

DAEWOO

Service Manual

Side By Side Refrigerator

Model: FRS-2021

FRS-2041

FRS-2421

FRS-2441

! Notice !

There was an engineering change in Side By Side Refrigerators.

The function that controls Top Hinge's left and right side was removed.

As a result, "Installation Guide" was modified and "Screw Machine" was deleted in service manual.

This change took effect on **Nov. 11th, 2003**.

So please refer to the revision service manual for the SBS models produced after **Nov. 11th, 2003**

✓ Caution

: In this Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service Information Center (<http://svc.dwe.co.kr>).



DAEWOO ELECTRONICS CORP.

<http://svc.dwe.co.kr>

Nov. 2003

TABLE OF CONTENTS

1. EXTERNAL VIEWS	-----	3
1-1. EXTERNAL SIZE	-----	3
1-2. NAME OF PARTS	-----	7
2. SPECIFICATIONS	-----	9
2-1. OUTLINE	-----	9
2-2. ELECTRIC PARTS	-----	10
2-3. POWER CORD	-----	13
2-4. DOOR COLOR	-----	14
3. OPERATIONS AND FUNCTIONS	-----	15
4. DIAGRAM	-----	41
4-1. WIRING DIRGRAM	-----	41
4-2. CIRCUIT DIAGRAM	-----	42
4-3. AIR FLOW DIAGRAM	-----	44
4-4. REFRIGERANT CYCLE DIAGRAM	-----	45
5. DISASSEMBLY AND ASSEMBLY	-----	46
6. INSTALLATION GUIDE	-----	54
7. EXPLODED VIEW AND PART LIST	-----	60
7-1. TOTAL EXPLODED VIEW	-----	60
7-2. TOTAL PART LIST	-----	68

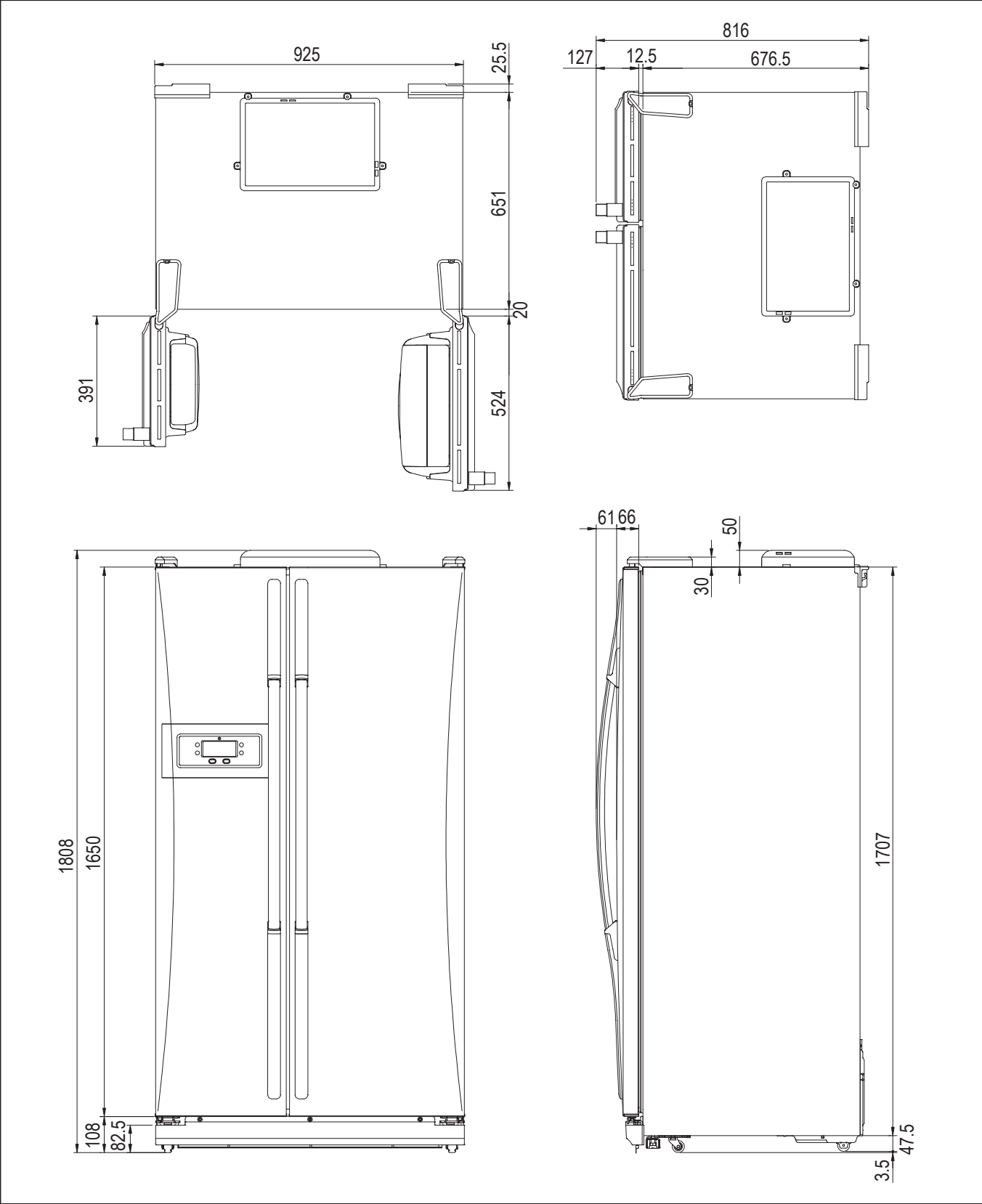
◆ SAFETY AND PRECAUTIONS ◆

- 1) For starters, be sure to check any chances of the leakage of electricity
- 2) You could handle a part in the vicinity of electricity after unplugging
- 3) You should put on rubber glovers to prevent an electric shock on operation test
- 4) Make sure the rated current, voltage, capacity before using an instrument
- 5) Keep your wet hands away from the metal goods in the freezer compartment not to be frostbitten
- 6) Be careful not to let water to permeate the electric part in the machine room
- 7) with the door open during your working, you might be damaged by that door
- 8) You should give a tilt to the refrigerator for your safe after removing the breakable goods inside the refrigerator
- 9) You'd better use cotton gloves if you fix it up around the evaporator

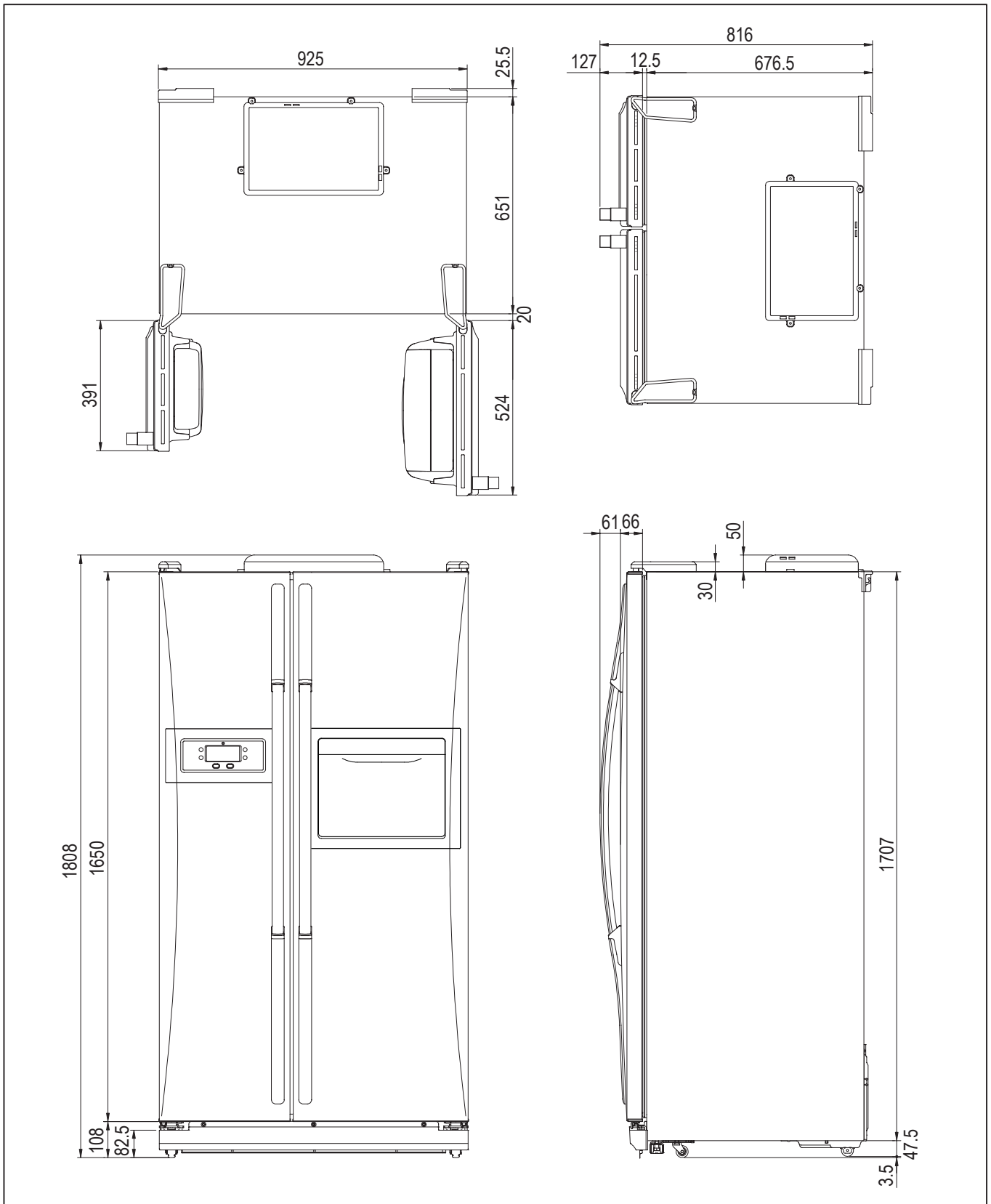
1. EXTERNAL VIEWS

1-1. EXTERNAL SIZE

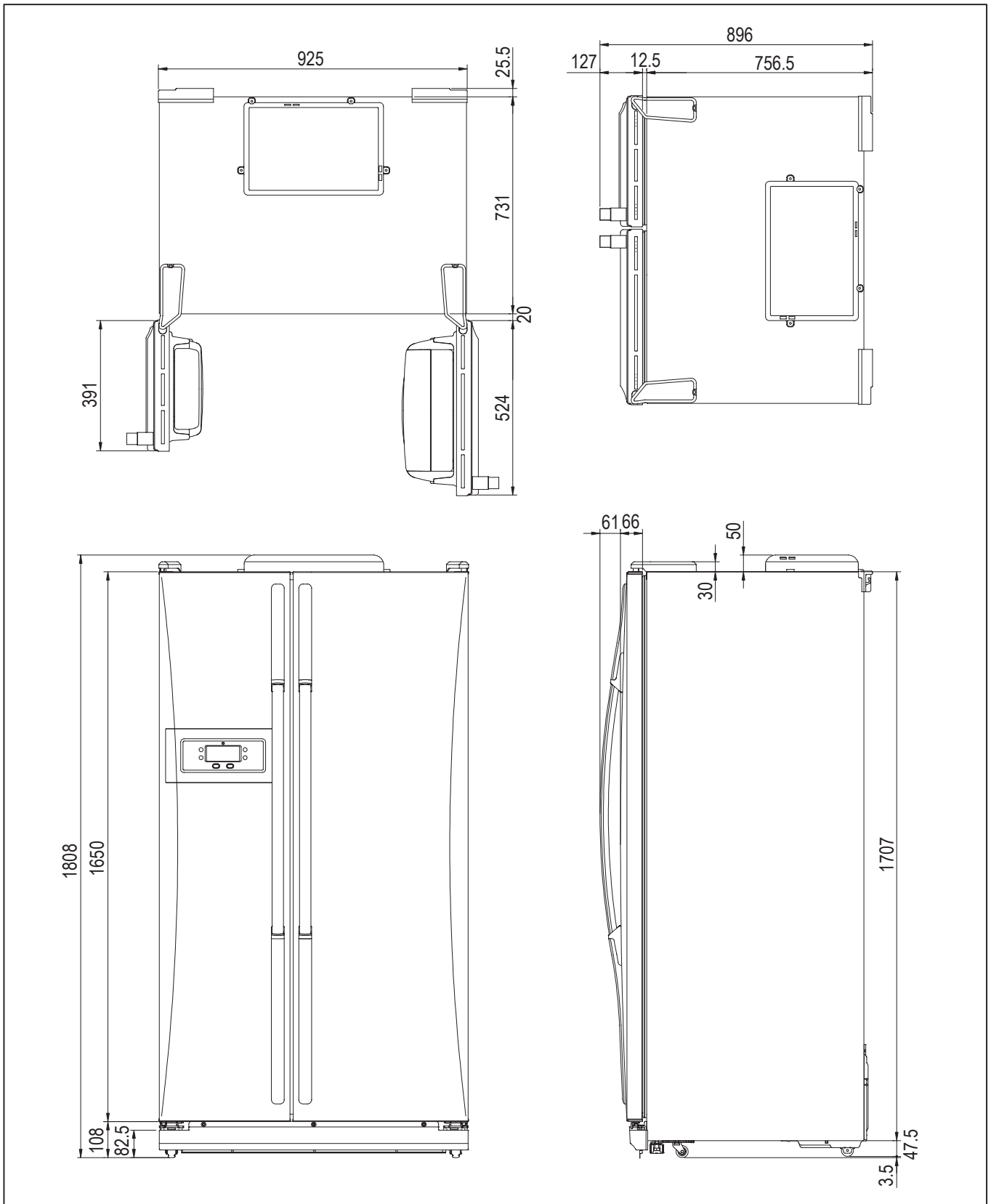
■ FRS-2021



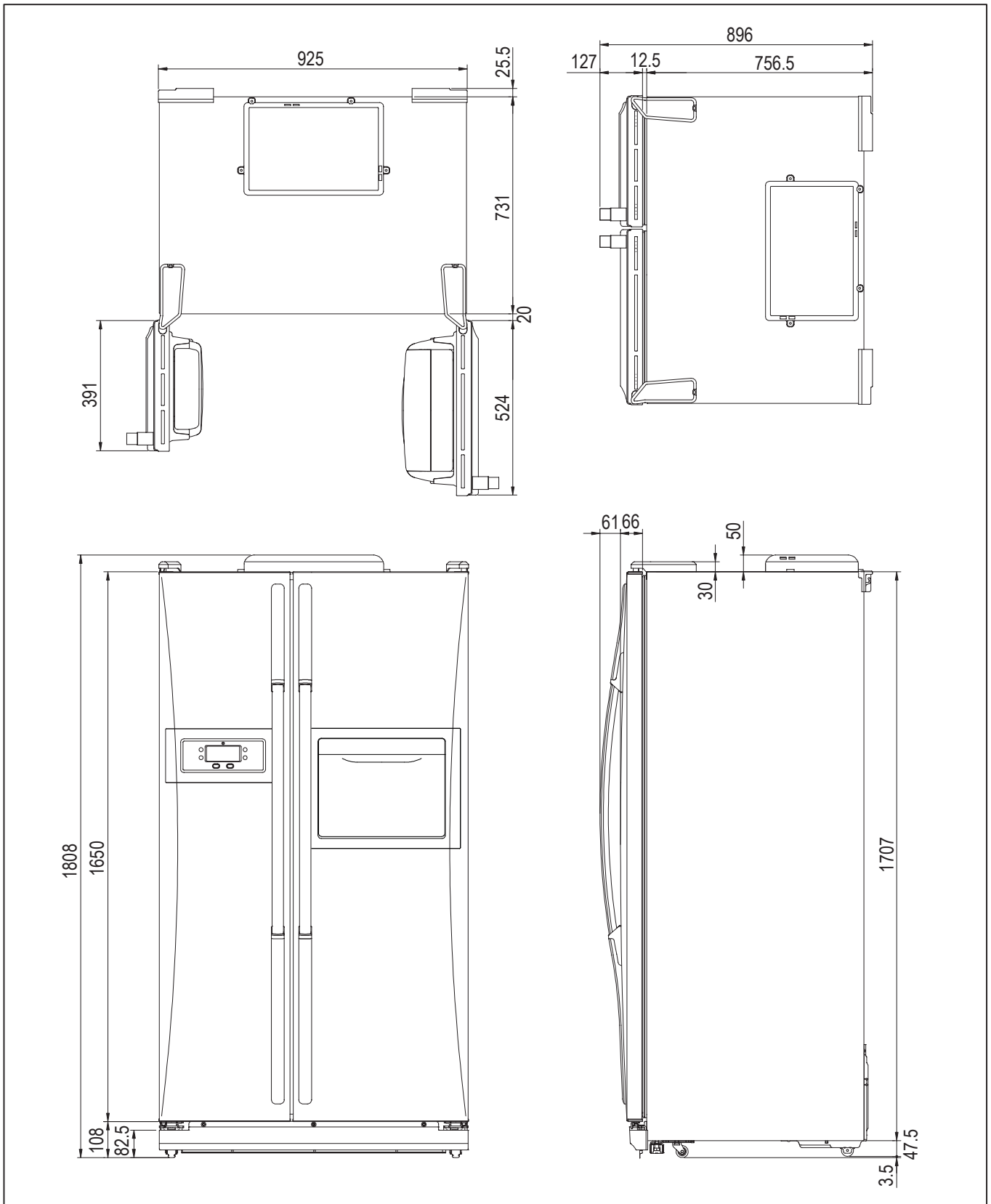
■ FRS-2041



■ FRS-2421

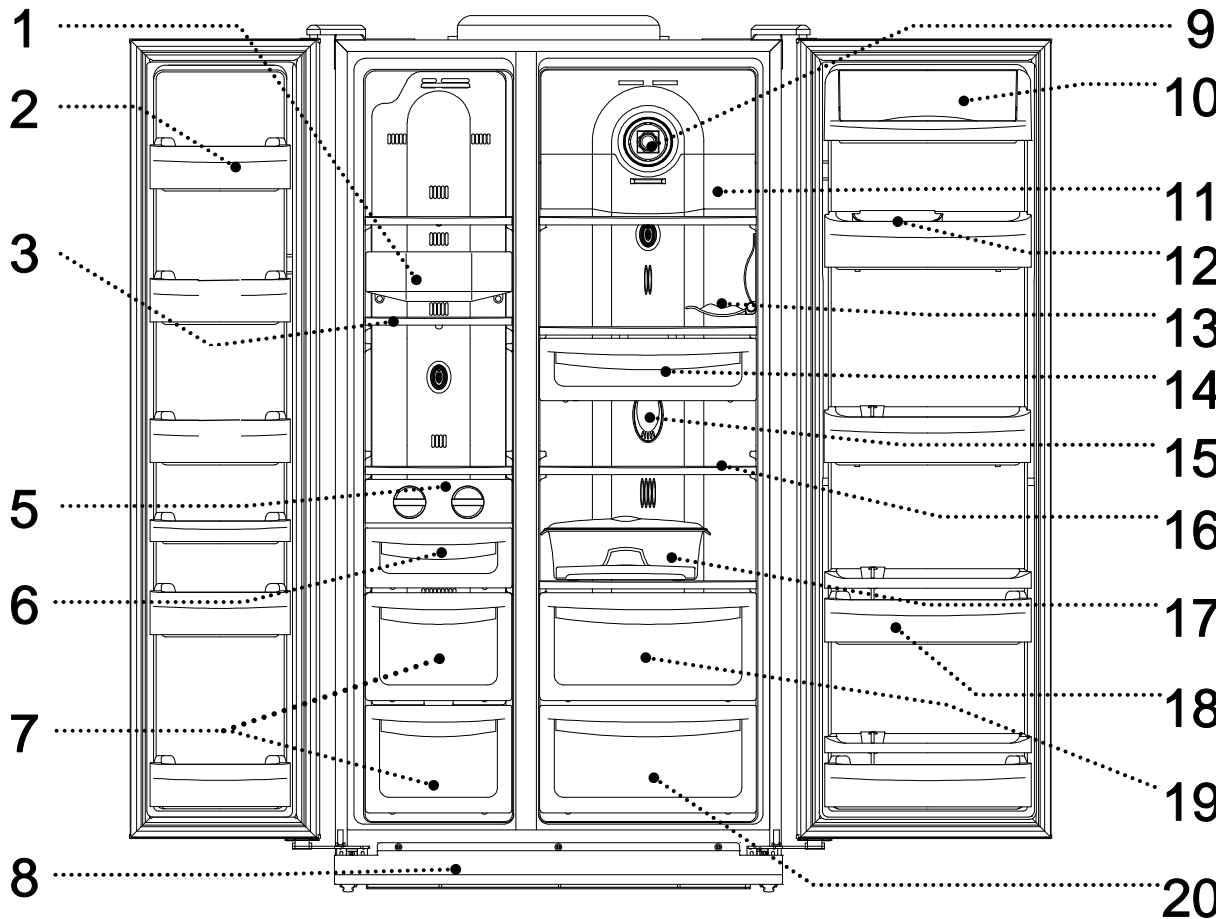


■ FRS-2441



1-2. NAME OF PARTS

■ FRS-2021 / FRS-2421



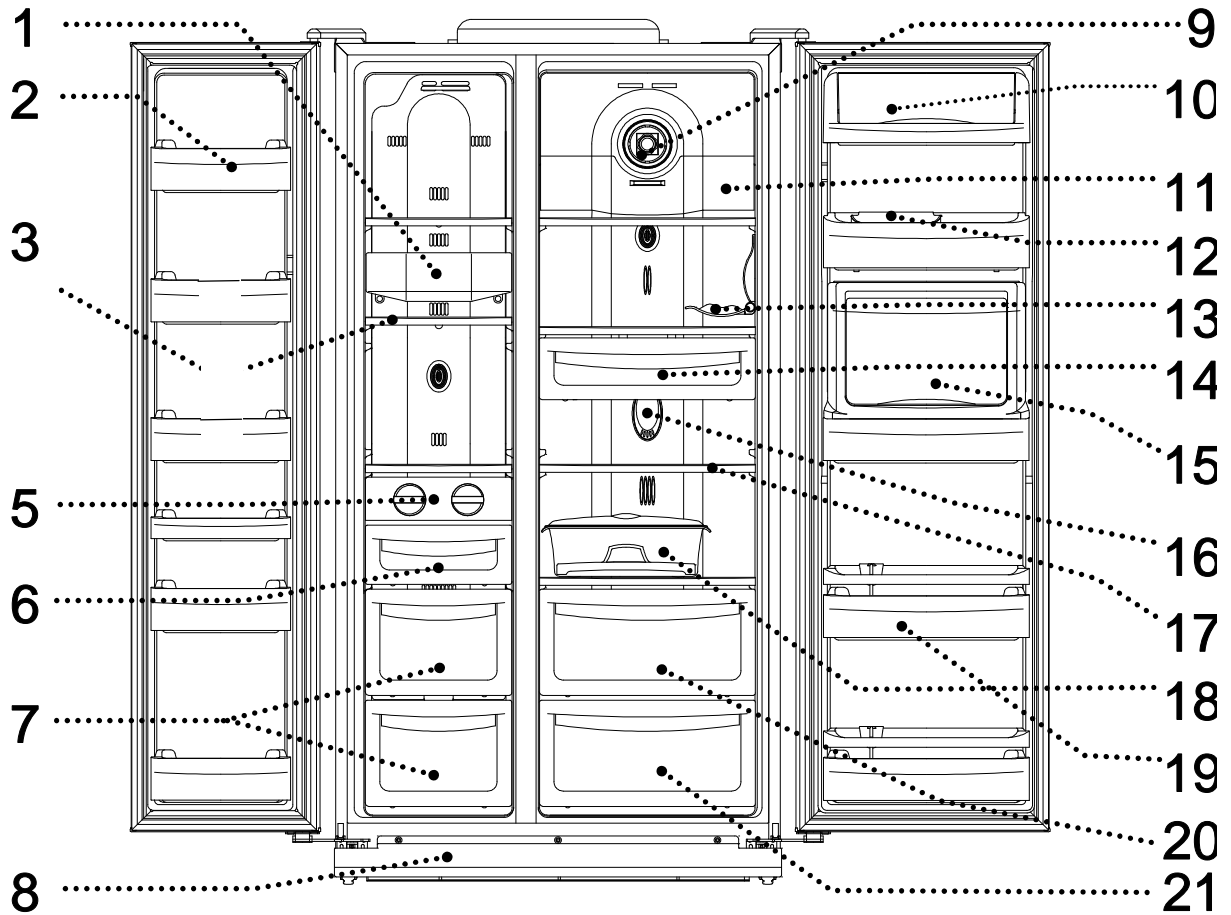
Freezer Compartment

1. Freezer Light
2. Freezer Pockets
3. Freezer Shelves
5. Ice Cubes Maker
6. Ice Cubes Case
7. Freezer Case
8. Front Cover

Refrigerator Compartment

9. Deodorizer
10. Dairy Pocket
11. Refrigerator Top Light
12. Refrigerator Small Pocket
13. Foldaway Wine Support
14. Chilled Case
15. Refrigerator Bottom Light
16. Refrigerator Shelves
17. Egg Case
18. Refrigerator Pockets
19. Vegetables Case
20. Fruits Case

■ FRS-2041 / FRS-2441



Freezer Compartment

- 1. Freezer Light
- 2. Freezer Pockets
- 3. Freezer Shelves
- 5. Ice Cubes Maker
- 6. Ice Cubes Case
- 7. Freezer Cases
- 8. Front Cover

Refrigerator Compartment

- 9. Deodorizer
- 10. Dairy Pocket
- 11. Refrigerator Top Light
- 12. Refrigerator Small Pocket
- 13. Foldaway Wine Support
- 14. Chilled Case
- 15. Refreshment (Home-Bar) Pocket
- 16. Refrigerator Bottom Light
- 17. Refrigerator Shelves
- 18. Egg Case
- 19. Refrigerator Pockets
- 20. Vegetables Case
- 21. Fruits Case

2. SPECIFICATIONS

2-1. OUTLINE

DIVISION		CONTENTS			
MODEL NAME		FRS-2021	FRS-2041	FRS-2421	FRS-2441
USABLE CAPACITY (L)	FREEZER	215		256	
	REFRIGERATOR	370		430	
	TOTAL	585		686	
EXTERNAL DIMENSION (mm)	WIDTH	925		925	
	DEPTH	816		896	
	HEIGHT	1808		1808	
REFRIGENT	R134a	150/190			
COOLING & CONTROL SYSTEM	COOLING SYSTEM	Fan Cooling System			
	DEFROST SYSTEM	Fin Evaporator Forced			
	DEFORST CONTROL	Automatic Start & Stop			
NET WEIGHT (kg)		112	114	120	122

2-2 ELECTRIC PARTS

1) COMPRESSOR

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220 / 60	220 ~240/50	230 /50 (EUROP)
COMP MODEL	X	HBL27YG-3	X	HCL27YG-2	HPL27YG-4A	HPL30YG-5	DK190Q-L2U
PART CODE	X	3952127R30	X	3957127R20	3956127R40	395S130R50	3956190D50
STARTING TYPE	X	CSR	X	CSIR	RSCR	RSCR	RSCR

2) RELAY

REFRIGERANT	R134a							
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220 / 60	220~240 / 50	230 / 50	
ASSY	TYPE NAME	X	783SHB	X	801SFB	419RHB	308NHB	265RHB
	PART CODE	X	3018119370	X	3018118180	3018118131	3018119980	3018125210
PTC	RESISTANCE	X	6.8Ω	X	6.8Ω	33Ω	33Ω	33Ω
OVER LOAD	PART CODE	X	783SHB	X	801SFB	419RHB	308NHB	265RHB

3) STARTING CAPACITOR

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220 / 60	220~240 / 50	230 / 50
PART CODE	X	3016400100	X	3016400100	X	X	X
RATED VOLTAGE	X	200V	X	200V	X	X	X
RATED CAPACITANCE	X	100μF	X	100μF	X	X	X

4) RUNNING CAPACITOR

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220 / 60	220~240 / 50	230 / 50
PART CODE	X	400EL15130	X	X	3016401170	3016401920	3016401170
RATED VOLTAGE	X	230V	X	X	350V	400V	350V
RATED CAPACITANCE	X	10μF	X	X	5μF	5μF	5μF

5) F-FAN MOTOR

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
TYPE NAME	BL-2213DWFA-1						
PART CODE	3015911300						
REVOLUTION	DC 12V 2200RPM						

6) R-FAN MOTOR

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
TYPE NAME	BL-2213DWRA-1						
PART CODE	3015911400						
REVOLUTION	DC 12V 2200RPM						

7) C- FAN MOTOR

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
TYPE NAME	BL-2213DWCA-2						
PART CODE	3015911500						
REVOLUTION	DC 12V 2200RPM						

8) DEFROST HEATER

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
SPEC (W)	X	110V 140W	←	←	220V 140W	←	←
PART CODE	X	3012811210	←	←	3012811200	←	←

9) DRAIN HEATER

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
SPEC (W)	X	110V 10W	←	←	220V 10W	←	←
PART CODE	X	3012811110	←	←	3012811100	←	←

10) LAMP ASSEMBLY

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
SPEC (W)	X	120V 15W	←	←	240V 15W	←	←
PART CODE	X	3013600070	←	←	3013600060	←	←
SPEC (W)	X	120V 25W	←	←	230~240V 25W	←	←
PART CODE	X	3013602020	←	←	3013602010	←	←

11) MAIN PCB ASSEMBLY

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
TYPE NAME	X	Y202-SBS	←	←	←	←	←
PART CODE	X	30143B4011	←	←	←	←	30143B4021



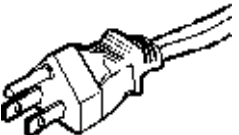
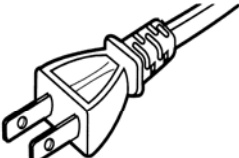
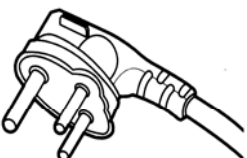
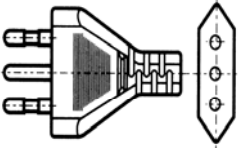
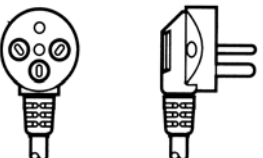
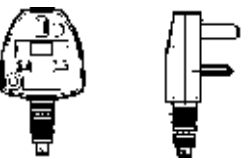

12) FUSE (PCB)

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
RATED CURRENT	X	250V/3.15A	←	←	←	←	←
PART CODE	X	5F3GB3282R	←	←	←	←	←

13) THERMOSTAT FUSE

REFRIGERANT	R134a						
VOLTAGE (V/HZ)	100 /50,60	110 / 60	115,120/60	127/60	220/60	220~240 / 50	230 / 50
OPERATING TEMPERATURE	x	77°C	←	←	←	←	←
PART CODE	x	30127201400	←	←	←	←	←

2-3. POWER CORD

NO	SHAPE OF POWER CORD	PART CODE	DESCRIPTION	REMARK
1		3011315000	CP-2PIN	For european country
2		401RA17200	CP-2PIN	For other country
3		4006D17101	KP-30	For America & El Salvador
4		401PD17101	KP-211	For Japan & Taiwan
5		3011300801	BP-3PIN	
6		3011303010	# 267	For Chile
7		3011315310		For Israel
8		3011303050	BS-1363A	For U.K, Middle Asia Singapore & Malaysia
9		3011301200	KP-551/550	For China & Australia

※ Upper power cord's part code is only lead wire, without any kinds of terminal or housing

2-4. DOOR COLOR

1) ASSEMBLY URETHAN FREEZER DOOR

FRS-2021 / FRS-2401 / FRS-2421 / FRS-2441

Refrigerant	Cyclo Pentane				
COLORTYPE	Bright White PCM	White Emboss	Beige Emboss	Inox Looking Ellio 1	Inox Looking Ellio 2
COLOR CODE	RWB3C	GWG1B	FBG3B	DSG1E	ISG3E
PARTCODE	3000018730	3000018720	3000018710	3000018740	3000018700

2) ASSEMBLY URETHAN REFRIGERATOR DOOR

a. FRS-2021 / FRS-2421

Refrigerant	Cyclo Pentane				
COLORTYPE	Bright White PCM	White Emboss	Beige Emboss	Inox Looking Ellio 1	Inox Looking Ellio 2
COLOR CODE	RWB3C	GWG1B	FBG3B	DSG1E	ISG3E
PARTCODE	3000018830	3000018820	3000018810	3000018840	3000018800

b. FRS-2041 / FRS-2441 (220V ~ 240V)

Refrigerant	Cyclo Pentane				
COLORTYPE	Bright White PCM	White Emboss	Beige Emboss	Inox Looking Ellio 1	Inox Looking Ellio 2
COLOR CODE	RWB3C	GWG1B	FBG3B	DSG1E	ISG3E
PARTCODE	3000025330	3000025320	3000025310	3000025340	3000025300

c. FRS-2041 / FRS-2441 (100V ~ 127V)

Refrigerant	Cyclo Pentane				
COLORTYPE	Bright White PCM	White Emboss	Beige Emboss	Inox Looking Ellio 1	Inox Looking Ellio 2
COLOR CODE	RWB3C	GWG1B	FBG3B	DSG1E	ISG3E
PARTCODE	3000025380	3000025370	3000025360	3000025390	3000025350

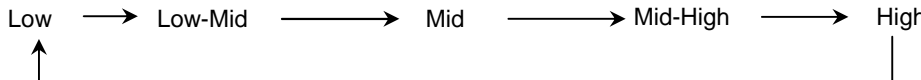
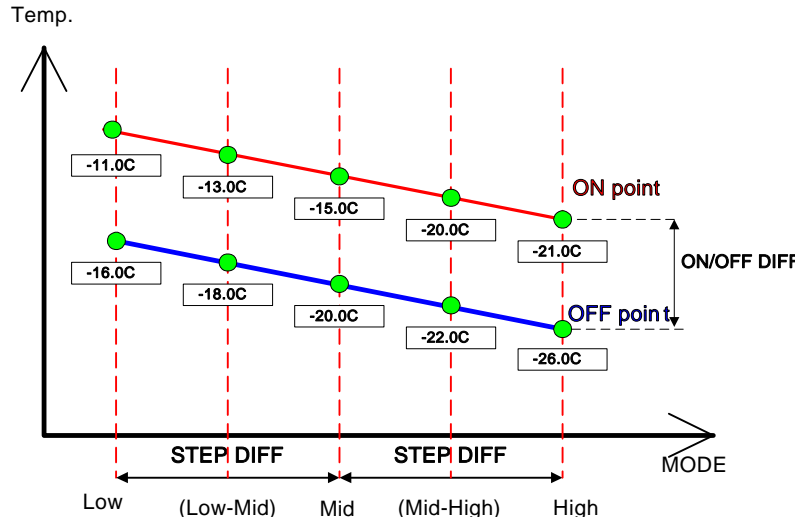
3. OPERATION AND FUCTIONS

■ Display

INPUT	Control Object				
Front PCB buttons FRZ SET. button / REF SET. button SUPER FRZ. button / SUPER REF. button LOCK button / SLEEP button	LCD				
CONTENTS			REMARKS		
1. Normal Operation 1) Temperature control of Freezer / Refrigerator (Initial mode : Freezer & Refrigerator -> Middle) 2) Lock mode : unlock(OFF) / Sleep mode : OFF 3) SPEED icon : inactive 4) FUZZY & DEODORIZER letters and icons : always ON 5) Other display modes					
CUSTOM LCD	Normal Operation		Silent Mode		Sleep Mode
	Normal Mode	Load Mode		Silence Mode	
Freezer / Refrigerator BAR	DIAL	DIAL	DIAL	DIAL	DIAL
Temp. SEG.	DIAL	DIAL	DIAL	DIAL	DIAL
1) Letters of [FRZ., REF., LOW, HIGH, SET TEMP, C, FUZZY, DEODO., SILENT, SLEEP] 2) Icons of [FUZZY, DEODO., SLEEP] 3) Temp. bars and lines	ON	ON	ON	ON	ON
SILENT icon	OFF	OFF	ON	ON	OFF
SPEED letters	OFF	ON	ON	OFF	OFF
SPEED bars	OFF	ON (progressive)	ON (progressive)	OFF	OFF
LOCK ON/OFF, SLEEP ON/OFF	DIAL	DIAL	DIAL	DIAL	DIAL

CONTENTS	REMARK
<p>2. "FRZ SET." button</p> <ol style="list-style-type: none"> 1) Temperature control of Freezer compartment 2) 5 steps of sequential temperature mode Initial mode by power input : "MID" (Temperature and bars are shown.) * Letters are not indicated at Soft-Mid and Mid-Strong modes. (Just temperatures and bars are shown.) <p style="margin-left: 40px;">Temperature progress : Low -> (Low-Mid) -> Mid -> (Mid-High) -> High Temp. indication : -15C -17C -19C -21C -25C Number of bars : 5EA 3EA 5EA 3EA 5EA</p> <p>3. "SUPER FRZ." button When this mode is chosen, "QUICK" icon and letters of freezer flicker 3 times and ON. (The set temperature and bars are still the previous value.)</p> <p>4. "REF SET." button</p> <ol style="list-style-type: none"> 1) Temperature control of Refrigerator compartment 2) 5 steps of sequential temperature mode Initial mode by power input : "MID" (Temperature and bars are shown.) * Letters are not indicated at Soft-Mid and Mid-Strong modes. (Just temperatures and bars are shown.) <p style="margin-left: 40px;">Temperature progress : Low -> (Low-Mid) -> Mid -> (Mid-High) -> High Temp. indication : 4C 3C 2C 1C 0C Number of bars : 5EA 3EA 5EA 3EA 5EA</p> <p>5. "SUPER REF." button When this mode is chosen, "QUICK" icon and letters of refrigerator flicker 3 times and ON. (The set temperature and bars are still the previous value.)</p> <p>6. "SLEEP" button</p> <ol style="list-style-type: none"> 1) Start by pushing the button ("ON" lights.) 2) Stop by pushing button again ("OFF" lights.) 3) Automaticcally terminated after maximum 12 hours ("OFF" lights.) <p>7. "LOCK" button</p> <ol style="list-style-type: none"> 1) Start by pushing the button ("LOCK" letters and icon light.) * No other buttons and modes, buzzer sound are controllable. 2) Stop by pushing button again for a second ("OFF" and icon light.) 	

■ Temperature Control of Freezer Compartment (FC)

INPUT	Control Object
1. FRZ SET. button / SUPER FRZ. button 2. F-sensor	1. COMP 2. F-FAN
CONTENTS	
1. Temperature modes change by pushing the button.	
	
2. Comp. and F-fan are controlled by ON / OFF point of each mode.	
3. FC [ON / OFF] DIFF : 5 C (Freezer middle OFFpoint : -20.0 C	
4. FC [Low -> (Low-Mid) -> Mid -> (Mid-High)] DIFF : 2 degrees respectively (* [(Mid-High) -> High] DIFF : 4 degrees)	
5. Control point of each mode	
	

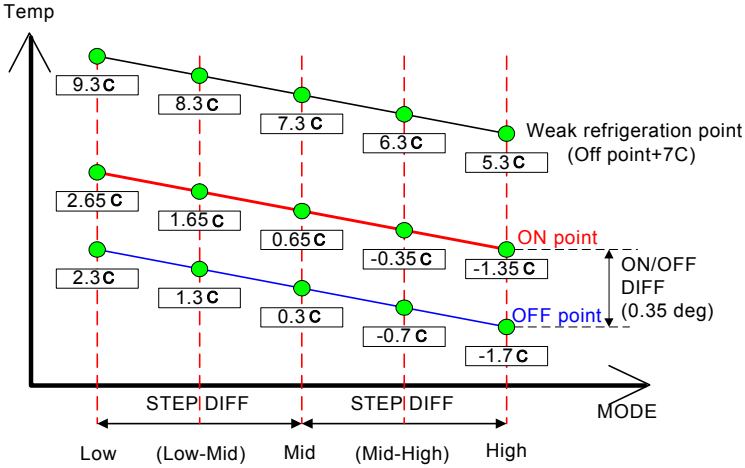
CONTENTS	REMARKS
<p>6. SUPER FRZ. (Quick Freezing)</p> <p>1) Comp. and F-fan are ON (about 150 minutes) regardless of F-sensor.</p> <p>2) F-fan runs at 14V for the first 90 min., then at 12V for the rest time.</p> <p style="text-align: center;">SUPER FRZ. start F-fan RPM change point Normal operation</p>	<p>* <u>ON/OFF DIFF. :</u> fixed by MICOM</p> <p>* <u>STEP DIFF. :</u> fixed by MICOM</p> <p>* <u>Comp. and C-fan :</u> linked</p>

■ Temperature Control of Refrigerator Compartment (RC)

INPUT	Control Object
1. REF SET. button 2. R-sensor	1. COMP 2. R-FAN
CONTENTS	REMARKS
<p>1. Temperature modes change by pushing the button.</p> <p>Low → Low-Mid → Mid → Mid-High → High</p> <p>↑</p> <p>2. R-fan are controlled by ON / OFF point of each mode.</p> <p>3. RC [ON / OFF] DIFF : 0.35C (RC middle OFF point : 0.3C)</p> <p>4. RC [Low -> (Low-Mid) -> Mid -> (Mid-High)] DIFF : 1 degree respectively</p> <p>5. Prevention of weak/poor-refrigeration</p> <p>1) When weak refrigeration is sensed, comp. is ON regardless of F-sensor.</p> <p>2) When R-sensor reaches R-fan OFF point, comp. is controlled by F-sensor and R-fan turns OFF.</p> <p>3) Sensing point of weak refrigeration : R-sensor OFF point of each mode + 7C</p> <p>4) Termination point : Same as R-sensor OFF point of each mode</p>	<p>* <u>ON/OFF Diff. :</u> fixed by MICOM</p> <p>* <u>STEP DIFF. :</u> fixed by MICOM</p>

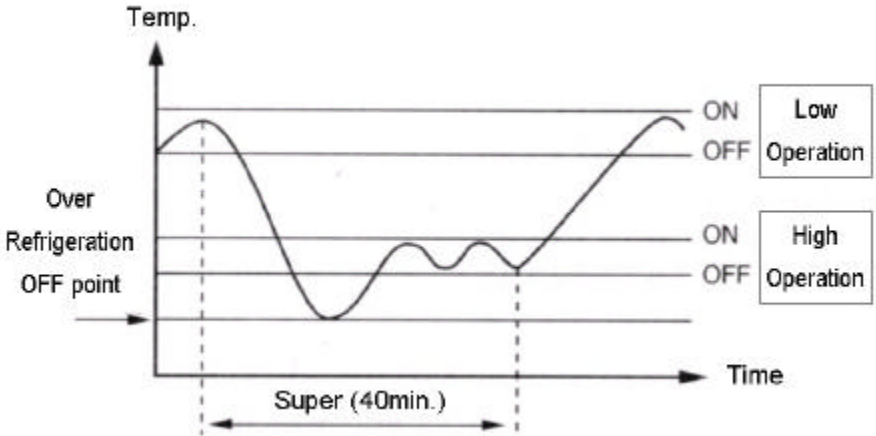
CONTENTS	REMARKS
----------	---------

6. Control point of each mode



7. Super refrigeration proceeds for 40 minutes.

* Example of temperature change
(Refrigerator ; Low (normal) -> Super refrigeration)



- 1) R-fan and comp. are ON until R-sensor reaches to over-refrigeration OFF point (-7C).
- 2) After reaching to the point, it goes on with "HIGH" mode until the end of Super refrigeration. It returns to normal after Quick refrigeration of 40 minutes.

■ SLEEP Mode

INPUT	Control Object	
1. SLEEP button	1. COMP 2. R-FAN 3. F-FAN 4. CUSTOM-LCD	
CONTENTS		REMARKS
<p>1. This mode starts with a push of "SLEEP" button.</p> <p>2. Conditions to start Sleep mode</p> <ol style="list-style-type: none"> 1) F-sensor $\leq -13C$ 2) Unless it is a restart within 40 minutes after the end of previous Sleep mode 3) F-sensor error 4) Door switch error 5) Defrosting (Heater defrosting, pause, Fan delay) 6) If the above conditions of 1) ~ 5) are all satisfied, the sleep mode starts. <p>3. Control of electrical parts</p> <ol style="list-style-type: none"> 1) Mode 1 Once Sleep mode starts, all the electrical parts (COMP, F-FAN, R-FAN) turn OFF. ("ON" letters of SLEEP on LCD is display.) 2) Mode 2 It operates with Silent mode and "ON" letters of SLEEP on LCD is displayed on.) <p>4. Termination of Sleep mode</p> <ol style="list-style-type: none"> 1) MODE 1 <ol style="list-style-type: none"> a. F-sensor $\geq -9C$ b. In case of F-sensor error c. When other button is pushed during this mode d. Total F/R door open time exceeds 30 seconds during the mode e. If Sleep mode is terminated by a, b and f, F/R-fan delay for 5 minutes and restart of this mode is prevented for 40minutes. f. If it exceeds time limit of 130 minute, Mode1 is terminated and Mode2 starts. 2) MODE 2 Sleep mode is terminated 12 hours after the first start. (Speed mode and defrosting operate in normal way.) <p>5. After Sleep mode stops all the electrical parts return to normal operation and Sleep icon changes from "ON" to "OFF".</p> <p>6. If Sleep mode starts during PRECOOL, it goes on again after the Sleep mode is terminated.</p> <p>7. If Sleep mode starts during Super FRZ., Super REF., it returns to previous set modeafter the Sleep mode is terminated.</p>		

■ SILENT (Silence Mode)

INPUT		Control Object																
1. CDS SENSOR		5. COMP 6. R-FAN 7. F-FAN 8. CUSTOM-LCD																
CONTENTS				REMARKS														
<p>1. Purpose of Silence mode To reduce refrigerator noise at night by decreasing fan RPM to a minimum degree</p> <p>2. Condition to start 1) The optical or light sensor in top middle of control panel senses surround light and Silence mode starts if the amount of light sensed is below the standard value for more than 1 minute. (The mode does not start for initial 240 minutes to prevent down of cooling performance.) a. Standard value to decide 'night' : below 5~7 Lux (optical sensor surface) b. Standard value to decide 'daytime' : above 4~16 Lux (optical sensor surface)</p> <p>3. Control Method</p> <table border="1"> <thead> <tr> <th colspan="2">Control Mode</th> <th>F-FAN</th> <th>R-FAN</th> <th>C-FAN</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Silence</td> <td>Normal</td> <td>10V</td> <td>10V</td> <td>10V</td> </tr> <tr> <td>Load Control</td> <td>12V</td> <td>12V</td> <td>10V</td> </tr> </tbody> </table> <p>4. Termination Condition The mode stops if lux value is above the standard for more than 1 minute.</p>				Control Mode		F-FAN	R-FAN	C-FAN	Silence	Normal	10V	10V	10V	Load Control	12V	12V	10V	
Control Mode		F-FAN	R-FAN	C-FAN														
Silence	Normal	10V	10V	10V														
	Load Control	12V	12V	10V														

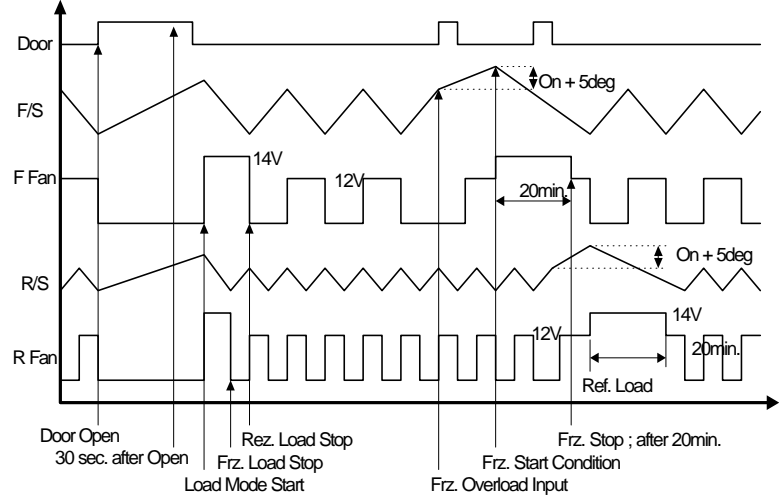
■ Control of Each Mode

INPUT		Control Object		
1. CDS SENSOR 2. R SENSOR 3. F SENSOR		1. F-FAN (14V, 12V, 10V)		
CONTENTS				REMARKS
<p>* Control of Silence mode : operation mode when the optical sensor feels that it is night</p> <p>* Normal control : daytime operation mode (Refrigerator noise is relatively low at daytime.)</p> <p>* Load control : operation mode when inside temperature goes up due to an increase of load (foods) or frequent door openings</p>				

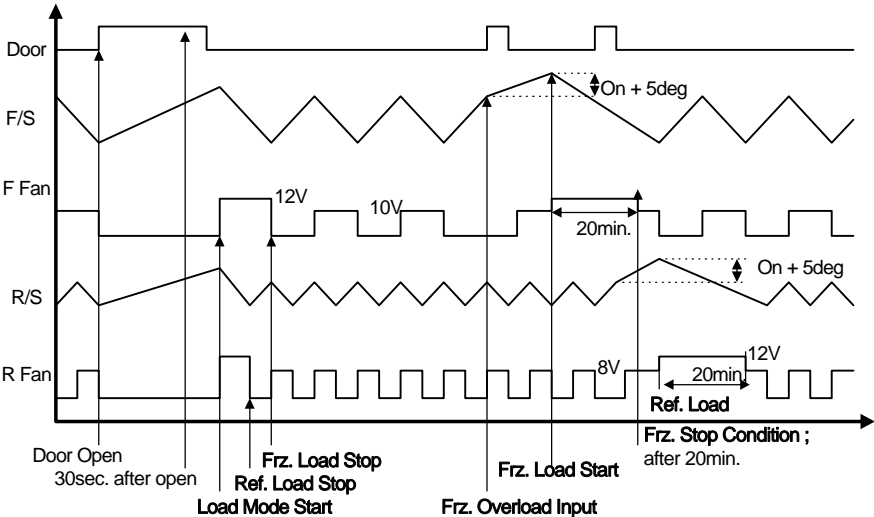
CONTENTS				REMARKS
1. Fan voltage of each control mode				
Control Mode		F-FAN	R-FAN	C-FAN
Normal		12V	12V	10V
Load Control	Normal	14V	14V	
	Silence	12V	12V	
Silence	Normal	10V	10V	
Sleep Mode2	Normal	10V	10V	
	Load control	12V	12V	
2. Control against (under) load (Load Control)				
1) Purpose : To restore F/R-temperature which has risen by load (much foods in or frequent door openings) as soon as possible				
2) Display : "SPEED" lights until the mode and speed icons flicker.				
3) Conditions to start (from both Normal and Silence)				
a. F or R door open time exceeds 30 seconds at a time -> Freezer and Refregerator load control starts respectively.				
b. Over [F-sensor On Point + 5 degree] -> F load control				
c. Over [R-sensor On Point + 5 degree] -> R load control				
4) Conditions to avoid load control				
a. Initial operation (rught after power input) of refrigerator				
b. Just after Pre-cool, Heater defrosting, Pause, Defrosting cycle				
5) Control Method				
5-1) Control mode by F/R-door open time (over 30 seconds)				
-> F/R-fan works by 14V respectively.				
5-2) Control mode by [F-sensor On Point + 5 degree]				
-> F-fan works by 14V.				
5-3) Control mode by [R-sensor On Point + 5 degree]				
-> R-fan works by 14V.				
* C-fan works by 10V as normal.				
6) Conditions to stop				
a. The mode works for 20 minutes.				
(If another condition happens at the end of the mode, it starts again.)				
b. When it reaches to [F-sensor Off point], F-fan load control mode stops.				
c. When it reaches to [R-sensor Off point], R-fan load control mode stops.				

CONTENTS	REMARKS
----------	---------

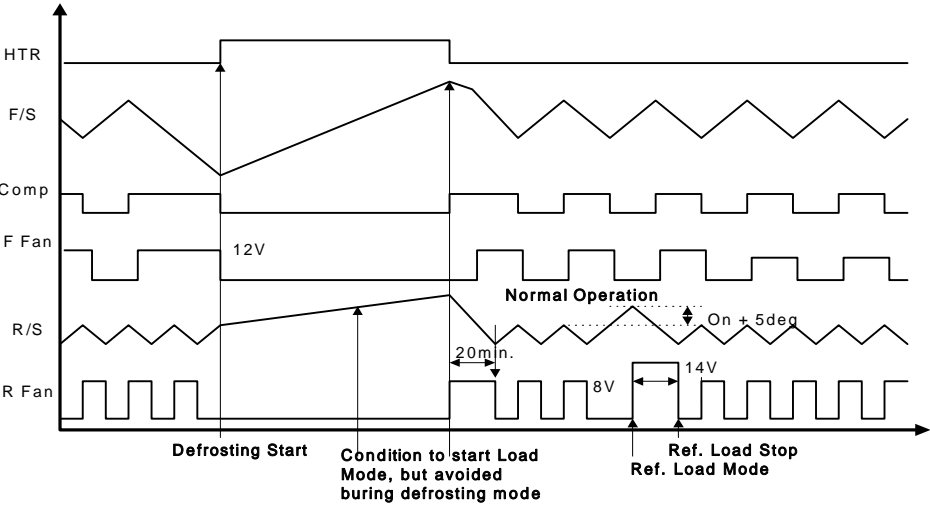
3. Control Time Chart of Each Mode
 1) Start & stop of load control mode (Normal Control)



2) Start & stop of load control mode (Silence Control)



3) Start & stop of load control mode (Normal defrosting control)



CONTENTS	REMARKS
<p>4. Flow Chart of Load Control Mode</p> <pre> graph TD Start([Start]) --> T1{240 minutes?} T1 -- N --> T2{Control Mode} T1 -- Y --> T2 T2 -- Normal --> RPM1[Fan RPM F Fan: 12V R Fan: 12V C Fan: 10V] T2 -- Silence --> RPM2[Fan RPM Normal Overload F Fan: 10V 12V R Fan: 10V 12V C Fan: 10V 12V] RPM1 --> T3{Load control is avoided?} RPM2 --> T3 T3 -- Y --> NMC[Normal mode control] T3 -- N --> T4{F/R door open time is over 30 sec.?} T4 -- Y --> OBC[Overload of both compartments] T4 -- N --> T5{F/S ON + 5deg?} T5 -- Y --> FCO[Freezer Compartment Overload] T5 -- N --> T6{R-sensor ON + 5deg?} T6 -- Y --> RCO[Refrigerator Compartment Overload] T6 -- N --> T7{Overload mode?} FCO --> OMC[Overload mode control] RCO --> OMC OBC --> OMC T7 -- Y --> OMC T7 -- N --> NMC OMC --> T8{F load control; over 20 min.?} T8 -- Y --> FLCMS[F load control mode stop] T8 -- N --> T9{F-sensor OFF point?} T9 -- Y --> FLCMS T9 -- N --> T10{R load control; over 20 min.?} T10 -- Y --> RLCMS[R load control mode stop] T10 -- N --> T11{R-sensor OFF point?} T11 -- Y --> RLCMS T11 -- N --> End([End]) FLCMS --> NMC RLCMS --> NMC NMC --> End </pre>	

■ Defrosting Cycle

INPUT	Control Object	
<ol style="list-style-type: none"> 1. Total comp. work time 2. Comp. work rate 3. RT temperature 4. Total door open time 	<ol style="list-style-type: none"> 1. Defrosting Mode 	
CONTENTS		REMARKS
<ol style="list-style-type: none"> 1. Conditions to start defrosting cycle <ol style="list-style-type: none"> 1) Total comp. work time : 6, 8, 10 hours 2) Comp. work rate (by the 2 hours) : over 65% 3) Total door open time : 3 minutes (Any door - F or R – open time is over 3 minutes.) 4) Total time of [comp. ON + comp. OFF] : 60 hours 5) Ambient temperature : over 35C 6) Any error mode : R1, F1, D1, F3, RT/S, Door-switch 2. Conditions to start defrosting mode <ol style="list-style-type: none"> 1) The mode starts in the following conditions ; <ol style="list-style-type: none"> a. Any error happens when total comp. work time is 6 or 8 or 10 hours. b. Comp. work rate by the 2 hours is over 65%. c. Total door open time is over 3 minutes. (Any door - F or R – open time is over 3 minutes.) d. Ambient temperature is over 35C 2) Defrosting mode starts unconditionally as long as total comp. work time is 10 hours, even if the above conditions (a~d) are not satisfied. 3) Defrosting mode starts immediately as long as total time of [comp. ON + comp. OFF] is over 60 hours, even if the above 1) and 2) conditions are not satisfied. 		

CONTENTS	REMARKS
<p>3. Flow Chart of Defrosting Start</p> <pre> graph TD Start([Start]) --> D1{Comp. work time is over 2 hours ?} D1 -- No --> End[End] D1 -- Yes --> D2{Total time is over 60 hours ?} D2 -- Yes --> StartDefrost[Defrosting mode starts.] D2 -- No --> D3{Comp. work time is over 10 hours ?} D3 -- Yes --> StartDefrost D3 -- No --> D4{Comp. work time is over 8 hours ?} D4 -- No --> End D4 -- No --> D5{Comp. work time is over 6 hours ?} D5 -- No --> End D5 -- Yes --> D6{Comp. work rate is over 65 % ?} D6 -- Yes --> StartDefrost D6 -- No --> D7{Total door open time is over 3 minutes ?} D7 -- Yes --> StartDefrost D7 -- No --> D8{Ambient temp. is over 35C ?} D8 -- Yes --> StartDefrost D8 -- No --> D9{Any error ?} D9 -- Yes --> StartDefrost D9 -- No --> End </pre>	

■ Defrosting Mode

INPUT	Control Object		REMARKS																														
1. Defrosting Cycle	1. COMP 2. F-FAN 3. R-FAN 4. HEATER																																
CONTENTS			REMARKS																														
<p>1. Defrosting Mode</p> <pre> graph TD A[Pre-Cool] --> B[Heater Defrosting] B --> C[Pause] C --> D[Fan Delay] </pre> <p>Pre-Cool</p> <ul style="list-style-type: none"> 1) Time : 50 minutes 2) Comp. / F-fan : ON R-fan : Control Heater : OFF 3) If F-sensor $\leq -27\text{C}$, PRE-COOL becomes OFF. <p>Heater Defrosting</p> <ul style="list-style-type: none"> 1) If D-sensor $\geq 10\text{C}$, Heater becomes OFF. 2) In case of Heater return by time limit of 40 or 80 min (F3-Error) 3) Heater is ON for 30 minutes (time limit) in case of D-sensor error. 4) Time limit <ul style="list-style-type: none"> a. 30 seconds : Heater is ON regardless of D-sensor temperature right after defrosting start. b. 30 minutes : in case of D1-Error c. 80 minutes : in normal control state <p>Pause</p> <ul style="list-style-type: none"> 1) Time : 7 minutes Comp., F-fan, R-fan, Heater : OFF <p>Fan Delay</p> <ul style="list-style-type: none"> 1) Time : 5 minutes Comp. : ON F/R-fan, Heater : OFF <p>* Output control and time limit of each defrosting mode</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>PRE-COOL</th> <th>Heater Defrosting</th> <th>Pause</th> <th>Fan Delay</th> </tr> </thead> <tbody> <tr> <td>COMP</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>F-FAN</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>R-FAN</td> <td>Control</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>HEATER</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>Time Limit</td> <td>50 min.</td> <td>a. 80 min. b. 30 min. (in case of D1-Error)</td> <td>7 min.</td> <td>5 min.</td> </tr> </tbody> </table> <p>2. Initial Defrosting If D-sensor $\leq 3.5\text{C}$, defrosting mode starts from Pre-Cool at initial power input or first plugin.</p>				PRE-COOL	Heater Defrosting	Pause	Fan Delay	COMP	ON	OFF	OFF	ON	F-FAN	ON	OFF	OFF	OFF	R-FAN	Control	OFF	OFF	OFF	HEATER	OFF	ON	OFF	OFF	Time Limit	50 min.	a. 80 min. b. 30 min. (in case of D1-Error)	7 min.	5 min.	<p>C-fan and comp. are linked.</p>
	PRE-COOL	Heater Defrosting	Pause	Fan Delay																													
COMP	ON	OFF	OFF	ON																													
F-FAN	ON	OFF	OFF	OFF																													
R-FAN	Control	OFF	OFF	OFF																													
HEATER	OFF	ON	OFF	OFF																													
Time Limit	50 min.	a. 80 min. b. 30 min. (in case of D1-Error)	7 min.	5 min.																													

■ Error Display (LCD Display of F-PCB)

INPUT	Control Object																							
1. Temperature Control Buttons	CUSTOM LCD																							
CONTENTS		REMARKS																						
<p>1. How to start</p> <p>1) Set "LOCK ON" first.</p> <p>2) Push "LOCK" button 3 times while pushing "REF SET." button at the same time.</p> <p>2. Display</p> <p>Error code is displayed on Freezer temperature display part.</p> <p>3. How to stop</p> <p>1) Push "LOCK" button 3 times while pushing "REF SET." button.</p> <p>2) It stops automatically 4 minutes after the start.</p> <p>4. All the error Ccdes are reset if they turn to be normal.</p> <p>5. Error Code</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #cccccc;">ERROR CODE</th> <th style="background-color: #cccccc;">CONTENTS</th> </tr> </thead> <tbody> <tr> <td>F1</td> <td>F-sensor ; disconnection, short(pull-down)</td> </tr> <tr> <td>r1</td> <td>R-sensor ; disconnection, short(pull-down)</td> </tr> <tr> <td>rt</td> <td>RT-sensor ; disconnection, short(pull-down)</td> </tr> <tr> <td>d1</td> <td>D-sensor ; disconnection, short(pull-down)</td> </tr> <tr> <td>dr</td> <td>R-Door Switch ; defective</td> </tr> <tr> <td>dF</td> <td>F-Door Switch ; defective</td> </tr> <tr> <td>dH</td> <td>Homebar (Refreshment Center) Door Switch ; defective</td> </tr> <tr> <td>C1</td> <td>Cycle ; abnormal or defective.</td> </tr> <tr> <td>F3</td> <td>Return after defrosting ; abnormal or defective</td> </tr> <tr> <td>d2</td> <td>Forced defrosting mode for A/S</td> </tr> </tbody> </table>		ERROR CODE	CONTENTS	F1	F-sensor ; disconnection, short(pull-down)	r1	R-sensor ; disconnection, short(pull-down)	rt	RT-sensor ; disconnection, short(pull-down)	d1	D-sensor ; disconnection, short(pull-down)	dr	R-Door Switch ; defective	dF	F-Door Switch ; defective	dH	Homebar (Refreshment Center) Door Switch ; defective	C1	Cycle ; abnormal or defective.	F3	Return after defrosting ; abnormal or defective	d2	Forced defrosting mode for A/S	
ERROR CODE	CONTENTS																							
F1	F-sensor ; disconnection, short(pull-down)																							
r1	R-sensor ; disconnection, short(pull-down)																							
rt	RT-sensor ; disconnection, short(pull-down)																							
d1	D-sensor ; disconnection, short(pull-down)																							
dr	R-Door Switch ; defective																							
dF	F-Door Switch ; defective																							
dH	Homebar (Refreshment Center) Door Switch ; defective																							
C1	Cycle ; abnormal or defective.																							
F3	Return after defrosting ; abnormal or defective																							
d2	Forced defrosting mode for A/S																							

CONTENTS	REMARKS												
<p>6. Control Way of Errors (if any)</p> <p>1) "F1" ERROR</p> <ul style="list-style-type: none"> a. Cause : F-sensor disconnection / short (pull-down) b. Control : Comp. / F-fan -> ON for 25min., OFF for 25min. c. if F-sensor is normal, the error is terminated automatically. <p>2) "r1" ERROR</p> <ul style="list-style-type: none"> a. Cause : R-sensor disconnection / short (pull-down) b. Control : Condition of ambient temperature <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">RT/S</th> <th style="text-align: center;">In ERROR</th> <th style="text-align: center;">~ 13C</th> <th style="text-align: center;">14 ~ 19C</th> <th style="text-align: center;">20 ~ 29C</th> <th style="text-align: center;">29C ~</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Work rate ON/OFF</td> <td style="text-align: center;">8 / 12</td> <td style="text-align: center;">7 / 13</td> <td style="text-align: center;">8 / 12</td> <td style="text-align: center;">8 / 12</td> <td style="text-align: center;">9 / 11</td> </tr> </tbody> </table> <ul style="list-style-type: none"> c. If R-sensor is normal, the error is terminated automatically. <p>3) "rt" ERROR</p> <ul style="list-style-type: none"> a. Cause : RT-sensor disconnection / short (pull-down) b. Control : Normal operation, deletion of control condition by RT-sensor c. If RT-sensor is normal, the error is terminated automatically. <p>4) "d1" ERROR</p> <ul style="list-style-type: none"> a. Cause : D-sensor disconnection / short (pull-down) b. Control : Time limit (30min.) of defrosting-return c. If D-sensor is normal, the error is terminated automatically. <p>5) Door ERROR("dF", "dR", "dH" on display)</p> <ul style="list-style-type: none"> a. Cause : in case it senses that door is open for more than 1 b. Control : Deletion of function related door switch sensing c. If door switch (open & close) is sensed, the error is terminated automatically. d. After displaying on LCD the mode is terminated. <p>6) "C1" ERROR</p> <ul style="list-style-type: none"> a. Cause : in case comp. works for over 3 hours when D-sensor temp. is over -5C b. Control : Normal operation c. When D-sensor temp. is below -5C in comp. OFF, it is terminated. <p>7) "F3" ERROR</p> <ul style="list-style-type: none"> a. Cause : in case defrosting-return is done by time limit of 80min. b. Control : Deletion of Pre-cool mode in defrosting mode c. If defrosting-return is done by D-sensor, it is terminated. <p>8) "d2" MODE (A/S forced defrosting mode)</p> <ul style="list-style-type: none"> a. Set "LOCK ON" first, then push "REF SET." button 5 times while pushing "FRZ SET." button simultaneously. b. Control : A/S forced defrosting control (Pre-cool is deleted.) c. If D-sensor temp. is over 10C, the mode is terminated automatically. 	RT/S	In ERROR	~ 13C	14 ~ 19C	20 ~ 29C	29C ~	Work rate ON/OFF	8 / 12	7 / 13	8 / 12	8 / 12	9 / 11	
RT/S	In ERROR	~ 13C	14 ~ 19C	20 ~ 29C	29C ~								
Work rate ON/OFF	8 / 12	7 / 13	8 / 12	8 / 12	9 / 11								

■ Forced Defrosting

INPUT	Control Object
1. "FRZ SET." button 2. "REF SET." button 3. "LOCK" button	Defrosting Mode
CONTENTS	REMARKS
1. How to start -> Set "LOCK ON" first, then push "REF SET." button 5 times while pushing "FRZ SET." button simultaneously.	
2. How to proceed 1) Delete Pre-cool mode. (Others are same as normal defrosting.) 2) Heater is ON regardless of D-sensor temp. at first 30 seconds. (Check of defrosting current)	

6-11. Initial Defrosting

INPUT	Control Object
D-sensor Initial or first power input (power plugin)	Defrosting Mode
CONTENTS	REMARKS
If D-sensor temp. $\leq 3.5\text{C}$, defrosting mode starts from Pre-cool at first power input.	Comp. is delayed for 6 min. at the initial defrosting.

6-12. Buzzer or Alarm

INPUT	Control Object
F-PCB buttons Door Switch Initial Power Input	BUZZER
CONTENTS	REMARKS
1. Buzzer sounds if any button of F-PCB is pushed. 2. Buzzer sounds 3 times 3 minutes after initial power input. 3. Buzzer sounds for 1 second in case of A/S forced defrosting, short (pull-down) operation, explanation mode. 4. If door is open, buzzer sounds continually 3 times for 5 seconds. (Door open alarm)	

■ LCD Background Light

INPUT	Control Object
F-PCB buttons Door Switch Initial Power Input	LCD BACK LIGHT

CONTENTS	REMARKS
1. Conditions to turn on LCD Light 1) Power input (plugin) 2) When any button on the panel is pushed, first the back light turns on, then button control is done. 3) When F/R door is open, the light turns on. 2. Conditions to turn off the light 1) The back light turns off 10 seconds after F/R door is closed 2) 1 minute after button control	

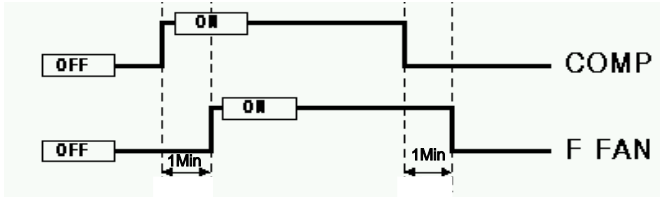
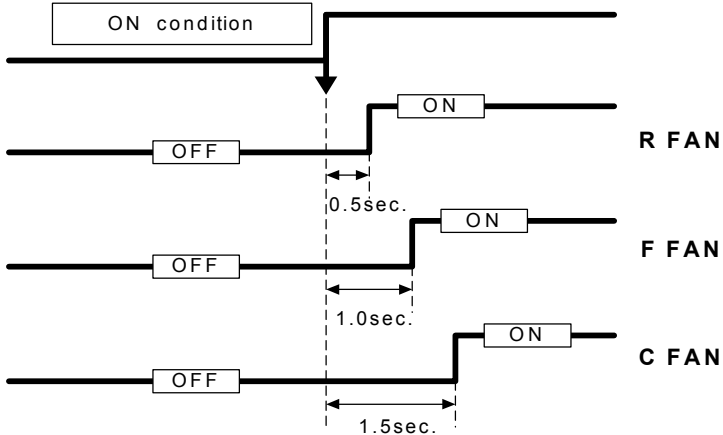
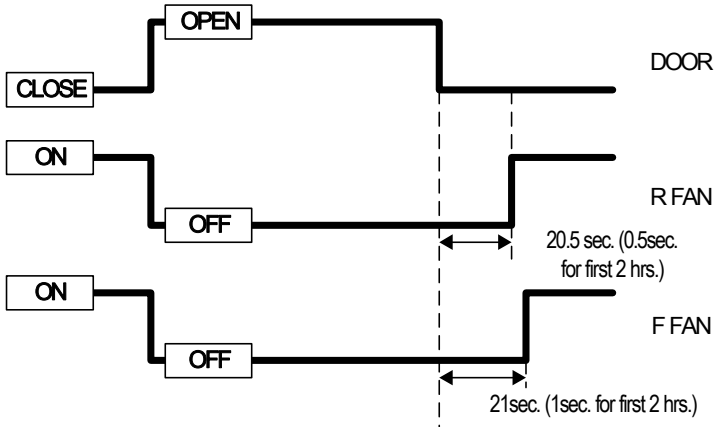
■ Explanation After Delivery

INPUT	Control Object
"FRZ SET." button "REF SET." button Power Cord	Electrical components and LCD
CONTENTS	REMARKS
1. Start Push "REF SET." button for 3 seconds within 10 seconds just after power input. 2. Control 1) Electrical components are OFF for 3 hours. 2) Display operates in normal way.	

■ Prevention of Compressor Restart

INPUT	Control Object
None	Comp.
CONTENTS	REMARKS
Comp. does not start again for 6 minutes though F-sensor is ON.	6min. delay

■ Delay Function of Electric Components

INPUT	Control Object
COMP ON/OFF	COMP F-FAN
CONTENTS	
<p>1) F-fan delay by comp. ON/OFF -> F-fan is ON/OFF 1 minute after comp. is ON/OFF.</p>  <p>2) Fan Delay and Priority</p>  <p>3) F/R-fan delay by door open/close for easy door -> Inspection : checkup door opening 2 hours after initial start -> First R is ON, 1 second later F is ON to protect DC fan against over current at initial start.</p> 	REMARKS

■ **Home Bar (Refreshment Center) Heater (FR-S580CR MODEL)**

INPUT	Control Object
None	COMP
CONTENTS	
It is linked with comp.	
REMARKS	

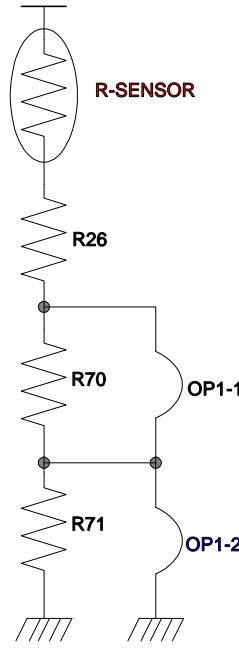
■ **Control of Interior Lights**

INPUT	Control Object
Refrigerator Door Freezer Door Home-Bar Door (Refreshment Center ; FR-S580CR)	COMP
CONTENTS	
<p>1) Control of Refrigerator Compartment Lights R lights turn ON/OFF by R-door switch (ON/OFF). * 10 minutes after sensing door open, the lights turn off automatically though door close is not sensed.</p> <p>2) Control of Freezer Compartment Lights F lights turn ON/OFF by F-door switch (ON/OFF). * 10 minutes after sensing door open, the lights turn off automatically though door close is not sensed.</p> <p>3) R-lights ON/OFF by Home-Bar door opening R-lights turn ON for 1 minute after sensing HOME-BAR switch open. (If the switch is pushed again within 1 minute, the light turns on another 1 minute.)</p>	REMARKS

■ **Demonstration Function**

INPUT	Control Object
"LOCK" button "REF SET." button "SLEEP" button	COMP F-FAN R-FAN
CONTENTS	
<p>1. Start 1) Set "LOCK ON" first. 2) Push "SLEEP" button 5 times while pushing "REF SET." button simultaneously.</p> <p>2. Control 1) All other electrical components are OFF except for F-fan / R-fan. 2) Fan Control DOOR OPEN -> FAN ON / DOOR CLOSE -> FAN OFF 3) Display : Normal mode (3.8sec.) -> SPEED(3sec.) -> Silent mode(3sec.) -> Sleep mode (3sec.)</p> <p>3. Stop or Termination 1) During Demo mode push "SLEEP" button 5 times while pushing "REF SET." button simultaneously. 2) Power in again.</p>	REMARKS

■ Regulation of R-sensor OFF Point

INPUT	Control Object
J18, 22 on Main PCB	Resistance of R-sensor Mid OFF Point
CONTENTS	
<p>a. Regulation of R-sensor OFF point (1.5degree DOWN) b. In case refrigeration of refrigerator is weak or insufficient, take the following action.</p>  <p>a. R26 : R-SENSOR standard resistance in normal mode (31.4K) b. R70 : In case of weak ref., cut J18 to down the standard resistance by 1.5deg(2K) c. R71 : In case of weak ref., cut J22 to down the standard resistance by 1.5deg(2K)</p> <p>R26 = Mid OFF point R26 + R70 = Mid OFF point - 1.5 deg R26 + R70 + R71 = Mid OFF point - 3.0 deg</p>	
REMARKS	

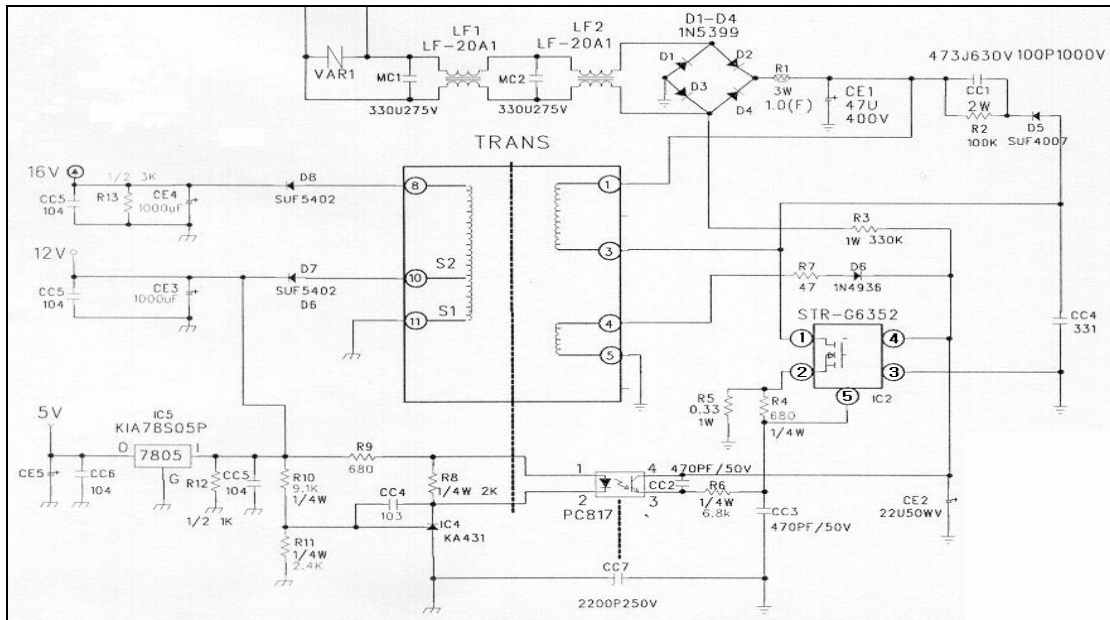
■ Summary of Function

CONTENTS	REMARKS
* How to start function modes * All the modes are started with "LOCK ON" except for "explanation after delivery & installation".	
A/S forced defrosting	"FRZ SET." + "REF SET." 5 times
Demonstration	"REF SET." + "SLEEP" 5 times
Explanation after delivery & installation	"REF SET." for 3 sec. Right after first power in
ERROR display	"REF SET." + "LOCK" 3 times

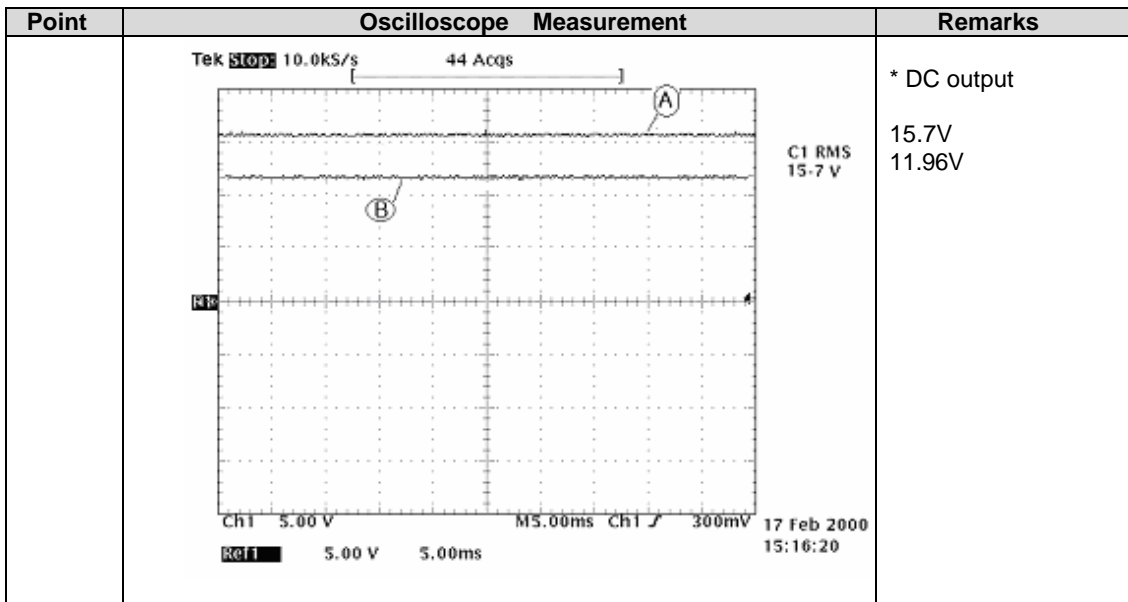
MICOM Circuit

Power

Circuit

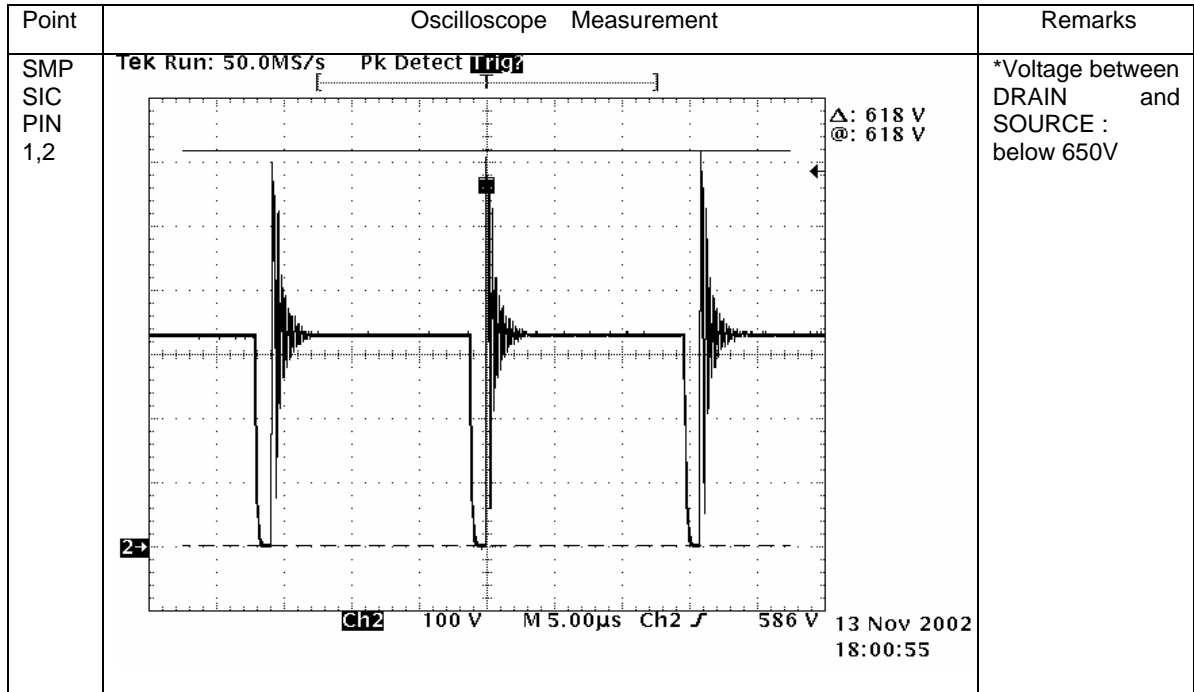


DC Output Power (Voltage)

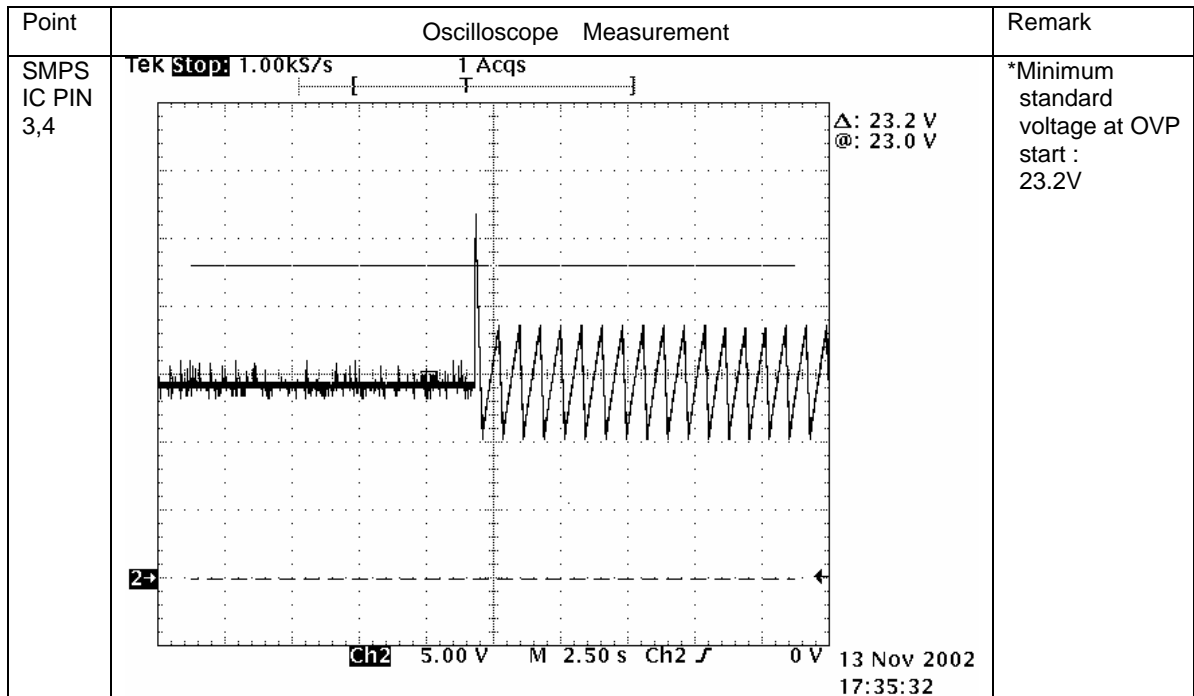


■ SMPS Movement Wave

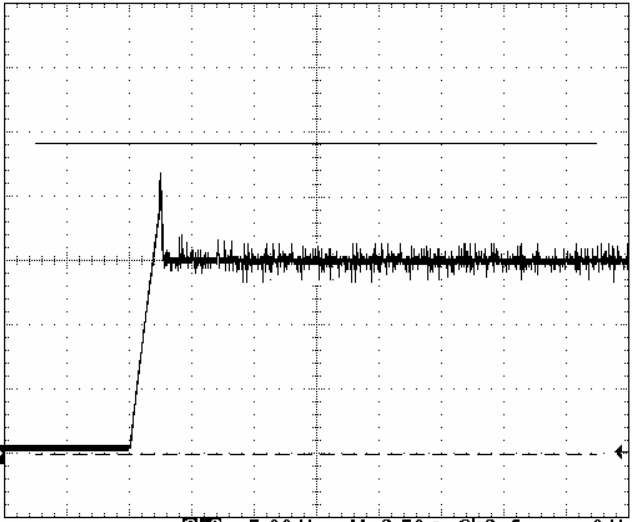
Drain to Source Break Voltage



OVP(Overvoltage Protection) Wave at power input

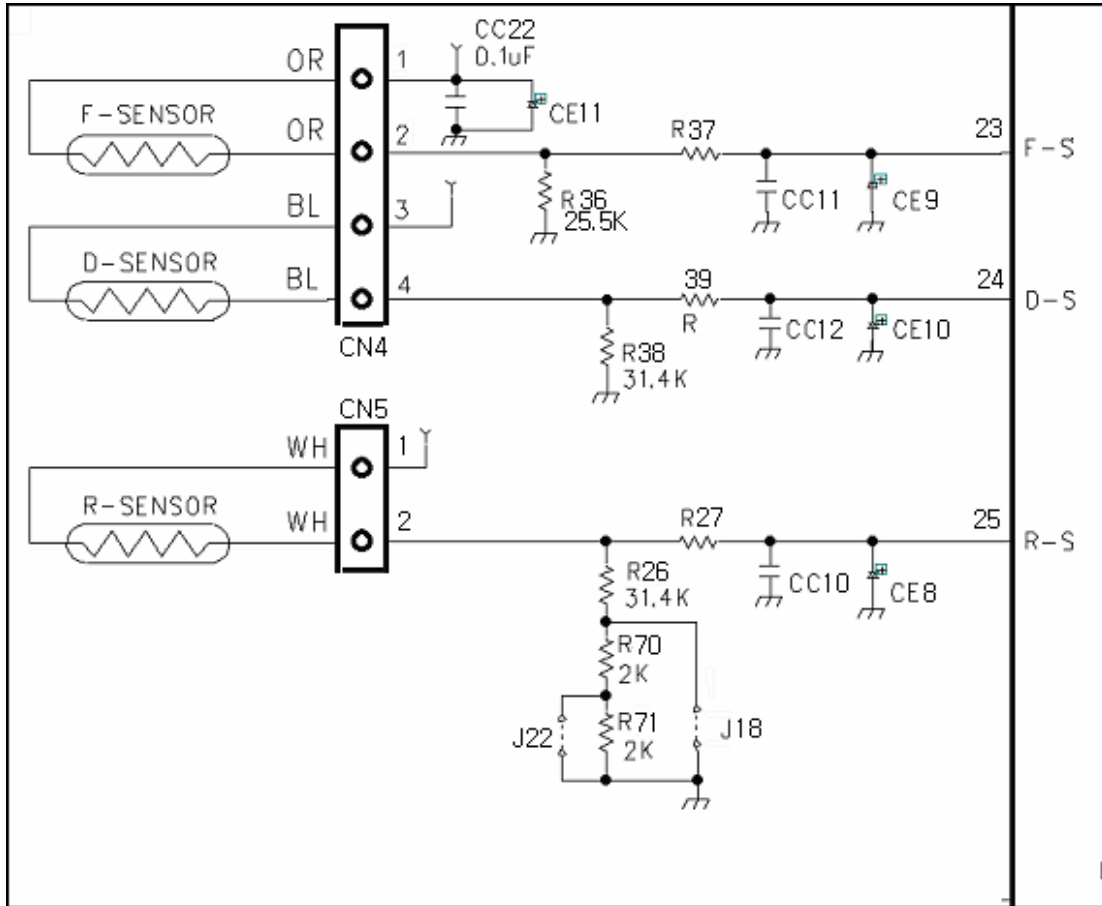


Initial Power Wave of Switching Power IC

Point	Oscilloscope Measurement	Remark
SMPS IC PIN 3,4	<p>Tek Stop 1.00kS/s 1 Acqs</p>  <p>Δ: 24.3 V @: 24.1 V</p> <p>ch2 5.00 V M 2.50 s Ch2 J 0 V</p> <p>13 Nov 2002 17:39:23</p>	

■ **Sensors**

Circuit Diagram



■ **Function of Each Sensor**

[F-sensor]

- 1) It senses the temperature of freezer compartment and controls Comp., F-fan ON / OFF.
- 2) How it works ;

Working Point	Low ON	Mid OFF	High OFF
Working Temp.	-11.0 C	-20.0 C	- 26.0 C
Resistance	≅ 14.74 kΩ	≅ 22.33 kΩ	≅ 30.92 kΩ
Sensing Voltage	3.50 V	3.00 V	2.14 V

[D-sensor]

-> It senses return point of defrosting heater.

Working Point	Return point of defrosting heater
Working Temp.	10 C
Resistance	≅ 19.53 kΩ
Sensing Voltage	3.1 V

[R-sensor]

1) It senses the temperature of refrigerator compartment and controls R-fan ON / OFF.

2) How it works ;

Working Point	Low ON	Mid OFF	High OFF
Working Temp.	2.65 C	0.3 C	-1.7 C
Resistance	≅ 26.88 kΩ	≅ 29.34 kΩ	≅ 32.00 kΩ
Sensing Voltage	≅ 2.90V	≅ 2.81V	≅ 2.74V

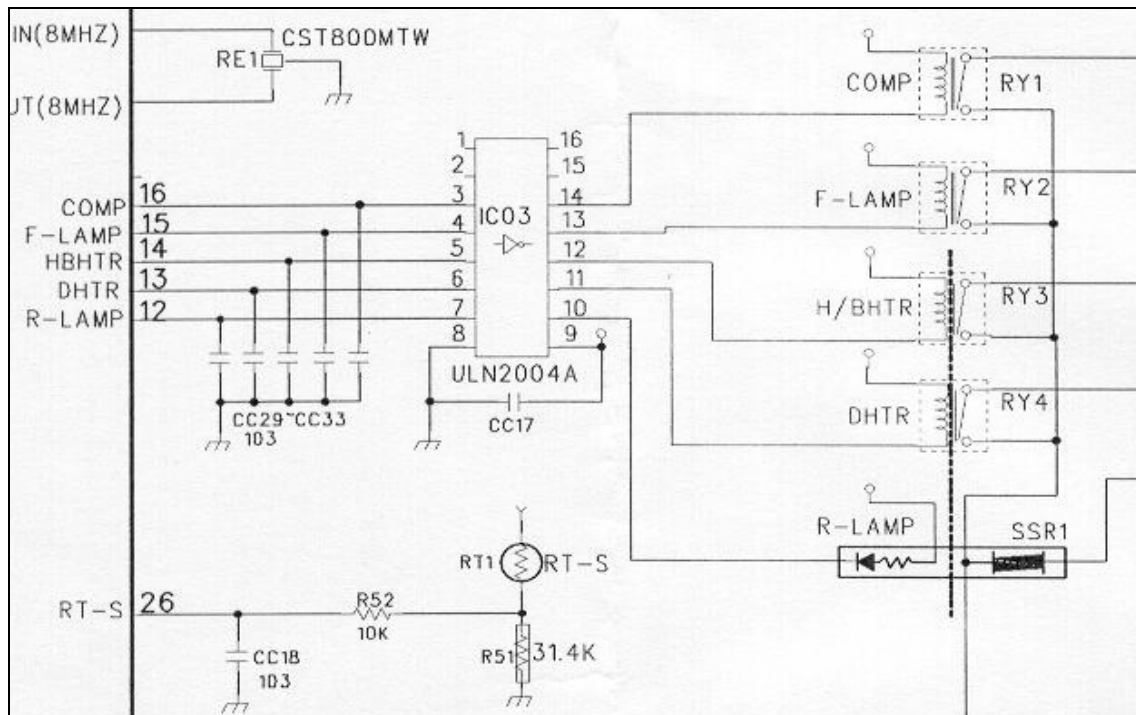
* In case refrigeration of refrigerator compartment is poor or insufficient though comp. and R-fan operate in normal way ;

1) Cut J18 on M-PCB, then temp. is lowered -2 C than [Mid OFF point].

2) In addition to 1) action, cut J22 on M-PCB, then the temp. is lowered -1 C more.

■ Relay Function

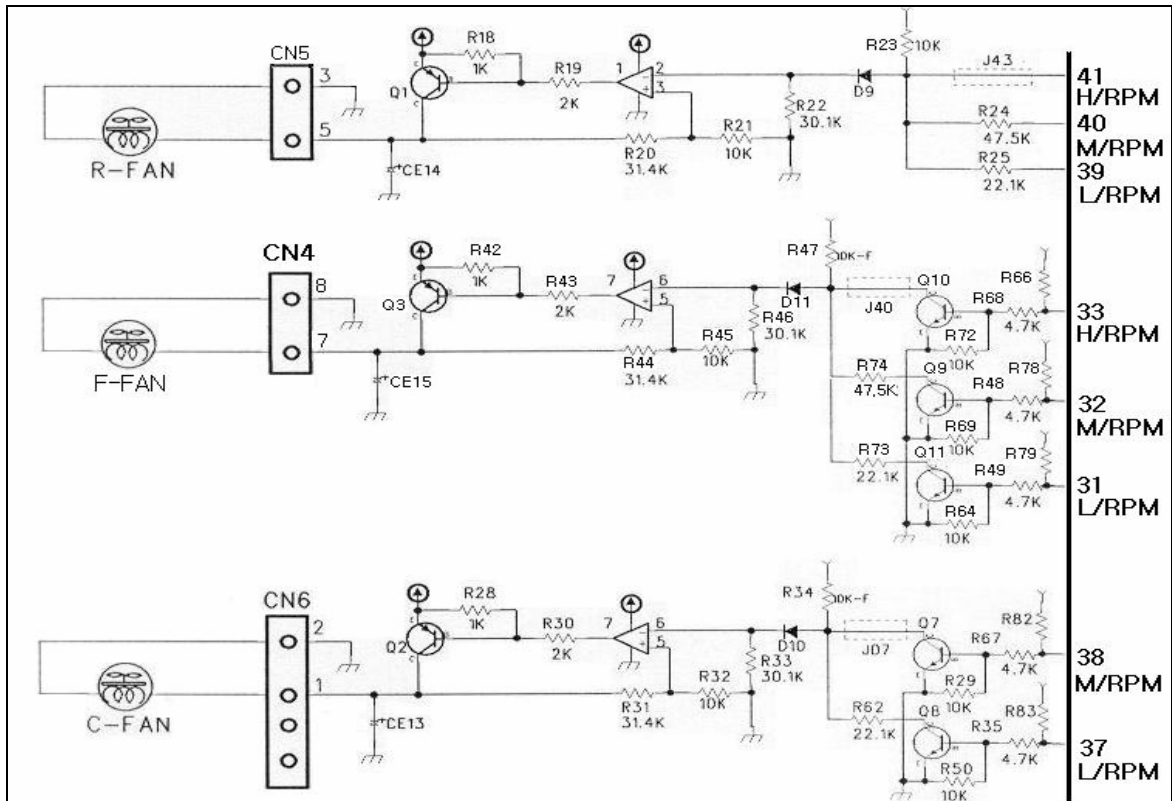
Circuit Diagram



How it works ;

Control	Control Method	ON Condition		OFF Condition	
		MICOM Port	IC3 Output Pin	MICOM Port	IC3 Output Pin
COMP	RELAY	# 16 ≅ 3.7V	# 14 ≅ 0.7V	# 16 ≅ 0V	# 14 ≅ 12V
F-LAMP	RELAY	# 15 ≅ 3.7V	# 13 ≅ 0.7V	# 15 ≅ 0V	# 13 ≅ 12V
HB-HTR	RELAY	# 14 ≅ 3.7V	# 12 ≅ 0.7V	# 14 ≅ 0V	# 12 ≅ 12V
HTR	RELAY	# 13 ≅ 3.7V	# 11 ≅ 0.7V	# 13 ≅ 0V	# 11 ≅ 12V
R-LAMP	RELAY or SSR	# 12 ≅ 3.7V	# 10 ≅ 0.7V	# 12 ≅ 0V	# 10 ≅ 12V

■ Fan Function



How It Works ;

Control Object	Control Method	ON Condition				OFF Condition			
		MICOM Port			IC Collector	MICOM Port			IC Collector
		31	32	33		31	32	33	
F-FAN	Low (10V) operation	5V	0V	0V	10.35V	5V	5V	5V	0V
	Mid (12V) operation	0V	5V	0V	12.19V				0V
	High (14V) operation	0V	0V	0V	14.38V				0V

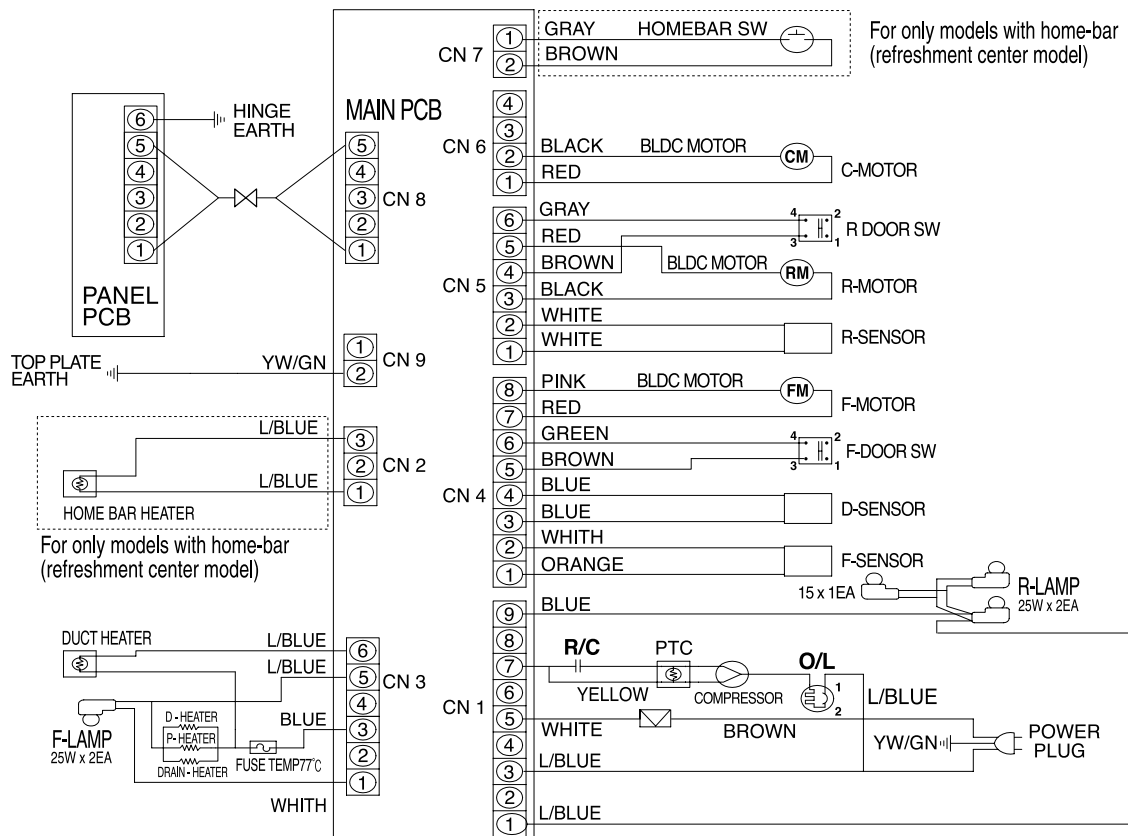
Control Object	Control Method	ON Condition				OFF Condition			
		MICOM PORT			IC Collector	MICOM Port			IC Collector
		39	40	41		39	40	41	
R-FAN	Low (10V) operation	0V	5V	5V	10.38V	0V	0V	0V	0V
	Mid (12V) operation	5V	0V	5V	12.24V				0V
	High (14V) operation	5V	5V	5V	14.42V				0V

Control Object	Control Method	ON Condition			OFF Condition		
		MICOM PORT		IC Collector	MICOM Port		IC Collector
		37	38		37	38	
C-FAN	High (14V) operation	0V	0V	14.54V	5V	5V	0V
	Low (10V) operation	5V	0V	10.45V			0V

4. DIAGRAM

4-1. WIRING DIAGRAM

WIRING DIAGRAM

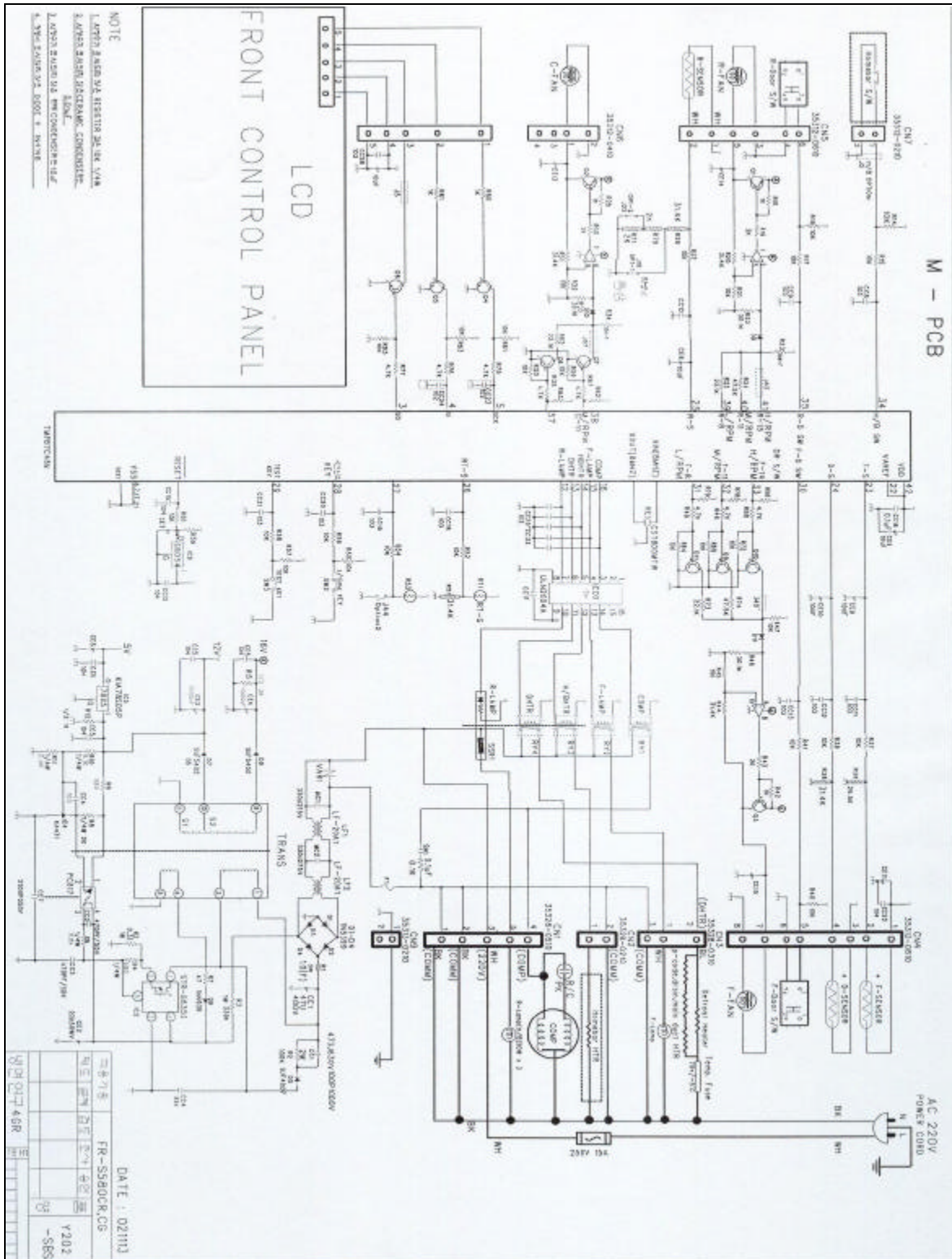


NOTICE 1. Allow 10 cm or more clearance between wall and side and rear plate of the refrigerator for good fresh air circulation.

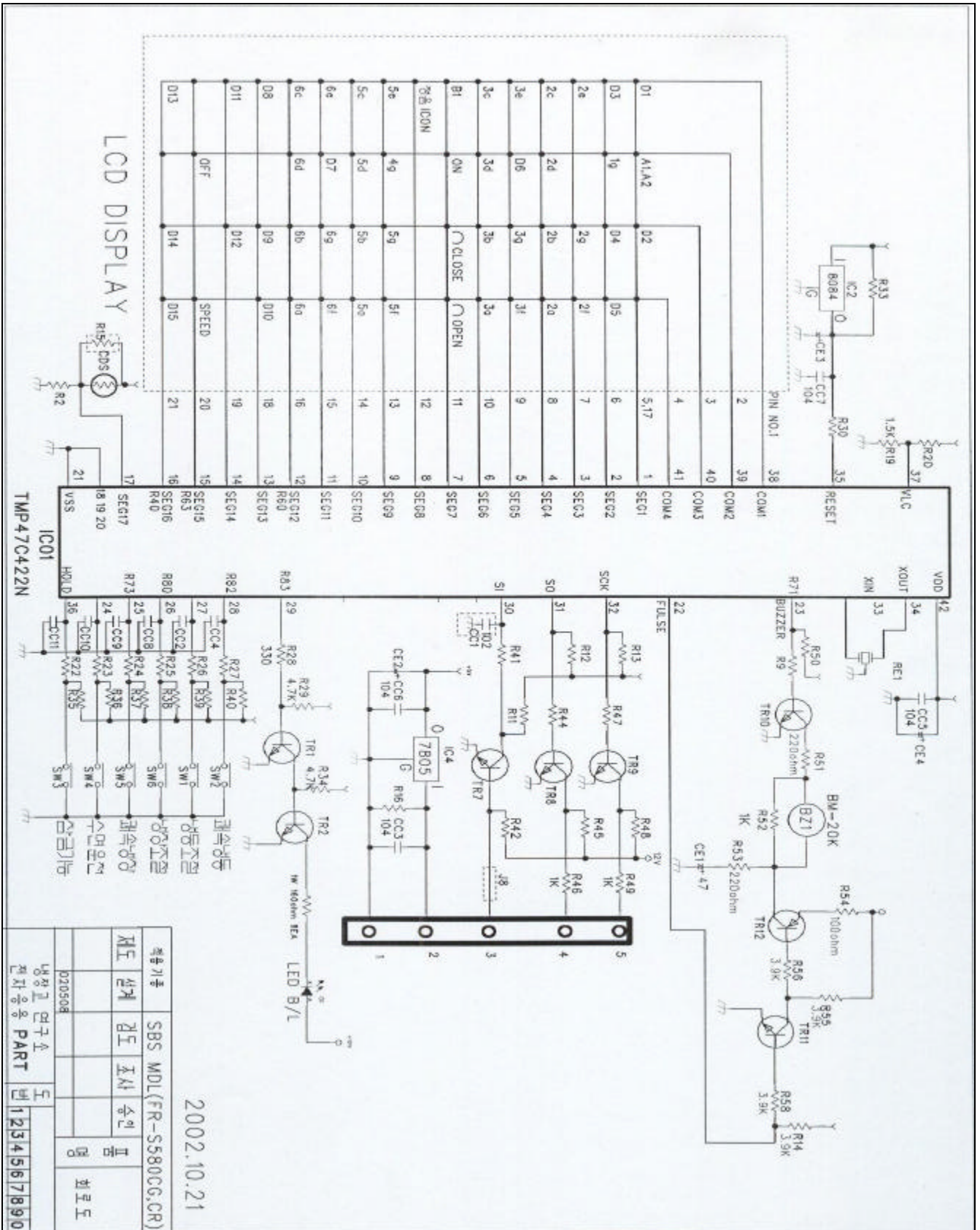
CODE:WSBS1-3

4-2. CIRCUIT WIRING DIAGRAM

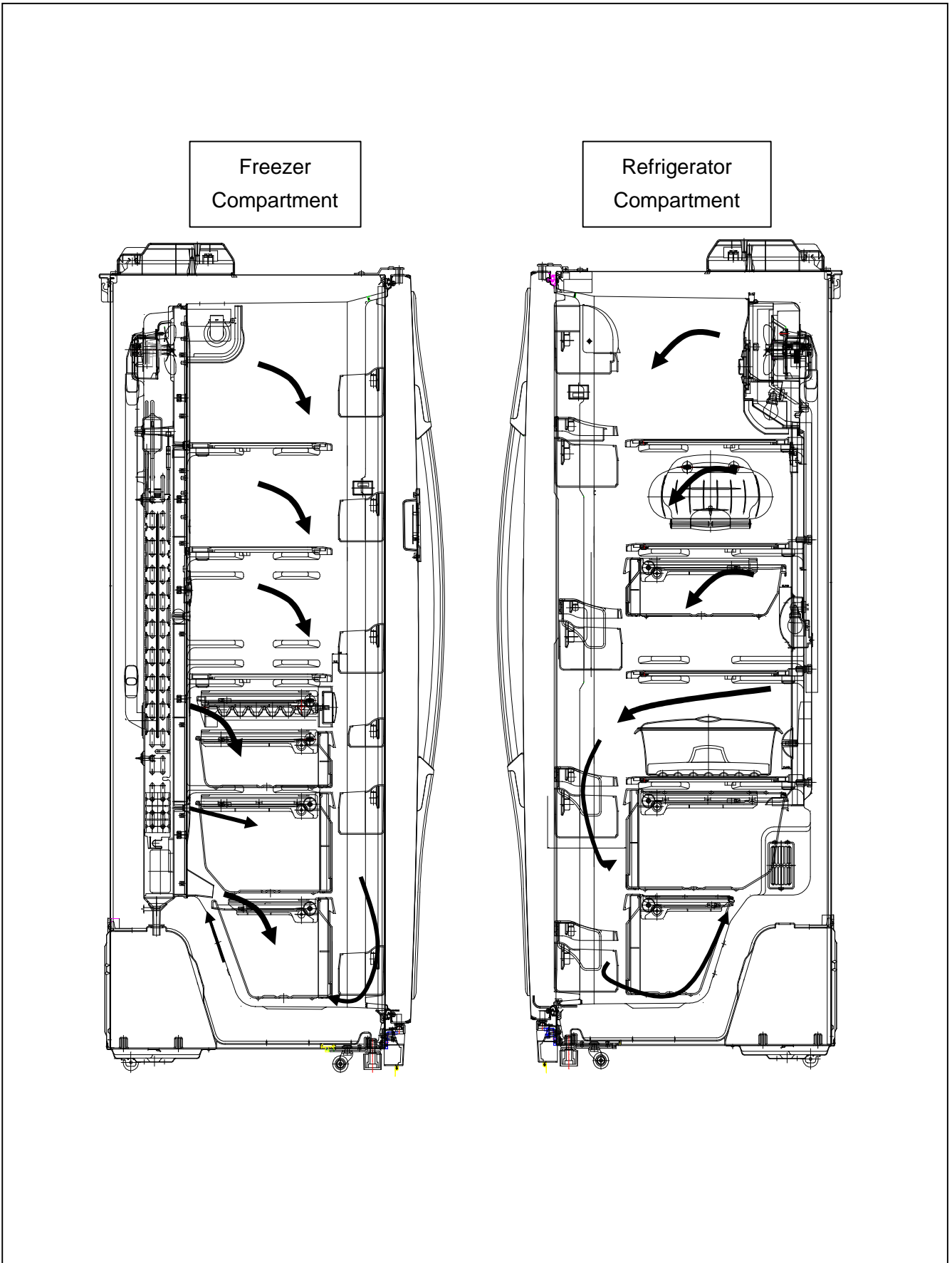
Main PCB



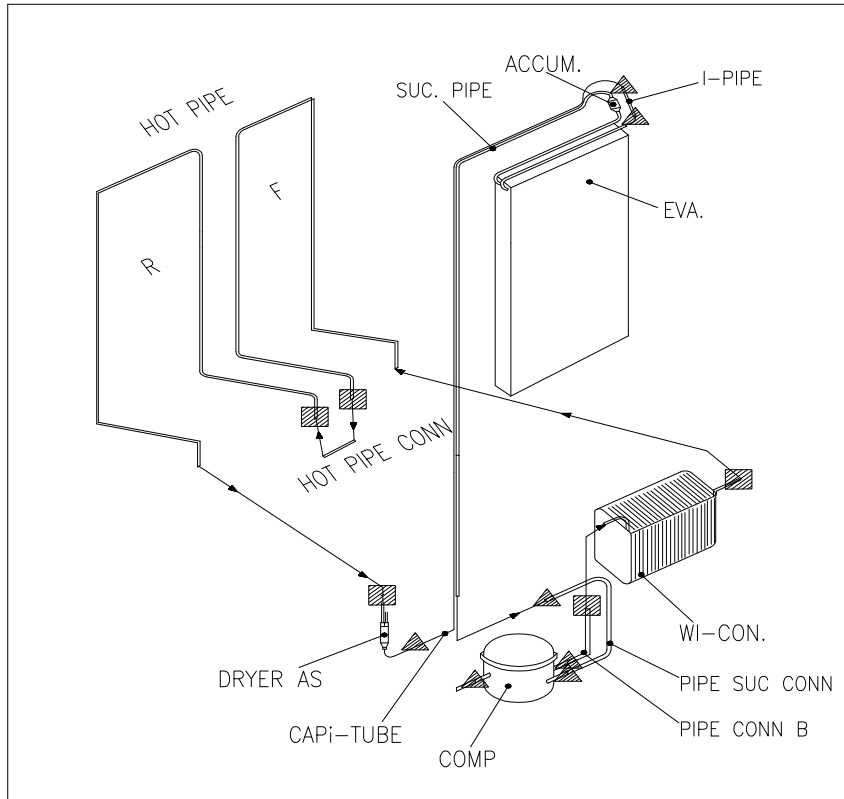
Front PCB



4-3. AIR FLOW DIAGRAM



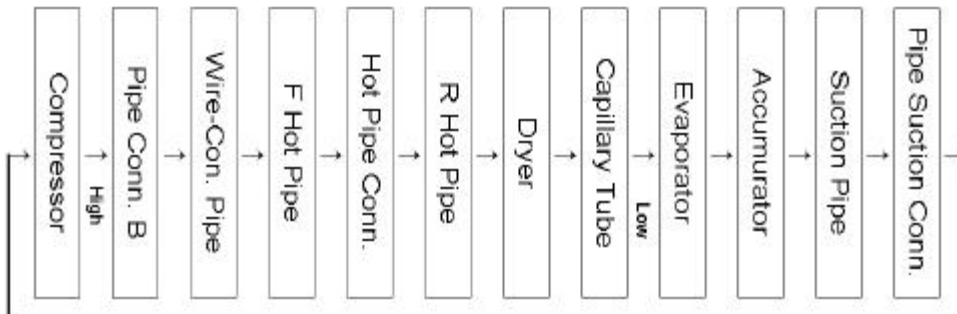
4-4. REFRIGERANT CYCLE DIAGRAM



Welding Points

▲	5 %	7 points
■	35 %	5 points

Flow of Refrigeration Cycle



5. DISASSEMBLY AND ASSEMBLY

5-1. Replacing Freezer Parts

1) Exchanging F-lights

* Remove screw cap with a small tip (-) driver on the bottom of light cover



* Pull down the light cover smoothly to remove.



* Replacing F-lights.
- Assembling order is the reverse of disassembling.



2) Ice Cubes Maker & Ice Cubes Case

* Pull forward Ice case and lift up a little to remove then pull Ice cubes maker.



3) Drying Case & Meat Case

* Pull forward and lift up a little like Ice case.
- Fruit case, vegetable case and chilled case in Refrigerator are the same way.



4) Front Cover

- * At first remove the screw caps with a (-) driver.
- * Unscrew three screws with a (+) driver.
- * Assembling order is the reverse of disassembling. In order to assemble, match front cover to the cabinet groove before screwing.



5) Freezer (Refrigerator) Pockets

- * Hold the middle and pull up slightly.
(Assembling order is the reverse of disassembling.)
- Ref Pockets are the same way.



6) F-Louver Parts Disassembling.

- * Open the door fully and remove the shelves.
- * Remove screw cap on the bottom of light cover and unscrew two screws with a (+) driver to separate the light cover. **[Refer to 1) Exchanging F-lights]**



- * Separate F-lights housing & Heater housing (Eva front cover) from the interior side terminals.



- * Remove screw caps on F-louver A/B with a (-) driver and then unscrew three screws with a (+) driver.

- * Hold both end and pull forward smoothly.

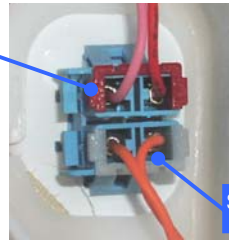


* Separate sensor housing on the top of F-louber C.



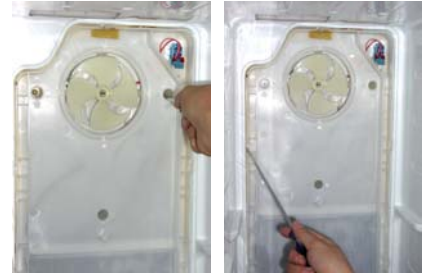
냉동실 MOTER HOUSING

* Hold the bottom nose of cover and pull forward out smoothly.



SENSOR HOUSING

* Separate Moter Housing and remove three screws.



* In order to disassemble F-louber C, separate hook with a (-) driver and pull out smoothly.



* Like F-louber C, remove F-louber D.
(Assembling order is the reverse of disassembling.)



7) Front Control Panel

- * Insert a flat tip driver into the left down groove of panel frame and snap it out smoothly.
- * Remove housing from F-PCB and screws on the board to change for a new one.
- * Assembling is the reverse order of disassembling.



5-2. Replacing Refrigerator Parts

1) Deodorizer

- * Turn deodorizer counterclockwise.
(Assembling is the reverse order of disassembling.)



2) Top R-Light

- * Like F-lights, remove two screw caps at the bottom of light cover with a (-) driver.



- * Unscrew two screws with a (+) driver.



- * Pull down R-light cover a little to separate the hook and pull out forward smoothly.



- * Replacing the bulb.
(Assembling is the reverse order of disassembling.)



3) Refrigerator Bottom Light

- * Snap out the bottom hook of light cover with a flat tip screw driver.
- * Hold down the light cover to pull out.
- * Change the light bulb.
(Assembling is the reverse order of disassembling.)



4) Wine Holder

- * Remove two screw caps on the top of Wine holder with a (-) driver.
- * Unscrew 2 screws with a (+) driver.
- * Hold end of wineholder and pull up smoothly after separating completely fixed hook.
(Assembling is the reverse order of disassembling.)



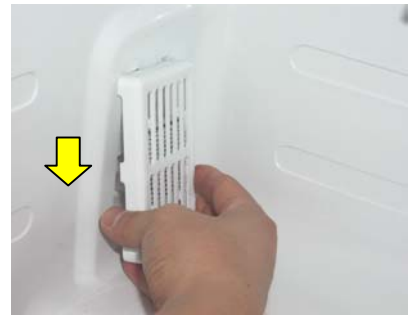
5) Shelves

- * Pull forward shelves and lift up a little to remove.
(Freezer shelves are the same way.)



6) Return Duct Cover

* Pull out the cover to arrow direction.



7) Dairy Pocket

* Pull forward and lift up a little.



8) Refreshment Pocket (Only for FRS-2041)

- * Hold both end and pull up to remove the pocket.
- * Lift up a little and then pull forward out.



9) Refrigerator interior parts

- * Remove foods and shelves of R-compartment.
- * Remove screws caps with a tiny tip screw driver and remove light cover screws with a (+) screw driver **(Refer to 2) Top R-Light)**
- * Disassemble RAMP R A HOUSING, SENSOR HOUSING and RAMP R B HOUSING.



* Unscrew two screws on the left and right side of DAMP COVER.



* Hold the bottom and right of damper to pull down to remove.



* After removing bottom R-light cover, unscrew with a (+) driver. (**Refer to 3) Refrigerator Bottom Light**)



* Hold top of the MULT DUCT COVER AS and pull forward to remove.



* Remove FAN HOUSING on the right side.
(Unscrew two screws on the FIXTURE MOTOR B.)
* Assembling is the reverse order of disassembling.
When assembling, be careful not to disturb Fan.

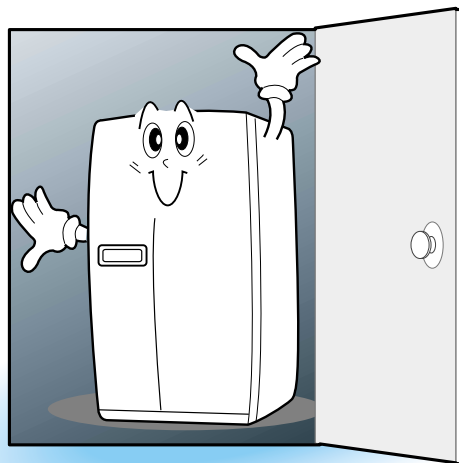


6. INSTALLATION GUIDE

6-1. Installation Preparation

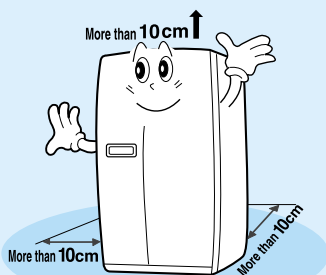
Check if the refrigerator can pass a doorway or enter a door first.

Dimensions (Including Door Handles)	
(Width X Depth X Height)	928mm X 816mm X 1808mm [FRS-2021 / FRS-2041]
	928mm X 896mm X 1808mm [FRS-2421 / FRS-2441]

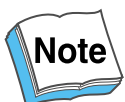
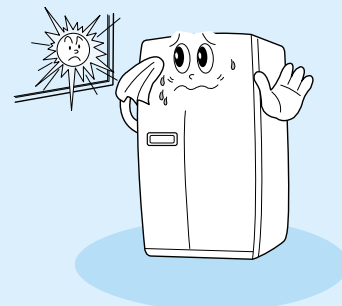


Find a suitable place to install.

Sufficient space from refrigerator back to the wall for free air ventilation



Avoid direct sunlight.



Once the installation place is ready follow the installation instructions.

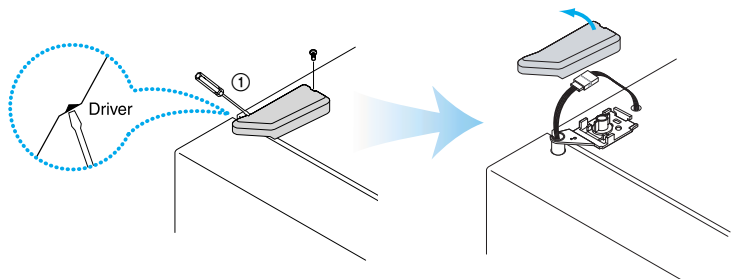
If surround temperature of refrigerator is low (below 5C), foods can be frozen or the refrigerator can work in an abnormal way.

6-2. If the refrigerator can not enter the door, follow these steps.

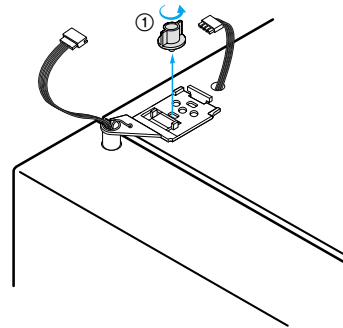
○ Removing Freezer Door

Remove front bottom cover first, if it is attached.

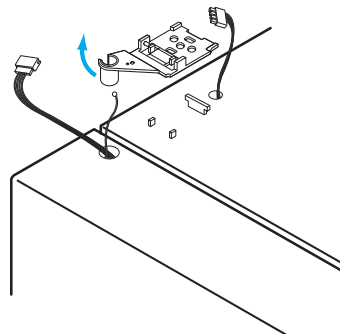
1 Unscrew top hinge cover with a screw driver. Insert a thin screw driver into the side groove of the cover to remove.



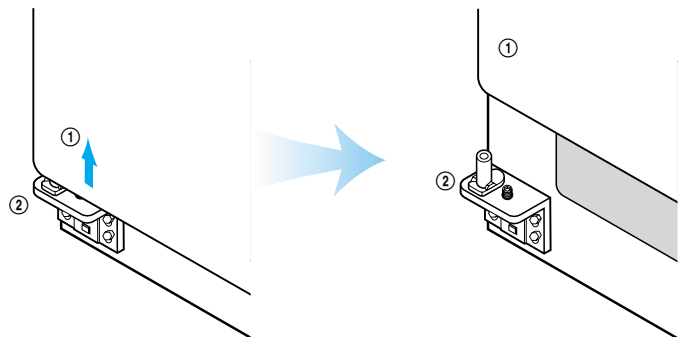
2 Turn top hinge fastener counterclockwise 3~4 times.
Disconnect the harness wires.



3 Lift up the front of hinge to remove. (After the hinge is removed the door can fall down forward. Be careful!)



4 Lift the door straight up to remove.



Removing Refrigerator Door

- 1 Unscrew top hinge cover with a screw driver.
Insert a thin screw driver into the side groove of the cover to remove.



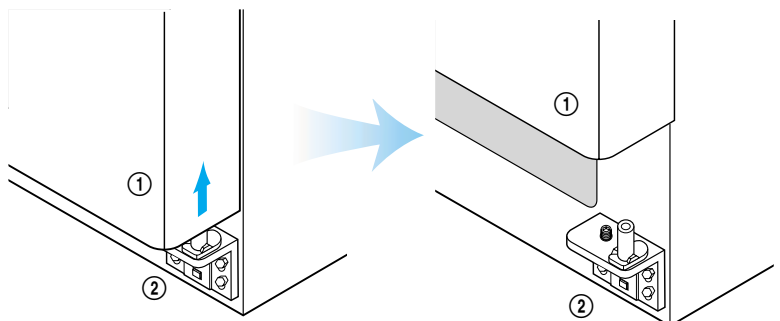
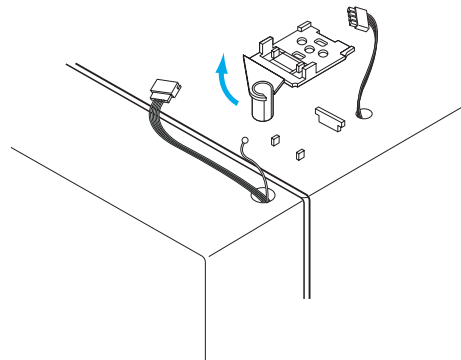
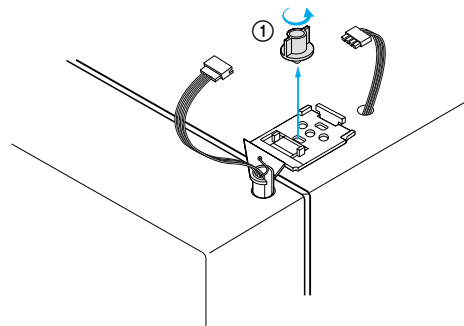
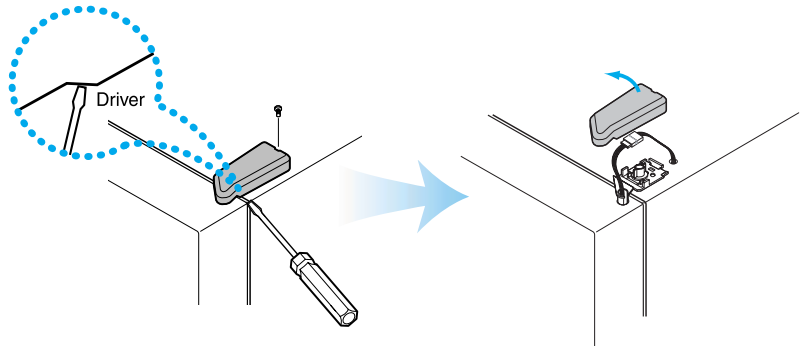
- 2 Turn top hinge fastener counterclockwise 3-4 times.
Disconnect harness wires.



- 3 Lift up the front of hinge to remove. (After the hinge is removed the door can fall down forward. Be careful !)

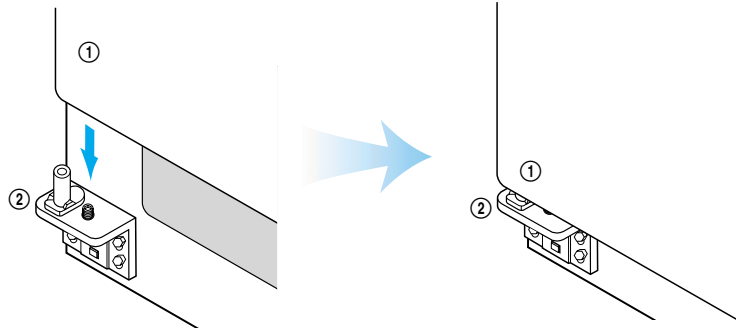


- 4 Lift the door straight up to remove.

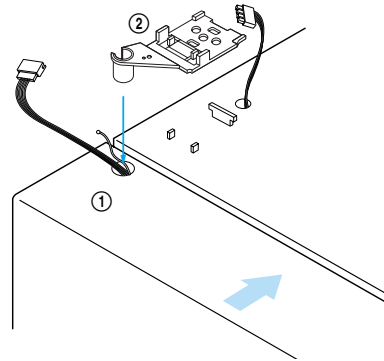


Replacing Freezer Door

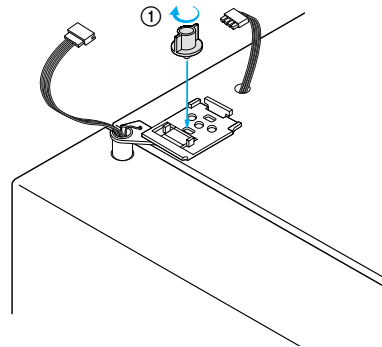
- 1 Insert the bottom hole of freezer door straight to the bottom hinge pin.



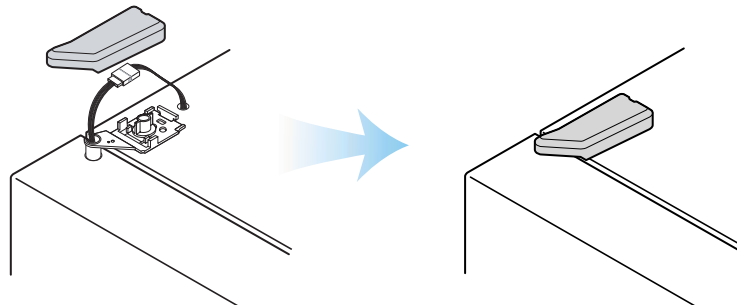
- NEXT**
- 2 Let the top of door close to the cabinet and insert the top hinge pin to the top hole of freezer door.
(Insert the back of hinge to the groove of protrusion first, then front to the top hole of door.)



- NEXT**
- 3 Turn the hinge fastener tightly to the end. Connect harness wirings and screw ground wire.



- NEXT**
- 4 Click and screw the top hinge cover.



● Replacing Refrigerator Door

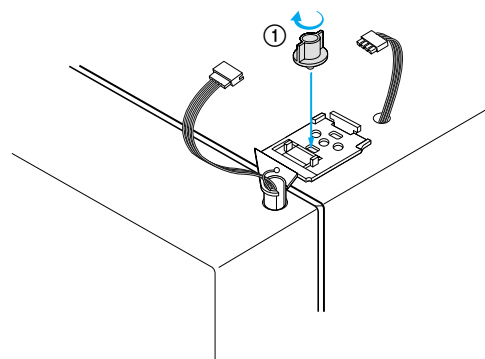
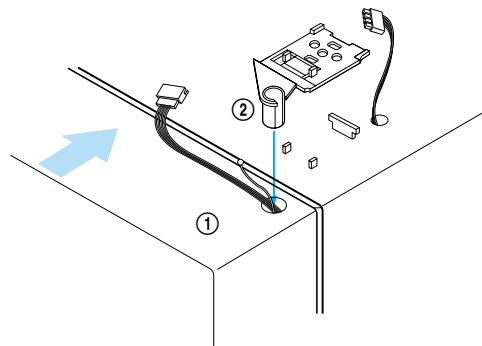
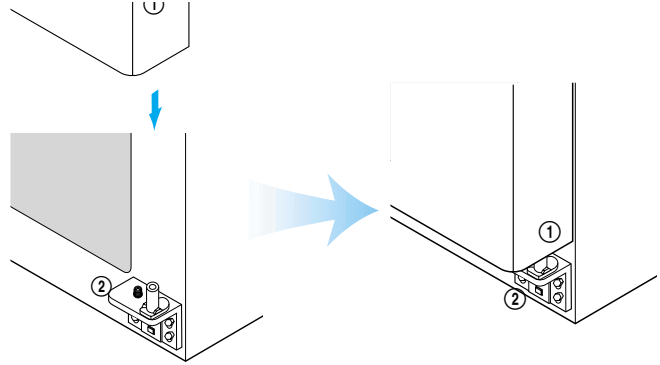
- 1 Insert the bottom hole of refrigerator door straight to the bottom hinge pin.



- 2 Let the top of door close to the cabinet and insert the top hinge pin to the top hole of freezer door.
(Insert the back of hinge to the groove of protrusion first, then front to the top hole of door.)



- 3 Turn the hinge fastener tightly to the end.
Connect harness wirings and screw ground wire.
Click and screw the top hinge cover.

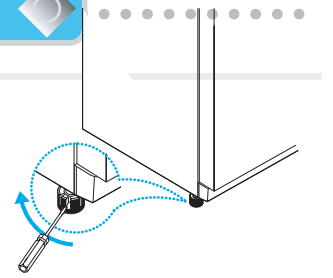


6-3. Refrigerator Leveling & Door Adjustment (If needed.)

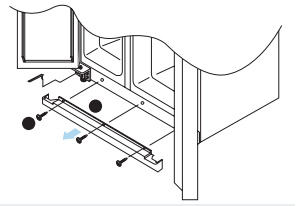
Refrigerator must be level in order to maintain optimal performance and desirable front appearance.
(If the floor beneath the refrigerator is uneven, freezer and refrigerator doors look unbalanced.)

In case freezer door is lower than refrigerator door...

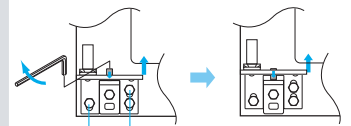
- 1 Insert a screw driver (flat tip) into a groove of the left wheel (bottom of freezer) and turn it clockwise until the door is balanced. (clockwise to raise freezer door ; counterclockwise to lower)
Unless the freezer door is balanced by step 1, then follow the next steps.



- 2 Open the doors, unscrew the front cover and remove, if it is attached.



- 3 Loosen 3 hinge bolts(1 on the left + 2 on the right) a little. (Do not unfasten them completely) Insert a hexagonal wrench into the groove of adjusting nut and turn clockwise until the door is level.

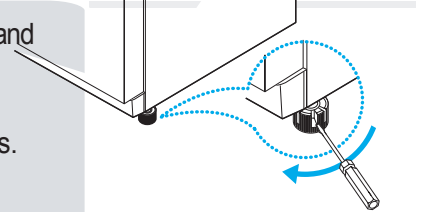


- 4 Once the door is balanced, fasten the hinge bolts tightly and screw the front cover.

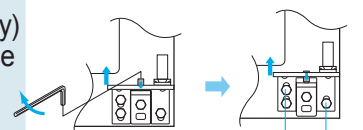


In case refrigerator door is lower than freezer door...

- 1 Insert a screw driver (flat tip) into a groove of the right wheel (bottom of refrigerator) and turn it clockwise until the door is balanced. (clockwise to raise refrigerator door ; counterclockwise to lower)
Unless the refrigerator door is balanced by step 1, then follow the next steps.



- 2 Loosen 3 hinge bolts(2 on the left + 1 on the right) a little. (Do not unfasten them completely) Insert a hexagonal wrench into the groove of adjusting nut and turn clockwise until the door is level.



- 3 Once the door is balanced, fasten the hinge bolts tightly.



Front Cover

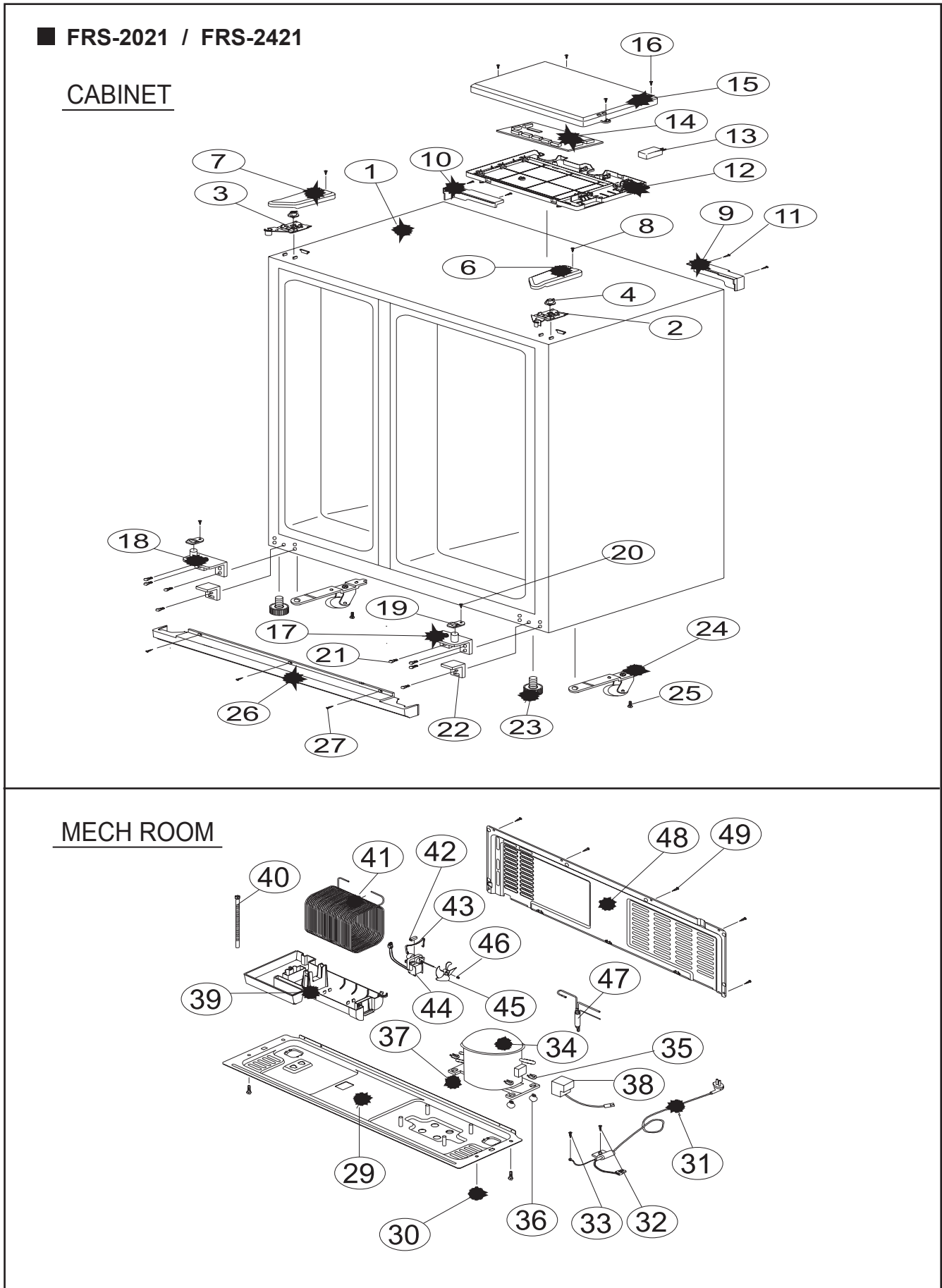
After installation and/or door leveling, fasten front cover with screws.(Remove the screws on the front bottom panel first.
Click and screw the cover)

Notice

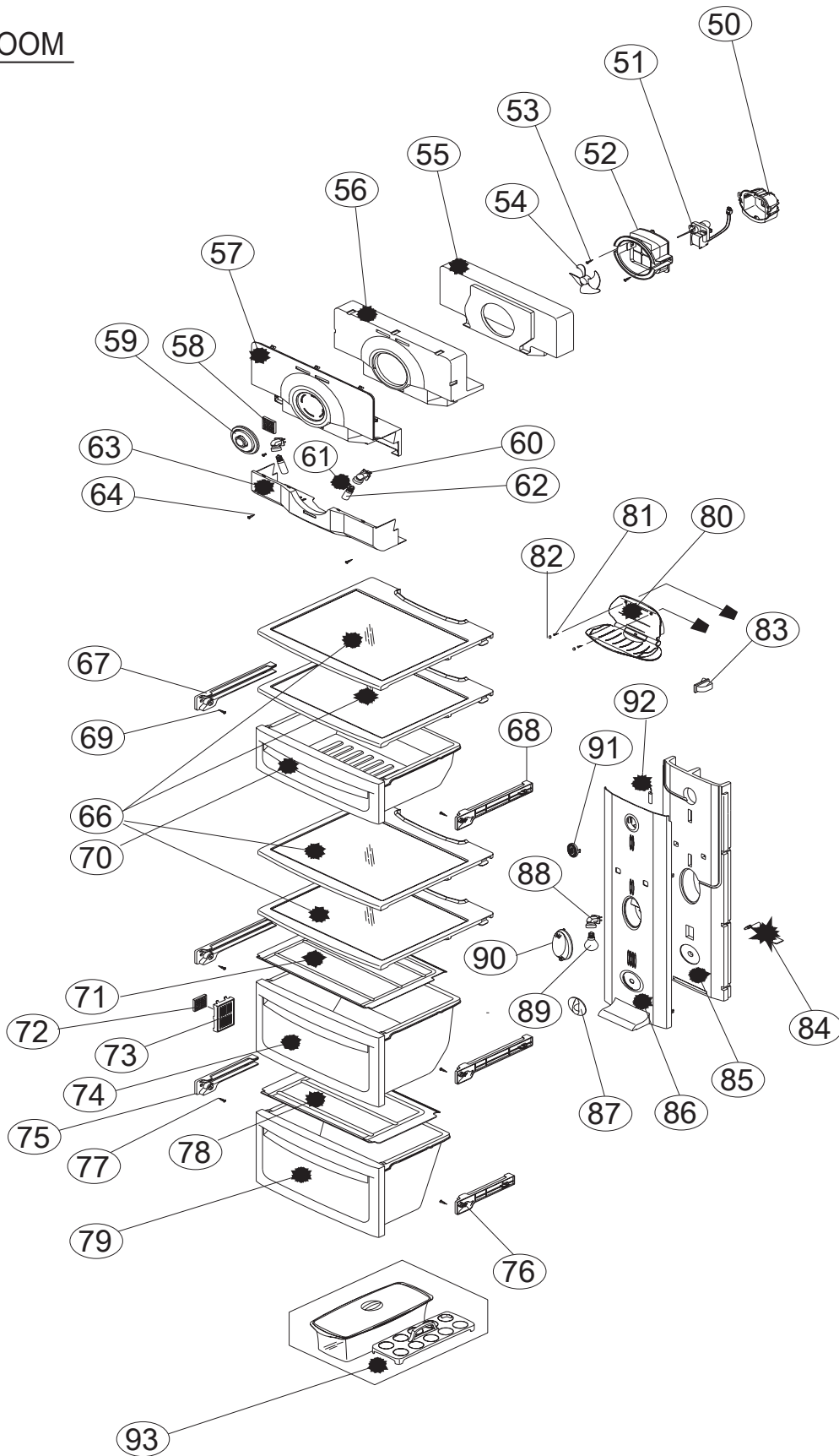
The front of refrigerator needs to be higher just a little than the back for easy door closing, but if the wheel is raised too much for door balance, i.e. front of refrigerator is too higher than the back, it can be difficult to open the door.

7. EXPLODED VIEW AND PARTS LIST

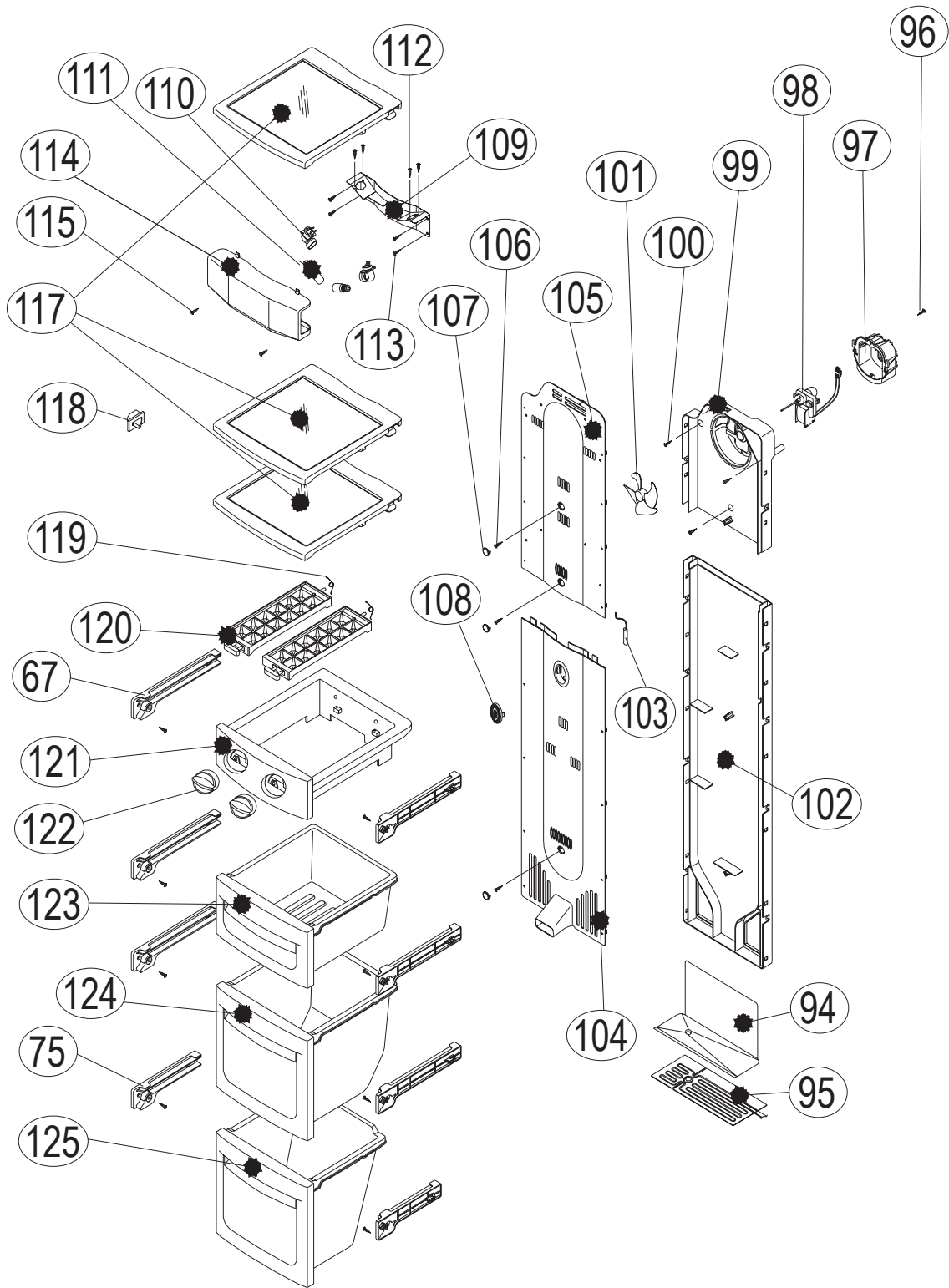
7-1. Total Exploded View



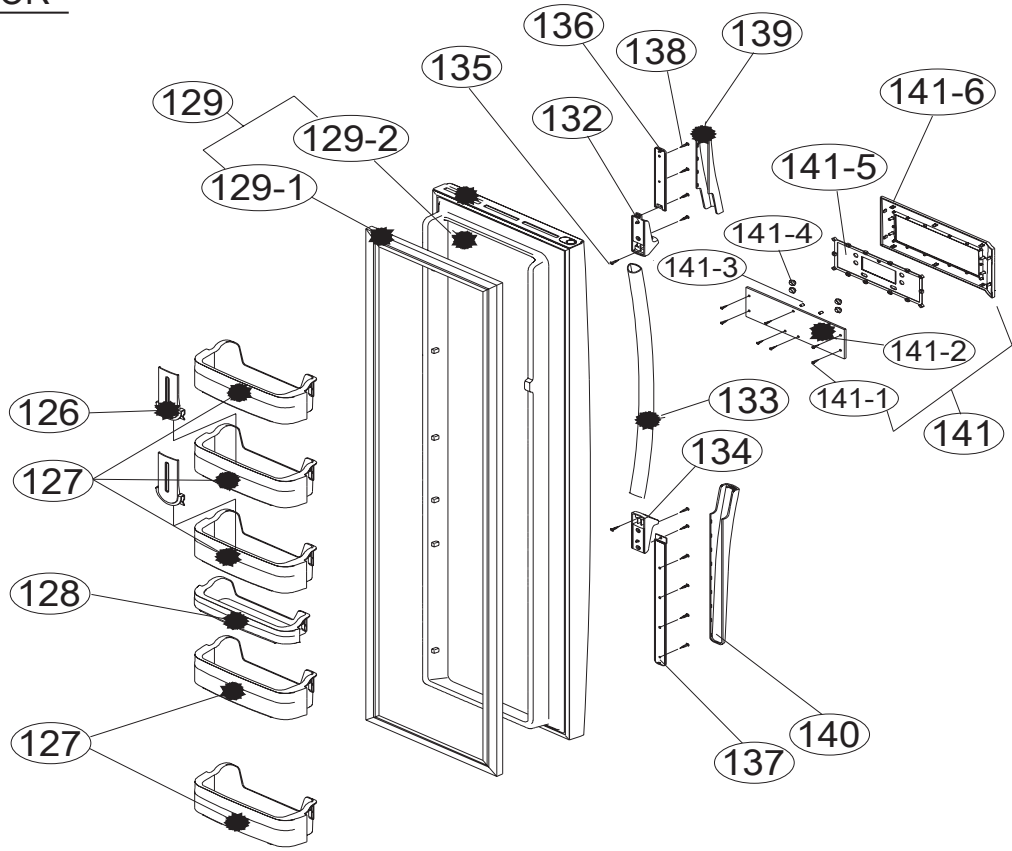
R ROOM



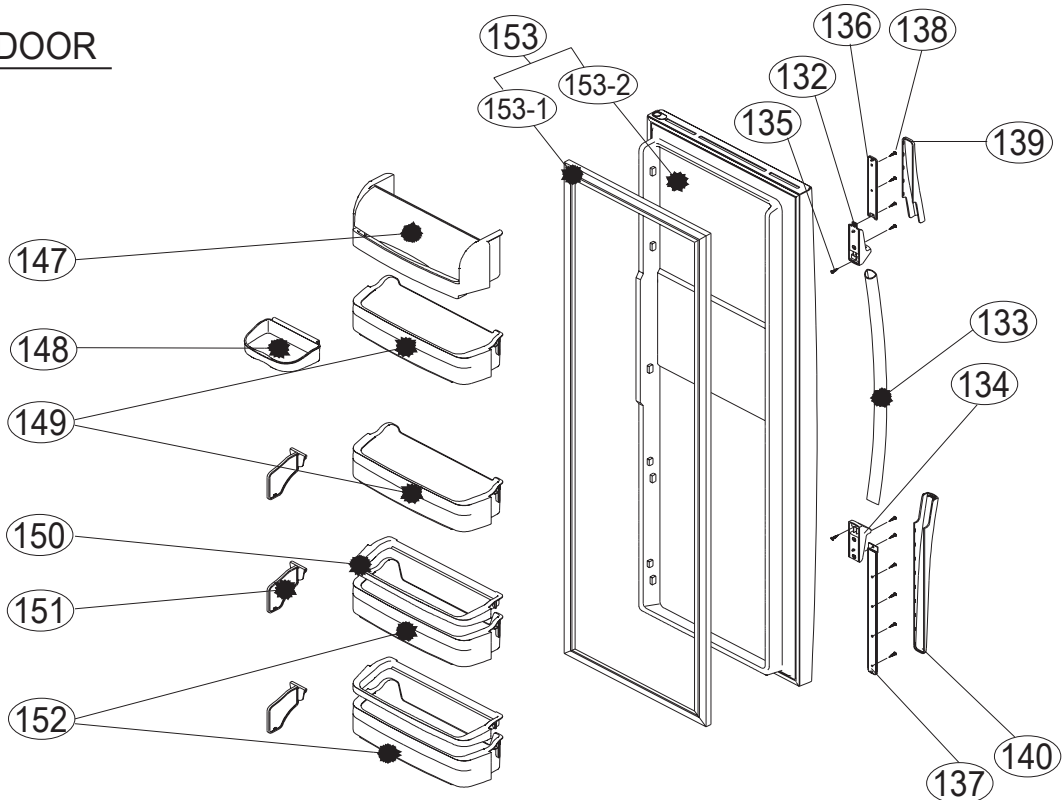
F ROOM



F DOOR

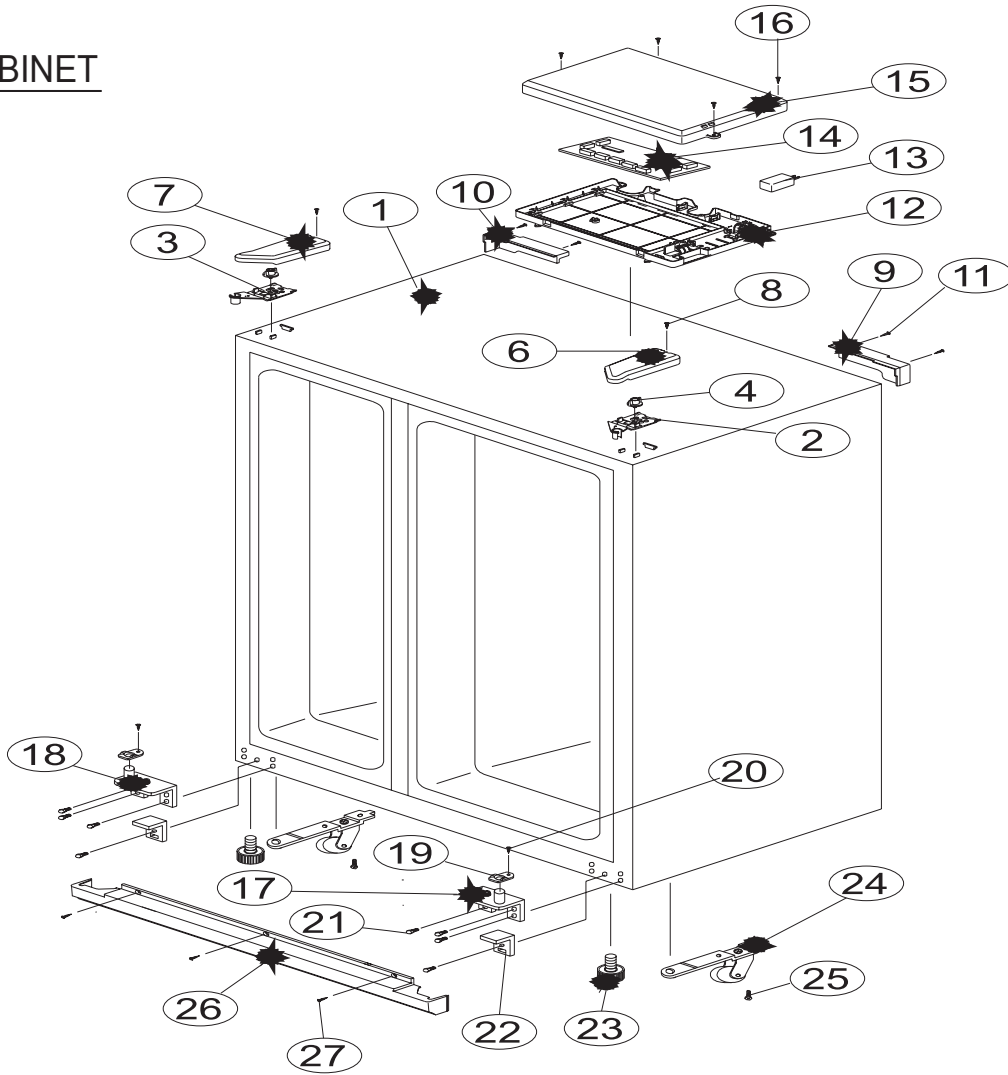


R DOOR

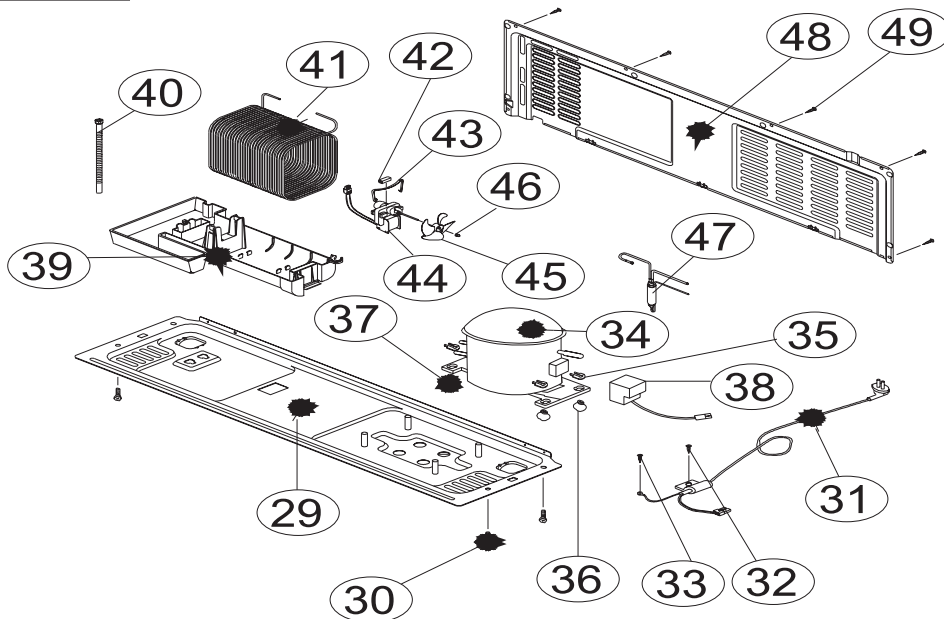


■ FRS-2041 / FRS-2441

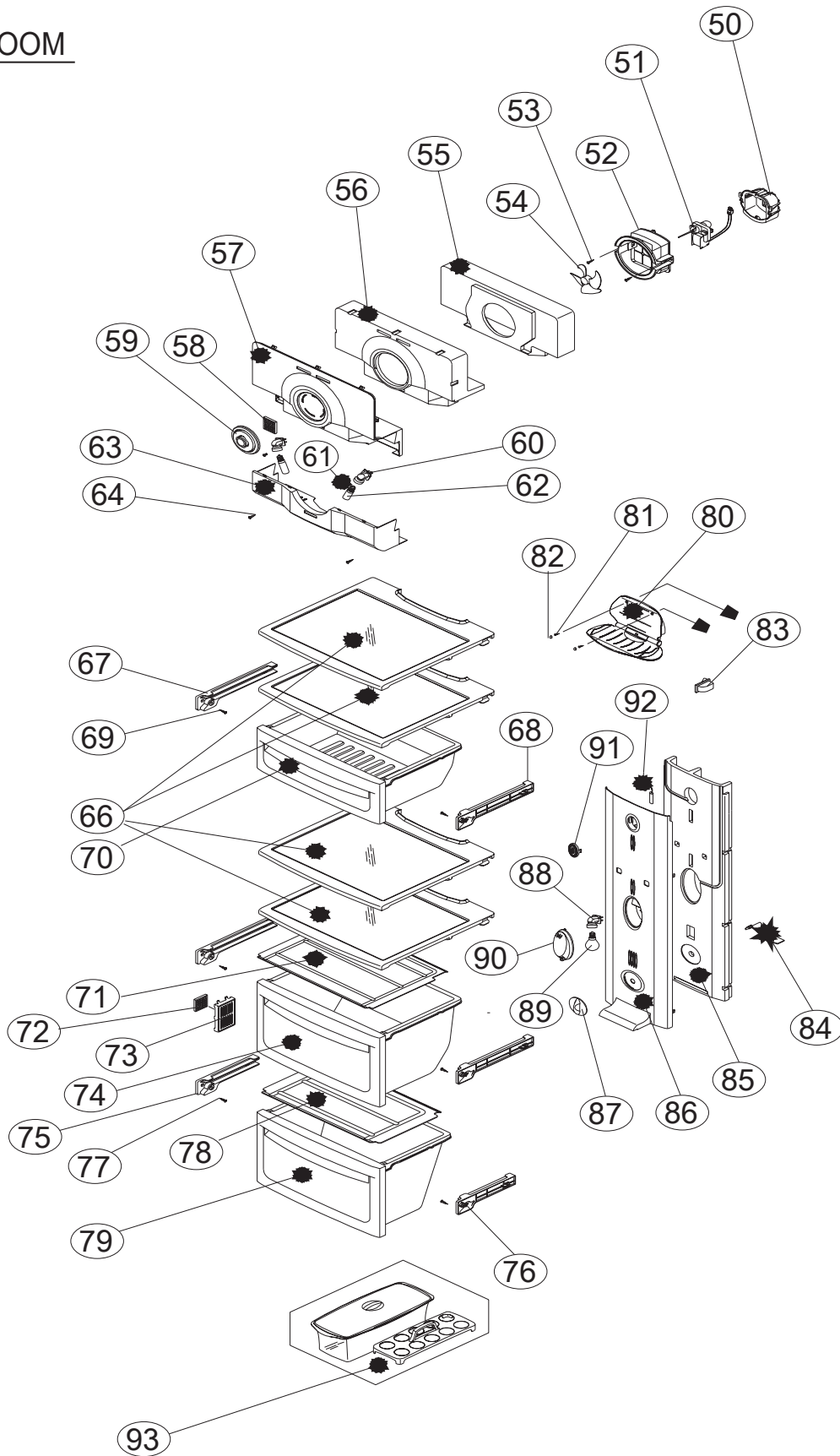
CABINET



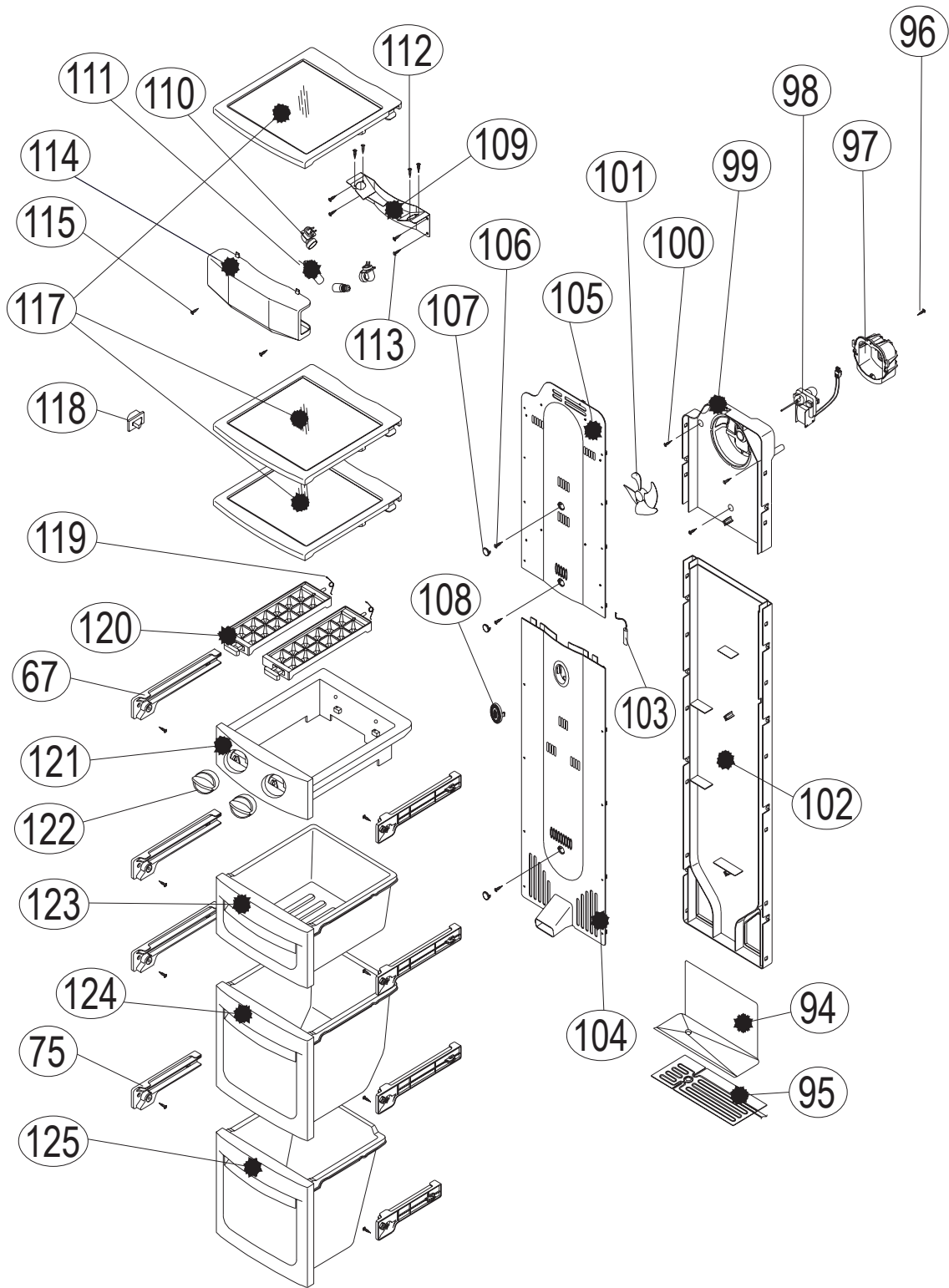
MECH ROOM



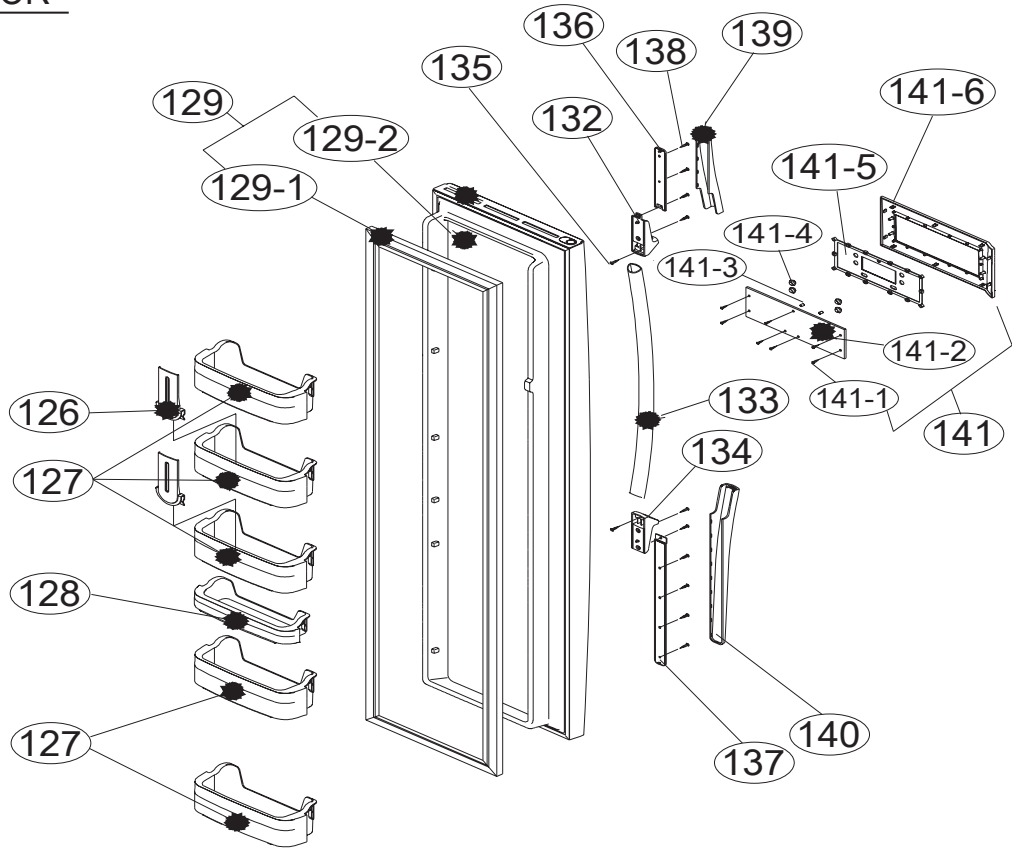
R ROOM



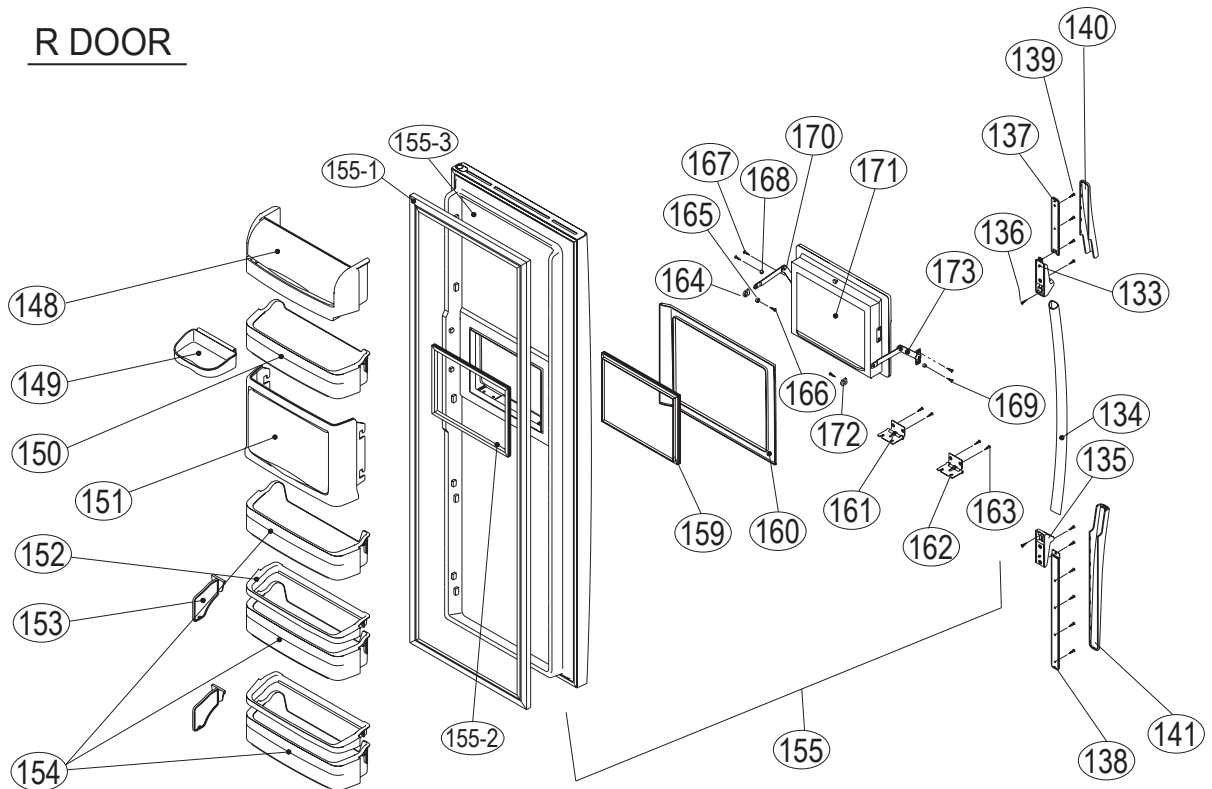
F ROOM



F DOOR



R DOOR



7-2. Total Parts List

■ FRS-2021 / FRS-2421

✓ **Caution:** In this Service Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service information Center(<http://svc.dwe.co.kr>)

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
1	3000003600	ASSY CAB URT		1	FRS-2021
	3000025700	ASSY CAB URT	FR-S690CG/CR		FRS-2421
2	3012917600	HINGE *T *R AS	PO T3.0	1	
3	3012918500	HINGE *T *L AS	PO T3.0	1	
4	3012013000	FIXTURE *T HI	PP	2	
6	3011472400	COVER HI *T *R	PP	1	
7	3011472300	COVER HI *T *L	PP	1	
8	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	2	
9	3012601301	HANDLE CAB COVR *R	PP	1	
10	3012601201	HANDLE CAB COVR *L	PP	1	
11	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
12	3010533400	BOX MAIN PCB	PP	1	
13		CAPACITOR RUN		1	
14		PCB MAIN AS		1	
15	3011472610	COVER MAIN PCB BOX	PP	1	
16	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
17	3012917810	HINGE *U *R AS	PO T5.0+PAINTING	1	
18	3012917710	HINGE *U *L AS	PO T5.0+PAINTING	1	
19	3012513300	GUIDE *U HINGE *U	POM	2	
20	7002501611	SCREW MACHINE	TRS M5 x 16 MFZN	2	
21	3016001240	SPECIAL BOLT *T	6 x 22 SWCH22A(YL)	8	
22	3015306700	SUPPORTER *U HI AS	PO T5.0	2	
23	3012104400	FOOT ADJUST AS		2	
24	3016501200	CASTER TURN AS	TURN CASTER	2	
25	3016001240	SPECIAL BOLT *T	6 x 22 SWCH22A(YL)	2	
26	3011471010	COVER CAB BRKT	PP	1	
27	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	3	
29	3010326700	BASE COMP AS	SBHG T1.2	1	
30	3016003300	SPECIAL BOLT	T2 M6.5 x 20 4EA	4	
31		CORD POWER AS		1	
32	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
33	7051401065	SCREW MACHINE	PAN 4 x 10 SW BSNI	1	
34		COMP		1	
35	3016002500	SPECIAL WASHER	SK-5 T0.8	4	
36	3010101440	ABSORBER COMP AS		4	
38		RELAY STARTING		1	
39	3011113500	CASE VAPORI	PP + CTALC	1	
40	3013201700	HOSE DRAIN	PEHD	1	
41	3014413730	PIPE WICON AS		1	
42	3010102100	ABSORBER C MOTR	NR FRB-5350NT	1	
43	3012004400	FIXTURE C MOTR	SUS	1	

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
44	3015911500	MOTOR C FAN AS	DC12V 2.5W	1	
45	3011802200	FAN	ABS (O.D.)3.17 x D110	1	
46	3011200500	CLAMP FAN	SUS 304	1	
47	3016806900	DRYER AS	XH-9 15g	1	
48	3011474710	COVER MACH ROOM AS	SBHG T0.4	1	
49	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	6	
50	3012007800	FIXTURE MOTOR A	PP	1	
51	3015911400	MOTER R FAN AS		1	
52	3012007900	FIXTURE MOTOR B	HIPS	1	
53	7122401211	SCREW TAPPING	T2S TRS 4 x 12 MFZN	2	
54	3011802200	FAN	ABS (O.D.)3.17 x D110	1	
55	3013344200	INSU DAMP B	F-PS	1	
56	3013344100	INSU DAMP A	F-PS	1	
57	3011471200	COVER DAMP	HIPS	1	
58	3018701800	DEO ANTI AS		1	
59	3011471310	COVER DEO	ABS	1	
60	3017905300	SOCKET R LAMP AS		2	
61	7121300811	SCREW TAPPING	T2S PAN 3 x 8	1	
62		LAMP R A		2	
63	3015507900	WINDOW R LAMP A	MIPS	1	
64	3016002710	SPECIAL SCREW	4 x 12	2	
66	3017827300	SHELF R A AS	GLASS + HIPS	4	FRS-2021
	3017831900	SHELF R A AS	FRAME + SHELF + FIXTURE	4	FRS-2421
67	3012514500	GUIDE CASE A *L AS	ABS	2	
68	3012514600	GUIDE CASE A *R AS	ABS	2	
69	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	4	
70	3011171200	CASE CHILD AS	GPPS + HIPS	1	FRS-2021
	3011177700	CASE CHILD AS	CASE + FRAME STAMPING	1	FRS-2421
71	3011473100	COVER VEGETB CASE A	GPPS	1	FRS-2021
	3011485300	COVER VEGETB CASE A	GPPS	1	FRS-2421
72	3018701800	DEO ANTI AS		1	
73	3011472900	COVER RETURN DUCT	HIPS	1	
74	3011172000	CASE VEGETB A AS	GPPS + HIPS	1	FRS-2021
	3011178200	CASE VEGETB A AS	CASE + FRAME STAMPING	1	FRS-2421
75	3012514700	GUIDE CASE B *L AS	ABS	1	
76	3012514800	GUIDE CASE B *R AS	ABS	1	
77	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	2	
78	3011473200	COVER VEGETB CASE B	GPPS	1	FRS-2021
	3011485400	COVER VEGETB CASE B	GPPS	1	FRS-2421
79	3011172100	CASE VEGETABLE B AS	GPPS + HIPS	1	FRS-2021
	3011178300	CASE VEGETABLE B AS	CASE + FRAME STAMPING	1	FRS-2421
80	3017827500	SHELF WINE AS	ABS	1	
81	3016002710	SPECIAL SCREW	4 x 12	2	
82	3010903200	CAP SCREW	PE	2	
83	3018124000	SWITCH LAMP	SP201R-7DR	1	

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
84	3017100500	FLAP MULT DUCT	PP	1	
85	3013345000	INSU MULT DUCT AS	F-PS	1	
86	3011472700	COVER MULT DUCT	HIPS	1	
87	3013408100	KNOB MULT DUCT	ABS	1	
88	3017905310	SOCKET R LAMP AS	250V 1A	1	
89		LAMP R B		1	
90	3015508000	WINDOW R LAMP B	MIPS	1	
91	3011473000	COVER SENS	ABS	1	
92	3014805400	SENSOR R AS	PBN-438	1	
93	3011171300	CASE EGG AS	GPPS	1	
94	3012514200	GUIDE DRN	GA	1	
95		HEATER DRN GUIDE AS		1	
96	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
97	3012007800	FIXTURE MOTOR A	PP	1	
98	3015911300	MOTOR F FAN AS	DC12V 2.5W	1	
99	3018914400	LOUVER F C	PP	1	
100	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	3	
101	3011802200	FAN	ABS (O.D.)3.17 x D110	1	
102	3018914900	LOUVER F D AS	PP	1	
103	3014805300	SENSOR F AS	PT-38	1	
104	3018914700	LOUVER F B AS	HIPS	1	
105	3018914610	LOUVER F A AS	HIPS	1	
106	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	3	
107	3010924600	CAP F LUVR	HIPS	3	
108	3011473000	COVER SENS	ABS	1	
109	3014559510	PLATE LAMP F	SBHG T0.8	1	
110	3017905200	SOCKET F LAMP AS		2	
111	3013602000	LAMP F/R	240V 25W	2	
112	7121300811	SCREW TAPPING	T2S PAN 3X8 MFZN	4	
113	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	4	
114	3015507710	WINDOW F LAMP	MIPS	1	
115	3016002710	SPECIAL SCREW	4 x 12	2	
117	3017827100	SHELF F A AS	GLASS + HIPS	3	
118	3018124000	SWITCH LAMP	SP201R-7DR	1	
119	3015101300	SPRING ICING CASE	STS304WPB	2	
120	3011170600	CASE ICING	PP	2	FRS-2021
	3011177300	CASE ICING	PP	2	FRS-2421
121	3012203800	FRAME ICE MAKER	ABS	1	FRS-2021
	3012205300	FRAME ICE MAKER	ABS	1	FRS-2421
122	3013408000	KNOB ICEING CASE	HIPS	2	FRS-2021
	3013409300	KNOB ICEING CASE	HIPS	2	FRS-2421
123	3011171800	CASE ICE AS	GPPS + HIPS	1	FRS-2021
	3011178000	CASE ICE AS	GPPS + HIPS	1	FRS-2421
124	3011171400	CASE F A AS	GPPS + HIPS	1	FRS-2021
	3011177800	CASE F A AS	GPPS + HIPS	1	FRS-2421

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
125	3011171500	CASE F B AS	GPPS + HIPS	1	FRS-2021
	3011177900	CASE F B AS	GPPS + HIPS	1	FRS-2421
126	3012516000	GUIDE F POCKET	PP	2	
127	3019019100	POCKET F *U	HIPS	5	
128	3019019000	POCKET F *T	HIPS	1	
129	3000018700	ASSY F DR	FRS-2021	1	
129-1	3012314200	GASKET F DR AS	PVC	1	
129-2	3000003700	ASSY F DR URT		1	
132	3011623800	DECO HNDL *T	ABS + PLATING	1	
133	3012628500	HANDLE	AL	1	
134	3011613900	DECO HNDL *U	ABS + PLATING	1	
135	3016031700	SPECIAL SCREW		2	
136	3010326100	BASE DECO COVER *T	HIPS	1	
137	3010326200	BASE DECO COVER *U	HIPS	1	
138	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	8	
139	3011472100	COVER HNDL DECO *T	ABS	1	
140	3011472200	COVER HNDL DECO *U	ABS	1	
141	3011747510	COVER F PCB AS	FRS-2021	1	
141-1	7111300811	SCREW TAPPING	T1 PAN 3 x 8 MFZN	7	
141-2	30143B4110	PCB F AS		1	
141-3	3016302600	BUTTON CONTL B	ABS	2	
141-4	3016303100	BUTTON CONTL A	ABS +	4	
141-5	3015507800	WINDOW F PCB	ABS	1	
141-6	3011471600	COVER F PCB	ABS + COATING	1	
147	3019019400	POCKET DAIRY AS	GPPS + HIPS	1	
148	3019019300	POCKET R *S	GPPS	1	
149	3019019800	POCKET R *M	HIPS	2	
150	3012514100	GUIDE R POKT	HIPS	2	
151	3012513400	GUIDE BOTL	PP	2	
152	3019019200	POCKET R	HIPS	2	
153	3000018800	ASSY R DR	FRS-2021	1	
153-1	3012314500	GASKET R DR AS	PVC	1	
153-2	3000003800	ASSY R DR URT		1	

 means that you're recommended to refer to the No. 2-2 "Eletric Parts".

■ FRS-2041 / FRS-2441

✓ **Caution:** In this Service Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service information Center(<http://svc.dwe.co.kr>)

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
1	3000003600	ASSY CAB URT		1	FRS-2041
	3000025700	ASSY CAB URT	FR-S690CG/CR		FRS-2441
2	3012917600	HINGE *T *R AS	PO T3.0	1	
3	3012918500	HINGE *T *L AS	PO T3.0	1	
4	3012013000	FIXTURE *T HI	PP	2	
6	3011472400	COVER HI *T *R	PP	1	
7	3011472300	COVER HI *T *L	PP	1	
8	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	2	
9	3012601301	HANDLE CAB COVR *R	PP	1	
10	3012601201	HANDLE CAB COVR *L	PP	1	
11	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
12	3010533400	BOX MAIN PCB	PP	1	
13		CAPACITOR RUN		1	
14		PCB MAIN AS		1	
15	3011472610	COVER MAIN PCB BOX	PP	1	
16	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
17	3012917810	HINGE *U *R AS	PO T5.0+PAINTING	1	
18	3012917710	HINGE *U *L AS	PO T5.0+PAINTING	1	
19	3012513300	GUIDE *U HINGE *U	POM	2	
20	7002501611	SCREW MACHINE	TRS M5 x 16 MFZN	2	
21	3016001240	SPECIAL BOLT *T	6 x 22 SWCH22A(YL)	8	
22	3015306700	SUPPORTER *U HI AS	PO T5.0	2	
23	3012104400	FOOT ADJUST AS		2	
24	3016501200	CASTER TURN AS	TURN CASTER	2	
25	3016001240	SPECIAL BOLT *T	6 x 22 SWCH22A(YL)	2	
26	3011471010	COVER CAB BRKT	PP	1	
27	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	3	
29	3010326700	BASE COMP AS	SBHG T1.2	1	
30	3016003300	SPECIAL BOLT	T2 M6.5 x 20 4EA	4	
31		CORD POWER AS		1	
32	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
33	7051401065	SCREW MACHINE	PAN 4 x 10 SW BSNi	1	
34		COMP		1	
35	3016002500	SPECIAL WASHER	SK-5 T0.8	4	
36	3010101440	ABSORBER COMP AS		4	
38		RELAY STARTING		1	
39	3011113500	CASE VAPORI	PP + CTALC	1	
40	3013201700	HOSE DRAIN	PEHD	1	
41	3014413730	PIPE WICON AS		1	
42	3010102100	ABSORBER C MOTR	NR FRB-5350NT	1	
43	3012004400	FIXTURE C MOTR	SUS	1	
44	3015911500	MOTOR C FAN AS	DC12V 2.5W	1	
45	3011802200	FAN	ABS (O.D.)3.17 x D110	1	

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
46	3011200500	CLAMP FAN	SUS 304	1	
47	3016806900	DRYER AS	XH-9 15g	1	
48	3011474710	COVER MACH ROOM AS	SBHG T0.4	1	
49	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	6	
50	3012007800	FIXTURE MOTOR A	PP	1	
51	3015911400	MOTER R FAN AS		1	
52	3012007900	FIXTURE MOTOR B	HIPS	1	
53	7122401211	SCREW TAPPING	T2S TRS 4 x 12 MFZN	2	
54	3011802200	FAN	ABS (O.D.)3.17 x D110	1	
55	3013344200	INSU DAMP B	F-PS	1	
56	3013344100	INSU DAMP A	F-PS	1	
57	3011471200	COVER DAMP	HIPS	1	
58	3018701800	DEO ANTI AS		1	
59	3011471310	COVER DEO	ABS	1	
60	3017905300	SOCKET R LAMP AS		2	
61	7121300811	SCREW TAPPING	T2S PAN 3 x 8	1	
62		LAMP R A		2	
63	3015507900	WINDOW R LAMP A	MIPS	1	
64	3016002710	SPECIAL SCREW	4 x 12	2	
66	3017827300	SHELF R A AS	GLASS + HIPS	4	FRS-2041
	3017831900	SHELF R A AS	FRAME + SHELF + FIXTURE	4	FRS-2441
67	3012514500	GUIDE CASE A *L AS	ABS	2	
68	3012514600	GUIDE CASE A *R AS	ABS	2	
69	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	4	
70	3011171200	CASE CHILD AS	GPPS + HIPS	1	FRS-2041
	3011177700	CASE CHILD AS	CASE + FRAME STAMPING	1	FRS-2441
71	3011473100	COVER VEGETB CASE A	GPPS	1	FRS-2041
	3011485300	COVER VEGETB CASE A	GPPS	1	FRS-2441
72	3018701800	DEO ANTI AS		1	
73	3011472900	COVER RETURN DUCT	HIPS	1	
74	3011172000	CASE VEGETB A AS	GPPS + HIPS	1	FRS-2041
	3011178200	CASE VEGETB A AS	CASE + FRAME STAMPING	1	FRS-2441
75	3012514700	GUIDE CASE B *L AS	ABS	1	
76	3012514800	GUIDE CASE B *R AS	ABS	1	
77	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	2	
78	3011473200	COVER VEGETB CASE B	GPPS	1	FRS-2041
	3011485400	COVER VEGETB CASE B	GPPS	1	FRS-2441
79	3011172100	CASE VEGETABLE B AS	GPPS + HIPS	1	FRS-2041
	3011178300	CASE VEGETABLE B AS	CASE + FRAME STAMPING	1	FRS-2441
80	3017827500	SHELF WINE AS	ABS	1	
81	3016002710	SPECIAL SCREW	4 x 12	2	
82	3010903200	CAP SCREW	PE	2	
83	3018124000	SWITCH LAMP	SP201R-7DR	1	
84	3017100500	FLAP MULT DUCT	PP	1	
85	3013345000	INSU MULT DUCT AS	F-PS	1	
86	3011472700	COVER MULT DUCT	HIPS	1	

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
87	3013408100	KNOB MULT DUCT	ABS	1	
88	3017905310	SOCKET R LAMP AS	250V 1A	1	
89		LAMP R B		1	
90	3015508000	WINDOW R LAMP B	MIPS	1	
91	3011473000	COVER SENS	ABS	1	
92	3014805400	SENSOR R AS	PBN-438	1	
93	3011171300	CASE EGG AS	GPPS	1	
94	3012514200	GUIDE DRN	GA	1	
95		HEATER DRN GUIDE AS		1	
96	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	1	
97	3012007800	FIXTURE MOTOR A	PP	1	
98	3015911300	MOTOR F FAN AS	DC12V 2.5W	1	
99	3018914400	LOUVER F C	PP	1	
100	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	3	
101	3011802200	FAN	ABS (O.D.)3.17 x D110	1	
102	3018914900	LOUVER F D AS	PP	1	
103	3014805300	SENSOR F AS	PT-38	1	
104	3018914700	LOUVER F B AS	HIPS	1	
105	3018914610	LOUVER F A AS	HIPS	1	
106	7142401611	SCREW TAPPING	T2 TRS 4 x 16 MFZN	3	
107	3010924600	CAP F LUVR	HIPS	3	
108	3011473000	COVER SENS	ABS	1	
109	3014559510	PLATE LAMP F	SBHG T0.8	1	
110	3017905200	SOCKET F LAMP AS		2	
111	3013602000	LAMP F/R	240V 25W	2	
112	7121300811	SCREW TAPPING	T2S PAN 3X8 MFZN	4	
113	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	4	
114	3015507710	WINDOW F LAMP	MIPS	1	
115	3016002710	SPECIAL SCREW	4 x 12	2	
117	3017827100	SHELF F A AS	GLASS + HIPS	3	
118	3018124000	SWITCH LAMP	SP201R-7DR	1	
119	3015101300	SPRING ICING CASE	STS304WPB	2	
120	3011170600	CASE ICING	PP	2	FRS-2041
	3011177300	CASE ICING	PP	2	FRS-2441
121	3012203800	FRAME ICE MAKER	ABS	1	FRS-2041
	3012205300	FRAME ICE MAKER	ABS	1	FRS-2441
122	3013408000	KNOB ICEING CASE	HIPS	2	FRS-2041
	3013409300	KNOB ICEING CASE	HIPS	2	FRS-2441
123	3011171800	CASE ICE AS	GPPS + HIPS	1	FRS-2041
	3011178000	CASE ICE AS	GPPS + HIPS	1	FRS-2441
124	3011171400	CASE F A AS	GPPS + HIPS	1	FRS-2041
	3011177800	CASE F A AS	GPPS + HIPS	1	FRS-2441
125	3011171500	CASE F B AS	GPPS + HIPS	1	FRS-2041
	3011177900	CASE F B AS	GPPS + HIPS	1	FRS-2441
126	3012516000	GUIDE F POCKET	PP	2	
127	3019019100	POCKET F *U	HIPS	5	

NO	PART CODE	PART NAME	PART DESCRIPTION	Q'TY	REMARK
128	3019019000	POCKET F *T	HIPS	1	
129	3000018700	ASSY F DR	FRS-2021	1	
129-1	3012314200	GASKET F DR AS	PVC	1	
129-2	3000003700	ASSY F DR URT		1	
132	3011623800	DECO HNDL *T	ABS	1	
133	3012628500	HANDLE	AL	1	
134	3011613900	DECO HNDL *U	ABS	1	
135	3016031700	SPECIAL SCREW		2	
136	3010326100	BASE DECO COVER *T	HIPS	1	
137	3010326200	BASE DECO COVER *U	HIPS	1	
138	7112401211	SCREW TAPPING	T1 TRS 4 x 12 MFZN	8	
139	3011472100	COVER HNDL DECO *T	ABS	1	
140	3011472200	COVER HNDL DECO *U	ABS	1	
141	3011747510	COVER F PCB AS	FRS-2021	1	
141-1	7111300811	SCREW TAPPING	T1 PAN 3 x 8 MFZN	7	
141-2	30143B4110	PCB F AS		1	
141-3	3016302600	BUTTON CONTL B	ABS	2	
141-4	3016303100	BUTTON CONTL A	ABS	4	
141-5	3015507800	WINDOW F PCB	ABS	1	
141-6	3011471600	COVER F PCB	ABS	1	
148	3019019400	POCKET DAIRY AS	GPPS + HIPS	1	
149	3019019300	POCKET R *S	GPPS	1	
150	3019019800	POCKET R *M	HIPS	2	
151	3011474600	COVER HOMEBAR AS	GPPS	1	
152	3012514100	GUIDE R POKT	HIPS	2	
153	3012513400	GUIDE BOTL	PP	2	
154	3019019200	POCKET R	HIPS	2	
155	3000025300	ASSY R DR	FRS-2041	1	
155-1	3012314500	GASKET R DR AS	PVC	1	
155-2	3012314400	GASKET HOMEBAR B AS	PVC	1	
155-3	3000003810	ASSY R DR URT		1	
159	3012314300	GASKET HOMEBAR A AS	PVC	1	
160	3011471700	COVER FRAME HOMEBAR	ABS	1	
161	3012918300	HINGE HOMEBAR *R AS	STS304	1	
162	3012918200	HINGE HOMEBAR *L AS	STS304	1	
163	3016030600	SPECIAL SCREW C	SUS M5	8	
164	3010951600	CAP HOMEBAR ARM PLT *R	ABS	1	
165	3012514000	GUIDE HOMEBAR ARM RING A	POM	1	
166	3016030800	SPECIAL SCREW A	SUS M5	2	
167	3016030600	SPECIAL SCREW C	SUS M5	2	
168	3015202100	STOPPER HOMEBAR DR	PP	2	
169	3016030900	SPECIAL SCREW B	SUS M5	2	
170	3014560300	PLATE HOMEBAR ARM *R AS	STS 304	1	
171	3011791900	DOOR HOMEBAR URT AS		1	
172	3010951500	CAP HOMEBAR ARM PLT *L	ABS	1	
173	3014560200	PLATE HOMEBAR ARM *L AS	STS 304	1	

 means that you're recommended to refer to the No. 2-2 "Eletric Parts".