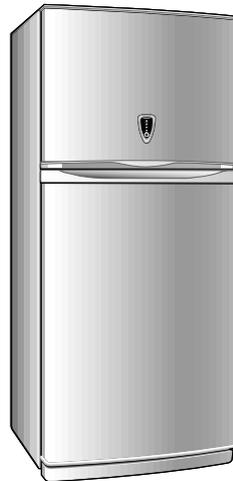


S/M No:

Service Manual

Refrigerator

FR-4501..
FN-4501..



FRP-371..

FR-4502..
FN-4502..



FRP-372..

FR-4506..
FN-4506..



FRP-376..

✓ Caution

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

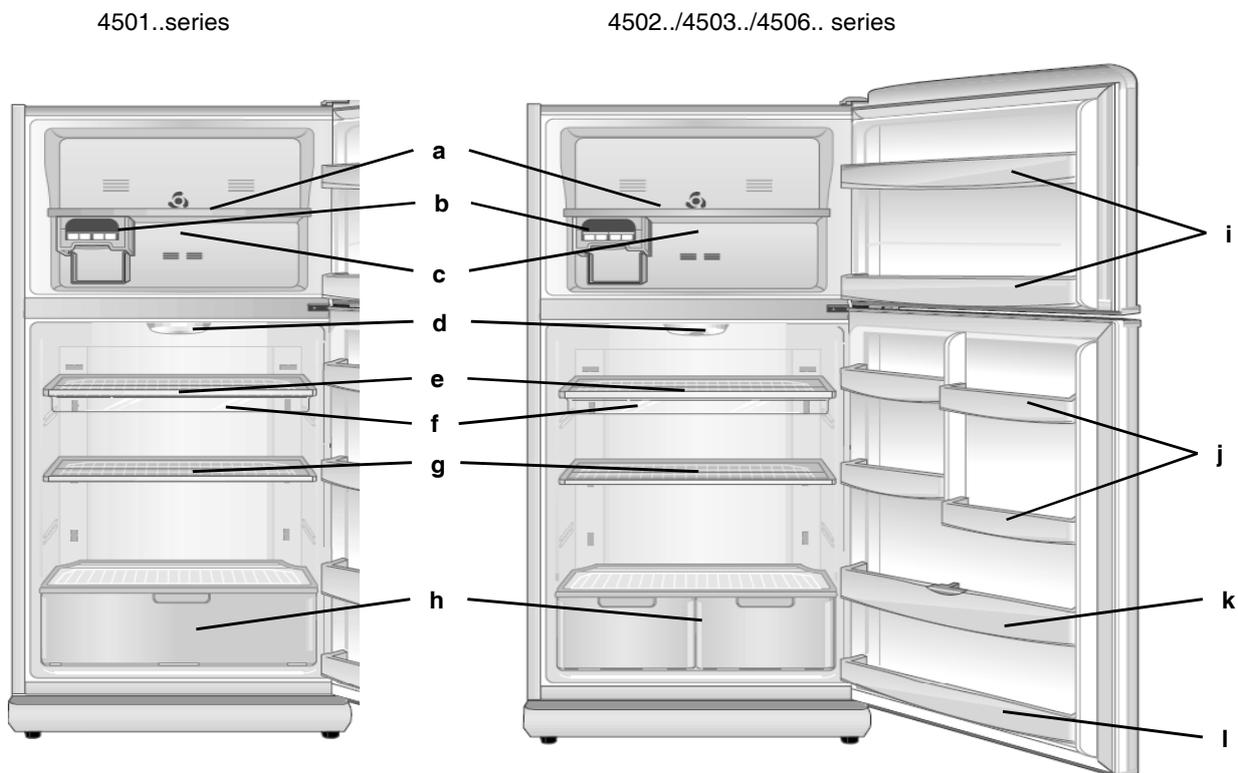
Please observe the following safety precautions in order to use safely and correctly the refrigerator and to prevent accident and danger during repair.

1. Be care of an electric shock. Disconnect power cord from wall outlet and wait for more than three minutes before replacing PCB parts.
Shut off the power whenever replacing and repairing electric components.
2. When connecting power cord, please wait for more than five minutes after power cord was disconnected from the wall outlet.
3. Please check if the power plug is pressed down by the refrigerator against the wall.
If the power plug was damaged, it may cause fire or electric shock.
4. If the wall outlet is over loaded, it may cause fire.
Please use its own individual electrical outlet for the refrigerator.
5. Please make sure the outlet is properly earthed, particularly in wet or damp area.
6. Use standard electrical components when replacing them.
7. Make sure the hook is correctly engaged.
Remove dust and foreign materials from the housing and connecting parts.
8. Do not fray, damage, machine, heavily bend, pull out or twist the power cord.
9. Please check the evidence of moisture intrusion in the electrical components.
Replace the parts or mask it with insulation tapes if moisture intrusion was confirmed.
10. Do not touch the icemaker with hands or tools to confirm the operation of geared motor.
11. Do not let the customers repair, disassemble and reconstruct the refrigerator for themselves.
It may cause accident, electric shock, or fire.
12. Do not store flammable materials such as ether, benzene, alcohol, chemicals, gas, or medicine in the refrigerator.
13. Do not put flower vase, cup, cosmetics, chemicals, etc., or container with full of water on the top of the refrigerator.
14. Do not put glass bottles with full of water into the freezer.
The contents shall freeze and break the glass bottles.
15. When you scrap the refrigerator, please disconnect the door gasket first and scrap it where children are not accessible.

1. Specification

Factory No.		FRP-37..	FRP-37..
Buyer No.		FR-450..	FN-450..
Gross Vol. (ISO15502)	Total	408L	408L
	Freezer	126L	126L
	Refrigerator	282L	282L
Storage Vol. (ISO15502)	Total	361L	361L
	Freezer	99L	99L
	Refrigerator	262L	262L
Net Dimension	Width	742mm	742mm
	Depth (w/o handle)	697mm	697mm
	Height	1801mm	1801mm
Cooling Cycle	Refrigerant type	R-134a	R-600a
	Refrigerant charge	90g	40g
	Evaporator type	Fin Type	Fin Type
	Colling system	Fan cooling system	Fan cooling system
Heater	Defrost heater	148W	180W
	Defrost control	Automatic start & stop	Automatic start & stop
Sensor	Defrost sensor	PBN-43	PBN-43
	Refrigerator sensor	PBN-43	PBN-43
Electronic Part	Fuse temp.	77℃	77℃
	Refrigerator lamp	15w x 1ea	15w x 1ea
	Fan motor	AC or DC (model dependent)	
Net Weight		69kg	69kg

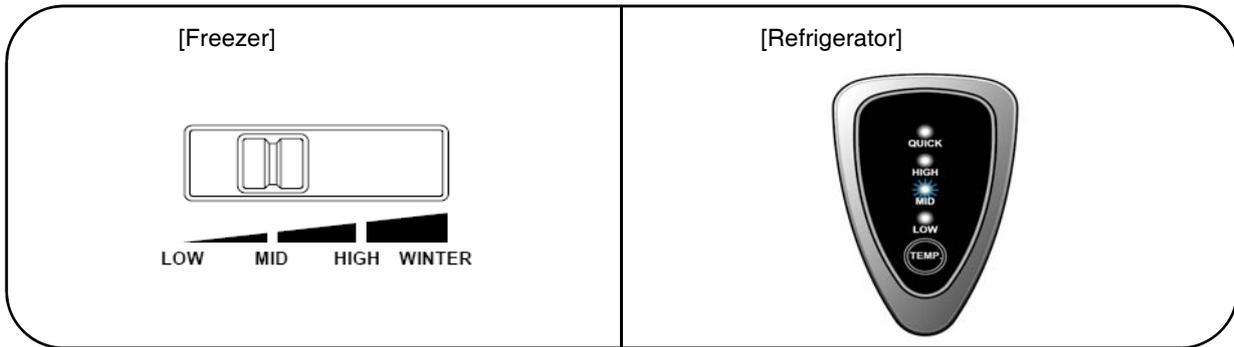
2. Internal View



※ The real features are model dependent..

Freezer Compartment	Refrigerator Compartment
a. Freezer shelf	g. Refrigerator shelf
b. Twist ice maker	h. Vegetable case*
c. Freezer temperature control knob	i. Freezer pocket
d. Lamp window (15W x 1ea)	j. Utility pocket
e. Shelf chilled case (*option)	k. Jumbo pocket
f. Chilled Case (*option)	l. Bottle Pocket

1. Temperature control



1) Freezer temperature control

- Temperature controlled by moving the lever horizontally.
- No relation with M-PCB. It just controls the cold air hole. (Low is fully open, Winter is almost close the hole.)

2) Refrigerator temperature control

- The dial will be changed by the TEMP button.
- Initial mode is Mid and whenever pressing TEMP button, the dial will change as follows.

Low - Mid - High - Quick - Low

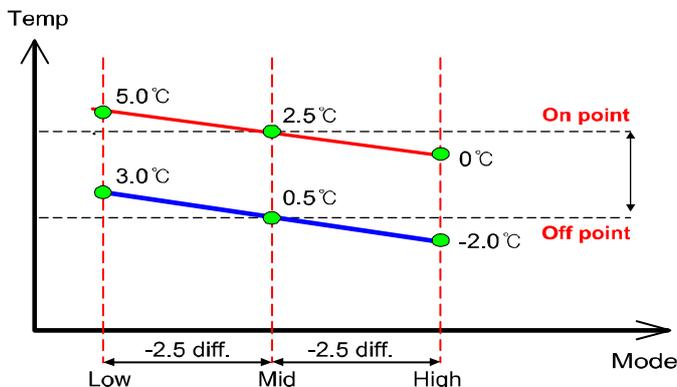
- Inner real temperature controlled by sensor on/off point.
- Each sensor on/off point controls Compressor & Fan motor operation.
- Fan motor is on/off after 1minute from compressor is on/off. (Fan motor delay time is 1 minute.)

Control	Low	Mid	High	Quick
On (°C)	5.0	2.5	0.0	-
Off (°C)	3.0	0.5	-2.0	-3.0 (for 40 minute)

3) Quick Mode (max. time limit is 40 min.)

- When Quick mode selected, led is on.
- When refrigerator sensor is below -3.0°C, this mode is end. Then returns to previous setting.

4) Control point in each mode

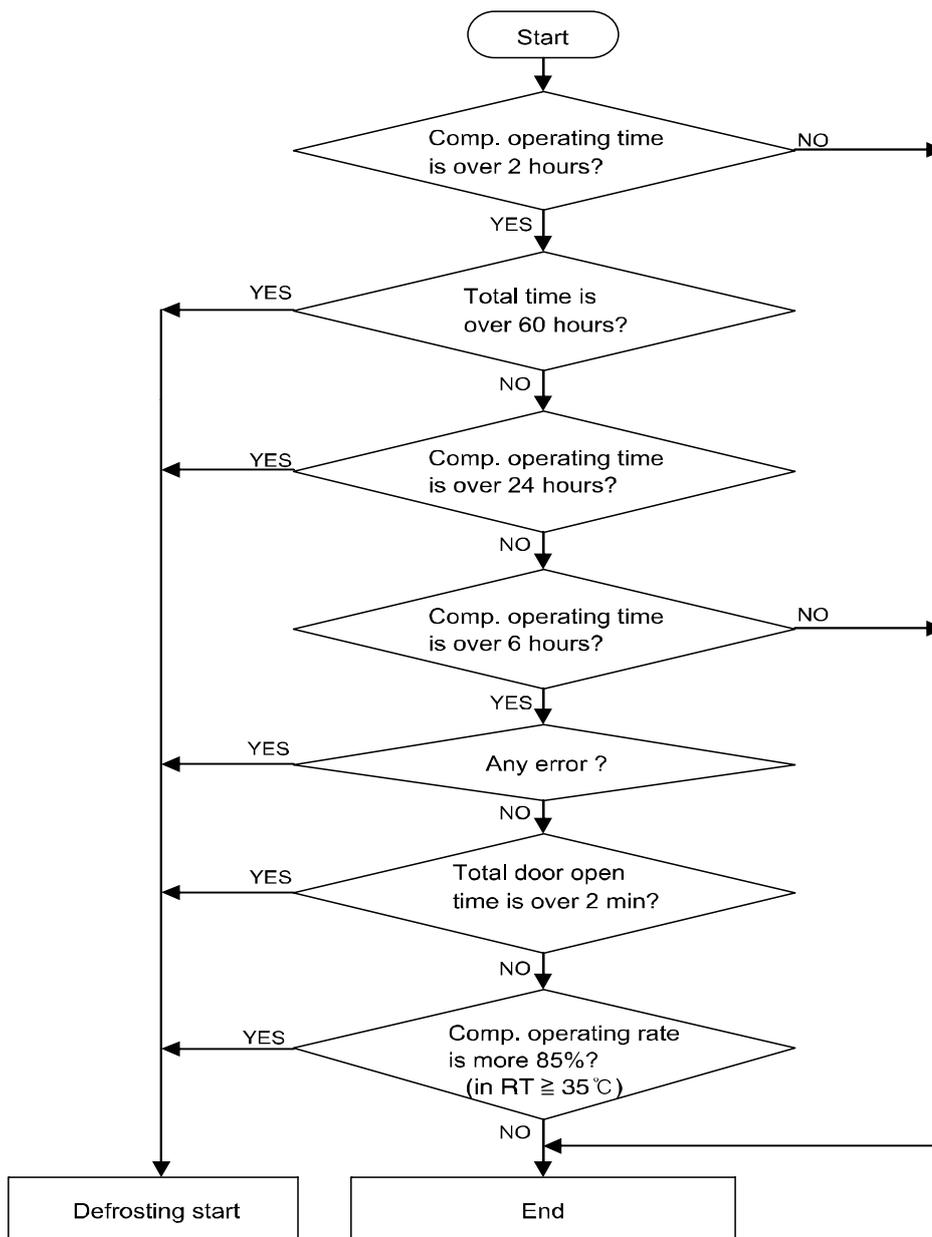


2. Defrosting Mode

1) Determination of defrosting mode.

- Basic condition is compressor running time is 6, 8, 10 ~ 24 hours.
- Compressor running-ratio (at every 2 hours) is 85% in the room temperature is over 35°C.
(The room temperature affects the compressor running-ratio. The degree is proportional to running-ratio.)
- Door opening time is over 2 minutes.
- Total time (Compressor is on time + off time) is 60 hours.
- Any error happens.

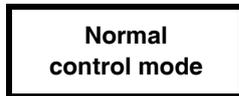
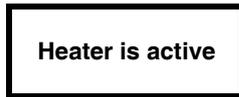
2) Defrost flow



3. Defrosting Process

1) Defrost mode is active according to the condition. (operation time, any error, door opening time & etc.)

2) Precess



[Pre-cool]

- Control : Compressor on, Fan on, Heater off.
- Exit : When refrigerator sensor is below -4℃. (about 20 ~ 30 minutes)

[Heater defrosting]

- Control : Compressor off, Fan off, Heater on.
- 30 seconds : Heater is on unconditionally.
- 30 minutes : When D1 error happens. (D1 : defrost sensor is abnormal)
- 80 minutes : Maximum time limit.
- Exit : Defrost sensor is more than 10℃.

[Pause]

- Control : Compressor off, Fan off, Heater off.
- Exit : After 4 minutes.

[Fan delay]

- Control : Compressor on, Fan off, Heater off.
- Exit : After 4 minutes.

4. Prevention of compressor restart

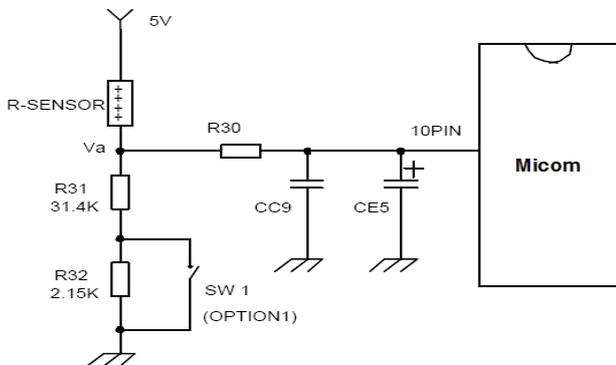
; Compressor doesn't restart for about 6 minutes to protect compressor regardless of refrigerator sensor.

5. Initial Defrosting

; If defrosting sensor temperature is below 3.5℃ in initial power input, normal defrosting mode starts.

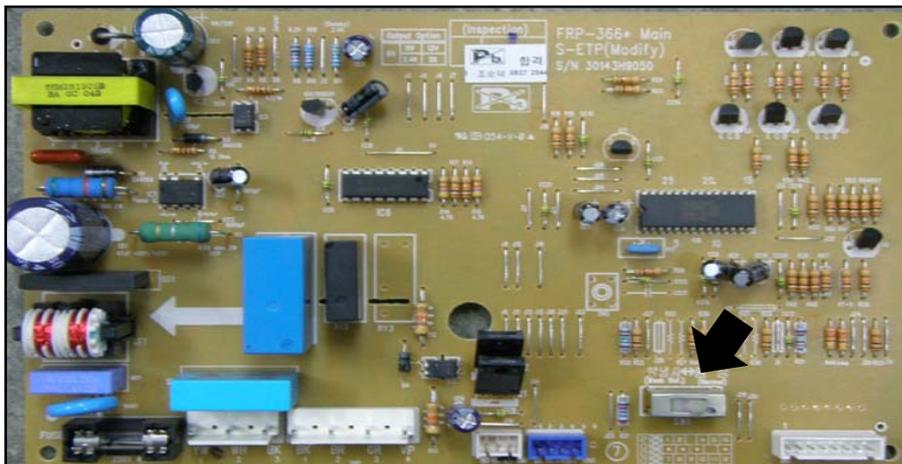
6. Weak Cooling) easy action

; Adjustment of refrigerator sensor resistance value → Change on/off temperature.



- 1) When weak cooling in refrigerator compartment sw1 is useful.
- 2) Normal : SW1 is on. The R-Sensor off point is 0.5°C.
(When the dial is MID step.)
- 3) Weak Ref. : SW1 is off. The sensor off point is -1.0°C.
(When the dial is MID step.)

Dial	SW1	Resistance value	Sensor Off point
Low	Normal (on)	R31 (31.4K)	3.0°C
	Weak Ref. (off)	R31 + R32 (31.4K + 2.15K)	1.5°C
Mid	Normal (on)	R31 (31.4K)	0.5°C
	Weak Ref. (off)	R31 + R32 (31.4K + 2.15K)	-1.0°C
High	Normal (on)	R31 (31.4K)	-2.0°C
	Weak Ref. (off)	R31 + R32 (31.4K + 2.15K)	-3.5°C
Quick (active for 40min.)	Normal (on)	R31 (31.4K)	-3.0°C
	Weak Ref. (off)	R31 + R32 (31.4K + 2.15K)	-4.5°C



6. Error Display

- 1) How to start : Push the TEMP button 30 times. And then keep pressing the button for 5 seconds.
- 2) How to exit : Returns to normal mode after 20 seconds automatically.
- 3) Error display in detail

Error display	Explanation	Remark										
 <p>Low LED is flicker</p>	<ul style="list-style-type: none"> - Cause : Defrost sensor is disconnected or short. - Control : Defrosting is active for 30 minutes. (Heater is on for 30 minutes and then off.) 											
 <p>Mid LED is flicker</p>	<ul style="list-style-type: none"> - Cause : Refrigerator sensor is disconnected or short. - Control : Compressor is on/off according to room temperature. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>R.T.</td> <td>~ 10℃</td> <td>11 ~ 15℃</td> <td>16 ~ 29℃</td> <td>35℃ ~</td> </tr> <tr> <td>Comp. on/off</td> <td>6 / 34 (min.)</td> <td>10 / 30 (min.)</td> <td>16 / 24 (min.)</td> <td>20 / 20 (min.)</td> </tr> </table>	R.T.	~ 10℃	11 ~ 15℃	16 ~ 29℃	35℃ ~	Comp. on/off	6 / 34 (min.)	10 / 30 (min.)	16 / 24 (min.)	20 / 20 (min.)	
R.T.	~ 10℃	11 ~ 15℃	16 ~ 29℃	35℃ ~								
Comp. on/off	6 / 34 (min.)	10 / 30 (min.)	16 / 24 (min.)	20 / 20 (min.)								
 <p>High LED is flicker</p>	<ul style="list-style-type: none"> - Cause : Defrost mode ends after limit time 80 minutes. (When evaporator is fully cover by frost or temperature fuse is abnormal or Heater is disconnected.) - Action : Need to check all defrost parts. 											
 <p>Quick LED is flicker</p>	<ul style="list-style-type: none"> - Cause : After 2 hours' compressor runing time, defrost sensor is over -5℃ (Cycle is abnormal : refrigerant leakage or block) - Action : Need to check all cycle parts. 											

- 4) If there is no error, all LED is off when error display.

7. Time delay of electric parts.

- 1) Normal control state : Fan motor is on/off after 1 minute from compressor on/off.
- 2) Initial plug-in : Fan motor is on after 4 minutes from compressor on.
- 3) Door opening → closing : Fan motor is on after 20 seconds.

8. Pull Down (it is a kind of test mode)

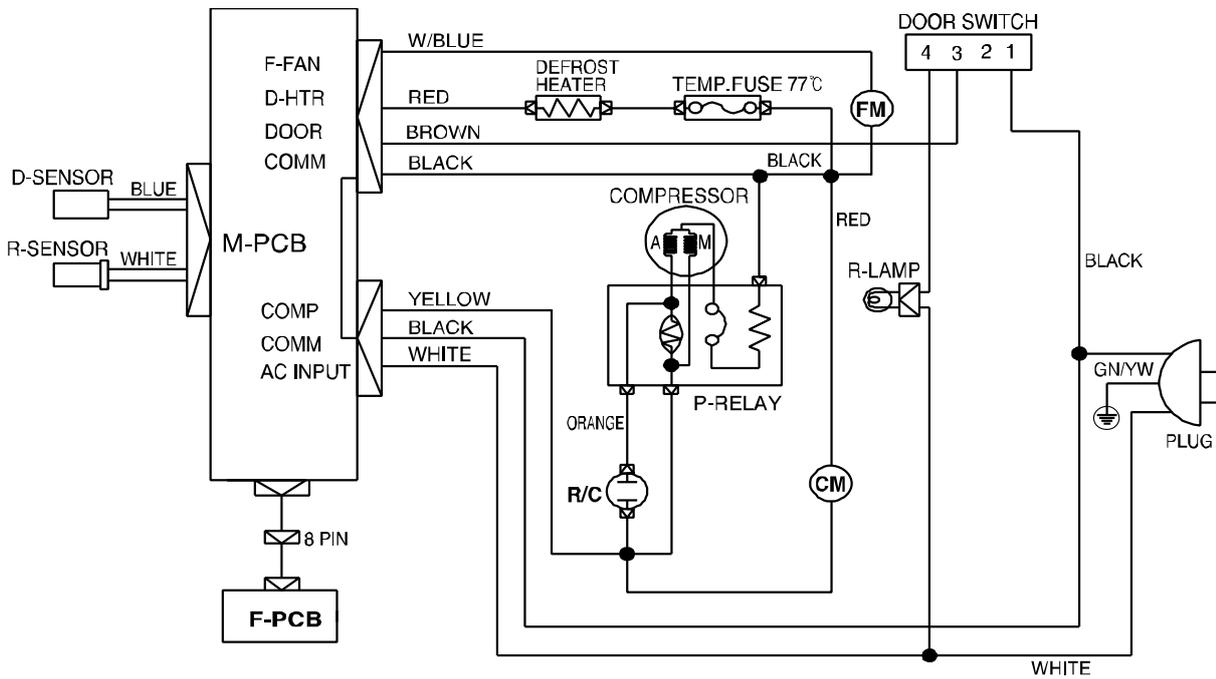
- 1) How to start : Push the TEMP button 30 times.
- 2) How to exit
 - Push the TEMP button 30 times again. or
 - After 21 hours automatically ends.
- 3) Display : All LED is on.
- 4) Compressor / freezer fan & compressor cooling fan are on for 21 hours.

9. A/s Defrosting (forced defrosting)

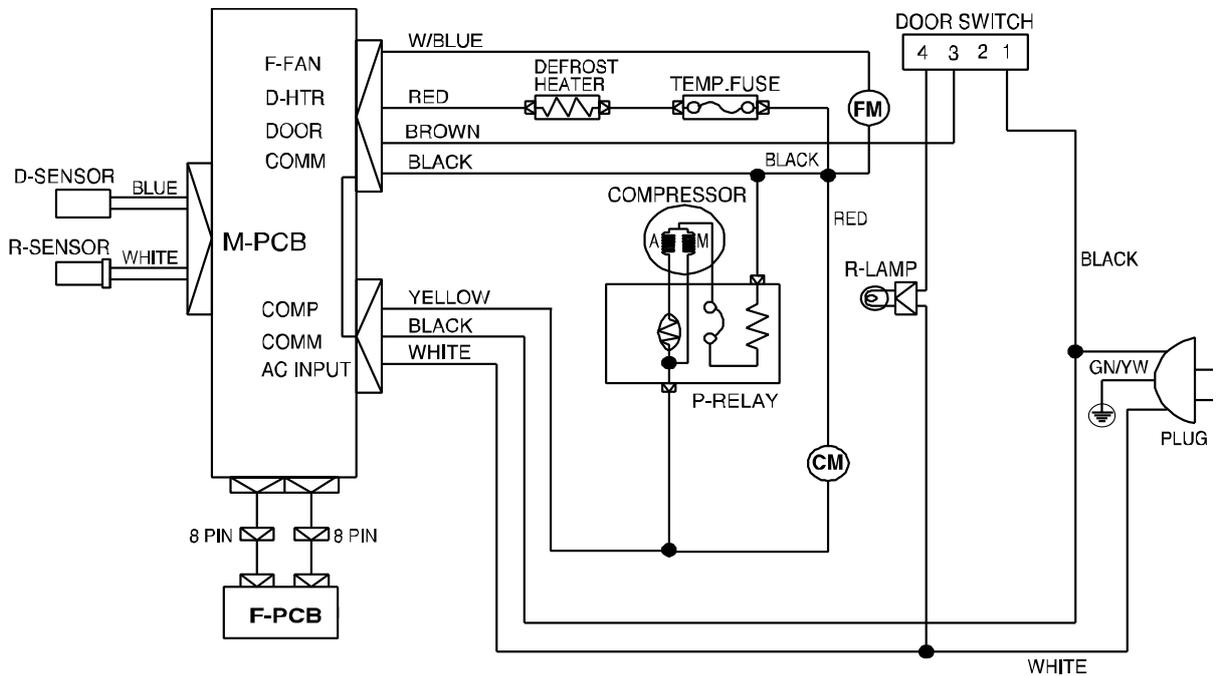
- 1) How to start : Push TEMP button 5 times while door is open.
- 2) How to exit
 - Push TEMP button 5 times while door is open again.
- 3) Display : No display.
- 4) The process is the same with the defrosting mode without pre-cool.

1. Wiring Diagram

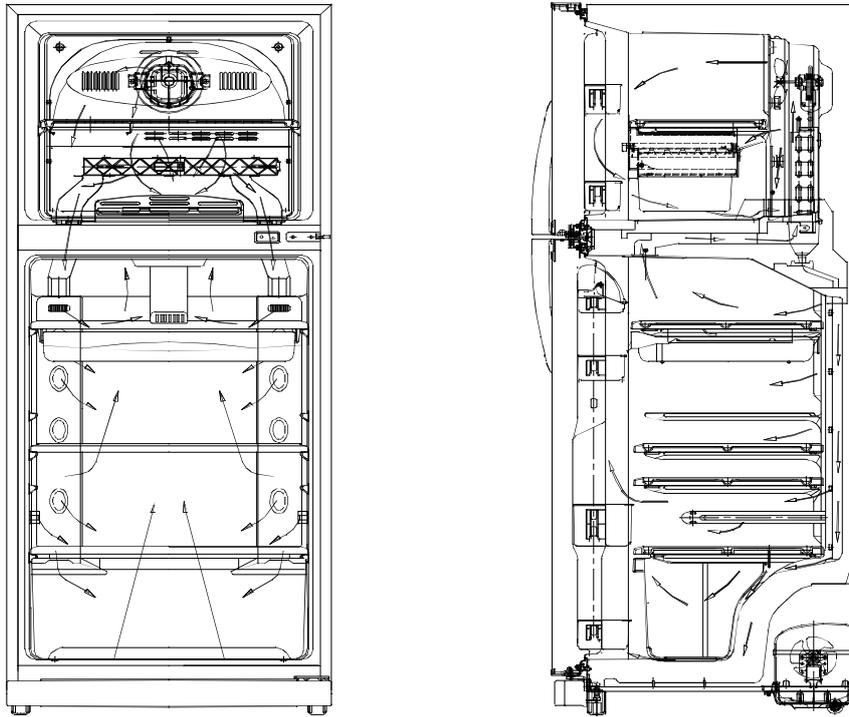
[RSCR]



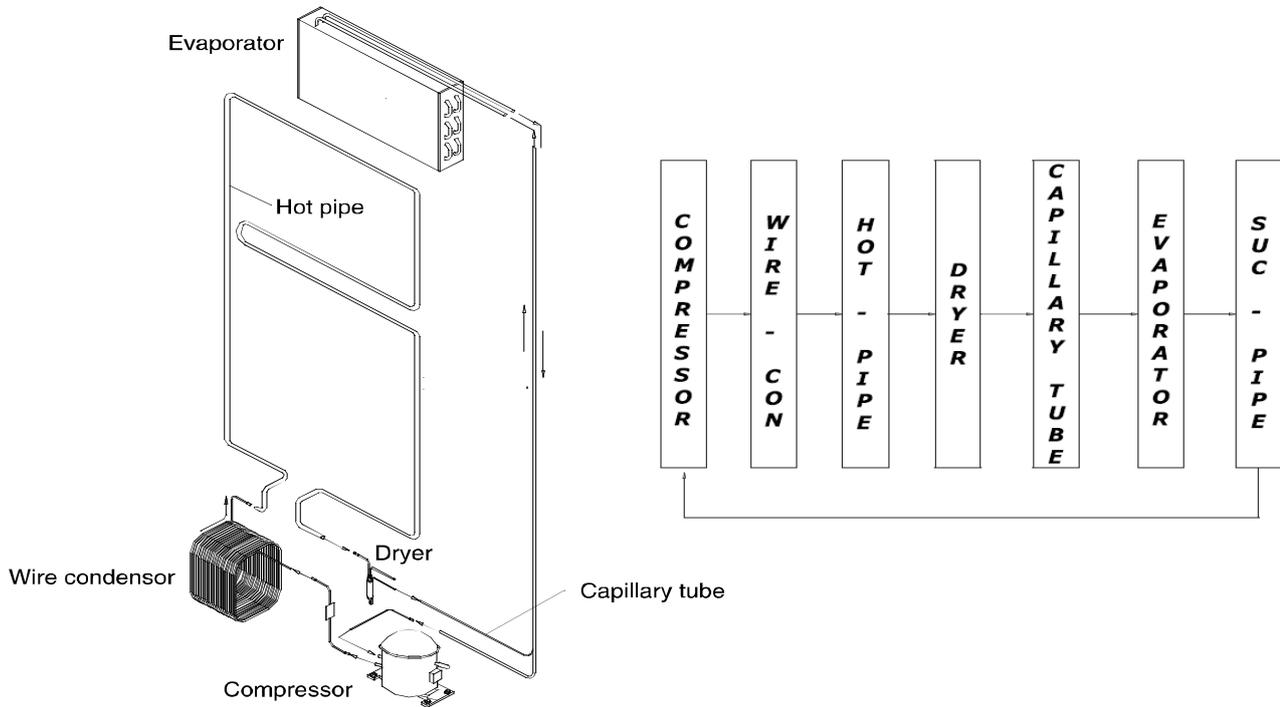
[RSIR]



2. Air Flow Diagram



3. Refrigerant Cycle Diagram



1. Freezer Louver



1) Remove screw cap on the Freezer Louver.



2) Remove 2 screws.



3) Take off the louver with driver as left figure shown.

2. Refrigerator) Control Box As.



1) Take off lamp window as left figure shown.



2) Disassemble refrigerator lamp.
(15Wx1ea)



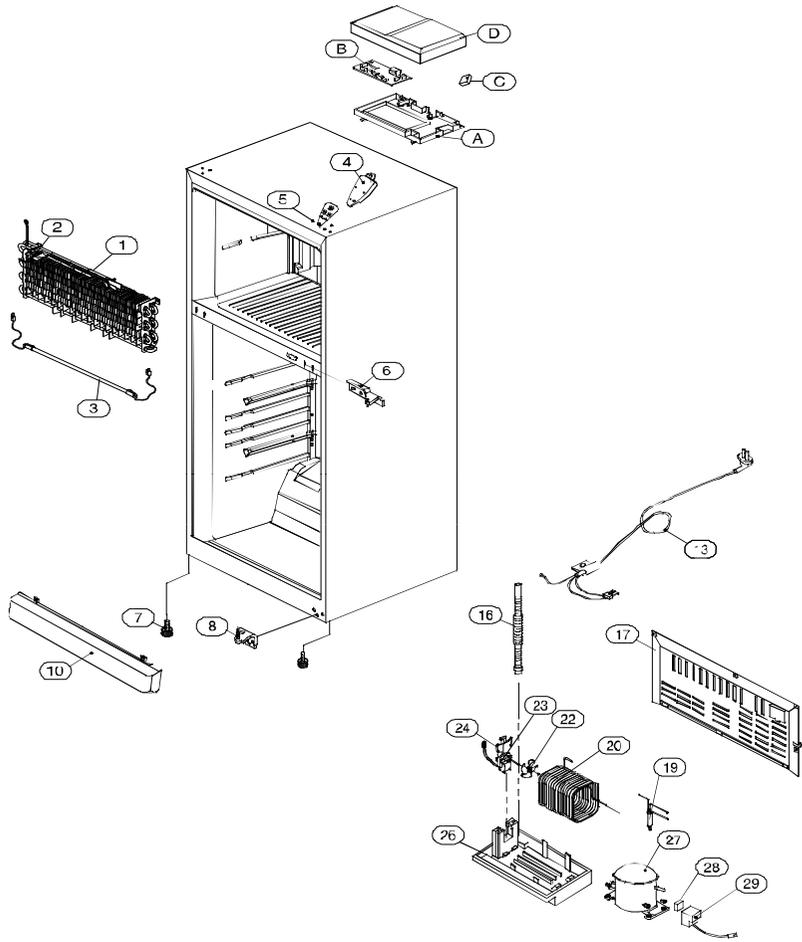
3) Unscrew which fixing the control box.



4) Unscrew which fixing the control box.

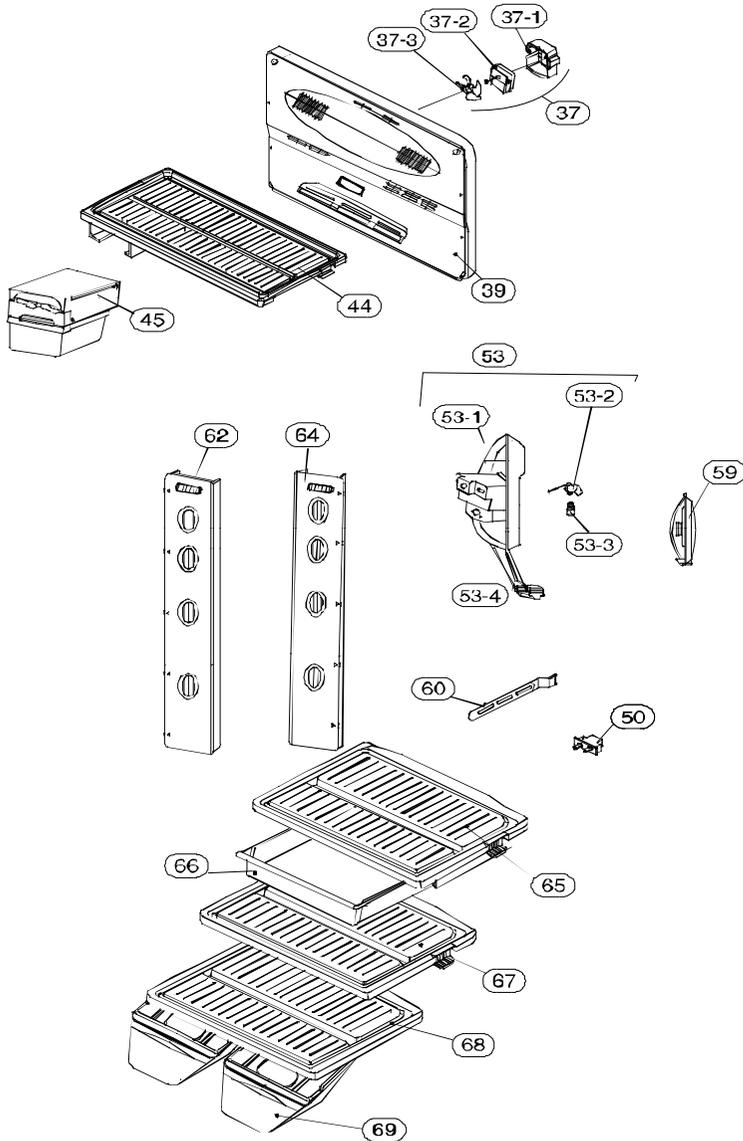


5) Take off the control box as.



No	Part Code	Part Name	Spec.	Q'ty	Remark
A	3010519210	BOX M/PCB	PP	1	
B	Last page	PCB MAIN AS		1	
C	Last page	CAPACITOR RUN		1	
D	3011444901	COVER M/PCB BOX	PP	1	
1	3017046401	EVA FIN SAS	FR-B372ET (R-134a)	1	
	3017046440		FRP-37..(R-600a)		
2	3017200410	FUSE TEMP AS	FRB-4870KT	1	
3	Last page	HEATER D AS		1	
4	3012911500	HINGE *T	SCP-1 T2.3	1	
5	3011449800	COVER *T HI	PP	1	
6	3012911420	HINGE *M AS	PO/T3.2	1	
7	3012101300	FOOT ADJ AS	PP	2	
8	3012911301	HINGE *U AS	PO/T4.0	1	
10	3011450200	COVER CAB BRKT	PP	1	
13	-	CORD POWER AS	COUNTRY DEPENDENT	1	
16	3013201700	HOSE DRN B	PE FRB-5350NT	1	
17	3012405820	GRILLE	PCM B GRADE T0.4	1	
19	3016805500	DRYER AS	FRM(P)-371	1	
20	3014434021	PIPE WICON AS	FRM-37	1	
22	3011801310	FAN C AS	110(FAN), 3.17(SHAFT)	1	
23	Last page	MOTOR C		1	
24	3012004400	FIXTURE C MOTR	SUS	1	
26	3011117511	CASE VAPORI	PP	1	
27	Last page	COMPRESSOR		1	
28	Last page	SWITCH P RELAY AS		1	
29	-	COVER RELAY	-	1	

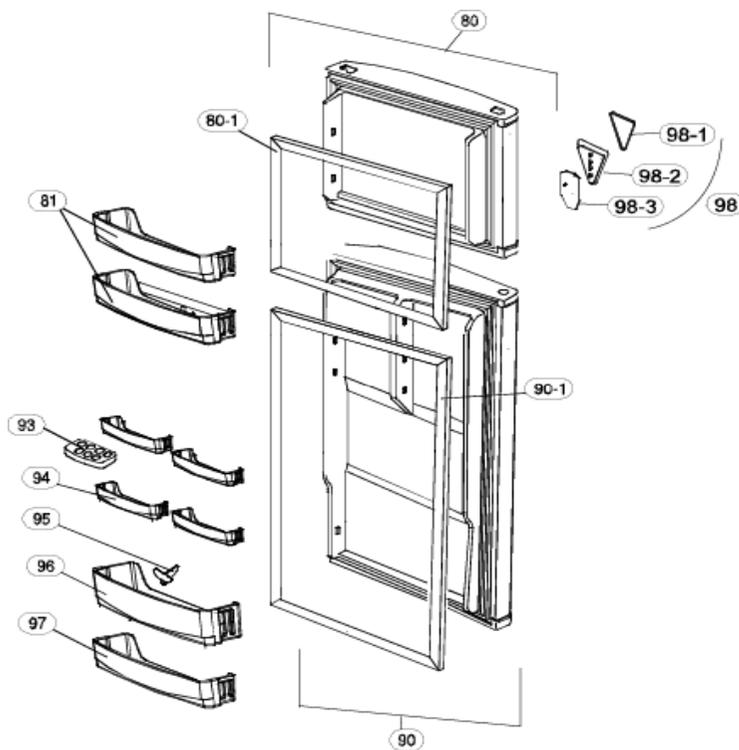
- Some parts can be changed for improving their performance without notice.



No	Part Code	Part Name	Spec.	Q'ty	Remark
37	Last page	MOTOR F AS		1	
37-1	3012007901	FIXTURE MOTR B	PP	1	
37-2	Last page	MOTOR F		1	
37-3	3011802200	FAN	ABS OD3.17XD110	1	
39	3018911500	LOUVER F AS	FRM(P)-371	1	
44	3017822500	SHELF F	WIRE+DECO	1	Option
	3017821600		HIPS		
45	3011163910	CASE TWIST ICE AS	FRM(P)-371G/H	1	
50	3018100010	SWITCH DR	2 BUTTON/4P,DSD-5	1	
53	3011452801	COVER R LAMP AS	FRP-371	1	
53-1	3011450100	COVER R LAMP	HIPS	1	
53-2	3017900842	SOCKET F/R LAMP AS	-	1	
53-3	3013600050	LAMP AS	110-127V/15W	1	
	3013600020		220-240V/15W		
53-4	3014800411	SENSOR R1 AS	ABS	1	
59	3015505200	WINDOW F LAMP	PP	1	
60	3011439500	COVER CUBIC DUCT	HIPS	2	
62	3018911600	LOUVER R *S *L AS	FRM(P)-371	1	
64	3018911700	LOUVER R *S *R AS	FRM(P)-371	1	
65	3017821800	SHELF CHILD (AS)	GPPS(MOLD)	1	Option
	3017823110		GLASS(NO PRINT)	1	
66	3011162300	CASE CHILD	GPPS(MOLD)	1	
67	3017822400	SHELF R (AS)	WIRE+DECO	1	Option
	3017822000		GPPS(MOLD)		
	3017823010		GLASS(NO PRINT)		
68	3011451400	COVER V/CASE	GPPS(MOLD)	1	
69	3011162400	CASE VEGETB	CRYSTAL, 4501..Series	1	Option
	3011162420		BLUE, 4501..Series		
	3011162500		CRYSTAL, HALF-WIDE	2	Option
	3011162520		BLUE, HALF-WIDE		

- Some parts can be changed for improving their performance without notice.

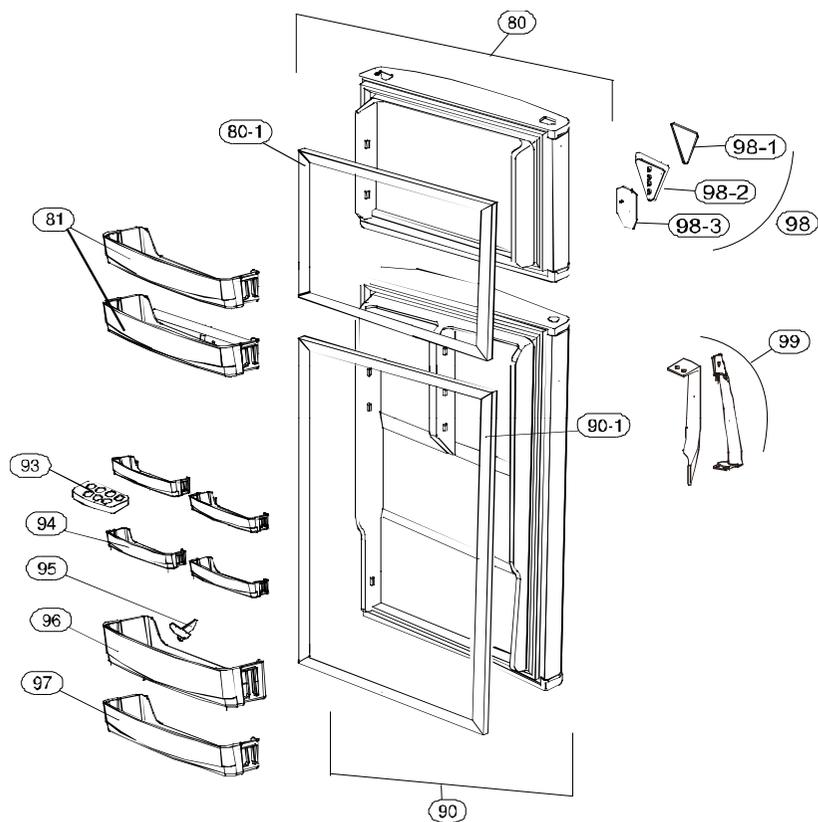
4501.. series (Hidden Handle)



No	Part Code	Part Name	Spec.	Q'ty	Remark
80	30100894L0	ASSY F DR TOTAL	-	1	
80-1	3012301420	GASKET F DR AS	PVC	1	
81	3019013500	POCKET F	HIPS	2	
90	30100334J0	ASSY R DR TOTAL	-	1	
90-1	3012301720	GASKET R DR AS	PVC	1	
93	3011162100	CASE EGG	GPPS FRM(P)-371	1	
94	3019013100	POCKET SM	HIPS(FRP-371H)	4	
95	3012509600	GUIDE POKT	ABS	1	
96	3019013300	POCKET JUMBO	HIPS (SILK)	1	
97	3019013400	POCKET BOTL	HIPS	1	
98	3014229020	PANEL F CONTL AS	FRP-371	1	
98-1	3015505300	WINDOW FCP	GPPS	1	
98-2	3014228600	PANEL CONTL F	ABS	1	
98-3	3014301170	PCB *F AS	FRP-371	1	

- Some parts can be chaged for improving their performance without notice.

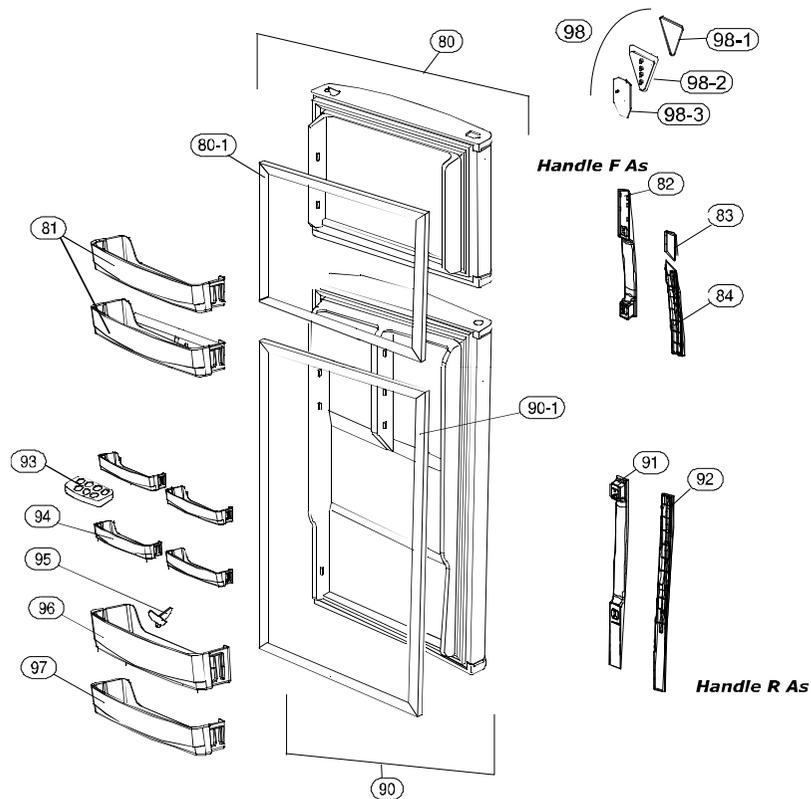
4502.. series (Handle Packing)



No	Part Code	Part Name	Spec.	Q'ty	Remark
80	3010089460	ASSY F DR TOTAL	-	1	
80-1	3012301420	GASKET F DR AS	PVC	1	
81	3019013500	POCKET F	HIPS	2	
90	3010033440	ASSY R DR TOTAL	-	1	
90-1	3012301720	GASKET R DR AS	PVC	1	
93	3011162100	CASE EGG	GPPS FRM(P)-371	1	
94	3019013100	POCKET SM	HIPS(FRP-371H)	4	
95	3012509600	GUIDE POKT	ABS	1	
96	3019013300	POCKET JUMBO	HIPS (SILK)	1	
97	3019013400	POCKET BOTL	HIPS	1	
98	3014229020	PANEL F CONTL AS	FRP-371	1	
98-1	3015505300	WINDOW FCP	GPPS	1	
98-2	3014228600	PANEL CONTL F	ABS	1	
98-3	3014301170	PCB *F AS	FRP-371	1	
99	3014001801	PACKING HNDL AS	FRP-372/3	1	

- Some parts can be changed for improving their performance without notice.

4506.. series (Grip Handle)



No	Part Code	Part Name	Spec.	Q'ty	Remark
80	3010084700	ASSY F DR	-	1	
80-1	3012301420	GASKET F DR AS	PVC	1	
81	3019013500	POCKET F	HIPS	2	
82	3012624300	HANDLE F	ABS	1	
83	3011611300	DECO F HNDL A	ABS	1	
84	3011611410	DECO F HNDL B	ABS+SPRAY	1	
90	3010084800	ASSY R DR	-	1	
90-1	3012301720	GASKET R DR AS	PVC	1	
91	3012624400	HANDLE R	ABS	1	
92	3011611500	DECO R HNDL	ABS	1	
93	3011162100	CASE EGG	GPPS FRM(P)-371	1	
94	3019013100	POCKET SM	HIPS(FRP-371H)	4	
95	3012509600	GUIDE POKT	ABS	1	
96	3019013300	POCKET JUMBO	HIPS (SILK)	1	
97	3019013400	POCKET BOTL	HIPS	1	
98	3014229020	PANEL F CONTL AS	FRP-371	1	
98-1	3015505300	WINDOW FCP	GPPS	1	
98-2	3014228600	PANEL CONTL F	ABS	1	
98-3	3014301170	PCB *F AS	FRP-371	1	

- Some parts can be chaged for improving their performance without notice.

No	Part Name	Part Code	Spec.	Q'ty	Remark
B	PCB MAIN AS	3014301070 3014301080 3014302070 30143H9060	AC 220-240V, BASIC AC 220-240V, WIRE SHELF AC 110V, BASIC EUROPE, TAIWAN, CUBA	1	*Refrigerator compartment shlf is wire. Europe, Taiwan, Cuba (R600a or unique country)
C	CAPACITOR RUN	3016406300 3016405900 3016406100 3016405020 3016405800 3016406000	230VAC/10 μ F (WIRE,P2) 350VAC/5 μ F (WIRE, P2) 400VAC/5 μ F (WIRE, P2) 250VAC/12 μ F (WIRE,P2) 350VAC/4 μ F (WIRE, P2) 400VAC/4 μ F (WIRE, P2)	1	HEL23YG-9 HPL23YH-5 HPL25YH-5-K JX58LHE3, MSA151-L1B JX58LHP4 MQ98NAEM
3	HEATER D AS HEATER SHEATH AS	3012807802 3012807702 3012823110	FRM(P)-372, 110V/148W FRM(P)-372,220-240V/148W FRM(P)-372,220-240V/180W	1	110-127V 220-240V R600a, 220-240V
23	MOTOR C	3015909900 3015910000 3015909800 3015906850	AC 110V AC 220V/60Hz AC 220-240V DC 10V	1	 Europe, Taiwan, Cuba (R600a or unique country)
27	COMPRESSOR	3953123R90 3956123S50 3956125S51 3954125G50 3953158J30 3956158J40 3956198M50 3956151D20	HEL23YG-9 HPL23YH-5 HPL25YH-5-K HSL25YE-5 JX58LHE3 JX58LHP4 MQ98NAEM MSA151-L1B	1	110V/50Hz, Jamaica Country dependent 110V/60Hz 220V/60Hz Europe (R600a, 220-240V/50Hz) Taiwan
28	SWITCH P RELAY AS	3018118150 3018116610 3018118250 3018119940 3018118220 3018118230 3018133710 3018118270	783NHB, S068 181SHB, S330 265NHB, S220 276THB, S220 317NHB, S068 213THB, S220 4TM174TFB, P330MD2 4TM308RHB, 100MD2	1	HEL23YG-9 HPL23YH-5 HPL25YH-5-K HSL25YE-5 JX58LHE3 JX58LHP4 MQ98NAEM MSA151-L1B
37	MOTOR F AS	3015900931 3015900951 3015900941 3015900952	110V/50, 60HZ 220V/60HZ 220-240V/50HZ DC 12V	1	 Europe, Taiwan, Cuba (Unique country)
37-2	MOTOR F	3015900741 3015900701 3015900731 3015905330	110V/50, 60HZ 220V/60HZ 220-240V/50HZ DC 12V	1	 Europe, Taiwan, Cuba (Unique country)