CUBELET ICE DISPENSER

DCM-80LS-HC
DCM-80LS-P-HC
DCM-120LS-HC
DCM-120LS-P-HC

SERVICE MANUAL

L040-1185 (082324)

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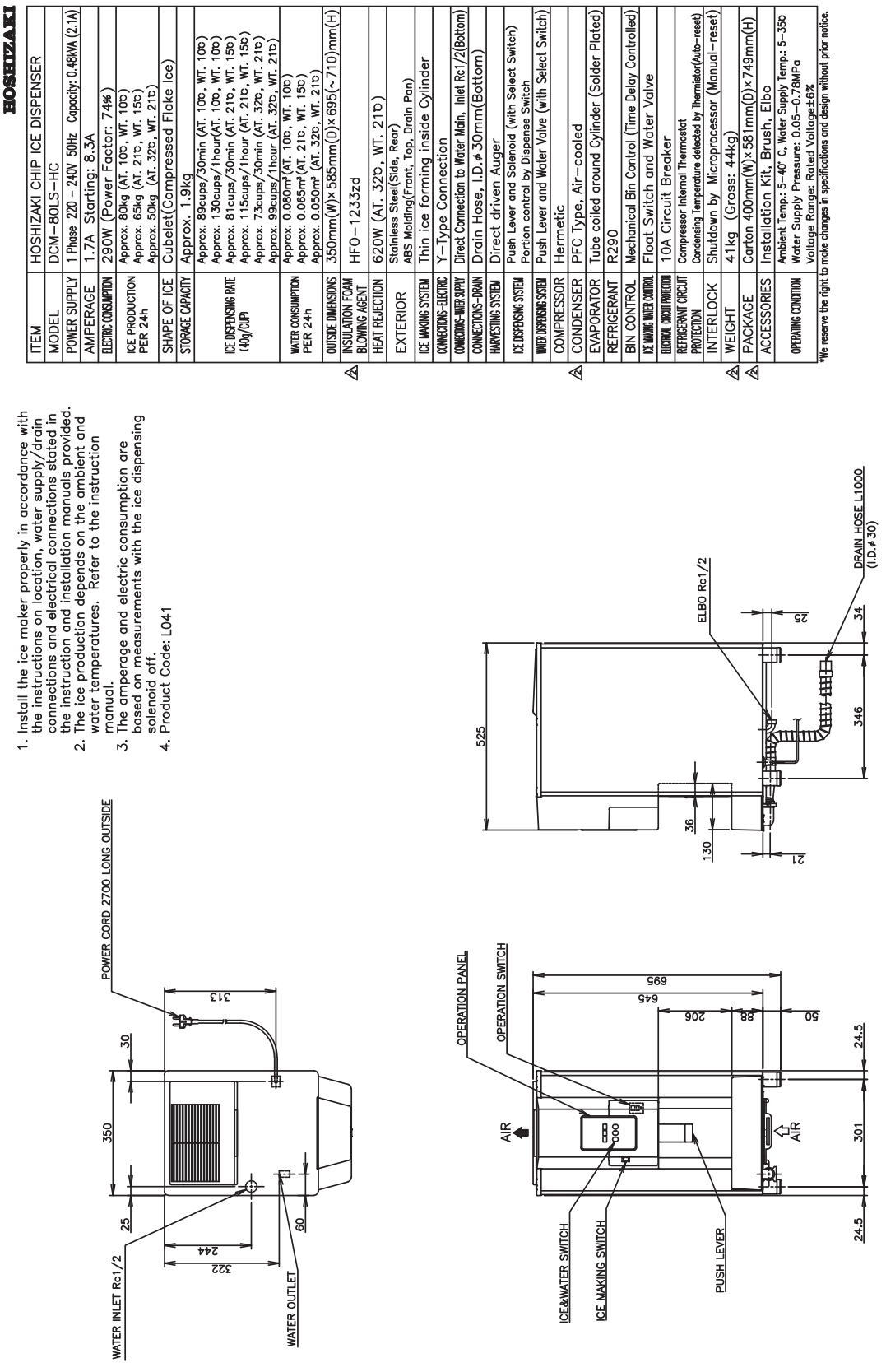
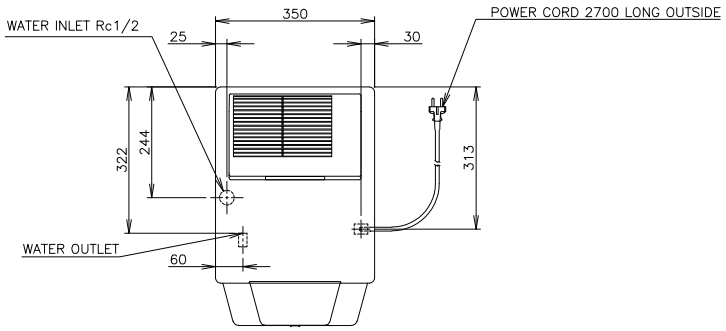
I. SPECIFICATIONS

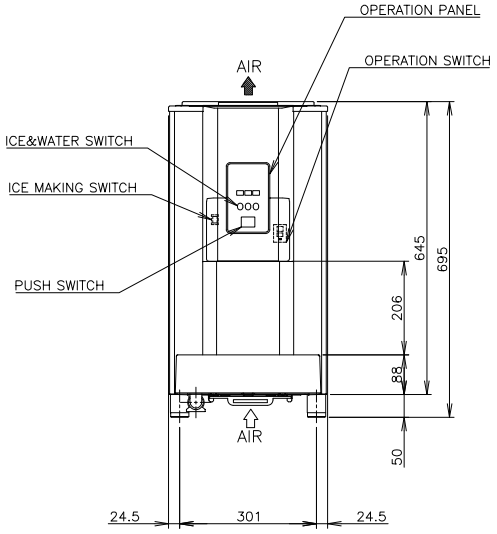
1. DIMENSIONS/SPECIFICATIONS

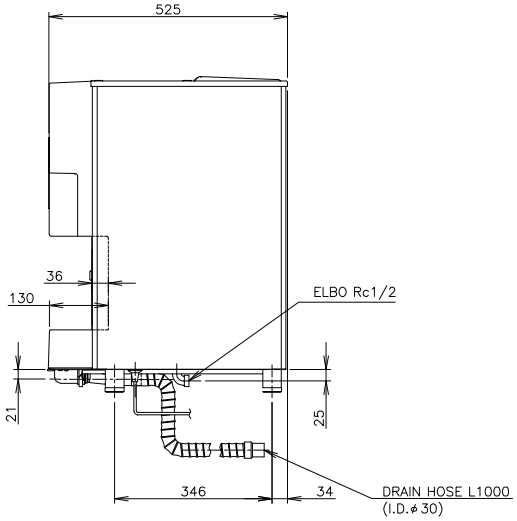
[a] DCM-80LS-HC





1. Install the ice maker properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.
2. The ice production depends on the ambient and water temperatures. Refer to the instruction manual.
3. The amperage and electric consumption are based on measurements with the ice dispensing solenoid off.
4. Product Code: L041-C100

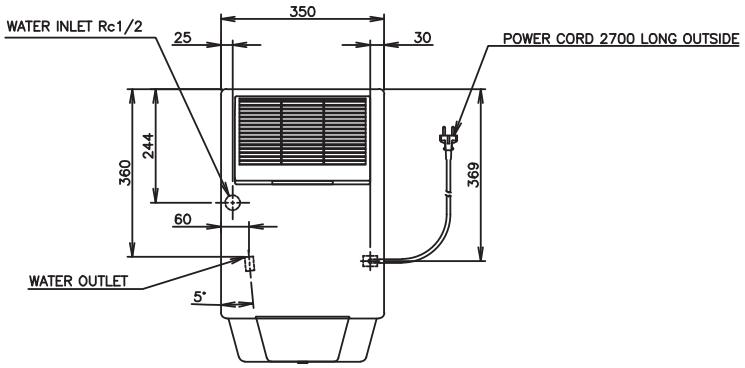




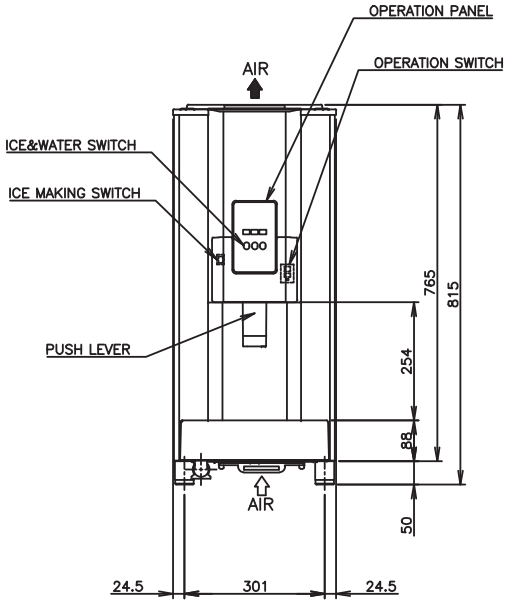
HOSHIZAKI

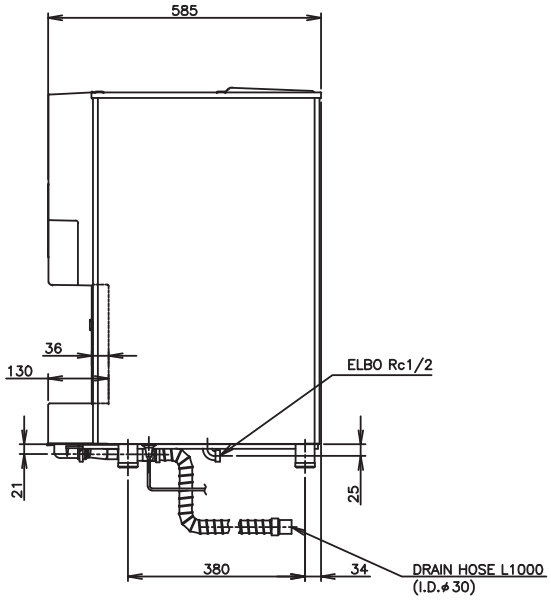
ITEM	HOSHIZAKI CHIP ICE DISPENSER
MODEL	DCM-80LS-P-HC
POWER SUPPLY	1 Phase 220 - 240V 50Hz Capacity: 0.48kVA (2.1A)
AMPERAGE	1.7A Starting: 8.3A
ELECTRIC CONSUMPTION	290W (Power Factor: 74%)
ICE PRODUCTION PER 24h	Approx. 80kg (AT. 10℃, WT. 10℃) Approx. 65kg (AT. 21℃, WT. 15℃) Approx. 50kg (AT. 32℃, WT. 21℃)
SHAPE OF ICE	Cubelet(Compressed Flake Ice)
STORAGE CAPACITY	Approx. 1.9kg
ICE DISPENSING RATE (40g/CUP)	Approx. 89cups/30min (AT. 10℃, WT. 10℃) Approx. 130cups/1hour(AT. 10℃, WT. 10℃) Approx. 81cups/30min (AT. 21℃, WT. 15℃) Approx. 115cups/1hour (AT. 21℃, WT. 15℃) Approx. 73cups/30min (AT. 32℃, WT. 21℃) Approx. 99cups/1hour (AT. 32℃, WT. 21℃)
WATER CONSUMPTION PER 24h	Approx. 0.080m³(AT. 10℃, WT. 10℃) Approx. 0.065m³(AT. 21℃, WT. 15℃) Approx. 0.050m³ (AT. 32℃, WT. 21℃)
OUTSIDE DIMENSIONS	350mm(W)×585mm(D)×695(~710)mm(H)
INSULATION FOAM BLOWING AGENT	HFO-1233zd
HEAT REJECTION	620W (AT. 32℃, WT. 21℃)
EXTERIOR	Stainless Steel(Side, Rear) ABS Molding(Front, Top, Drain Pan)
ICE MAKING SYSTEM	Thin ice forming inside Cylinder
CONNECTIONS-ELECTRIC	Y-Type Connection
CONNECTIONS-WATER SUPPLY	Direct Connection to Water Main, Inlet Rc1/2(Bottom)
CONNECTIONS-DRAIN	Drain Hose, I.D.φ30mm(Bottom)
HARVESTING SYSTEM	Direct driven Auger
ICE DISPENSING SYSTEM	Push Switch and Solenoid(with select Switch) Portion control by Dispense Switch
WATER DISPENSING SYSTEM	Push Switch and Water Valve (with select Switch) Portion control by Dispense Switch
COMPRESSOR	Hermetic
CONDENSER	PFC Type, Air-cooled
EVAPORATOR	Tube coiled around Cylinder (Solder Plated)
REFRIGERANT	R290
BIN CONTROL	Mechanical Bin Control (Time Delay Controlled)
ICE MAKING WATER CONTROL	Float Switch and Water Valve
ELECTRICAL CIRCUIT PROTECTION	10A Circuit Breaker
REFRIGERANT CIRCUIT PROTECTION	Compressor Internal Thermostat Condensing Temperature detected by Thermistor(Auto-reset)
INTERLOCK	Shutdown by Microprocessor (Manual-reset)
WEIGHT	41kg (Gross: 44kg)
PACKAGE	Carton 400mm(W)×581mm(D)×749mm(H)
ACCESSORIES	Installation Kit, Brush, Elbo
OPERATING CONDITION	Ambient Temp.: 5-40° C, Water Supply Temp.: 5-35℃ Water Supply Pressure: 0.05-0.78MPa Voltage Range: Rated Voltage±6%

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



1. Install the ice maker properly in accordance with the instructions on location, water supply/drain connections and electrical connections stated in the instruction and installation manuals provided.
2. The ice production depends on the ambient and water temperatures. Refer to the instruction manual.
3. The amperage and electric consumption are based on measurements with the ice dispensing solenoid off.
4. Product Code: L040





HOSHIZAKI

	ITEM	HOSHIZAKI CHIP ICE DISPENSER
	MODEL	DCM-120LS-HC
	POWER SUPPLY	1 Phase 220-240/220-230V 50/60Hz Capacity: 0.69kVA (3.0A)
	AMPERAGE	2.4A Starting: 9.7A
	ELECTRIC CONSUMPTION	391W (Power Factor: 72%)
	ICE PRODUCTION PER 24h	Approx. 120kg (AT. 10℃, WT. 10℃) Approx. 110kg (AT. 21℃, WT. 15℃) Approx. 90kg (AT. 32℃, WT. 21℃)
	SHAPE OF ICE	Cubelet(Compressed Flake Ice)
	STORAGE CAPACITY	Approx. 4.0kg
	ICE DISPENSING RATE (40g/CUP)	Approx. 162cups/30min (AT. 10℃, WT. 10℃) Approx. 225cups/1hour(AT. 10℃, WT. 10℃) Approx. 157cups/30min (AT. 21℃, WT. 15℃) Approx. 214cups/1hour (AT. 21℃, WT. 15℃) Approx. 146cups/30min (AT. 32℃, WT. 21℃) Approx. 193cups/1hour (AT. 32℃, WT. 21℃)
	WATER CONSUMPTION PER 24h	Approx. 0.12m³(AT. 10℃, WT. 10℃) Approx. 0.11m³(AT. 21℃, WT. 15℃) Approx. 0.09m³ (AT. 32℃, WT. 21℃)
	OUTSIDE DIMENSIONS	350mm(W)×585mm(D)×815(~830)mm(H)
2	INSULATION FOAM BLOWING AGENT	HFO-1233zd
	HEAT REJECTION	760W (AT. 32℃, WT. 21℃)
	EXTERIOR	Stainless Steel(Side, Rear) ABS Molding(Front, Top, Drain Pan)
	ICE MAKING SYSTEM	Thin ice forming inside Cylinder
	CONNECTIONS-ELECTRIC	Y-Type Connection
	CONNECTIONS-WATER SUPPLY	Direct Connection to Water Main,Inlet Rc1/2(Bottom)
	CONNECTIONS-DRAIN	Drain Hose, I.D.φ30mm(Bottom)
	HARVESTING SYSTEM	Direct driven Auger
	ICE DISPENSING SYSTEM	Push Lever and Solenoid (with Select Switch) Portion control by Dispense Switch
	WATER DISPENSING SYSTEM	Push Lever and Water Valve (with Select Switch)
	COMPRESSOR	Hermetic
2	CONDENSER	PFC Type, Air-cooled
	EVAPORATOR	Tube coiled around Cylinder (Solder Plated)
	REFRIGERANT	R290
	BIN CONTROL	Mechanical Bin Control (Time Delay Controlled)
	ICE MAKING WATER CONTROL	Float Switch and Water Valve
	ELECTRICAL CIRCUIT PROTECTION	10A Circuit Breaker
	REFRIGERANT CIRCUIT PROTECTION	Compressor Internal Thermostat Condensing Temperature detected by Thermistor(Auto-reset)
	INTERLOCK	Shutdown by Microprocessor (Manual-reset)
2	WEIGHT	44kg(Gross: 48kg)
	PACKAGE	Carton 400mm(W)×641mm(D)×872mm(H)
	ACCESSORIES	Installation Kit, Brush, Elbo
	OPERATING CONDITION	Ambient Temp.: 5-40° C, Water Supply Temp.: 5-35℃ Water Supply Pressure: 0.05-0.78MPa Voltage Range: Rated Voltage±6%

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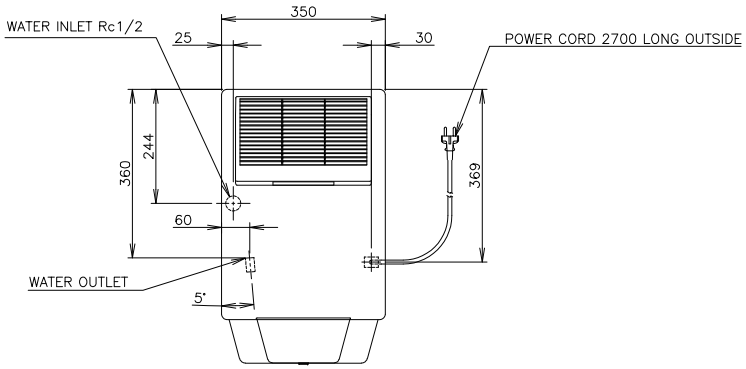

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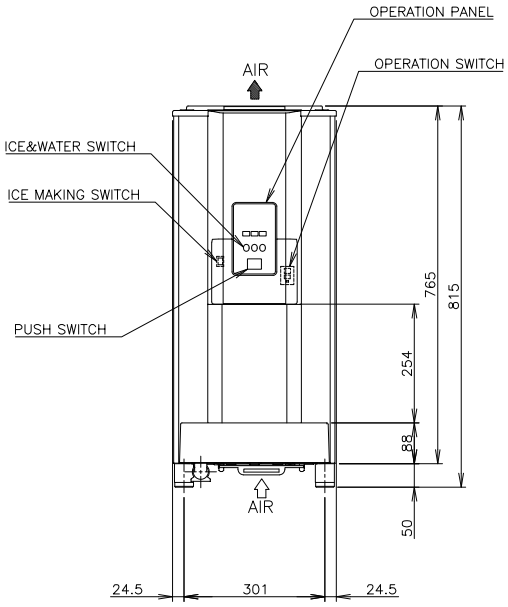

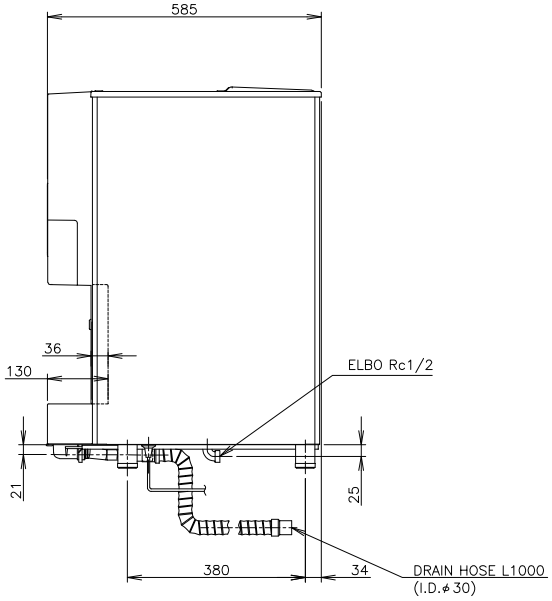

HOSHIZAKI

ITEM	HOSHIZAKI CHIP ICE DISPENSER
MODEL	DCM-120LS-P-HC
POWER SUPPLY	1 Phase 220-240/220-230V 50 Capacity: 0.69kVA (3.0A)
AMPERAGE	2.4A Starting: 9.7A
ELECTRIC CONSUMPTION	391W (Power Factor: 72%)
ICE PRODUCTION PER 24h	Approx. 120kg (AT. 10℃, WT. 10℃) Approx. 110kg (AT. 21℃, WT. 15℃) Approx. 90kg (AT. 32℃, WT. 21℃)
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WATER CONSUMPTION PER 24h	Approx. 0.12m³(AT. 10℃, WT. 10℃) Approx. 0.11m³(AT. 21℃, WT. 15℃) Approx. 0.09m³ (AT. 32℃, WT. 21℃)
OUTSIDE DIMENSIONS	350mm(W)×585mm(D)×815(~830)mm(H)
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CONDENSER	PFC Type, Air-cooled
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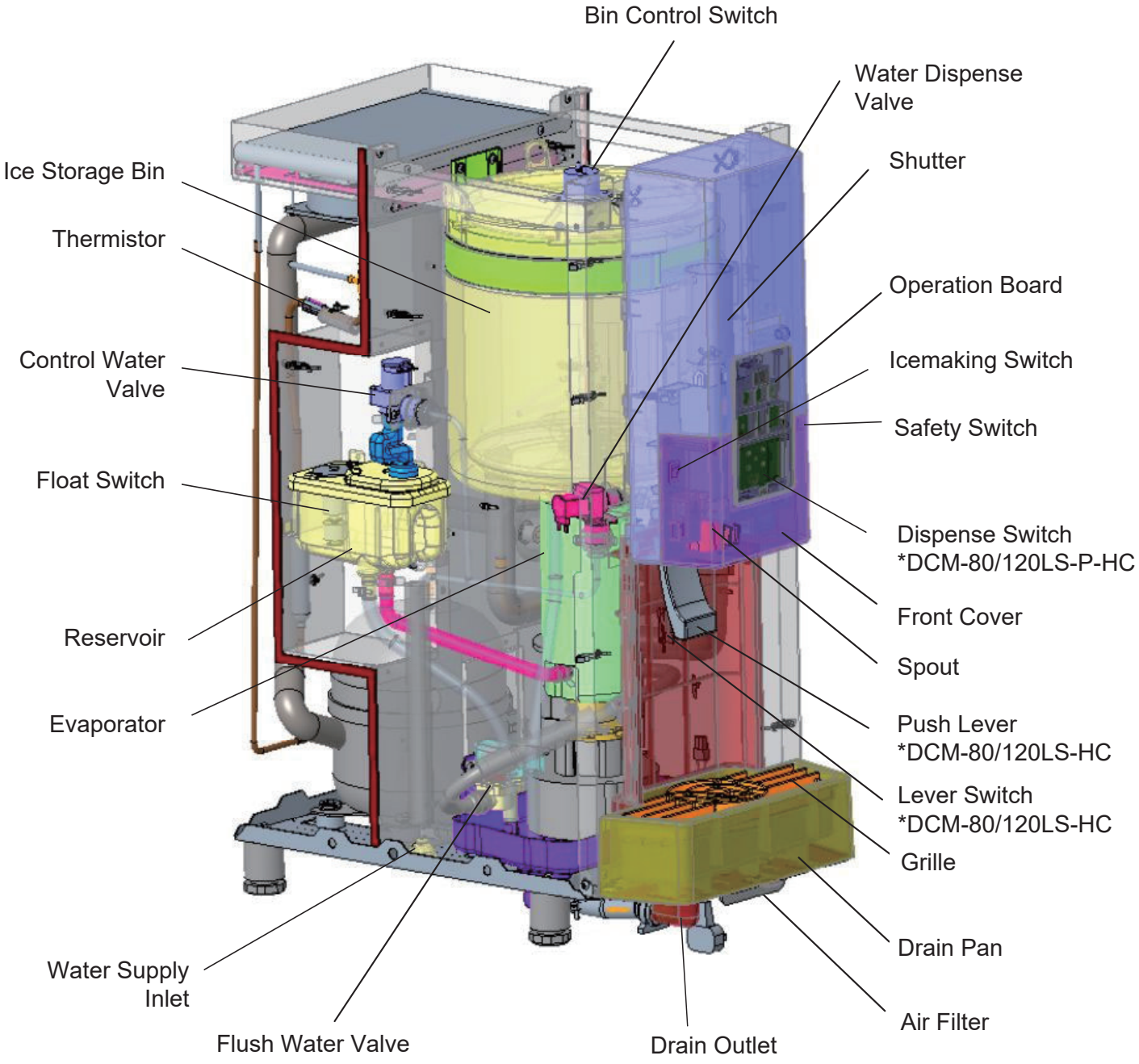
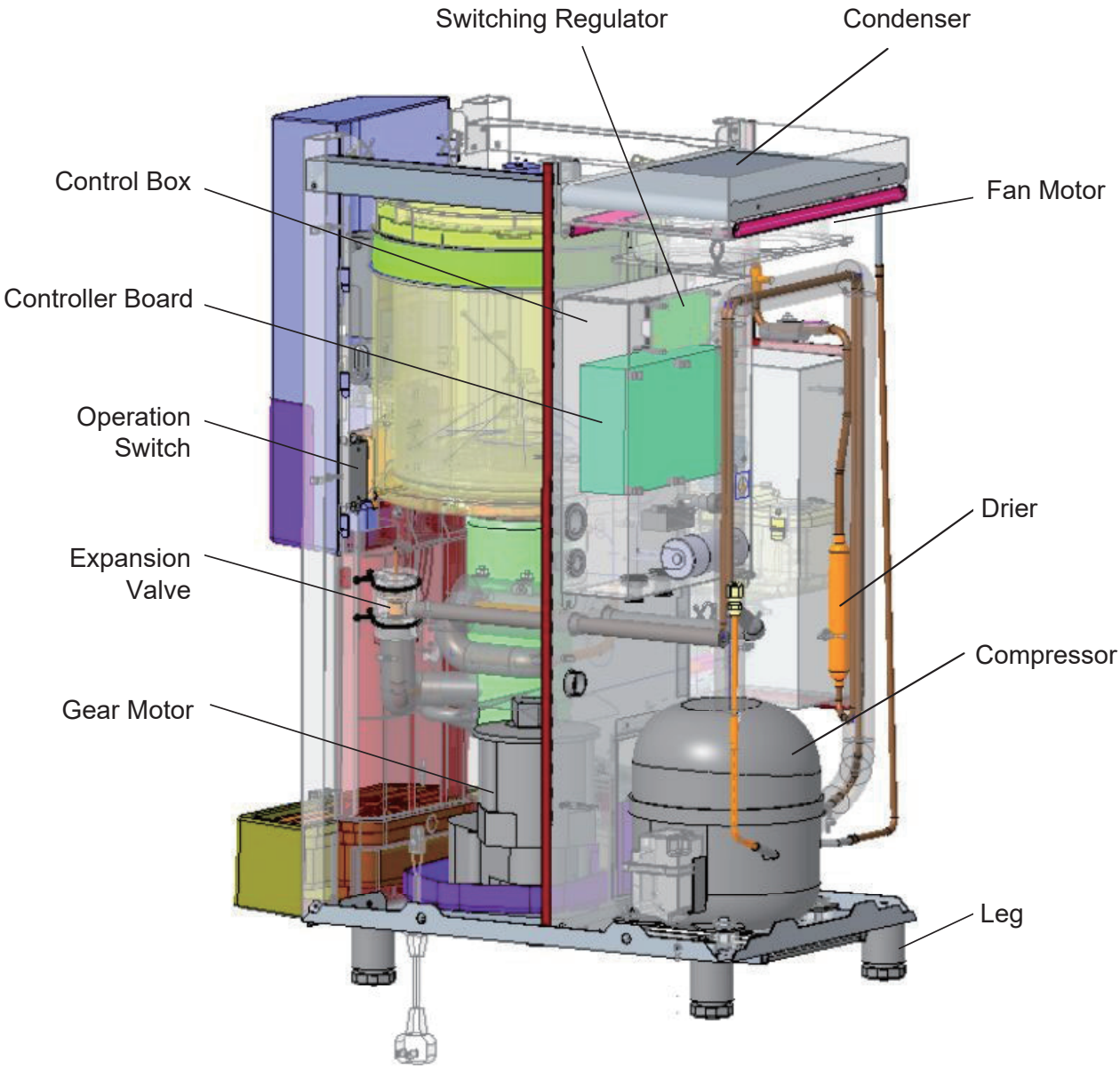
2. CONSTRUCTION




Switching Regulator
Condenser
Control Box
Fan Motor
Controller Board
Operation Switch
Drier
Expansion Valve
Compressor
Gear Motor
Leg

II. MAINTENANCE AND CLEANING INSTRUCTIONS

IMPORTANT

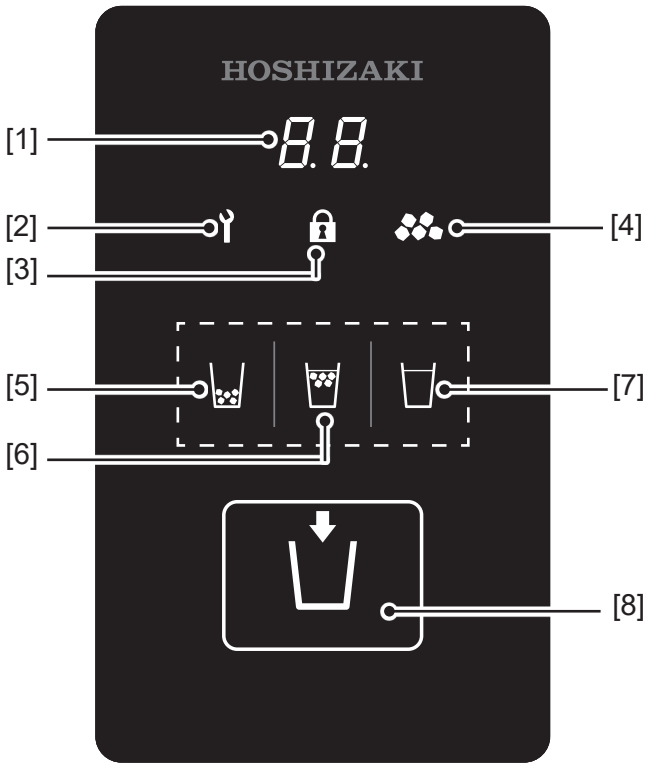
1. This ice dispenser must be maintained individually, referring to the instruction manual and labels provided with the ice dispenser.

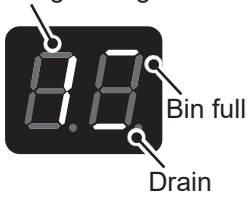
2. To achieve optimum ice dispenser performance, the following parts need periodic inspection and maintenance:
   Extruding head (upper bearing)
   Housing (lower bearing)
   Mechanical seal
   These parts should be inspected after two years from installation or 10,000 hours of operation, whichever comes first, and once a year thereafter. Their service life, however, depends on water quality and environment. More frequent inspection and maintenance are recommended in bad or severe water conditions.

1. PERIODIC PARTS REPLACEMENT

Operation Panel

[1] Display
[2] Service Call Lamp (red)
[3] Lock Lamp (white)
[4] Icemaking Lamp (white)
[5] Ice Switch
[6] Ice & Water Switch
[7] Water Switch
[8] Dispense Switch (dispense switch type only)



Display	Indication	
Dispensing setting number  	Dispensing setting number	Indicates the dispensing setting number.
	Bin full	Lights up when the ice storage bin is full.
	Drain	Lights up during draining. Goes off when the draining completes.
	Periodic replacement	"PC" is indicated when periodic parts repracement is required.

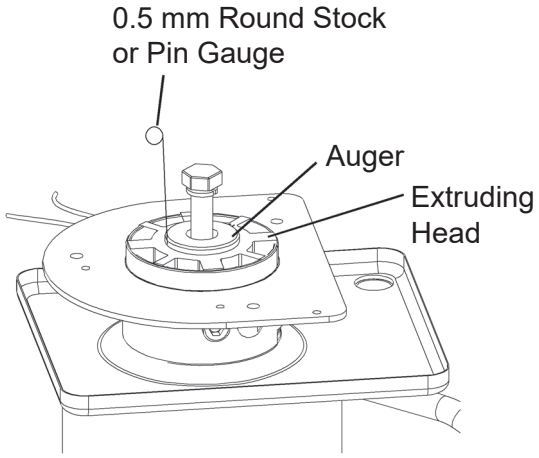
When the total operating time reaches 20,000 hours, the service call lamp on the operation panel lights up and the display on the control panel flashes “PC”. Then, after 500 hours, the unit shuts down to ensure safety and the service call lamp starts flashing. The operation can be resumed by turning off the operation switch and turning it back on. But the unit shuts down again after 500 hours and cannot be restarted.
This information is provided on the label attached to the front panel and in the instruction manual. But instruct the user to contact a Hoshizaki service agent for replacement as soon as the service call lamp lights up and the display starts flashing “PC”.

After replacing the extruding head and mechanical seal:
1) Reset the compressor operating hours in accordance with “III. 5. [j] RESETTING COMPRESSOR OPERATING HOURS”. The service call lamp and the “PC” indication on the display go off.
2) Record the date of replacement on the label attached to the front panel.

Operating Hours	**Service Call Lamp**	**Display**	**Operation**
0 to 20,000 hours	Off	Normal (operational status)	Normal
20,000 to 20,500 hours	On	Flash "PC"	Normal
20,500 hours (turn off and on power)	Flash	Light up "PC"	Shut down
20,500 to 21,000 hours	Flash	Flash "PC"	Normal
21,000 hours	Flash	Light up "PC"	Shut down

2. EXTRUDING HEAD (UPPER BEARING), HOUSING (LOWER BEARING)

These parts should be replaced if a diametrical gap of more than 0.5 mm is found when at least three spots are checked by changing the direction of the auger on each bearing.
It depends on the water quality and conditions, but normally the bearings should be checked for wear after a total of 8,000 - 10,000 hour operation from installation date.



For reference only
(May differ from actual design)

Note: The clearance between the auger blades and the evaporator interior is 0.4 - 0.5 mm. If the bearings and rotating parts are worn out to create a larger clearance, the evaporator interior may be damaged. (The diameters differ by 0.8 - 1.0 mm.)
If the auger surfaces against which the bearings contact are no longer smooth or show any burrs or abrasions during the above inspection, replace the auger.

3. MECHANICAL SEAL

The mechanical seal prevents water leaks from between the auger and the housing bearing and gradually wears out to reduce its watertightness. Check the amount of water leakage from the drain pipe located at the side of the gear case to determine the necessity of replacement.

Total operation time	Water leakage
3,000 hours	0.1 mL/h
10,000 hours	0.5 mL/h

Note: The water leakage will exceed the above amount with scale/dirt build up or damage on the mating surface. Replace the mechanical seal when the water leakage exceeds 0.5 mL/h.

4. GEAR MOTOR

After the following hours of operation, check the gear motor for excessive noise caused by increased torque or deterioration of mechanical parts.

Bearing, gear and other mechanical parts:	10,000 hours
Oil seal:	5 years

Note: When the output shaft oil seal is exposed to a large amount of water at one time, water may enter the gear case. Always drain the water circuit before removing the auger for service.

5. CONDENSER

Check the condenser once a year, and clean if required by using a brush or vacuum cleaner. More frequent cleaning may be required depending on the location of the ice dispenser.

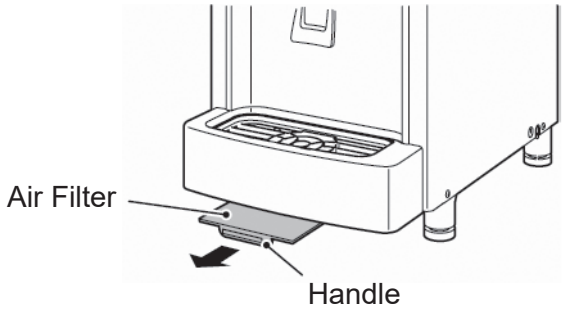
6. AIR FILTER

Plastic mesh air filters remove dirt or dust from the air, and keep the condenser from getting clogged. If the filters get clogged, the ice dispenser's performance will be reduced. Remove and clean the air filter(s) at least twice per month:

1) Pull out the air filter from the bottom of the drain pan.

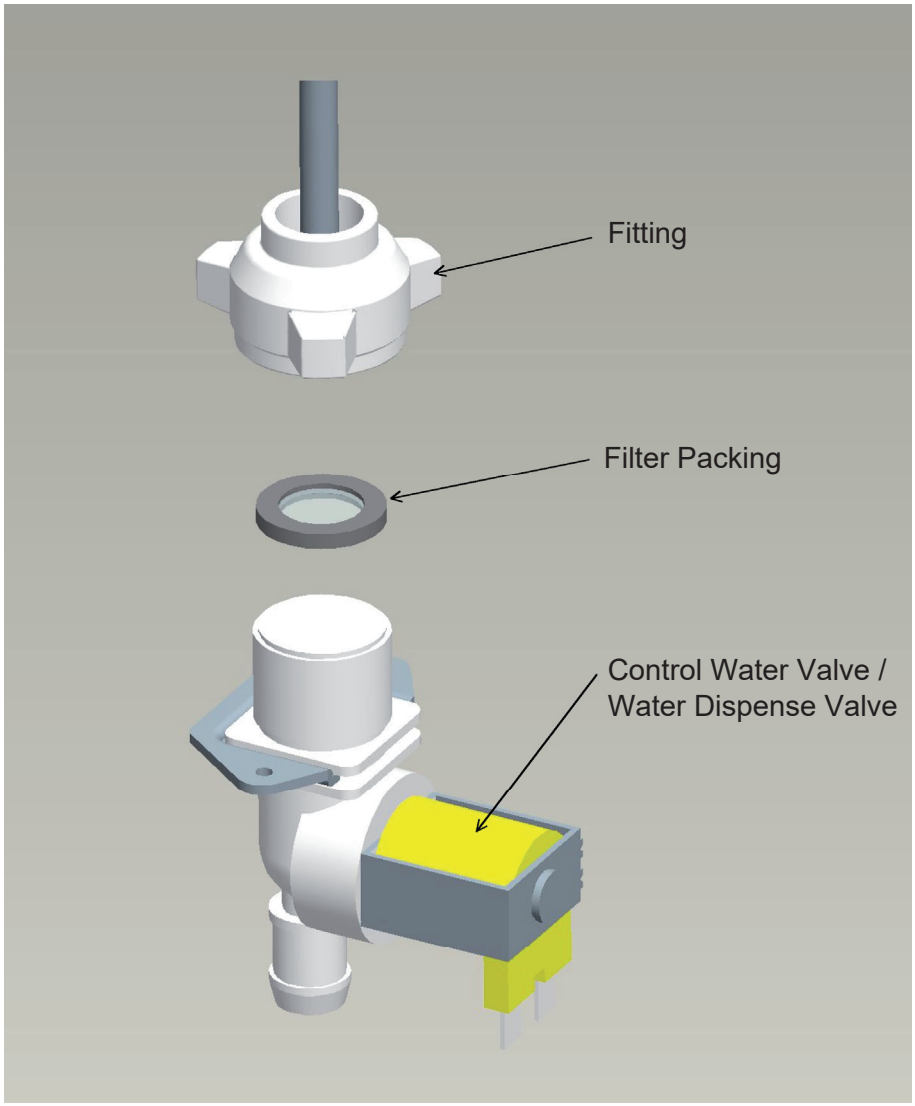
2) Clean the air filter by using a vacuum cleaner. When severely clogged, use warm water and a neutral cleaner to wash the air filter.

3) Rinse and dry the air filter thoroughly, and place it in position.



7. CONTROL WATER VALVE AND WATER DISPENSE VALVE

1) Unplug the ice dispenser.
2) Close the water supply tap.
3) Disconnect the fitting from the valve.
4) Clean the filter packing using a brush.
5) Replace the filter packing and fitting in their correct positions.
6) Open the water supply tap.
7) Plug in the ice dispenser.
8) Check for leaks.



8. CLEANING OF WATER SYSTEM

WARNING

1. HOSHIZAKI recommends cleaning this unit at least twice a year. More frequent cleaning, however, may be required in some existing water conditions.
2. Do not touch the operation switch and icemaking switch with damp hands.
3. Always wear rubber gloves, eye protectors, apron, etc. for safe handling of the cleaner and sanitiser.
4. Use the cleaners and sanitisers recommended by Hoshizaki. Contact your local Hoshizaki office for further details. (The instructions below give an example of those recommended cleaners and sanitisers.)
5. Never mix cleaning and sanitising solutions in an attempt to shorten cleaning time.
6. Wipe off any splashed or spilt cleaner/sanitiser immediately.
7. Do not use any ammonia type cleaners on any part of the ice dispenser.

CAUTION

Do not use ice produced with cleaning and sanitising solutions. Be sure none remains in the storage bin on completion of cleaning.

<STEP 1>

Dilute the solutions with water as follows:

Cleaning solution: “Nickel-Safe Ice Machine Cleaner” by The Rectorseal Corporation or similar. Prepare approximately 5 L of solution as directed on the container.

Sanitising solution: 30 mL of 5.25% sodium hypochlorite with 7.6 L of water or the Hoshizaki recommended sanitiser directed on the container.

IMPORTANT

For safety and maximum effectiveness, use the solutions immediately after dilution.

<STEP 2>

Use the cleaning solution to remove lime deposits in the water system.

1) Remove the front cover. Move the icemaking switch to the “OFF” position. Refit the front cover.

2) Remove all ice from the storage bin as follows:

[Dispensing ice using the bucket holder]

(1) Press and hold the ice, ice & water and water switches together for 3 seconds. The ice switch flashes rapidly, and the dispense switch flashes slowly. Then the unit enters the continuous ice dispensing mode.

Note: During the continuous ice dispensing mode, the push lever becomes unavailable (push lever type only). Use the dispense switch to start/stop dispensing.

To reset continuous ice dispensing mode, press the ice, ice & water or water switch.

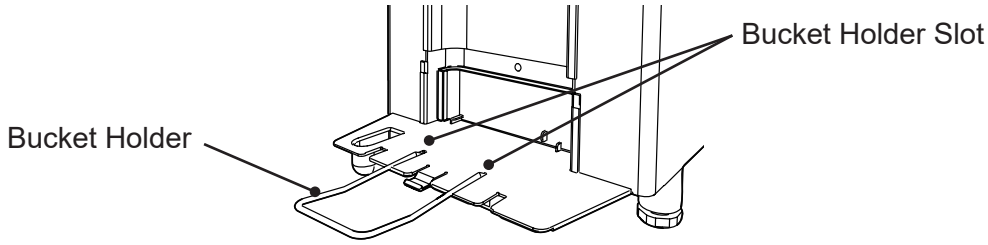
(2) Remove the grille and check for water accumulation at the drain pan outlet.

Note: If there is water accumulation, inspect the drain pipe with the drain pan attached.

(3) Remove the drain pan.

Note: While the drain pan is removed, keep the unit in the continuous ice dispensing mode. If the unit is not in the continuous ice dispensing mode or the mode is reset halfway, water may leak from the drain outlet.

(4) Remove the bucket holder and insert it in the bucket holder slots. Press it down gently to ensure it is secure.



(5) Put a container such as a bucket on the bucket holder. Press the dispense switch once to dispense all ice in the storage bin. The dispense switch flashes rapidly, and ice is dispensed continuously. After 2 minutes and 20 seconds, dispensing stops automatically.

Note: 1. If the dispense switch is pressed again while ice is being dispensed, dispensing stops and the dispense switch flashes slowly.

2. Depending on its shape or material, a container may become unstable. Hold it with your hand.

3. For the 120kg model of the push lever type, a container may contact the push lever and become unstable. Hold the container with your hand for 10 seconds (until ice accumulates) after pressing the dispense switch.

(6) Press the dispense switch to ensure no more ice is dispensed.

Note: There may be a sound from remaining ice, but it is not a problem as long as no ice is dispensed.

(7) Refit the bucket holder, drain pan and grille.

Note: Make sure that the drain pan is inserted fully into place.

(8) Press the ice, ice & water or water switch to reset the continuous dispensing mode.

(9) Remove the front cover.

(10) Make sure that the “DRAIN” in the lower right of the display does not illuminated. Refit the front cover.

Note: If the “DRAIN” is illuminated in the display, wait until it goes off.

[Dispensing ice without using the bucket holder]

(1) Follow the instructions 1) and 2) of [Dispensing ice using the bucket holder].

(2) Press the dispense switch once to dispense all ice in the ice storage bin. Use a large container to collect ice until no more ice is dispensed. The dispense switch flashes rapidly, and ice is dispensed continuously. After 2 minutes and 20 seconds, dispensing stops automatically.

Note: If the dispense switch is pressed again while ice is being dispensed, the dispensing stops and the dispense switch flashes slowly.

(3) Follow the instructions 7), 9) to 10) of [Dispensing ice using the bucket holder].

3) Turn off the operation switch.

4) Unplug the ice dispenser.

5) Remove the top panel and storage bin cover.

6) Pour the cleaning solution carefully into the opening in the center of the storage bin (top of the evaporator) to an overflow level (surplus solution will be seen overflowing into the drain pan).

Note: The overflow will be from the water reservoir and indicates that it is full.

7) Allow the cleaning solution to stand for 10 minutes. During this time, take a small brush or a cloth and clean the inside of the storage bin with the remaining solution.

8) Refit the storage bin cover, and loosely fit the machine’s top panel.

9) Plug in the ice dispenser to make ice with the cleaning solution.

10) With the water supply tap open, move the icemaking switch to the “ON” position. Allow the machine to continue icemaking for a further 20 minutes.

11) Move the icemaking switch to the “OFF” position.

12) While the display illuminates “DRAIN” during the drain cycle of about 30 seconds, pour warm water into the storage bin to melt any ice down the drain.

Note: 1. If the machine has heavy deposits of scale, repeat the complete cleaning procedure.

2. Do not increase the proportion of cleaning solution to shorten cleaning times, as this may lock the auger when completing item 7).

<STEP 3>

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

Use 2.8 litres of the sanitising solution to sanitise the ice dispenser.

13) Unplug the ice dispenser.

14) Remove the top panel and storage bin cover.

15) Pour the sanitising solution carefully into the reservoir through the opening in the center of the storage bin up to an overflow level.

16) Wait for 10 minutes. During this time, use a clean cloth and some of the remaining solution to wipe the inside of the storage bin and the bin cover. (Do not fit the agitator or the drip ring.)

17) Refit the storage bin cover, and loosely fit the machine's top panel.

18) Plug in the ice dispenser to make ice with the sanitising solution.

19) With the water supply tap open, move the icemaking switch to the "ON" position. Allow the machine to continue icemaking for a further 20 minutes.

20) Move the icemaking switch to the "OFF" position.

21) While the display illuminates "DRAIN" during the drain cycle of about 30 seconds, pour clean warm water carefully into the bin to melt any ice and into the opening in the center to an overflow level. Be careful not to wet the bin control switch on the storage bin cover.

22) Unplug the ice dispenser.

23) Remove the top panel and storage bin cover.

24) Remove the agitator by unscrewing counterclockwise. Lift out the drip ring.

25) Take a clean cloth and a pan of fresh cold water to wipe/rinse thoroughly the bin liner and storage bin cover.

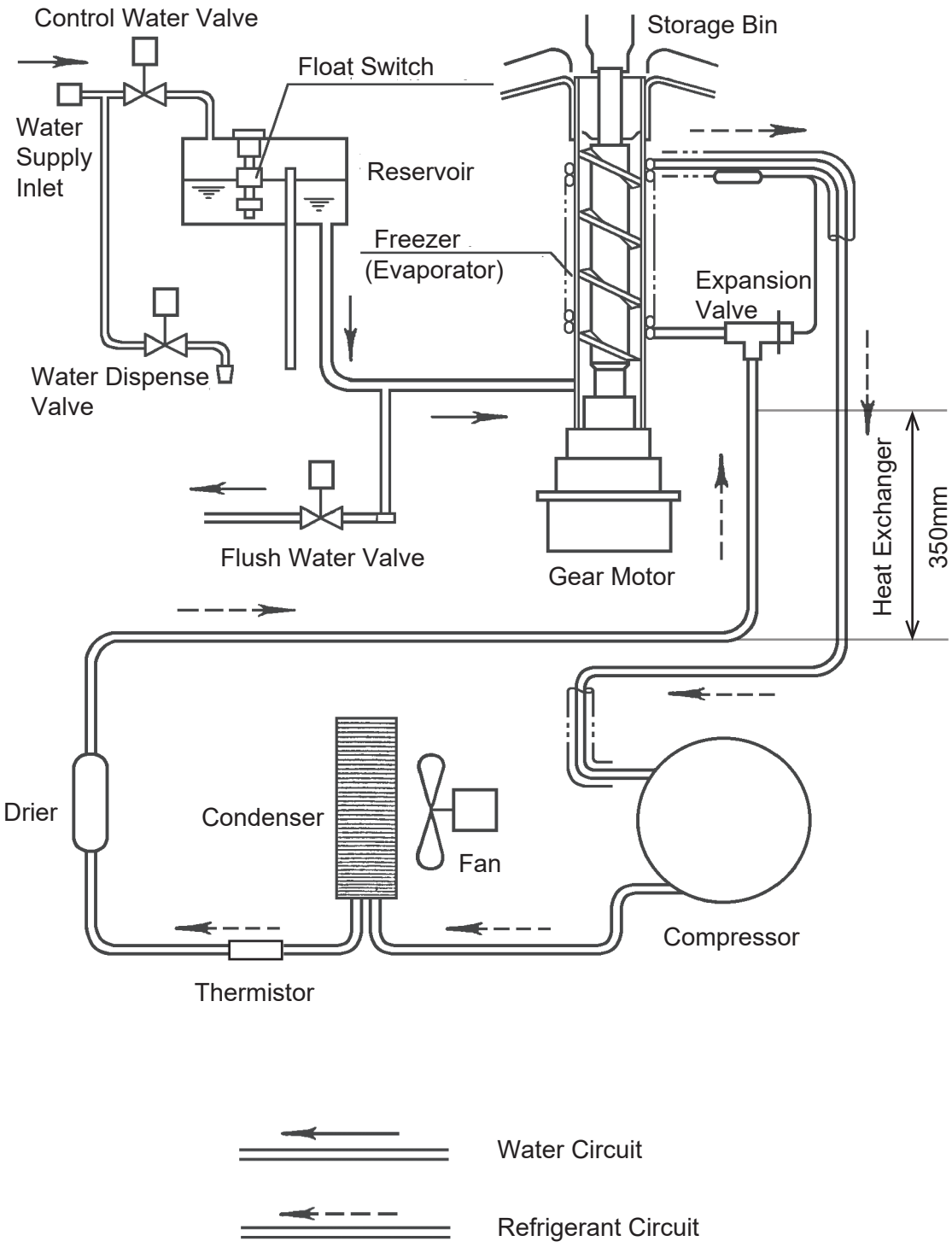
26) Wash the agitator and drip ring with a neutral cleaner. Rinse thoroughly.

27) Immerse the agitator and drip ring into the remaining sanitising solution. Rinse thoroughly.

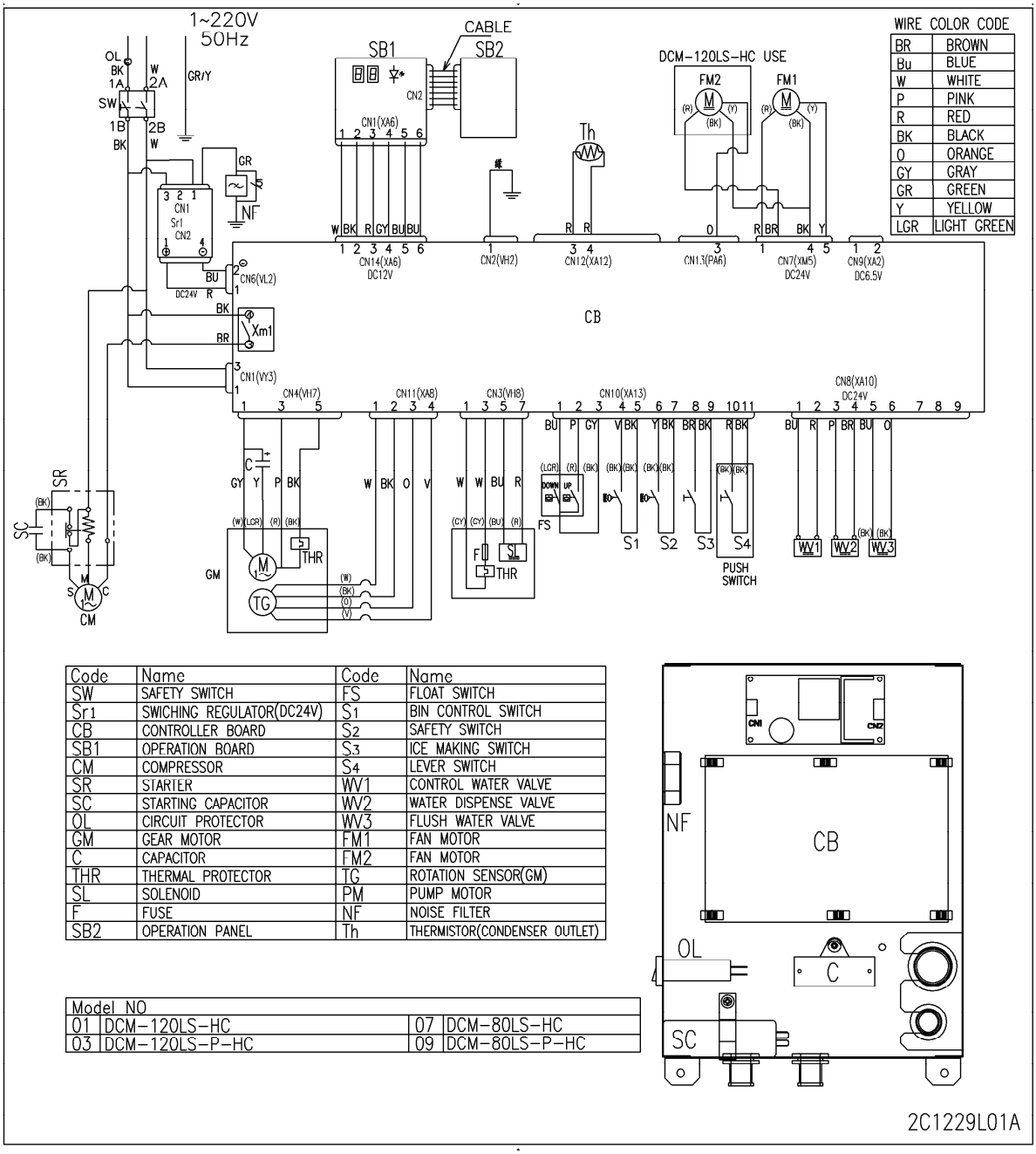
28) Refit the removed parts in reverse order.

III. TECHNICAL INFORMATION

1. WATER CIRCUIT AND REFRIGERANT CIRCUIT



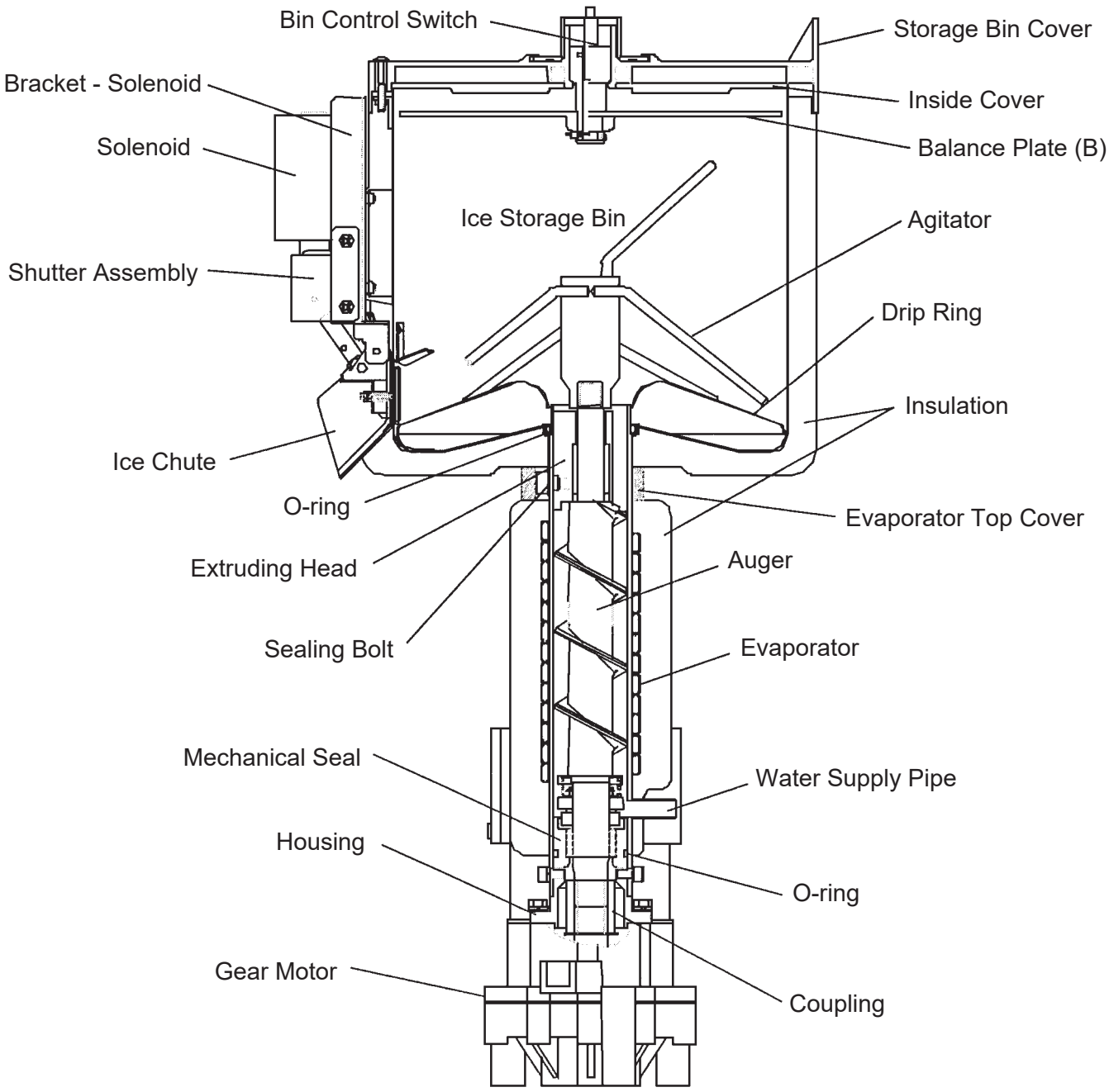
2. WIRING DIAGRAM



Code	Name	Code	Name
SW	SAFETY SWITCH	FS	FLOAT SWITCH
Sr1	SWICHING REGULATOR(DC24V)	S1	BIN CONTROL SWITCH
CB	CONTROLLER BOARD	S2	SAFETY SWITCH
SB1	OPERATION BOARD	S3	ICE MAKING SWITCH
CM	COMPRESSOR	S4	LEVER SWITCH
SR	STARTER	WV1	CONTROL WATER VALVE
SC	STARTING CAPACITOR	WV2	WATER DISPENSE VALVE
OL	CIRCUIT PROTECTOR	WV3	FLUSH WATER VALVE
GM	GEAR MOTOR	FM1	FAN MOTOR
C	CAPACITOR	FM2	FAN MOTOR
THR	THERMAL PROTECTOR	TG	ROTATION SENSOR(GM)
SL	SOLENOID	PM	PUMP MOTOR
F	FUSE	NF	NOISE FILTER
SB2	OPERATION PANEL	Th	THERMISTOR(CONDENSER OUTLET)

Model NO			
01	DCM-120LS-HC	07	DCM-80LS-HC
03	DCM-120LS-P-HC	09	DCM-80LS-P-HC

3. ICEMAKING MECHANISM



[a] EVAPORATOR (CASING)

The evaporator consists of a stainless steel icemaking cylinder coiled with a refrigeration pipe and wrapped together with a polyurethane foam insulation material. Water coming from the inlet into the evaporator will be frozen into ice. The ice spout is located on top of the evaporator.

[b] AUGER

The stainless steel auger is supported by the upper and lower bearings of the evaporator and slowly rotated by the gear motor, while scraping off the ice forming on the inner wall of the cylinder and pushing up to the ice spout.

[c] EXTRUDING HEAD (BEARING)

The stainless steel extruding head is provided with a press-fit plastic bearing inside and fixed on top of the evaporator. The extruding head functions as the auger bearing and compresses the sherbet ice carried up by the auger into a column shape with the path resistance.

[d] HOUSING

The cast bronze housing is provided with a press-fit plastic bearing inside and fixed on the bottom of the evaporator for connection with the gear motor.

[e] MECHANICAL SEAL

The mechanical seal on the lower auger bearing prevents icemaking water leaks into the evaporator. The mating surfaces are made of ceramic and carbon.

[f] COUPLING (SPLINE JOINT)

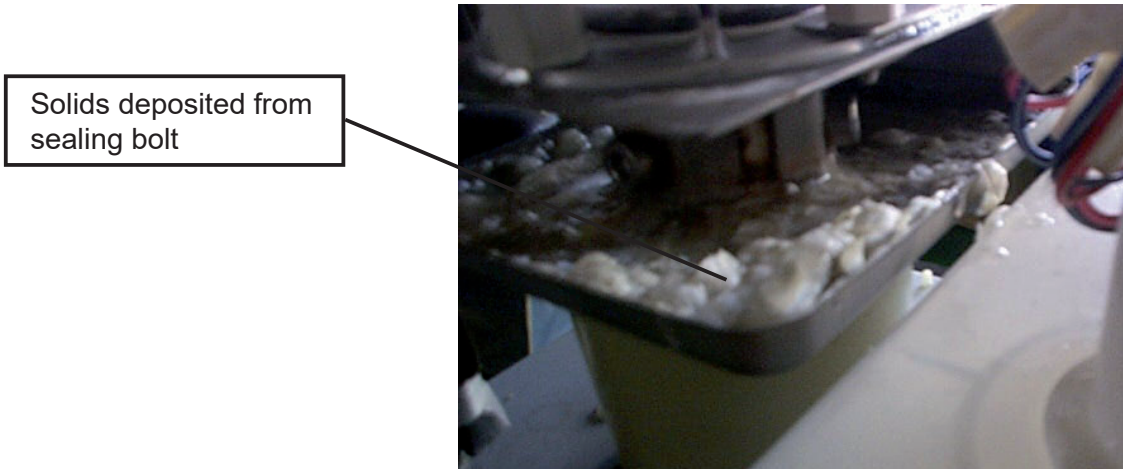
The auger bottom and gear motor output shaft are splined and connected with the spline joint.

[g] GEAR MOTOR

The gear motor consists of a 200W 1 phase 240V or 80W 1 phase 220 - 240 / 220V drive motor integrated with a decelerator and provided with a built-in auto-reset thermal protector. When the thermal protector trips, the controller board will stop the gear motor. The thermal protector trips when the gear motor mechanism is overloaded or when excessively high or low voltage is applied on the gear motor. The electrical capacity must be increased if a large current flows through the surrounding equipment.

[h] SEALING BOLT

Sometimes the icemaking operation may produce white solids on the drip pan. They are deposits of silica and calcium contents in the icemaking water leaking from the sealing bolt. The bolt is provided with retaining and sealing functions, which may be reduced by the load and vibration during a freeze cycle. Do not reuse a removed sealing bolt.



4. ELECTRIC CIRCUIT

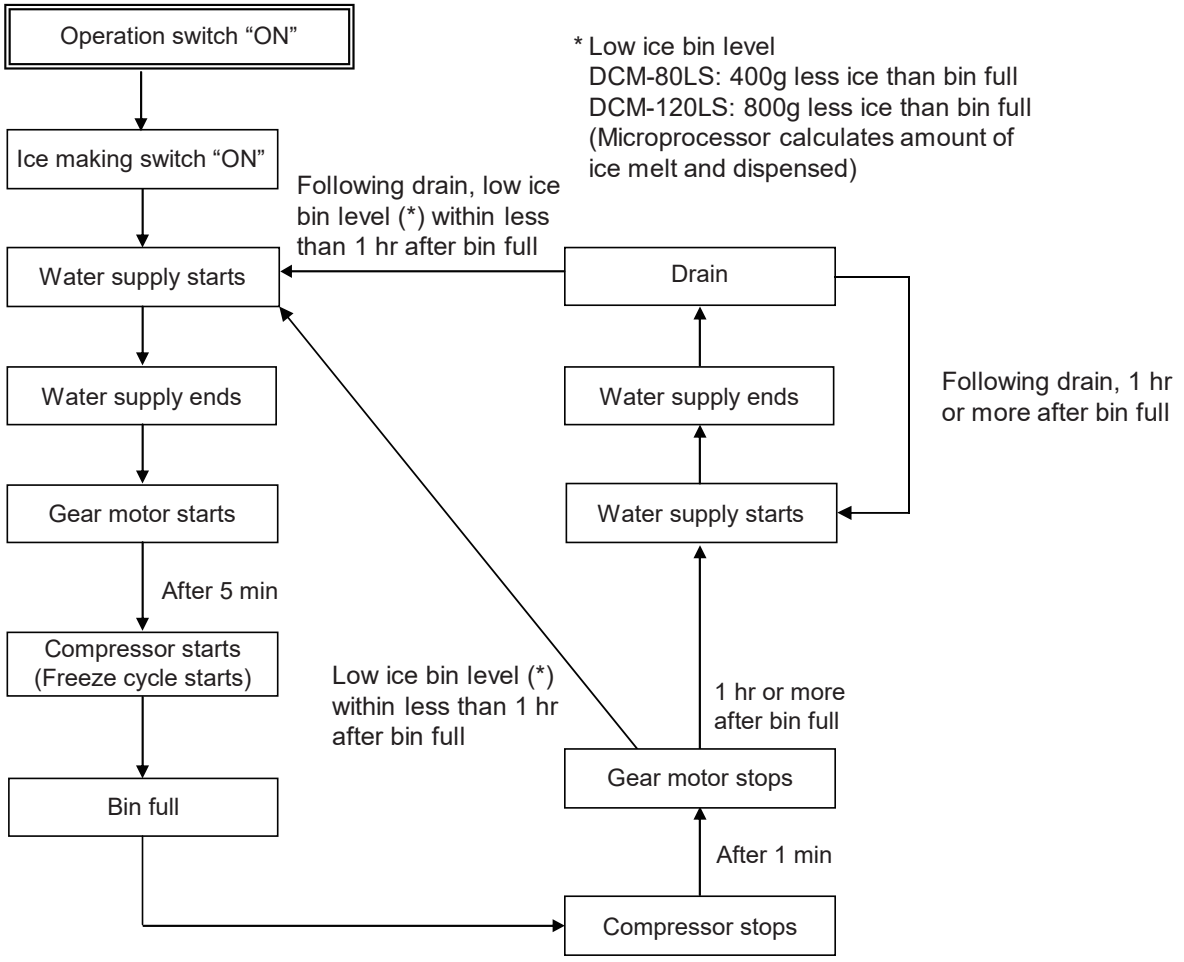
CAUTION

Reassemble all the components as they were after servicing the unit according to a service call.

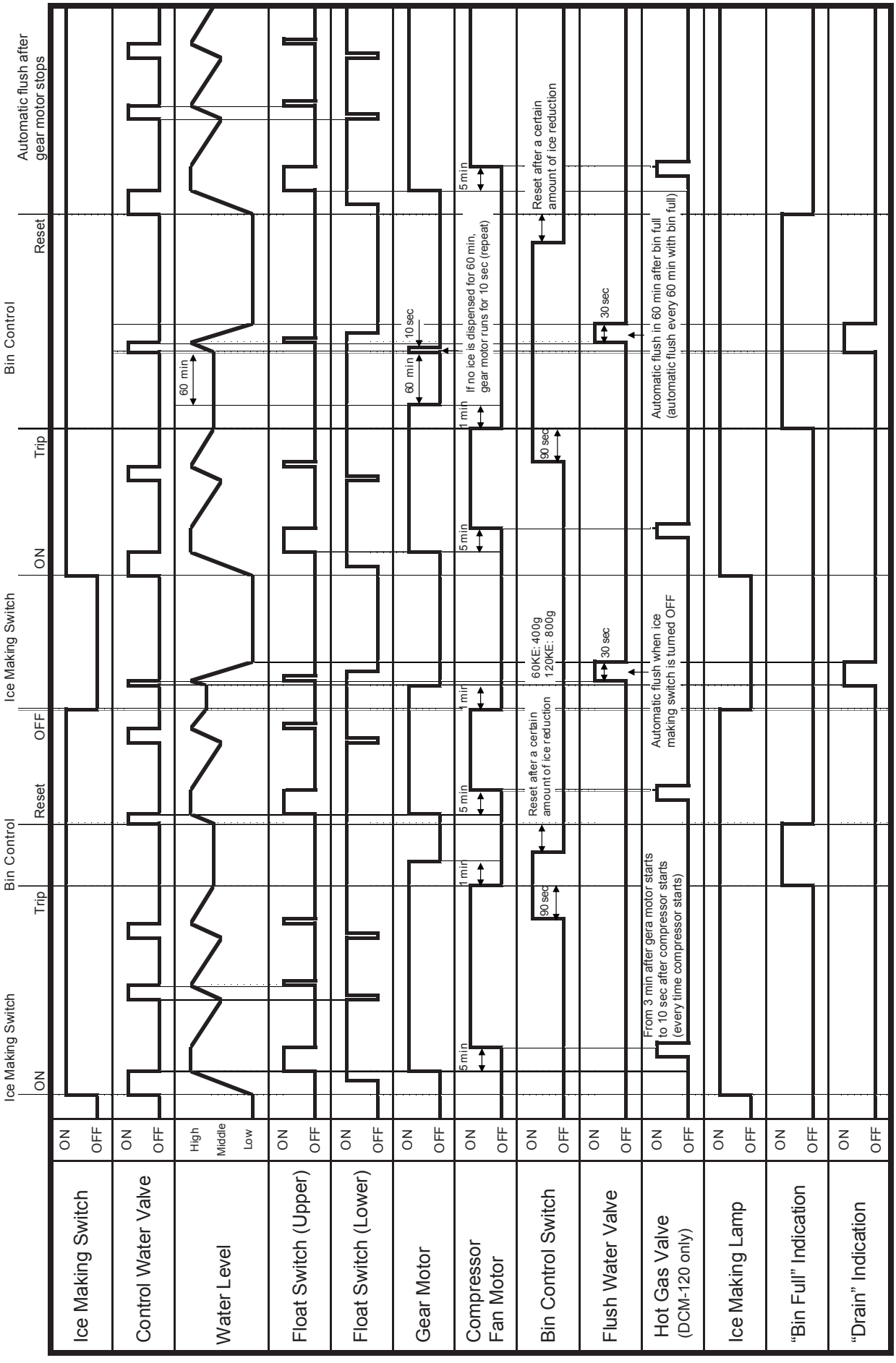
[a] BASIC OPERATION

The ice dispenser starts water supply when the operation switch and icemaking switch are moved to the “ON” position. On completion of water supply, the gear motor starts immediately. After 5 minutes the compressor starts to begin icemaking operation.

In normal operation, the ice dispenser shuts down when the storage bin fills up to trip the bin control switch or the icemaking switch is moved to the “OFF” position.



[b] TIMING CHART



5. OPERATION BOARD

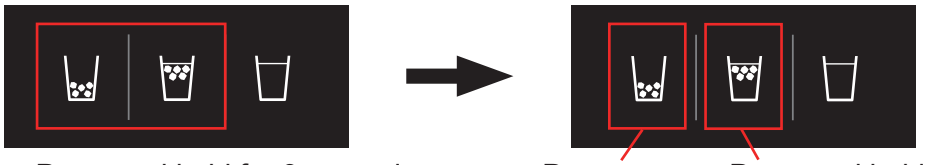
[a] DISPLAYING COMPRESSOR OPERATING HOURS

Press and hold for 3 seconds.

1) Remove the front cover.
2) Press and hold the ice switch and ice & water switch.
3) After 3 seconds, the display shows the compressor operating hours.

Note: The display shows the compressor operating hours in six digits divided into three parts (two digits for 2 seconds each time).
Then, "- -" appears in the display (to show the end of the compressor operating hours display mode).
e.g. 3527 hours = "00", "35", "27", "- -"

[b] DISPLAYING CYCLE TIME



Press and hold for 3 seconds. Press once. Press and hold.

1) Remove the front cover.
2) Press and hold the ice switch and ice & water switch.
3) After 3 seconds, the display shows the compressor operating hours.
4) While still holding down the ice & water switch, press the ice switch once.
5) The display shows the cycle time.

Note: The display shows the cycle time in four digits divided into two parts (first minutes then seconds, for 2 seconds each time) from the latest record (5 records at maximum).
Then, "- -" appears in the display (to show the end of the cycle time display mode).
If no cycle time is recorded, the display shows "- -" only.

Minutes are indicated as follows:

o 0 to 9 = 0 to 9 minutes
A 0 to 9 = 10 to 19 minutes
b 0 to 9 = 20 to 29 minutes
C 0 to 9 = 30 to 39 minutes
d 0 to 9 = 40 to 49 minutes
E 0 to 9 = 50 to 59 minutes

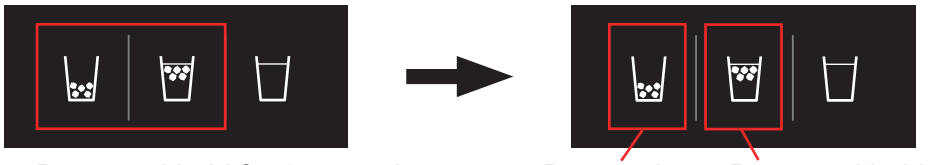
Seconds are indicated as 0 to 5 0 to 9.

e.g. o9 48 = 9 minutes 48 seconds b7 36 = 27 minutes 36 seconds

By using the freeze cycle time, **approximate ice production capacity** can be calculated.

Ice production capacity (kg/d) = 28,000 / cycle time (sec)

[c] DISPLAYING MODEL NUMBER



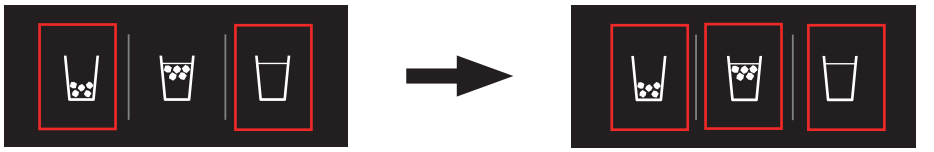
Press and hold for 3 seconds. Press twice. Press and hold.

1) Remove the front cover.
2) Press and hold the ice switch and ice & water switch.
2) After 3 seconds, the display shows the compressor operating hours.
3) While still holding down the ice & water switch, press the ice switch twice.
4) The display shows the model number.

Note: The display shows two digits.
* The model number is specified on the wiring label.

[d] SETTING MODEL NUMBER

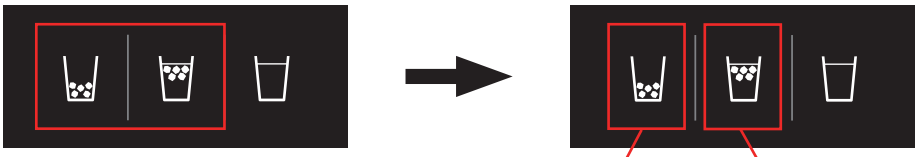
The model number setting is required at the time of replacement of the controller board (not required at the time of replacement of the operation board only).
Without this setting, the ice dispenser will display “77” and will not work.
Check the model number specified on the wiring label. Improper setting may result in failure or inoperability. Check for the correct model number after this setting.



After indications light up, press and hold. Decrease Set Increase

1) Remove the front cover, and turn on the operation switch.
2) Press and hold the ice switch and water switch within 3 seconds after all the indications light up.
   Note: The switches do not work before the indications light up.
3) The display shows current model number, and the ice switch, ice & water switch and water switch flash.
4) Press the water switch to increase the number, or press the ice switch to decrease the number until it matches the desired number.
5) Press the ice & water switch to complete the setting.

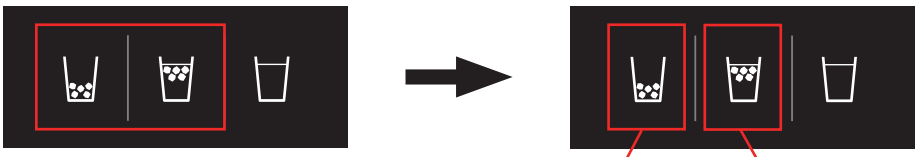
[e] DISPLAYING CONTROLLER BOARD SOFTWARE VERSION



1) Remove the front cover.
2) Press and hold the ice switch and ice & water switch.
3) After 3 seconds, the display shows the compressor operating hours.
4) While still holding down the ice & water switch, press the ice switch three times.
5) The display shows the software version of controller board.

Note: The display shows the software version divided in three parts.
e.g. Ver. 1-1-1 = “ 1”, “-1”, “-1”

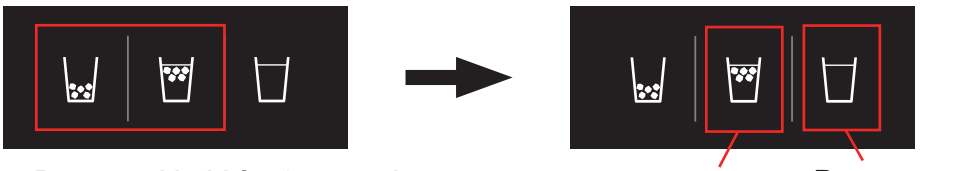
[f] DISPLAYING OPERATION BOARD SOFTWARE VERSION



1) Remove the front cover
2) Press and hold the ice switch and ice & water switch.
3) After 3 seconds, the display shows the compressor operating hours.
4) While still holding down the ice & water switch, press the ice switch four times.
5) The display shows the software version of operation board.

Note: The display shows the software version divided in three parts.
e.g. Ver. 1-0-0 = “ 1”, “-0”, “-0”

[g] DISPLAYING ERROR LOG AND ONGOING ERROR



1) Remove the front cover.
2) Press and hold the ice switch and ice & water switch.
3) After 3 seconds, the display shows the compressor operating hours.
4) While still holding down the ice & water switch, press the water switch once.
5) The display shows error log.
6) When the display shows “- -” to indicate the end of the error log display mode, press the water switch once.
7) The display shows ongoing errors including hidden errors.

Note: 1. The display shows up to eight errors from the latest error.
2. If there is no error log, the display shows "- -".
3. Ongoing errors appear from the smallest error code, not from the latest error.

[h] RESETTING ERROR LOG

Press and hold after indications light up.

1) Remove the front cover, and turn on the operation switch.
2) Press and hold the ice & water switch and water switch within 3 seconds after all the indications light up.
   Note: The switches do not work before the indications light up.
2) The display shows "E_", and error log is reset.

[i] REDUCING COMPRESSOR STARTING TIME

Press and hold after indications light up.

1) Remove the front cover, and turn on the operation switch.
2) Press and hold the ice & water switch within 3 seconds after all the indications light up.
   Note: The switches do not work before the indications light up.
3) The display shows the model number, and the compressor starts running.

Note: The compressor startup delay time is reduced from 5 minutes to 2 minutes.

[j] RESETTING COMPRESSOR OPERATING HOURS

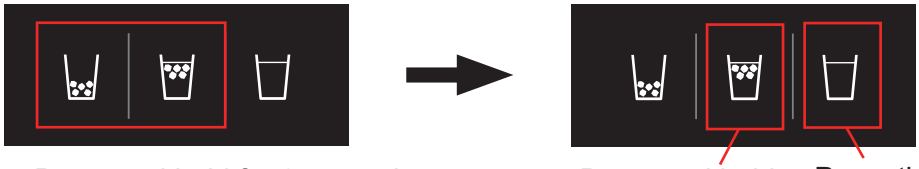
Note: This operation should be performed only after the periodic replacement.

Press and hold after indications light up.

1) Remove the front cover, and turn on the operation switch.
2) Press and hold the ice switch and ice & water switch within 3 seconds after all the indications light up.
   Note: The switches do not work before the indications light up.
3) The display shows "C_" and then the model number.
4) Turn off the operation switch.
5) The compressor operating hours are reset.

Note: Be sure to turn off the operation switch once, otherwise malfunction may occur.

[k] DISPLAYING NUMBER OF TIMES TURNING OFF ICEMAKING SWITCH



Press and hold for 3 seconds. Press and hold. Press three times.

1) Remove the front cover.
2) Press and hold the ice switch and ice & water switch.
3) After 3 seconds, the display shows the compressor operating hours.
4) While still holding down the ice & water switch, press the water switch three times. If the error log is being displayed, wait until “- -” appears in the display to show the end of the indication.
5) The display shows the number of times turning off the icemaking switch (continuous ice dispensing is included).

Note: The display shows the number of times in four digits divided into two parts.
Then, “- -” appears in the display to show the end of the indication.
e.g. 1234 times = “12”, “34”, “- -”

Even if the icemaking switch is ON, continuous ice dispensing is available, and ice production will automatically stop.

6. ERROR CODES

Interlock Errors

Code	Error	Condition	Operation	Reset	Check/Repair
10	Low Ice Production	Interval between reservoir water supplies exceeds: DCM-80LS(-P)-HC 1st freeze cycle 40 minutes 2nd cycle or later 20 minutes DCM-120LS(-P)-HC 1st freeze cycle 30 minutes 2nd cycle or later 15 minutes	Whole unit stops, then automatically restarts. Dispensing available.	Error record only.	Inlet hose clogged or deformed, water leak from water valve connection, gas leak, refrigeration parts clogged (drier, expansion valve), condenser/filter clogged, fan motor, float switch, compressor overload relay tripped (DCM-80LS(-P)-HC: 145°C, DCM-120LS(-P)-HC: 115°C)
11	Icemaking Water Leak	After initial water supply, float switch trips at lower float level within 5 minutes after gear motor starts and before compressor starts.	Whole unit stops. Flush water valve turns ON for 1 second, then turns OFF. Unit restarts.	Error record only.	Water leak from water circuit (reservoir, hoses, mechanical seal, flush water valve), float switch
14	Float Switch Error	Float switch trips at both upper and lower float levels for 2 seconds.	Icemaking lamp flashes. Whole unit stops. Water is forcibly supplied for 30 seconds. Dispensing not available during forced water supply.	Automatically resets after 30 seconds.	Float switch
16	High Pressure Error	Condenser thermistor reads higher than set point for 2 minutes: DCM-80LS(-P)-HC 70°C DCM-120LS(-P)-HC 64°C	Icemaking lamp flashes. Whole unit stops. Dispensing not available.	Automatically resets after thermistor reads lower than set point: DCM-80LS(-P)-HC 55°C DCM-120LS(-P)-HC 49°C	Condenser/filter clogged, fan motor (bad contacts, open circuit, rotation failure), installation conditions (ambient temp, air inlet/outlet), condenser thermistor installation
17	Gear Motor Lock	While gear motor is running (at least 10 seconds after gear motor starts), voltage detection signal is not input to controller board.	Icemaking lamp flashes. Whole unit stops. Dispensing not available. Icemaking operation restarts after stored ice decreases by 800g (120LS) or 400g (80LS).	Automatically resets after 15 minutes.	Gear motor locked or thermal protector tripped due to overload (auger and evaporator stuck, evaporator/fixed blade dirty, evaporator frozen, abnormal power supply, low ambient/water temp, ice sticking in storage bin, agitator motor deformed), controller board (gear motor circuit, rotation sensor detection circuit), gear motor/rotation sensor defective
40, 41	Controller Board Error	Controller board IC fails.	Service call lamp flashes. Display indicates "40" or "41". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Replace controller board.

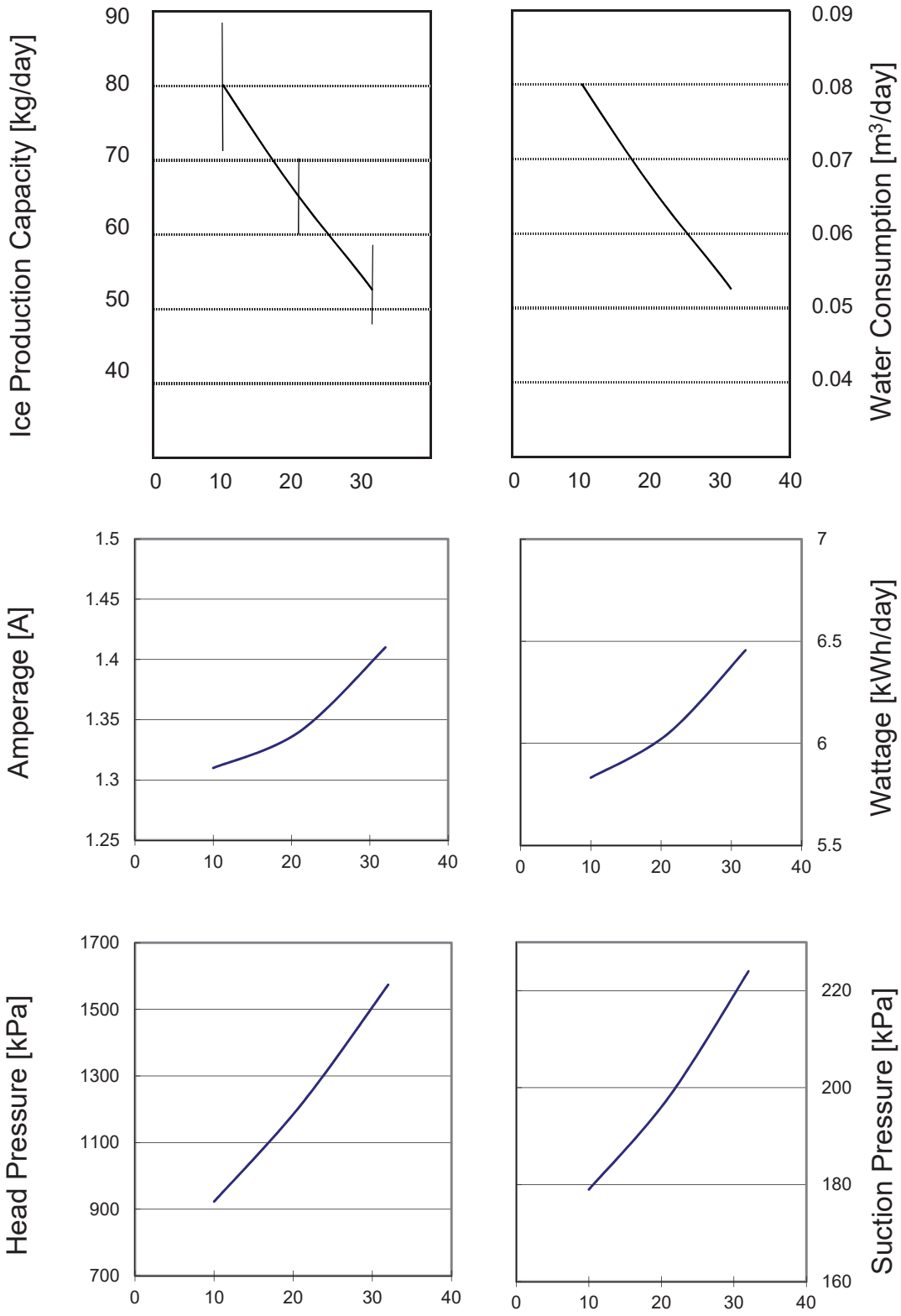
Code	Error	Condition	Operation	Reset	Check/Repair
43	Operation Board Communication Error	Operation board fails to communicate with controller board for more than 1 second.	No error indication due to communication error. Error record only. Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Controller board, operation board, communication line between operation board and controller board
46	High Pressure Error	Error 16 occurs 5 times in 1 hour of compressor operation.	Service call lamp flashes. Display indicates "46". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON (only error indication resets) Restarts after thermistor reads lower than set point: DCM-80LS(-P)-HC 55°C DCM-120LS(-P)-HC 49°C	Refrigeration parts clogged (drier, expansion valve), condenser/filter clogged, fan motor, thermistor, controller board
60	Low Ice Production	Error 10 occurs 2 times in a row.	Service call lamp flashes. Display indicates "60". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Inlet hose clogged/ deformed, water leak from water valve connection, gas leak, refrigeration parts clogged (drier, expansion valve), condenser/filter clogged, fan motor, float switch, compressor overload relay tripped
65	Fan Lock Error	Condenser fan motor is ON, but fan rotation signal is not input to controller board.	Service call lamp flashes. Display indicates "65". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON (only error indication resets) Restarts after 30 minutes.	Fan motor (defective, open circuit), controller board
67	Condenser Thermistor Error	Condenser thermistor circuit is open or shorted.	Service call lamp flashes. Display indicates "67". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Condenser thermistor (defective, open circuit), controller board
70	Low Water	Float switch trips at lower float level 60 seconds after control water valve opens, or float switch trips at upper float level 90 seconds after control water valve opens.	Icemaking lamp flashes. Control water valve repeats closing for 5 minutes and opening for 30 seconds three times. Then unit shuts down. Dispensing not available.	Before shutdown, automatically resets after reservoir fills up. After shutdown, turn ON power supply.	Water supply interruption, control water valve (open circuit, connector disconnected, defective, clogged), float switch, water leak (reservoir, hoses, mechanical seal, flush water valve)
71	Water Leak	Error 11 occurs 2 times in a row.	Service call lamp flashes. Display indicates "71". Whole unit stops. Dispensing not available during shutdown.	Power supply, Turn OFF - Turn ON	Water leak from water circuit (reservoir, hoses, mechanical seal, flush water valve)

Code	Error	Condition	Operation	Reset	Check/Repair
76	Bin Control Switch Error	While compressor is running, number of water supply cycles reaches in a row: DCM-80LS(-P)-HC 12 times DCM-120LS(-P)-HC 30 times * This count is reset when ice is dispensed or compressor stops.	Service call lamp flashes. Display indicates "76". Whole unit stops. Dispensing not available	Power supply, Turn OFF - Turn ON	Bin control switch, water leak, shutter, float switch
77	Model Setting No. Error	Controller board model number is not set.	Service call lamp flashes. Display indicates "77". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Controller board model setting * This error occurs if service part is used without model number setting. * All service parts: 99 * No model number setting is required for operation board.
78	Drain Error	After drain cycle, float switch trips at lower float level and upper float level (reservoir full).	Service call lamp flashes. Display indicates "78". Unit keeps running. Dispensing available.	Power supply, Turn OFF - Turn ON (only error indication resets)	Flush water valve (defective, clogged, open circuit, connector disconnected), evaporator drain hose
94	Float Switch Error	After 30-second forced water supply by error 14, float switch trips at both upper and lower float levels for 2 seconds.	Service call lamp flashes. Display indicates "94". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Float switch (bad contacts, open circuit, defective)
95	Gear Motor Rotation Sensor Error	While gear motor is running (10 seconds after gear motor starts), rotation detection signal is not input to controller board.	Service call lamp flashes. Display indicates "95". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON * Before turning on power supply, remove sticking ice from storage bin.	Gear motor overloaded/ locked (auger and evaporator stuck, evaporator/fixed blade dirty, evaporator frozen, pump motor never stops, drive element defective, rotation detection element defective, open circuit, ice sticking in storage bin)
96	Gear Motor Drive Element Error	While gear motor is not running, rotation detection signal is input to controller board continuously for 15 seconds.	Service call lamp flashes. Display indicates "96". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON	Gear motor (rotation detection sensor, rotation detection sensor element)
97	Gear Motor Error	Reverse rotation detection signal is input to controller board.	Service call lamp flashes. Display indicates "97". Whole unit stops. Dispensing not available.	Power supply, Turn OFF - Turn ON * Before turning on power supply, remove sticking ice from storage bin.	Gear motor hunting (auger and evaporator stuck, evaporator/fixed blade dirty, evaporator frozen)

Code	Error	Condition	Operation	Reset	Check/Repair
PC	Periodic Parts Replacement	Compressor operating hours reach 20,000 hours.	[20,000 hours] Service call lamp lights up. “PC” starts flashing. [20,500 hours] Service call lamp starts flashing. Whole unit stops but can be restarted by turning OFF and ON power supply. [21,000 hours] Whole unit stops again and cannot be restarted. * When whole unit stops, no water or ice becomes available.	After replacing parts, reset compressor operating hours.	Replace periodic replacement parts.

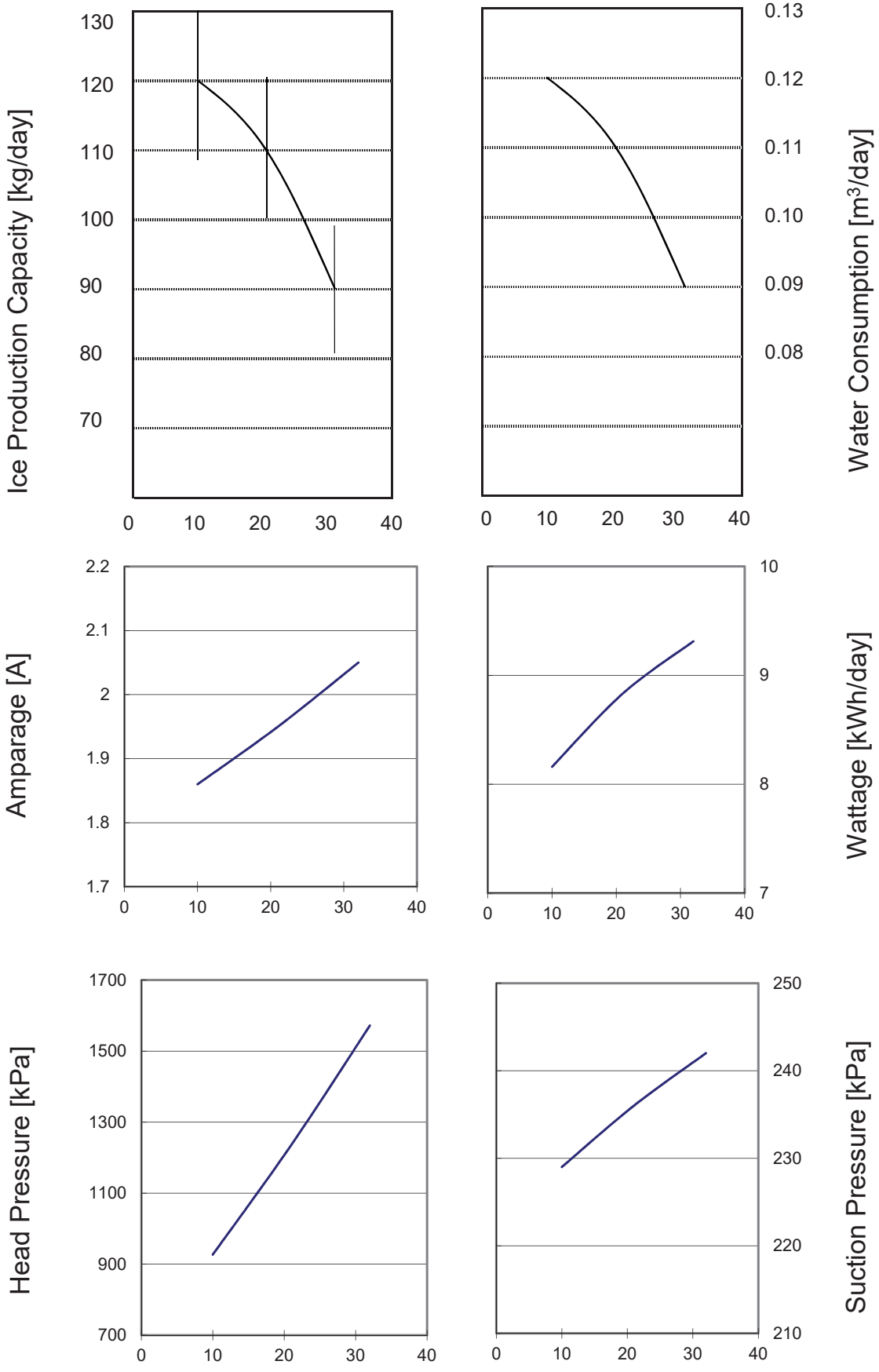
7. PERFORMANCE DATA

[a] DCM-80LS(-P)-HC: 50Hz



The horizontal axis shows the ambient temperature.
It refers to the data of at/wt=10/10, 21/15, 32/21, 40/35.

[b] DCM-120LS(-P)-HC: 50Hz



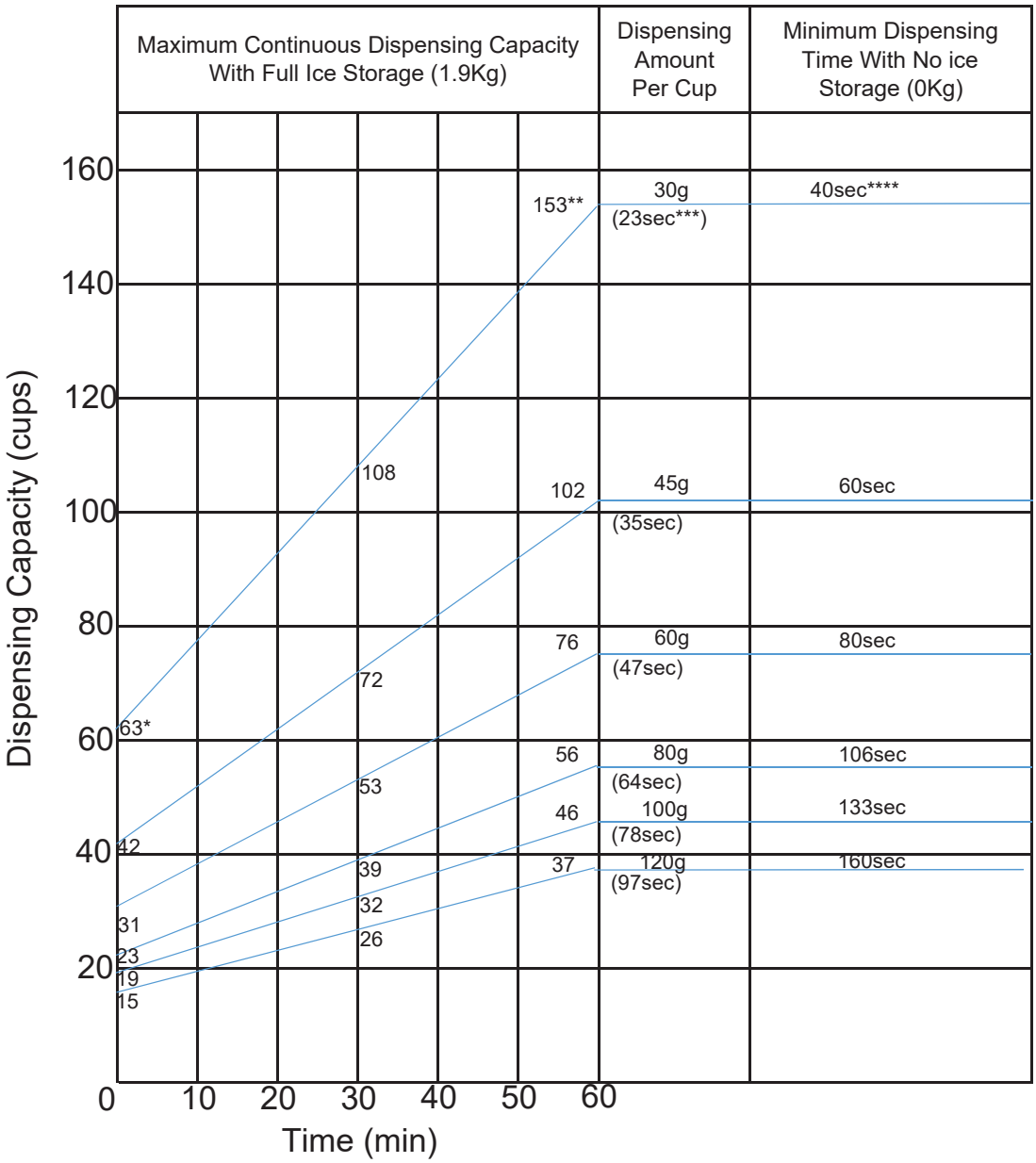
The horizontal axis shows the ambient temperature.
It refers to the data of at/wt=10/10, 21/15, 32/21, 40/35.

8. ICEMAKING CAPACITY

[a] DCM-80LS(-P)-HC: 50Hz

Ambient temperature: 21°C
Water temperature: 15°C

Ice production: 65kg/day
Storage bin capacity: 1.9kg

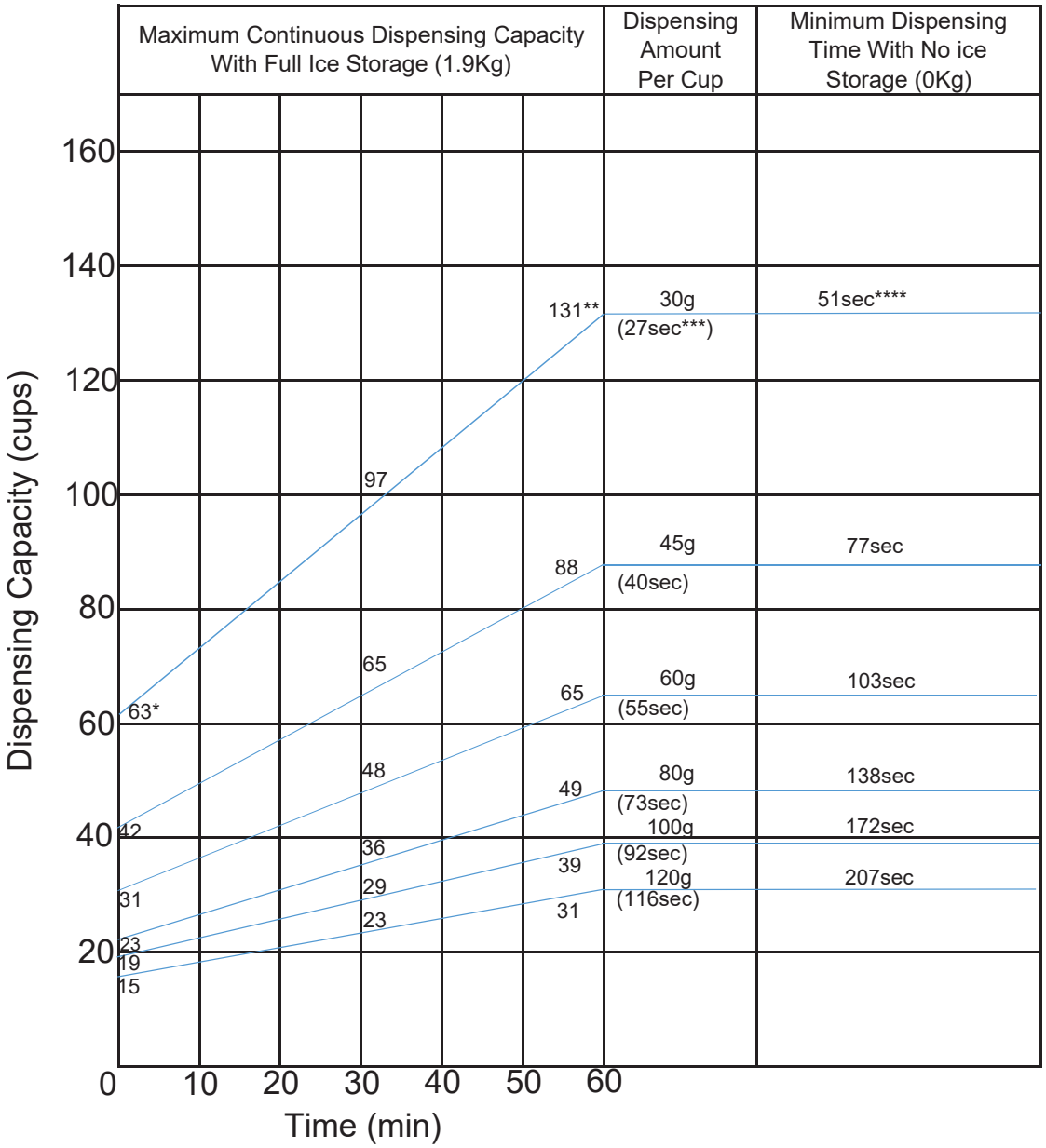


*= Storage Capacity (1900g) / Dispensing Amount Per Cup (30g)
**= {Storage Capacity (1900g) + Ice Production Per Hour (2708g)} / Dispensing Amount Per Cup (30g)
***= 3600sec. (1Hour) / Dispensing Capacity (153cups)
****= Dispensing Amount Per Cup (30g) / Ice Production Per Second (0.75g)

[b] DCM-80LS(-P)-HC: 50Hz

Ambient temperature: 32°C
Water temperature: 21°C

Ice production: 50kg/day
Storage bin capacity: 1.9kg

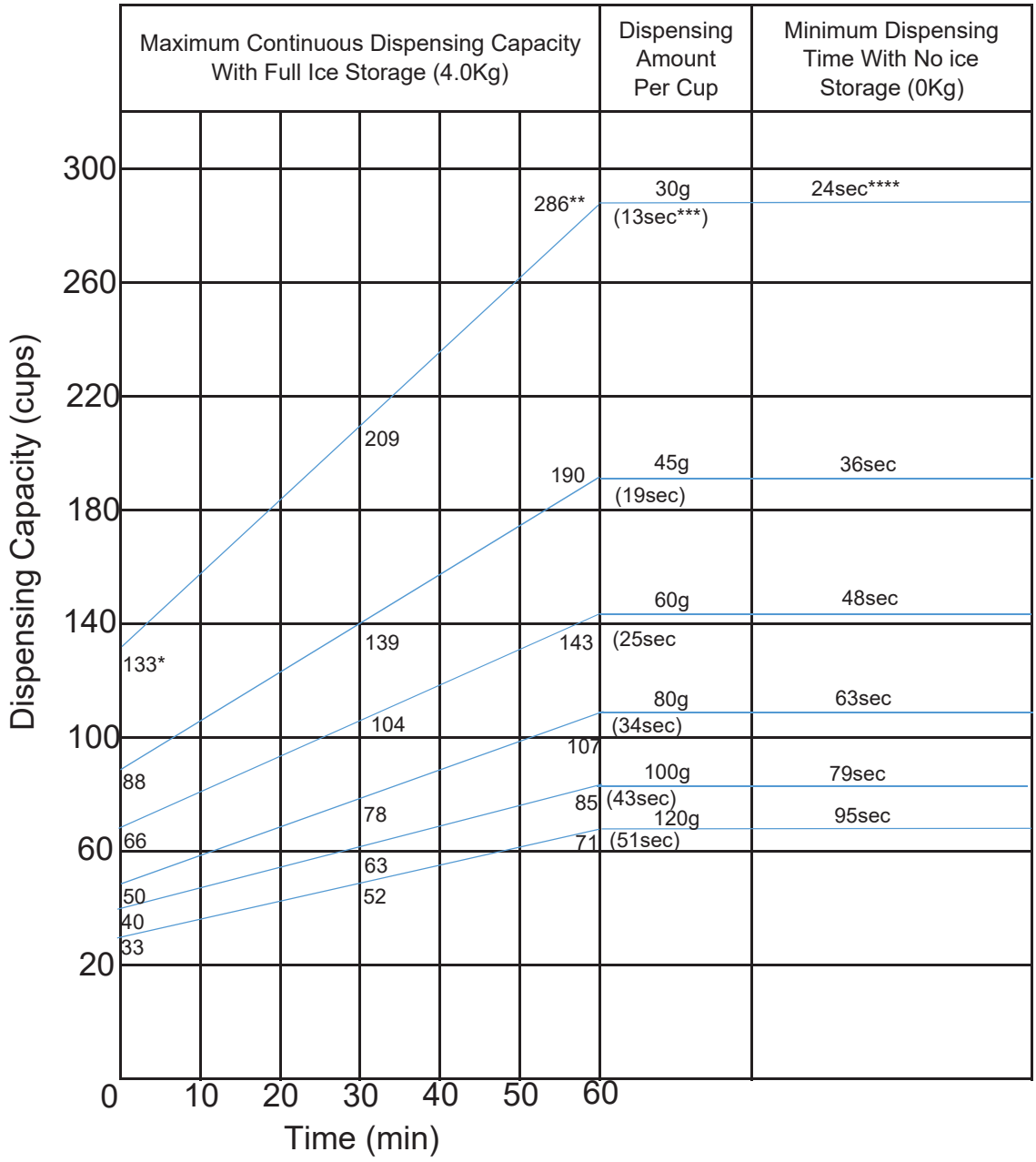


= Storage Capacity (1900g) / Dispensing Amount Per Cup (30g)
*= {Storage Capacity (1900g) + Ice Production Per Hour (2083g)} / Dispensing Amount Per Cup (30g)
**= 3600sec. (1Hour) / Dispensing Capacity (131cups)
***= Dispensing Amount Per Cup (30g) / Ice Production Per Second (0.57g)

[c] DCM-120LS(-P)-HC: 50Hz

Ambient temperature: 21°C
Water temperature: 15°C

Ice production: 110kg/day
Storage bin capacity: 4kg

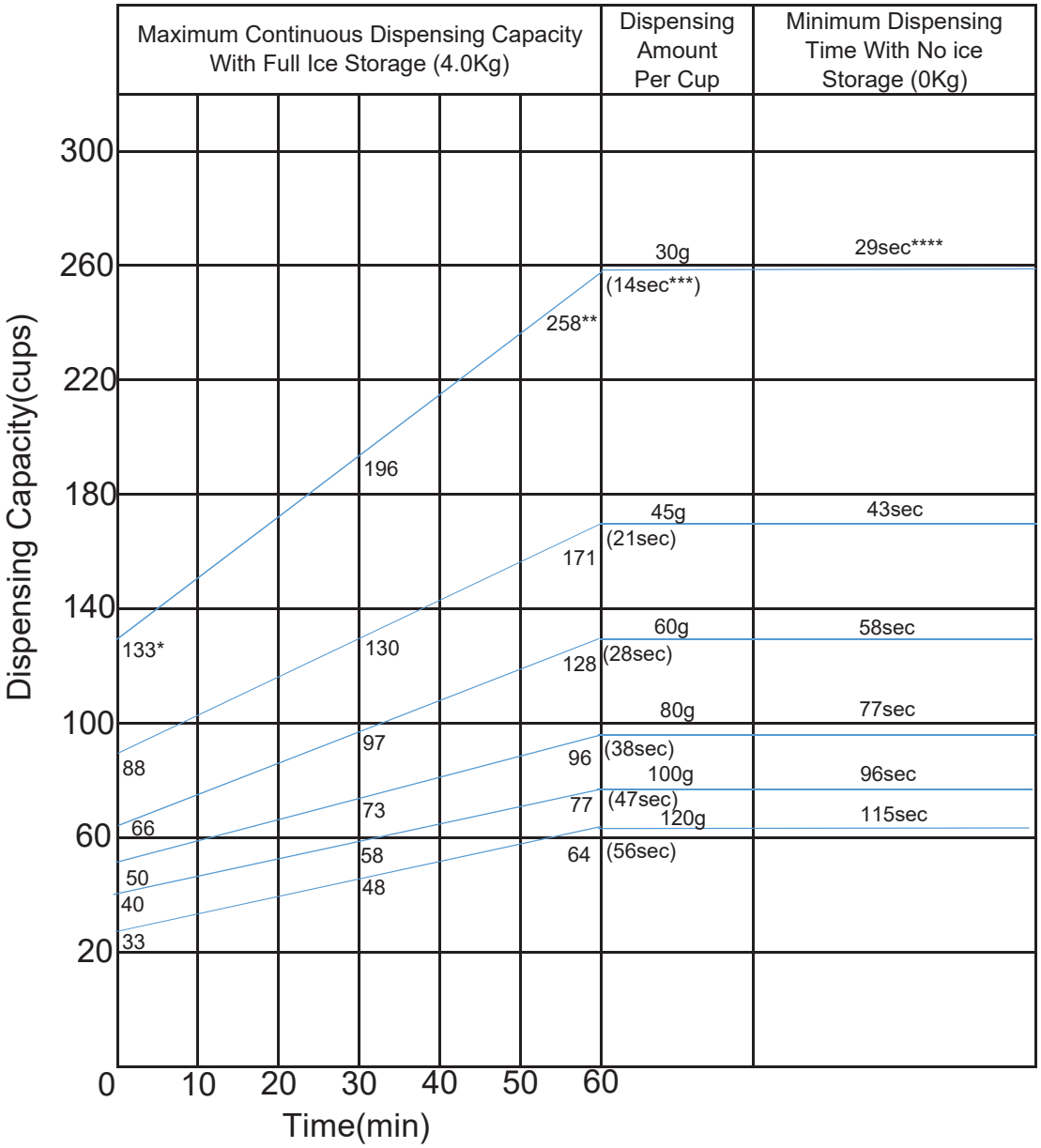


*= Storage Capacity (4000g) / Dispensing Amount Per Cup (30g)
**= {Storage Capacity (4000g) + Ice Production Per Hour (4583g)} / Dispensing Amount Per Cup (30g)
***= 3600sec. (1Hour) / Dispensing Capacity (286cups)
****= Dispensing Amount Per Cup (30g) / Ice Production Per Second (1.27g)

[d] DCM-120LS(-P)-HC: 50Hz

Ambient temperature: 32°C
Water temperature: 21°C

Ice production: 90kg/day
Storage bin capacity: 4kg



*= Storage Capacity (4000g) / Dispensing Amount Per Cup (30g)
**= {Storage Capacity (4000g) + Ice Production Per Hour (3750g)} / Dispensing Amount Per Cup (30g)
***= 3600sec. (1Hour) / Dispensing Capacity (258cups)
****= Dispensing Amount Per Cup (30g) / Ice Production Per Second (1.04g)

IV. SERVICE DIAGNOSIS

Display error records by operating the operation board (see “III. 5. [g] DISPLAYING ERROR LOG AND ONGOING ERROR”). Check for a possible cause and service the unit.

1. NO ICE PRODUCTION

PROBLEM	POSSIBLE CAUSE		REMEDY
[1] The ice dispenser will not start.	a) Power supply	1. OFF position.	1. Move to ON position.
		2. Loose connections.	2. Tighten.
		3. Bad contacts.	3. Check for continuity and replace.
		4. Blown fuse.	4. Replace.
		5. Voltage too low.	5. Get recommended voltage.
	b) Fuse	1. Blown out. No indication on operation board.	1. Locate and resolve the cause of short circuit (e.g. control water valve, flush water valve), and replace.
	c) Transformer receptacle	1. Disconnected.	1. Connect.
	d) Operation switch	1. OFF position.	1. Move to ON position.
		2. Bad contacts.	2. Check for continuity and replace.
	e) Transformer	1. Coil winding opened.	1. Replace.
	f) Water valve	1. Coil winding opened.	1. Replace.
	g) Water supply tap	1. Closed.	1. Open.
		2. Water failure.	2. After water is supplied, turn off power supply and turn it back on.
	h) Plug and receptacle (control box)	1. Disconnected.	1. Connect.
		2. Terminal out of plug or receptacle.	2. Insert terminal back in position.
	i) Overload protector	1. Tripped.	1. Reset.
	j) Model number	1. Incorrect.	1. Set correct number. See “III. 5. [d] SETTING MODEL NUMBER”.
[2] Water does not stop, and the ice dispenser will not start.	a) Water control relay (controller board)	1. Contacts fused.	1. Replace controller board.
		2. Coil winding opened.	2. Replace controller board.
	b) Float switch	1. Bad contacts.	1. Check for continuity and replace.
		2. Float does not move freely.	2. Clean or replace.
	c) Flush water valve	1. Valve seat clogged and water leaking.	1. Clean or replace.
	d) Hoses	1. Disconnected.	1. Connect.
	e) Mechanical seal	1. Water leaks.	1. Replace.
	f) Reservoir	1. Cracked.	1. Replace.
[3] Water has been supplied, but the ice dispenser will not start.	a) Bin control	1. Bad contacts.	1. Check for continuity and replace.
	b) Gear motor protector (thermal breaker)	1. Tripped.	1. Find out the cause, resolve it, and press reset button on motor protector.
	c) Controller board	1. Defective.	1. Replace.

PROBLEM	POSSIBLE CAUSE		REMEDY
[3] (Continued)	d) Condenser thermistor	1. Dirty condenser fins.	1. Clean.
		2. Ambient temperature too warm.	2. Check for recommended temperature.
		3. Fan not rotating.	3. Replace.
		4. Condenser water pressure too low or off.	4. Check and get recommended pressure.
		5. Water regulating valve clogged.	5. Clean.
		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.
	e) Gear motor protect relay	1. Coil winding opened.	1. Replace.
		2. Bad contacts.	2. Check for continuity and replace.
	f) Capacitor	1. Defective	1. Replace.
[4] Gear motor starts, but compressor will not start or operates intermittently.	a) Icemaking switch	1. OFF position	1. Move to ON position.
	b) X3 relay (controller board)	1. Bad contacts.	1. Check for continuity and replace controller board.
		2. Coil winding opened.	2. Replace controller board.
	c) Compressor	1. Loose connections.	1. Tighten.
		2. Motor winding opened or earthed.	2. Replace.
		3. Motor protector tripped.	3. Find out the cause of overheat or overcurrent.
	d) Power supply	1. Circuit ampacity too low.	1. Install a larger-sized conductor.
	e) Controller board	1. Defective.	1. Replace.
	f) Starter	1. Defective.	1. Replace.
	g) Start capacitor or run capacitor	1. Defective.	1. Replace.
[5] Gear motor and compressor start, but no ice is produced.	a) Refrigerant line	1. Gas leaks.	1. Check for leaks with a leak detector. Reweld leak, replace drier and charge with refrigerant. The amount of refrigerant is marked on nameplate or label.
		2. Refrigerant line clogged.	2. Replace the clogged component.

2. LOW ICE PRODUCTION

PROBLEM	POSSIBLE CAUSE		REMEDY
[1] Low ice production	a) Refrigerant line	1. Gas leaks.	1. See 1 - [5] - a).
		2. Refrigerant line clogged.	2. Replace the clogged component.
		3. Overcharged.	3. Recharge.
	b) High-side pressure too high	1. Dirty air filter or condenser.	1. Clean.
		2. Ambient or condenser water temperature too warm.	2. Check for recommended temperature.
		3. Fan rotating too slow.	3. Replace.
		4. Bad ventilation.	4. Remove anything blocking vents.
		5. Less than 15 cm clearance at rear, sides and top.	5. Allow proper clearance for ventilation.
	c) Expansion valve (not adjustable)	1. Low-side pressure exceeding the limit.	1. Replace.
	d) Evaporator	1. Evaporator pipe crushed.	1. Replace.

3. FAULTY DISPENSER

PROBLEM	POSSIBLE CAUSE		REMEDY
[1] No ice is dispensed.	a) Storage bin	1. Ice block or bridge.	1. Remove all ice from storage bin when not using ice dispenser for a long time.
	b) Agitator	1. Deformed due to ice block or bridge.	1. Replace.
	c) Solenoid	1. Coil winding opened.	1. Replace.
	d) Lever switch	1. Bad contacts.	1. Check for continuity and replace.
[2] No water is dispensed.	a) Water valve (dispensing)	1. Clogged filter.	1. Clean.
		2. Coil winding opened.	2. Replace.
	b) Lever switch	1. Bad contacts.	1. Check for continuity and replace.
[3] Ice keeps being dispensed.	a) Shutter	1. Faulty adjustment.	1. With shutter closed, lock shutter in place by securing with two screws at the lower part of solenoid and two screws under solenoid.
	b) Lever switch	1. Contacts fused.	1. Replace.

4. OTHERS

PROBLEM	POSSIBLE CAUSE		REMEDY
[1] Abnormal noise	a) Fan motor (condenser unit)	1. Bearing worn out.	1. Replace.
		2. Fan blade deformed.	2. Replace fan blade.
		3. Fan blade does not move freely.	3. Replace.
	b) Compressor	1. Bearings worn out, or cylinder valve defective.	1. Replace.
		2. Mounting pad out of position.	2. Reinstall.
	c) Refrigerant lines	1. Rub or touch lines or other surfaces.	1. Replace.
	d) Gear motor (icemaking)	1. Bearing or gear wear/damage.	1. Replace.
	e) Evaporator	1. Low-side pressure too low.	1. See if expansion valve bulb is mounted properly, and replace the valve if necessary.
		2. Scale on inside wall of freezing cylinder.	2. Remove auger. Use a solution of lime removing cleaner to clean periodically. If water is found to surpass the following levels, install a conditioner. Hardness 50 ppm Silica 30 ppm
[2] Overflow from reservoir (Water does not stop.)	a) Water supply	1. Water pressure too high.	1. Install a pressure reducing valve.
	b) Water valve	1. Diaphragm does not close.	1. Clean or replace.
	c) Float switch	1. Bad contacts.	1. Check for continuity and replace.
[3] Gear motor protector operates frequently.	a) Power supply voltage	1. Too high or too low.	1. Connect the unit to a power supply of proper voltage.
	b) Evaporator assy	1. Bearings or auger worn out.	1. Replace bearing or auger.

V. REMOVAL AND REPLACEMENT

1. EXTERIOR

[a] TOP PANEL AND SIDE PANEL

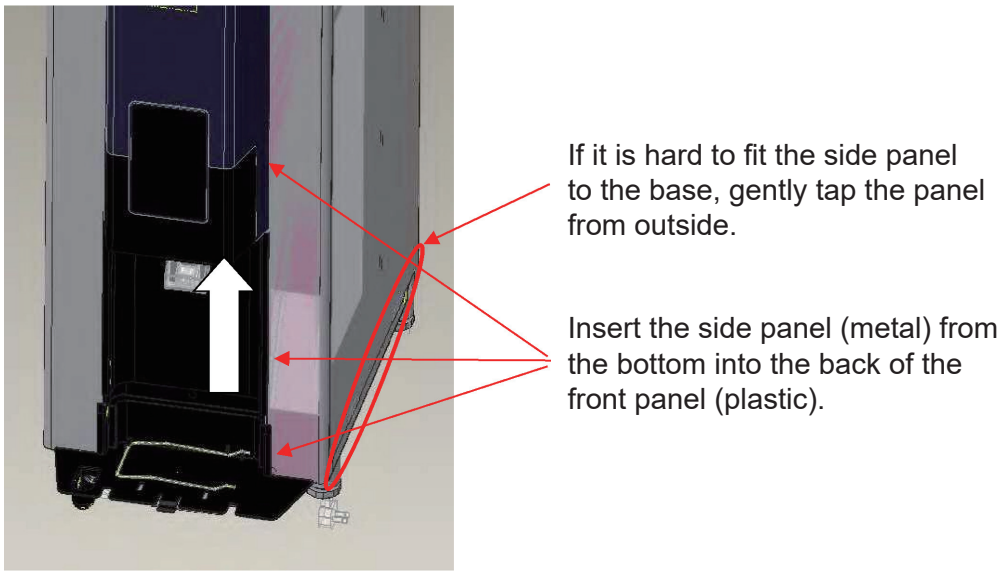
[Removal]

1) Remove the four screws securing the top panel.
2) Lift off the left side panel (no screws attached).
3) Lift off the right side panel (no screws attached).

[Replacement]

Replace the removed parts in the reverse order of which they were removed.

1) Remove the drain pan at the unit front.
2) Fit the hole at the bottom of the right side panel onto the base projection. If it is hard to fit, gently tap the bottom of the side panel from outside.
3) Insert the right side panel end into the backside of the front panel. If it is hard to insert the side panel end into the front panel (UP), twist the front panel (UP) clockwise from above to make a gap, or slightly lift the front panel (UP).



4) Hook the three projections on the left side panel end into the holes in the right side panel.
5) Fit the hole at the bottom of the left side panel onto the base projection.
6) Insert the left side panel end into the backside of the front panel. If it is hard to insert the side panel end into the front panel (UP), twist the front panel (UP) counterclockwise from above to make a gap, or slightly lift the front panel (UP).

7) Fit the top panel over the side panels and secure them with screws. Make sure that the top panel fits over the outside of side panels.

8) Refit the drain pan.

[b] FRONT PANEL

If possible, remove the side panels before removing the front panels. When removing the front panels without removing the side panels, follow the instructions below.

- When removing the plastic parts, do not apply excessive force. It may break or damage the securing point of the plastic parts.

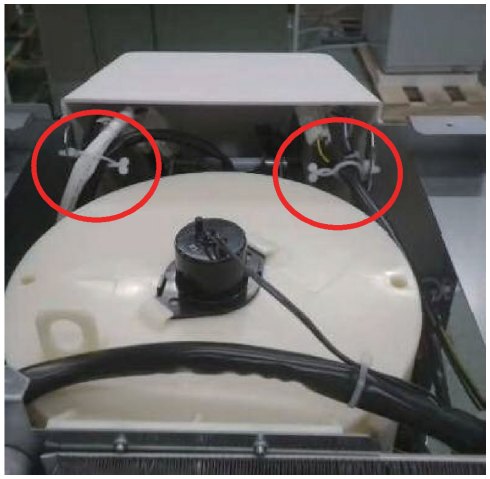
- Bind the connectors and drain hose as they were.

[Removal of front panel (UP)]

1) Remove the front cover and spout.

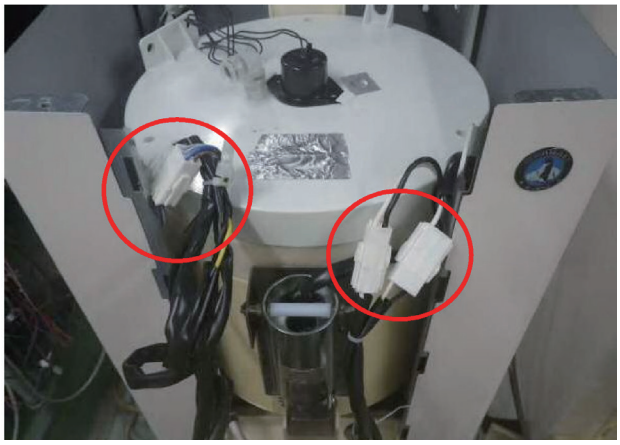
2) Remove the top panel.

3) Remove the two wire retainers (view from the backside).



4) Lift the front panel to unhook. Be careful not to break the hook tabs.

5) Disconnect the four connectors.

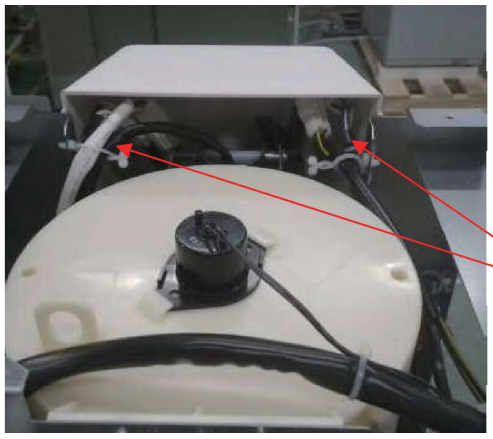


[Replacement of front panel (UP)]

Replace the removed parts in the reverse order of which they were removed.

- Before installing the front panel, put the water pipe through the front panel.

- When securing the electric wires with wire retainers, make sure that the bare wires do not contact the metal edges and the connectors do not contact the storage bin.



Make sure that the electric wires (except protective tubes and connectors are not included) do not contact the metal edges.

[Removal of front panel (LO)]

1) Remove the drain pan.

2) Remove the hose clamp from the black drain hose at the unit bottom.

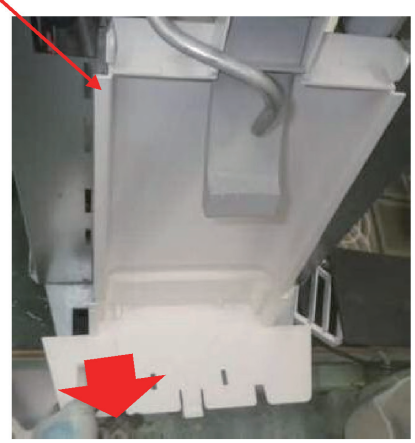
3) Push the two tabs and slightly pull the front panel toward you. To avoid excessive load, do not tilt the panel too much.

4) Push up the plastic projection from the round hole in the metal base and pull the front panel (LO) toward you while tilting its entire part diagonally. Make sure to fully push up the projection to avoid damaging it.

Remove the front panel (LO) by tilting it diagonally without pulling the top toward you.

(Bottom View)

(Front View)



5) The reed switch is connected for the lever type models. If necessary, remove the screws to disconnect the reed switch. If the side panels are not attached, disconnect the connector.

(View without Front Panels)

WARNING

Only trained service engineer can service the R290 refrigeration unit.

2. SERVICE FOR REFRIGERANT LINES

[a] SERVICE INFORMATION

1) Allowable Compressor Opening Time and Prevention of Lubricant Mixture [R290]

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 [R290]

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 R290 has possibly drawn in air, the drier must be replaced. Be sure to use a drier designed for R290.

3) Handling of Handy Flux [R290]

Brazing is needed to connect the refrigeration circuit pipes. 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 [R290]

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 R290

Some parts used for refrigerants other than R290 are similar to those for R290. But never use any parts unless they are specified for R290 because their endurance against the refrigerant has not been evaluated. Also, for R290, do not use any parts that have been used for other refrigerants. Otherwise, wax and chlorine remaining on the parts may adversely affect the R290.

6) Replacement Copper Tubing [R290]

The copper tubes currently in use are suitable for R290. 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 [R290]

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 R290.

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 R290 to suddenly react with oxygen and explode. Be sure to use nitrogen to prevent explosion.

[b] REFRIGERANT RECOVERY

WARNING

Do not recover the R290 refrigerant in a refrigerant recovery cylinder for R404A or R134a.

The R290 refrigerant has almost no effect on global warming, so can be released to outdoors atmosphere without risk to the environment. Recovery should only be considered if the unit cannot be taken outdoors to evacuate the circuit.
If R290 is recovered in a refrigerant recovery cylinder for R404A or R134a, there is a risk of ignition and a refrigerant destruction operator may reject collection.

[c] REFRIGERANT REMOVAL

WARNING

Remove the R290 refrigerant from the unit in an area well-ventilated and free from open flames.

When removing the refrigerant from the unit, be sure the surrounding area is well-ventilated and free from open flames. Discharge refrigerant in small amounts into the atmosphere. If the surrounding area is not well-ventilated and exposed to open flames, recover the refrigerant in a refrigerant recovery cylinder and discharge it in small amounts into the atmosphere outdoors.

[d] EVACUATION AND RECHARGE

1) Attach charging hoses, service manifold and vacuum pump to the low-side and high-side (to be fitted by service engineer) access valves.

2) Turn on the vacuum pump.

3) Allow the vacuum pump to pull down to a 760 mmHg vacuum. Evacuating period depends on the pump capacity.

4) Close the low-side and high-side valves on the service manifold.

5) Disconnect the vacuum pump, and attach a refrigerant charging cylinder to accurately weigh in the liquid charge. Remember to purge any air from the charging hose. See the nameplate for the required refrigerant charge.

6) Open the high-side valve on the gauge manifold, and accurately measure in the liquid charge. Close the valve on the charging cylinder before closing the high-side manifold valve. Any remaining liquid in the line can be charged into the low side.

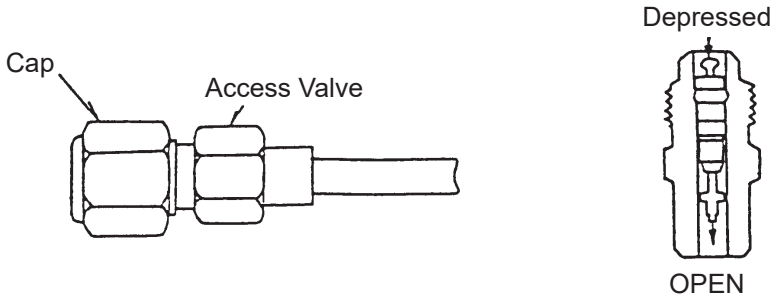
7) Do not charge more than 150 g of R290.

8) 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.

9) Always cap the access valves to prevent a refrigerant leak.

10) Always thoroughly leak test all joints and valve caps.

11) Avoid charging large quantities of liquid into the low side in case of damage to the compressor.



3. WELDING REPAIR FOR R290 REFRIGERATION CIRCUIT

1) Make sure the surrounding area of the unit to be repaired is free from ignition sources.

2) Open the window or operate the ventilator to make the surrounding area well-ventilated.

3) Connect the piercing valve. Recover the refrigerant in the specified manner or discharge it into the atmosphere.

4) The refrigeration circuit pressure is back to atmospheric pressure. Pressurize the circuit using nitrogen.

5) Discharge the pressurized nitrogen and recover the refrigeration circuit to atmospheric pressure.

6) Repeat 4) and 5) above. Use a gas detector at the open end of refrigeration circuit to detect any gas left inside the circuit.

7) Evacuate the refrigeration circuit for 30 minutes to remove any gas left inside the circuit.

WARNING

Remove the R290 refrigerant from the unit in an area well-ventilated and free from open flames.

Note: Attach an access valve for recharging the unit charged by a lock ring.

4. COMPRESSOR

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) Disconnect the power source.

2) Remove the panels.

3) Remove the terminal cover on the compressor, and disconnect the compressor wiring.

4) Remove the refrigerant from the unit and then any residual refrigerant still existing in the unit to allow welding process. (See “3. WELDING REPAIR FOR R290 REFRIGERATION CIRCUIT”.).

5) Remove the discharge, suction and access pipes from the compressor using brazing equipment.

WARNING

1. When it is required to disconnect the pipes using brazing equipment, be careful that the refrigerant in the oil left inside the pipes may burn.
2. When repairing a refrigerant system, be careful not to let the burner flame contact any electrical wires or insulation.

6) Remove the bolts and rubber grommets.

7) Slide and remove the compressor. Unpack the new compressor package. Install the new compressor.

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 discharge, suction and access pipes.

12) Braze the access, suction and discharge pipes (Do not change this order) with nitrogen gas flowing at the pressure of 0.2 - 0.3 bar.

WARNING

Always protect the compressor body around the suction pipe by using a damp cloth to prevent the inner plastic parts from overheating. Do not braze with the compressor body exceeding 120°C.

13) Install the new drier (See “5. DRIER”).

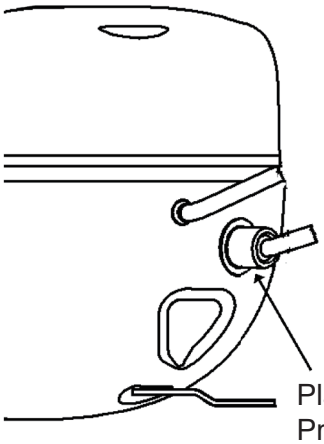
14) Check for leaks using nitrogen gas (10 bar) and soap bubbles.

15) Evacuate the system, and charge it with refrigerant. See the nameplate for the required refrigerant charge (See “2. [d] EVACUATION AND RECHARGE”).

16) Connect the terminals to the compressor, and replace the terminal cover in its correct position.

17) Refit the panels in their correct position.

18) Connect the power source.



Plastic parts are here.
Prevent them from overheating.

5. DRIER

IMPORTANT

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

1) Unplug the ice dispenser.

2) Remove the front cover.

3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See “2. [b] REFRIGERANT RECOVERY”).

4) Remove the drier using brazing equipment.

5) Install 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 the tubings.

6) Check for leaks using nitrogen gas (10 bar) and soap bubbles.

7) Evacuate the system, and charge it with refrigerant. See the nameplate for the required refrigerant charge (See “2. [d] EVACUATION AND RECHARGE”).

8) Refit the front cover in its correct position.

9) Plug in the ice dispenser.

6. EXPANSION VALVE

IMPORTANT

Sometimes moisture in the refrigerant circuit exceeds the drier capacity and freezes up at the expansion valve. Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacement has been made.

1) Unplug the ice dispenser.

2) Remove the front cover.

3) Recover the refrigerant and store it in a proper container, if required by an applicable law (See “2. [b] REFRIGERANT RECOVERY”).

4) Remove the expansion valve bulb at the evaporator outlet.

5) Remove the expansion valve cover, and disconnect the expansion valve using brazing equipment.

6) Braze the new expansion 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.

7) Install the new drier (See “5. DRIER”).

8) Check for leaks using nitrogen gas (10 bar) and soap bubbles.

9) Evacuate the system, and charge it with refrigerant. See the nameplate for the required refrigerant charge (See “2. [d] EVACUATION AND RECHARGE”).

10) Attach the bulb to the suction line. Be sure to secure the bulb using a wire or clamp and replace the insulation.

11) Place the new set of expansion valve covers in position.

12) Refit the front cover in its correct position.

13) Plug in the ice dispenser.

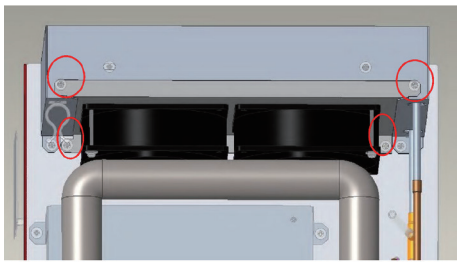
7. FAN MOTOR

1) Unplug the ice dispenser.

2) Remove the side panels.

3) Disconnect the lead wires at their connection.

4) Take out the fan motor with its bracket from the unit.



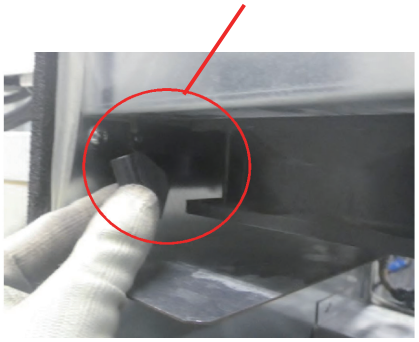
Remove 4 screws.

5) Remove the fan motor from the fan motor bracket.

6) Assemble the removed parts in the reverse order of which they were removed.

Note: The label must face up.
For DCM-120LS-(P)-HC, the two connectors are interchangeable.
Make sure not to lose the fan motor rib. If it comes off, refit it in place.

Fan motor rib



8. EVAPORATOR ASSEMBLY

See the exploded view under “III. 3. ICEMAKING MECHANISM”.

1) Move the icemaking switch to the “OFF” position.

2) Press the push lever or dispense switch to dispense ice, and remove all ice from the storage bin.

3) Press the drain switch on the control panel. The display illuminates “DRAIN” during the 1 minute drain cycle.

4) Unplug the ice dispenser.

5) Remove the panels.

6) Remove the storage bin assembly (See “13. STORAGE BIN ASSEMBLY”).

EXTRUDING HEAD

7) Remove the sealing bolts, and lift off the extruding head.

8) Check the bearing inside the extruding head. If it is worn out or scratched, replace the bearing.

Note: Replacing the bearing needs a fitting tool. If it is not available, replace the whole extruding head.

AUGER

9) Lift out the auger. Check the top and bottom areas in contact with the bearings. If the surface is scratched or pitted, replace the auger. Check the blade edge of the auger. If it is scratched or worn where it has contacted the evaporator, replace it.

EVAPORATOR

Note: Skip the following steps 10) through 15) when the evaporator does not need replacement.

10) Recover the refrigerant and store it in a proper container, if required by an applicable law.

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.

11) Remove the bulb of the expansion valve.

12) Disconnect the brazing connections of the expansion valve and the copper tube - low side from the evaporator, using brazing equipment.

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.

13) Disconnect the hoses from the evaporator.

14) Remove the four socket head cap screws securing the evaporator with the housing.

15) Lift off the evaporator.

HOUSING AND MECHANICAL SEAL

16) The mechanical seal consists of two parts. One part rotates with the auger, the other is static and is fitted into a top recess in the housing. If the contact surfaces of these two parts become worn or scratched, the mechanical seal may leak water and should be replaced.

17) Remove the O-ring on the top outer edge of the housing.

18) Remove the four bolts and lift the housing clear of the gear motor. Check the bearing inside the housing. If it is worn or scratched, replace it using a fitting tool. Carefully ease out the lower part of the mechanical seal before replacing the bearing.

Note: If a fitting tool is not available, replace the whole lower housing complete with bearing.

GEAR MOTOR

19) Cut the connectors.

20) Remove the three socket head cap screws securing the gear motor.

21) Assemble the removed parts in the reverse order of which they were removed.

WARNING

Be careful not to scratch the surface of the O-ring, or it may cause water leaks. Handle the mechanical seal with care not to scratch nor to contaminate its contact surface.

22) When replacing the evaporator:

(a) Braze the new evaporator with nitrogen gas flowing at the pressure of 0.2 - 0.3 bar.

(b) Replace the drier.

(c) Check for leaks using nitrogen gas (10 bar) and soap bubbles.

(d) Evacuate the system, and charge it with refrigerant. See the nameplate for the required refrigerant charge.

23) Refit the panels in their correct position.

24) Plug in the ice dispenser.

9. CONTROL WATER VALVE AND WATER DISPENSE VALVE

1) Unplug the ice dispenser.
2) Close the water supply tap.
3) Remove the panels.
4) Disconnect the terminals from the valve.
5) Loosen the fitting nut on the valve inlet, and remove the valve. Do not lose the packing inside the fitting nut.
6) Install the new valve.
7) Assemble the removed parts in the reverse order of which they were removed.
8) Open the water supply tap.
9) Plug in the ice dispenser.
10) Check for water leaks.
11) Refit the panels in their correct position.

10. FLUSH WATER VALVE

1) Move the icemaking switch to the “OFF” position.
2) Press the drain switch on the control panel. The display illuminates “DRAIN” during the 1 minute drain cycle.
3) Unplug the ice dispenser, and close the water supply tap.
4) Remove the panels.
5) Remove the clamp and disconnect the hose from the flush water valve.

   Note: Water may still remain inside the evaporator. Be sure to drain the water into the drain pan.

6) Disconnect the terminals from the flush water valve.
7) Remove the flush water valve from the bracket.
8) Remove the drain pipe from the flush water valve.
9) Connect the drain pipe to the new flush water valve, and place the valve in position.
10) Connect the hose to the flush water valve, and secure it with the clamp.
11) Pour water into the reservoir, and check for water leaks on the flush water valve.
12) Open the water supply tap.

13) Plug in the ice dispenser.

14) Check for water leaks.

15) Push the drain switch, and make sure water is flushing.

16) Refit the panels in their correct position.

11. CONTROLLER BOARD

IMPORTANT

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

[a] MODIFICATION

1) Check that the service board package includes:
   Controller board 1 pc. Instruction sheet 1 pc.

2) Modify the service board referring to the instruction sheet attached (Set the model number according to “III. 5. [d] SETTING MODEL NUMBER”).

[b] REPLACEMENT

1) Unplug the ice dispenser.

2) Remove the panels.

3) Remove the control box.

4) Disconnect the connectors and board support from the controller board.

5) Remove the controller board from the control box.

6) Install the new controller board and reassemble the control box in the reverse order of the removal procedure.

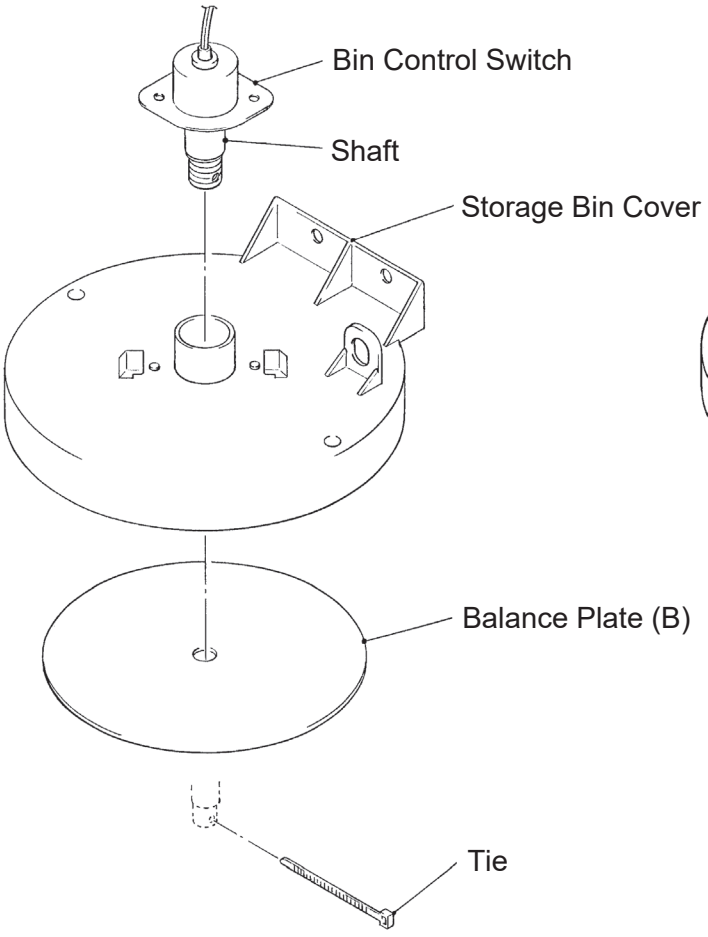
7) Replace the panels in their correct position.

8) Plug in the ice dispenser.

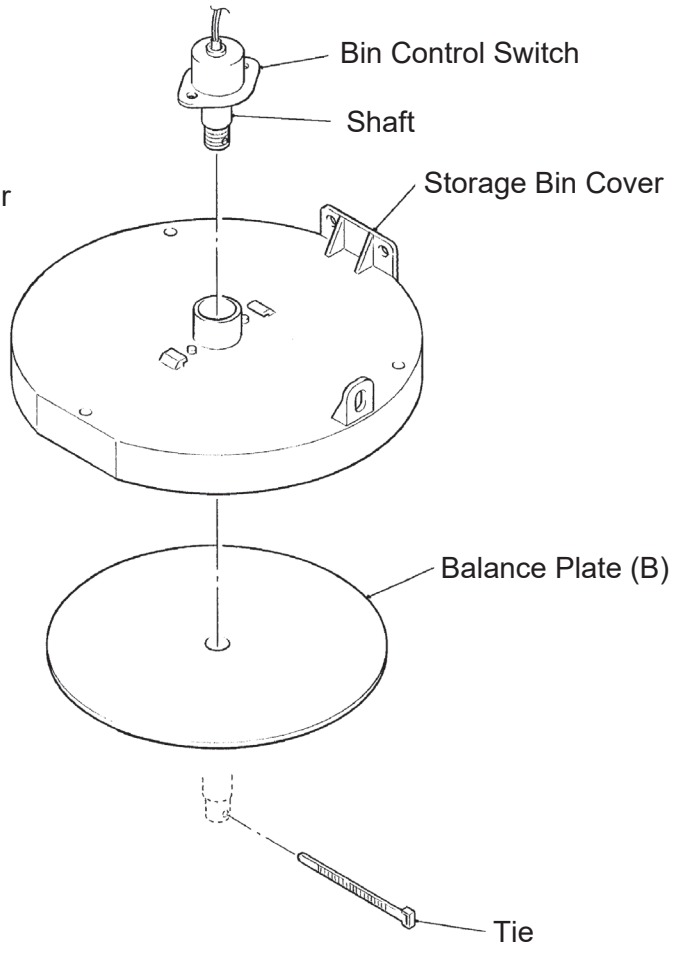
12. BIN CONTROL SWITCH ASSEMBLY

1) Unplug the ice dispenser.
2) Remove the top panel.
3) Remove the storage bin cover.
4) Remove the bin control switch.
5) Remove the snap pin and E-ring, and disassemble the balance plate (B) and shaft.
6) Install the new bin control switch assembly.
7) Assemble the removed parts in the reverse order of which they ware removed.
8) Plug in the ice dispenser, and check that the bin control switch works normally.

DCM-80LS(-P)-HC



DCM-120LS(-P)-HC



13. STORAGE BIN ASSEMBLY

1) Move the icemaking switch to the “OFF” position.
2) Press the push lever or dispense switch to dispense ice, and remove all ice from the storage bin.
3) Press the drain switch on the control panel. The display illuminates “DRAIN” during the 1 minute drain cycle.
4) Unplug the ice dispenser.
5) Remove the panels.
6) Remove the storage bin cover.
7) Remove the agitator, drip ring and shutter assembly.
8) Remove the three sealing bolts, and lift off the storage bin assembly.
9) Install the new storage bin assembly.
10) Assemble the removed parts in the reverse order of which they were removed.
11) Plug in the ice dispenser.
12) Mover the shutter to check for proper operation.

14. AGITATOR AND DRIP RING

1) Move the icemaking switch to the “OFF” position.
2) Press the push lever or dispense switch to dispense ice, and remove all ice from the storage bin.
3) Unplug the ice dispenser.
4) Remove the top panel.
5) Remove the storage bin cover.
6) Rotate the agitator counterclockwise, and lift off.
7) Rotate the dip ring about 30 degrees clockwise, and lift out.
8) Install the new drip ring and agitator.
9) Assemble the removed parts in the reverse order of they were removed.
10) Plug in the ice dispenser.