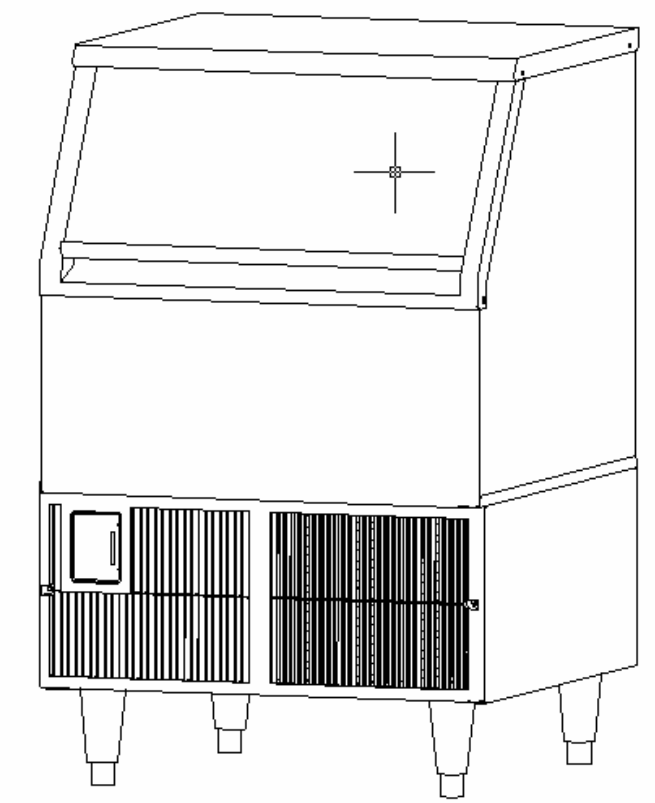
Automatic Ice Maker

Service Manual



MODEL FS-260IM A

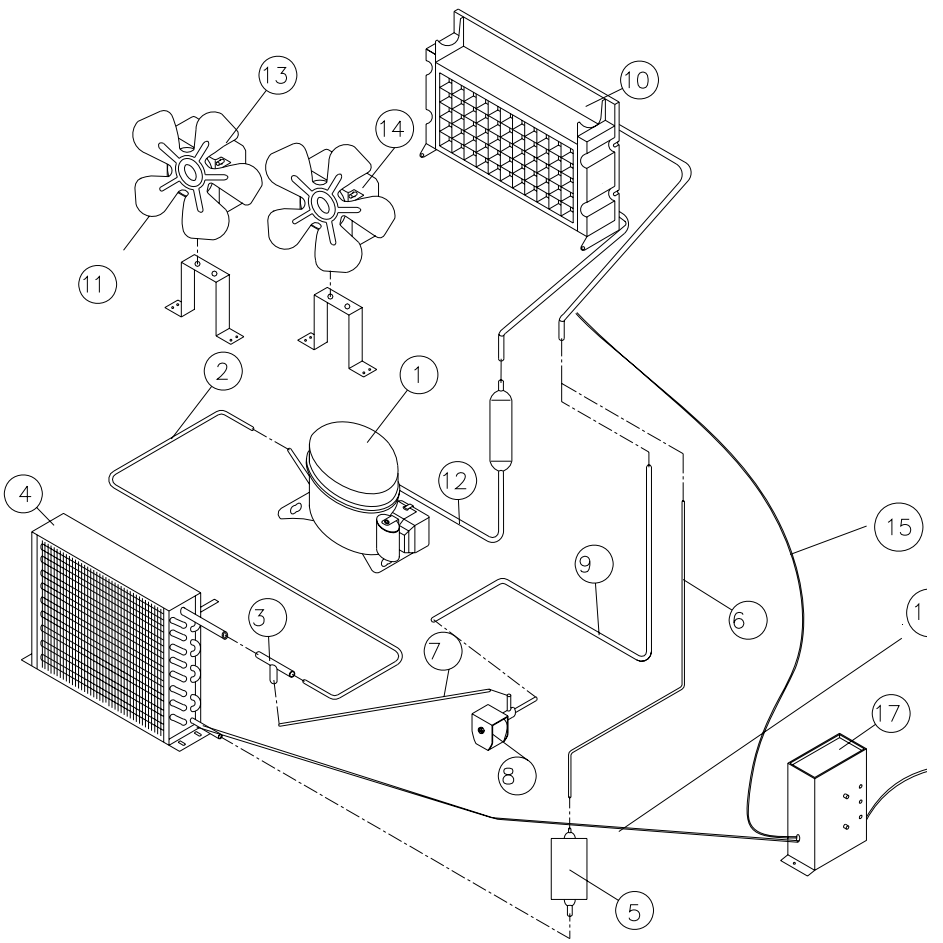
Table of contents

IMPORTANT: The service manual is based on the user manual. Before servicing, please read user manual and service manual carefully. The service operation should be implemented by qualified technician.

How the Icemaker Works

Please refer to the section "**Operation** of user manual" from page 12 to 14 . It describes clear how the icemaker makes ice and uses the water.
There are 3 systems including Cooling System, Water System and Wiring Connection and Controller.

Cooling System



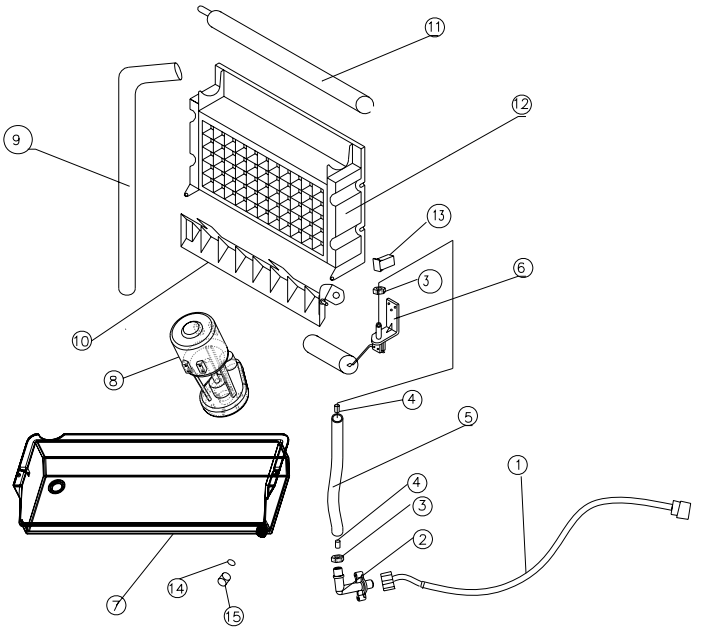
ITEM NO	CODE	DESCRIPTION
1	1858420900	Compressor
2	1861512102	Discharge tube
3	1861530100	Cu three ways
4	1880013102	Condenser
5	1880007900	Drier and filter
6	1805000600	Capillary tube
7	1861502502	Connection tube
8	1854701800	Hot gas valve
9	1861501701	Hot gas tube
10	1880024700	Evaporator (Ice Mold)
11	1860700100	Fan blade(φ 200X28°)
12	1880020202	suction pipe
13	1858200601	Motor 5W
14	1858201300	Motor 10W
15	1851701002	Temperature sensor of the evaporator
16	1851700802	Temperature sensor of the condenser
17	1854204603	Control box

During the ice-making stage, the hot gas solenoid valve is **closed.** The hot refrigerant gas is pumped out off compressor to condenser. The hot gas is cooled by fan forced air to warm liquid refrigerant after passing through the condenser. The drier & filter reduces the possible dirty and humidity in the refrigerant. The evaporator is cooled by the refrigerant. So ice can formed on the evaporator during water is sprayed to the evaporator. Low pressure refrigerant gas may go back compressor from the evaporator.

During the ice harvest stage, the solenoid valve is **open**. The hot refrigerant gas is pumped out off compressor to evaporator through hot gas valve. As the hot gas is not cooled by the condenser, the refrigerant makes the evaporator (ice mold) warm. So some ice touching the evaporator is thawed. All of ice can slide down to the ice storage bin.

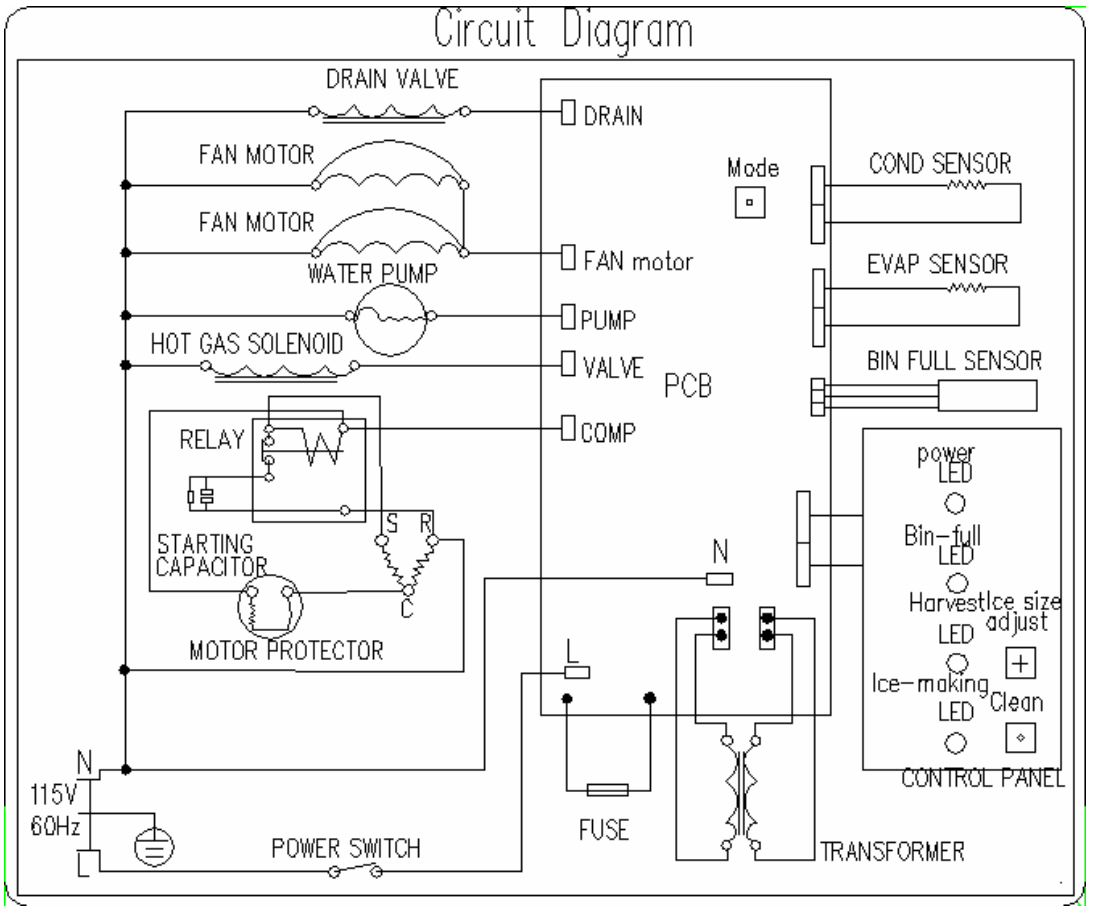
Water System

When the water supply pipe is connected with the main water supply, water will fill the water trough through the floater valve till enough water inside water trough makes floater valve close. During ice-making stage, water is pumped from the water trough to the water distribution tube. The distributed water flow the surface of evaporator. Most parts of water go back water trough. Some water is frozen on the evaporator step by step. The floater valve will open and fresh water is recruited at any moment.



ITEM NO	CODE	DESCRIPTION
1	1811306014	Water supply tube
2	1864526301	Water inlet connector
3	1864529100	Nut of water inlet tube
4	1864515100	Supporting tube
5	1811206006	Water pump inlet tube
6	1880001701	Floater valve
7	1864802001	Water trough
8	1858904000	Water pump
9	1811330102	Water pump outlet tube
10	1861701802	Ice slideway
11	1864550601 1864550701	Water distribution tube
12	1880024700	Evaporator (Ice Mold)
13	1854005801	Magnetism switch
14	1813406016	Gasket
15	1864608400	Screw cap

Wiring Connection :



Circuit Description

1. Electrify Status For The First Time

As the icemaker is properly installed. switch on the water tap, let the water trough full (reach on the level), then turn the Power switch to the ON position on the panel. The icemaker will start working automatically

In this status, the time is fixed about 3 minutes. This function is also helpful to protect the compressor avoiding restart within 3 minutes.

At this status, the **White, Green, Yellow and Red** LEDs are light together.

2. Ice-making Status

The compressor, motor fan and pump are powered on. The hot gas solenoid valve is powered off.

When this green LED is lit, the unit is working in the ice making mode controlled by a temperature probe on the evaporator. When the green LED is flashing, the unit is working in the ice making mode controlled by a fixed timer.

The fan motor is also controlled by a condenser sensor. When the ambient temperature is too lower, the motor fan stop working for good condensation to refrigerant.

3. Ice Harvest Status

The pump is powered off. The hot gas solenoid valve, compressor and motor fan is powered on.

The fan motor is also controlled by a condenser sensor. When the ambient temperature is too lower, the motor fan stop working for good condensation to refrigerant.
The Yellow LED indicates the ice harvest status.

5. Cleaning Status

Turn the machine CLEAN SWITCH at the CLEAN in 3 minutes after the POWER SWITCH is turned on, the machine turn to Cleaning Status. At this status, the pump is powered on. Compressor, motor fan and the hot gas solenoid valve are powered off. The GREEN and YOLLOW LEDs are flashing together. To stop the cleaning mode, turn the machine "OFF" at the Power switch or it will turned off automatically after 30 minutes.
NOTE: In order to start the Clean Status the power switch must be on. The CLEAN switch must be turned in 3 before the COMPRESSOR starts. To clean, it is no use turning the CLEAN switch when machine is in ice-making status or ice-harvest status.

Controller box:

Instructions for LEDs and buttons:

1. White LED: Ice full indicator light.
When this LED is lit, the ice storage bin is full of ice or there is something between the ice-full sensor and the evaporator. The unit will stop making ice. When ice cubes are taken out of the ice storage bin making the ice-full probe free, the white LED will keep flashing for 3 minutes. Then the unit will restart and return to the ice making mode.
2. Green LED: Ice making indicator light.
When this LED is lit, the unit is working in the ice making mode controlled by a temperature probe on the evaporator. When the green LED is flashing, the unit is working in the ice making mode controlled by a fixed timer.
3. Yellow LED: Ice harvest indicator light.

When this LED is lit, the unit is working in the ice harvest mode controlled by ice-full probe .

When green LED and yellow LED is lit, it means the unit is working in the cold preservation stage .
4.Red LED: power indicator light.
The power is on when the red LED is lit.
5. Mode button:
Mainly for service. When this button is pressed, it can change from ice making mode to ice harvest mode, or from ice harvest mode to ice making mode. You can judge the mode from the status of the green and yellow LEDs.
6. Ice size adjust: Turn the screw clockwise, and the size of individual ice cubes will be larger in the next cycle; the cycle time will be longer. Turn the screw counter clockwise, and the ice size will be smaller in the next cycle.
NOTE: *It is not a good idea to adjust the ice size often or for no good reason, because the controller may damaged.*

IMPORTANT

*1. Avoid water to the controller box.

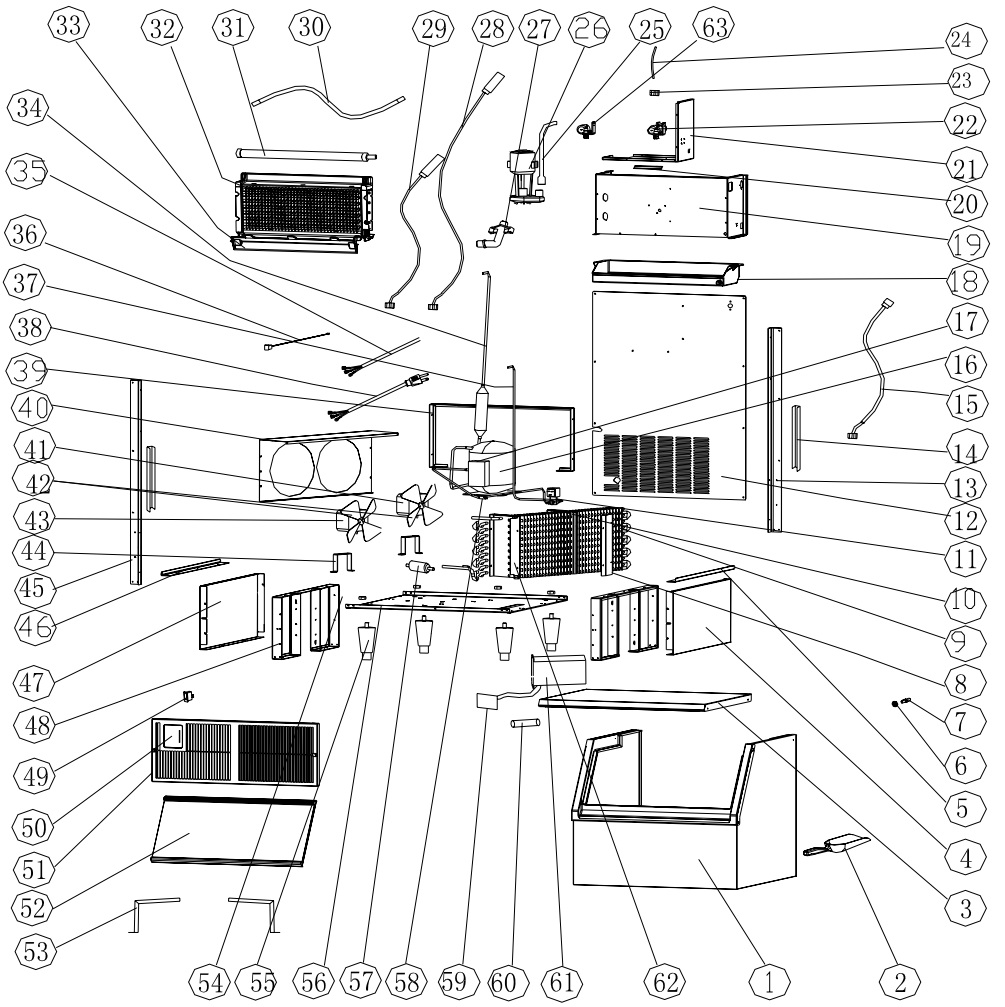
***2. T**o start the Clean Status the power switch must be on. The CLEAN switch must be turned in 3 minutes before the COMPRESSOR starts.
*3. When turn the machine "ON" at the Power switch, the compressor, motor fan and pump will be delayed 3 minutes to power on to protect compressor. At this moment, the **Red, Green, Yellow and White** LEDs are light together.

MAJOR FUNCTIONS OF CONTROLLER

1. Completely automatic operating procedure.

2. When the ice storage bin is full of ice cubes， the machine stops making ice and turn into cold preservation stage automatically and starts making ice again after the ice cubes are removed.
3. The different colors of the LED display indicate various work modes.
4. The fan motor responds to the ambient temperature. If it is cold, the motor will stop working to keep the cooling system in good working condition.
5. The thickness of ice cubes is adjustable.
6. A sensitive probe and accurate timer enhance the performance of the ice maker.
7. Built-in compressor protection system.

Exploding Drawing



Spare parts list of FS-260IM A

ITEM NO	CODE	DESCRIPTION
1	1864701601	ice storage bin
2	1864800100	Ice scoop
3	1860106303	top panel
4	1860110802	down right panel
5	1860410601	right slide way
6	1864514100	Drain nut
7	1864536200	Drain connector
8	1860004904	right cover wind panel
9	1858420900	condenser
10	1854701210	Hot gas valve body (EVU3)
11	1854701800	Hot gas valve coil（042N4212）
12	1860002004	back panel
13	1860111102	right back support
14	1860604901	little support
15	1811306014	Water supply pipe
16	1858420900	Compressor
17	1858441300	compressor starting device component
18	1864802001	water trough
19	1858201704	evaporator support
20	1858201800	water trough support
21	1860601803	water pump support
22	1880001701	Floater valve
23	1864529100	water inlet pipe screw
24	1864500100	water inlet pipe
25	1811330102	Water out tube of pump
26	1858904000	Water pump
27	1864526301	Water inlet
28	1851700802	Temperature sensor of condenser
29	1851701002	Temperature sensor of evaporator
30	1864532701	Water drain pipe
31	1880001900	water sprinkler
32	1880024700	Evaporator (Ice Mold)
33	1861701801	Ice full probe
34	1880020202	suction pipe
35	1853701903	Wiring harness
36	1854005801	Magnetism switch
37	1861501701	discharge pipe
38	1853110500	Power supply line
39	1860601504	back support
40	1860004802	fan motor cover
41	1858200601	Motor 5W

42	549738100	Fan blade (φ 200X28°)
43	1858201300	Motor10W
44	1860508200	fan motor bracket
45	1860111204	left back support
46	1860410501	left silde way
47	1860110703	down left panel
48	1860601606	left support
49	1854000500	Power switch
50	1864901700	operator buttom cover
51	1860600802	under louver
52	1864806902	door
53	1860111700	stability support
54	1803200100	locked screw
55	1880014901	foot
56	1860604600	compressor base
57	1880007900	Drier
58	1861530100	T shape three ways
59	1860617100	control panel of FS-260IM control box)
60	1854800300	15A fuse of control box
61	1854204602	Control box
62	1880013101	Condenser
63	1854700800	Drain valve
	1861530802	Water outler connector

Troubleshooting

Before Maintenance

1. Check out the user if the user uses a 115 VAC, 60Hz. only 15ampere electrical supply, and have properly grounded, ensure the maintainer against electrical shock.
2. Check out the leads loose? Turn off? Short circuit? If have such problems, foreclose in turn.

Basic Checking

The icemaker has some trouble, through the appearance phenomena judges. So the service technician must check it thoroughly, then maintain.

Hearing

- Hearing the user 's depiction about the icemaker at using process and the phenomena. Try to understand what is the defect and how did the user operate the icemaker before calling for service.
- If the running sound is normal?

Looking

- Check the pipe of cooling system, especially the welding point. If there is some oil, the gas is leak out so that no ice making or less ice produced.
- If the cycle of the ice making and harvest is normal?
- Check the water system, especially the connection. If there is some water leakage.
- Check if the water filter needs to be replaced.
- Check if the icemaker installed according to the user manual.
- Check if the icemaker needs to be cleaned.

Touching

- Touch the hot gas pipe (with the evaporation weld), feeling the temperature. At the ice making stage, feeling cool. At the ice harvest stage, feeling hot.
- Touch the capillary tube (the drier nearby), feeling tepefaction.

Troubleshooting Guide

This troubleshooting guide in the user manual should be read before this guide. Be sure only when the trouble shooting in user manual can’t help you solve the problem, turn to this guide.

Troubleshooting Guide

1.The machine does not make ice

Problem kinds	Check part or point	Possible Cause	Probable Correction
The machine don't operate	Plug	The icemaker is unplugged.	Plug the icemaker in.
	Socket	Socket is damaged	Check and replace
	Power switch	The icemaker power switch turns to OFF.	Turn the icemaker power switch to ICE.
	Fuse	The fuse is blown.	Replace fuse.
	Wiring connection	Some wiring connection is incorrect or loosed	Check and re-connect
	Voltage	The voltage of the power supply is low.	Add manostat.
	Ice full probe	The ice full probe is out of function.	Replace a new one.
	Ice full probe	The ice full probe is covered by something	Clear the probe and make the ice-full probe is free.
	wiring	Some wiring is damaged	Replace a new one
	Electric component	Some electric component fail	Find the controller, press the mode button to change the mode. It is helpful to judge which part is out of function
	Control box	The control box fail	Replace a new one
Water System	Water supply tap	The water supply tap is turn off.	Turn on the water supply tap.
	Water supply pipe	The water supply pipe is not proper connected or maybe kinked	Reconnect the water supply pipe.
	Water line	Some water line leaks.	Plug into again.
		The water line blocks	Clean it, see user and care manual "ice making system cleaning"
		Water supply pressure is lower.	Adjust the water supply pressure within the range of stated range.
	Water inlet	Water inlet blocks	Check and clear it
	Water dump valve	Water dump valve leakes,	Replace the water dump valve
	Water pump	Water pump damages	Replace water pump.
		The lines of the water pump loose.	Plug into again
		The housing of water pump leaks.	Replace water pump.

Problem kinds	Check part or point	Possible Cause	Probable Correction
The compressor	Wiring connects	loose.	Plug tightly, or replace.
	The start relay/thermal protect	Be damaged.	Replace the start relay/thermal protect of the compressor
	The startup	Be turnoff.	Replace the compressor.

doesn't start or start frequency	coil / running coil	The motor of the compressor is short circuit.	Replace the compressor.
	Condenser	The condenser may be dirty.	Clean the condenser.
	Fan	The fan may be dirty or damaged	Clean or Replace the fan .
	The Electronic control box	The control box is damaged	Replace the Electronic control box.
The compressor run but no ice	Refrigerant	Refrigerant leaks completely	Add low side access valve, locate leak, recover refrigerant, replace drier, evacuate and weigh in the data plate charge.
	Capillary tube	Capillary tube is blocked	Add low side access valve, recover refrigerant, replace hot gas valve, replace drier, evacuate and weigh in the nameplate charge.
	Vent	The vent is obstructed around the ice machine	Clean the vent
	Hot gas valve	Hot gas valve damaged	Replace
	The Electronic control box	The model of making ice doesn't turn to harvest.	Replace the Electronic control box.
		Tthe unit is working in the cold preservation stage mode controlled.	Work in normal mode

2.Low production

Problem kinds	Check part or point	Possible Cause	Probable Correction
Cooling System	Refrigerant	Refrigerant leaks partially	Recharge.
	Condenser	The condenser may be dirty.	Clean the condenser.
	The ambient temperature	The ambient temperature is high or too low	Check the ambient and air flow
	Fan	The fan is dirty or damaged	Clean or repalce
	Hot gas valve	Hot gas valve performance poor, leads to few ice is produced.	Replace the hot gas valve
	Electronic control box	The setting temperature of Electronic control box is low.	See the service manual "adjust the size of ice cubes"
	Sensor	The sensor of temperature damages	Replace the sensor of temperature.

Water System	Water distribution tube	The water distribution tube blocks	Clean the water distribution tube
	Water line	The water quality is too poor. The water line blocks	Using a filter apparatus installed in front of the water inlet valve.
	Silica gel tubes	The silica gel tubes distort, lead to block.	Make the silica gel tubes resile
	Water dump valve	The water dump valve bad, the water leakes	Replace the water dump valve
	Floater valve	The floater valve leaks. Lead to few ice produced.	Repair or replace

3. Ice Cube is not OK

Problem kinds	Check part or point	Possible Cause	Probable Correction
Cubes are too small	Condenser	The condenser is dirty or the air grills are covered	Clean the condenser. Leave space around the machine
	The ambient temperature	The ambient temperature is too high.	Adjust the ambient temperature.
	Electronic control box	The setting temperature is high.	See the service manual "adjust the size of ice cubes"
	Refrigerant	Refrigerant leaks	Recharge.
Cubes are too big	Electronic control box	The setting temperature of Electronic control box is low.	See the service manual "adjust the size of ice cubes"
	Sensor	Temperature sensor of the evaporator damages	Replace the sensor of temperature.
	The ambient and water temperature	The ambient temperature and water temperature is too low.	Adjust the temperature.
The cubes are partially formed--have ragged sides or white and deformity	Water quality	The water quality is poor	Using a water-soften / filter apparatus installed in front of the water inlet valve.
	Evaporator	Ice machine is dirty	Clean and sanitize the ice machine
	Water distribution tube	The water distribution tube blocks partially	Clean the water distribution tube
	The water pump	The water pump is dirty	Clean the water pump inside
	The water lack	The water floater is bad	Replace the water floater
	Water trough	Water trough level is too low	Adjust the water floater

4.Other problems

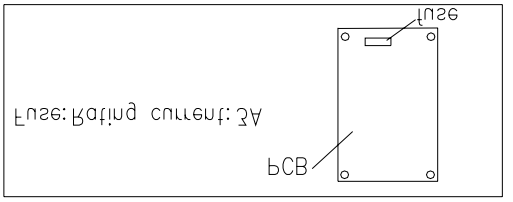
Problem kinds	Check part or point	Possible Cause	Probable Correction
The body is electrified	Earth line	The earth line isn't in the socket.	Please use the socket meeting the standard.
	Lines	The lines are creepage.	Adjust, reconnect /replace lines
	Electric component	The electric component is creepage,	Replace this electric component.
Scales occur frequently inside the machine	the water quality	The rigidity of the water quality is too high.	Using a water-soften apparatus installed in front of the water inlet.
Noise during operation is big	Spring of the internal compressor	The spring of the internal compressor drops.	Replace the compressor.
	Water pump	The noise of the water pump	Replace the water pump.
	Pipeline system	Pipeline system resonate	Clear pipeline system
	Fan motor	The fan motor loose, the clearance of the rotor is bigger, the fan blade turns back	Relocate the fan motor / replace
Water is leaking out the unit	The operation	A few water drops to the floor when you open the door to take out ice from ice storage bin.	Normal condensation on the door or some water together with ice. Take care when you take out ice.
	Water supply connection	Water supply connection leaking.	Tighten fitting.
	Water line	Some water line leaks.	Plug into again.
	Water drain pipe	No water drain pipe or connection leaking	Replace the water drain pipe
The water distribution tube doesn't spray	Lines of the water pump	The lines of the water pump loose.	Plug into again
	Water pump	Water pump damages	Replace water pump.
	Water distribution tube	The water distribution tube blocks	Clean the water distribution tube
	Ice full probe	The ice full probe is broken or can not turn back normal position.	Repair or replace the probe
Harvesting ice is difficult	Hot gas valve	The hot gas valve is poor,	Replace the hot gas valve
		The hot gas valve damage	Replace the hot gas valve
	Ice mold of the evaporator	The ice mold is dirty, or polishing degree is poor.	Clean the ice mold, or replace the evaporator.
	Refrigerant	Refrigerant leaks	Recharge
	Ice machine	Ice machine is not proper leveled	Level the ice machine

	The ambient and water temperature	The ambient and water temperature is too low	Adjust the temperature.
	Ice cubes size	The size is too big.	See “the adjust of ice cube size”.
The evaporator is hot more than 4 minutes	Hot gas valve	The lines of the hot gas valve loose.	Plug into again
		Hot gas valve performance poor or break	Replace the coil of hot gas valve if only because of the coil.
	Refrigerant	Refrigerant leaks	Recharge
	Electric control box	The electric control box is wrong	Check the control box

Adjustment and Replacement

Replace Control box, fuse and the sensor of temperature

- Remove the rear cover, front panel,
- Locate the Electronic control box,
- Pull out the sensors of temperature (one at the evaporator, another at the condenser).
- loosen the screws of rooting the Electronic controller, replace a new one. Reverse the above step to replace.
- If you need replace the fuse, open the front panel of the control box, you will find the figure.



se, replace a new one.

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e, pull out the sensor of temperature, open the panel of the controller box, pull out the other side, replace a new one. Reverse the above step to reassemble.

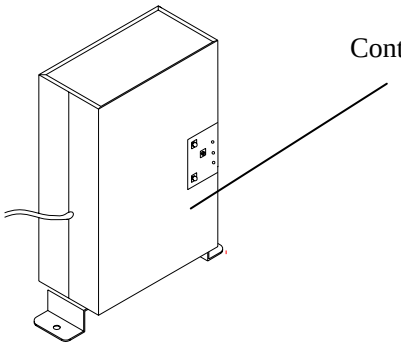
Adjust the size of ice cube

The cube size should only be adjusted to bring the cubes to the correct shape, the overall size can't be adjusted, Try to adjust the cubes size when the ice maker is work in the Ice Harvest Status.

1. Power off the icemaker.

2.Remove the front panel, locate the Electronic control box,

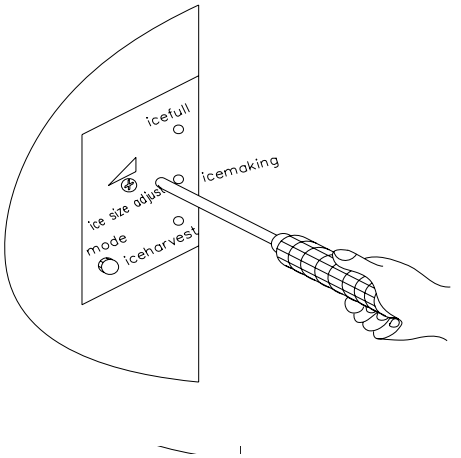
3.Locate the cube size adjustment screw, and to make fuller cubes, turn the screw clockwise about

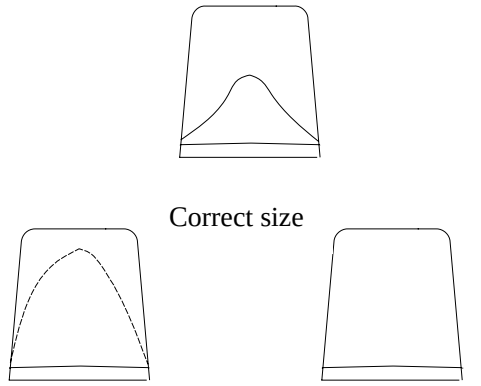


1/36 turn (10°-15°). This will make the freezing cycle longer.

4. To shorten the freezing cycle and make cubes that are not as full, turn the adjustment screw 1/36 turn (10°-15°) counter clockwise.

5.After the next freezing cycle, the cubes should have responded to the adjustment, if another adjustment is required, do it early in the freeze cycle.





ADVICE

Expert advises the cube size have been adjusted ok before leave factory, had better not adjust it.

Replace the water system components

Please see the water system drawing. The water leakage should be checked after this kind of operation

NOTICE

Before replace the water system components, it will be necessary to drain the system of water.

Replace the water pump

- Disconnect electrical power.
- Remove the front cover.
- Unplug the lines connector with the water pump, the water outlet tube of pump.
- Loosen the screws, replace a new one.
- Reverse the above step to reassemble.

Replace the Water Dump Valve

The water dump valve normally does not require removal for cleaning. To determine if removal is necessary:

1. Locate the water dump valve.

2. Set the toggle switch to ICE.

3. While the ice machine is in the freeze mode, check the dump valve's clear plastic outlet drain hose for leakage.

A. If the dump valve is leaking, remove, disassemble and clean it.

B. If the dump valve is not leaking, do not remove it. Instead, follow the "Ice Machine Cleaning Procedure".

Replace the cooling system components

Replace the condensing components, See Figure "cooling system"

1.Replace the compressor and the compressor kit (includes relay, thermal protect).

- If only need replace the compressor kit, remove the top panel and left panel, locate the compressor, take the clip, replace the wrong,
- Reverse the above step to reassemble.
- If need replace the compressor, remove the top cover, locate the compressor.
- Unplug the lines and taken out the earth line, open the Process/Suction, evacuate refrigerant, take out the compressor, replace a new one, joint together, then recover refrigerant, weigh in the nameplate charge.
- Reverse the above step to reassemble.

2. Replace the fan motor and fan blade.

- Remove the top and right panel.
- locate the fan motor, unplug the lines connecting with the fan motor, loosen the screws of holding bracket and fan motor bracket, taken out the damaged, replace a new one
- Reverse the above step to reassemble.

3. Replace the hot gas valve, drier and evaporator.

- Remove the top panel.

- Locate the drier and hot gas valve, weld open , ,replace the drier and hot gas valve, weld ,recover refrigerant , evacuate and weigh in the nameplate charge.
- Reverse the above step to reassemble.
- If need replace the evaporator.
- Remove the front and top panel, locate the evaporator, open the process/suction , weld open the two welds, replace a new one. Recover refrigerant, evacuate and weigh in the nameplate charge.
- Reverse the above step to reassemble.