9. Operation Function

9-1) Digital Panel

for **Dispense Model**
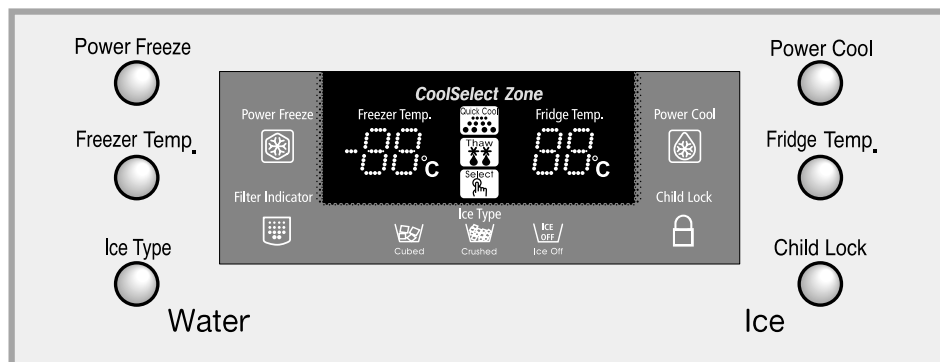
for **Cool Select Zone**™

9-2) Temperature Control Function

When the system power is initally engaged, the default set temperature are -20℃ for the freezer and 3℃ for the set refrigerator, respectively. The numbers shown on the digital display panel stand for the actual compartments temperatures. When the compartment temperatures go down, so do the numbers on the display panel, and finally they reach the set temperatures. Once the system is stabilized, the display temperatures are the set temperature.

1) Freezer Temperature Control.
   To select a set temperature, press the Freezer Temp. button. The display shows the set temperature from -14℃ to -25℃ in sequence.
2) Refrigerator Temperature Control.
   To select a set temperature, press the Fridge Temp. button. The display shown the set temperature from 1℃ to 7℃ in sequence.

note) Because of the temperature sensor sensivity, the refrigerator can be under and/or over cooled when the air flow is blocked by stored foods. (Temperature range of the sensor : -9℃～30℃)
    In the event of a power failure, if the freezer temperature is maintained lower than 5℃, the last selected set temperature and functions memorized in EEPROM will be restored when the power is on.

Operation Function

9-3) Power Freeze and Power Cool Functions

● Select the Power Freeze or Power Cool buttons separately.
● These buttons are toggled ON and OFF and the indicators as well.
● Although you select Power Freeze or Power Cool, the set temperatures in the freezer and refrigerator are not changed.
● The set temperatures for the compartments can be changed while these functions are in use.

1) Power Freeze function
   1-1) When you press the Power Freeze button, the LED indicator lights right away, but there is 10 seconds lag time to an actual operation. When this button is pressed again, the Power Freeze function stops and the indicator is off immediately .
   1-2) If you select Power Freeze, both the compressor and the freezer fan run for 10 hours continuously.

   note) When the Power Freeze is selected, it enables maximum ice maker output. The ice making interval is reduced from 90 mins to 55 mins (55 mins after the water delivery, if the ice temperature is maintained lower than -7℃, the ice tray will be twisted). When the ice bucket is full before 10 hours of operation, Power Freeze is automatically terminated.

   1-3) During Power Freeze, the freezer retains the current settings.
   1-4) When Power Freeze expires, the indicator goes off and the freezer set temperature will be restored.

2) Power Cool function
   2-1) Power Cool operation and the indicator work exactly same as the Power Freeze function.
   2-2) When Power Cool is selected, COMP and R-FAN operate continuosly until the refrigerator reaches -4℃. This function will be terminated after $2\frac{1}{2}$ hr running.

3) When you select Power Freeze and Power Cool together
     Each function works at the same time. The COMP and F-FAN run continuously and the R-FAN runs until -4℃ in the refrigerator.

4) Initial Power-On
  4-1) The freezer and the refrigerator temperatures are higher than -10℃ and 10℃ espectively if, respectively. If Power Freeze is selected, the R-FAN will be off. If Power Cool is selected, the F-FAN will be off.
  4-2) When both functions are selected, there is no benefit of fast cooling for each compartment.

9-4) Child Lock Function

● When the child lock button is pressed for 3 seconds, the child lock indicator is on with an audible tone. when it is locked, all keys can not be modified except the Ice type button. This function will prevent accidental setting that may be caused by children or pets. To unlock the setting functions, press this button for 3 seconds again. Also, this button has another function. When this button is pressed for 3 seconds (lock indication lamp turn on), the heater for sweat control is off and all lamps are off except the ice type lamp and child lock indication lamp(But in case of the model produced before April 2004, all lamps are on)at a same time. If sweat is appeared around the cover dispenser or beverage station, press this button for 3 seconds again. then, the light will turn off and the sweat control function will be performed. and all keys will be unlocked at a same time.

Operation Function

9-5) Ice & Water Dispenser Function

● Among several ice-maker functions, the ice extraction function is performed by mechanical system. Only the relay control for a cubed-ice dispensing and the SSR control for the ice chute door are performed electronically.

1) Select Cubed/Crushed/Ice-off function
  1-1) The Ice Type button selects Cubed/Crushed/Ice-off options in sequence.
  1-2) A default setting is Cubed option.
  1-3) If Cubed ice is selected, the Crushed ice bypass solenoid and the geared motor will allow Cubed ice to by pass the ice Crusher.
  1-4) If Ice-off is selected, the ice maker will stop working. This option will be terminated when Cubed and Crushed options are selected.

 Note) When the Ice-off indicator is on and the remained ice is in tray, only Cubed ice will be dispensed from the ice bucket.

  1-5) The ice chute door must be open for 5 seconds after dispensing ceases. After this 5 seconds delay, SSR will be controlled to shut the ice chute door.

 Note) Do not force to close the ice chute door. Try to dispense some more ice again to work it automatically.

2) Water Dispenser function
  2-1) To dispense water, depress the water dispenser lever located in the dispenser recess.
  2-2) When the lever is depressed, the water solenoid valve located in the machine compartment is open to flow water.
  2-3) There is no electronic control function for this option.

9-6) C-Fan Motor Delay Function of the Machine Compartment

● According to the ambient temperature, the condenser fan located in the machine compartment is operated with different modes.

	Ranges of ambient temp.	Operation
C-FAN Delay function	Above 19℃	C-FAN is ON as soon as the compressor is on.
	16℃ ~ 18℃	C-FAN is ON with 5 minutes delay from the compressor on.
	Below 15℃	C-FAN is OFF regardless of the compressor operation.

9-7) CoolSelect Zone™ Function (RS21K/J, RS23K/J)

● To select this function, open the refrigerator door and press the button on the control panel of CoolSelect Zone ™ drawer.
● When the CoolSelect Zone™ function is selected, the damper inside fan ductwork is open. So the refrigerator cooling is performed first, then the damper is closed to control the CoolSelect Zone™ temperature.

Operation Function

1) Select function
   1-1) Using Select button, Cool, Chill(-1℃), and Soft Freeze(-5℃) options can be selected in sequence. Cool option
       maintains a set temperature of the refrigerator.

2) Quick Cool function
   2-1) If the Quick Cool is selected, LEDs will flash 60 and Min. The count will be decreased in every minute.
   2-2) To cancel this function, press Quick Cool button again or Thaw button or Select button. Otherwise, it will be
       terminated 60 minutes later automatically.
   2-3) After this function ends, this drawer will come back to Cool option.
   2-4) A defrost cycle will be postponed until Quick Cool option is finished.

3) Thaw function
   3-1)When the thaw button is pressed, LEDs will flash 4, 6, 10, and 12 in sequence and Hr.
   3-2) The count will be decreased in every hour.
   3-3) A cancellation of this function is same as Quick Cool function.
   3-4) After this function ends, this drawer will be maintained with -1℃.
   3-5) While the compressor is on, this drawer retains a certain temperature and while the compressor is off, the defrost
       heater is activated and R-FAN is on with a closed position of the damper.

9-8) Water Filter Indicator Function

1) Filter Indicator
   1-1)This indicator initally lights in green. The light color will be changed to orange after 5 month operation then to red
       at the 6th month. The EEPROM in the control board counts a period of time regardless of a power failure.
   1-2)To reset the counter and the light color, press Ice Type button and Child lock button for 3 seconds simultaneously.
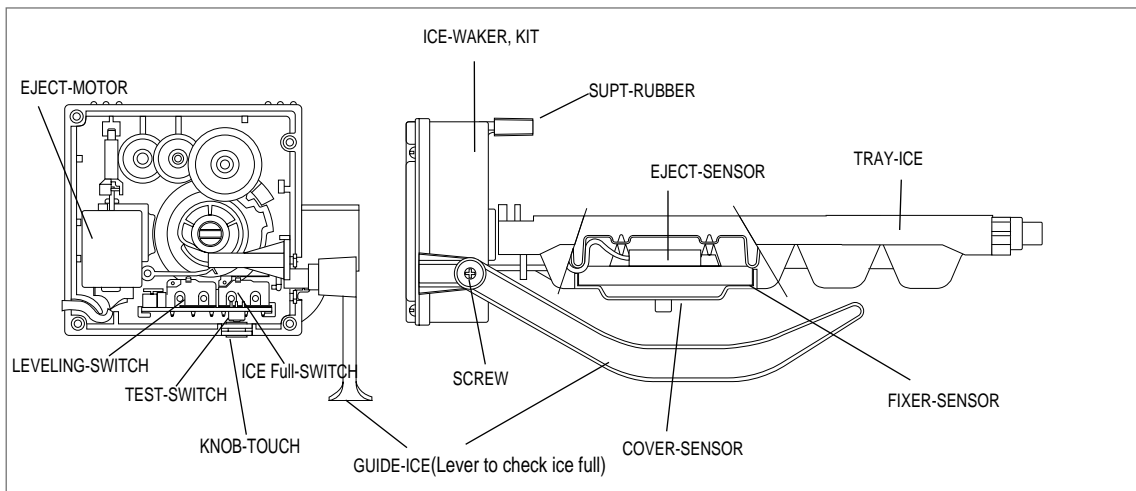   1-3)If these two buttons are pressed simultaneously for 5 seconds, this function will cease.
   1-4)To restore this function, press these buttons again for 3 seconds.

9-9) Ice-Maker Function

● The Ice-maker is referred to the device with an automatic ice production, storage in the ice bucket and dispensing
 through the ice chute.

1) Ice-maker parts

2) Preparation of Ice-maker
2-1) Connect the water line to the water supply valve of refrigerator to supply water. (See how to connect a water supply line in the owner's manual.)
2-2) Push the bucket back fully so that the guide-ice of ice maker should not touch the back of bucket. (If the back of bucket touches the guide-ice of ice maker, the ice maker will not make ice any more because of a ice full signal.)
2-3) It takes 6 hours to have a first ice, and throw away 2-3 times of these ice to make sure the supplied water clean.

Push the bucket back fully so that the lever should not be pushed up.
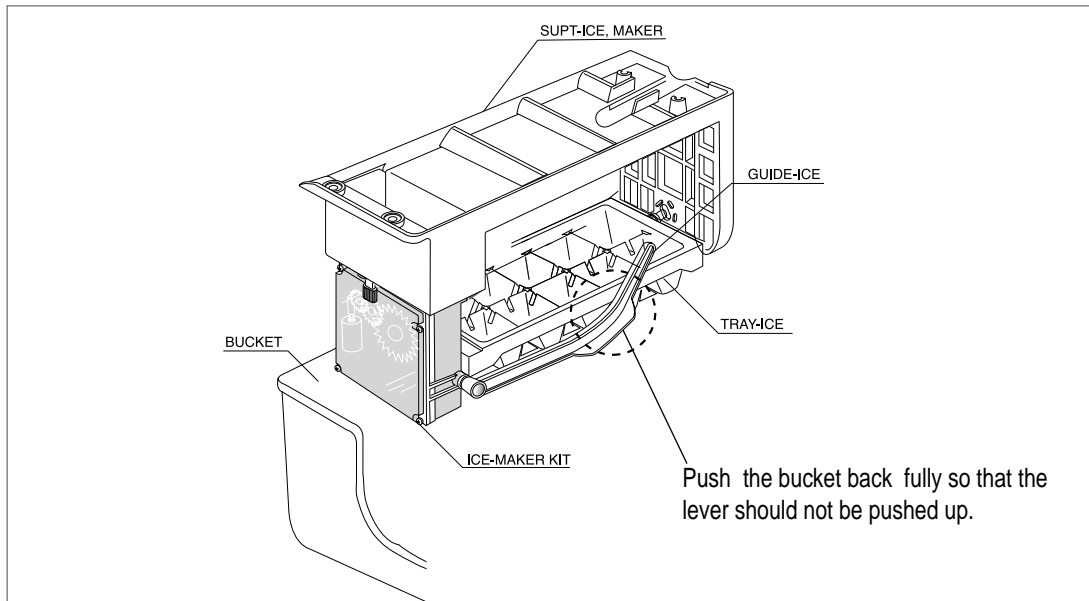
1) Initial Operation function
1-1) Whenever the power is on, the control board checks the ice tray leveling with the leveling switch within 2 seconds.
1-2) If the leveling switch is not off position, the geared motor will turn to the initial position to make the ice tray leveled.
1-3) When the ice tray is leveled, it will remain this position for 2 hours (1 cycle time for ice production).
1-4) After 2 hours, the sensor located under the ice tray will measure the tray temperature. If the temperature is maintained lower than -7 ℃ for 5 minutes, and the ice full switch is off position, the ice tray twisting process will begin.

<Reference table>

Leveling S/W	Ice full S/W	Judgement	Remark
ON("LOW")	ON("LOW")	Not ready	· MICOM Port
ON("LOW")	OFF("HIGH")	Not ready	PIN #51: Leveling PIN #51: Ice full
OFF("HIGH")	ON("LOW")	Not ready(Ice bucket with full of ice)	· Port level OFF : 4.5V ↑
OFF("HIGH")	OFF("HIGH")	Ready	ON : 0.5V ↓

2) Water Supply function
  2-1) When the ice tray is leveled again after ejecting ice, the water solenoid value will be controlled to supply water by time check basis. (See the "Time to supply water" Table)

3) Ice production
  3-1) After 90 minutes pass from the water supply, the control board will check the temperature.
  3-2) If the sensor reads the temperature lower than -7℃ for more than 5 minutes, than the ice production process is completed.

4) Test function
● In order to operate a test function, press the knob (Test Switch) for 1.5 second.
● This function can be used to check a proper working, to clean the ice tray, and to adjust the water level in the ice tray.
  4-1) This function only works when the ice tray is leveled and the ice full signal is cleared.
  4-2) When the water line is connected, each process such as a water supply, ejection, and leveling, can be investigated by this button.

5) Ice off function
  5-1) When the Ice off option is selected by Ice Type button, the ice making process will cease.
  5-2) When the ice making process ceases, the final state will be the ice tray with the supplied water.
  5-3) When Cubed or Crushed option is selected again, the control board will check an accummlated time period. After making it 90 minutes and when the ice tray temperature is acceptable, ice ejection process will begin.

6) Functions when the freezer door is open
● When the freeze door is open, all ice maker related processes will cease in order to minimize noise and to prevent ice from dispensing.
  6-1) The ice tray stops moving regardless of the position.
  6-2) The water supply process remains working as usual.
  6-3) If the ice tray is in the middle of ice ejecting process, close the freezer for 30 seconds and check if the tray is leveled. If it is not leveled, it must be out of order.

9-10) Defrost Function

1) A defrost is determined based on the accumulated compressor on-time.
2) When the power is engaged for the first time, the defrost cycle for the freezer and the refrigerator will begin after 4 hours of the accumulated compressor on-time.
3) A defrost interval depends on the ambient temperature, the number of door openings, and the door open time.
4) A minimum interval is 6 hours and a maximum is 8 hours for the refrigerator, and 12 hours and 16 hours for the freezer, respectively.
5) The defrost heater on-time is determined by the defrost sensors as follow :

	Refrigerator	Freezer
Heater ON	Below 10℃	-
Heater OFF	17℃	10℃

9-11) Forced Operation Function (Pull-down / R-Defrost / R.F-Defrost / Cancellation)

● This function enables a pull-down mode, a defrost mode for the refrigerator only, a defrost mode for the freezer and the refrigerator at the same time, and a cancellation of this function.
● Press Power Freeze and Fridge Temp. buttons for 8 seconds simultameously to get in the ready mode for a forced operation.
● The display panel will return to normal after 20 seconds in the ready mode.
● At the ready mode, press any button(except Ice Type and Child Lock) once to start a pull-down operation, twice for a defrost cycle for the refrigerator, three times for a defrost cycle for the freezer and the refrigerator, and finally four times for cancellation of this function.
● Another way to cancel this function is to simply plug out and in the power cord.

Press both button for 8 seconds at the same time.
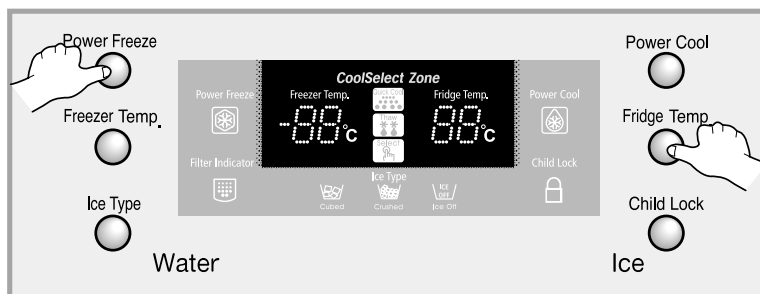
1) Pull-down Operation
   1-1) At the ready mode, press any button once then the buzzer will beep (ON for 1/2 second and OFF for 1/2 second) until this mode is cancelled.
   1-2) At this pull-down mode, the compressor will start immediately (No 5 minute delay) and if the system is in the defrost cycle, it will be cancelled right away.

Note) If this pull-down mode begins right after the compressor was off, the compressor may not start to run due to an overload condition.

   1-3) At this mode, the compressor and freezer fan will operate continuously for 24 hours and the refrigerator fan will be on and off according to the set temperature(-20 ℃)
   1-4) After 24 hour operation, the system will be cycled at -25℃ for the freezer and 1℃ for the refrigerator.
   1-5) In order to cancel this mode at any time, select the next mode on the ready mode or power off the system.

2) Defrost operation
   2-1) At the pull-down mode, press any button again on the ready mode to begin the defrost cycle for the refrigerator.
   2-2) The beep sound continues for 3 second at the beginning, then ON for 3/4 seconds and OFF for 1/4 second until this mode cease.
   2-3) After this operation, the system will come back to normal operation.
   2-4) At this mode, press any button again on the ready mode to operate the defrost cycles for both compartments.
   2-5) The beep sound continues for 3 seconds at that time, then ON for 1/4 second and OFF for 3/4 seconds until the defrost operation cease.

3) Cancellation
   3-1) At the R,F-Defrost mode, press any button again on the ready mode to return to a normal operation.
   3-2) Simply unplug the power cord, then plug it again to return to a normal operation.

9-12) Sound Function

1) Sound function
   1-1) To make sure a command input, whenever a button is pressed, a "ding-dong" sounds.
   1-2) When two or more buttons are pressed simultaneously or if a wrong button is pressed, there is no sound.

2) Door Open Alarm
   2-1) When the doors remain open for 2 minutes, there are 10 times beeps.
   2-2) If the doors continue to remain open more than 2 minutes, the additional 10 beeps interval will change to 1 minute.
   2-3) The beeps will cease immediately when the doors are closed.

9-13) Exhibition Function

● This function is for a display purpose on the floor of show room or store.

1) Mode ON/OFF
   1-1) For the exhibition mode, press Power Freeze and Freezer Temp. buttons simultaneously for 8 seconds until a "ding-dong" sounds.
   1-2) Press the same time buttons again for 8 seconds to cancel this mode put with a "ding-dong" sound.

2) Operation
   2-1) Most of the system function except the compressor operation are working properly.
   2-2) There is no defrost cycle in this mode.

9-14) Self-Diagnostics Function

1) Self-Diagnostics in the initial Power ON
   1-1)The control board performs a self diagnostics test within 1 second and check out the temperature sensors abilities.
   1-2) If a sensor failure occurs, a corresponding LED segment will blink with a beep.
   1-3) When a LED segment blinks, only the cancellation function (Press Power Freeze and Power Cool buttons simultaneously for 8 seconds) is acceptable.
   1-4) After a replacement of bad sensor or a cancellation of this function, this self diagnostics will end.

2) Self-Diagnostics in the normal operation
   2-1) To select this function, press Power Freeze and Power Cool buttons simultaneously for 8 seconds with an audible tone.
   2-2) In the self diagnostic mode, only corresponding LED segments will be illuminated (see the check list on the next page)
   2-3) After a 30 second illumination of error signal, the system will return to the normal operation.

✷ Self-diagnostics check list

Press both buttons simultaneously for 8 seconds

NO	Error
①	ICE-MAKER SENSOR
②	R-SENSOR
③	R-DEF-SENSOR
④	R-FAN ERROR
⑤	I/M function error
⑥	CoolSelect Zone™ SENSOR
⑦	R-DEFROST ERROR
⑧	EXIT-SENSOR
⑨	F-SENSOR
⑩	F-DEF ERROR
⑪	F-FAN ERROR
⑫	C-FAN ERROR
⑬	F-DEFROST ERROR

Power Freeze

Freezer Temp.

Ice Type

Freezer Temp. Fridge Temp.

⑧
⑬ ⑨
⑫ ⑩
⑪

⑥ ⑦ ②
⑤ ③
④

Power Cool

Fridge Temp.

Child Lock
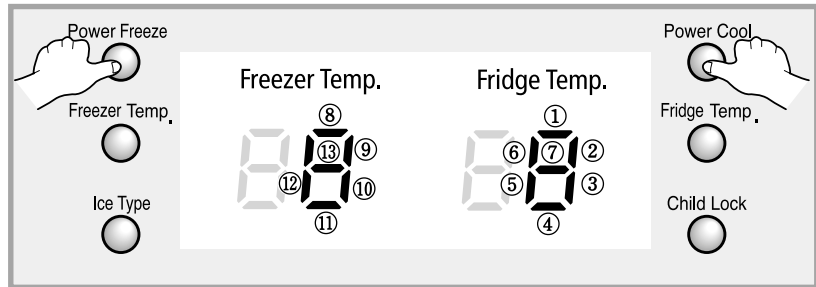
If any LEDs blink, the corresponding sensors and components must be checked for an error.

✷ Error items of self-diagnostics

| NO	Error items	LED Display	Details	Remarks
01	I/M-SENSOR	REF. SEGMENT	I/M sensor connector missing; contact failure, electric wire cut, short-circuit; I/M-sensor failure; and so on	Indicate Error when the temperature sensed by I/M-sensor is higher than 65℃ or lower than -50℃.
02	R-SENSOR	REF. SEGMENT	REF sensor connector missing; contact failure, electric wire cut, short- circuit; R-sensor itself failure; and so on	Indicate Error when the temperature sensed by R-sensor is higher than 65℃ or lower than -50℃.
03	REF DEFROST SENSOR	REF. SEGMENT	REF evaporator internal defrosting sensor connector missing; contact failure, electric wire cut, short-circuit; sensor itself failure; and so on	Indicate Error when the temperature sensed by R defrosting sensor is higher than 65℃ or lower than -50℃.
04	R-FAN ERROR	REF. SEGMENT	R-Fan motor operation failure; feedback signal line contact failed, electric wire cut, short- circuit; and so on	Indicate Error if the F and G signals generated by the FAN-motor operation are not input.
05	I/M function ERROR	FREEZER SEGMENT	Ice-ejector and level failed three times or more	
06	CoolSelect Zone™ sensor	REF. SEGMENT	CoolSelect Zone™ sensor connector missing; contact failed, electric wire cut, short-circuit; CoolSelect Zone™ sensor itself failed; and so on.	Indicate Error when the temperature sensed by CoolSelect Zone™ sensor is higher than 65℃ or lower than -50℃.
07	R-DEFROST ERROR	REF. SEGMENT	In the refrigerator room, if frost removal mode is finished due to limited time of 80 minutes. Error is displayed.	-
08	Ambient Air SENSOR	FREEZER SEGMENT	Air sensor connector missing; contact failure, electric wire cut, short-circuit; open air sensor itself failure; and so on	Indicate Error when the temperature sensed by the open air sensor is higher than 65℃ or lower than -50℃.
09	F-SENSOR	FREEZER SEGMENT	FRE sensor connector missing; contact failed, electric wire cut, short-circuit; F-Room sensor itself failure.	Indicate Error when the temperature sensed by F-sensor is higher than 65℃ or lower than -50℃.
10	FRE Defrost SENSOR	FREEZER SEGMENT	FRE evaporator defrosting sensor connector missing; contact failed, electric wire cut, short-circuit; sensor itself failure; and so on	Indicate Error when the temperature sensed by F-defrosting sensor is higher than 65℃ or lower than -50℃.
11	F-FAN ERROR	FREEZER SEGMENT	F-Fan motor operation failure; feedback signal line contact failure, motor's electric wire missing; and so on.	Indicate Error if the F and G signals generated by the FAN-motor operation are not input.
12	C-FAN ERROR (COMP-FAN)	FREEZER SEGMENT	C-Fan motor operation failure; feedback signal line contact failure, motor's electric wire missing; and so on.	Indicate Error if the F and G signals generated by the FAN-motor operation are not input
13	F-DEFROST ERROR	FREEZER SEGMENT	In the freezer room, if frost removal mode is finished due to limited time of 70 minutes. Error is displayed	-

Operation Function

9-15) Load Operation Check Function

1) In the normal operation, press Power Freeze and Power Cool buttons simultaneously for 6 second, then the display panel will blink for 2 seconds.
2) Press Fridge Temp. button ⓐ to get into this check mode with an audible tone.
3) Each illuminating LED segment stands for the component which has an ouput signal from the control board.
4) This mode will terminate automatically after 30 seconds.

✱ Table of Load Mode Check List

NO	Contents
①	R-FAN High or AC motor operation
②	R-FAN Low
③	R-DEF heater
④	Start mode
⑤	Overload mode
⑥	Low-temperature mode
⑦	Exhibition mode
⑧	COMP
⑨	F-FAN High
⑩	F-FAN Low
⑪	F-DEF-Heater
⑫	C-FAN High
⑬	C-FAN Low
⑭	Dispenser-Heater
⑮	Damper
-	Normal condition

Press both buttons simultaneously for 6 seconds, all LED lights will be turned off. At this time press button ⓐ
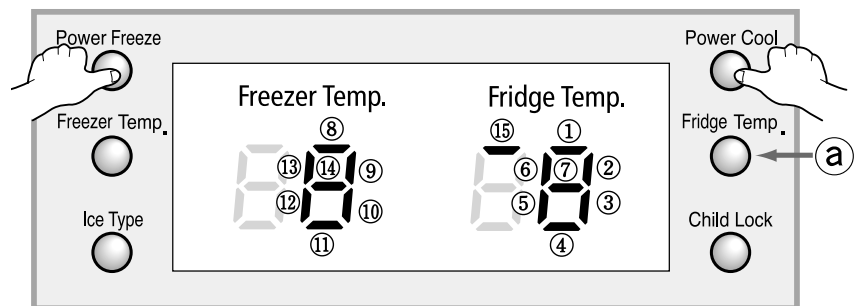
※ For the R-FAN, only one rpm is applied for the current models, so that ① and ② show R-FAN operation only.
※ The F-FAN and C-FAN are operated to High/Low rpm automatically according to the operational condition.
※ ④⑤ and ⑥ only explain the system operation status according to the ambient condition

9-16) Restoration Function for Power Outage

1) When the freezer temperature is lower than 5℃, all functions on the display panel will be restored.
2) When the freezer temperature is higher than 5℃, all functions will be initialized.
   (-20℃ for the freezer, 2℃ for the refrigerator, and Cubed for the Ice Type)

9-17) Set Point Shift Function

● Press Freezer Temp. and Power Cool buttons simultaneously for 12 seconds to get into this mode.
● In this mode, only the display LEDs for temperature will be ON.

Press both buttons simultaneously for 12 seconds
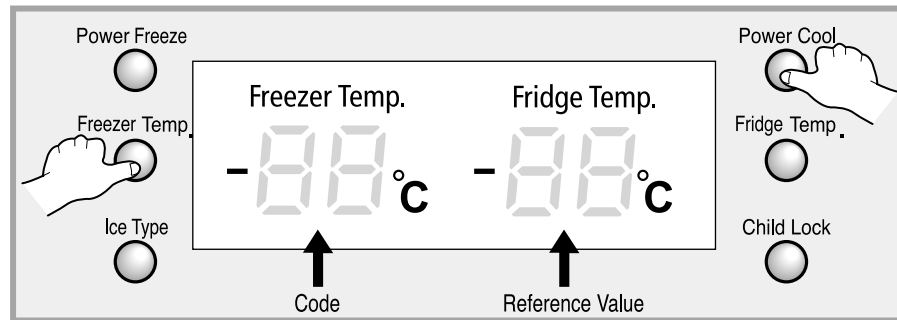
1) Initially, all products set the code, "0" and press Power Cool or Fridge Temp. to increase or decrease # of Reference.

2) To increase or decrease #of Code,press the Power Freeze or Freezer Temp. so that it can be adjusted such as the temperatures of freezer,refrigerator,Ice maker,and CoolSelect Zone™,and the quantity of water supply.

3) After 20 seconds from adjustment, a new setting will be stored in EEPROM and return to the normal display.

9-18) Table of Set Point Shift Function

1) Shift the freezer temperature sensor

Reference Value	0

Code	Temp. shift	Code	Temp. shift
0	0	8	0.5℃
1	− 0.5℃	9	1.0℃
2	− 1.0℃	10	1.5℃
3	− 1.5℃	11	2.0℃
4	− 2.0℃	12	2.5℃
5	− 2.5℃	13	3.0℃
6	− 3.0℃	14	3.5℃
7	− 3.5℃	15	4.0℃

Example) If you are lowering the current temperature of the freezer by $-3.0℃$

```
Power Freeze                                    Power Cool
    ◯                                              ◯

Freezer Temp.        Freezer Temp.    Fridge Temp.     Fridge Temp.
    ◯                  ┌6┐℃            ┌0┐℃              ◯

Ice Type                                            Child Lock
    ◯                  ↑               ↑                ◯

                     Code         Reference value
```
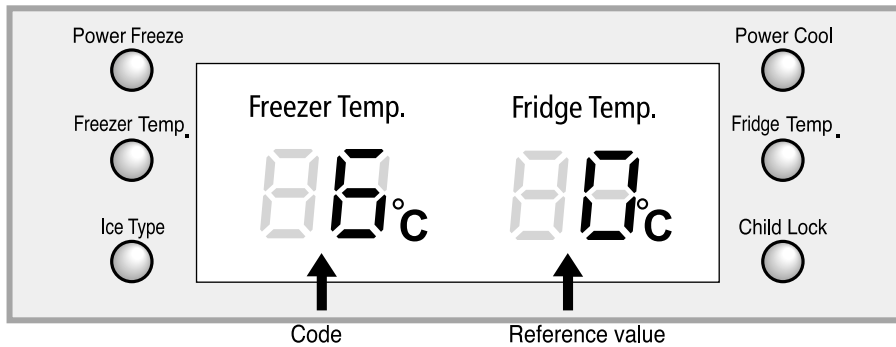
2) Shift the refrigerator temperature sensor

Reference Value	1

Code	Temp. shift	Code	Temp. shift
0	0	8	0.5℃
1	−0.5℃	9	1.0℃
2	−1.0℃	10	1.5℃
3	−1.5℃	11	2.0℃
4	−2.0℃	12	2.5℃
5	−2.5℃	13	3.0℃
6	−3.0℃	14	3.5℃
7	−3.5℃	15	4.0℃

Example) If you are raising the current temperature of the refrigerator by $+1.5℃$

```
Power Freeze                                    Power Cool
    ◯                                              ◯

Freezer Temp.        Freezer Temp.    Fridge Temp.     Fridge Temp.
    ◯                  ┌10┐℃           ┌1┐℃              ◯

Ice Type                                            Child Lock
    ◯                  ↑               ↑                ◯

                     Code         Reference Value
```
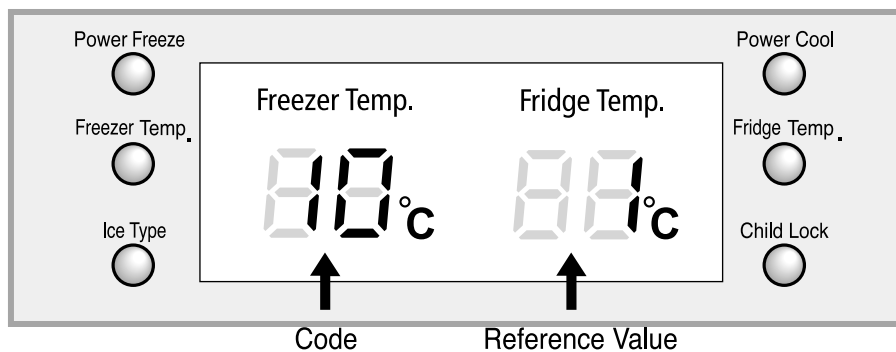
■ The following options is limited to a model with the Ice Maker.

3) Adjust the time to supply water for the ice maker

Reference Value	3

Code	Time to supply water
0	5 sec
1	4 sec
2	3 sec
3	6 sec
4	7 sec
5	8 sec
6	9 sec
7	10 sec
8	12 sec
9	13 sec
10	15 sec
11	17 sec
12	19 sec
13	21 sec
14	23 sec
15	25 sec

5) Shift the CoolSelect Zone™ temperature sensor.

Reference Value	20

Code	CoolSelect Zone™ temperature sensor
0	0
1	− 0.5℃
2	− 1.0℃
3	− 1.5℃
4	0.5℃
5	1.0℃
6	1.5℃
7	2.0℃

4) Shift the Ice maker temperature sensor

Reference Value	4

Code	Ice maker temperature sensor
0	-7℃
1	-6℃
2	-8℃
3	-9℃
4	-10℃
5	-11℃
6	-12℃
7	-13℃