



SELF-CONTAINED CUBER

IM-65NE-Q
IM-65WNE-Q

SERVICE MANUAL

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This service manual provides specific information for IM-65NE/WNE-Q only. For any other information please refer to the service manual for the standard model IM-65NE/WNE.

1. DIMENSIONS/SPECIFICATIONS

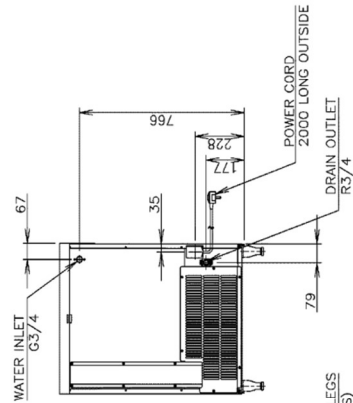
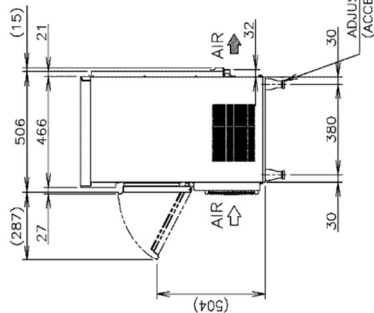
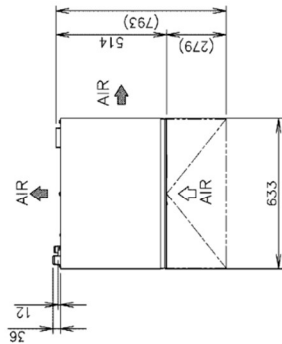
[a] IM-65NE-Q

1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided. Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections).
2. The ice production depends on the ambient and water temperatures.
3. Product Code: E1FD-D012

HOSHIZAKI

ITEM	Hoshizaki Ball Ice Maker
MODEL	IM-65NE-Q
POWER SUPPLY	1 PHASE 220-240V 50Hz Capacity: Min.1.1kVA (4.7A) Running: 2.9A Rated Motor: 2.9A Starting: 17A
AMPERAGE	Rated Motor: 390W (Power factor: 56%)
ELECTRIC CONSUMPTION	Approx. 28 kg (6mm) (Ambient Temp.10° C, Water Temp.10° C) Approx. 24 kg (6mm) (Ambient Temp.21° C, Water Temp.15° C) Approx. 20 kg (6mm) (Ambient Temp.32° C, Water Temp.21° C)
ICE PRODUCTION PER 24H	Approx. 0.97m ³ (Ambient Temp.10° C, Water Temp.10° C) Approx. 0.72m ³ (Ambient Temp.21° C, Water Temp.15° C) Approx. 0.45m ³ (Ambient Temp.32° C, Water Temp.21° C)
WATER CONSUMPTION PER 24H	Ball Approx. ϕ 4.5mm
SHAPE OF ICE	Approx. 33min (Ambient Temp.21° C, Water Temp.15° C) Approx. 0.67kg/15ps (Ambient Temp.21° C, Water Temp.15° C)
FREEZE CYCLE TIME	Approx. 17kg (Bin Control Setting Approx. 9kg)
ICE PRODUCTION PER CYCLE	633mm(W) x 506mm(D) x 860mm(H)
MAX STORAGE CAPACITY	Stainless Steel, Galvanized Steel (Rear)
OUTSIDE DIMENSIONS	Polyurethane Foam
EXTERIOR	Water Blown
INSULATION	Water Blown
INSULATION FOAM	X-Type Con. (with CONT. Plug)
BLOWING AGENT	Inlet G3/4 (connected at rear side)
CONNECTIONS-ELECTRIC	Outlet R3/4 (connected at rear side)
CONNECTIONS-WATER SUPPLY	Cell type
CONNECTIONS-DRAIN	Hot Gas Defrost
ICE MAKING SYSTEM	Hermetic
HARVESTING SYSTEM	Fin and Tube type, Air-cooled
COMPRESSOR	800W (690kcal/h) (Ambient Temp.32° C, Water Temp.21° C)
CONDENSER	Heat Rejection
HEAT REJECTION	800W (690kcal/h) (Ambient Temp.32° C, Water Temp.21° C)
EVAPORATOR	Tin-plated Copper Tube on Sheet and Cells
REFRIGERANT CONTROL	Capillary Tube
REFRIGERANT CHARGE	R134a/200g
ICE MAKING CONTROL	Thermistor, Timer
HARVESTING CONTROL	Thermistor
BIN CONTROL	Microswitch (with Time Delay)
ICE MAKING WITH CONTROL SYSTEM	Timer, Water Pan's Movement
ELECTRICAL PROTECTION	Class I Appliance, 5A Fuse
COMPRESSOR PROTECTION	Auto-reset Overload Protector
ICE MAKER PROTECTION	Interlock by Controller Board
WEIGHT	53kg (Gross 66kg)
PACKAGE	Carton 735mm(W) x 570mm(D) x 1012mm(H)
ACCESSORIES	Scoop, Leg, Installation Kit
OPERATING CONDITIONS	Ambient Temp.: 1 ~ 40° C, Water Supply Temp.: 5 ~ 35° C Water Supply Pressure: 0.07 ~ 0.8MPa (0.7 ~ 8bar) Voltage Range: Rated Voltage $\pm$ 6%

*We reserve the right to make changes in specifications and design without prior notice.



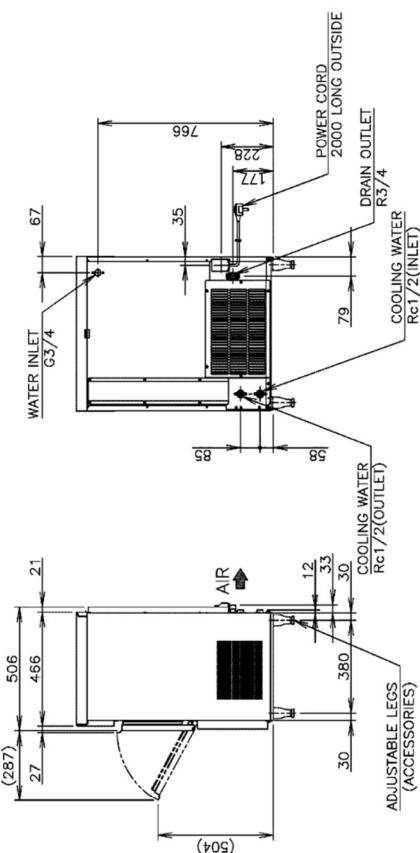
HOSHIZAKI BALL ICE MAKER IM-65NE-Q

APPROVED	CHECKED	DESIGNED	DRAWN	SCALE	1/20	TRIGONOMETRY
M. NOTSU	M. NOTSU	M. NOTSU	M. NOTSU			
DATE	2014.05.08	DATE	2013.10.15	DRAWING NO.	D13560	SYMBOL
APPROVED	DESIGNED	SYMBOL				

HOSHIZAKI

OPERATING CONDITIONS Ambient Temp.: 1 ~ 40° C, Water Supply Temp.: 5 ~ 35° C Water Supply Pressure: 0.07 ~ 0.8MPa (0.7 ~ 8bar) Voltage Range: Rated Voltage±5% <i>We reserve the right to make changes in specifications and design without prior notice.</i> 1. Install the product properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided. Allow 10mm extra space at the installation site to meet any installation requirements (additional spacing is also required for proper air flow and pipe connections). 2. The ice production depends on the ambient and water temperatures. 3. Product Code: E1FD~D015	ITEM MODEL POWER SUPPLY AMPERAGE ELECTRIC CONSUMPTION ICE PRODUCTION PER 24h WATER CONSUMPTION PER 24h SHAPE OF ICE FREEZE CYCLE TIME ICE PRODUCTION PER CYCLE MAX STORAGE CAPACITY OUTSIDE DIMENSIONS EXTERIOR INSULATION INSULATION FOAM BLOWING AGENT CONNECTIONS -ELECTRIC CONNECTIONS -WATER SUPPLY CONNECTIONS -DRAIN CONNECTIONS -COOLING WATER ICE MAKING SYSTEM HARVESTING SYSTEM COMPRESSOR CONDENSER HEAT REJECTION EVAPORATOR REFRIGERANT CONTROL REFRIGERANT CHARGE ICE MAKING CONTROL HARVESTING CONTROL BIN CONTROL ICE MAKING WATER CONTROL SYSTEM ELECTRICAL PROTECTION COMPRESSOR PROTECTION ICE MAKER PROTECTION WEIGHT PACKAGE ACCESSORIES	Hoshizaki Ball Ice Maker IM-65WNE-Q 1-PHASE 220~240V 50Hz Capacity: Min.0.98kVA (4.1A) Running: 2.3A Rated Motor: 2.3A Starting: 15A Rated Motor: 350W (Power factor: 63%) Approx. 24kg (56mm) (Ambient Temp.10° C, Water Temp.10° C) Approx. 23kg (56mm) (Ambient Temp.21° C, Water Temp.15° C) Approx. 21kg (56mm) (Ambient Temp.32° C, Water Temp.21° C) Approx. 0.76m³ (Ambient Temp.10° C, Water Temp.10° C) Approx. 0.39m³ (Ambient Temp.21° C, Water Temp.15° C) Approx. 0.27m³ (Ambient Temp.32° C, Water Temp.21° C) Ball Approx. ϕ45mm Approx. 33min (Ambient Temp.21° C, Water Temp.15° C) Approx. 0.67kg/15pcs (Ambient Temp.21° C, Water Temp.15° C) Approx. 17kg (Bin Control Setting Approx. 9kg) 633mm(W) x 506mm(D) x 860mm(H) Stainless Steel, Galvanized Steel (Rear) Polyurethane Foam Water Blown X-Type Con. (with CONT. Plug) Inlet G3/4 (connected at rear side) Outlet R3/4 (connected at rear side) Inlet Rc1/2 (connected at rear side) Outlet Rc1/2 (connected at rear side) Cell type Hot Gas Defrost Hermetic Tube and Tube type, Water-cooled 770W (660cal/h) (Ambient Temp.32° C, Water Temp.21° C) Tin-plated Copper Tube on Sheet and Cells Capillary Tube R134a/250g Thermistor, Timer Thermistor Microswitch (with Time Delay) Timer, Water Pan's Movement Class I Appliance, 5A Fuse Auto-reset Overload Protector Interlock by Controller Board 54kg (Gross 64kg) Carton 735mm(W) x 570mm(D) x 1012mm(H) Scoop, Leq, Installation Kit

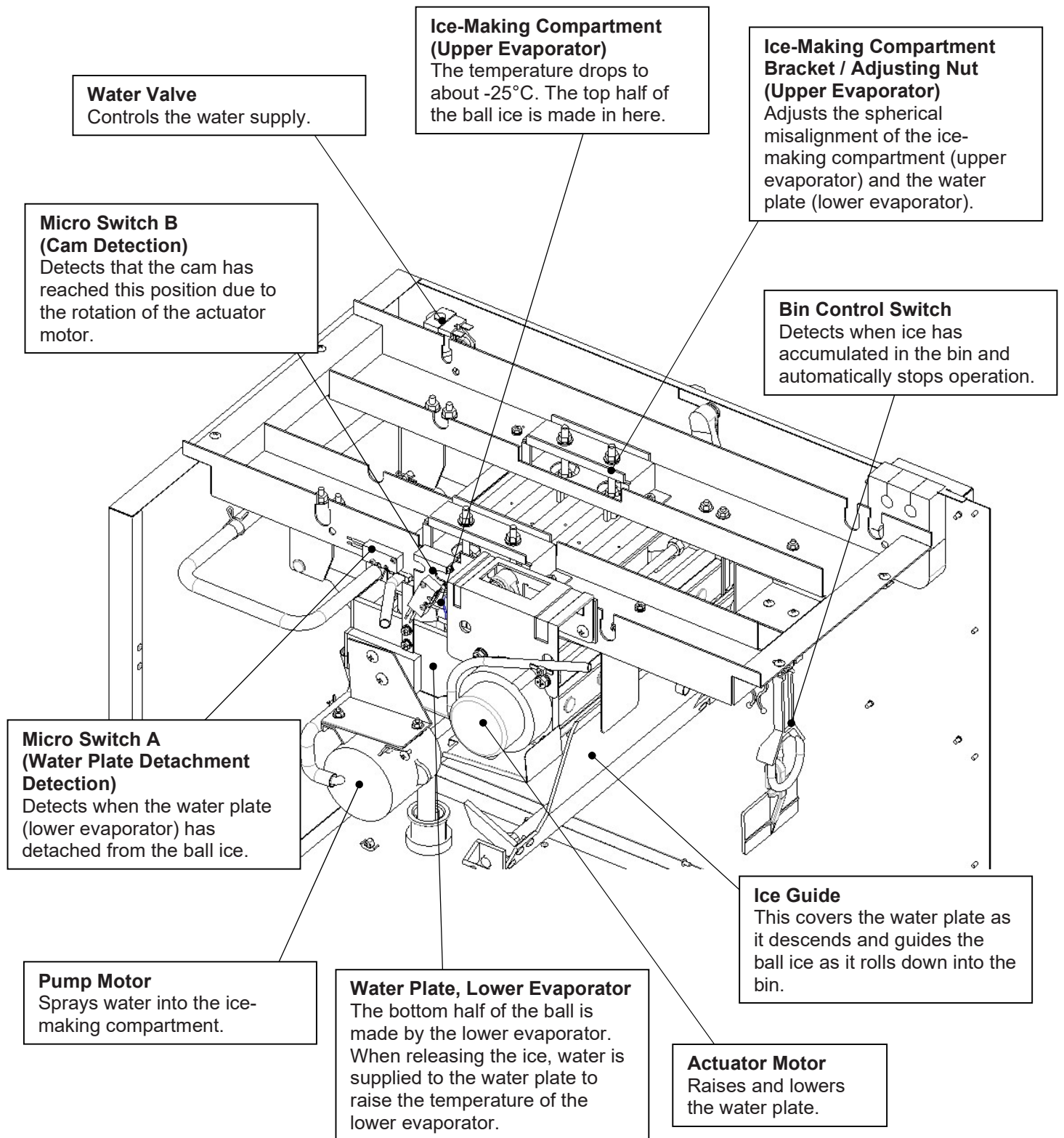
Technical drawing of the Hoshizaki IM-65WNE-Q ice maker showing dimensions and connection points. The drawing includes labels for Water Inlet (G3/4), Water Outlet (R3/4), Drain Water (Rc1/2), Cooling Water (Rc1/2), Power Cord (2000 LONG OUTSIDE), and various dimensions: 67, 76, 79, 35, 228, 172, 766.



HOSHIZAKI BALL ICE MAKER IM-65WNE-Q

APPROVED YAMASAKI	CHECKED OSAKA	DESIGNED SHITOMI	DRAWN OHASHI	SCALE 1/20	TRIGONOMETRY
APPROVED YAMASAKI	CHECKED SHITOMI	DATE 2017.03.15	DATE 2017.03.03	DRAWING NO. D20165	SYMBOL 1

2. CONSTRUCTION



[a] IM-65NE-Q

Diagram illustrating the wiring and components of the IM-65NE-Q system, including the Controller Board, Motor Board, and various sensors and actuators.

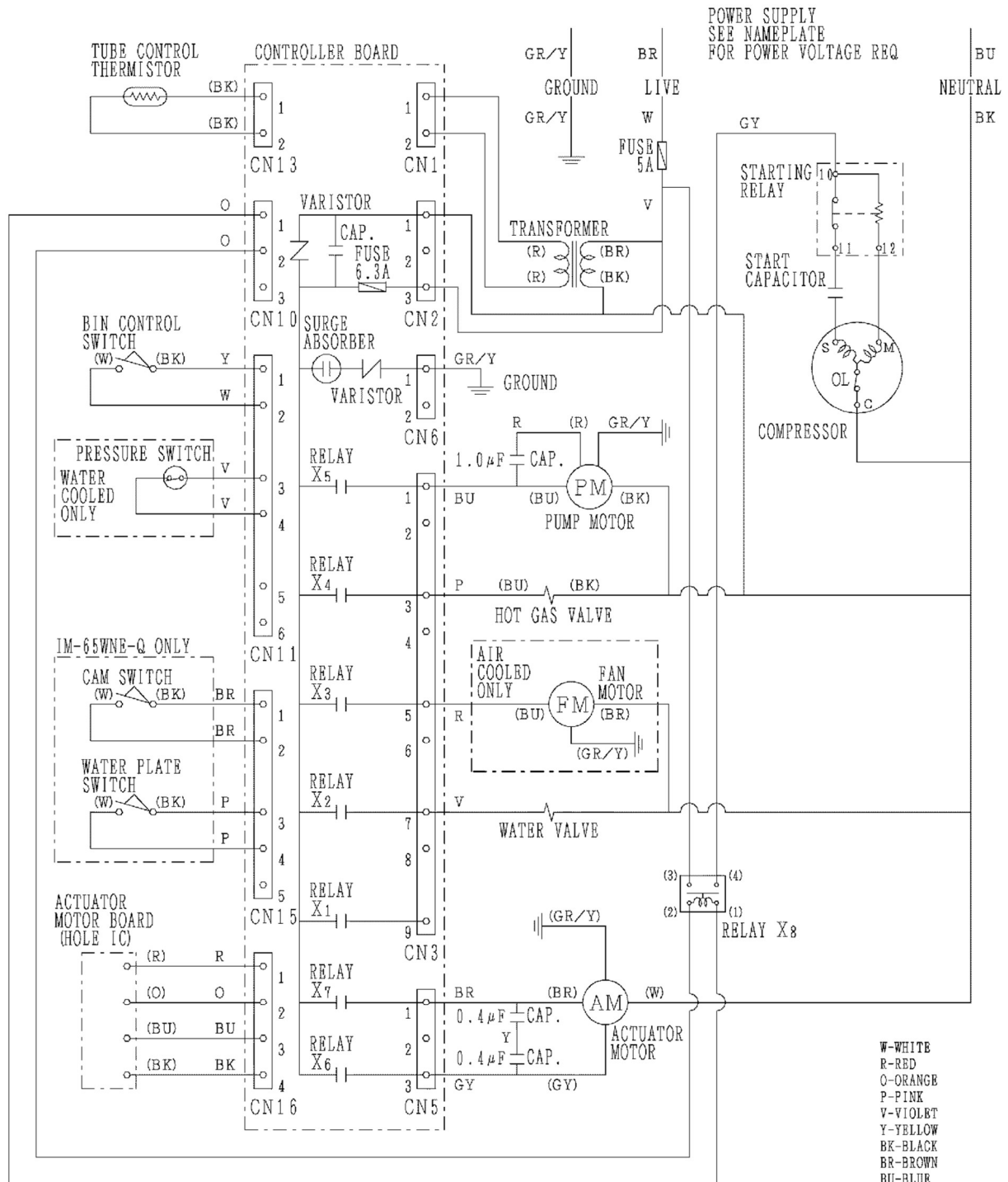
Legend:

- W-WHITE
- R-RED
- O-ORANGE
- P-PINK
- V-VIOLET
- Y-YELLOW
- BK-BLACK
- BR-BROWN
- BU-BLUE
- GR/Y-GREEN/YELLOW

Part Number: 3Y5648L011

[b] IM-65WNE-Q

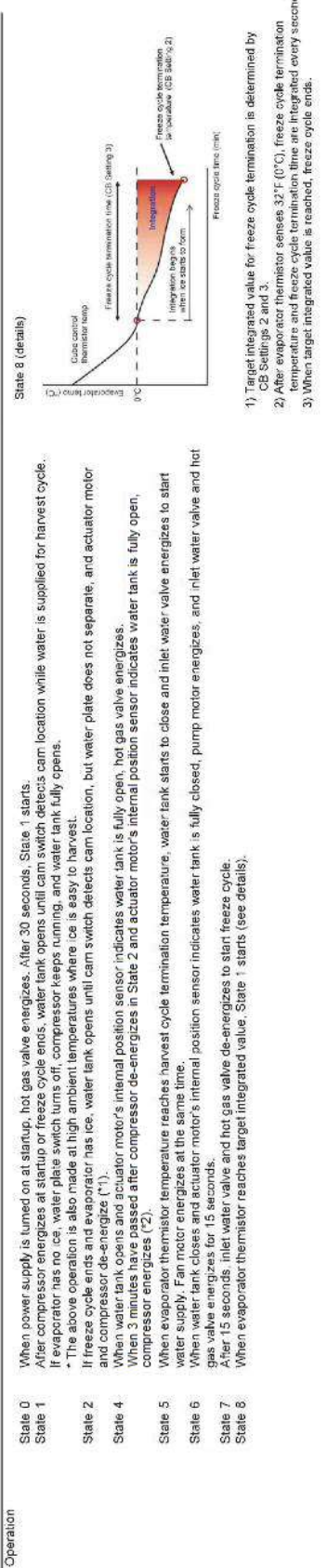
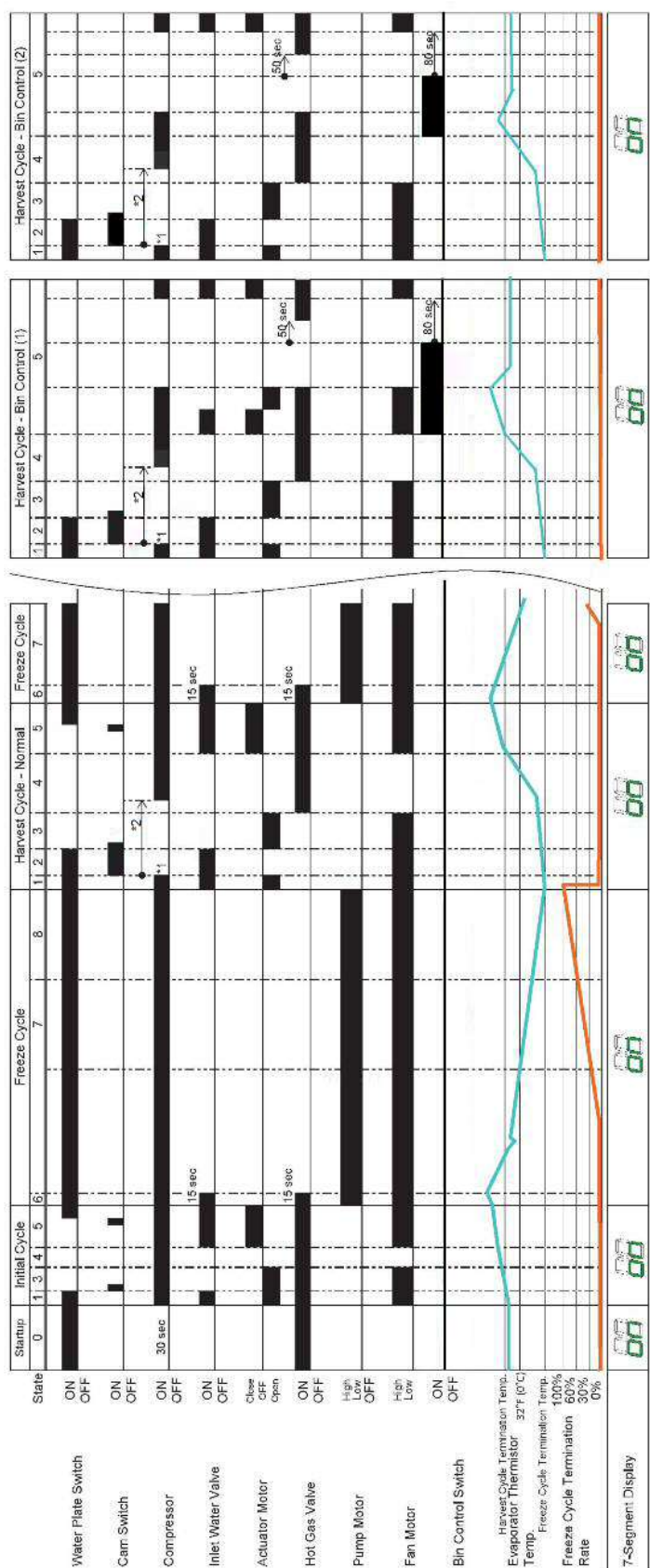
WIRING DIAGRAM



W-WHITE
R-RED
O-ORANGE
P-PINK
V-VIOLET
Y-YELLOW
BK-BLACK
BR-BROWN
BU-BLUE
GY-GRAY
GR/Y-GREENw/YELLOW

3Y7761L01B

4. TIMING CHART



1) Target integrated value for freeze cycle termination is determined by CB Settings 2 and 3.

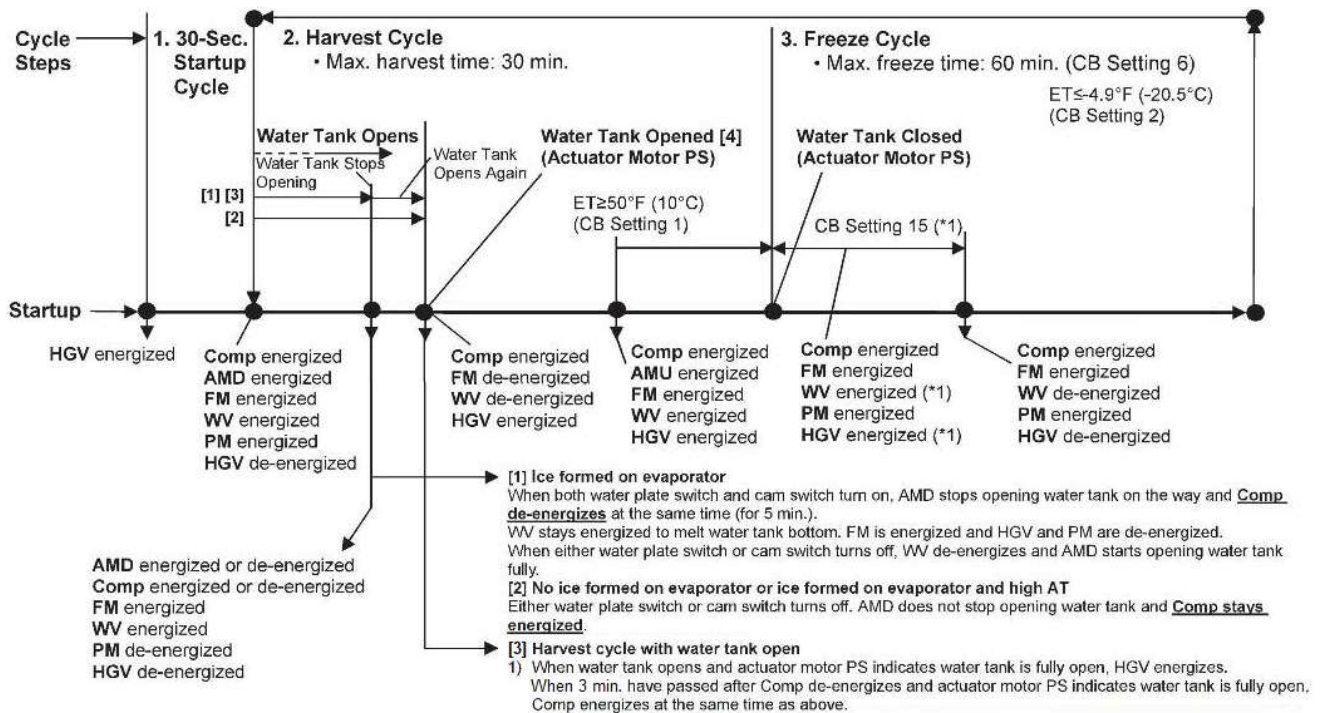
2) After evaporator thermistor senses 32°F (0°C), freeze cycle termination temperature and freeze cycle termination time are integrated every second.

3) When target integrated value is reached, freeze cycle ends.

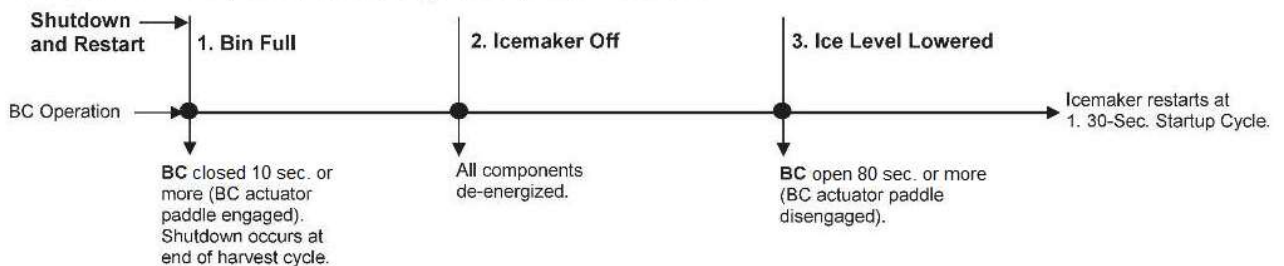
Harvest Cycle - Bin Control (1): Bin control while water tank is closing. Bin control trips while water tank is closing. After 10 seconds, water tank starts to open again, and actuator motor's internal position sensor indicates water tank is fully open. Then, ice maker shuts down. (When bin control is ON for 10 seconds, inlet water valve de-energizes. Then, after water tank fully opens, compressor and hot gas valve de-energize.)

Harvest Cycle - Bin Control (2): Bin control after water tank opens. Water tank opens and actuator motor's internal position sensor indicates water tank is fully open. When bin control trips, water tank does not close even if harvest cycle termination temperature is reached. After 10 seconds, ice maker shuts down. When bin control is ON for 50 seconds, hot gas valve energizes. When bin control is ON for 80 seconds, State 5 in harvest cycle - normal starts followed by freeze cycle.

5. FLOW CHART



Shutdown and Restart Sequence Flow Chart



Legend:

AMD—actuator motor down
BC—bin control
ET—evaporator thermistor
PM—pump motor
WV—inlet water valve

AMU—actuator motor up
CBT—control board thermistor
FM—fan motor
PS—position sensor

AT—ambient temperature
Comp—compressor
HGV—hot gas valve
WT—water temperature

6. SEQUENCE OPERATION

6-1 Initial Cycle

The operation will automatically start 30 seconds connecting the power supply and opening the main water tap, allowing the water to flow.

The hot gas valve opens as the power supply is switched on. 30 seconds later the compressor, fan motor and water valve are activated. At the same time, the actuator motor starts rotating making the water plate descend. The water valve closes when the water plate detachment detection is activated (micro switch A is off). The fan motor then stops when the water plate reaches its lowest point.

When the ice-making thermistor exceeds the ice release completion temperature, the water valve and fan motor are activated again. At the same time, the actuator motor starts to rotate, causing the water plate to rise. Once fully risen, the freeze cycle begins.

6-2 Freeze Cycle

When the freeze cycle begins, the pump motor is activated, the water valve and hot gas valve close after 15 seconds, the cooling operation is initiated, and the ice forms.

The ice completion detection is controlled by checking the ice-making thermistor temperature every second from the point at which the temperature falls below 0°C, and terminating when the required energy value, calculated in advance on the control board, is reached.

6-3 Harvesting Cycle

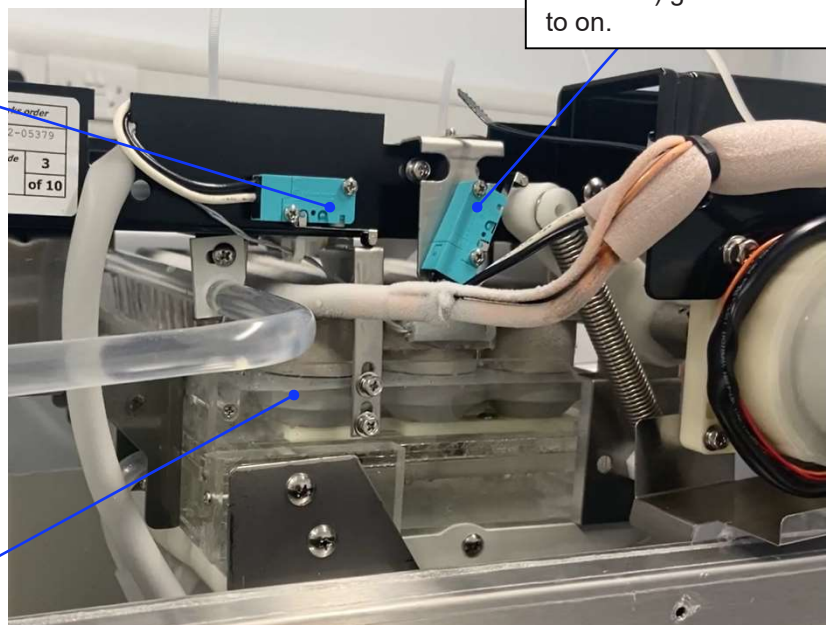
When the freeze cycle is complete the pump motor stops, and the water valve opens to start releasing the ice with water. At the same time, the actuator motor starts to rotate to the cam detection position. (Micro switch B is on.)

If the water plate has not detached from the ice after the actuator motor has rotated to the cam detection position (if micro switch A remains on), the actuator motor and the compressor will stop.

Micro switch A (water plate separation detection) remains on.

Water supply continues, releasing the ice with water.

Micro switch B (cam detection) goes from off to on.



Water continues to be supplied to the water plate (lower evaporator). After a while, the lower evaporator detaches from the ball ice, and this separation from the water plate is detected. (Micro switch A is OFF)

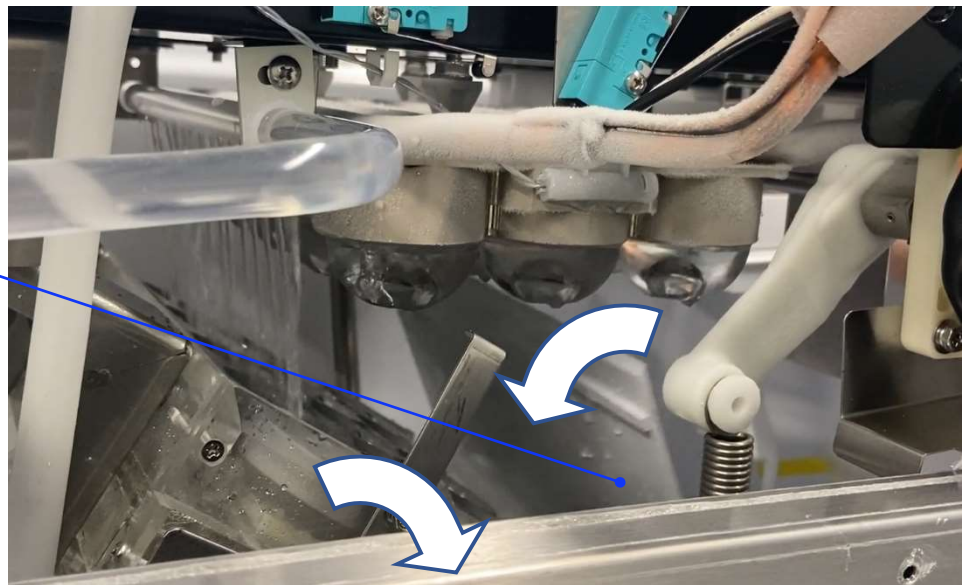
When the lower half of the ball ice detaches, the water plate lowers under its own weight and micro switch A turns off.



When the water plate detaches, the water valve closes, the actuator motor starts to rotate again, and the water plate descends.

As the water plate descends, the ice guide covers the lower evaporator.

The ice guide covers the lower evaporator.



When the water plate reaches its lowest point, the fan motor stops, the hot gas valve opens, and the ice-making compartment (upper evaporator) starts to release the ice. In this state, 3 minutes after compressor stops it will start again. (If it takes time for the water plate to detach and 3 minutes have elapsed at the time the water plate is lowered, then the compressor will start running when the water plate is at its lowest point.)

When the ice-making thermistor exceeds the ice release completion temperature, the water valve and fan motor are activated again. At the same time, the actuator motor starts to rotate, causing the water plate to rise. Once fully risen, the freeze cycle begins.

7. SERVICE DIAGNOSIS

This service manual provides specific information for IM-65NE/WNE-Q only. For any other information, please refer to the service manual for the standard model IM-65NE/WNE.

Situation	Cause	Solution
Ice is deformed.	Upper and lower evaporators are misaligned.	Adjust with the adjustment plate and adjustment nut in the ice-making mechanism.
	The surface of the lower evaporator coating is rough.	Replace lower evaporator.
Ice crushed.	Ice guide malfunction. • The mounting position of the ice guide is misaligned. It does not rotate because it gets caught on the ball ice when it rotates. • Ice that falls without the lower evaporator being covered remains on the lower evaporator.	Refer to "How to Maintain" and adjust the ice guide mounting position.
Ice release takes time.	Micro switch malfunction. • Cam does not rotate. • False detection stops the water supply and releasing the ice with water is not possible.	Refer to "How to Maintain" and adjust the micro switch mounting position.
Tension spring damaged.	Micro switch malfunction. • The cam rotates to the lowest point without detaching the water plate, and the spring bends.	If the part is broken, replace it.

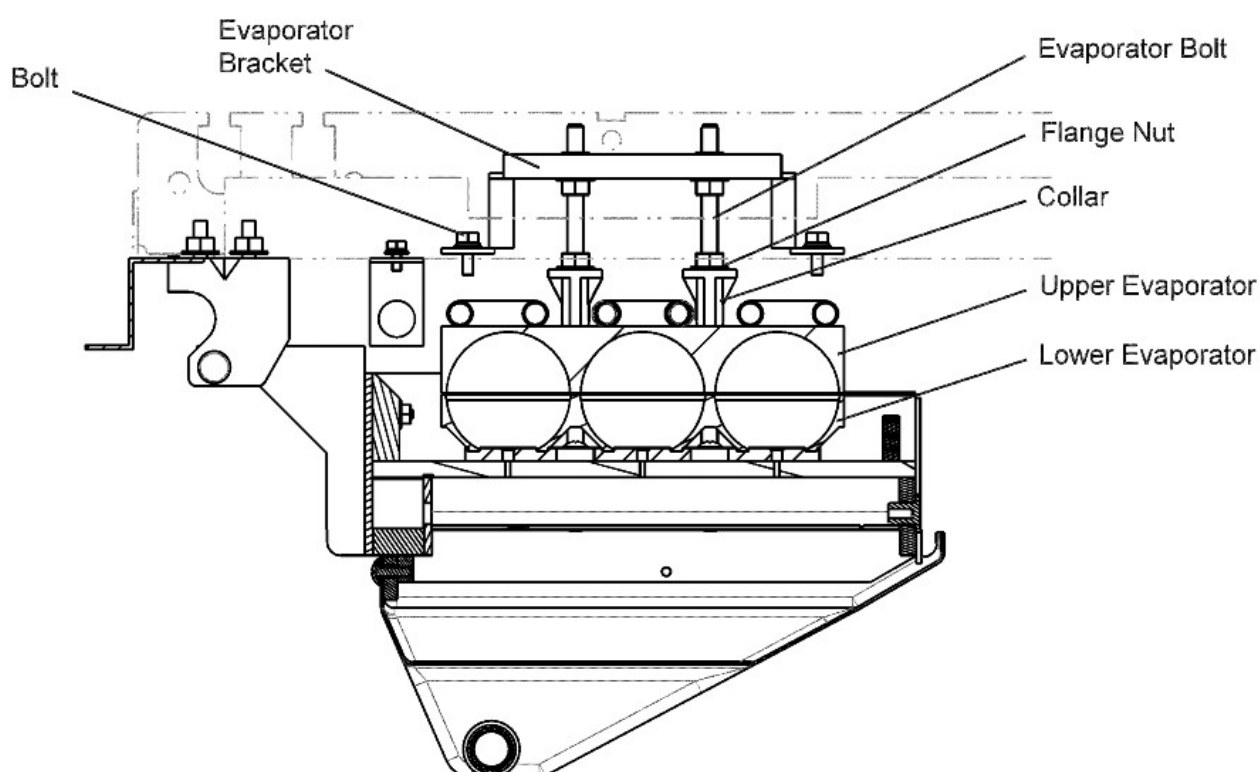
8. REMOVAL AND REPLACEMENT

[a] Upper Evaporator

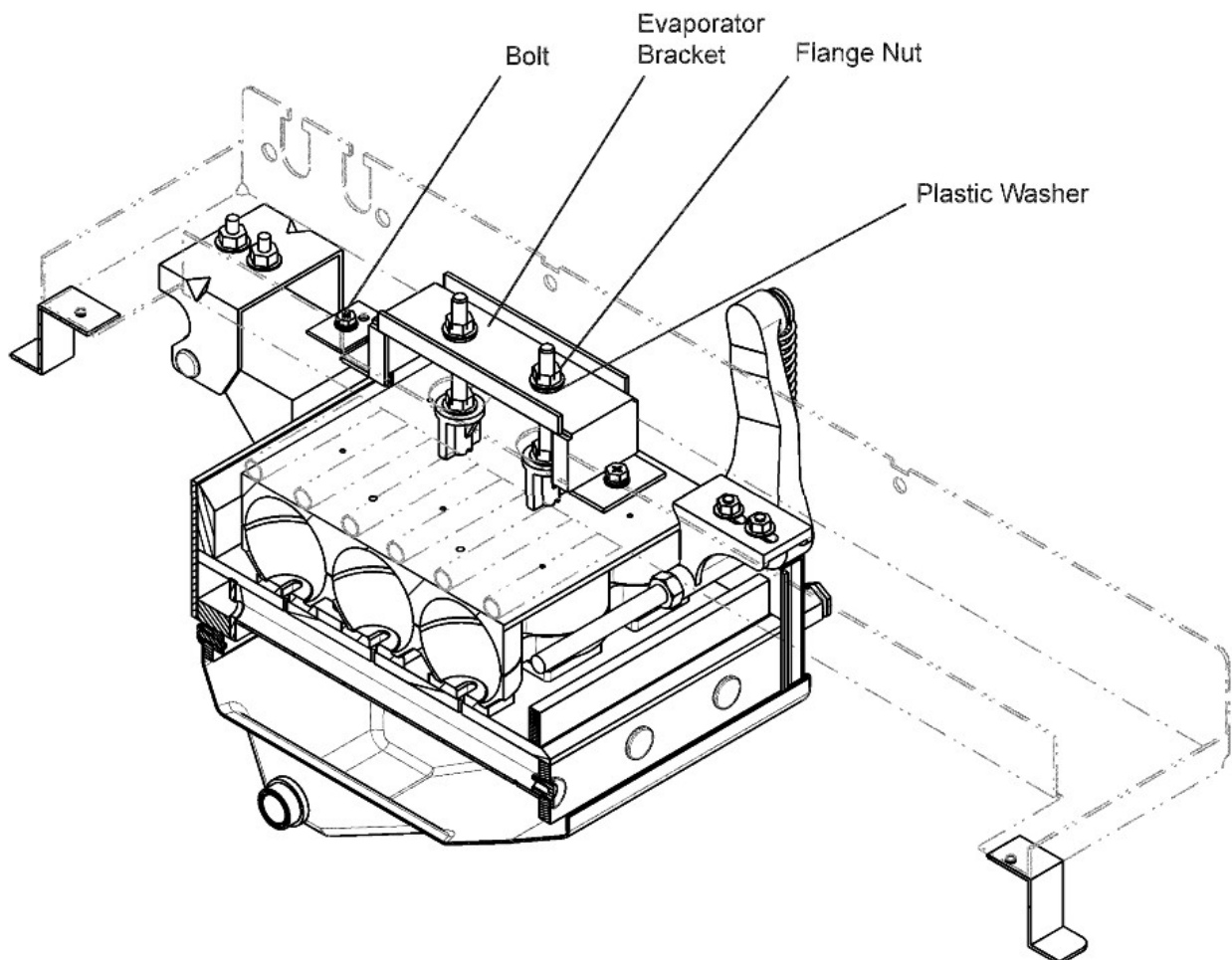
- 1) Loosen the flange nut fixed to the evaporator bracket, and lower the evaporator to keep a distance from the mechanism base.
- 2) Remove the access valve from the condenser shroud, and recover the refrigerant from the access valve.
- 3) Remove the upper evaporator copper tubes using brazing equipment.
- 4) Remove the flange nuts fixed to the evaporator bracket to release the evaporator from the bottom side.
- 5) Remove the collars, evaporator bolts, and flange nuts from the upper evaporator.
- 6) Replace the upper evaporator, and braze the copper tubes.

Upper Evaporator Location Adjustment

- 1) Loose the bolt fixing the evaporator bracket to the mechanism base to move the bracket freely.
- 2) Screw the flange nut (with the flange side up) into the evaporator bolt of the upper evaporator as far as necessary.



- 3) Insert the evaporator bolt from the bottom into the evaporator bracket hole, and put the plastic washer from the top. Then, screw the flange nut into the evaporator bolt while allowing the upper evaporator to move up and down.
- 4) Press the "RESET" button. Then, the water tank assembly starts to close.
- 5) When the water tank assembly stops in its fully closed position, switch off.
- 6) Screw in the flange nut on the evaporator bracket so that the lower and upper evaporators fixed to the water tank assembly will have a vertical gap of $1/50'' - 1/25''$ (0.5 - 1mm). (When the flange nut is screwed in, the evaporator bolt moves up to raise the upper evaporator.)
- 7) When the upper evaporator is vertically positioned, screw in the flange nut under the evaporator bracket. (Use the flange nut to fix the evaporator bolt to the evaporator bracket.)
- 8) With the upper evaporator fixed to the evaporator bracket, move the evaporator bracket to fit the upper and lower evaporators from front to back and left to right. (When the exterior surfaces of the upper and lower evaporators fit perfectly, the hemispheres inside fit and make spherical ice balls.)
- 9) After the upper evaporator is positioned from front to back and left to right, fix the evaporator bracket to the mechanism base.

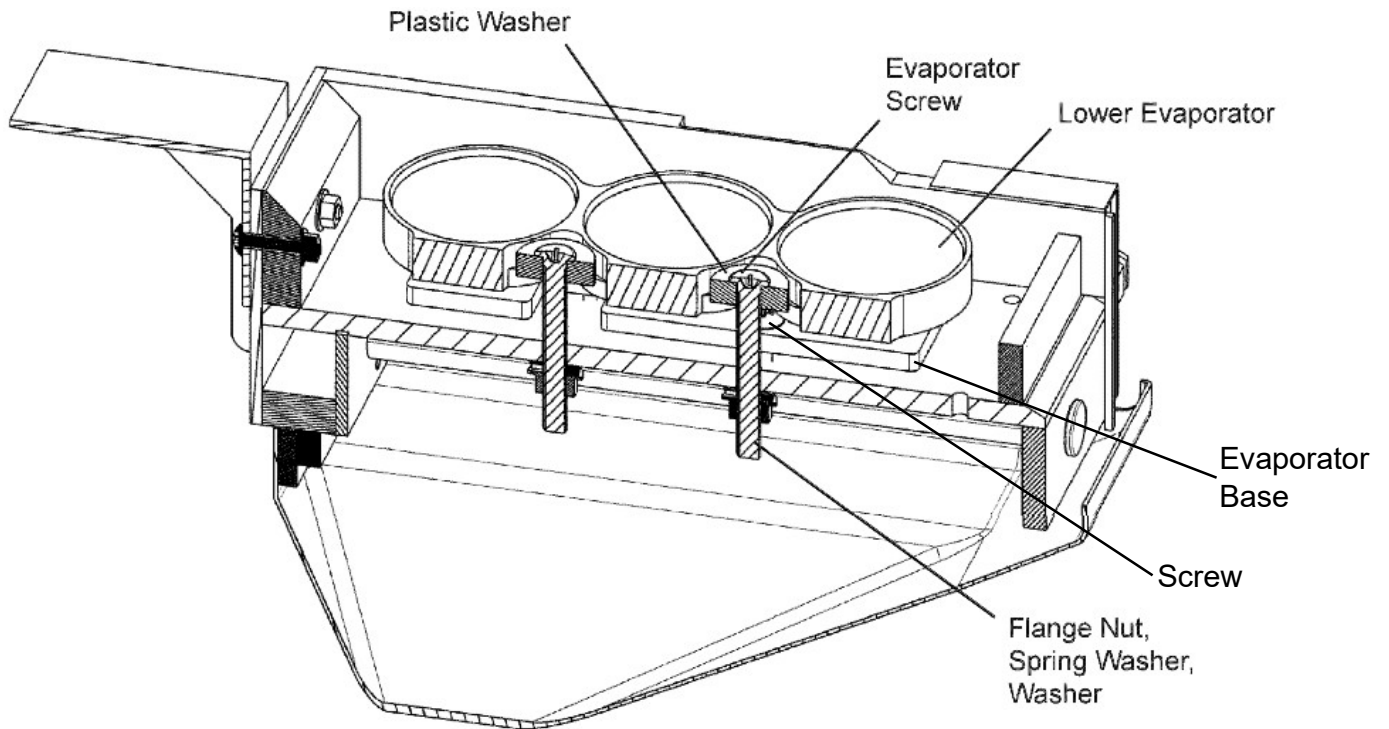


[b] Lower Evaporator

- 1) Remove the flange nuts, spring washers, washers, evaporator screws and plastic washers under the water plate to release the lower evaporator from the water plate.

[c] Evaporator Base

- 1) Remove the screws fixing the evaporator base on the water plate.



[d] Water Plate Switch

- 1) Remove the screws and nuts fixing the water plate switch to the mechanism base.

[e] Cam Switch

- 1) Unscrew and remove the cam switch from the switch bracket.

Water Plate Switch and Cam Switch Operation

- 1) When harvest cycle starts after freeze cycle, the actuator motor rotates the cam counterclockwise. But the water tank assembly stays fully closed because ice is frozen to the lower evaporator.
 - 2) The cam keeps rotating until the cam switch closes, then stops.
 - 3) Then, tap water is supplied to the water plate surface, reaches 7/10" (17mm) in height, and overflows to immerse the lower evaporator.
 - 4) Water warms the lower evaporator and raises its temperature up to around 32°F (0°C). Then, the lower evaporator separates from ice, the water tank assembly opens by its own weight, and the water plate switch opens.
 - 5) When the water plate switch does not open within a specific time, the control board operates the actuator motor, and the cam forcibly separates the lower evaporator from the ice, which opens the water tank assembly and water plate switch.
 - 6) When the water plate switch opens, the actuator motor operates to open the water tank assembly and stop it at a specific angle.
 - 7) Hot gas flows into the upper evaporator to melt the surface of ice stuck there.
- * The compressor stops after freeze cycle until the cam switch opens.

Water Plate Switch Positioning

- 1) To adjust the water plate switch position, loosen the bolts fixing the level to the side of the water tank assembly, and move the lever up or down.
- 2) Check that the water plate switch closes when the water tank assembly is fully closed.

Cam Switch Positioning

- 1) To adjust the cam switch position, loosen the bolts fixing the switch bracket, and move it to the left-or-right.
- 2) Check that the cam switch closes when the cam is in the location shown below.

