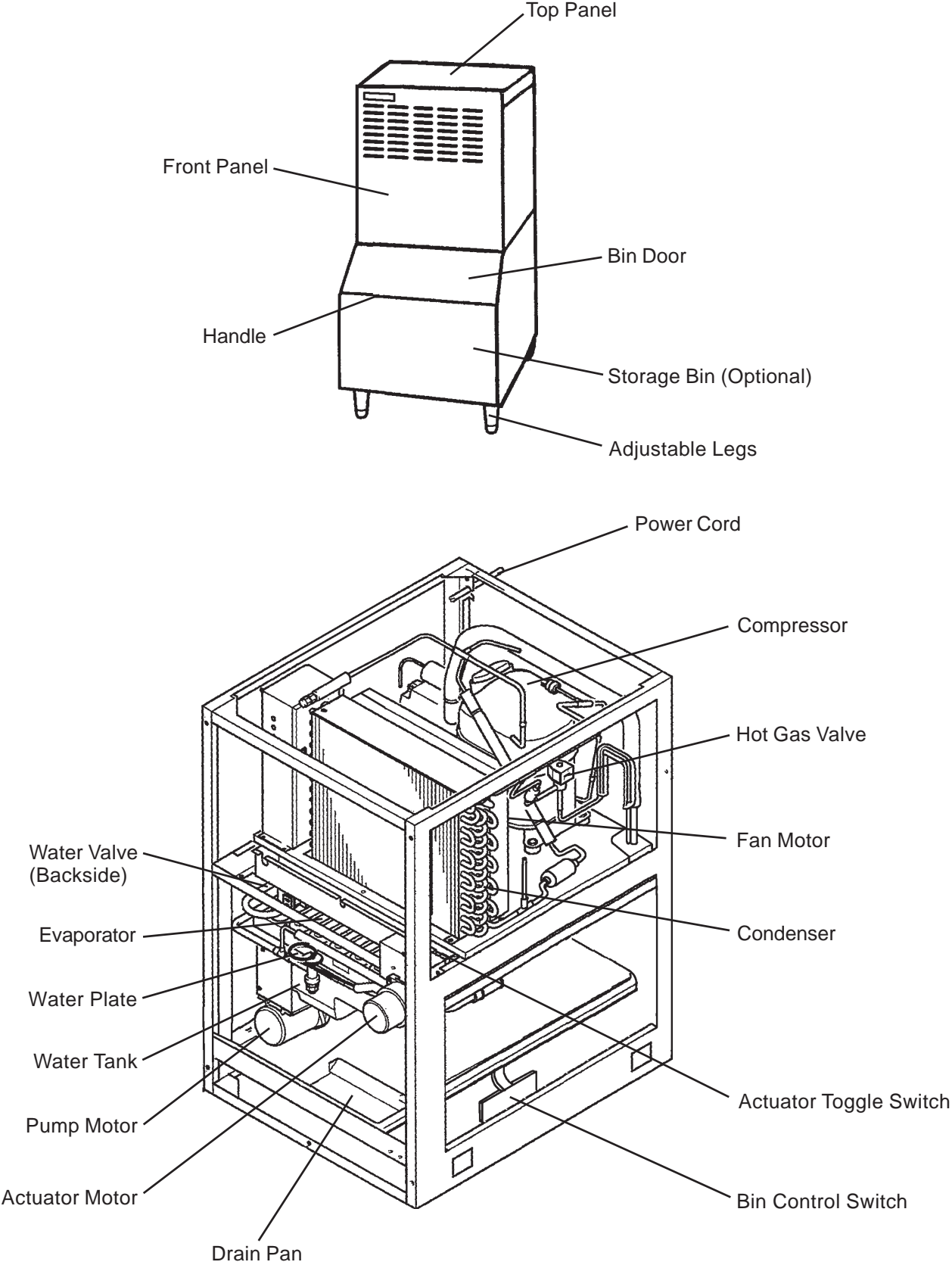


Remote Condenser Unit

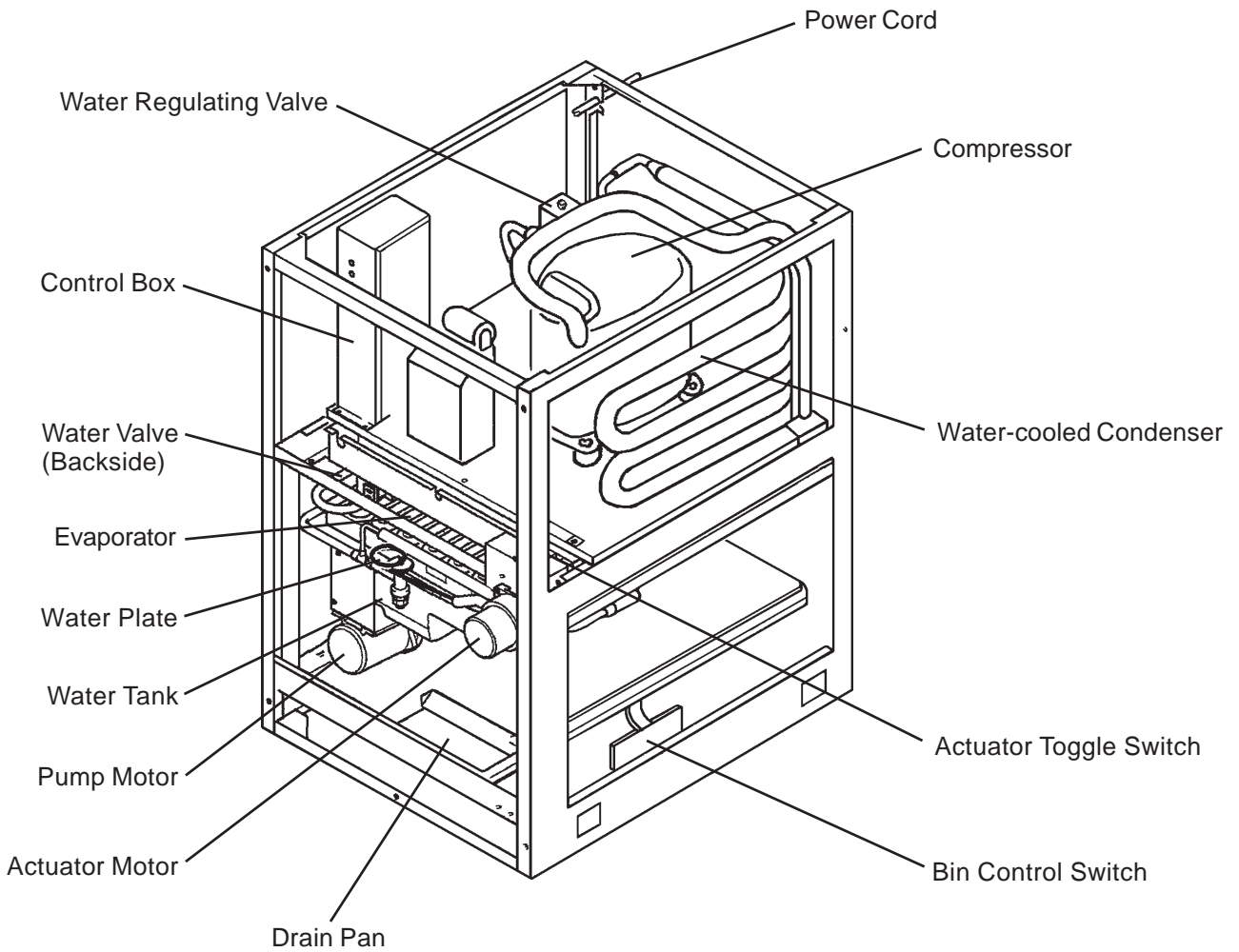
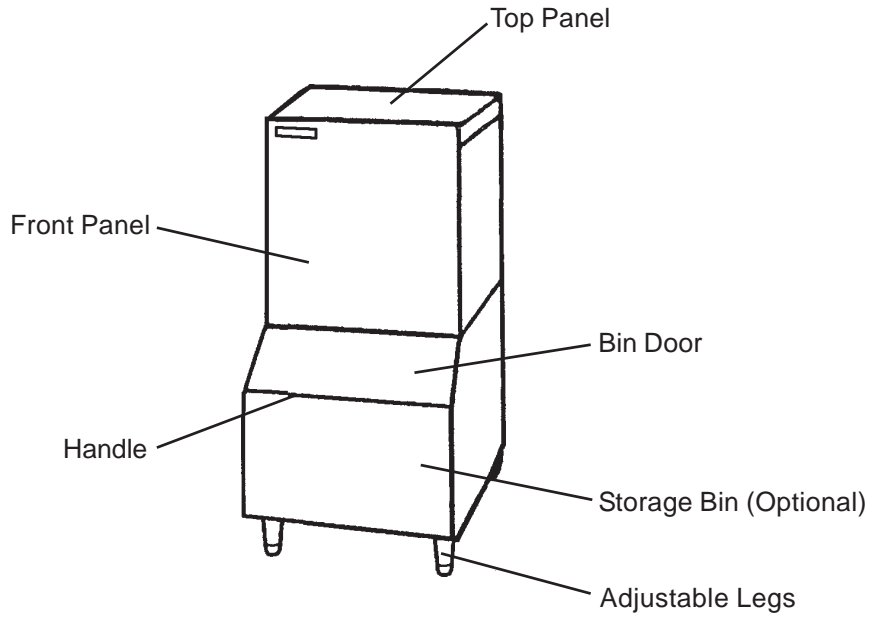




[d] IM-240AME



[e] IM-240AWME



## 2. CONTROLLER BOARD

Note: Refer to the “Hoshizaki IM Cuber Controller Board Service Manual” (E1AX-676) for the new Controller Board used for the later models (from Auxiliary Code “E-1”).

### IMPORTANT

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

### CAUTION

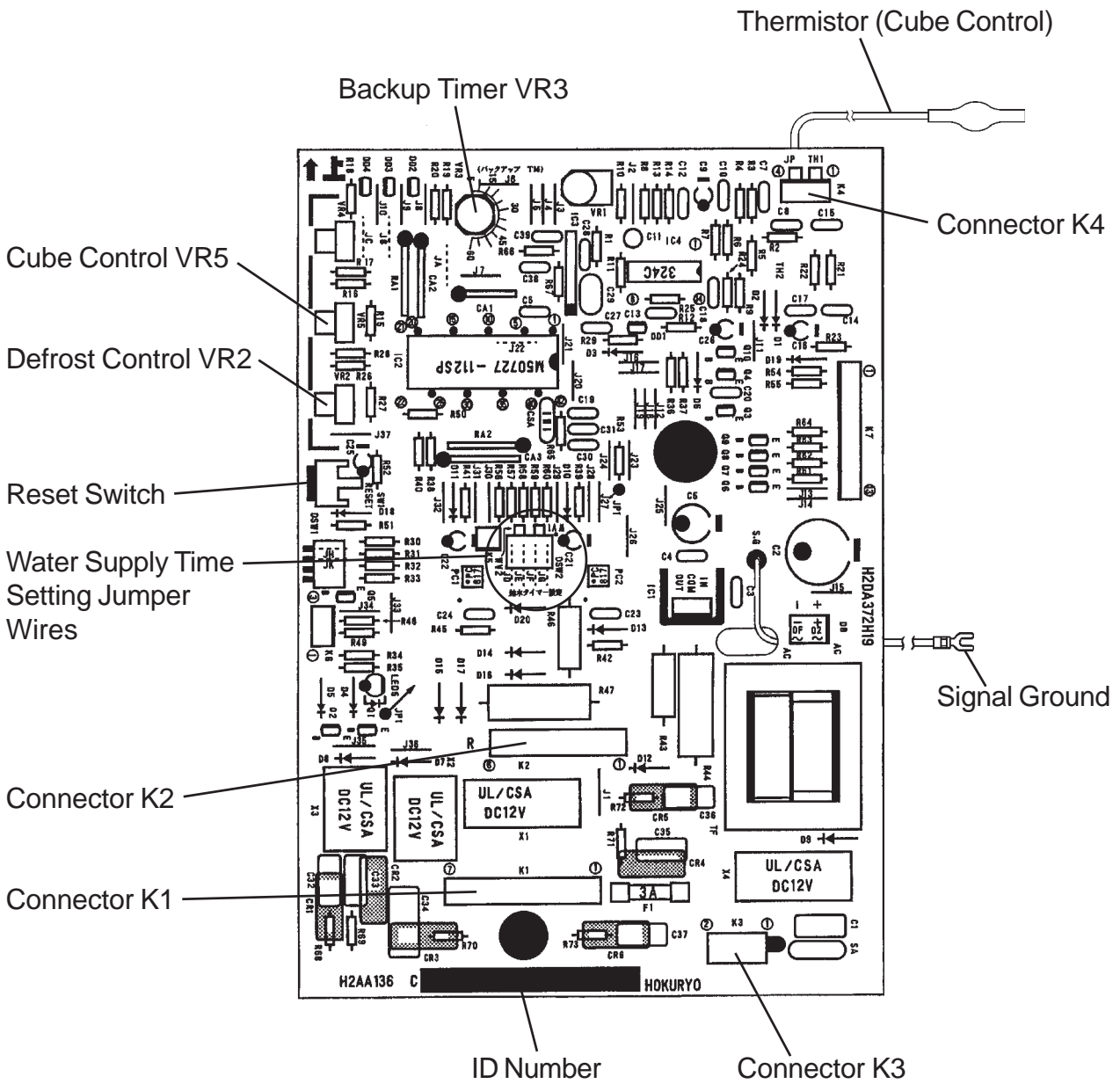
1. Check that the icemaker has been earthed properly. If not, the Controller Board will not work properly.
2. Do not change wiring and connections, or the Controller Board will not work properly.
3. Do not touch the reverse side of the Controller Board and tiny electronic devices on it.
4. Do not repair 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 icemaker 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.

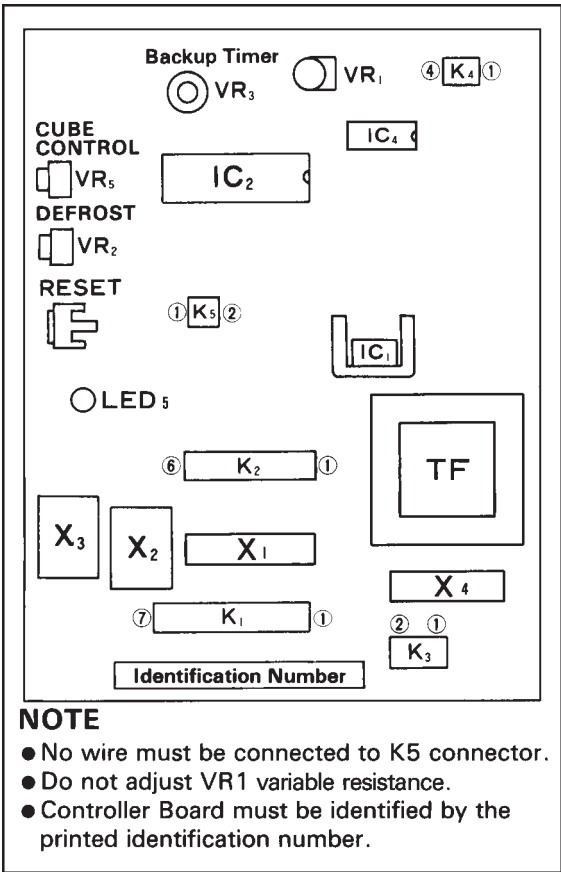
[a] CONTROLLER BOARD LAYOUT



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 Switch

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

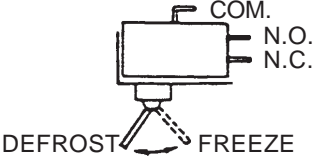
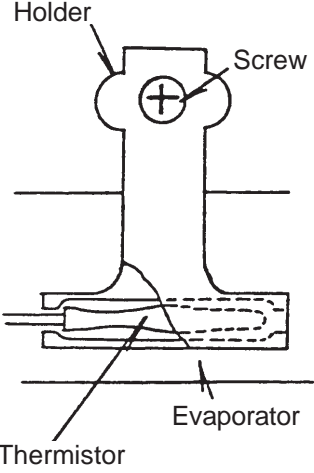
Control

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

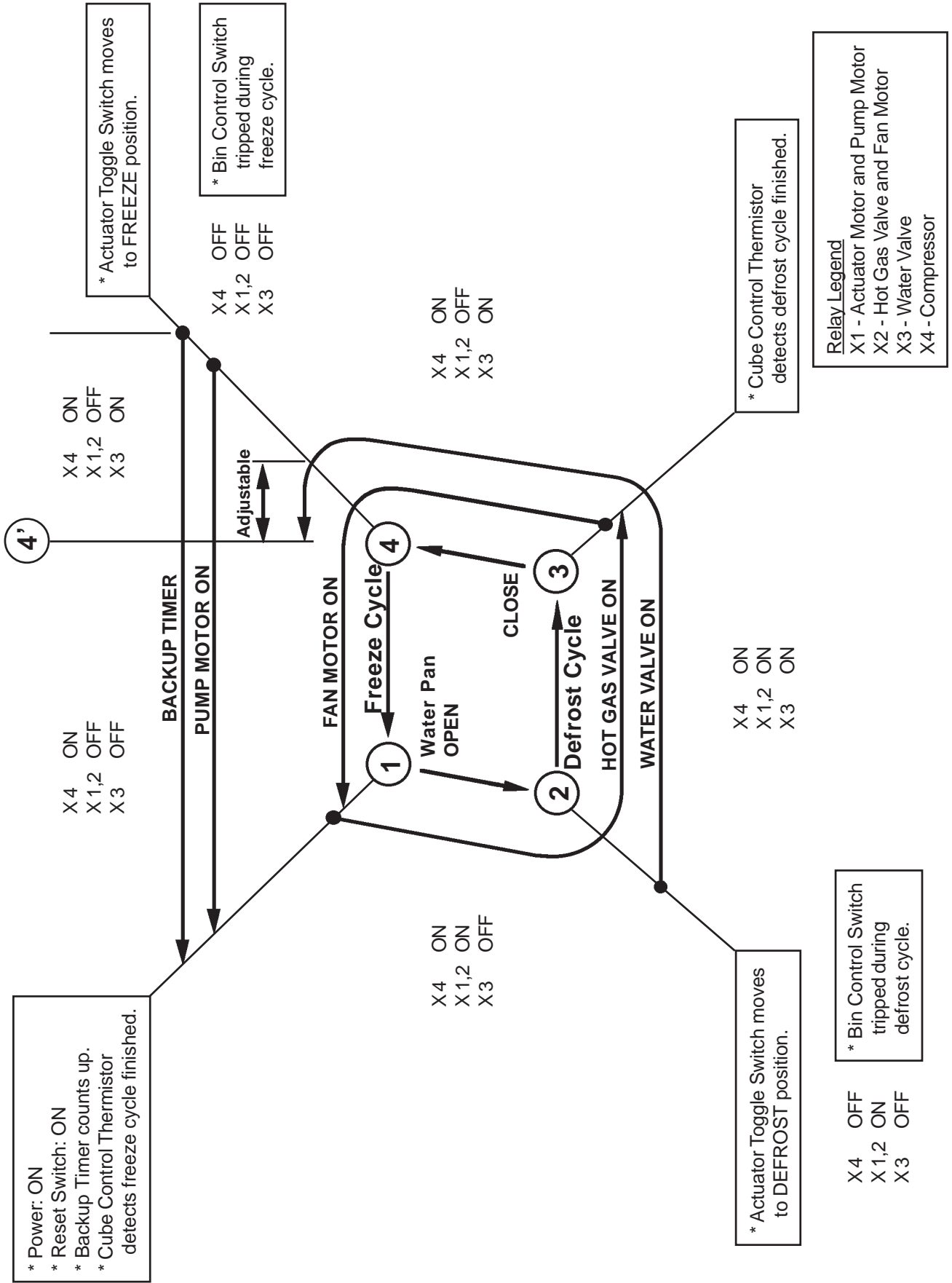
All the controls are factory-adjusted. Do not change setting except when replacing the board or if the setting has changed. Refer to “[e] CONTROLS AND ADJUSTMENT.”

## [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    Close</p> <p>FREEZE COM-NO    Close COM-NC    Open</p>
<p>2. Thermistor (on Evaporator)</p> 	<p style="text-align: center;"><b>CAUTION</b></p> <p style="text-align: center;">Thermistor Sensor part is fragile, glass sealed. Handle with care.</p> <ul style="list-style-type: none"> <li>* Disconnect the Connector K4 on the board.</li> <li>* Remove the screw and the Thermistor Holder on the Evaporator.</li> <li>* Immerse the Sensor part in a glass containing ice and water for 5 minutes.</li> <li>* Check the resistance between K4 Connector Pins.</li> <li>* Replace the Thermistor in its correct position.</li> <li>* Connect K4.</li> </ul>	<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


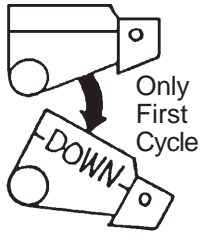
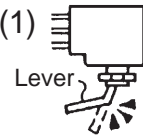
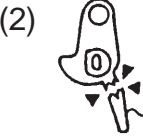

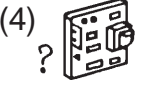
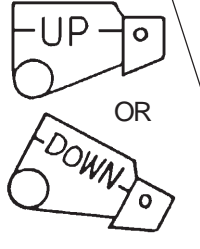
The Timer has stopped the machine because of an excessive defrost time. See the guide below to check out the probable cause.

### Lamp flashing ON/OFF


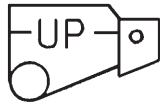


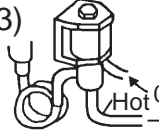





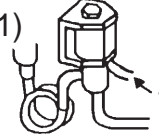



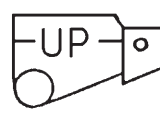

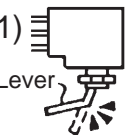


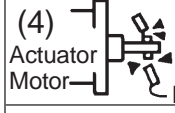

If on the first cycle, check out the Cam operation and/or Toggle Switch. If the machine has been in service for some time, the Controller Board may be at fault.

**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 icemaker 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)  <p>Lever</p> <p>Actuator Toggle Switch Lever bent</p>	Replace Actuator Toggle Switch
			(2)  <p>Cam Arm</p> <p>Cam Arm (A) broken</p>	Replace
		(3)  <p>Defective Actuator Motor</p>	Replace	
		(4)  <p>Defective Controller Board</p>	Replace	
		 <p>OR</p>		



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

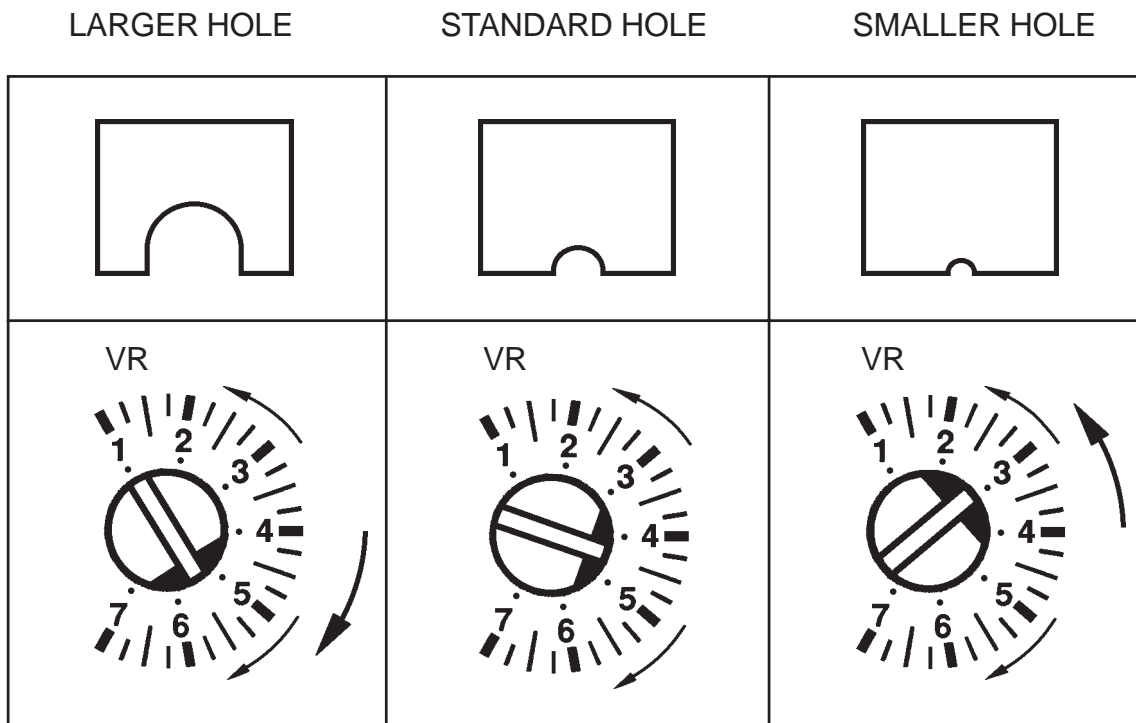
### 1) Cube Control (VR5)

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

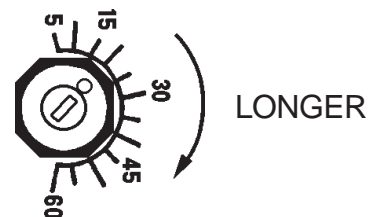
When adjusting the Variable Resistor VR5 for smaller dimple cubes, it may be necessary to also increase the water supply time to melt away fragments of ice obstructing the Water Plate which could prevent cubes falling into the Bin.



### 2) 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.



### 3) Defrost Control (VR2)

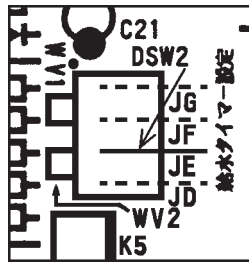
The defrost control regulates the time period between ice-drop and actuator motor restart. Any adjustment will not be required for normal operation. Factory setting is shown in the table below. When servicing or replacing the controller board, adjust the Variable Resistor VR2 using a miniature flat blade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

Ambient Temp.	Approximate Period (sec.)
30°C	20
20°C	40
10°C	60



### 4) 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.

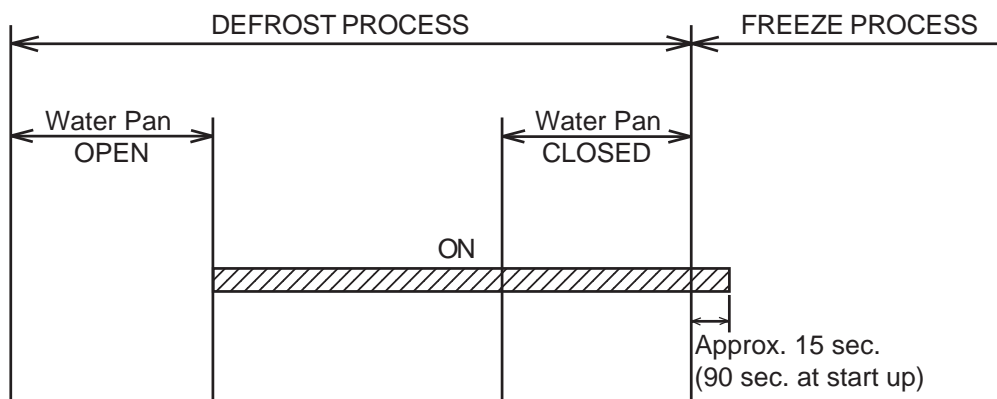


Cut the jumper wire JE (marked by arrow) by a nipper. Water supply time will be 60 sec. when the Water Plate is closed.

Normal setting = 15 sec. with Water Plate closed

Note: 1. See “II. 2. [a] CONTROLLER BOARD” for location of the Jumper Wires.

- 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.
- In some areas where excessively hard water (approx. 250 ppm or more) results in production of cloudy ice, change the water supply time setting. Also, the Tank Drain Pipe must be moved to the drain position to prevent concentration of calcium carbonate, etc. See the figure below.



### 3. FAN MOTOR CONTROL - DME/XME ONLY

The Condenser Fan Motor rotates at two speeds. The Motor is operated by Relay X6 which is in turn controlled by the Bimetal Thermostat which is attached to the Control Box. When the Relay is energised (Thermostat contacts closed), the Motor operates at approximately half speed. When the Relay is de-energised (Thermostat contacts open), the Motor operates at full speed.

Half speed =  $11 \pm 3^{\circ}\text{C}$

Full speed =  $21 \pm 3^{\circ}\text{C}$  (1272 R.P.M.)

### III. INSTALLATION INSTRUCTIONS

#### WARNING

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

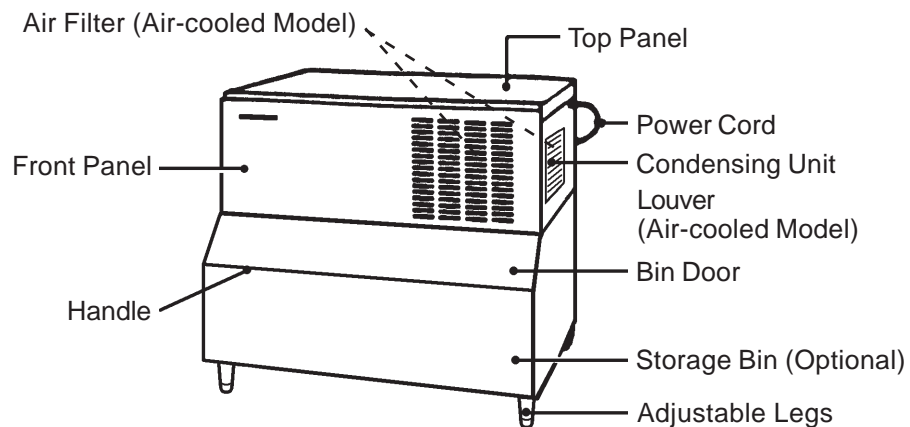
#### 1. UNPACKING

#### 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 icemaker, it will not work properly.

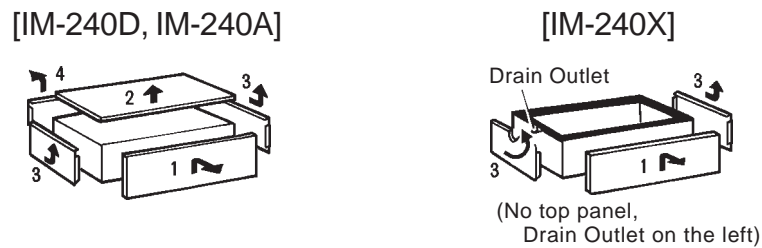


**Fig. 1**

Note: This icemaker needs a Storage Bin. Hoshizaki recommends the following Ice Storage Bins:

P-200SD ----- IM-240D  
F650-44 ----- IM-240D/IM-480D  
F950-48 ----- IM-480D/IM-720D  
F1025-52 ----- IM-480D/IM-720D  
B-300 ----- IM-240A

- 1) After removing the packaging, make sure that the icemaker and the Storage Bin are in good condition. If in doubt, please do not use the equipment. See the instruction sheet attached to the Storage Bin for its unpacking and installation guidelines.
- 2) Remove the icemaker panels to gain access to the accessory kit and to assist easier installation.



- a) Front Panel: Remove the screw(s). Lift up and pull toward you.
- b) Top Panel: Remove the screw(s). Simply lift off.
- c) Side Panel: Remove the screw(s). Slide forward slightly, and then lift off.
- d) Rear Panel: Does not require removal.

**Fig. 2**

- 3) Remove the package of accessories, and check the contents:

a) Installation Kit

Inlet Hose	(Air-Cooled)	1
	(Water-Cooled)	2
	(Remote Air-Cooled)	1
Outlet Hose	(Air-Cooled)	1
	(Water-Cooled)	2
	(Remote Air-Cooled)	1
1/2-3/4 Nipple	(Water-Cooled)	2
b) Scoop	(Except IM-240X)	1
c) Ice Chute	(IM-240X, IM-240A)	1
d) Drain Pipe Collar	(IM-240X only)	1
e) Packing	(IM-240X only)	1

- 4) Remove the shipping tape holding the Bin Control Switch.
- 5) Remove the protective plastic film from the exterior. If the icemaker is exposed to the sun or to heat, remove the film after the icemaker cools.

## 2. LOCATION

### WARNING

1. This icemaker 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 icemaker, for extended periods, outside of these normal temperature ranges may affect production capacity.
2. The icemaker 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 15 cm clearance at rear, sides and top for proper air circulation and ease of maintenance and/or service should they be required. For air-cooled model only, allow 30 cm clearance at the right side.
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 icemaker or in front of the Louver.
7. This icemaker will not work at subfreezing temperatures. To prevent damage to the water supply line, drain the icemaker when air temperature is below zero.

### 3. INSTALLATION

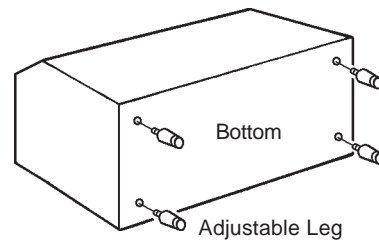
\* Incorrect installation can cause harm to people, animals or things, for which the manufacturer cannot be held responsible.

#### [a] IM-240D, IM-240X

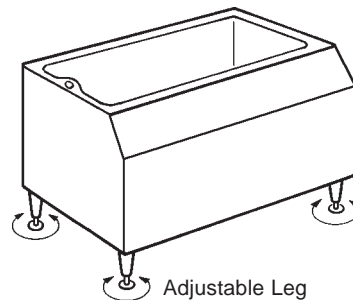
- 1) Lay the Storage Bin on its rear side carefully to prevent damage. Secure the four adjustable legs (bin accessory) into the four tapped holes on the underside of the Bin. See Fig. 3.
- 2) Position the Storage Bin in the selected permanent position, and level it in both the left-to-right and front-to-rear directions. See Fig. 4.
- 3) Remove the icemaker panels. The Rear Panel is not required to be removed for installation. See "1. UNPACKING".
- 4) Remove the shipping tape holding the Drain Pan.
- 5) Place the icemaker on the top of the Storage Bin. Be careful not to damage the icemaker frame and the Bin Control Switch. See Fig. 5.
- 6) Secure the icemaker with the two bolts provided. See Fig. 5.
- 7) Align the Storage Bin drain hole and the drain pan hole. Insert the Packing (bin accessory) and fasten the Drain Pipe Collar (bin accessory). See Fig. 5.

Note: On the F-series Bins, an extension drain tube kit is provided which attaches to the icemaker Drain Pan and exits through the pre-drilled hole in the side of the Bin.

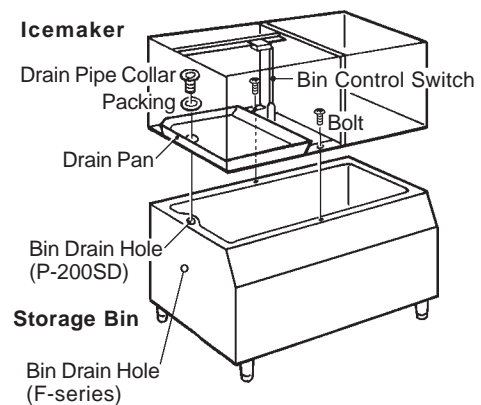
- 8) Replace the icemaker panels in their correct positions.



**Fig. 3**



**Fig. 4**

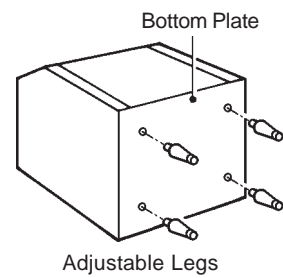


**Fig. 5**

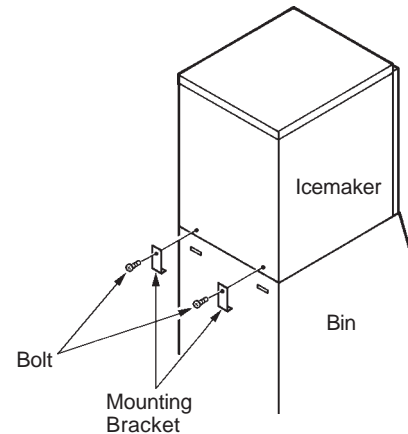


**[b] IM-240A**

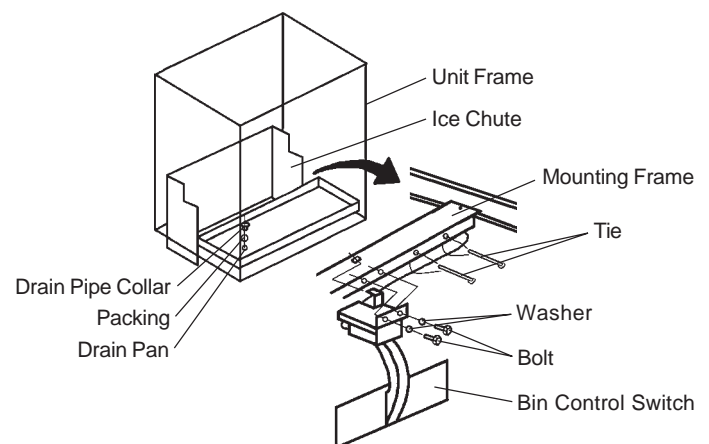
- 1) Fully screw in the four legs provided (bin accessory) into the Storage Bin underside. See Fig. 6.
- 2) Position the Storage Bin in the selected permanent site.
- 3) Place the icemaker on top of the Storage Bin by holding the bottom.
- 4) Secure the icemaker to the Storage Bin, by using the two mounting brackets and two bolts provided. See Fig. 7.
- 5) Seal the seam between the icemaker and the Storage Bin with food grade sealant.
- 6) Remove the Drain Pipe Collar and Drain Pan. Secure the Bin Control Switch to the Mounting Frame using the two bolts and flat washers provided. Fix the Bin Control Switch wiring with the two nylon ties. Place the Ice Chute on the Unit Frame, and refit the Drain Pan in its correct position. See Fig. 8.
- 7) Refit the panels in their correct positions.
- 8) Adjust the four legs on the bottom (adjustable from 0 to 25.4 mm) to have the icemaker perfectly horizontal. Use the spirit level. See Fig. 9.



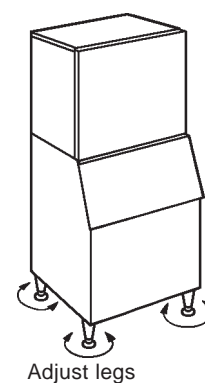
**Fig. 6**



**Fig. 7**



**Fig. 8**



**Fig. 9**

## 4. STACKING ICEMAKERS - IM-240D, IM-240X ONLY

### WARNING

Check the icemaker models. A D-type icemaker and an X-type icemaker will be required for stacking two icemakers. A D-type icemaker and two X-type icemakers will be required when stacking three icemakers. The D-type icemaker is designed for the upper unit, and the X-type for the middle and lower units. The D-type and X-type icemakers are provided with two different types of Bin Control Switch. Use the Bin Control Switch of the lower X-type icemaker only when stacking icemakers. The Bin Control Switch must be removed from the upper (and middle) units. Connection of the Bin Control from the lower (and middle) to the upper unit will require additional connecting leads which are supplied with the X-type icemaker. Misconnection or no connection may cause serious damage to the icemaker units, resulting in failure.

- 1) Prepare and position the Storage Bin as detailed in 1) and 2) in “3. INSTALLATION”.
- 2) Remove the icemaker panels. The Rear Panel is not required to be removed for installation. See “1. UNPACKING”.
- 3) Move the icemaker carefully to prevent damage to the icemaker frame.
- 4) Remove the shipping tape holding the Drain Pan.
- 5) Attach the lower unit (X-type) on the top of the Storage Bin. See Fig. 10.
- 6) Secure the lower unit with the two bolts and two plastic washers provided. See Fig. 10.

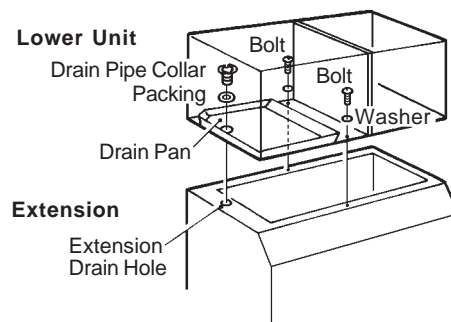


Fig. 10

- 7) Remove the shipping tape holding the Bin Control Switch on the Drain Pan. Attach the Bin Control Switch to the frame located at the left bottom of the condensing unit, and secure it using the two screws and the two washers provided. See Fig. 11.

- 8) [P-200SD]  
Align the drain hole and the drain pan hole. Insert the Packing (bin accessory) and fasten the Drain Pipe Collar (bin accessory) tightly, within the recommended torque of 39.2 N·m. See Fig. 10.

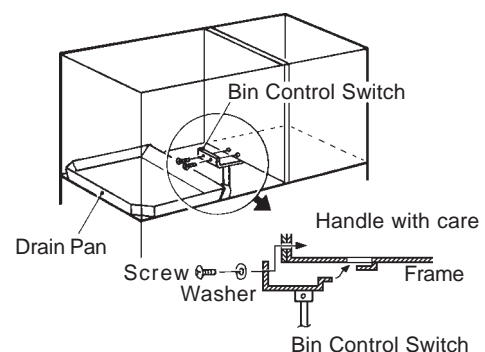


Fig. 11

9) [F-series]

Locate the extension drain tube kit. Remove the Locking Nut from the threaded section, and push the threaded pipe through the hole in the side of the Bin. Align the Drain Pan, and insert the Drain Pipe Collar and Packing into the free end of tube kit and tighten. Secure the tube kit by re-attaching the Locking Nut and tightening to the Bin exterior.

10) Before stacking, remove the clear plastic cover on the upper or middle unit wiring channel. Disconnect the Bin Control Switch leads (with three-way plug). Remove the screws and the Bin Control Switch. When stacking two or three icemakers, this switch will not be required. Keep it after removal. See Fig. 12.

11) Attach the upper or middle unit on the lower unit. See Fig. 13.

12) Secure the two units with the two bolts and the two nuts provided. See Fig. 13.

13) Align the lower unit drain hole and the upper unit drain pan hole. Insert the Packing (lower unit accessory) and fasten the Drain Pipe Collar (lower unit accessory). See Fig. 13.

14) Place the Ice Chute (lower unit accessory) and secure it to the Bracket with the two screws.

15) Connect the leads (with three-way plug) located in the lower unit wiring channel to the upper or middle unit receptacle, unplugged in the above step 10). Secure the leads using the plastic clamp provided. Place the plastic cover in position. See Fig. 14.

16) Replace the icemaker panels in their correct positions.

Note: If stacking three icemakers, repeat the instructions 10) - 16) for the upper unit. Remember, only ONE Bin Control is needed regardless of configuration. The Bin Control extension leads are pre-wired with the plug and will be found coiled in the X-type wiring channel.

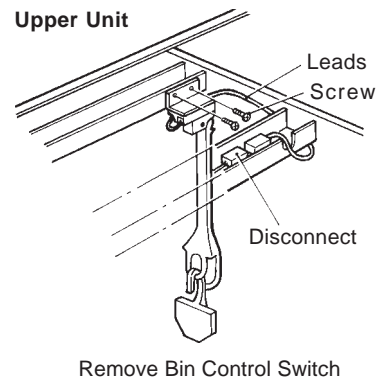


Fig. 12

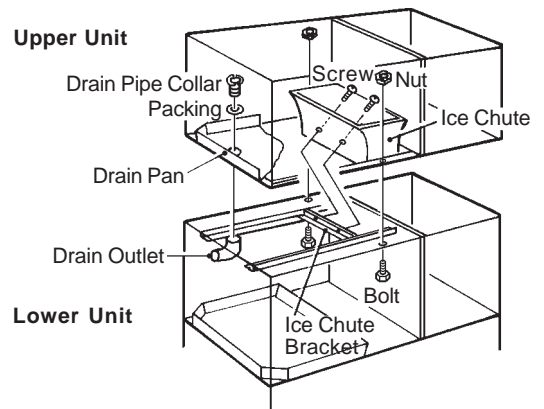


Fig. 13

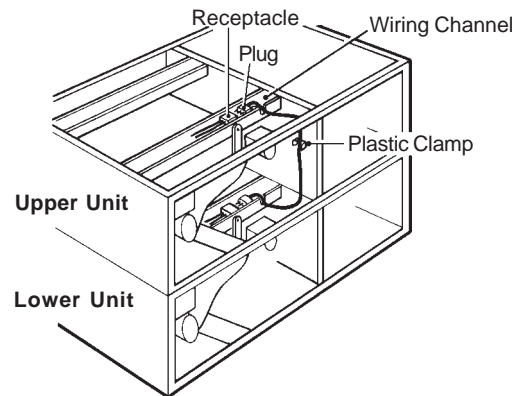


Fig. 14

## 5. ELECTRICAL CONNECTIONS

### WARNING

#### **THIS APPLIANCE MUST BE EARTHED**

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

- \* This icemaker must have a separate power supply or receptacle of 220 - 240V.
- \* Stacked icemakers should each have a separate receptacle, but they must all be connected in parallel to the same single phase supply or circuit with sufficient ampacity. In addition and to avoid nuisance tripping, individual circuit breakers for each machine should not be used.
- \* 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.

## 6. REMOTE CONDENSER UNIT (Remote Air-Cooled Model Only)

### [a] UNPACKING

- 1) Unpack and remove shipping carton, tape(s) and packing.
- 2) Remove the Top Panel.
- 3) Check that the refrigerant lines do not rub or touch lines or other surfaces, and that the fan blade turns freely.
- 4) Recommended parts and materials listed below will be required.

#### Cord

17 AWG (1.0 mm<sup>2</sup>) three-wire cord will be required for the Fan Motor wiring between the icemaker and the Condenser Unit (L+N+  $\frac{1}{\text{PE}}$ ).

#### Copper Tubing

Phosphorus deoxidized copper tubing. Two tubings of the same size will be required for refrigerant lines. Mark them for a distinction between the gas line and liquid line to prevent misconnection.

9.52 (OD) x 7.93 (ID) - Gas

9.52 (OD) x 7.93 (ID) - Liquid

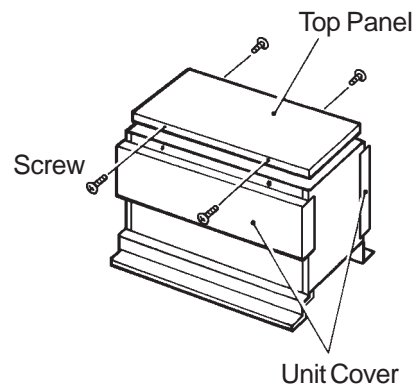
#### Pipe Insulation (for gas and liquid pipes)

To withstand temperatures up to 120°C.

#### Bolt

Four M8 Hexagon Bolts for securing the Condenser Unit.

- 5) Do not remove the Unit Covers before finishing installation, to prevent damage to the air-cooled Condenser.

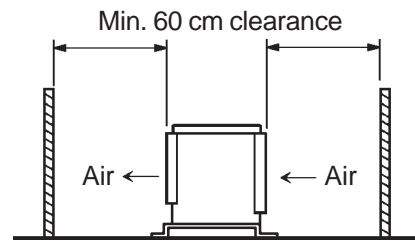


**Fig. 15**

## [b] LOCATION

The Condenser is intended for outdoor use and must be positioned in a permanent well ventilated site under the following guidelines:

- \* Select a firm and flat site.
- \* Should not be exposed to harsh or adverse weather conditions.
- \* Preferably a dry and well ventilated area with 60 cm clearance on both front and rear for ease of maintenance and service should they be required.
- \* Normal condenser ambient temperature: +1°C to +40°C. Temperatures not within this operating range may affect the production capacity of the icemaker.
- \* When the Condenser Unit is installed on a roof, a 50 cm height base is recommended to prevent heat reflection and to avoid the possibility of the unit standing in water.
- \* The maximum line length is 10 m. For information on longer line installations, call Hoshizaki Care +44 (0) 1223242254.
- \* The Condenser should not be installed more than 6 m above the height of the icemaker or more than 2 m below it.

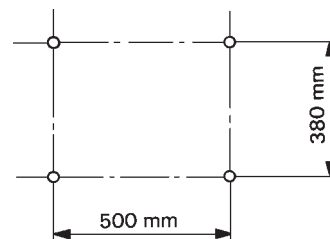


**Fig. 16**

Note: If the recommended guidelines of the installation are exceeded, the icemaker performance may be reduced.

## [c] INSTALLATION

1) This Condenser Unit is provided with four mounting holes. Secure the Condenser Unit with four bolts. See Fig. 17.

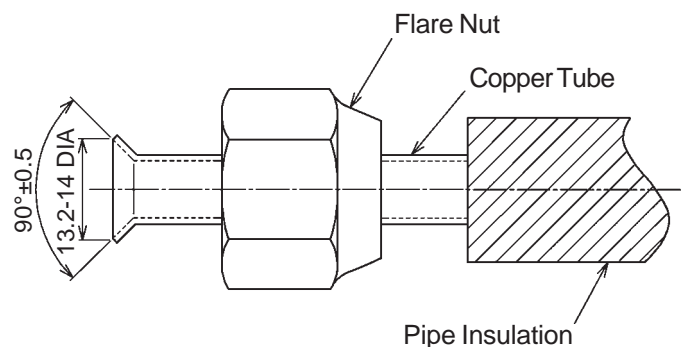


**Fig. 17**

2) Remove the Flare Nut from each of the Access Valves on the icemaker and Condenser Unit.

Note: Remove and discard the Copper Caps on the Flare Nuts.

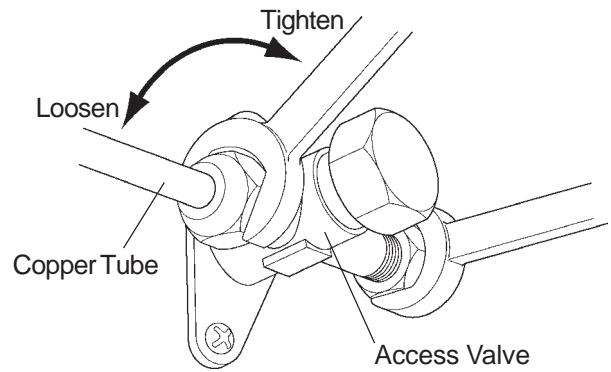
3) The two copper tubes (9.52 mm OD) to be provided at site should be insulated separately. Place the Flare Nuts onto each end of the tubes and flare the tube ends.



**Fig. 18**

Note: The tube ends to be flared should be free from damage, cracks and burrs and also clear of grease or scraps.

- 4) Connect the flared copper tubes on to the icemaker and Condenser Unit. The two tubes have the same diameter so mark them for a distinction between the gas line and the liquid line to prevent misconnection. Apply some clean refrigerant oil of a suitable type to the surfaces of the Flare before connection and tightening. Support the Access Valve with a spanner on the flat surfaces when tightening the nuts.



**Fig. 19**

Note: 1. Tighten the Flare Nuts to a torque of  $38 \pm 4$  Nm.

2. Check the distinction marks on both ends of each copper tubing to make sure the connections are correct.

3. The tubes should not vibrate. Fix or secure the tubes to prevent stressing.

- 5) Remove the Service Gauge Port Caps from the Access Valves on the icemaker. Evacuate the lines through the Gauge Ports for 20 minutes at max. 0.1 torr. Charge both lines with vapour refrigerant R404A to a pressure of 1 bar. Add nitrogen to raise the pressure to 15 bar. Thoroughly leak test the joints with a leak detector or soap bubbles.

- 6) Evacuate the lines again at max. 0.1 torr. Vapour charge the lines to 1 - 2 bar with refrigerant R404A. (The actual charge will depend upon the length of tube run.)

Base charge up to 10 m: 2400 g

Additional charge for each additional meter: 40 g

As the total precharged refrigerant amount in the icemaker and remote condenser is 2400 g, the required refrigerant charge will be:

$40 \text{ g} \times [\text{length of tube run} - 10] \text{ m}$

Example - If the length of tubing run is 15 m (i.e. distance between the icemaker and Condenser)

$15 \text{ m} - 10 \text{ m} = 5 \text{ m}$

Base charge = 2400 g (up to 10 m run)

Additional charge = 40 g/m

Required refrigerant charge =  $40 \text{ g} \times 5 \text{ m} = \underline{200 \text{ g}}$

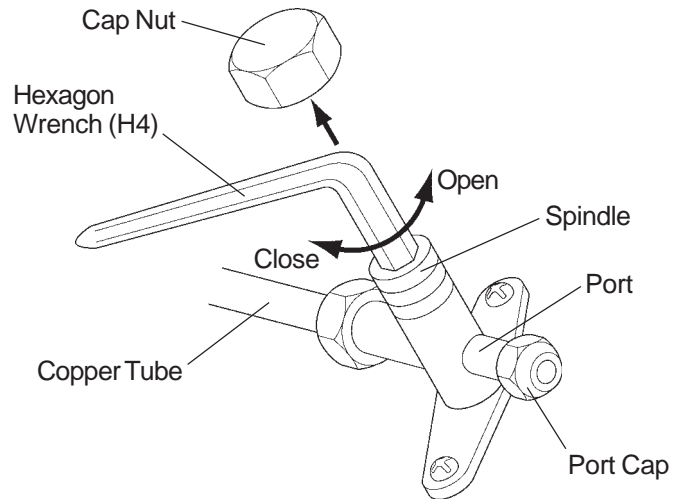
On completion of the refrigerant charge, remove the charging cylinder and charging lines. Refit the Port Caps and tighten to a torque of  $10 \pm 1$  Nm.

6) Remove the Cap Nuts from the Access Valves on both the Condenser and the icemaker. Open the liquid and gas line valves by turning the Spindle with a hexagon wrench until fully open.

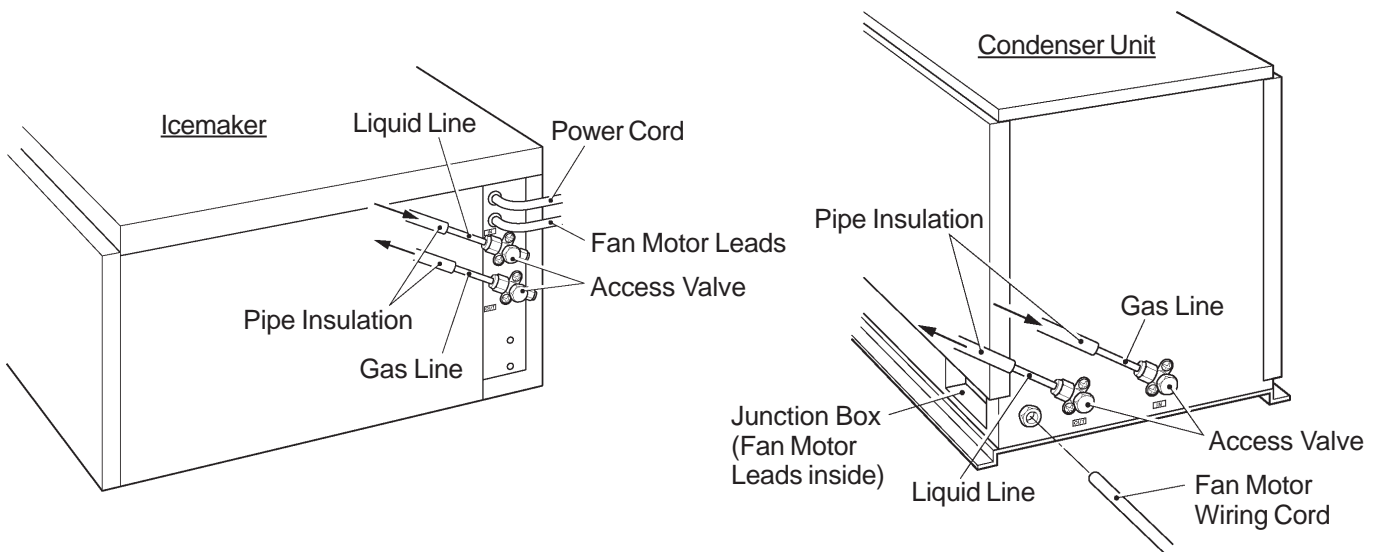
7) Refit the Cap Nuts to a torque of  $25 \pm 3$  Nm.

8) Check the Cap Nuts, Port Caps and flare joints for gas leaks with a detector or soap bubbles.

9) Insulate the joints and seal them for water tightness.

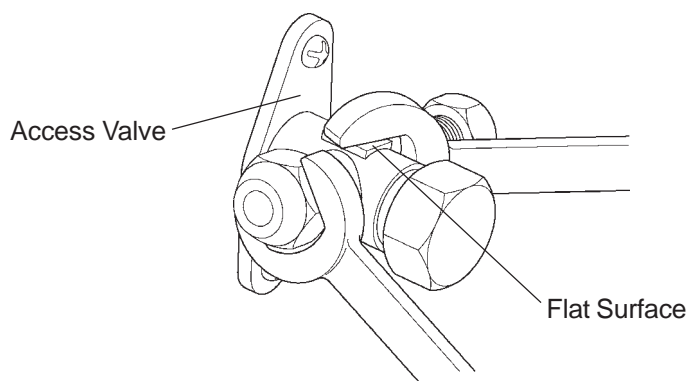


**Fig. 20**



**Fig. 21**

Note: When removing or installing the Nuts on the Access Valves, hold the flat surfaces of the valve with a spanner as shown below.



**Fig. 22**



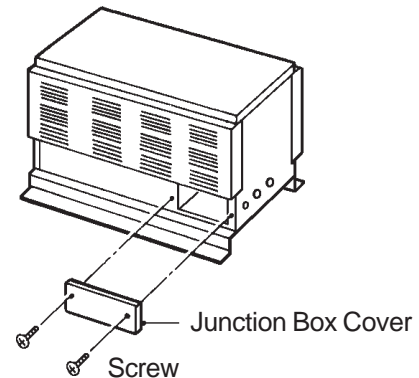
## [d] ELECTRICAL CONNECTIONS

### WARNING

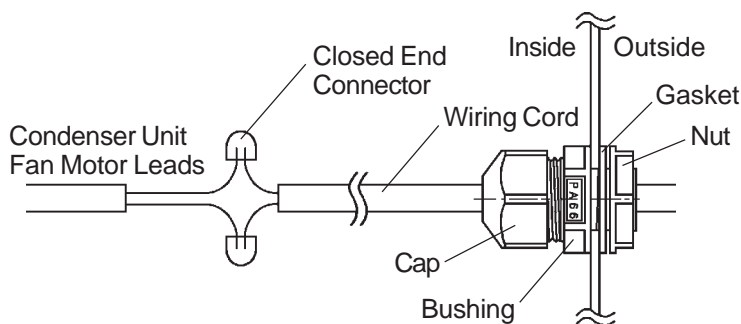
#### THIS APPLIANCE MUST BE EARTHED

This remote Condenser Unit 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 icemaker and ensure continuity to the Condenser.

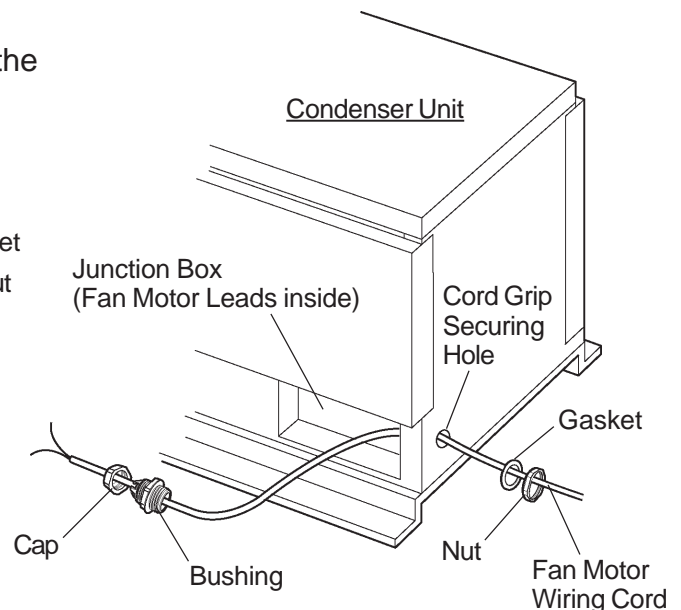
- \* This Condenser Unit must be connected to the Fan Motor Junction Box on the icemaker.
  - \* Usually an electrical permit and services of a licensed electrician are required.
- 1) Remove the two screws and the Junction Box Cover of the Condenser Unit. See Fig. 23.
  - 2) Connect the Fan Motor leads and earth wire in the Junction Box to the installed three-wire cord using proper wire connectors. See Fig. 21.
  - 3) Secure the three-wire cord in position with the Cord Grip provided.



**Fig. 23**



**Fig. 24**



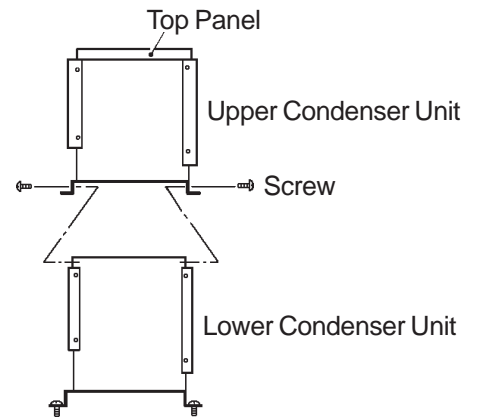
**Fig. 25**

Note: The space in the Junction Box is limited. Make the connections outside the Junction Box before securing the Cord Grip on the Condenser Unit inside by using the Nut and Bushing provided.

- 4) Replace the Junction Box Cover in its correct position and secure it with the two screws provided.

## [e] STACKING CONDENSER UNITS

- 1) Secure the lower Condenser Unit.
- 2) Remove the Top Panel of the lower Condenser Unit. Keep the four screws for the Top Panel.
- 3) Attach the upper Condenser Unit on top of the lower.
- 4) Secure the upper Condenser Unit with the four screws for the Top Panel.
- 5) Install refrigerant lines, and make electrical connections for each Fan Motor as instructed under [c] and [d].



**Fig. 26**

## 7. 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 the icemaker.

\* Water supply pressure should be minimum 0.5 bar and maximum 8 bar. If the pressure exceeds 8 bar, use a proper pressure reducing valve. Do **NOT** throttle back the supply tap.

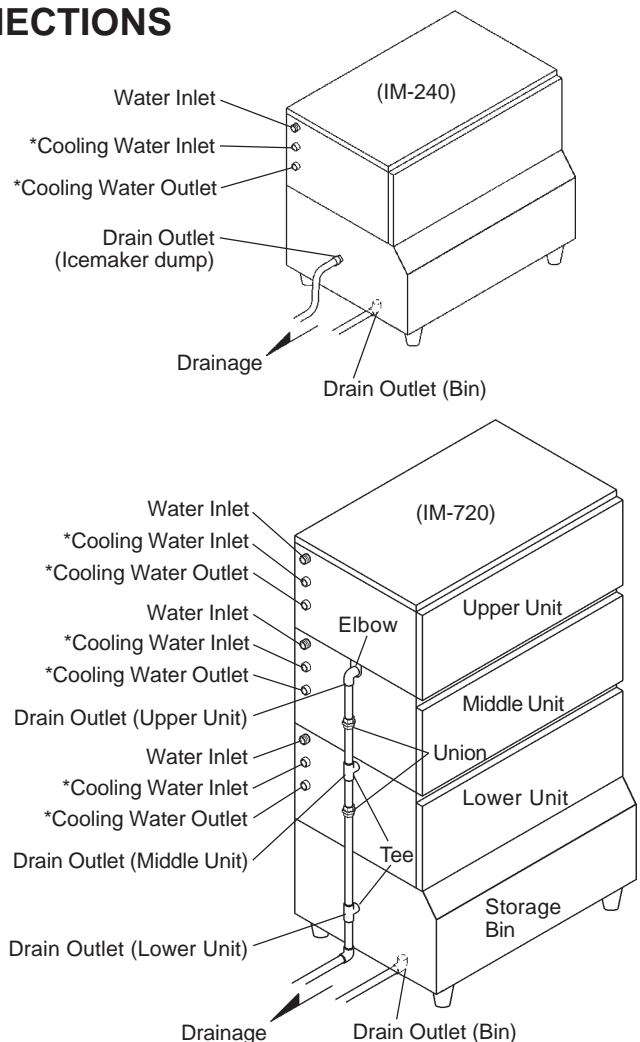
\* A plumbing permit and services of a licensed plumber may be required in some areas.

\* The icemaker drain is gravity flow, so ensure drain pipe has an adequate pitch or fall.

\* Water should drain into an open trap.

\* The Storage Bin has two drain outlets. The upper/outer one is for dump from the icemaker, and the lower/inner is for the Bin. The two drain lines must be separated to prevent a backflow into the Storage Bin.

\* On water-cooled model, a back flow preventer may be required in the cooling water circuit.



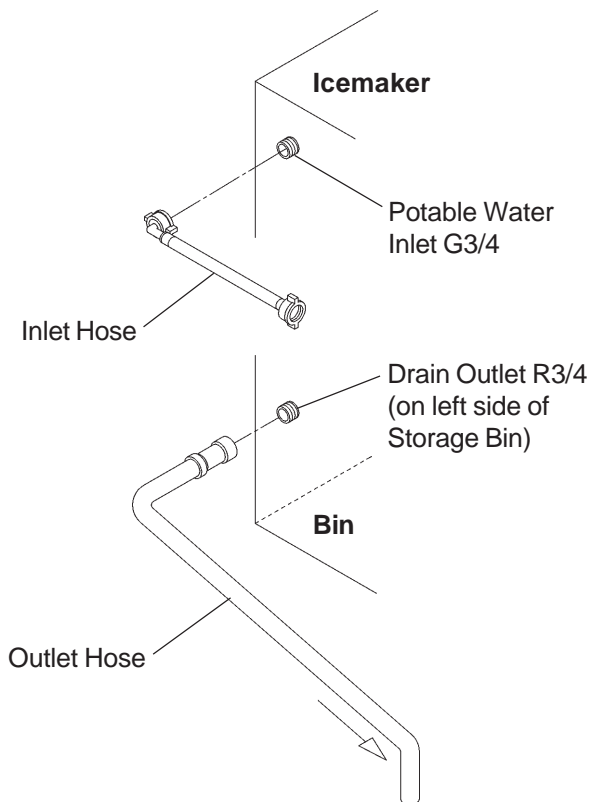
\* Water-cooled model only

**Fig. 27**

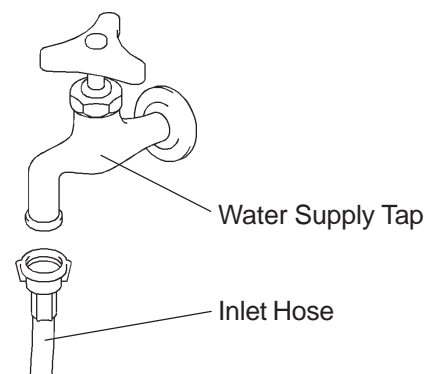
## [Air-Cooled and Remote Air-Cooled Models]

- 1) Attach the angled end of white flexible inlet hose (accessory) to the G3/4 fitting on the left side of the icemaker as indicated, ensuring rubber sealing washer is correctly positioned. Hand tighten sufficiently to provide leak free joint (Fig. 28).
- 2) Attach the other end of inlet hose to the water tap (Fig. 29), noting washer is correctly positioned before hand tightening as above. It is a wise precaution to have a stop valve within easy reach.
- 3) Hand tighten grey flexible outlet hose (accessory) onto the R3/4 fitting on the left side of the Storage Bin as indicated, ensuring rubber washer is correctly positioned to obtain a leak free joint. The pipe can be cut to length as necessary to suit position of main drain.

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



**Fig. 28**



**Fig. 29**

## **[Water-Cooled Model]**

- \* Hoshizaki recommends that the water-cooled Condenser should be connected to a closed circuit recirculating type cooling system utilizing a tower, water chiller or similar (see Fig. 30 and 31). Water make up should be via a ball valve/break tank arrangement.
- \* Whilst connecting a water-cooled Condenser to a mains water (potable) supply will not affect the performance of the machine, it will most certainly cause a high use/waste of a valuable resource and is not recommended.
- \* The services of a licensed or coded plumber should be used to ensure a correct installation.
- \* The connections should be made properly in compliance with the applicable national or local regulations.

## **[a] Standard connections according to WRC regulations in U.K. (Fig. 30 and 31)**

- \* When selecting a Cooling Tower, refer to the following peak values of heat flow in the Condenser:

Model IM-240DW/XW/AW: 5235W

- \* Pipes between the Cooling Tower and the icemaker should be at least 20 mm DIA to reduce pressure loss, even though the icemaker fittings are 13 mm DIA.
- \* Pressure loss in the water circuit inside the unit will be 5 to 6 m when the cooling water flows at the ratio of 4 to 5 lit/min.
- \* Select a Circulating Pump referring to the above values of heat flow.
- \* Do not use a Cascade Pump, or the Water Regulator will vary the flow and stop it during the defrost cycle.
- \* The Strainer must be cleaned periodically.

## **[Icemaker Connections]**

- 1) Attach the angled end of white flexible inlet hose (accessory) to the G3/4 fitting on the left side of the icemaker as indicated, ensuring rubber sealing washer is correctly positioned. Hand tighten sufficiently to provide leak free joint.
- 2) Attach the other end of inlet hose to the water tap (Fig. 29), noting washer is correctly positioned before hand tightening as above.

Note: If filtration or treatment is used, ensure icemaker section only is on treated water supply, not the Condenser.

- 3) Attach grey flexible outlet hose (accessory) to the R3/4 fitting on the left side of the Storage Bin as indicated (Fig. 28), confirming fitment of rubber washer before finally hand tightening

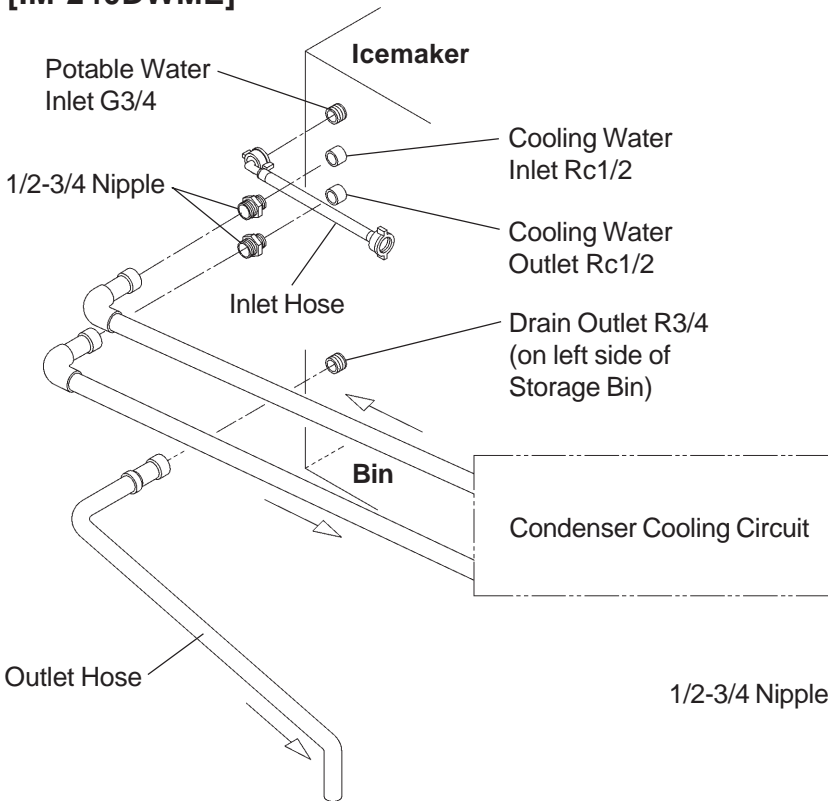
the joint. This pipe can be cut to length as necessary to suit position of main drain.

- 4) By means of a suitable spanner or wrench, tighten the 1/2-3/4 nipples (accessory) into the Rc1/2 fittings on the left side of the icemaker as indicated. P.T.F.E. tape and/or a suitable sealing compound should be used to obtain a leak free joint.

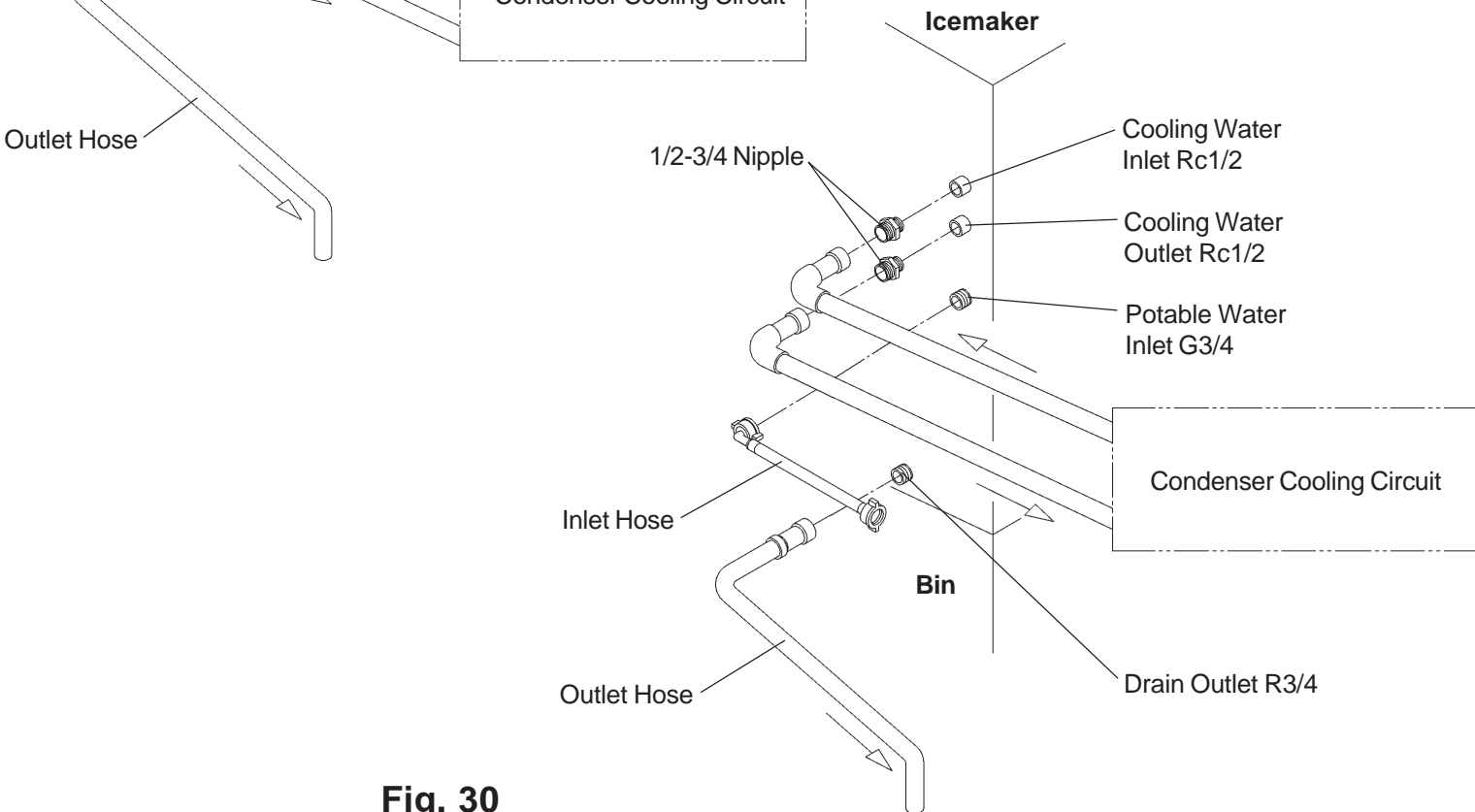
Note: Jointing compounds should be approved and suitable for potable water use.

- 5) Connect the Condenser cooling circuit to the free end of 1/2-3/4 nipples as indicated (Fig. 30) using a suitable rigid type pipe.

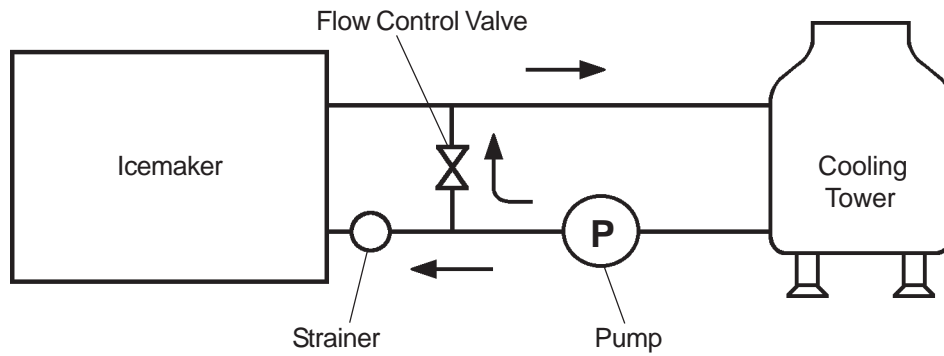
**[IM-240DWME]**



**[IM-240AWME]**



**Fig. 30**

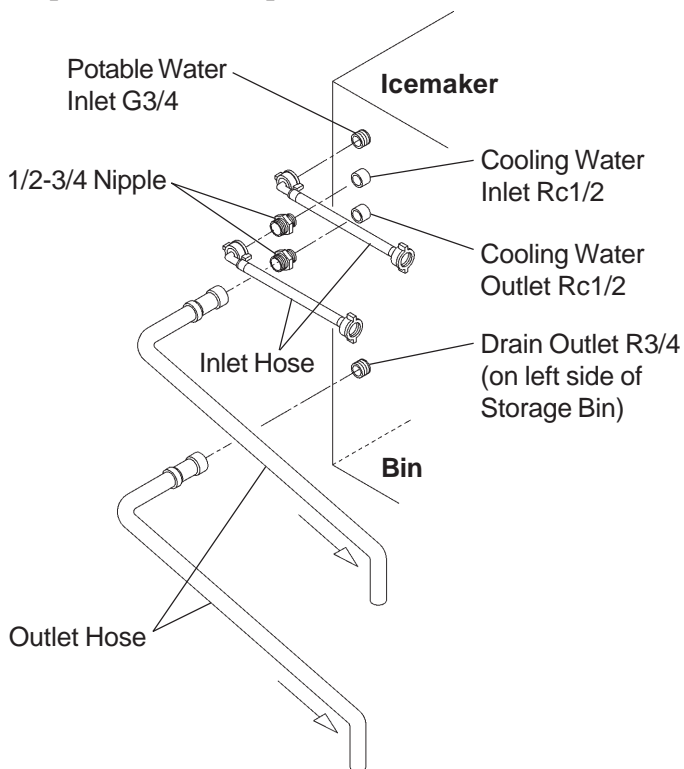


**Fig. 31**

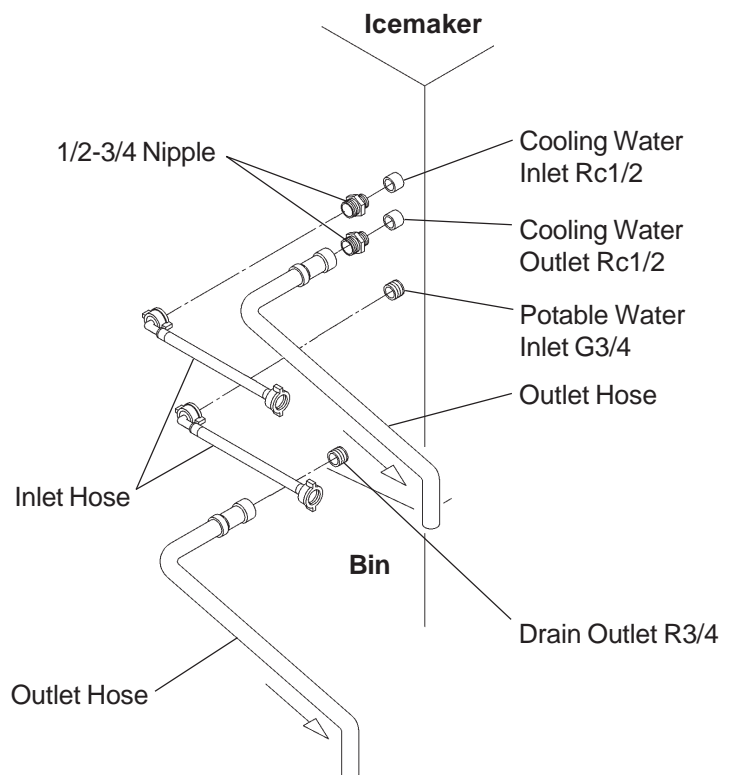
**[b] Connections according to regulations other than WRC by utilising accessory hoses (Fig. 32)**

- 1) Follow the instructions from 1) to 4) in [a] above.
- 2) For Condenser connections, use supplied accessory hoses and make the same connections as 1) to 3) in [a] above to the free end of 1/2-3/4 nipples as indicated (Fig. 32).

**[IM-240DWME]**



**[IM-240AWME]**



**Fig. 32**

## 8. FINAL CHECK LIST

- 1) Is the icemaker level?
- 2) Is the icemaker in a site where ambient temperatures are a minimum of 1°C and maximum 40°C all year around?
- 3) Is there at least 15 cm clearance around the icemaker for easy maintenance and service?
- 4) Have all shipping carton, tape(s) and packing been removed from the icemaker?
- 5) Have all electrical and piping connections been made?
- 6) Has the power supply voltage been tested or checked against the nameplate rating?  
Has a proper earth been installed to the icemaker?
- 7) Has the water supply pressure been checked to ensure a minimum of 0.5 bar and maximum 8 bar?
- 8) Have the compressor hold-down bolts and all refrigerant lines been checked against vibration and possible failure?
- 9) Have the Bin Control Switch been checked for correct operation? When the icemaker is running, push the Detector of the Bin Control Switch. The icemaker should stop within 10 seconds.

## IV. OPERATING INSTRUCTIONS

### WARNING

1. This icemaker is designed to produce and store edible ice. To keep the icemaker hygienic:
  - \* Wash your hands before removing ice. Use the Plastic Scoop provided (accessory).
  - \* The Storage Bin is for ice use only. Do not store anything else in the Bin.
  - \* Clean the Storage Bin before use (see "V. 1. PERIODICAL CLEANING").
  - \* Keep the Scoop clean. Clean it by using a neutral cleaner and rinse thoroughly.
  - \* Close the Door after removing ice to prevent entrance of dirt, dust or insects into the Storage Bin.
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 icemaker.
  - \* Do not pull the power cord in order to disconnect the icemaker from the feed network.
  - \* This appliance is not suitable for unsupervised use by young children or aged or infirm persons.
3. All parts are factory-adjusted. Improper adjustments may result in failure.
4. If the unit is turned off, wait for at least 3 minutes before restarting the icemaker to prevent damage to the Compressor.

### 1. START UP

[Air-Cooled and Water-Cooled Models]

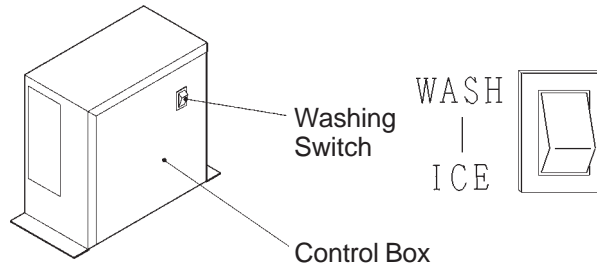
- 1) Disconnect the power supply.
- 2) Open the water tap.
- 3) Connect the power supply and energise.
- 4) The following should occur in sequence:
  - a) Compressor will start (Hot Gas Valve open).
  - b) Water Pan will fully open.
  - c) Water Solenoid will open.
  - d) Water Pan will start to close (Hot Gas Valve closed).
  - e) Water Pan fully closed - Pump Motor will start.
  - f) Water Solenoid will close.



[Remote Air-cooled Model]

Before starting the unit, energise the Oil Heater around the lower part of the Compressor to prevent a starting failure caused by the refrigerant staying inside the Compressor:

1) Move the Washing Switch on the Control Box to the “WASH” position.

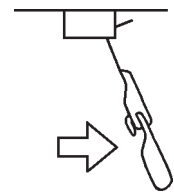


**Fig. 33**

2) Push the Bin Control Switch to the right into the “bin full” position, and fix it there with tapes.

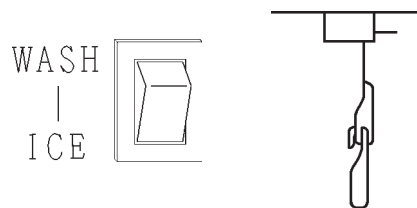
3) Connect the power supply.

4) After 10 seconds in the defrost cycle, the unit stops. Leave the unit for 12 hours (Oil Heater energised).



**Fig. 34**

5) Move the Washing Switch to the “ICE” position, and release the Bin Control Switch into the initial “running” position.



**Fig. 35**

6) The unit will start a freeze cycle in 80 seconds.

**IMPORTANT**

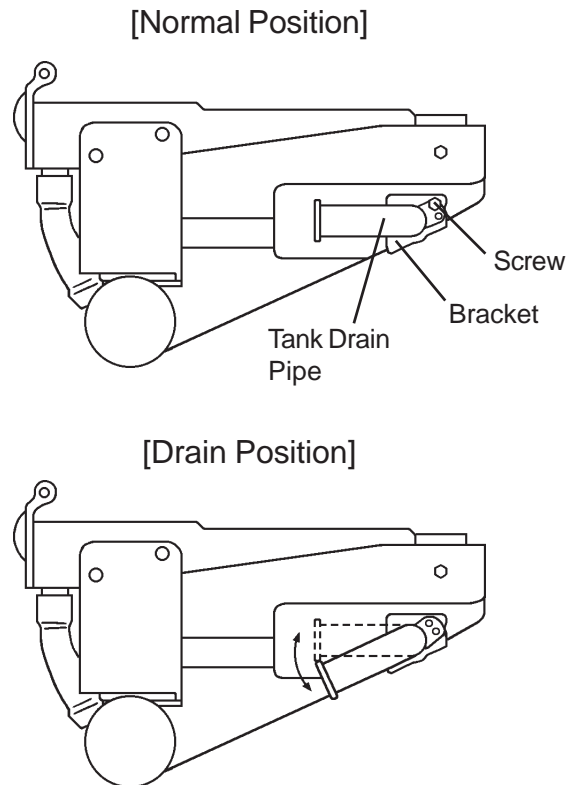
1. Check the conditions and quality of the ice production.
2. Do not use ice produced in the trial run. It might be contaminated with foreign matter in the water circuit. Discard or flush down the drain.

## 2. PREPARING THE ICEMAKER FOR LONG STORAGE

### WARNING

Drain the icemaker to prevent damage to the water supply line at subfreezing temperatures, using air or carbon dioxide. Shut off the icemaker until proper air temperature is resumed.

- 1) Close the water supply tap, and remove the Inlet Hose.
- 2) Remove the Front Panel.
- 3) Remove the screw located on the front of the Water Tank.
- 4) Move the Tank Drain Pipe to the drain position. See Fig. 36.
- 5) Push the Reset Switch in the Control Box, or disconnect power source and reconnect after 3 minutes.
- 6) The Water Pan will open, and then the Actuator Toggle Switch will turn to the "DEFROST" position in 40 seconds. (Click sound will be heard.)
- 7) Blow out the water supply line immediately after the Water Pan has opened.



**Fig. 36**

Note: This procedure is necessary to protect the icemaker from freezing up at subfreezing temperature.

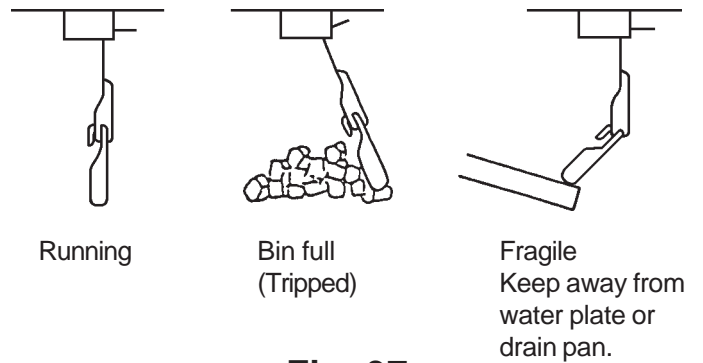
- 8) Unplug the icemaker or disconnect the power source with the Actuator Toggle Switch in the "DEFROST" position.
- 9) Move the Tank Drain Pipe to the normal position, and secure it with the screw.
- 10) Remove all ice from the Storage Bin, and clean the Bin.
- 11) Replace the panels in their correct positions.
- 12) Replace the Inlet Hose in its correct position.

### 3. BIN CONTROL

Bin Control Switch is mounted on the upper side of the Storage Bin. This switch will turn off the unit automatically when the Storage Bin is full of ice.

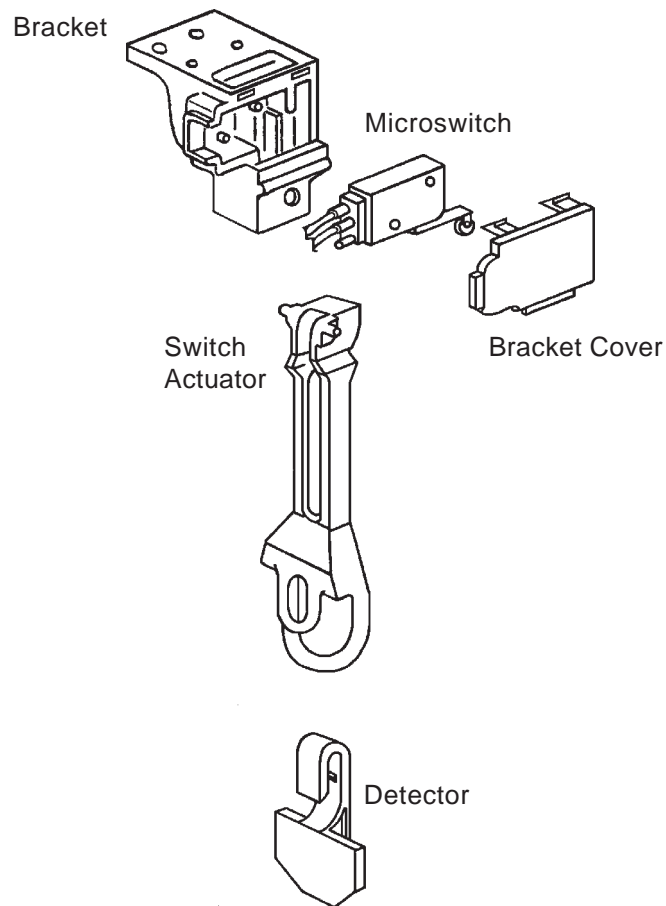
Handle the Bin Control Switch carefully, because the switch assembly is fragile. Especially on removing ice, do not touch or poke with a scoop.

Keep away from the Water Plate or Drain Pan to prevent jamming.



**Fig. 37**

#### [a] BIN CONTROL SWITCH ASSEMBLY

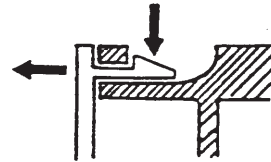


**Fig. 38**

## [b] REMOVAL

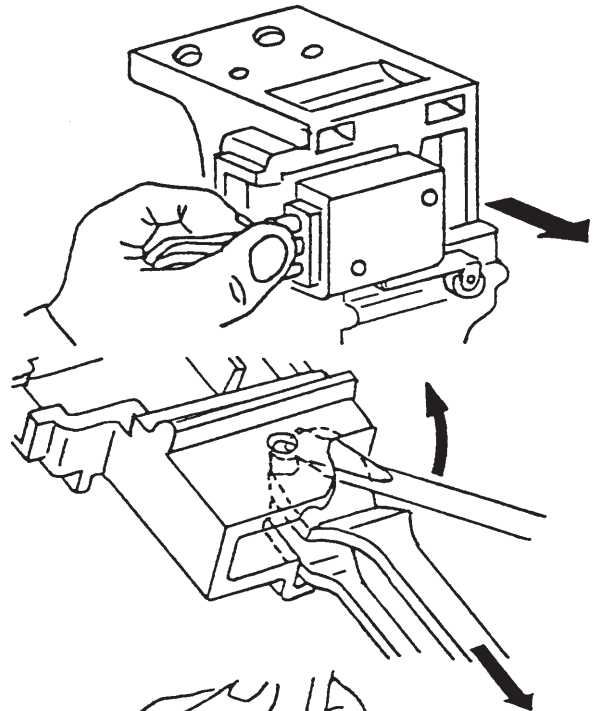
### BRACKET COVER

Push the two Pawls and remove the Bracket Cover.



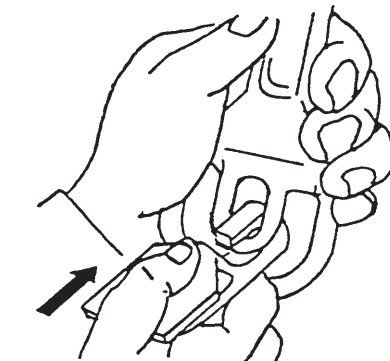
### SWITCH

Pull out the Switch, holding the Rubber Leads Cap. Handle with care.



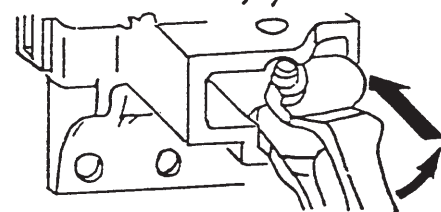
### SWITCH ACTUATOR

Insert a flat blade screwdriver and wrench it slightly to pull out the Switch Actuator. Handle with care to prevent damage to the cam surface of the Actuator.



### DETECTOR

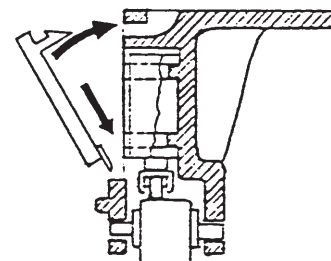
Push out the Detector, holding the Switch Actuator.



## [c] REASSEMBLING

### SWITCH ACTUATOR

Insert the lower Shaft and push it along the U Notch. Check that the Switch Actuator moves free.



### SWITCH & BRACKET COVER

Place the Switch Lever first, and then attach the Switch in position. Insert the guide and push the Bracket Cover to lock.

**Fig. 39**

## V. MAINTENANCE INSTRUCTIONS

### WARNING

1. Before carrying out any cleaning or maintenance operations, unplug the icemaker from the electrical supply network.
2. Before handling or using cleaning solutions, check the guidelines on the product for advice on suitable personal protective clothing, gloves, goggles, etc.
3. Clean and sanitize the icemaker water system at least twice a year, and check and clean the Condenser at least once a year.
4. This appliance must not be cleaned by use of a water jet.

### 1. PERIODICAL CLEANING

#### [1] Machine and Bin Exterior

Wipe the exterior 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] Scoop and Storage Bin Handle Cleaning/Sanitisation (Daily)

- 1) Either mix 3 litres of water with 11 ml of 5.25% sodium hypochlorite solution in a suitable container, or the recommended Hoshizaki sanitiser as directed.
- 2) Soak the Scoop in the solution for more than 3 minutes. Rinse thoroughly, and shake to remove surplus liquid.

Note: Using a cloth to dry may re-contaminate.

- 3) Use a neutral cleaner to wash the Storage Bin Handle. Rinse thoroughly.
- 4) Soak a clean cloth with the sanitising solution, and wipe the Handle. Use fresh water and a clean cloth to rinse/dry.

#### [3] Storage Bin Interior Cleaning/Sanitisation (Weekly)

- 1) Open the Storage Bin Door, and remove all ice.

Note: Hoshizaki recommends various types of Storage Bin for the icemaker which vary in size and design. The following instructions are therefore for general guidance only.

- 2) Wash the Bin liner, Ice Deflector and Door inner surface with a neutral non-abrasive cleaner. Rinse thoroughly with a clean cloth and fresh water.
- 3) Either mix 5 litres of water with 18 ml of 5.25% sodium hypochlorite solution in a suitable container, or the recommended Hoshizaki sanitiser as directed.
- 4) Soak a clean sponge or cloth with the solution, and wipe the Bin liner, Ice Deflector and Door inner surface.
- 5) Rinse thoroughly with fresh water and a clean cloth to wipe off the solution. Close the Bin Door.

Note: Some solutions may cause damage to the Bin liner surfaces or corrosion on the metal parts. Always rinse the sanitiser unless directed otherwise by Hoshizaki guidelines.

#### [4] Air Filter (Air-Cooled Model Only)

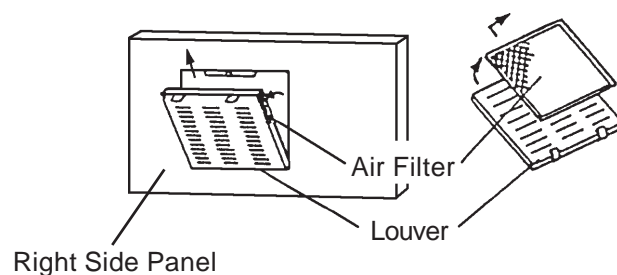
Plastic mesh Air Filters are fitted to remove dirt or dust from the air, preventing the Condenser from getting clogged. As the Filters become dirty, air circulation through the Condenser will be reduced, affecting the icemaker's performance.

Remove and clean the Air Filters at least twice per month:

- 1) Unscrew and remove the Front Panel. The Filter is fitted on the inside of the panel behind the air slots.
- 2) Unscrew and remove the Louver on the Right Side Panel. The Filter is fitted to the inside of the plastic Louver.

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

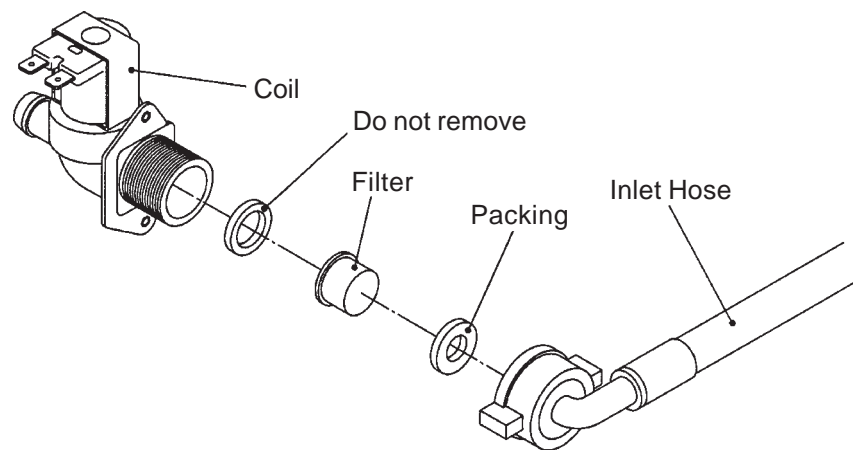
- 3) Remove the Air Filters.
- 4) Clean the Air Filters by using a vacuum cleaner. When severely clogged, use warm water and a neutral cleaner to wash the Air Filters.
- 5) Rinse and dry the Air Filters thoroughly, and place them back in position.



**Fig. 40**

## 2. WATER VALVE

- 1) Unplug the icemaker or disconnect the power source.
- 2) Close the water supply tap.
- 3) Remove the Top Panel and Front Panel.
- 4) Disconnect the Inlet Hose 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 Inlet Hose in their correct positions.
- 8) Open the Shut-off Valve.
- 9) Plug in the icemaker or connect the power source.
- 10) Check for leaks.
- 11) Replace the panels in their correct positions.



**Fig. 41**

### 3. WATER-COOLED CONDENSER

Deposits inside the water circuit of the Water-cooled Condenser decrease cooling performance. Clean inside of the Condenser by circulating a cleaning solution.

1) Prepare the following:

Cleaning solution [Read and follow any instructions on label or bottle.]

Pump            Container for solution

Hose

Hose bands

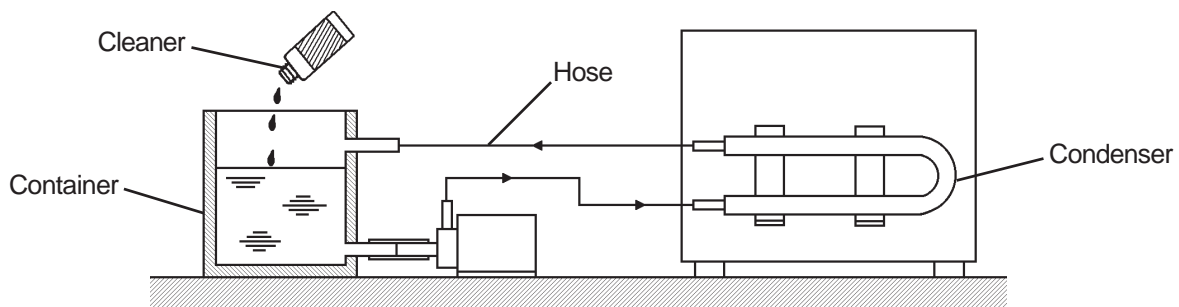
Two fittings [R1/2 - 3/8"DIA]

Two fittings [3/8" flare - 3/8"DIA]

#### CAUTION

Do not use a cleaning solution that will corrode the copper tubing.  
In case of contact with the solution, flush with water.

- 2) Remove the panels and check for leaks from the water line.
- 3) Unplug the icemaker or disconnect the power source, and close the water supply tap.
- 4) Disconnect the cooling water inlet and outlet pipings and attach fittings to connect hoses.
- 5) Disconnect the inlet and outlet tubings of the Water Regulator and replace the Water Regulator by fittings.
- 6) Connect hoses as shown in Fig. 42 and secure them by hose bands.
- 7) Fill the container with the cleaning solution.
- 8) Run the pump motor and circulate the solution for a period recommended in the instructions on label or bottle of the cleaner.
- 9) Rinse the water circuit.
- 10) Reverse the above procedure in steps 2) through 6).
- 11) Check the icemaking capacity referring to "VI. 3. PERFORMANCE DATA".



**Fig. 42**



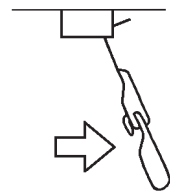
## 4. ICEMAKING WATER SYSTEM

To keep the icemaker hygienic, clean and sanitize the icemaking water system at least once every six months. More frequent cleaning and sanitizing may be required depending on the water quality.

### CAUTION

1. Do not touch the Washing Switch with damp hands.
2. Always wear rubber gloves, eye protectors, apron, etc. for safe handling of the cleaner and sanitizer.
3. Use the cleaners and sanitizers recommended by Hoshizaki. Contact your local Hoshizaki office for further details. (The instructions below give an example of those recommended cleaners and sanitizers.)
4. Never mix cleaning and sanitizing solutions in an attempt to shorten cleaning time.
5. Wipe off any splashed or spilt cleaner/sanitizer immediately.
6. Do not use any ammonia type cleaners on any part of the icemaker.
7. When the ambient and water temperatures are 10°C or below, the Water Pan may remain open. Warm the icemaking compartment up to 20°C around the Thermistor.
8. Be sure to follow the cleaning and sanitizing instructions below.

- 1) Use a suitable container to dilute 236 ml of the cleaner (“Nickel-Safe Ice Machine Cleaner” by The Rectorseal Corporation) with 11.4 lit. of water.
- 2) Open the Storage Bin Door, and remove all the ice to avoid contaminating by the cleaner.
- 3) Remove the Front and Top Panels. See Fig. 2.
- 4) If the icemaker is in a defrost cycle, wait until a freeze cycle starts.
- 5) Remove the screw, and move the Tank Drain Pipe to the drain position. See Fig. 36.
- 6) Push the Bin Control Switch to the right into the “bin full” position. Hold the switch until the icemaker stops in 10 seconds. See Fig. 43.

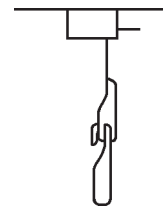


**Fig. 43**

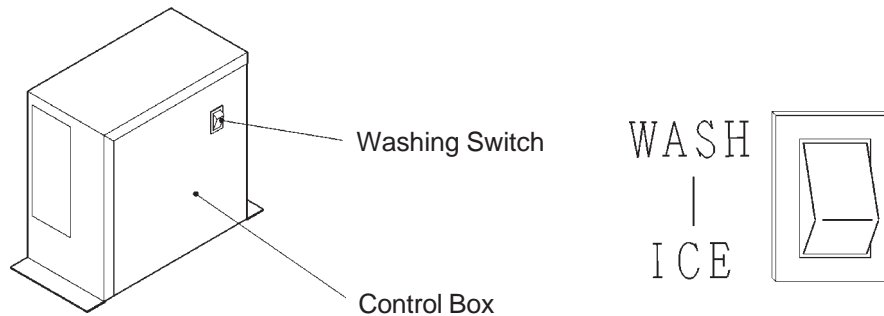
7) When the icemaker stops, release the Bin Control Switch into the “running” position. See Fig. 44. (The icemaker will restart in 80 seconds, and the Water Pan will start to open.)

8) Close the water supply tap.

9) After the ice has dropped and the Water Pan begins to close, move the Washing Switch on the right side of the Control Box to the “WASH” position. See Fig. 45.



**Fig. 44**



**Fig. 45**

10) As soon as the Water Pan closes, pour the cleaning solution prepared in 1) carefully into the Water Pan. Do not splash or spill the solution onto the other parts.

11) Circulate the cleaning solution for 30 minutes. Open the water supply tap, and repeat the above steps 6) and 7).

12) When the Water Pan closes again, pour clean water into the Water Pan until it floods from the Overflow Pipe, and circulate the water for 5 minutes.

13) Repeat the above steps 6), 7) and 12) at least three times to rinse thoroughly.

## **SANITIZING INSTRUCTIONS**

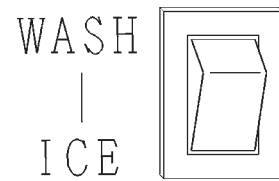
Note: Sanitizing should always be completed after cleaning or alternately as an individual procedure if conditions exist to make it necessary.

14) Use a suitable container to dilute 44 ml of 5.25% sodium hypochlorite solution with 11.4 lit. of water.

\* Alternatively use the Hoshizaki recommended sanitizer as directed by the relevant instructions.

15) Repeat the above steps 5), 6) and 7), and close the water supply tap.

- 16) As soon as the Water Pan closes, pour the sanitizing solution prepared in 14) carefully into the Water Pan. Do not splash or spill the solution onto the other parts.
- 17) Circulate the solution for 15 minutes. Open the water supply tap, and repeat the above steps 6) and 7).
- 18) When the Water Pan closes again, pour clean water into the Water Pan until it floods from the Overflow Pipe, and circulate the water for 5 minutes.
- 19) Repeat the above steps 6), 7) and 18) at least three times to rinse thoroughly.
- 20) Move the Tank Drain Pipe to the normal position, and secure it with the screw. See Fig. 36.
- 21) Repeat the above steps 6) and 7) again. When the icemaker stops, move the Washing Switch to the "ICE" position. See Fig. 46. (The icemaker will resume icemaking process.)
- 22) Replace the Front Panel and Top Panel in their correct positions.
- 23) Complete Storage Bin cleaning as detailed in V. 1. [3].



**Fig. 46**

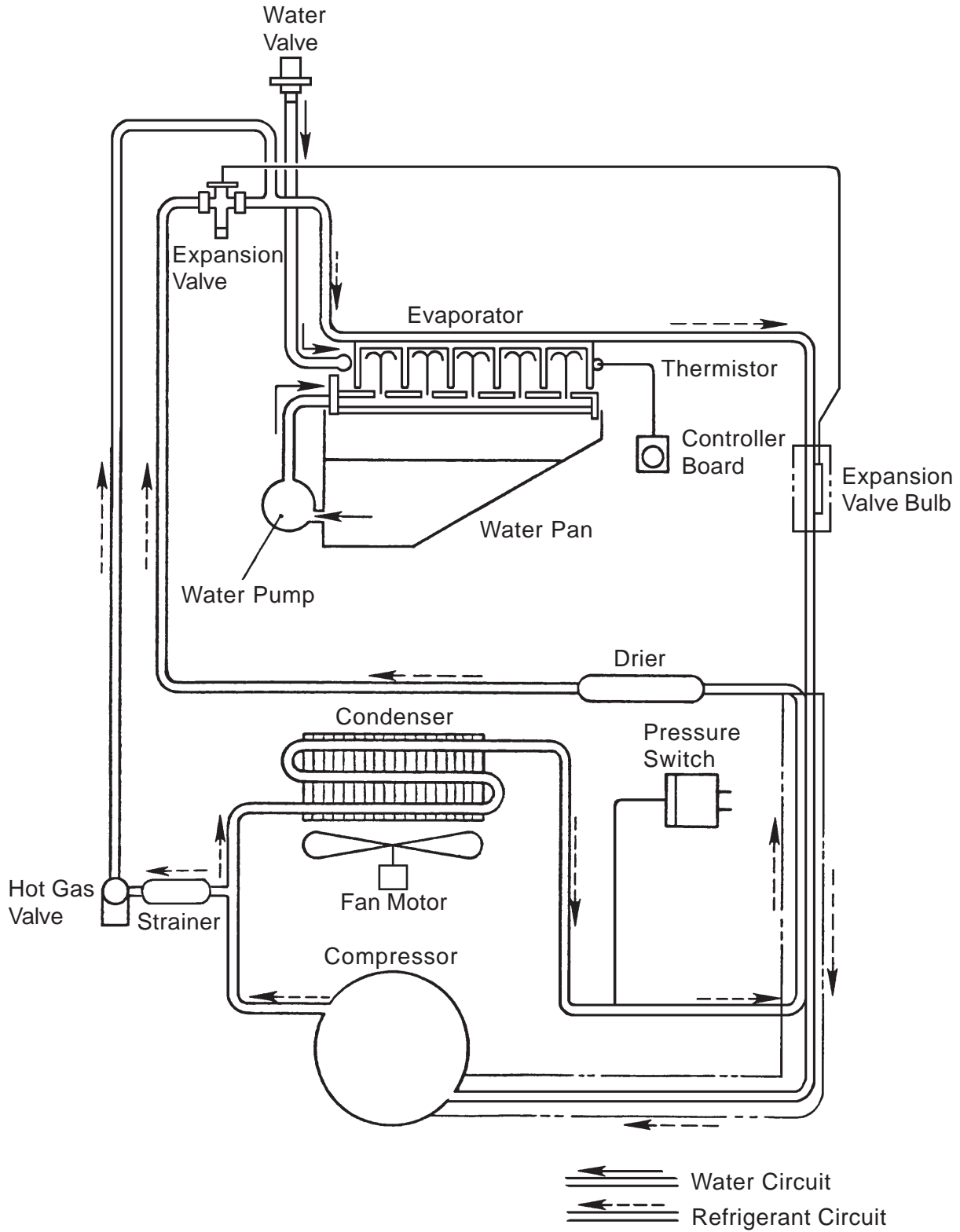
**IMPORTANT**

Be sure to operate the Bin Control Switch as specified in 11) and 17) within 40 minutes after the Water Pan closes. After 40 minutes pass, the interlock will operate to stop the icemaker. (It will not reset automatically.) If the interlock should operate, disconnect the power source and then reconnect it.

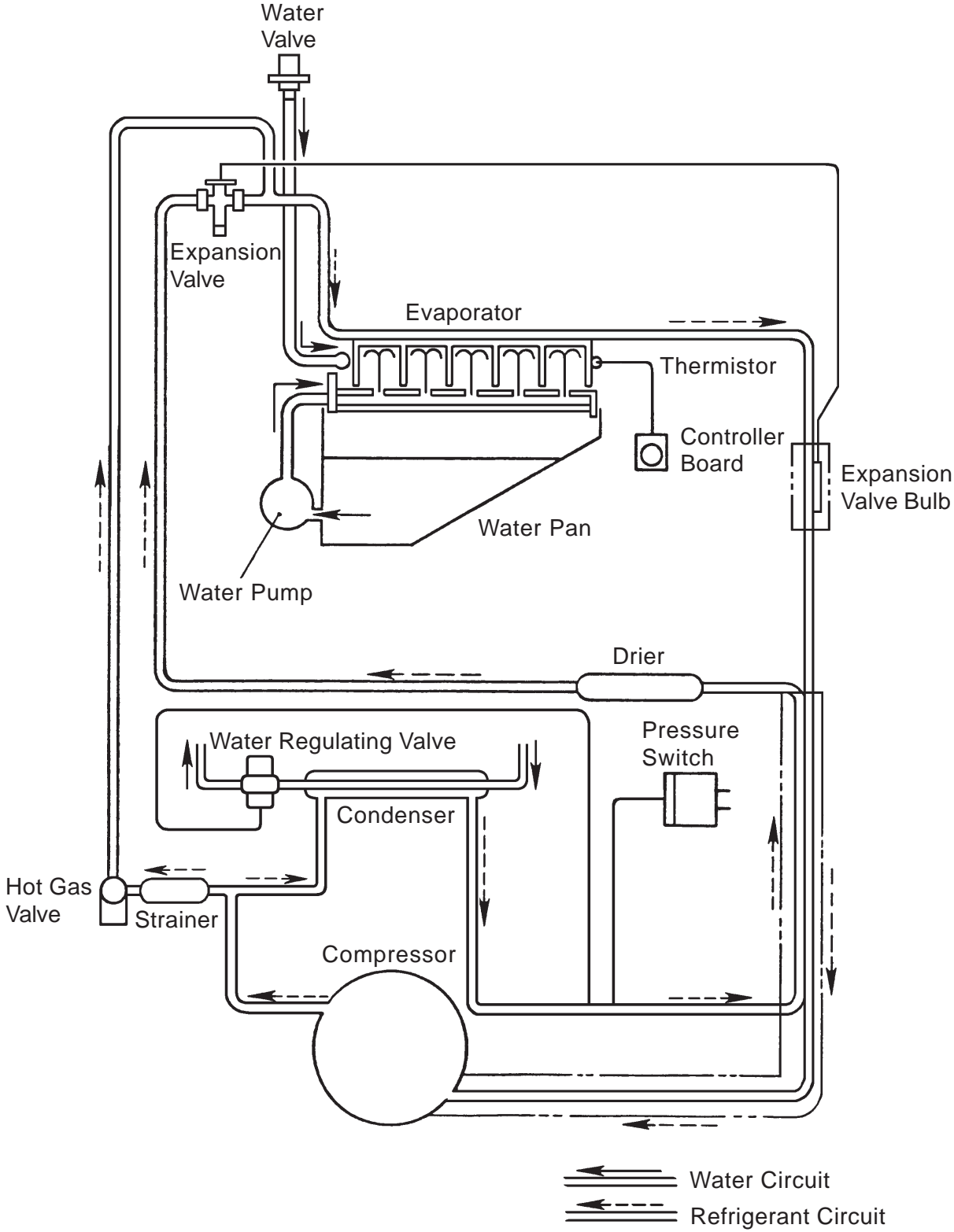
## VI. TECHNICAL INFORMATION

### 1. WATER CIRCUIT AND REFRIGERANT CIRCUIT

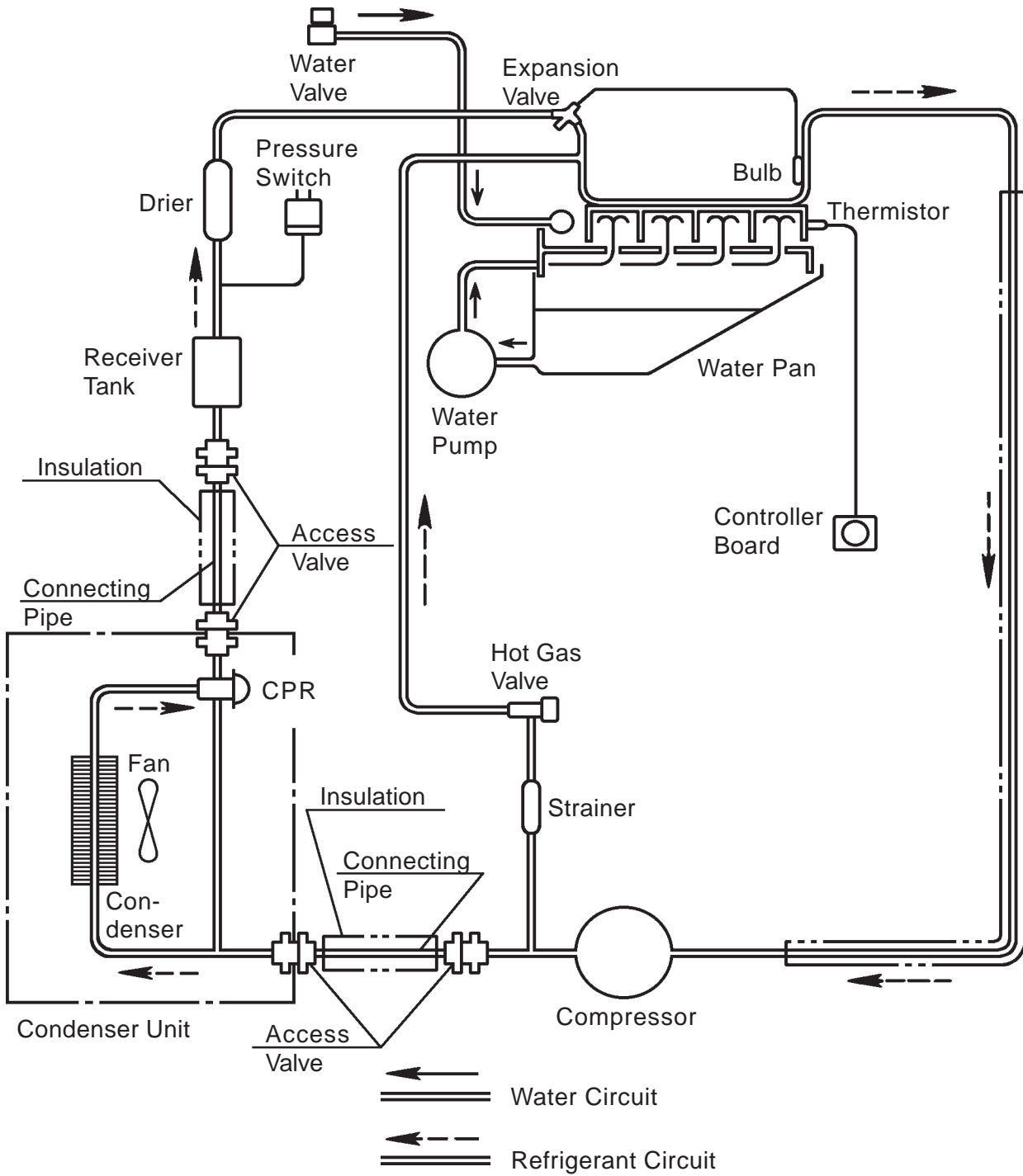
[a] IM-240DME, IM-240XME, IM-240AME (Air-cooled)



[b] IM-240DWME, IM-240XWME, IM-240AWME (Water-cooled)

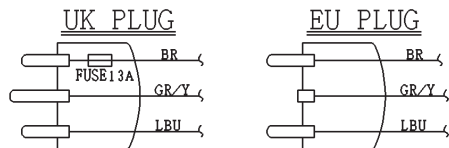
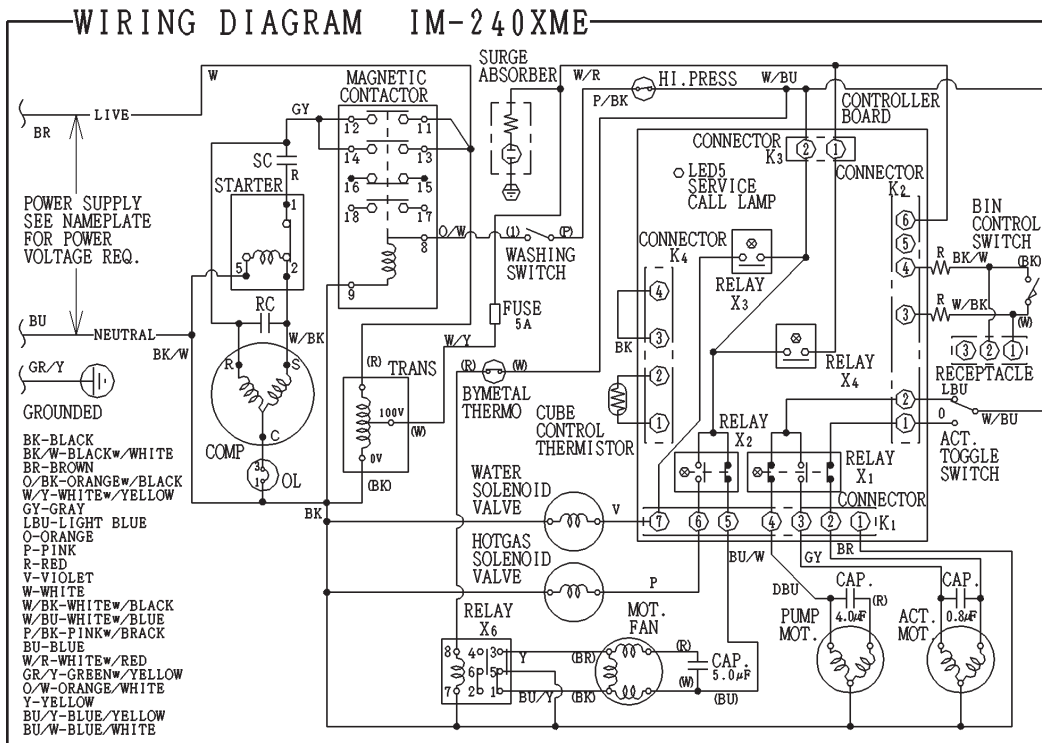
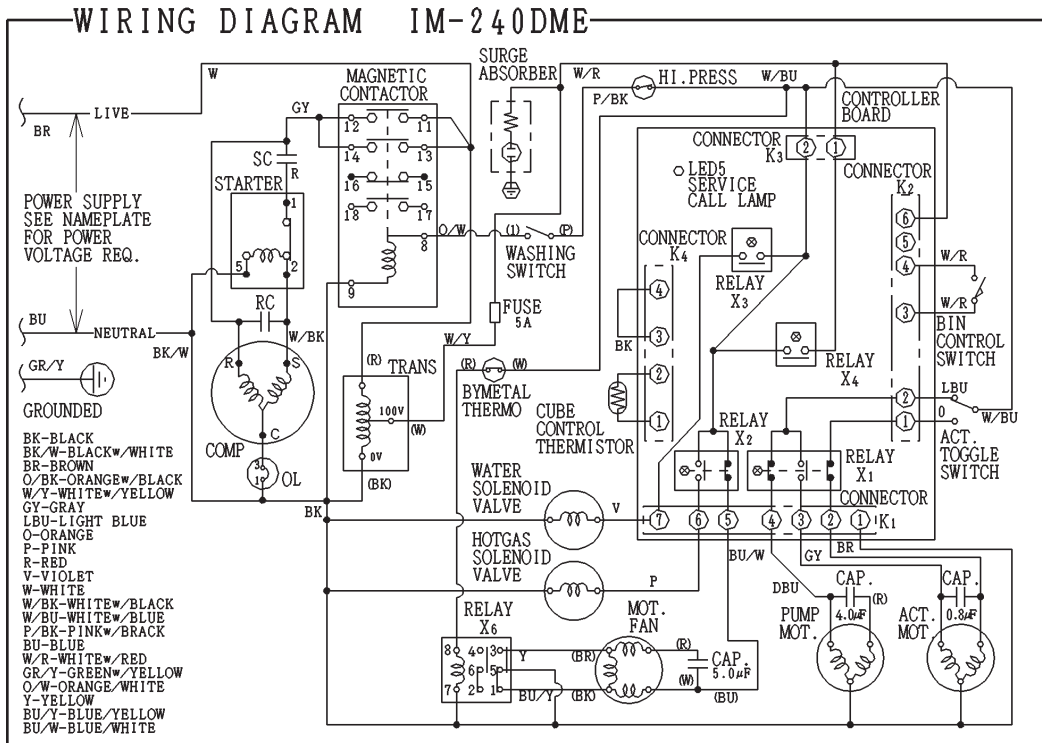


[c] IM-240DSME, IM-240XSME (Remote Air-cooled)

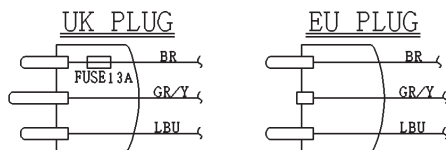
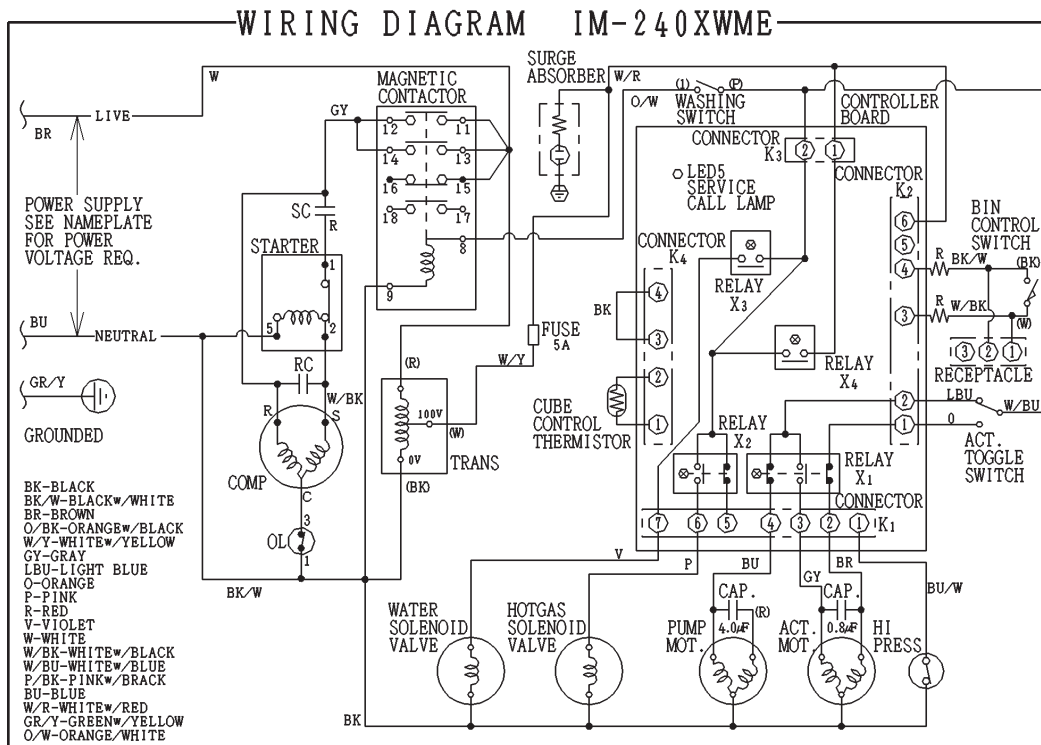
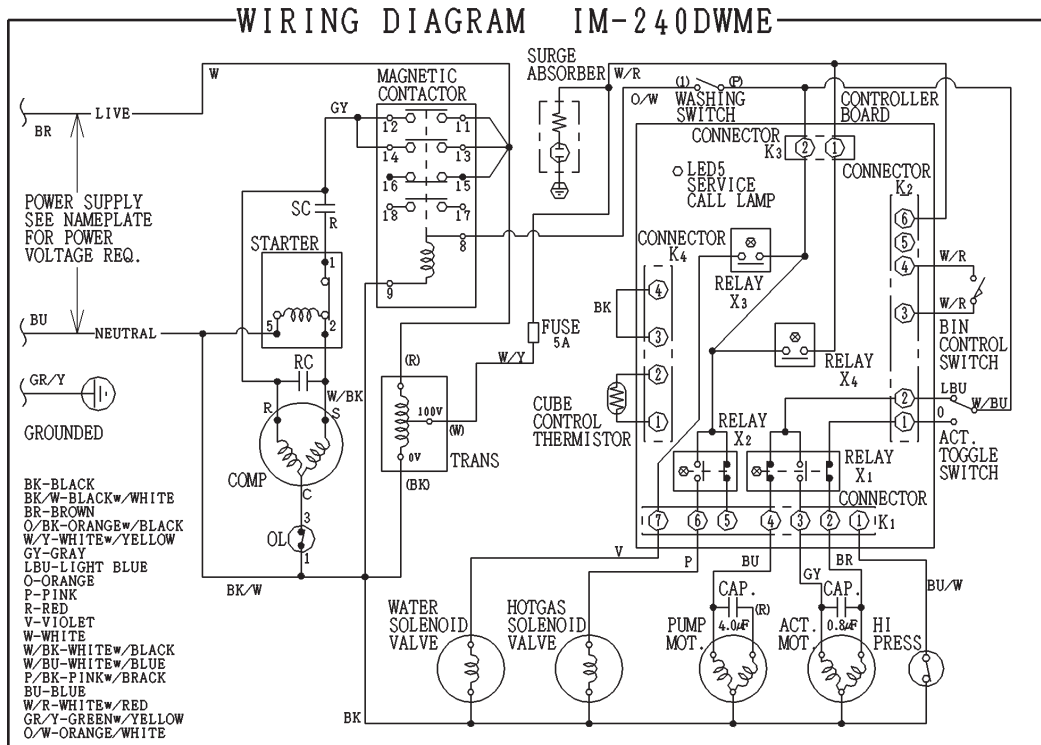


# 2. WIRING DIAGRAM

[a] IM-240DME, IM-240XME

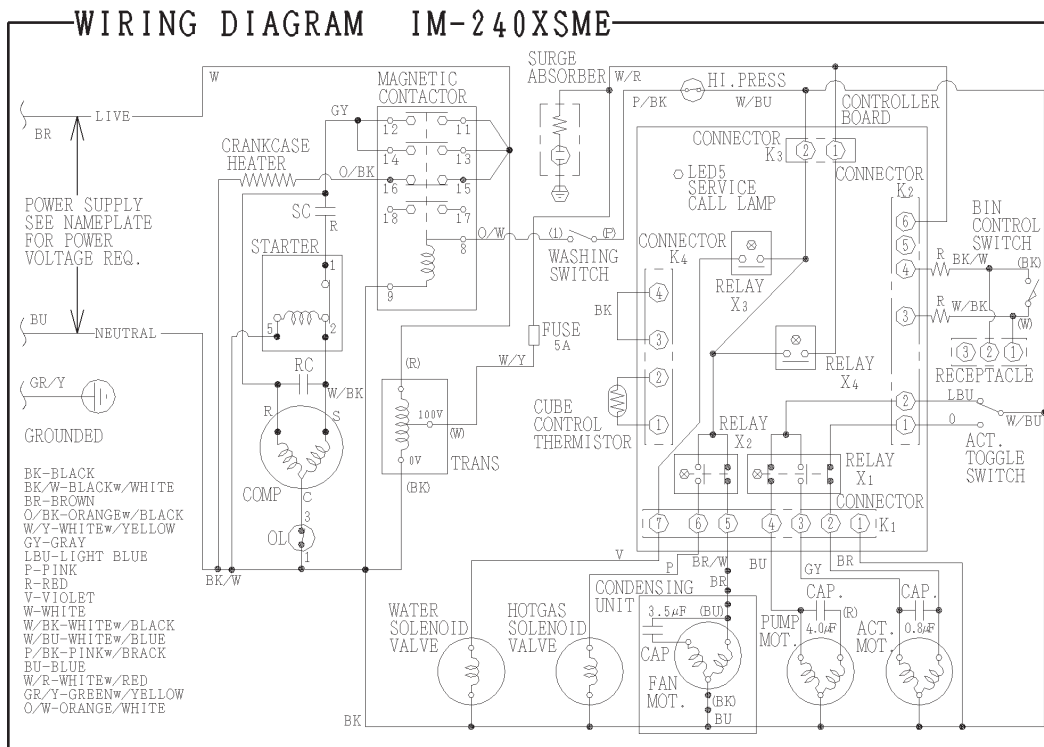
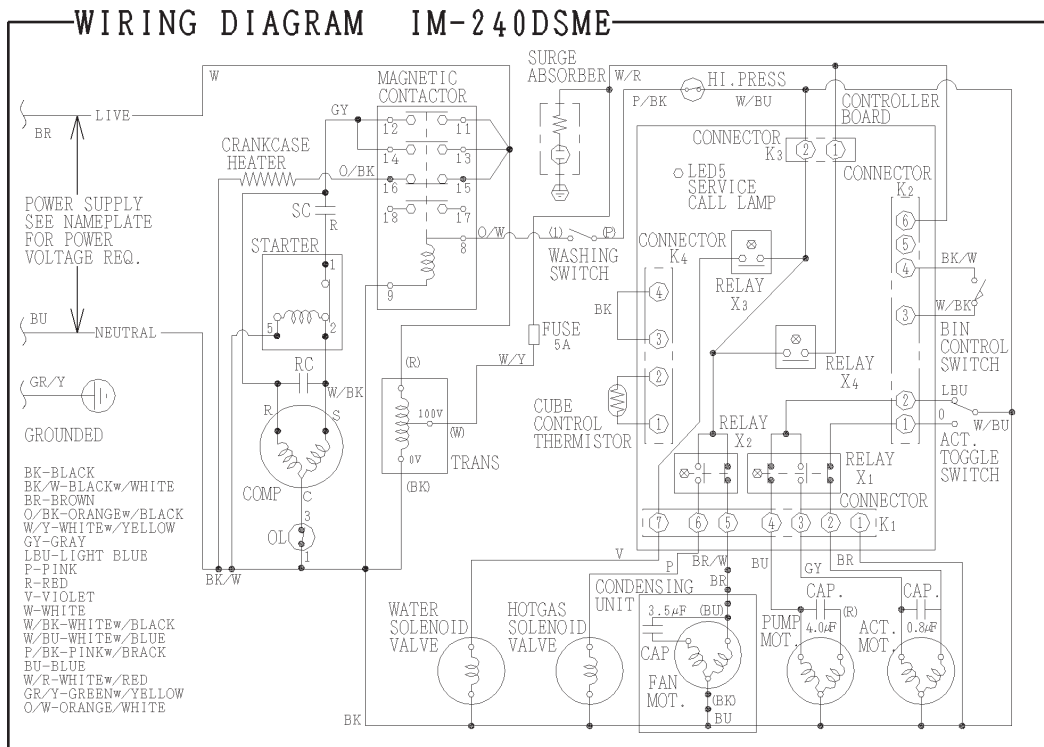


[b] IM-240DWME, IM-240XWME

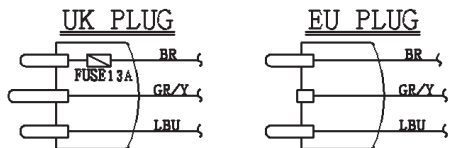
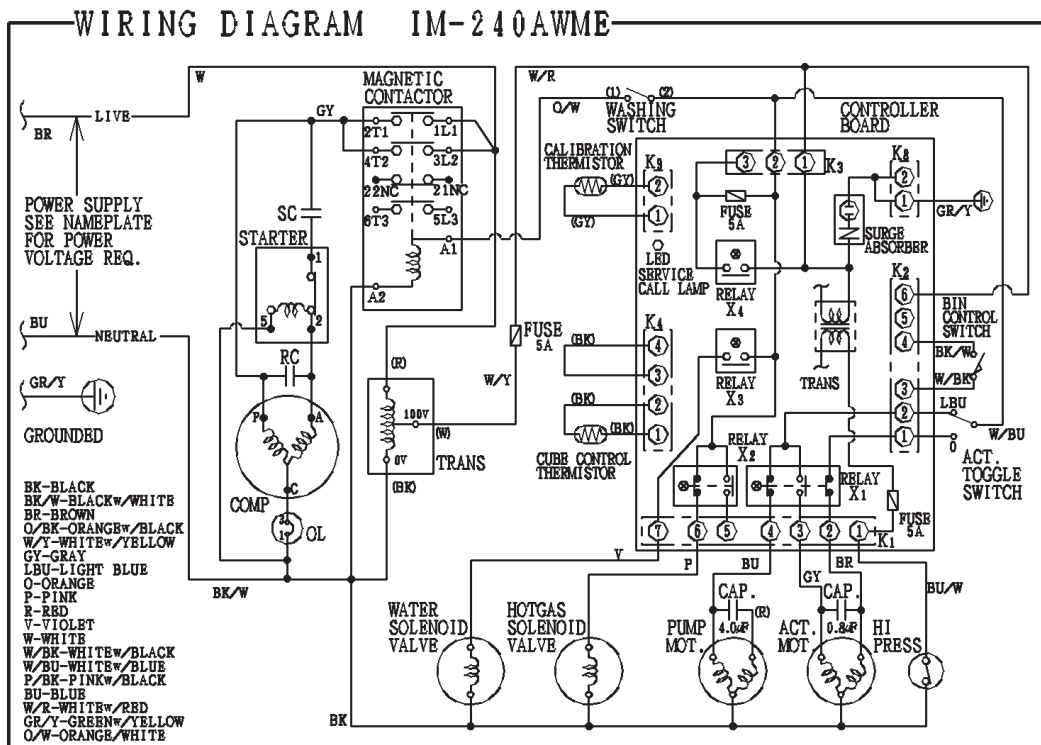
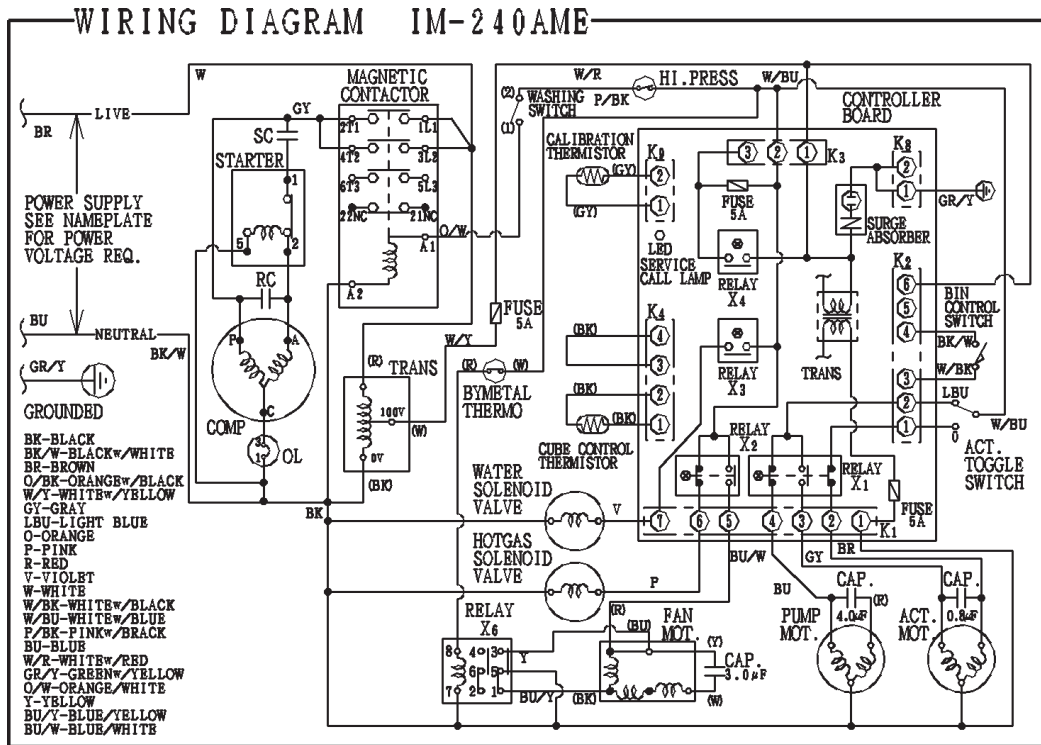




[c] IM-240DSME, IM-240XSME



[d] IM-240AME, IM-240AWME



### 3. PERFORMANCE DATA (Ice Production = Capacity when shipped from factory)

(\*Values for icemaking water only. Use a cooling tower for cooling water.)

Model	Ambient Temp. (°C)	10	21	32	38
	Water Temp. (°C)	10	15	21	32
IM-240DME IM-240XME	Ice Production (kg/d)	182	205	195	170
	Freeze Cycle Time (min)	19.5	19	21	25
	Defrost Cycle Time (min)	6	3.5	2.5	2
	Water Consumption (lit/h)	48.8	30	19	12.3
	Electric Consumption (W)	1120	1200	1330	1450
	Head Pressure [peak] (bar)	16	17.5	23	26
IM-240DME-21 IM-240XME-21	Ice Production (kg/d)	170	180	165	152
	Freeze Cycle Time (min)	11.5	12	15	17
	Defrost Cycle Time (min)	5.5	4	2.5	2
	Water Consumption (lit/h)	66.4	49.2	25.4	17.4
	Electric Consumption (W)	1120	1200	1330	1450
	Head Pressure [peak] (bar)	16	17.5	23	26
IM-240DME-23 IM-240XME-23	Ice Production (kg/d)	163	175	165	145
	Freeze Cycle Time (min)	16	16.5	19	21.5
	Defrost Cycle Time (min)	5	3	2	2
	Water Consumption (lit/h)	46.2	28.7	15.8	14.1
	Electric Consumption (W)	1120	1200	1330	1450
	Head Pressure [peak] (bar)	16	17.5	23	26
IM-240DME-32 IM-240XME-32	Ice Production (kg/d)	180	175	155	130
	Freeze Cycle Time (min)	22.5	23.5	28	34
	Defrost Cycle Time (min)	4	3.5	2.5	2.5
	Water Consumption (lit/h)	29.7	24.8	14.5	12.2
	Electric Consumption (W)	1120	1200	1330	1450
	Head Pressure [peak] (bar)	16	17.5	23	26
IM-240DME IM-240XME  (60Hz)	Ice Production (kg/d)	190	210	200	175
	Freeze Cycle Time (min)	18.5	19	21	24.5
	Defrost Cycle Time (min)	5.5	3	2	2
	Water Consumption (lit/h)	48.5	31.2	20.9	13.9
	Electric Consumption (W)	1420	1470	1600	1640
	Head Pressure [peak] (bar)	18	18	23	24
IM-240DME-21 IM-240XME-21  (60Hz)	Ice Production (kg/d)	180	210	180	155
	Freeze Cycle Time (min)	11	11	14	16.5
	Defrost Cycle Time (min)	5	2.5	2	2
	Water Consumption (lit/h)	65.5	35	22.8	19.7
	Electric Consumption (W)	1420	1470	1600	1640
	Head Pressure [peak] (bar)	18	18	23	24
IM-240DSME IM-240XSME	Ice Production (kg/d)	185	205	195	170
	Freeze Cycle Time (min)	21	19.5	21.5	25
	Defrost Cycle Time (min)	4	3	2	2
	Water Consumption (lit/h)	31.5	24.9	14.1	12.3
	Electric Consumption (W)	1120	1200	1330	1450
	Head Pressure [peak] (bar)	16	17.5	23	26
IM-240DSME-23 IM-240XSME-23	Ice Production (kg/d)	175	190	180	145
	Freeze Cycle Time (min)	16	15.5	17	21.5
	Defrost Cycle Time (min)	3.5	2.5	2	2
	Water Consumption (lit/h)	32.1	22.8	15.8	14.1
	Electric Consumption (W)	1120	1200	1330	1450
	Head Pressure [peak] (bar)	16	17.5	23	26

(Ice Production = Capacity when shipped from factory)

(\*Values for icemaking water only. Use a cooling tower for cooling water.)

Model	Ambient Temp. (°C)	10	21	32	38
	Water Temp. (°C)	10	15	21	32
IM-240DWME* IM-240XWME*	Ice Production (kg/d)	205	202	196	175
	Freeze Cycle Time (min)	18.5	19.5	21	24
	Defrost Cycle Time (min)	4	3.5	2.5	2.5
	Water Consumption (lit/h)	33.5	29.3	19	16.8
	Electric Consumption (W)	1250	1260	1300	1330
	Head Pressure [peak] (bar)	19.2	19.2	19.2	19.6
IM-240DWME-21* IM-240XWME-21*	Ice Production (kg/d)	203	193	181	170
	Freeze Cycle Time (min)	12	12.5	13.5	15
	Defrost Cycle Time (min)	2.5	2.5	2.5	2
	Water Consumption (lit/h)	30.7	29.7	27.8	19.5
	Electric Consumption (W)	1250	1260	1300	1330
	Head Pressure [peak] (bar)	19.2	19.2	19.2	19.6
IM-240DWME-23* IM-240XWME-23*	Ice Production (kg/d)	185	175	168	150
	Freeze Cycle Time (min)	15	16.5	18	21
	Defrost Cycle Time (min)	3.5	3	2.5	2
	Water Consumption (lit/h)	36.4	28.7	21.7	14.4
	Electric Consumption (W)	1250	1260	1300	1330
	Head Pressure [peak] (bar)	19.2	19.2	19.2	19.6
IM-240DWME-32* IM-240XWME-32*	Ice Production (kg/d)	180	170	160	152
	Freeze Cycle Time (min)	23.5	25	27.7	29.3
	Defrost Cycle Time (min)	3	3	2	2
	Water Consumption (lit/h)	21.1	20	11.2	10.6
	Electric Consumption (W)	1250	1260	1300	1330
	Head Pressure [peak] (bar)	19.2	19.2	19.2	19.6
IM-240DWME* IM-240XWME*  (60Hz)	Ice Production (kg/d)	210	205	200	180
	Freeze Cycle Time (min)	18.5	19.5	20.5	23
	Defrost Cycle Time (min)	3.5	3	2.5	2.5
	Water Consumption (lit/h)	32.2	26.4	20.9	18.8
	Electric Consumption (W)	1450	1470	1500	1550
	Head Pressure [peak] (bar)	19.4	19.5	19.6	20
IM-240DWME-21* IM-240XWME-21*  (60Hz)	Ice Production (kg/d)	210	200	190	180
	Freeze Cycle Time (min)	11.5	12.5	14	15
	Defrost Cycle Time (min)	3	2.5	2	2
	Water Consumption (lit/h)	40.9	31.8	22.8	21.5
	Electric Consumption (W)	1450	1470	1500	1550
	Head Pressure [peak] (bar)	19.4	19.5	19.6	20
IM-240AME-23	Ice Production (kg/d)	210	200	190	160
	Freeze Cycle Time (min)	12	13.5	15	18
	Defrost Cycle Time (min)	2.5	2.5	2	1.8
	Water Consumption (lit/h)	30.9	28.1	19.8	14.4
	Electric Consumption (W)	1220	1220	1320	1420
	Head Pressure [peak] (bar)	18	17.5	23	26
IM-240AWME-23*  (60Hz)	Ice Production (kg/d)	190	185	175	160
	Freeze Cycle Time (min)	13.7	14.7	16.2	18.4
	Defrost Cycle Time (min)	3.5	3	2.5	2
	Water Consumption (lit/h)	26.9	22.8	18.3	13.8
	Electric Consumption (W)	1430	1450	1500	1550
	Head Pressure [peak] (bar)	19.4	19.4	19.5	20

## Suction Pressure and Evaporator Temp.

		50/60Hz			
MODEL	Ambient Temp. (°C)	10	21	32	38
	Water Temp. (°C)	10	15	21	32
IM-240 "M" type (R404A)	Suction Pressure Peak (bar)	3.0	4.0	4.5	5.5
	Evaporator Inlet Temp. (°C)	-20	-19	-18	-17

Note: The above data are only for reference in servicing. Actual readings may be slightly different for each product.

Suction Pressure = Peak readings in freezing cycle

Evaporator Inlet Temp. = 5 minutes before completion of freezing cycle

## VII. SERVICE DIAGNOSIS

### 1. NO ICE PRODUCTION

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[1] The icemaker 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 repair or replace.
	e) High Pressure Control	1. Bad contacts.	1. Check for continuity and replace.
	f) Transformer	1. Coil winding opened.	1. Replace.
g) Wiring to Controller Board	1. Loose connections or open.	1. Check for continuity and replace.	
h) Thermistor	1. Leads short-circuit or open and High Temperature Safety (Backup Timer) operates.	1. See "II. 2. [c] BEFORE CHECKING CONTROLLER BOARD".	
i) 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.	
j) Controller Board	1. Defective.	1. See "II. 2. CONTROLLER BOARD".	
[2] Compressor will not start, or operates intermittently.	a) Pressure Switch	1. Dirty Air Filter or Condenser.	1. Clean.
		2. Ambient or condenser water temperature too warm (water-cooled).	2. Check for recommended temperatures.
		3. Condenser water pressure too low or OFF (water-cooled).	3. Check for recommended pressure.
		4. Water Regulating Valve set too high (water-cooled).	4. Adjust it lower.
		5. Fan not rotating.	5. See 4 - [2] - c).
		6. Refrigerant overcharged.	6. Recharge.
		7. Refrigerant line or components plugged.	7. Clean and replace Drier.
		8. Bad contacts.	8. Check for continuity and replace.
		9. Loose connections.	9. Tighten.
	b) Water Regulator (water-cooled)	1. Set too high.	1. Adjust lower.
	2. Clogged or defective.	2. Clean or replace.	

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY	
[2] (Continued)	c) 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.	
	d) Starter	1. Defective.	1. Replace.	
	e) Start Capacitor or Run Capacitor	1. Defective.	1. Replace.	
	f) Magnetic Contactor	1. Bad contacts.	1. Check for continuity and replace.	
		2. Coil winding opened.	2. Replace.	
	g) Compressor	1. Wiring to Compressor.	1. Check for loose connection or open, and replace.	
2. Defective.		2. Replace.		
h) 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 icemaker 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.	
		b) Water Solenoid Valve	1. Dirty mesh filter or orifice and water level in Water Tank too low.	1. Clean.
			2. Coil winding opened.	2. Replace.
	c) Water System	3. Wiring to Water Valve.	3. Check for loose connection or open, and replace.	
		1. Water leaks.	1. Check connections for water leaks, and repair.	
	d) Pump Motor	2. Clogged.	2. Clean (See "V. 4. ICEMAKING WATER SYSTEM").	
		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.		

PROBLEM	CHECK	POSSIBLE CAUSE	REMEDY
[6] (Continued)		4. Defective or bound impeller.	4. Replace and clean.
		5. Mechanical Seal worn out.	5. Check and replace.
	e) Controller Board	1. Defective.	1. See "II. 2. CONTROLLER BOARD".
	f) Actuator Toggle Switch	1. Defective.	1. Replace.
	g) Water Plate	1. Clogged.	1. Clean.
[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.
	d) Actuator Toggle Switch	1. Defective.	1. Replace.
	e) Water Supply Line	1. Water supply is off.	1. Check for recommended pressure.
[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".	
[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 to Condenser (water-cooled)	1. Low pressure.	1. Check for recommended pressure.
	b) Ambient or Water Temperature	1. Too high.	1. Check for recommended temperatures.
	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.
	h) Fan Motor	1. Running at half speed continuously (DME/XME only).	1. Check Bimetal Thermostat for closed contacts or Relay X6 for welded contacts.
[2] Takes too long for Water Pan to close.	a) Evaporator	1. Scaled up.	1. Clean or remove scale. Install a water filter or scale treatment.
		2. Defective.	2. Replace.
	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) Water Regulating Valve	1. Clogged.	1. Clean.
		2. Defective.	2. Repair or replace.
f) 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.
		2. Bearings worn out.	2. Replace.
		3. Mechanical Seal worn out.	3. Replace.
	f) Refrigerant Charge	1. Undercharged.	1. Check for leaks and recharge correctly.
g) Thermistor, Controller Board	1. See "II. 2. CONTROLLER BOARD".		
h) Expansion Valve	1. Poorly adjusted.	1. Readjust.	
[2] Cloudy cubes.	a) Water Supply Line	1. Low pressure.	1. Check for recommended pressure.
		2. Clogged.	2. Check Strainer and clean.
	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.
3. Mechanical Seal worn out.		3. 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] Icemaker will not stop when Bin is filled with ice.	a) Bin Control Switch	1. Out of position. 2. Bad contacts.	1. Place in position. 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.
[4] Fan Motor does not change speed (DME/XME only)	a) Bimetal Thermostat	1. Defective.	1. Replace.
	b) Fan Relay X6	1. Welded contacts or defective coil.	1. Replace.

## VIII. ADJUSTMENT

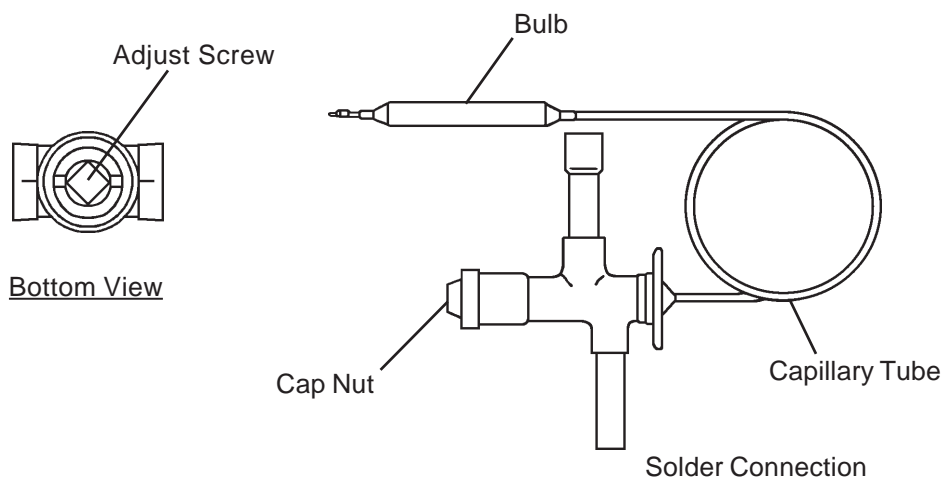
### 1. EXPANSION VALVE

The Expansion Valve is factory-adjusted. Do not adjust it except at replacement or service. Adjust the valve setting, if necessary, as follows:

- 1) Remove the Cap Nut.
- 2) Rotate the Adjust Screw.
- 3) Watch holes of ice cubes produced. Standard setting is that Evaporator inlet side and outlet side cubes have almost the same diameters. To make the inlet side larger, rotate 90 - 180° clockwise. Smaller, counterclockwise. Do not rotate more than 180° at a time.

#### CAUTION

Over adjustment of the valve may result in liquid refrigerant return causing freezing to the suction line and severe damage to the Compressor.

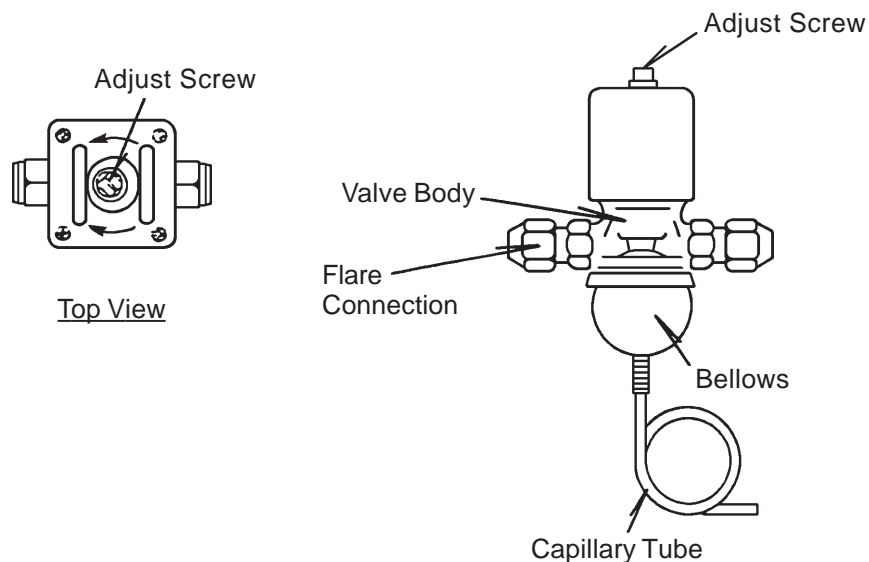


**Fig. 47**

## 2. WATER REGULATING VALVE - WATER-COOLED MODEL ONLY

The Water Regulating Valve is factory-adjusted. Do not adjust it except at replacement or service. Adjust the valve setting, if necessary, as follows:

- 1) Attach a pressure gauge to high-side line, or prepare a thermometer to check Condenser drain temperature.
- 2) Rotate the Adjust Screw using a flat blade screwdriver so that the pressure gauge shows 19 bar, or the thermometer reads 38 - 40°C, 5 minutes after Freeze Cycle starts. When the pressure or temperature exceeds the above, rotate the Adjust Screw counterclockwise.
- 3) Check that the pressure or temperature holds.



**Fig. 48**

## **IX. REMOVAL AND REPLACEMENT**

### **1. SERVICE FOR REFRIGERANT LINES**

#### **[a] SERVICE INFORMATION**

##### **1) Allowable Compressor Opening Time and Prevention of Lubricant Mixture [R404A]**

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**

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 reduce 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 R404A has possibly drawn in air, the drier must be replaced. Be sure to use a drier designed for R404A.

##### **3) Handling of Handy Flux [R404A]**

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 [R404A]**

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 R404A**

Some parts used for refrigerants other than R404A are similar to those for R404A. But never use any parts unless they are specified for R404A because their endurance against the refrigerant have not been evaluated. Also, for R404A, do not use any parts that have been used for other refrigerants. Otherwise, wax and chlorine remaining on the parts may adversely affect the R404A.

##### **6) Replacement Copper Tubing [R404A]**

The copper tubes currently in use are suitable for R404A. 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 [R404A]**

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 R404A.

## **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 R404A 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. A Low-side Access Valve is provided on an extension pipe connected to the suction port of the Compressor. On the DME/XME and DWME/XWME, a Tap Valve should initially be fitted to the High-side Process Tube to be replaced with a proper Access Valve (see Fig. 45) when recovery is completed.

The DSME/XSME high side can be accessed using the Gauge Port on the Upper Condenser Line Access Valve (liquid return) attached to the right side of the icemaker.

Recover the refrigerant, and store it in a proper container. Do not discharge the refrigerant into the atmosphere.

## **[c] EVACUATION AND RECHARGE**

- 1) On the DME/XME and DWME/XWME, attach Charging Hoses, Service Manifold and Vacuum Pump to the Low-side and High-side (to be fitted by servicer) Access Valves. Connect the DSME/XSME Charging Hoses as described in “[b] REFRIGERANT RECOVERY”. 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.

Important Note: The DSME/XSME Nameplate will only state a base refrigerant charge for up to 10 m of remote tubing (distance between Condenser and icemaker). When this distance exceeds 10 m, refer to “III. 6. [c] INSTALLATION” for refrigerant charge calculation.

- 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.

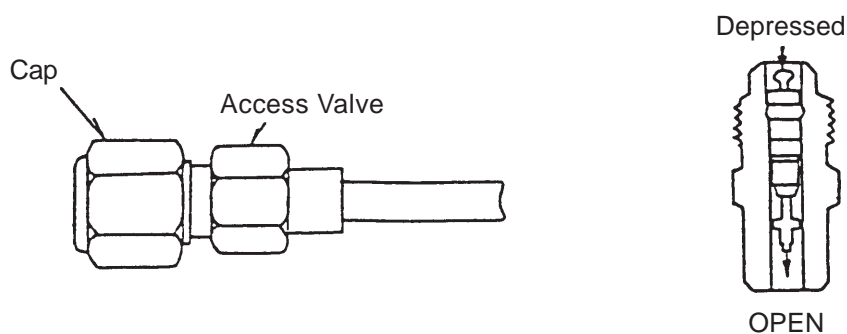
Note: Always charge in the liquid stage, as many refrigerants are blends and vapour charging will affect the blend consistency (eg. R404A).

- 7) Turn on the icemaker. 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. 49**



## 2. COMPRESSOR

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Top, Front and Right Side Panels.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "1. [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 the pressure of 0.2 - 0.3 bar.
- 13) Install the new Drier (See "3. DRIER").
- 14) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 15) Evacuate the system and charge it with refrigerant (See "1. [c] EVACUATION AND RECHARGE").
- 16) Connect the Solderless Terminals and replace the Terminal Cover in its correct position.
- 17) Replace the panels in their correct positions.
- 18) Plug in the icemaker or connect the power source.

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

### **3. DRIER**

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Top, Front and Right Side Panels.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "1. [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 the pressure of 0.2 - 0.3 bar when brazing tubings.
- 7) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 8) Evacuate the system and charge it with refrigerant (See "1. [c] EVACUATION AND RECHARGE").
- 9) Replace the panels in their correct positions.
- 10) Plug in the icemaker or connect the power source.

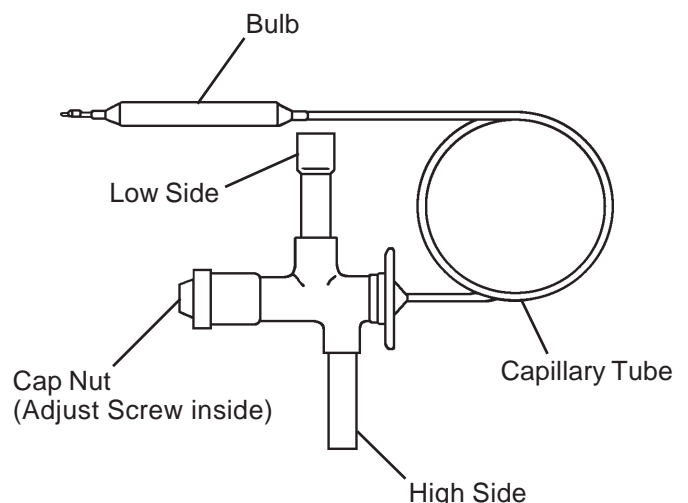
Note: Always use a Drier of the correct capacity and refrigerant type.

## 4. EXPANSION 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 icemaker or disconnect the power source.
- 2) Remove the Top, Front and Right Side Panels.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "1. [b] REFRIGERANT RECOVERY").
- 4) Remove the Expansion Valve using brazing equipment. Protect the Evaporator and pipes from excessive heat with damp cloths or similar.
- 5) Remove the Expansion Valve Sensor (Bulb).
- 6) Remove the Drier using brazing equipment.
- 7) Braze in the new Expansion Valve. Protect the body of the valve from excessive heat, and use nitrogen at a pressure of 0.2 - 0.3 bar when brazing.
- 8) Braze or solder the new Drier (See "3. DRIER").
- 9) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 10) Evacuate the system and charge it with refrigerant (See "1. [c] EVACUATION AND RECHARGE").
- 11) Attach the Bulb to the suction line in position. Be sure to secure it using a wire or clamp and replace the insulation.
- 12) Replace the panels in their correct positions.
- 13) Plug in the icemaker or connect the power source.



**Fig. 50**

## 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 icemaker or disconnect the power source.
- 2) Remove the Top, Front, Right and Left Side Panels.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "1. [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. Protect the Expansion Valve from excessive heat.
- 6) Remove four nuts holding the Evaporator.
- 7) Install the new Evaporator, and secure it with the Bolts, Collars (Spacer) and Nuts.
- 8) Install the new Drier (See "3. DRIER").
- 9) Braze pipes, with nitrogen gas flowing at the 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 "1. [c] EVACUATION AND RECHARGE").
- 12) Replace the removed panels in their correct positions.
- 13) Plug in the icemaker 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 icemaker or disconnect the power source.
- 2) Remove the Top, Front and Right Side Panels.
- 3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "1. [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 the 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 "3. DRIER").
- 9) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 10) Evacuate the system and charge it with refrigerant (See "1. [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 icemaker or connect the power source.

## 7. WATER REGULATING VALVE - WATER-COOLED MODEL ONLY

### [a] VALVE BODY

- 1) Unplug the icemaker or disconnect the power source.
- 2) Close the water supply tap.
- 3) Remove the Front Panel and Right Side Panel.
- 4) Disconnect the flare connections of the Water Regulating Valve.
- 5) Remove the valve from the Bracket.
- 6) Install a new Water Regulating Valve.
- 7) Connect the flare connections.
- 8) Open the water supply tap.
- 9) Check for water leaks.
- 10) Replace the panels in their correct positions.
- 11) Plug in the icemaker or connect the power source.

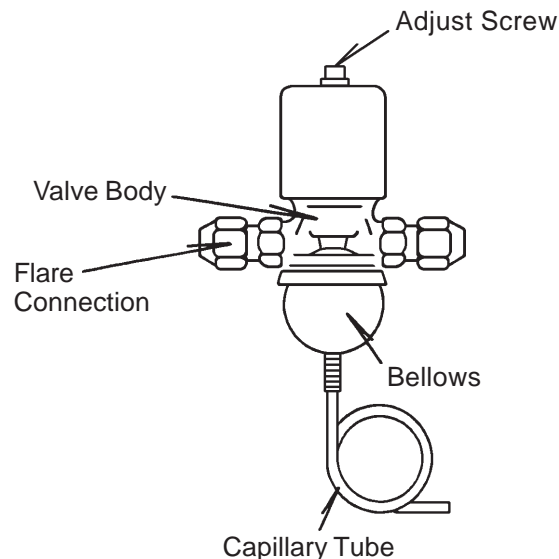
### [b] WHOLE VALVE

#### **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 icemaker or disconnect the power source.
- 2) Close the water supply tap.
- 3) Remove the Front, Top and Right Side Panels.
- 4) Recover the refrigerant and store it in a proper container, if required by an applicable law (See "1. [b] REFRIGERANT RECOVERY").
- 5) Cut off the Copper Tube near the Capillary Tube solder connection, using a pipe cutter.

- 6) Cut off the Capillary Tubes of the Valve and High-pressure Switch, using a file and pliers. Be careful not to damage the Capillary Tube end.
- 7) Disconnect the flare connections from the Bracket.
- 8) Remove the screws and the valve from the Bracket.
- 9) Install the new valve, and insert the Capillary Tubes into the Copper Tube.
- 10) Web the Copper Tube end, and braze or solder the Copper Tube and Capillary Tubes together.
- 11) Install the new Drier (See “3. DRIER”).
- 12) Check for leaks using nitrogen gas (10 bar) and soap bubbles.
- 13) Evacuate the system and charge it with refrigerant (See “1. [c] EVACUATION AND RECHARGE”).
- 14) Connect the flare connections.
- 15) Open the water supply tap.
- 16) Check for water leaks.
- 17) Replace the panels in their correct positions.
- 18) Plug in the icemaker or connect the power source.

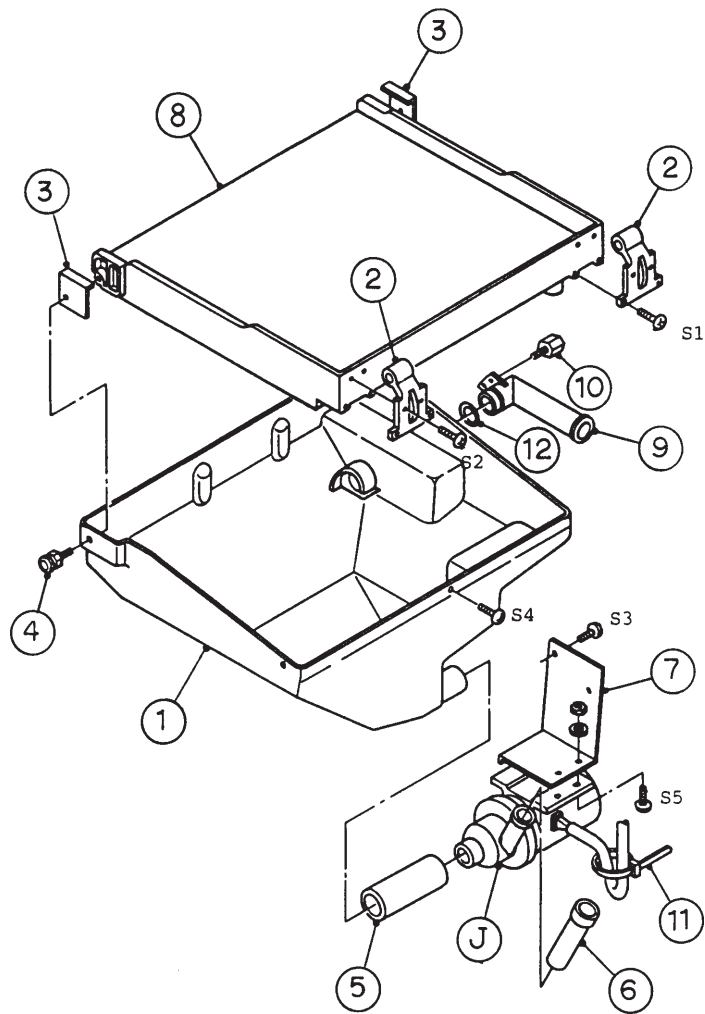


**Fig. 51**

## **8. WATER PAN ASSEMBLY**

- 1) Remove the Top, Front and Left Side Panels.
- 2) Push the Reset Switch on the Control Box to open the Water Pan.
- 3) Unplug the icemaker 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 Plate Bracket and the Water Pan Assembly.
- 7) Remove the two Spring Hook Screws from the Water Tank.
- 8) Remove the screws and the Water Plate Bracket.
- 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 icemaker or connect the power source.





INDEX NO.	DESCRIPTION
1	Water Tank
2	Water Plate Bracket
3	Bracket
4	Spring Hook Screw
5	Pump Tubing (Suction)
6	Pump Tubing (Discharge)
7	Pump Motor Bracket
8	Water Plate
9	Overflow Pipe
10	Thumbscrew (for Overflow Pipe)
11	Nylon Tie
12	O-ring
J	Pump Motor Assembly
S1 - 4	Tapping Screw
S5	Machine Screw

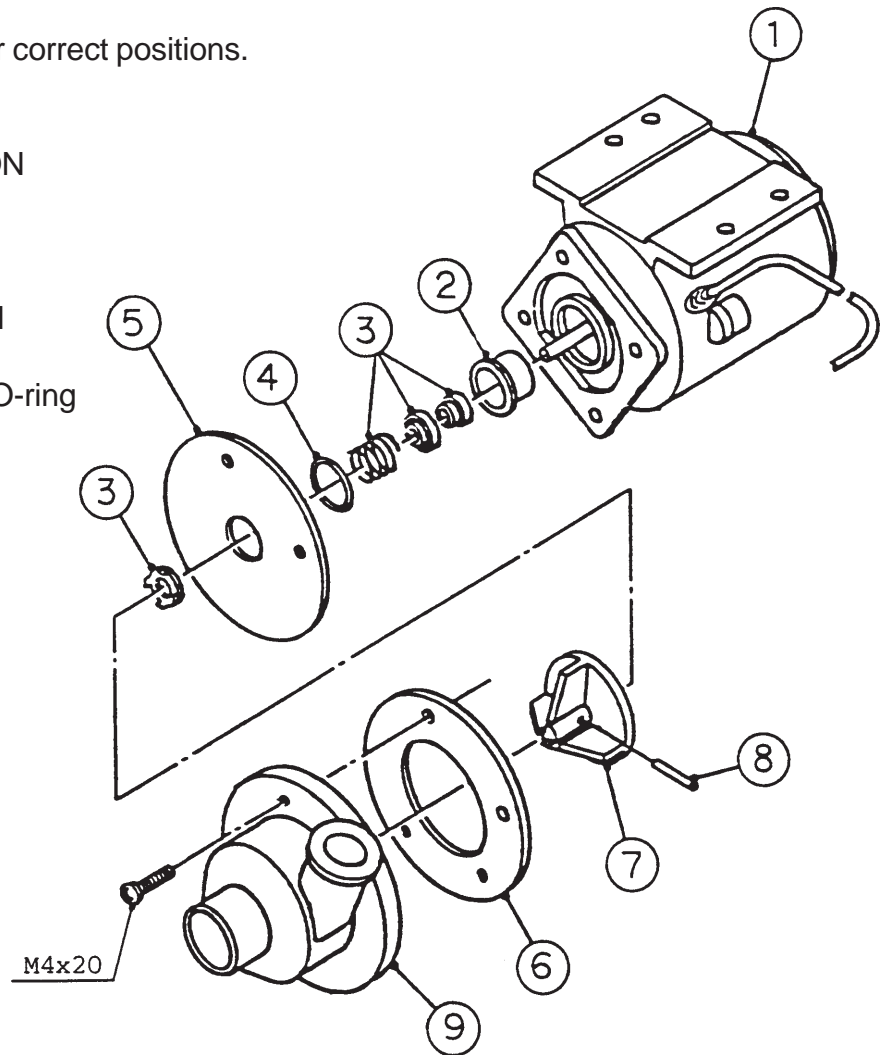
**Fig. 52**

## 9. PUMP MOTOR

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Top Panel and Front Panel.
- 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 icemaker or connect the power source, and check for leaks.
- 9) Replace the panels in their correct positions.

INDEX NO.	DESCRIPTION
-----------	-------------

- |   |                         |
|---|-------------------------|
| 1 | Pump Motor              |
| 2 | Retainer                |
| 3 | Mechanical Seal         |
| 4 | O-ring                  |
| 5 | Fixing Plate for O-ring |
| 6 | Packing                 |
| 7 | Impeller                |
| 8 | Pin                     |
| 9 | Cover                   |



**Fig. 53**

## **10. WATER VALVE**

- 1) Close the water supply tap.
- 2) Unplug the icemaker or disconnect the power source.
- 3) Remove the Top Panel and Front 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 icemaker or connect the power source.
- 10) Check for leaks.
- 11) Replace the panels in their correct positions.

Note: When replacing parts, disassemble as shown in Fig. 41 (page 51) and replace the defective parts.

## **11. ACTUATOR MOTOR**

- 1) Remove the Top Panel and Front Panel.
- 2) Push the Reset Switch on the Control Box to open the Water Pan.
- 3) Unplug the icemaker 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 icemaker or connect the power source.

## **12. CAM ARM**

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

Refer to “11. ACTUATOR MOTOR.”

### **[b] CAM ARM (B) - REAR SIDE**

- 1) Remove the Top Panel and Front Panel.
- 2) Push the Reset Switch on the Control Box to open the Water Pan.
- 3) Unplug the icemaker 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 icemaker or connect the power source.

### **13. ACTUATOR TOGGLE SWITCH**

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Top Panel and Front Panel.
- 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 icemaker or connect the power source.

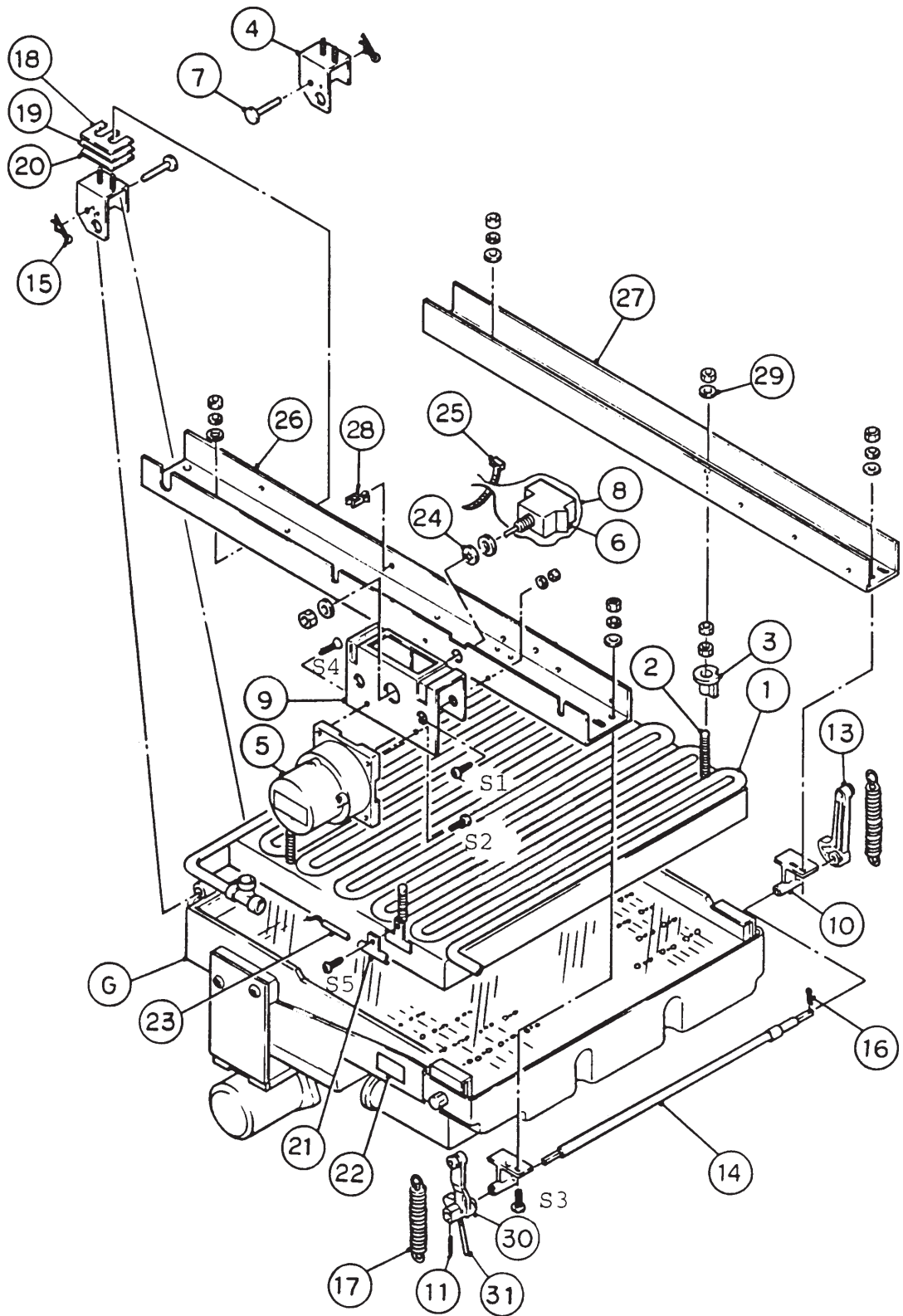


Fig. 54

## ICEMAKING ASSEMBLY AND CAM MECHANISM

INDEX NO.	DESCRIPTION
G	Water Pan Assembly
1	Evaporator
2	Bolt
3	Collar (Spacer)
4	Bearing
5	Actuator Motor
6	Actuator Toggle Switch
7	Shaft
8	Switch Cover
9	Actuator Motor Bracket
10	Cam Shaft Bearing
11	Spring Pin
13	Cam Arm (B)
14	Cam Shaft
15	Snap Pin
16	Split Pin
17	Spring
18	Washer (A)
19	Washer (B)
20	Washer (C)
21	Thermistor Holder
22	Label (for Overflow Pipe)
23	Thermistor (Cube Control)
24	Washer
25	Nylon Tie
26	Frame
27	Frame
28	Wire Saddle
29	Washer
30	Cam Arm (A)
31	Change Lever
S1 - 5	Machine Screw



## 14. CONTROLLER BOARD

### IMPORTANT

A single type Controller Board is supplied as a Service Board. Some modifications and adjustment will be required to fit the icemaker 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.
Instruction Sheet	1 pc.

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

#### [b] REPLACEMENT

1) Unplug the icemaker or disconnect the power source.

2) Remove the Front Panel.

3) Remove screws and the Control Box Cover.

4) Pull the Shield Plate slightly toward you, and disconnect the Signal Ground wire.

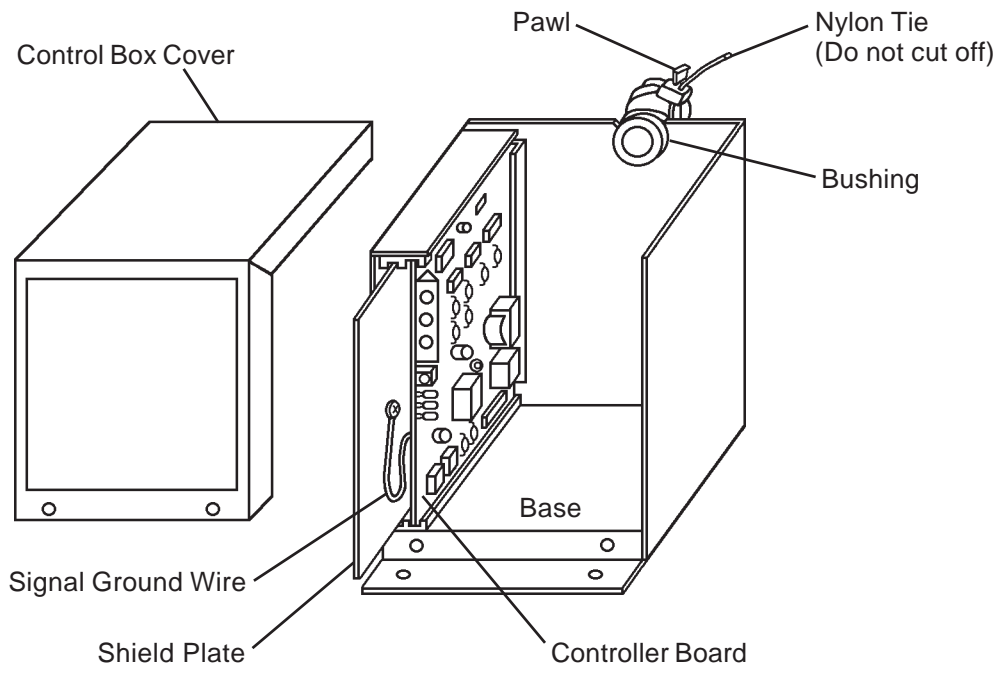
5) Pull out the Controller Board half way, and disconnect the Connectors K1, K2, K3 and K4.

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 Front Panel in its correct position.

9) Plug in the icemaker or connect the power source.

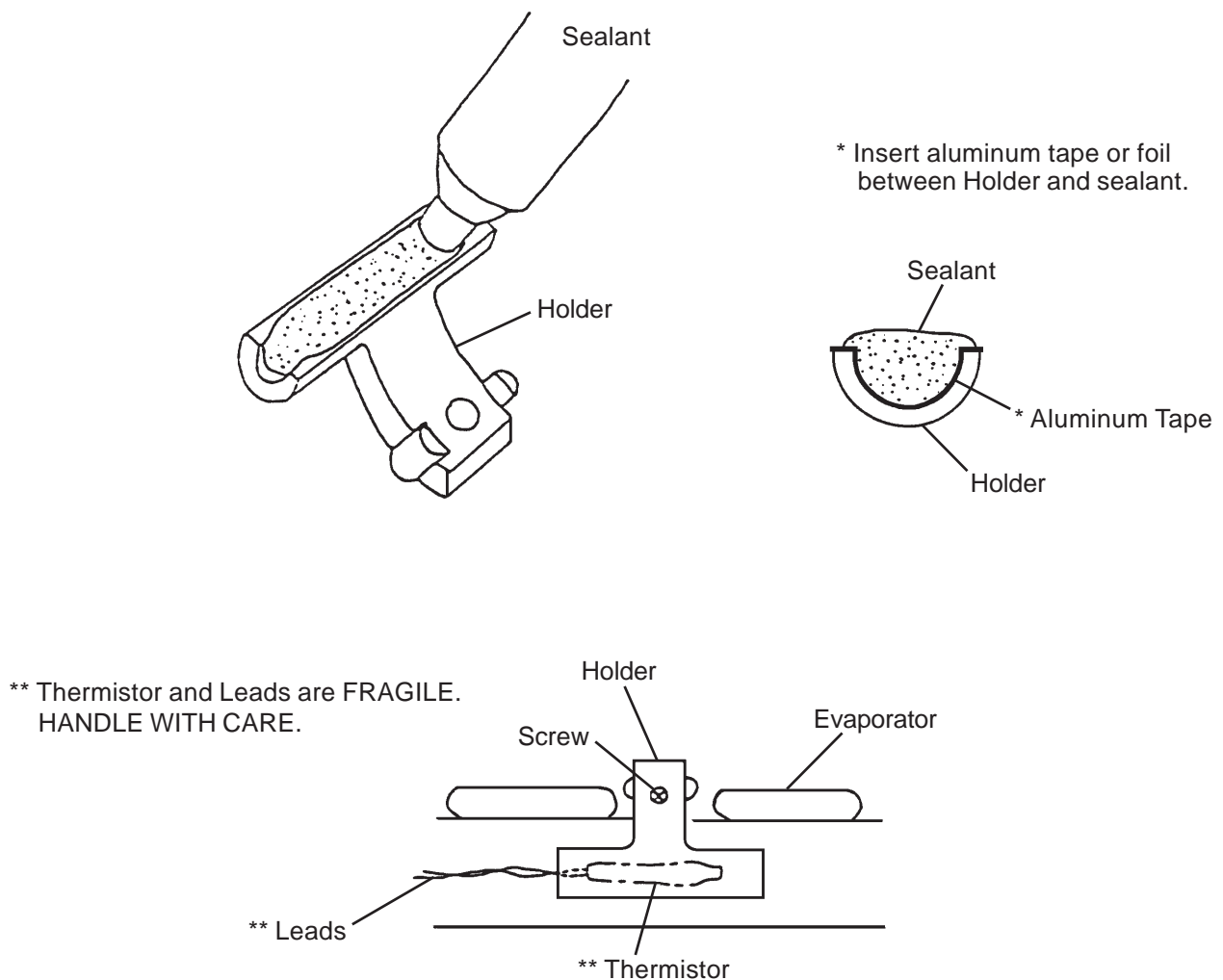


**Fig. 55**

## 15. THERMISTOR FOR CUBE CONTROL

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Top and Front Panels.
- 3) Remove the Connector K4 on the Controller Board, referring to "14. [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. 56.

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.



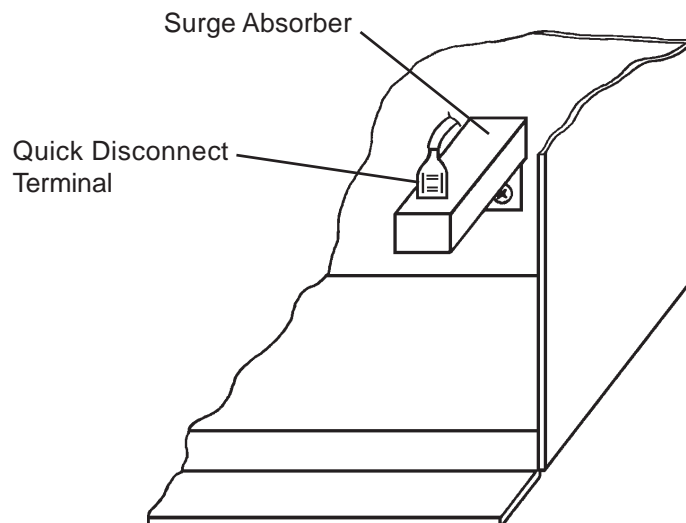
**Fig. 56**

## 16. 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. 57**

## **17. FAN MOTOR - DME/XME/AME ONLY**

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Top, Front and Right Side Panels.
- 3) Disconnect the Connector of the Fan Motor.
- 4) Remove the Fan Motor Bracket and the Fan Motor.
- 5) Cut the leads of the Fan Motor allowing enough lead length to reconnect using closed end connectors.
- 6) Install the new Fan Motor in the reverse order of the removal procedure.
- 7) Refit the panels in their correct positions.
- 8) Plug in the icemaker or connect the power source.

## **18. FAN MOTOR - DSME/XSME ONLY**

- 1) Unplug the icemaker or disconnect the power source.
- 2) Remove the Condenser Cover and Junction Box Cover.
- 3) Cut the Fan Motor Leads at the connectors in the Junction Box.
- 4) Release the Fan Motor Bracket and the Fan Motor, pulling the cut leads from the Junction Box.
- 5) Install the new Fan Motor in the reverse order of the removal procedure.
- 6) Reconnect the Fan Motor Leads to the Fan Wiring Cord using new closed end connectors.
- 7) Refit the panels in their correct positions.
- 8) Plug in the icemaker or connect the power source.
- 9) Check the operation of the Fan.

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