

# CONTENTS

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1. Specifications .....	3
1.2 Types of the approved safety standards .....	3
2. External drawings .....	4
3. Wiring diagrams .....	5
4. Name of parts .....	6
5. Air flow diagram .....	7
6. Refrigerant cycle diagram .....	8
7. Machine room view and part list .....	9
8. Components disassembly pictures .....	10
9. Components specifications .....	19
10. Explode drawings .....	22
11. Part lists .....	24
12. PCB control functions .....	35
13. Main PCB diagram .....	42
14. Trouble Shooting .....	43



# 1. SPECIFICATIONS

## 1. Specifications

Model name		ERF-331	ERF-361		ERF-391		ERF-411	
Division		M	A	M	A	M	A	M
Refrigerant	R-134a	80gr	90gr	90gr	90gr	90gr	90gr	90gr
Blowing agent		C-PENTANE						
Cooling system		Fan cool system						
Defrost system		Automatic start & Automatic stop system						
Compressor		HPL25YG1-5						
Rated voltage (w)		AC220~240V / 50Hz						
Rated input (W)		135	135	135	135	135	135	135
Lamp rated input (W)		15	15	15	15	15	15	15
Gross capacity (liter)	Freezer	99	93	93	93	93	114	114
	Refrigerator	201	223	223	253	253	254	254
	Total	300	316	316	346	346	368	368
External dimension (mm)	Height	1706	1780	1780	1911	1911	2000	2000
	Width	596	600	600	600	600	600	600
	Depth	624	618	618	618	618	618	618
Energy consumption	kwh/24h class	1,26 B	1,29 B	1,28 B	1,30 B	1,29 B	1,33 B	1,32 B
Freezing capacity(kg/24h)		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Star rating		* **	* **	* **	* **	* **	* **	* **
Climate class		N	N	N	N	N	N	N
Net weight (kg)		61	69	69	75	75	79	79

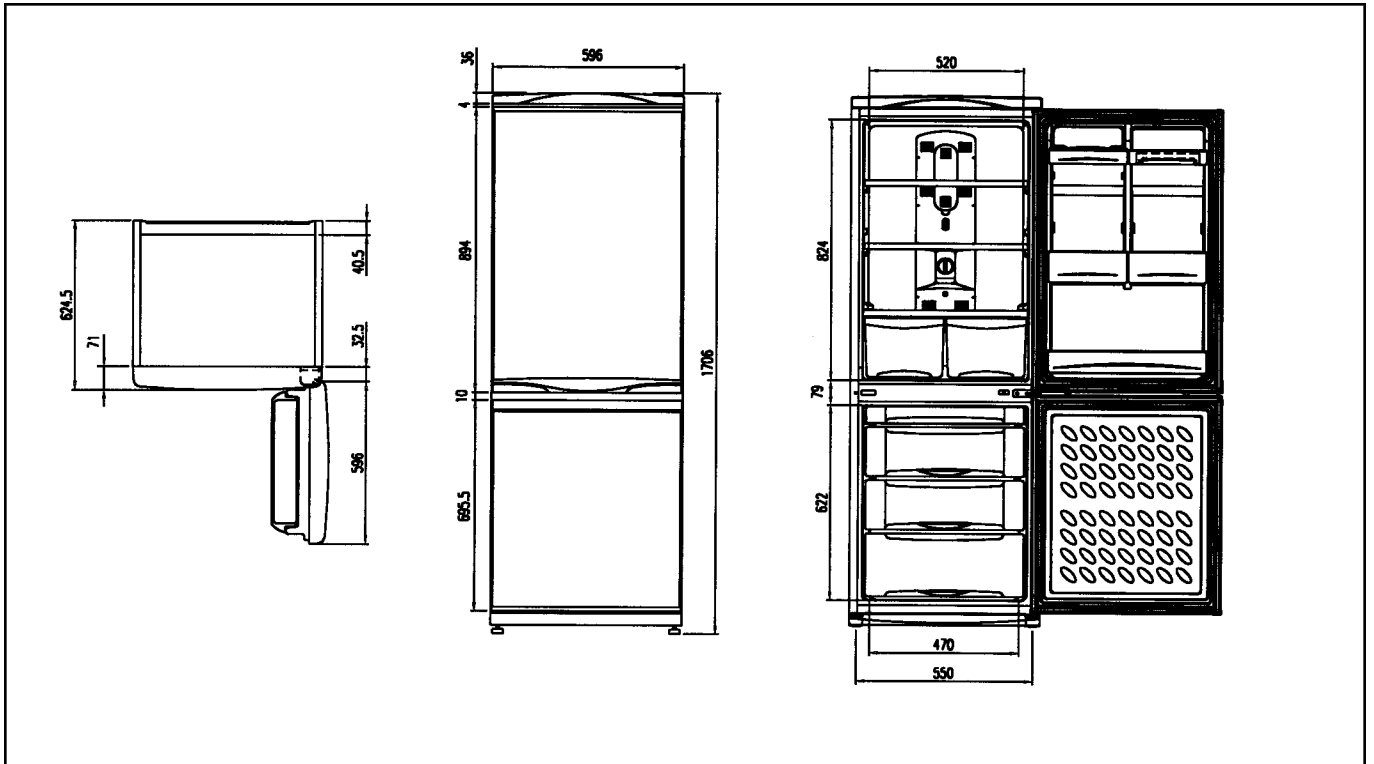
Note) A : Electronic control type  
M: Manual control type

## 1.2. Types of the approved safety standards

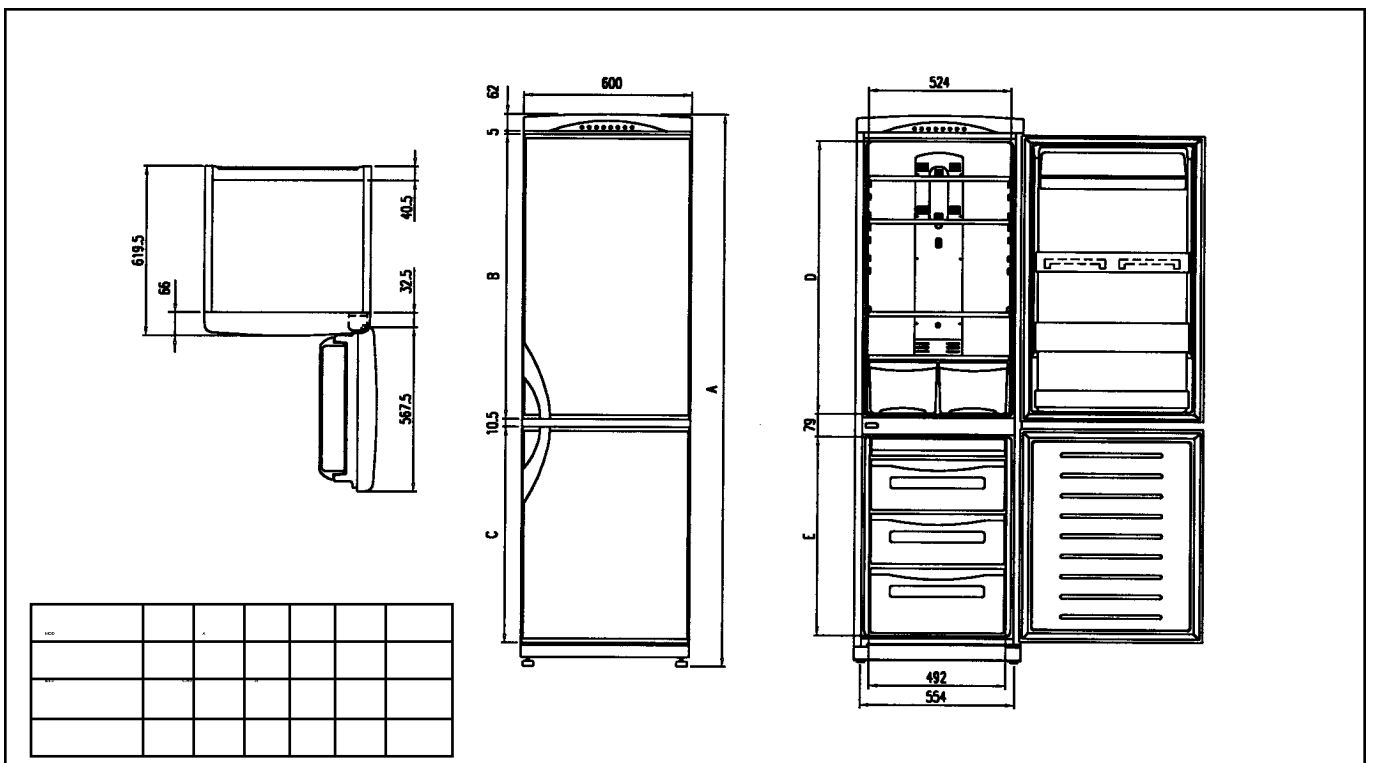


## 2. EXTERNAL DRAWINGS

### 1. ERF-331M

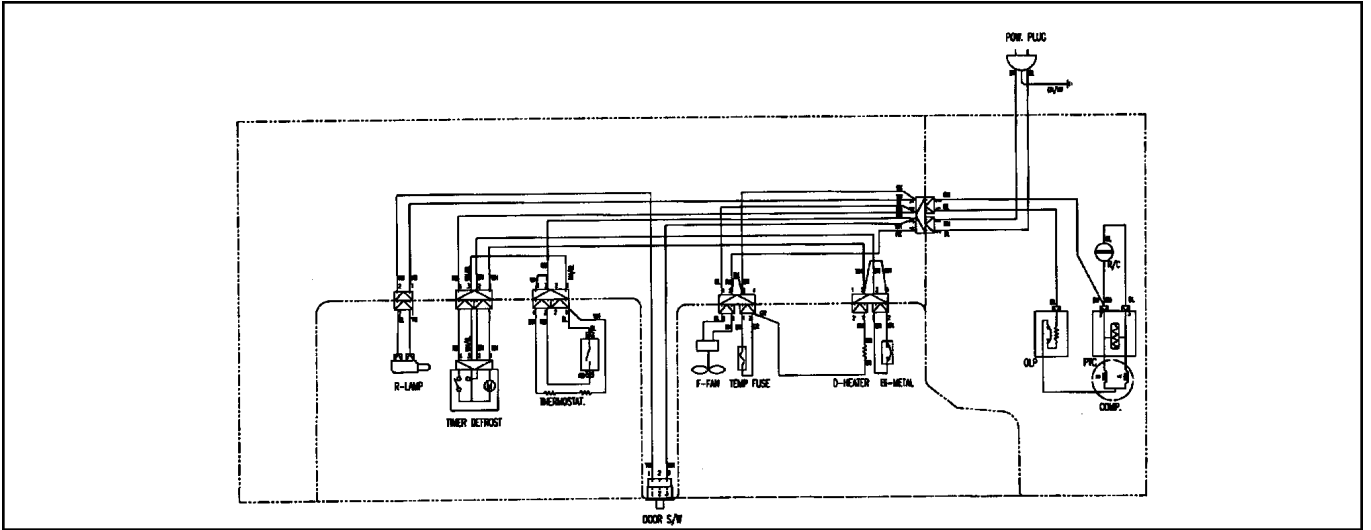


### 2. ERF-361A(M), 391A(M), 411A(M)

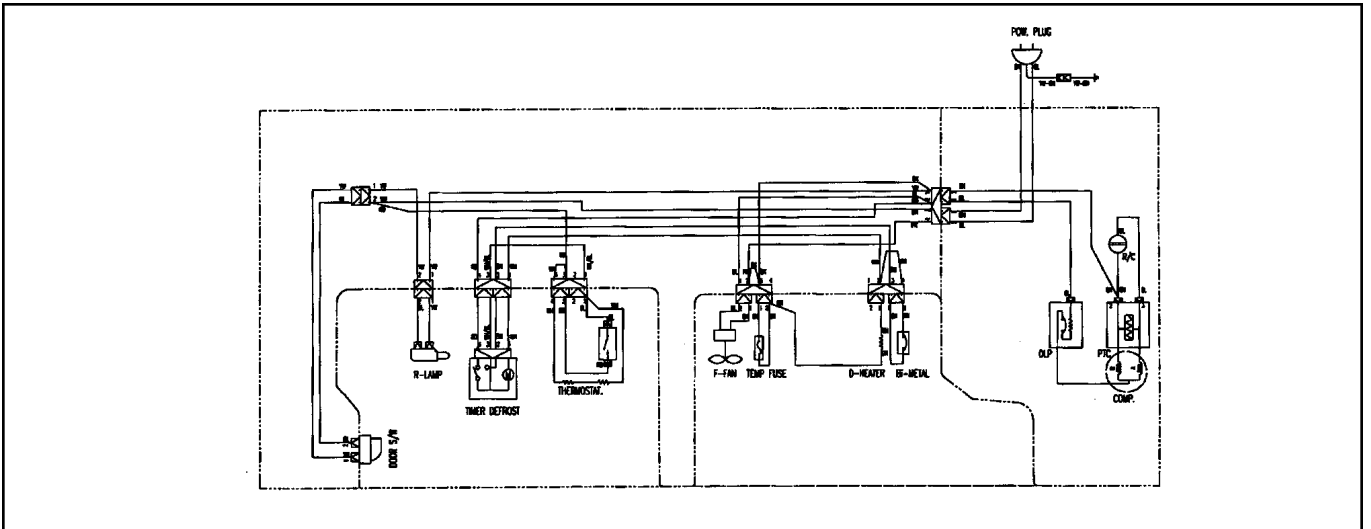


# 3. WIRING DIAGRAMS

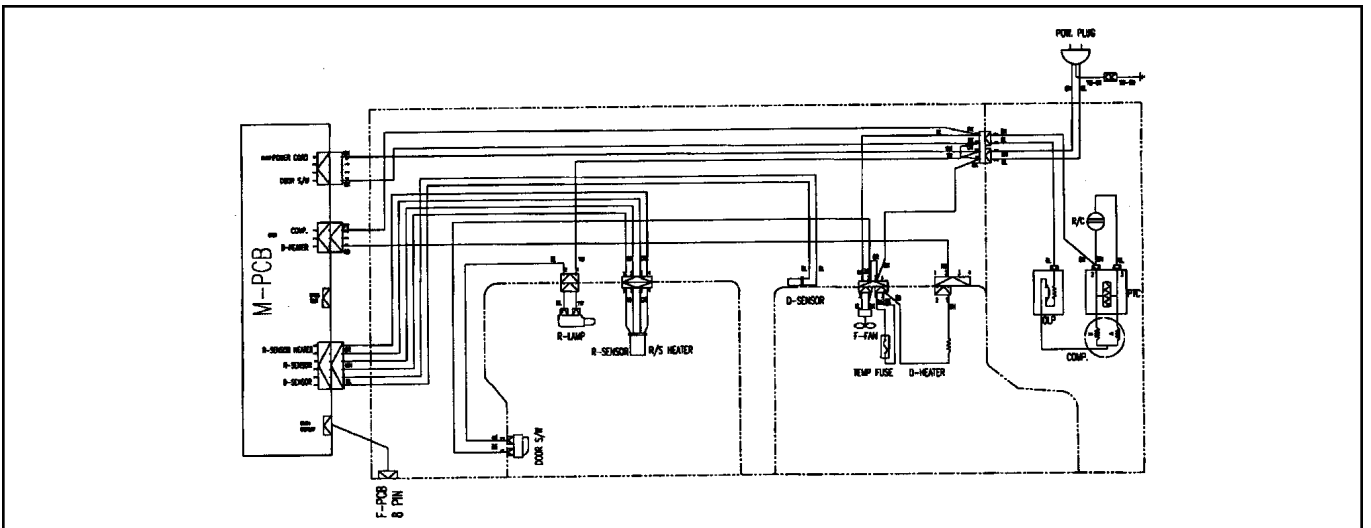
## 1. ERF-331M



## 2. ERF-361M, 391M, 411M

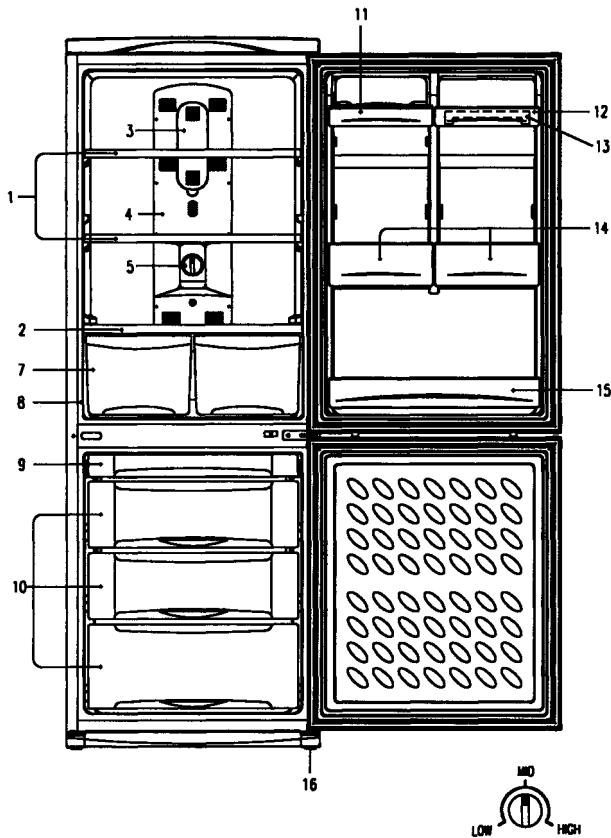


## 3. ERF-361A, 391A, 411A



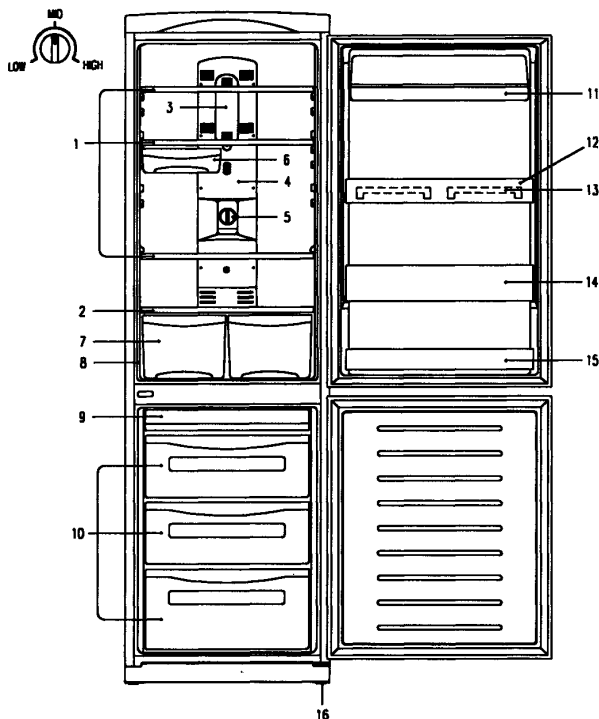
# 4. NAME OF PARTS

## 1. ERF-331M

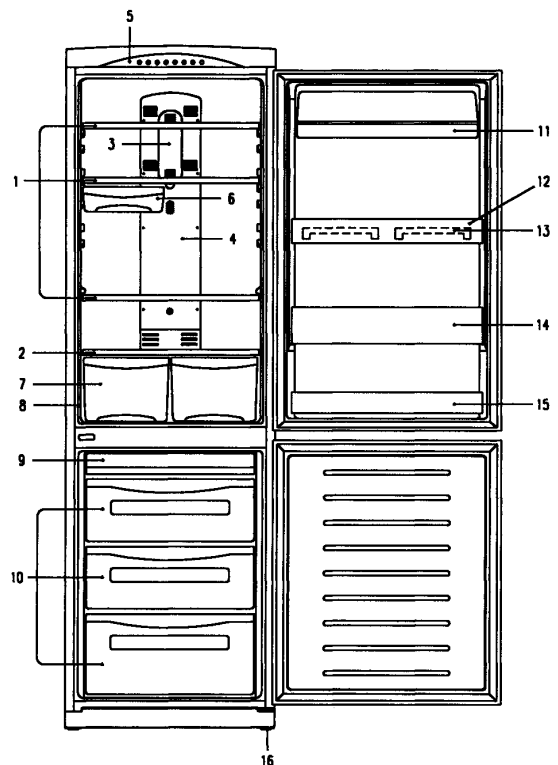


1. Shelves (The material of shelf can be changed by model).  
ERF-331, 361 series: 2 shelves.  
ERF-391, 411 series: 3 shelves
2. Cover vegetable case (The material of shelf can be changed by model).
3. Interior light for refrigerator compartment.
4. Multi air flow duct.
5. Refrigerator & freezer temperature control knob.
6. Low temperature compartments (only ERF-411A series).
7. Vegetable case. 1 box type or 2 boxes type (For the case of 1 box type, the Part (15) must be deleted).
8. Rating plate. It's attached in the refrigerator compartment on the left-hand side next to the vegetable case.
9. Ice cube tray.
10. Case for storing & freezing.
11. Butter pocket.
12. Egg pocket.
13. Egg tray.
14. Bottle pocket.
15. R door pocket.
16. Adjustable feet.

## 2. ERF-361M, 391M, 411M



## 3. ERF-361A, 391A, 411A

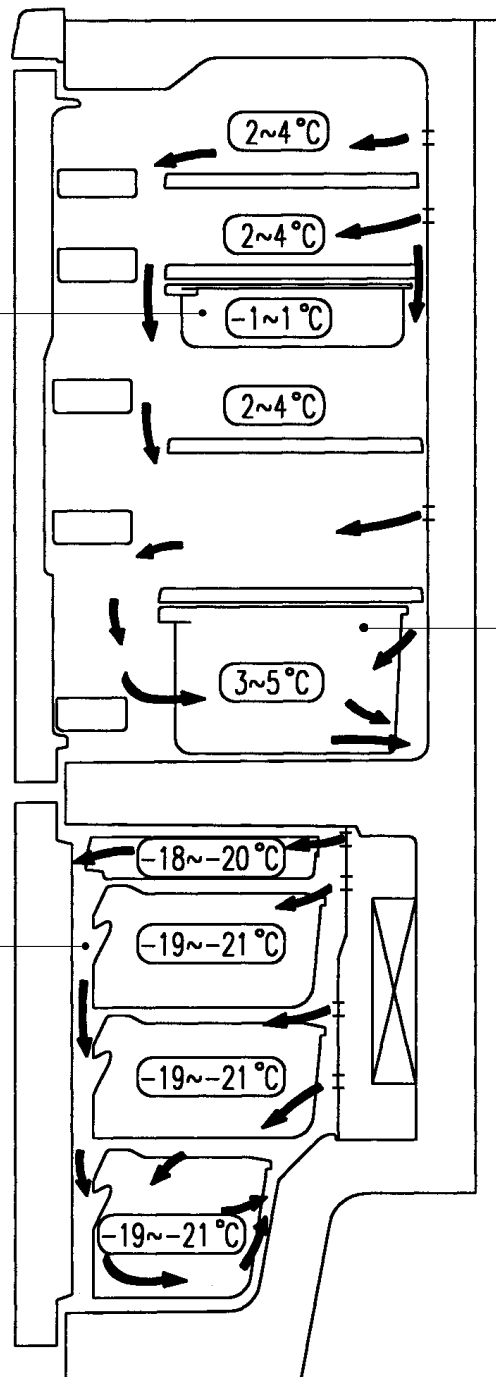


## 5. AIR FLOW DIAGRAM

Fresh food preserving case  
(Chilled case)  
Used for storing fish or meat

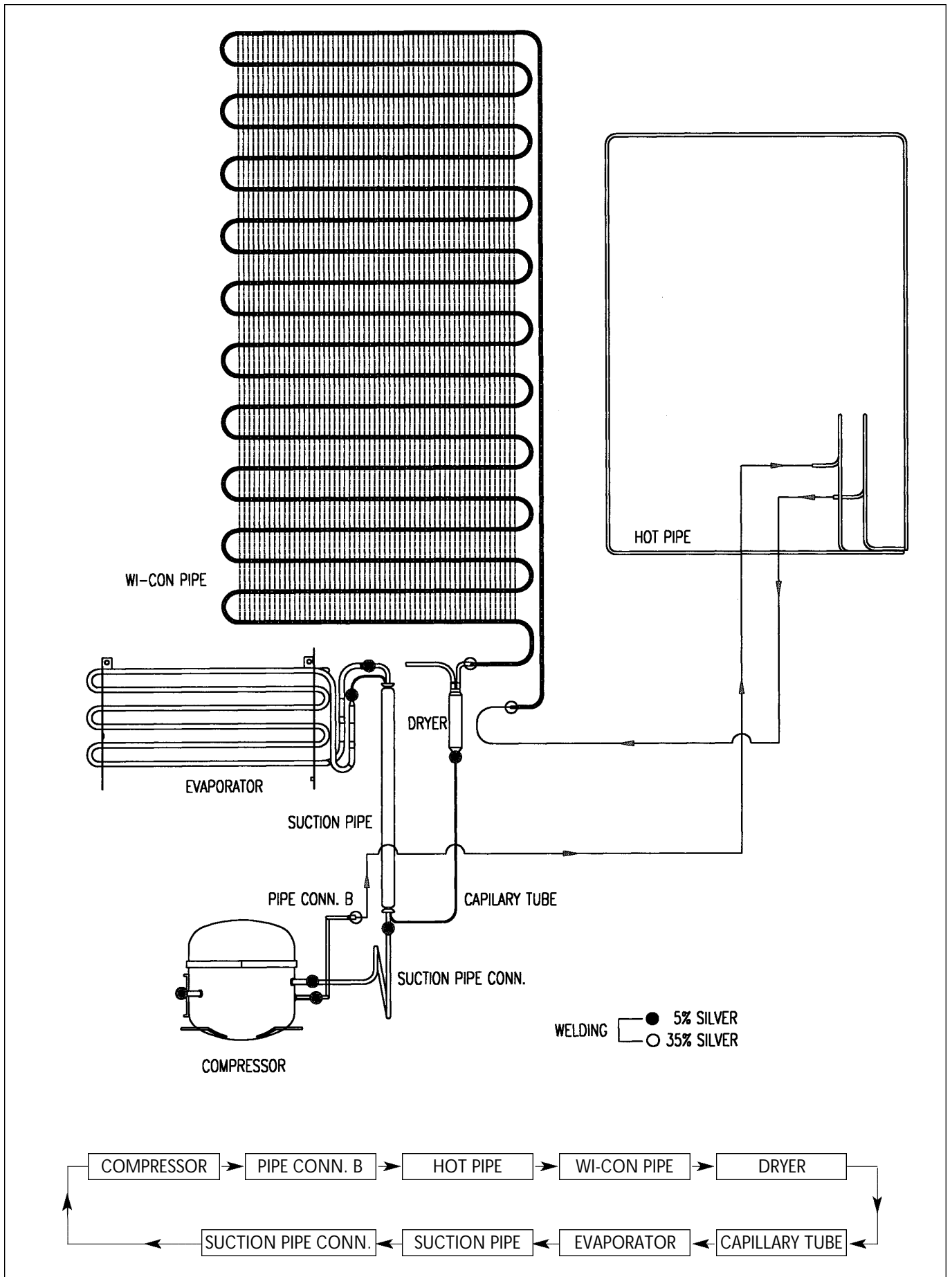
Case vegetable  
For storing fruits or vegetables

Air circulation in the  
freezer compartment  
Cold air flow comes  
out from the front  
hole and comes into  
the lower hole in  
louver



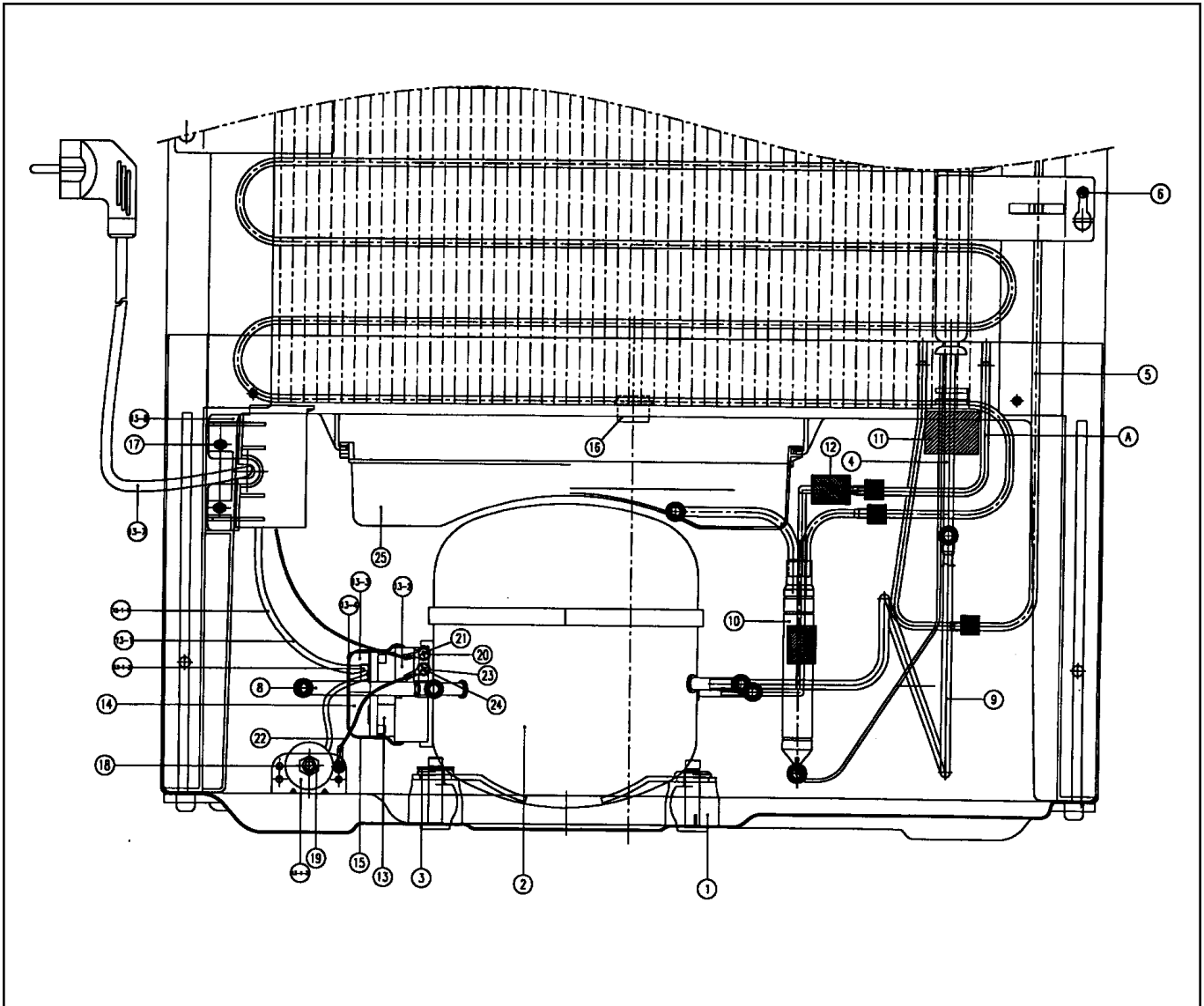
\* Standard Model

# 6. REFRIGERANT CYCLE DIAGRAM





## 7. MACHINE ROOM VIEW AND PART LIST



N°	PART NAME	N°	PART NAME	N°	PART NAME
A	PIPE HOT	13-1	HARNESS RELAY AS	17	SCREW TRS 4X14
1	ABSORBER COMP.	13-1-1	HARNESS RELAY	18	SPECIAL WASHER R/C
2	COMPRESSOR	13-1-2	CAPACITOR RUN AS	19	SPECIAL NUT R/C
3	FIXTURE COMP.	13-1-3	CABLE TIE	20	SPECIAL WASHER
4	EVAPORATOR AS	13-2	BOX RELAY	21	SPECIAL MASHINE
5	PIPE Wi-CON AS	13-3	CABLE CLAMP	22	HARNESS EARTH
6	SPECIAL SCREW E	13-4	SCREW TAPPING	23	SPECIAL WASHER
7	PIPE CONN B	13-5	SWITCH P RELAY PTC	24	SCREW MASHINE
8	PIPE CHARGE	13-6	SWITCH P RELAY OL	25	CASE VAPORI
9	PIPE SUC. CONN	13-7	CODE POWER AS		
10	DRYER AS	13-8	COVER ME HOUSING		
11	ABSORBER PIPE B	14	REALY COVER		
12	ABSORBER PIPE C	15	BAND REALY		
13	BOX RELAY AS	16	CAP DRAINER		

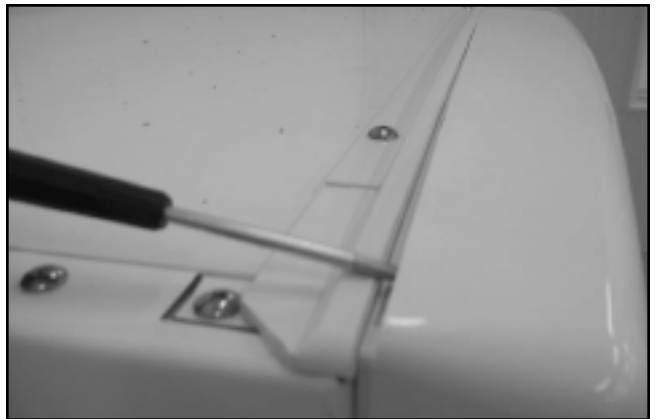
## 8. COMPONENTS DISASSEMBLY PICTURES

### 1- CONTROL PANEL

1) Remove two fixing screws.



2) Take out control panel by pulling it Up and inserting a minus driver like Picture shows, and move it left-right.



3) Detach F-Pcb harness, cable tie and Switch lamp.



- 4) Remove 3 front and 2 upper screws to take out base control panel.



- 5) Detach all connectors of M-Pcb and take out it.



- 6) Remove 3 fixing screws to take out F-Pcb.



- 7) Remove the door switch sliding by its guide.

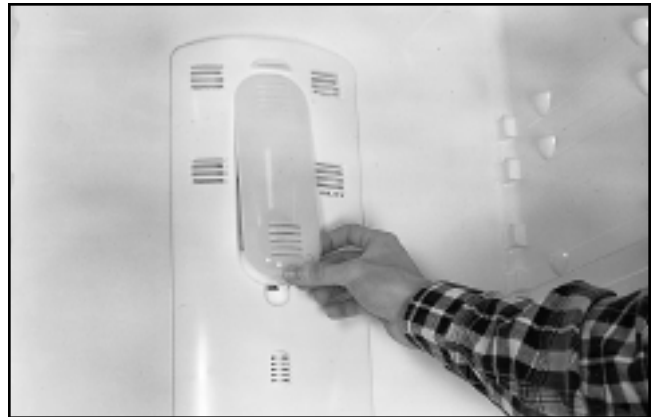


\* REMARK: Disassembly system for M type models is similar but with less components.

## Components disassembly pictures

### 2- COVER MULTI-DUCT (FOR M TYPE MODELS)

1) Remove the window by pushing lower part upward and pulling forward.



2) Remove 3 fixing screws.



3) Pull forward with instant force.



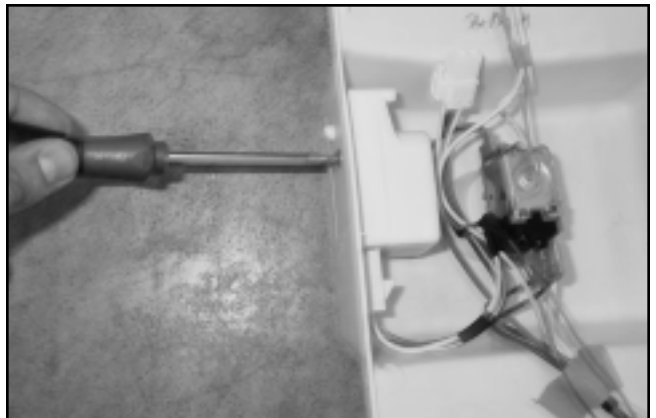
4) Remove socket lamp harness and timer/thermostat harness by pressing the housing with the fingers.



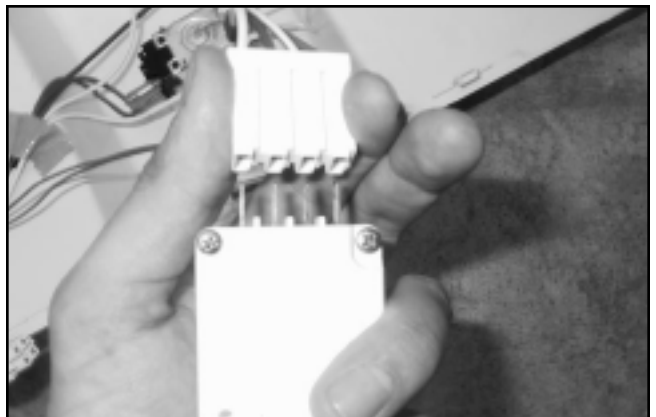
5) Remove insulator multi-duct.



6) Unscrew defrost timer.



7) Disconnect defrost timer housing.



8) Take out temperature control switch by a minus driver carefully.



## Components disassembly pictures

9) Take out thermostat by unscrewing it.



\* REMARK: Disassembly system for A type models is similar but with less components.

### 3 GASKET

- 1) Take out the gasket as shown.
- 2) Fix the new one.

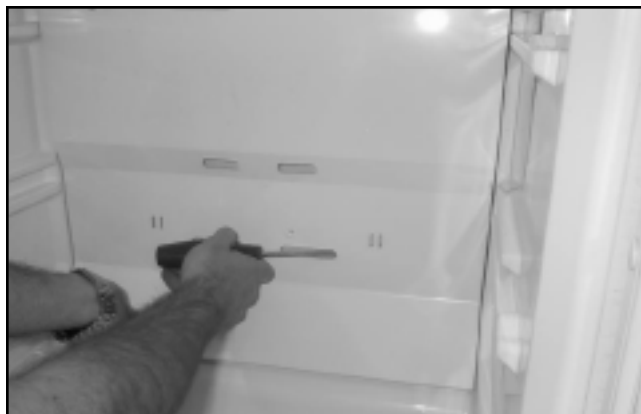


### 4- FREEZER COMPARTMENT

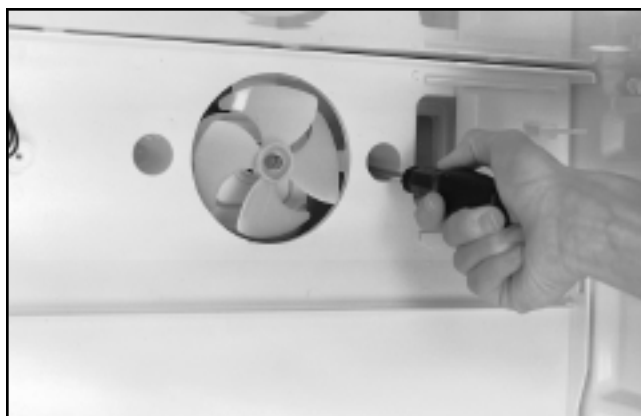
- 1) Remove 2 fixing screws.



- 2) Remove louver FA (to prevent damages  
Is better disassembly it like pictures show).



- 3) Remove 2 fixing screws of louver B.



- 4) Take out louver FB by hand.



## Components disassembly pictures

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5) Disconnect fan motor housing.



6) Take out defrost heater.



7) Disconnect housings of d-heater.

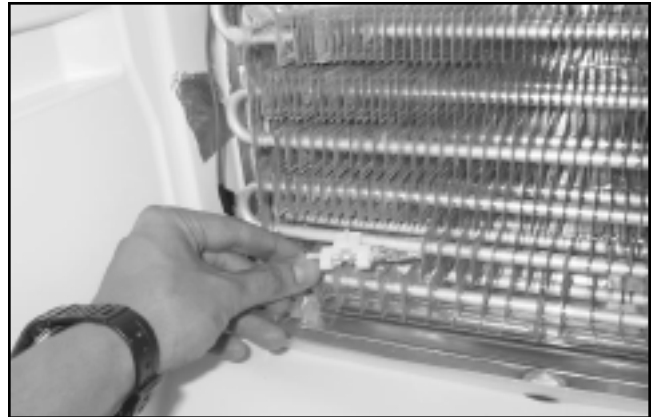
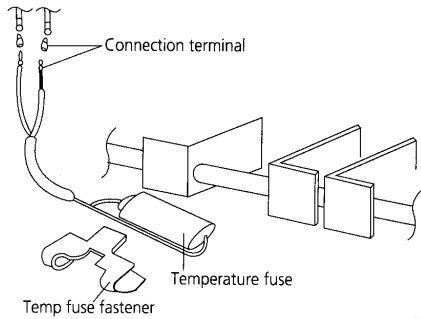


8) Disconnect Bi-metal housing and  
Cut cable tie  
(FOR M TYPE ONLY)



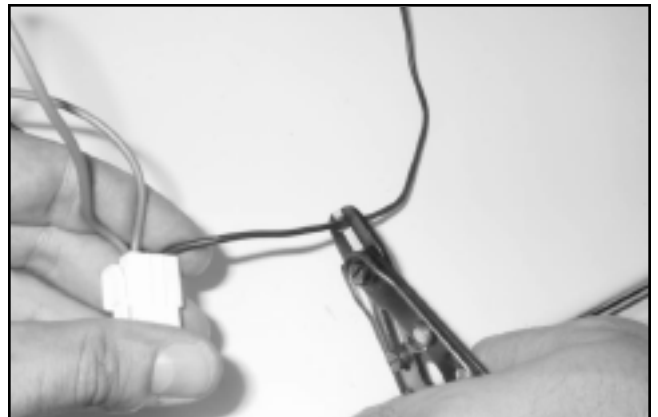
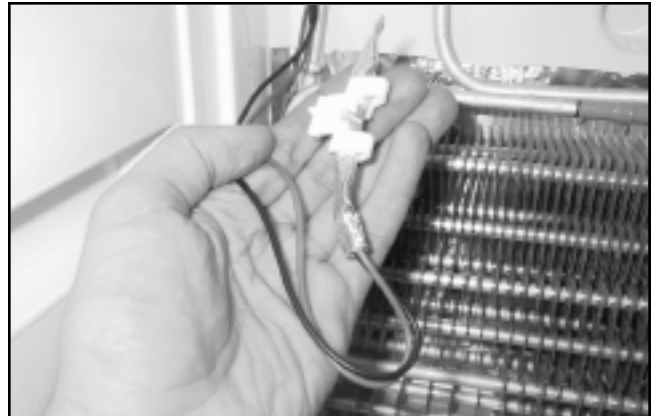


- 9) Take out fuse pulling out the fuse temp fixture.

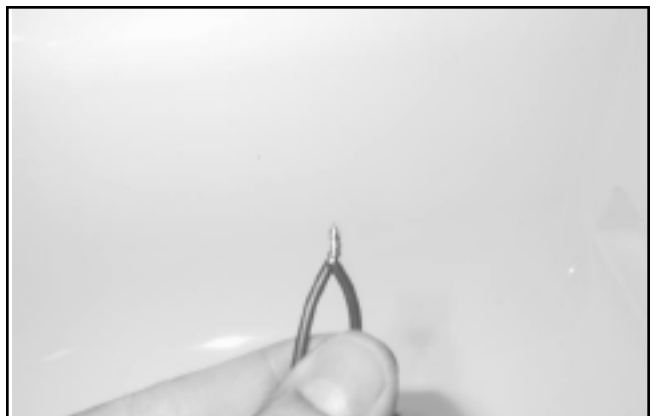


### **3.1 FOR REPLACE FUSE TEMP AND D-SENSOR**

- 1) Cut black and grey wires and take out the fuse.



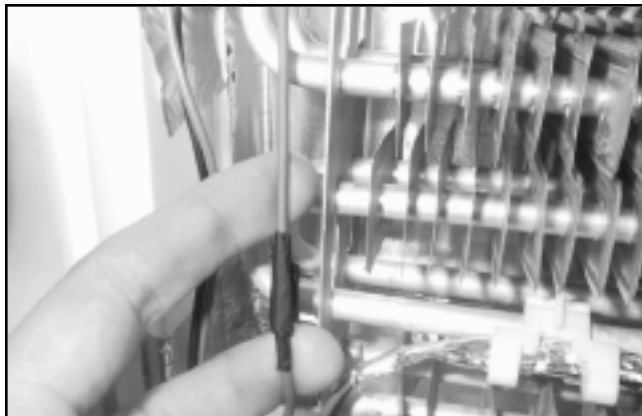
- 2) Join cut wires with the new fuse wires.



## Components disassembly pictures

- 3) Cover joint point with insulated tape  
(The best way is retractil tube).

\* REMARK: For replace D-sensor in A type models, is used the same system.



### 5- DOOR SWITCH ERF-331M

- 1) Remove the door switch out of cabinet  
by inserting "-" screw driver to the  
inside of rubber packing.

\*Take care not to damage the rubber  
packing and divisor plate paint.



- 2) Remove the terminals.



## 9. COMPONENTS SPECIFICATIONS

Specification

### 1. COMPRESSOR

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Part name	HPL25YG1-5						
Part code	3956420481						
Rated voltage	220/240V 50Hz						
Starting type	RSCR						
Refrigerant	R-134a						

### 2. PTC

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Part name	PTH490D-AS330						
Part code	3817907000						

### 3. OLP

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Part name	4TM213NHBY						
Part code	3817911200						

### 4. RUNNING CAPACITOR

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Part name	MP80040061						
Specification	4 $\mu$ F, 400VAC						
Part code	3010938000						

### 5. FAN MOTOR AS

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Part name	IS-2321 1DWBFO						
Specification	220-240V, 50HZ, 2400RPM						
Part code	3011604700						

### 6. HEATER A AS

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Type	Glass tube heater						
Specification	AC230V, 148W						
Part code	3012807600						

## Component specifications

### 7. LAMP

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Type	Pygmy						
Specification	AC230V, 15W (E14)						
Part code	3013600700						

### 8. SWITCHLAMP

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Type	DSSD-6	1051					
Specification	250V, 0,5A	250V, 0,25A					
Part code	3011721300	3018111500					

### 9. SOCKET LAMP

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Type	AIC-800						
Specification	AC250V, E14						
Part code	3017903900						

### 10. FUSE TEMPERATURE

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Type	DF77S						
Specification	AC250V, 77 °C						
Part code	3017200420						

### 11. SWITCH BI-METAL

	ERF-331M	ERF-361A	ERF-361M	ERF-391A	ERF-391M	ERF-411A	ERF-411M
Type	PST-3						
Specification	250V, 50-60Hz						
Part code	3018120600						

**12. SWITCH D TIMER**

	ERF-331M	ERF-361M	ERF-391M	ERF-411M
Type	JDT-MN7109D			
Specification	AC250V, 50/60Hz			
Part code	3018117500			

**13. THERMOSTAT**

	ERF-331M	ERF-361M	ERF-391M	ERF-411M
Type	BU-260			
Specification	250V, SA			
Part code	3018302200			

**14. SENSOR R AS**

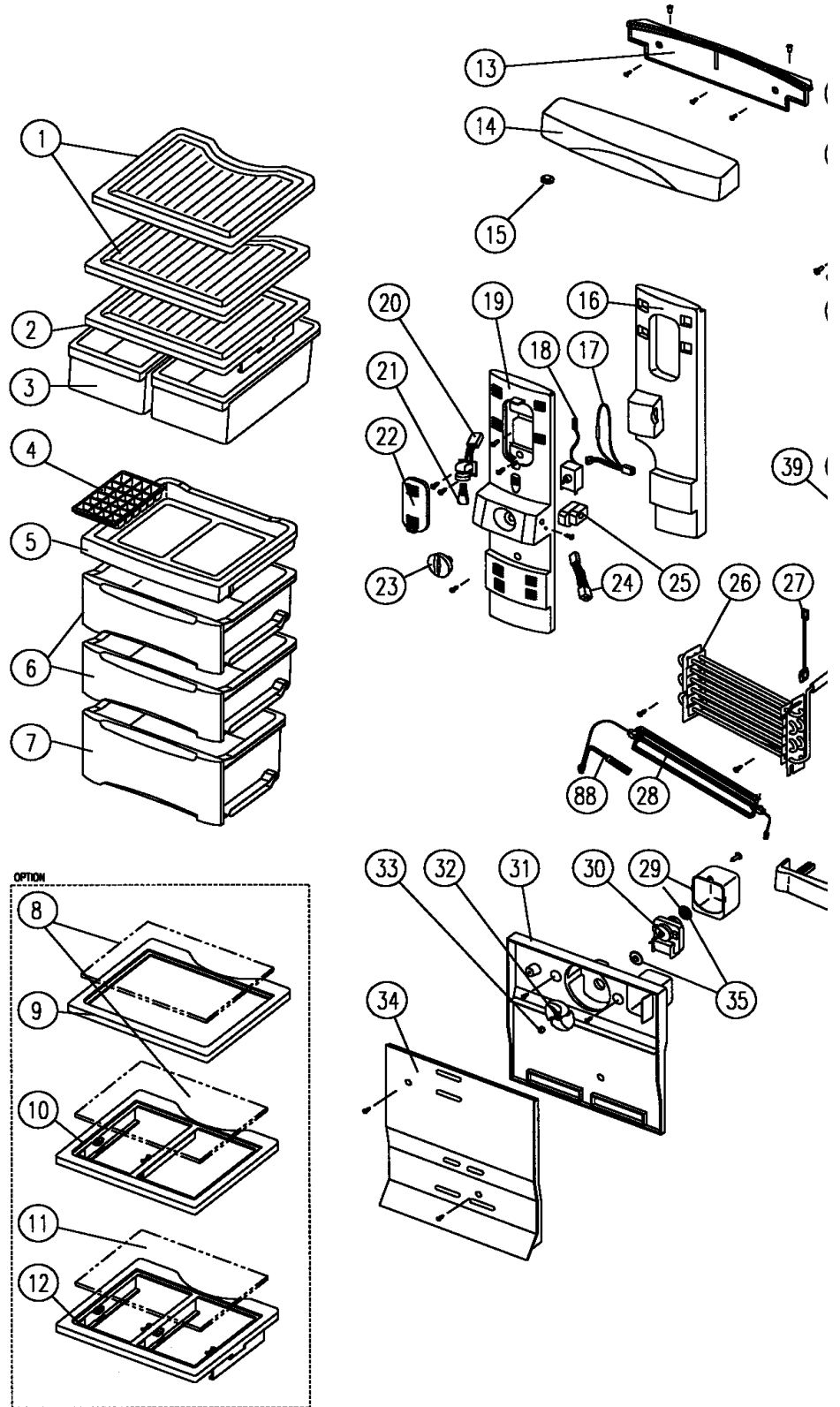
	ERF-361A	ERF-391A	ERF-411A
Type	NBC-K43-D21		
Specification	R=0 °C 30K ±3%		
Part code	3012731800		

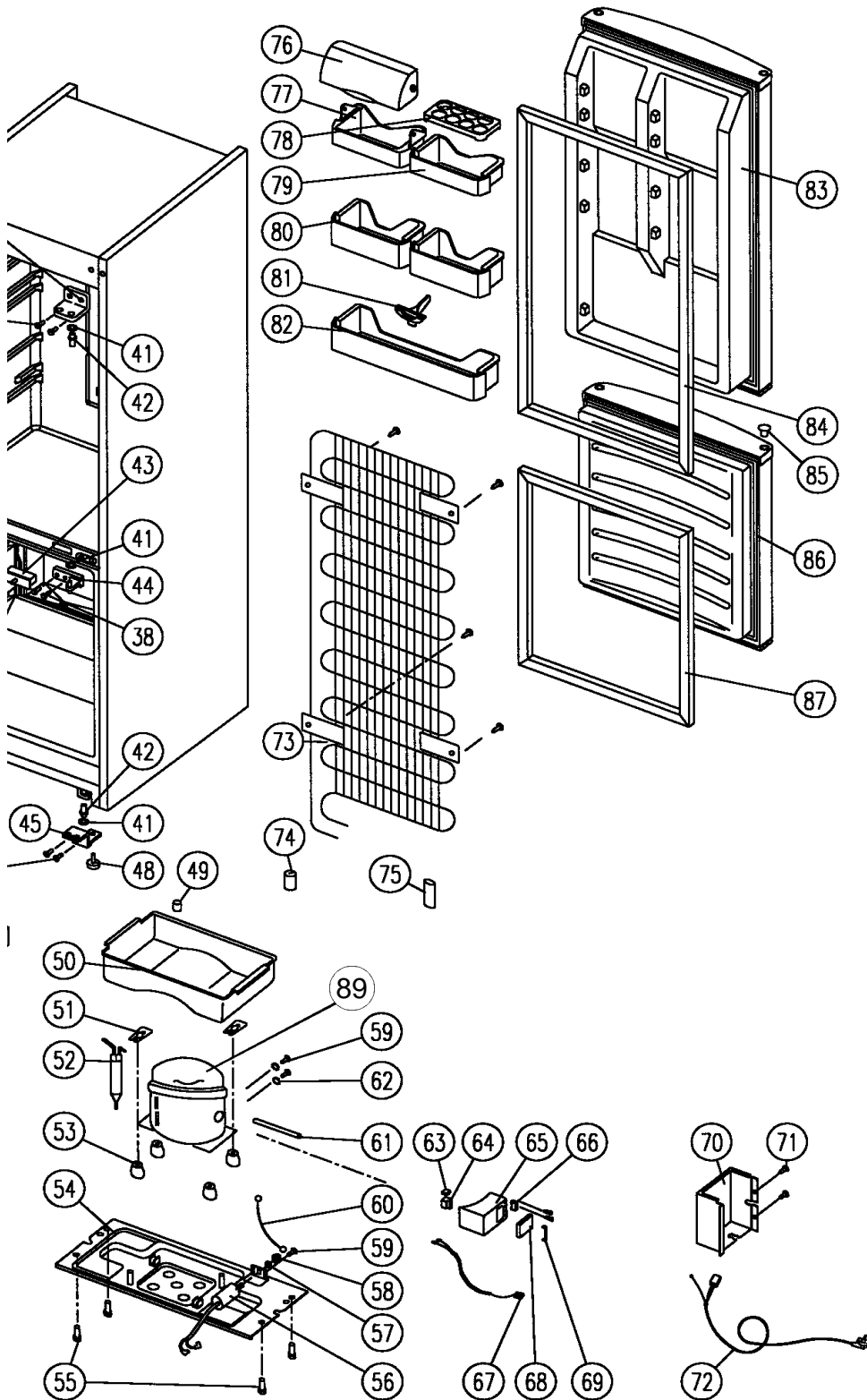
**15. SENSOR D AS**

	ERF-361A	ERF-391A	ERF-411A
Type	NBC-K43-D21		
Specification	R=0 °C 30K ±3%		
Part code	3012731400 (HARNESS SENSOR AS)		

# 10. EXPLODE DRAWINGS

## 1. ERF-331M





# 11. PART LIST

## 1. Parts list (ERF-331)

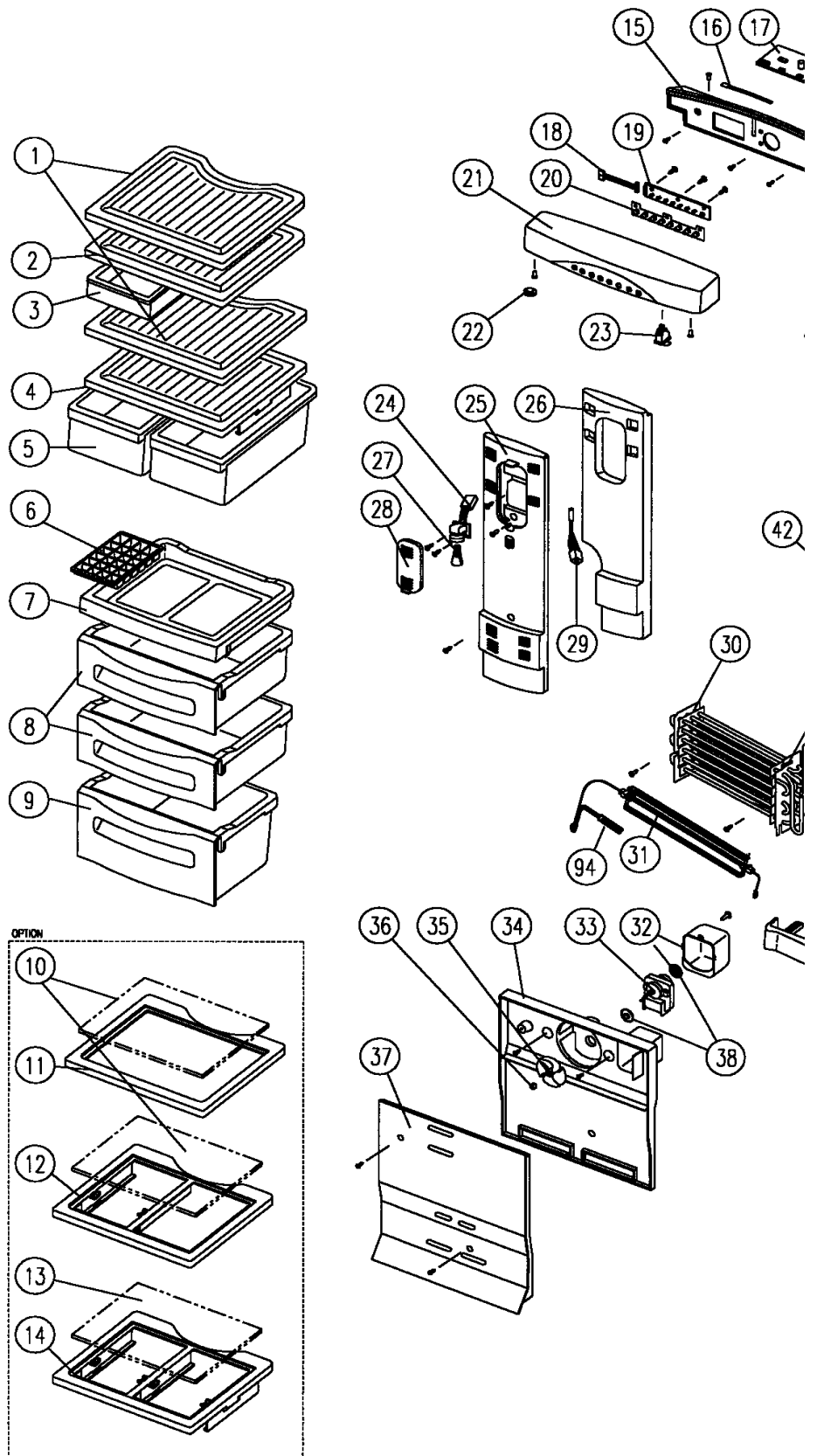
NO	PART NAME	PART CODE	MODEL	DESCRIPTION	REMARK
1	SHELF R	3017823200	2	GPPS	391/411
2	COVER VEGTB CASE	3011453600	1	GPPS	
3	CASE VEGTB	3011163400	2	GPPS	
4	CASE ICING	3011163200	1	PP	
5	CASE FD	3011163100	1	HIPS	
6	CASE FB AS	3011164200	2	CASE+COVER	
7	CASE FA AS	3011164100	1	CASE+COVER	
8	PLATE SHELF GLASS	3014547700	1	GLASS t4.0	OPTION
9	FRAME GLASS SHELF	3012202400	1	HIPS	OPTION
10	FRAME C/CASE COVER	3012202500	1	HIPS	OPTION
11	PLATE V/CASE COVER GLASS	3014547800	1	GLASS t4.0	OPTION
12	FRAME V/CASE COVER	3012202600	1	HIPS	OPTION
13	BASE CONTROL PANEL	3010318700	1	HIPS	
14	PANEL CONTROL	3014228900	1	ABS	
15	CAP CONTROL PANEL A	3010902800	1	SILICON RUBBER	
16	INSULATOR MULTI DUCT	3013337600	1	F-PS (0.025)	
17	HARNESS THERMOSTAT	3012731500	1		
18	THERMOSTAT	3018302200	1	250V 6A	
19	COVER MULTI DUCT	3011453000	1	HIPS t2.0	
20	SOCKET LAMP AS	3017903900	1		ASSY
21	LAMP	3013600700	1	230V 15W	
22	WINDOW LAMP	3015503300	1		GPPS
23	KNOB R	3013401410	1	HIPS	
24	HARNESS TIMER	3012731600	1		
25	SWITCH DEF TIMER	3018115700	1		
26	EVAPORATOR AS	3017045700	1	EVA+SUC PIPE	
27	SWITCH BI-METAL	3018120600	1	250V 5A	
28	HEATER D AS	3012807600	1	GLASS HEATER+FUSE TEMP	
29	BRACKET FAN MOTOR	3010615600	1	PP	
30	MOTOR FAN AS	3011604700	1	IS-231 1DWBFO	
31	LOUVER F B	3018911400	1	PP (411:HIPS)	
32	FAN	3011801400	1	ABS /100	
33	FIXTURE FAN RING	3012005400	1	SUS304 t0.5	
34	LOUVER F A	3018911300	1	HIPS	
35	BUSHING FAN MOTOR	3010901800	2	NR	
36	ASSY CAB URT	3010086300	1	ASSY	
37	HINGE *T	3012908100	2	P/O+ZN t3.2	
38	SPECIAL BOLT C	3016004900	10	M5xP0.89xL16 SWCH22A	
39	CAP SCREW	3010920200	1	PE-LD	
40	CAP SCREW HOLE	3010920300	1	HIPS	
41	SPECIAL WASHER HINGE	3016005500	3	S20C t1.0 13/7	
42	SHAFT HI	3014903200	2		
43	SWITCH DOOR	3018120500	1	DSD-6	
44	HINGE *M	3012911800	1	ZNDC2, DIE CASTING	
45	HINGE *U *L	3012912200	1	SPHC 3.2t	
46	HINGE *U *L	3012912100	2	SPHC 3.2t	
47	COVER CAB BRACKET	3011453300	1	PP	
48	FOOT ADJUSTING AS	3012101800	2	PP+SPECIAL BOLT	
49	CAP DRAIN HOSE	3010919700	1	NBR	
50	CASE VAPORY	3011162600	1	PP	
51	FIXTURE COMP	3012005300	2	SK5+ZN5-C t0.8	
52	DRYER ASSY	3016802200	1	15Gr (t0.51)	
53	ABSORBER COMP	3010101700	4	NR	
54	BASE COMP	3010318600	1	SBHG t1.0	
55	SPECIAL SCREW A	3016004300	4	M6.5xL20	
56	CAPACITOR RUNNING	3010938000	1	4uF 400AC	DNA
57	SPECIAL WASHER R/C	3016006400	1	A	

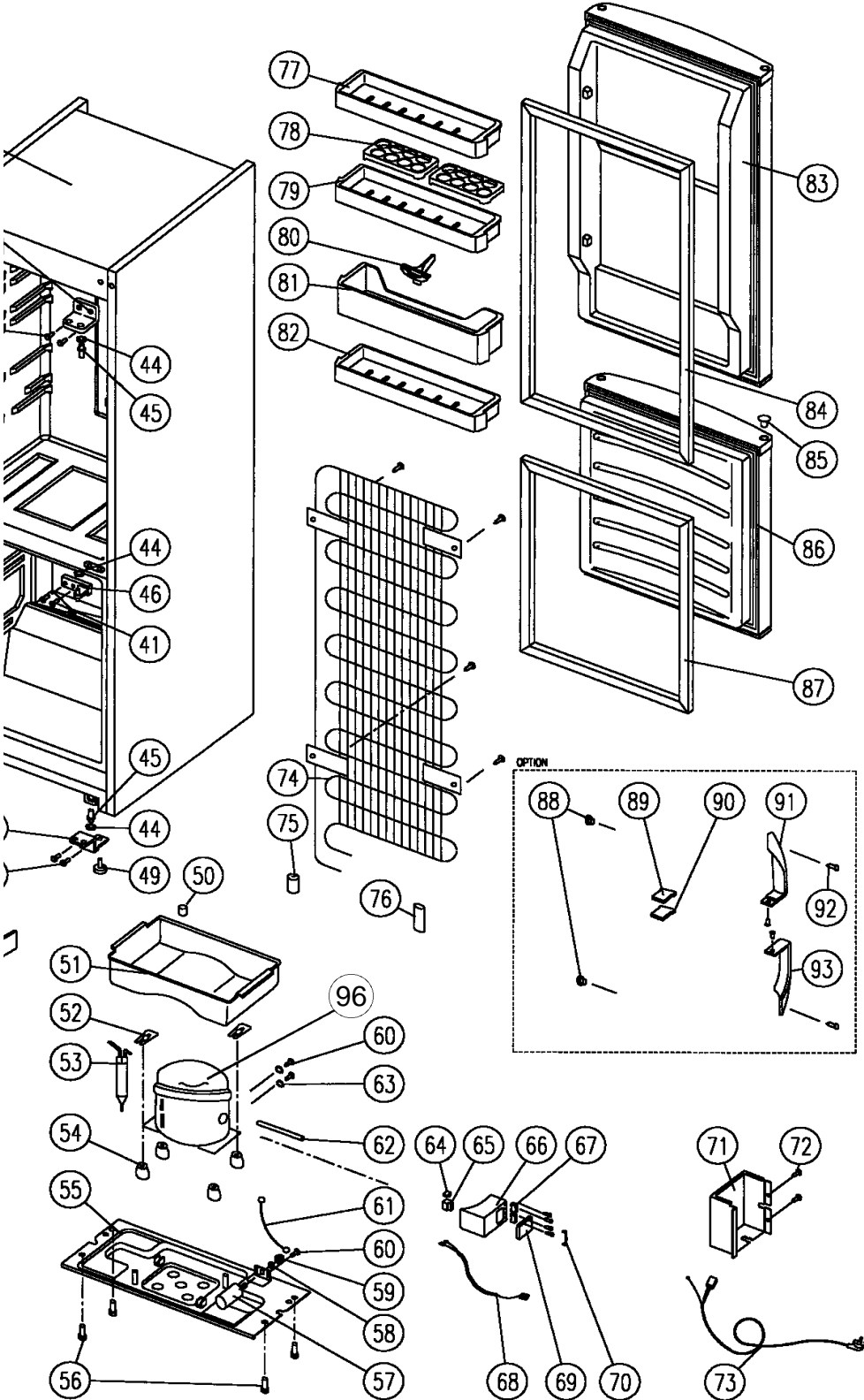




# Explode drawings

## 2. ERF-361A, 391A, 411A





## Part List

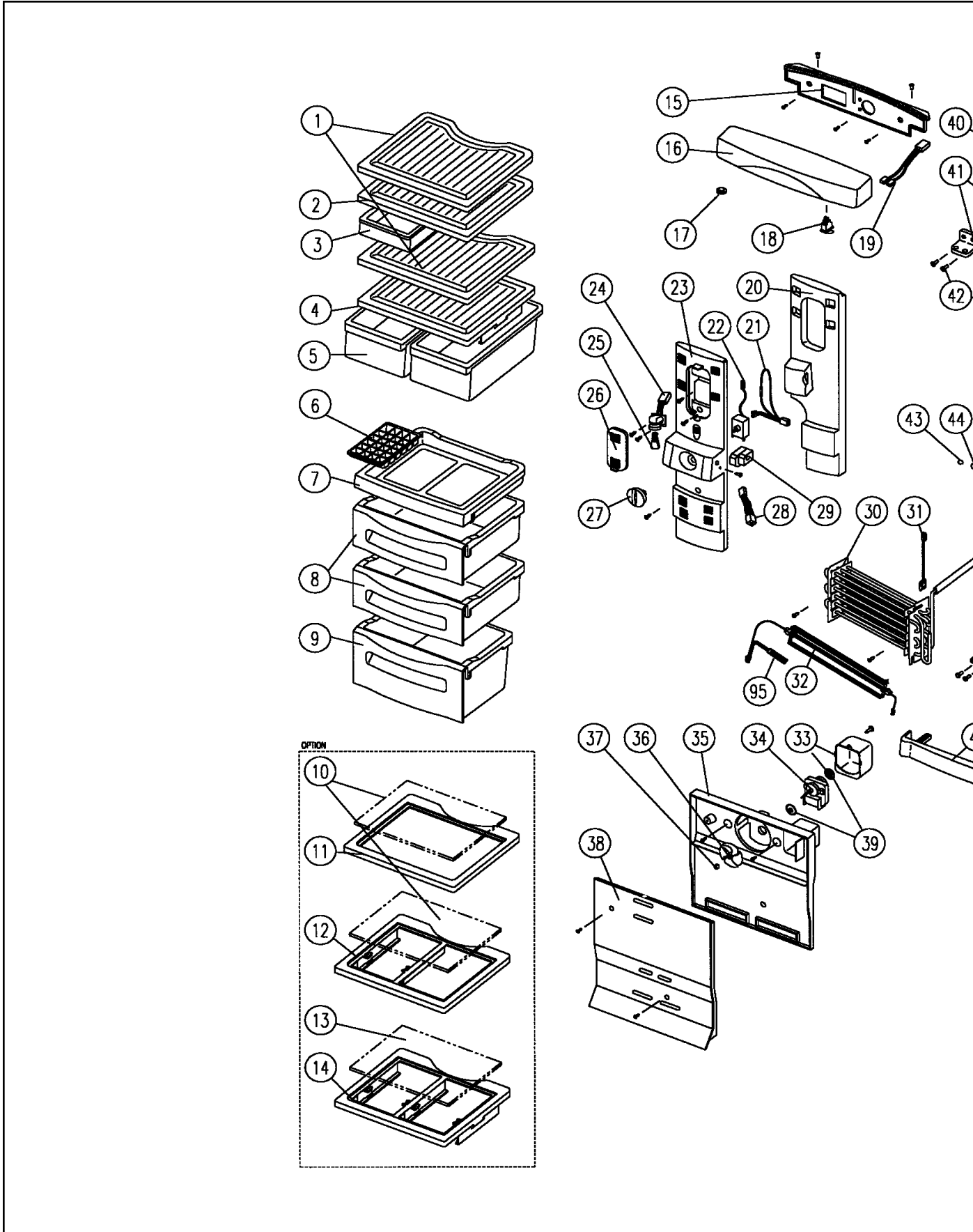
### 1. Parts list (ERF-361A/391A/411A TYPE)

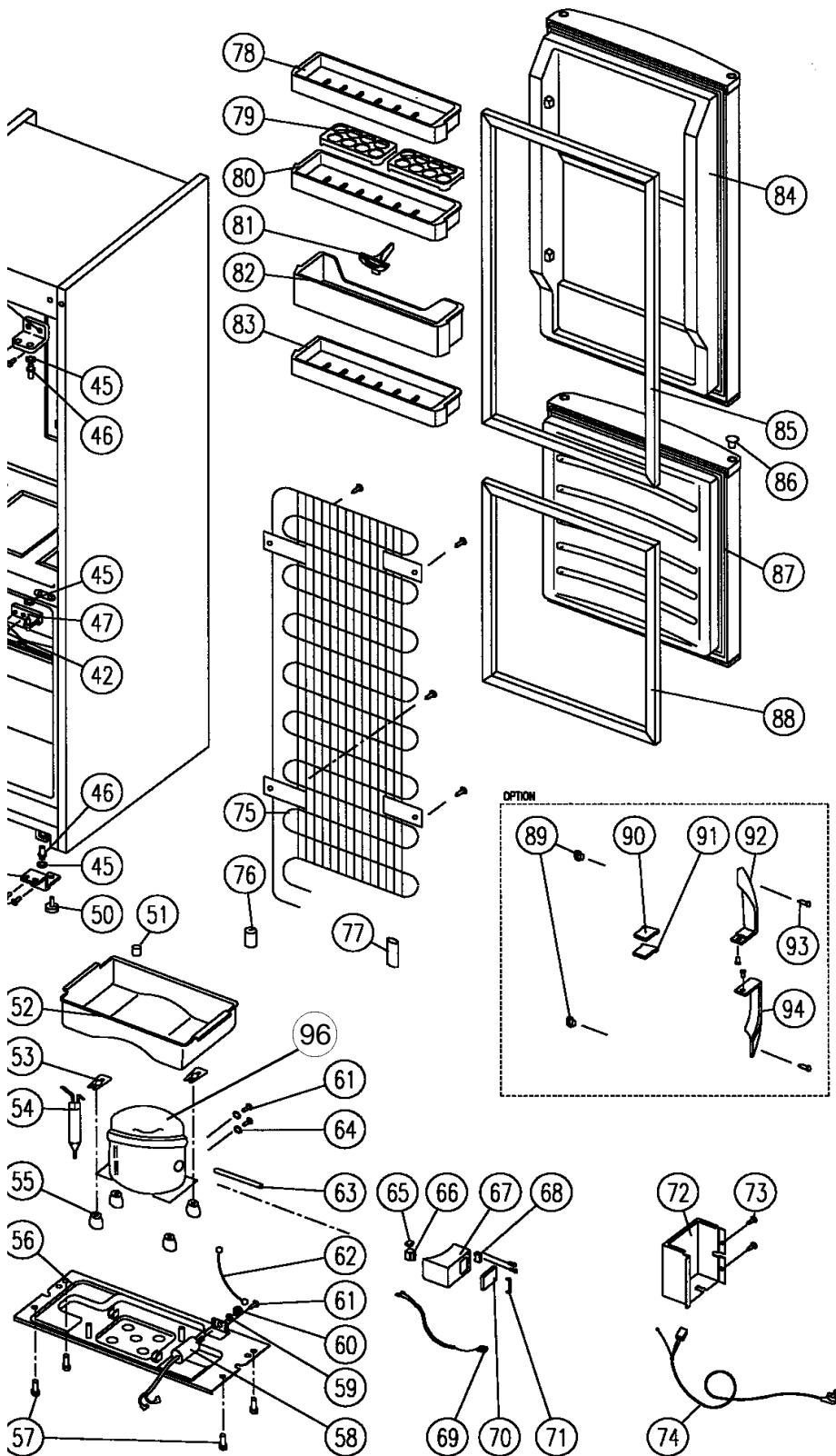
NO	PART NAME	PART CODE	MODEL			DESCRIPTION	REMARK
			361A	391A	411A		
1	SHELF R	3017823200	1	2	2	GPPS	391/411
2	COVER CHILLED CASE	3011453400	1	1	1		
3	CASE CHILD	3011163300	1	1	1	GPPS	
4	COVER VEGTB CASE	3011453600	1	1	1	GPPS	
5	CASE VEGTB	3011163400	2	2	2	GPPS	
6	CASE ICING	3011163200	1	1	1	PP	
7	CASE FD	3011115911	1	1	1	HIPS	
8	CASE FB (411:CASE FC)	3011115310	2	2	-	HIPS	
		3011115410	-	-	2	HIPS	
9	CASE FA	3011115202	1	1	1	HIPS	
10	PLATE SHELF GLASS	3014547700	1	1	1	GLASS t4.0	OPTION
11	FRAME GLASS SHELF	3012202400	1	1	1	HIPS	OPTION
12	FRAME C/CASE COVER	3012202500	1	1	1	HIPS	OPTION
13	PLATE V/CASE COVER GLASS	3014547800	1	1	1	GLASS t4.0	OPTION
14	FRAME V/CASE COVER	3012202600	1	1	1	HIPS	OPTION
15	BASE CONTROL PANEL	PAGE 34	1	1	1	HIPS	
16	CABLE TIE	4016N03281	1	1	1		
17	PCB MAIN AS	3014397060	1	1	1		
18	HARNESS F PCB	3012718300	1	1	1		
19	PCB F AS	3014372130	1	1	1		
20	WINDOWS LED	3015503400	1	1	1	SILICON RUBBER	
21	PANEL CONTROL	PAGE 34	1	1	1	ABS	
22	CAP CONTROL PANEL A	PAGE 34	1	1	1	SILICON RUBBER	
23	SWITCH LAMP	3018111500	1	1	1	250V 0,25A	
24	SOCKET LAMP AS	3017903900	1	1	1		ASSY
25	COVER MULTI DUCT	3011451900	1	-	-	HIPS t2.0	
		3011452100	-	1	1	HIPS t2.0	
26	INSULATOR MULTI DUCT	3016637000	1	-	-	F-PS	
		3013337200	-	1	1	F-PS	
27	LAMP	3013600700	1	1	1	230V 15W	
28	WINDOW LAMP	3015503300	1	1	1		GPPS
29	SENSOR R AS	3012731800	1	1	1		
30	EVAPORATOR AS	3017045600	1	1	1	EVA+SUC PIPE	
31	HEATER D AS	3012807600	1	1	1	GLASS HEATER+FUSE TEMP	
32	BRACKET FAN MOTOR	3010615600	1	1	1	PP	
33	MOTOR FAN AS	3011604700	1	1	1	IS-231 1DWBFO	
34	LOUVER F B	3018905500	1	1	-	PP (411:HIPS)	
		3018905600	-	-	1	PP (411:HIPS)	
35	FAN	3011801400	1	1	1	ABS /100	
36	FIXTURE FAN RING	3012005400	1	-	-	SUS304 t0.5	
37	LOUVER F A	3018905300	1	1	-	HIPS	
		3018905400	-	-	1	HIPS	
38	BUSHING FAN MOTOR	3010901800	2	2	2	NR	
39	ASSY CAB URT	3010071001	1	-	-	ASSY	
		3010071011	-	1	-	ASSY	
		3010071021	-	-	1	ASSY	
40	HINGE *T	3012908100	2	2	2	P/O+ZN t3.2	
41	SPECIAL BOLT C	3016004900	10	10	10	M5xP0.89xL16 SWCH22A	
42	CAP SCREW	PAGE 34	1	1	1	PE-LD	
43	CAP SCREW HOLE	3010920300	1	1	1	HIPS	
44	SPECIAL WASHER HINGE	3016005500	3	3	3	S20C t1.0 13/7	
45	SHAFT HI	3014903200	2	2	2		
46	HINGE *M	3012908000	1	1	1	DIE CASTING	
47	HINGE *U	3012908200	2	2	2	P/O+ZN t3.2	
48	COVER CAB BRACKET	PAGE 34	1	1	1	HIPS	
49	FOOT ADJUSTING AS	3012101800	2	2	2	PP+SPECIAL BOLT	
50	CAP DRAIN HOSE	3010919700	1	1	1	NBR	

NO	PART NAME	PART CODE	MODEL			DESCRIPTION	REMARK
			361A	391A	411A		
51	CASE VAPORY	3011162600	1	1	1	PP	
52	FIXTURE COMP	3012005300	2	2	2	SK5+ZN5-C t0.8	
53	DRYER ASSY	3016802200	1	1	1	15Gr (t0.51)	
54	ABSORBER COMP	3010101700	4	4	4	NR	
55	BASE COMP	3010318600	1	1	1	SBHG t1.0	
56	SPECIAL SCREW A	3016004300	4	4	4	M6.5xL20	
57	CAPACITOR RUNNING	3010938000	1	1	1	4uF 400AC	DNA
58	SPECIAL WASHER R/C	3016006400	1	1	1	A	
59	SPECIAL NUT R/C	3016006500	1	1	1	M8	
60	SCREW MACHINE	7051401065	3	3	3	PAN 4x10 BSNI	
61	HARNESS EARTH	3012735200	1	1	1	110mm	
62	PIPE CHARGE	3014418200	1	1	1	DCUT1-/6xT0.6x100	
63	SPECIAL WASHER	3016004700	4	4	4	/4.3 STAR	earth:4
64	SWITCH P RELAY OL	3817911200	1	1	1	4TM213NHB	
65	SWITCH P RELAY PTC	3817907000	1	1	1	33?(MURATA)	
66	RELAY BOX	3810506400	1	1	1		
67	CABLE CLAMP	3818200300	1	1	1		
68	HARNESS RELAY	3012731900	1	1	1		
69	RELAY BOX COVER	3811401300	1	1	1		
70	BAND RELAY	3816100400	1	1	1		
71	COVER MECH HOUSING	3011454100	1	1	1	HIPS	
72	SPECIAL SCREW	3016004800	2	2	2		
73	CORD POWER AS	3011343300	1	1	1	CP 2PIN	
74	WI-CON ASSY	3014434500	1	1	-		
		3014434600	-	-	1		
75	ABSORBER PIPE C	4016008014	2	2	2	EPDM (18g)	PIPE CONN
76	ABSORBER PIPE B	3010101900	1	1	1	IIR	PIPE SUC
77	POCKET BUTTER	3019008720	1	1	1	HIPS	
78	CASE EGG	3011163600	2	2	2	PP	
79	POCKET EGG	3019008701	1	1	1	HIPS	
80	GUIDE POCKET	3012510200	1	1	1	PP	
81	POCKET BOTTLE A	3019008600	1	1	1	HIPS	
82	POCKET R DOOR	3019013600	1	1	1	HIPS	
	POCKET BOTTLE B	3019009500	FOR SUPERIOR CLASS			HIPS	SUPERIOR
	GUIDE BOTTLE SUPPORT B	3012508000	FOR SUPERIOR CLASS			SUPERIOR POCKET R DOOR	
		3019008710	FOR SUPERIOR CLASS			HIPS	SUPERIOR
	GUIDE BOTTLE SUPPORT C	3012508010	FOR SUPERIOR CLASS				STEAL SUPERIOR
83	ASSY R DOOR URT	PAGE 34	1	-	-	ASSY	
		PAGE 34	-	1	1	ASSY	
84	GASKET R DOOR AS	3012306600	1	-	-	PVC+MAGNET	
		3012306800	-	1	1	PVC+MAGNET	
85	CAP DOOR BUSHING	PAGE 34	1	1	1	PP	
86	ASSY F DOOR URT	PAGE 34	1	-	-	ASSY	
		PAGE 34	-	1	1	ASSY	
87	GASKET F DOOR AS	3012306500	1	1	-	PVC+MAGNET	
		3012306700	-	-	1	PVC+MAGNET	
88	CAP HANDLE	PAGE 34	1	1	1	HIPS	OPTION
89	COVER DOOR CAP *L	PAGE 34	2	2	2	ABS	OPTION
90	COVER DOOR CAP *R	PAGE 34	2	2	2	ABS	OPTION
91	HANDLE *T	PAGE 34	1	1	1	PBT	OPTION
92	SPECIAL SCREW D	3016004810	4	4	4	T2 FLT 4x16 PAINTING	OPTION
93	HANDLE *U	PAGE 34	1	1	1	PBT	OPTION
94	TEPERATURE FUSE	3017200420	1	1	1		
95	D-SENSOR	3012733910	1	1	1		
96	COMPRESSOR	3956420481	1	1	1	HPL25Y61-5	

Explode drawings

3. ERF-361M, 391M, 411M





# 11. PART LIST

## 1. Parts list (ERF-361M/391M/411M TYPE)

NO	PART NAME	PART CODE	MODEL			DESCRIPTION	REMARK
			361M	391M	411M		
1	SHELF R	3017823200	1	2	2	GPPS	391/411
2	COVER CHILLED CASE	3011453400	1	1	1		
3	CASE CHILD	3011163300	1	1	1	GPPS	
4	COVER VEGTB CASE	3011453600	1	1	1	GPPS	
5	CASE VEGTB	3011163400	2	2	2	GPPS	
6	CASE ICING	3011163200	1	1	1	PP	
7	CASE FD	3011115911	1	1	1	HIPS	
8	CASE FB (411:CASE FC)	3011115310	2	2	-	HIPS	
		3011115410	-	-	2	HIPS	
9	CASE FA	3011115202	1	1	1	HIPS	
10	PLATE SHELF GLASS	3014547700	1	1	1	GLASS t4.0	OPTION
11	FRAME GLASS SHELF	3012202400	1	1	1	HIPS	OPTION
12	FRAME C/CASE COVER	3012202500	1	1	1	HIPS	OPTION
13	PLATE V/CASE COVER GLASS	3014547800	1	1	1	GLASS t4.0	OPTION
14	FRAME V/CASE COVER	3012202600	1	1	1	HIPS	OPTION
15	BASE CONTROL PANEL	PAGE 34	1	1	1	HIPS	
16	PANEL CONTROL	PAGE 34	1	1	1	ABS	
17	CAP CONTROL PANEL A	PAGE 34	1	1	1	SILICON RUBBER	
18	SWITCH LAMP	3018111500	1	1	1	250V 0,25A	
19	HARNES LAMP SW	3012717020	1	1	1		
20	INSULATOR MULTI DUCT	3013337100	1	-	-	F-PS	
		30133373000	-	1	1	F-PS	
21	HARNES THERMOSTAT	3012731500	1	1	1		
22	THERMOSTAT	3018302200	1	1	1	250V 6A	
23	COVER MULTI DUCT	3011452000	1	-	-	HIPS t2.0	
		3011452300	-	1	1	HIPS t2.0	
24	SOCKET LAMP AS	3017903900	1	1	1		ASSY
25	LAMP	3013600700	1	1	1	230V 15W	
26	WINDOW LAMP	3015503300	1	1	1		GPPS
27	KNOB R	3013401410	1	1	1	HIPS	
28	HARNES TIMER	3012731600	1	1	1		
29	SWITCH DEF TIMER	3018115700	1	1	1		
30	EVAPORATOR AS	3017045600	1	1	1	EVA+SUC PIPE	
31	SWITCH BI-METAL	3018120600	1	1	1	250V 5A	
32	HEATER D AS	3012807600	1	1	1	GLASS HEATER+FUSE TEMP	
33	BRACKET FAN MOTOR	3010615600	1	1	1	PP	
34	MOTOR FAN AS	3011604700	1	1	1	IS-231 1DWBFO	
35	LOUVER F B	3018905500	1	1	-	PP (411:HIPS)	
		3018905600	-	-	1	PP (411:HIPS)	
36	FAN	3011801400	1	1	1	ABS /100	
37	FIXTURE FAN RING	3012005400	1	-	-	SUS304 t0.5	
38	LOUVER F A	3018905300	1	1	-	HIPS	
		3018905400	-	-	1	HIPS	
39	BUSHING FAN MOTOR	3010901800	2	2	2	NR	
40	ASSY CAB URT	3010071031	1	-	-	ASSY	
		3010071041	-	1	-	ASSY	
		3010071051	-	-	1	ASSY	
41	HINGE *T	3012908100	2	2	2	P/O+ZN t3.2	
42	SPECIAL BOLT C	3016004900	10	10	10	M5xP0.89xL16 SWCH22A	
43	CAP SCREW	PAGE 34	1	1	1	PE-LD	
44	CAP SCREW HOLE	3010920300	1	1	1	HIPS	
45	SPECIAL WASHER HINGE	3016005500	3	3	3	S20C t1.0 13/7	
46	SHAFT HI	3014903200	2	2	2		
47	HINGE *M	3012908000	1	1	1	DIE CASTING	
48	HINGE *U	3012908200	2	2	2	P/O+ZN t3.2	
49	COVER CAB BRACKET	PAGE 34	1	1	1	HIPS	
50	FOOT ADJUSTING AS	3012101800	2	2	2	PP+SPECIAL BOLT	



NO	PART NAME	PART CODE	MODEL			DESCRIPTION	REMARK
			361M	391M	411M		
51	CAP DRAIN HOSE	3010919700	1	1	1	NBR	
52	CASE VAPORY	3011162600	1	1	1	PP	
53	FIXTURE COMP	3012005300	2	2	2	SK5+ZN5-C t0.8	
54	DRYER ASSY	3016802200	1	1	1	15Gr (t0.51)	
55	ABSORBER COMP	3010101700	4	4	4	NR	
56	BASE COMP	3010318600	1	1	1	SBHG t1.0	
57	SPECIAL SCREW A	3016004300	4	4	4	M6.5xL20	
58	CAPACITOR RUNNING	3010938000	1	1	1	4uF 400AC	DNA
59	SPECIAL WASHER R/C	3016006400	1	1	1	A	
60	SPECIAL NUT R/C	3016006500	1	1	1	M8	
61	SCREW MACHINE	7051401065	3	3	3	PAN 4x10 BSNI	
62	HARNESS EARTH	3012735200	1	1	1	110mm	
63	PIPE CHARGE	3014418200	1	1	1	DCUT1-/6xT0.6x100	
64	SPECIAL WASHER	3016004700	4	4	4	/4.3 STAR	earth:4
65	SWITCH P RELAY OL	3817911200	1	1	1	4TM213NHB	
66	SWITCH P RELAY PTC	3817907000	1	1	1	33?(MURATA)	
67	REALY BOX	3810506400	1	1	1		
68	CABLE CLAMP	3818200300	1	1	1		
69	HARNESS RELAY	3012731900	1	1	1		
70	RELAY BOX COVER	3811401300	1	1	1		
71	BAND RELAY	3816100400	1	1	1		
72	COVER MECH HOUSING	3011454100	1	1	1	HIPS	
73	SPECIAL SCREW	3016004800	2	2	2		
74	CORD POWER AS	3011343300	1	1	1	CP 2PIN	
75	WI-CON ASSY	3014434500	1	1	-		
		3014434600	-	-	1		
76	ABSORBER PIPE C	4016007014	2	2	2	EPDM (18g)	PIPE CONN
77	ABSORBER PIPE B	3010101900	1	1	1	IIR	PIPE SUC
78	POCKET BUTTER	3019008720	1	1	1	HIPS	
79	CASE EGG	3011163600	2	2	2	PP	
80	POCKET EGG	3019008701	1	1	1	HIPS	
81	GUIDE POCKET	3012510200	1	1	1	PP	
82	POCKET BOTTLE A	3019008600	1	1	1	HIPS	
83	POCKET R DOOR	3019013600	1	1	1	HIPS	
	POCKET BOTTLE B	3019009500	FOR SUPERIOR CLASS			HIPS	SUPERIOR
	GUIDE BOTTLE SUPPORT B	3012508000	FOR SUPERIOR CLASS			STEAL	SUPERIOR
	SUPERIOR POCKET R DOOR	3019008710	FOR SUPERIOR CLASS			HIPS	SUPERIOR
	GUIDE BOTTLE SUPPORT C	3012508010	FOR SUPERIOR CLASS			STEAL	SUPERIOR
84	ASSY R DOOR URT	PAGE 34	1	-	-	ASSY	
		PAGE 34	-	1	1	ASSY	
85	GASKET R DOOR AS	3012306600	1	-	-	PVC+MAGNET	
		3012306800	-	1	1	PVC+MAGNET	
86	CAP DOOR BUSSHING	PAGE 34	1	1	1	PP	
87	ASSY F DOOR URT	PAGE 34	1	-	-	ASSY	
		PAGE 34	-	1	1	ASSY	
88	GASKET F DOOR AS	3012306500	1	1	-	PVC+MAGNET	
		3012306700	-	-	1	PVC+MAGNET	
89	CAP HANDLE	PAGE 34	1	1	1	HIPS	OPTION
90	COVER DOOR CAP *L	PAGE 34	2	2	2	ABS	OPTION
91	COVER DOOR CAP *R	PAGE 34	2	2	2	ABS	OPTION
92	HANDLE *T	PAGE 34	1	1	1	PBT	OPTION
93	SPECIAL SCREW D	3016004810	4	4	4	T2 FLT 4x16 PAINTING	OPTION
94	HANDLE *U	PAGE 34	1	1	1	PBT	OPTION
95	TEMPERATURE FUSE	3017200420	1	1	1		
96	COMPRESSOR	3956420481	1	1	1	HPL25Y61-5	

**Part List**

**Part list of colour components (ERF-361A/M,ERF-391A/M,ERF-411A/M)**

**WHITE**

NO	PART NAME	PART CODE	MODEL			DESCRIPTION	REMARK
			361	391	411		
1	CONTROL PANEL A	3014204800	1	1	1	ABS	electronic
2	CONTROL PANEL M	3014204950	1	1	1	ABS	mechanical
3	BASE CONTROL PANEL	3010312900	1	1	1	HIPS	
4	REFRIGERATOR DOOR (310)	3010075201	1			URT FORMING ( CO-LAMINAR )	
5	REFRIGERATOR DOOR (340-370)	3010075213		1	1	URT FORMING ( CO-LAMINAR )	
6	FREEZER DOOR (310-340)	3010075303	1	1		URT FORMING ( CO-LAMINAR )	
7	FREEZER DOOR (370)	3010075313			1	URT FORMING ( CO-LAMINAR )	
8	HANDLE *F	3012610100	1	1	1	PBT	
9	HANDLE *R	3012610200	1	1	1	PBT	
10	COVER DOOR CAP *L	3011437000	2	2	2	ABS	
11	COVER DOOR CAP *R	3011437010	2	2	2	ABS	
12	CAP HANDLE	3010910010	4	4	4	HIPS	
13	CAP SCREW	3010920200	1	1	1	HIPS	
14	CAP DOOR BUSHING	3010918300	1	1	1	PP	
15	CAP CONTROL PANEL	3010902810	1	1	1	SILICON RUBBER	
16	COVER CAB BRACKET	3011433320	1	1	1	HIPS	

**SILVER**

NO	PART NAME	PART CODE	MODEL			DESCRIPTION	REMARK
			361	391	411		
1	CONTROL PANEL A	3014204940	1	1	1	ABS	electronic
2	CONTROL PANEL M	3014204970	1	1	1	ABS	mechanical
3	BASE CONTROL PANEL	3010312910	1	1	1	HIPS	
4	REFRIGERATOR DOOR (310)	3010074601	1			URT FORMING ( CO-LAMINAR )	
5	REFRIGERATOR DOOR (340-370)	3010075211		1	1	URT FORMING ( CO-LAMINAR )	
6	FREEZER DOOR (310-340)	3010075301	1	1		URT FORMING ( CO-LAMINAR )	
7	FREEZER DOOR (370)	3010075311			1	URT FORMING ( CO-LAMINAR )	
8	HANDLE *F	3012610120	1	1	1	PBT	
9	HANDLE *R	3012610220	1	1	1	PBT	
10	COVER DOOR CAP *L	3011437040	2	2	2	ABS	
11	COVER DOOR CAP *R	3011437050	2	2	2	ABS	
12	CAP HANDLE	3010910010	4	4	4	HIPS	
13	CAP SCREW	3010920210	1	1	1	HIPS	
14	CAP DOOR BUSHING	3010918310	1	1	1	PP	
15	CAP CONTROL PANEL	3010902810	1	1	1	SILICON RUBBER	
16	COVER CAB BRACKET	3011433320	1	1	1	HIPS	

**INOX (DARK GRAY)**

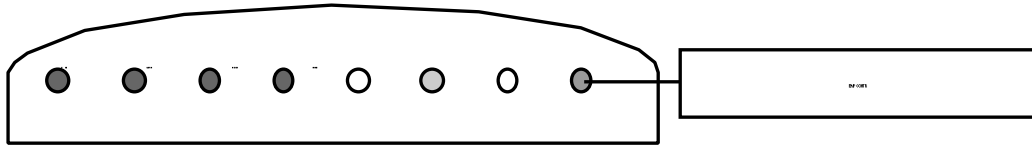
NO	PART NAME	PART CODE	APPLY MODEL			DESCRIPTION	REMARK
			361	391	411		
1	CONTROL PANEL A	3014204960	1	1	1	ABS	electronic
2	CONTROL PANEL M	3014204990	1	1	1	ABS	mechanical
3	BASE CONTROL PANEL	3010312910	1	1	1	HIPS	
4	REFRIGERATOR DOOR (310)	3010074602	1			URT FORMING ( INOX )	
5	REFRIGERATOR DOOR (340-370)	3010075212		1	1	URT FORMING ( INOX )	
6	FREEZER DOOR (310-340)	3010075302	1	1		URT FORMING ( INOX )	
7	FREEZER DOOR (370)	3010075312			1	URT FORMING ( INOX )	
8	HANDLE *F	3012610110	1	1	1	PBT	
9	HANDLE *R	3012610210	1	1	1	PBT	
10	COVER DOOR CAP *L	3011437020	2	2	2	ABS	
11	COVER DOOR CAP *R	3011437030	2	2	2	ABS	
12	CAP HANDLE	3010910010	4	4	4	HIPS	
13	CAP SCREW	3010920210	1	1	1	HIPS	
14	CAP DOOR BUSHING	3010918310	1	1	1	PP	
15	CAP CONTROL PANEL	3010902810	1	1	1	SILICON RUBBER	
16	COVER CAB BRACKET	3011433310	1	1	1	HIPS	

## 12. PCB CONTROL FUNCTIONS

### PCB SERVICE MANUAL OF ELECTRONIC CONTROL TYPE

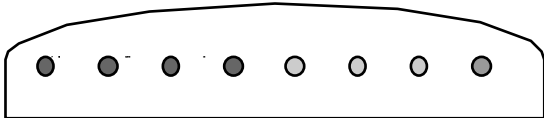
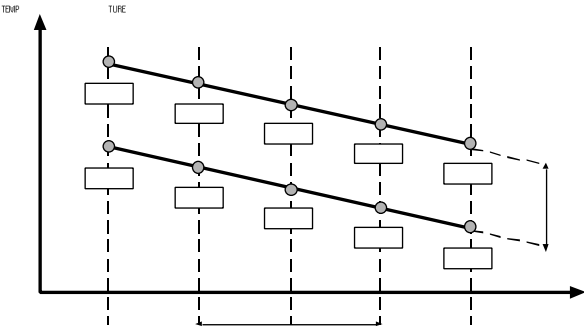
Model: ERF-361A/391A/411A

#### 1. How to use the panel



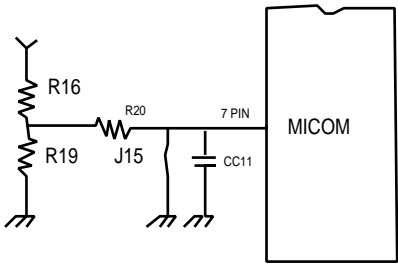
NO	CONTROL FUNCTION	CONTENTS
1	Initial Operation	<ol style="list-style-type: none"> <li>1) In the initial Operation, refrigerator default temp is in MID position</li> <li>2) Freezer and Refrigerator LED are on with red color</li> </ol>
2	PANEL DISPLAY	<ol style="list-style-type: none"> <li>1) VAC ON: When the comp is controlled by VAC on/off condition</li> <li>2) SUPER ON: When the comp is controlled by SUPER on/off condition</li> <li>3) FREEZER LED <ul style="list-style-type: none"> <li>GREEN ON: When the freezer temp. is OK(less than -5deg at D sensor)</li> <li>RED ON: When the freezer temp. is not good</li> <li>N.G condition (1 or 2) <ol style="list-style-type: none"> <li>1- More than -5 deg at D-sensor when comp. switches Off</li> <li>2- More than -5 deg when comp. is running for 240 min.</li> </ol> </li> <li>cf. Error display</li> <li>RED LED ON/OFF one time: D1 ERROR <ul style="list-style-type: none"> <li>It is D sensor error for open or short</li> </ul> </li> <li>RED LED ON/OFF two times: D2 ERROR <ul style="list-style-type: none"> <li>D2 Error happens when system is in defrost position for 80 min (heater doesn't work).</li> <li>This is "Defrost error".</li> </ul> </li> </ul> </li> <li>4) REFRIGERATOR LED <ul style="list-style-type: none"> <li>GREEN ON: When the refrigerator temp. is OK(-7~10 deg)</li> <li>RED ON: When the refrigerator temp. is not good</li> <li>N.G condition (1 and 2) <ol style="list-style-type: none"> <li>1- More than 10 deg or less than -7 deg at R-sensor</li> <li>2- More than 10 deg when comp. is running for 240 min.</li> </ol> </li> <li>cf. Error display</li> <li>RED LED ON/OFF one time: R1 ERROR <ul style="list-style-type: none"> <li>It is R sensor error for open or short</li> </ul> </li> <li>RED LED ON/OFF two times: RT ERROR <ul style="list-style-type: none"> <li>It is RT sensor error for open or short</li> </ul> </li> </ul> </li> <li>5) LOW ON: When comp is controlled by LOW on/off condition</li> <li>6) MID ON: When the comp is controlled by MID on/off condition</li> </ol>

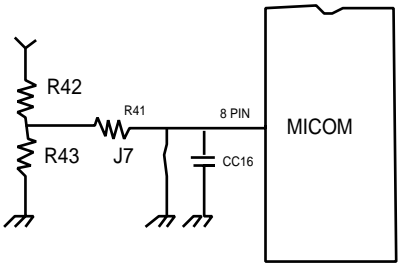
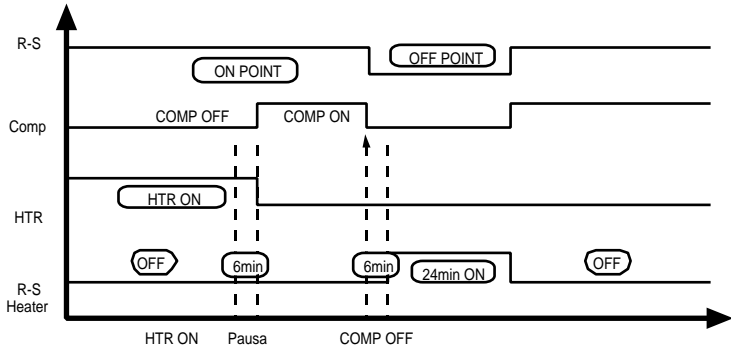
## Pcb Control Functions

NO	CONTROL FUNCTION	CONTENTS
2	PANEL DISPLAY	7) HIGH ON: When the comp is controlled by HIGH on/off condition
3	Refrigerator Temperature Control	<p>1) Temperature can be controlled by 5 steps with the refrigerator temperature button.            VAC → SUPER → LOW → MID → HIGH → VAC</p>  <p>2) Refrigerator control on/off temperature            1- MID OFF point: <math>-0,5^{\circ}\text{C}</math>            2- ON /OFF DIFF: <math>4^{\circ}\text{C}</math>            3- STEP DIFF (LOW-MID-HIGH): 3 deg</p> 
4	Determination of defrost	<p>1) Determination of defrost mode            1- Accumulated running time of compressor            2- Operation ration of compressor            3- Total time (on time + off time of compressor)</p> <p>2) Starting condition of Defrost mode            1- When accumulated running time of comp is 12 hours            2- Check after accumulated running time of comp. is 10 hours, if operation ration of compressor is more than 70% then defrost mode starts.</p> <p>3- Finally, when total time is more than 60 hours, then, defrost modestarts.</p>

NO	CONTROL FUNCTION	CONTENTS
5	Flow chart for Determination of defrost	
6	Defrost Mode	<p>1) Start: By determination defrost condition</p> <p>start                      10 hours                      12 hours Accumulated running time of compressor</p> <p>2) FLOW HEATER → PAUSE(6min.) → CONTROL</p> <p><b>1- HEATER</b></p> <ul style="list-style-type: none"> <li>* ON - When defrost condition is started.</li> <li>* OFF - When D-sensor is more than 10 deg If D1 ERROR exists, Heater off by Time (30 min)</li> <li>* D2 ERROR: 80 min in defrost position. (defrost problem)</li> </ul> <p><b>2- PAUSE</b></p> <ul style="list-style-type: none"> <li>* Time: 6 minutes minimum after defrost, all devices are off (hts, comp, fan)</li> <li>* <b>Forced defrost</b></li> </ul> <ol style="list-style-type: none"> <li>1) Start: Temp control SW is pushed for 10 sec continuously</li> <li>2) Flow: The flow is same as the general defrost flow</li> <li>3) Purpose: To check defrost current of HTR in mass product line, etc</li> <li>4) Though D-sensor is more than 10 deg, HTR is on at least for 30 sec</li> </ol>

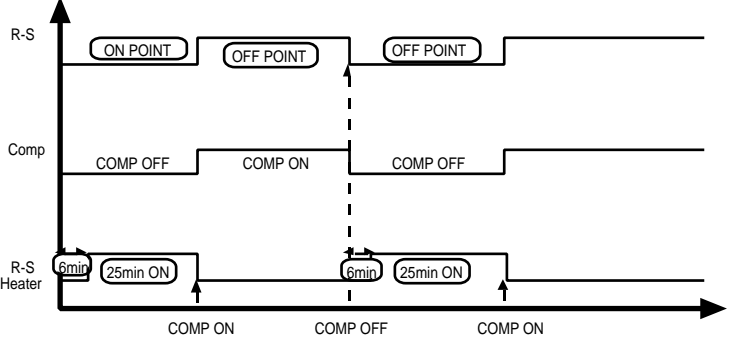
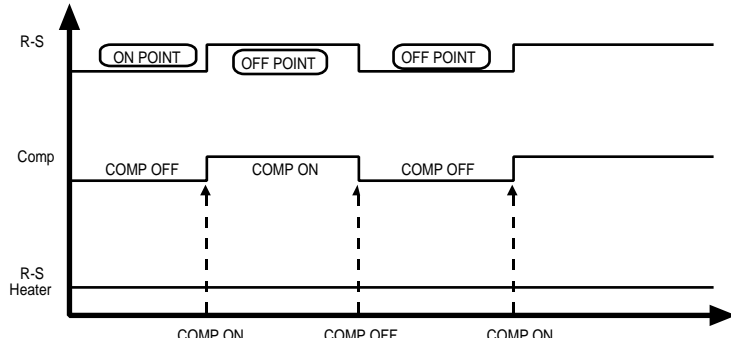
## Pcb Control Functions

NO	CONTROL FUNCTION	CONTENTS																										
7	Initial Defrost	1) When Power is on, Check the D-SENSOR temp. 2) Condition: Less than 3.5 deg for D-SENSOR																										
8	COMP Restart prevent	1) RT-S 24: The comp can't be on within 30 min after comp. off 2) RT-S>25: The comp can't be on within 6 min after comp. off																										
9	Control in R1 error	In R sensor open/short error, Comp. and fan are controlled by time as following:  <table border="1" style="width: 100px; height: 60px; margin: 10px auto;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>																										
10	Error code	1) D1 error 1- Display: Freezer red LED is on and off one time 2- Condition: It happens when D sensor is open or short  2) D2 error 1- Display: Freezer red LED is on and off two times 2- Condition: 80 min in defrost position. (defrost problem)  3) R1 error 1- Display: Refrigerator red LED is on and off one time 2- Condition: It happens when R sensor is open or short  4) RT error 1- Display: Refrigerator red LED is on and off two times 2- Condition: It happens when RT sensor is open or short  <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Display contents</th> <th>LED on/off Output</th> </tr> </thead> <tbody> <tr> <td>D1 ERROR</td> <td></td> </tr> <tr> <td>D2 ERROR</td> <td></td> </tr> <tr> <td>R1 ERROR</td> <td></td> </tr> <tr> <td>R2 ERROR</td> <td></td> </tr> </tbody> </table>	Display contents	LED on/off Output	D1 ERROR		D2 ERROR		R1 ERROR		R2 ERROR																	
Display contents	LED on/off Output																											
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R2 ERROR																												
11	SUPER option	PURPOSE: Protection of OVER-COOL in CRISP  <div style="display: flex; align-items: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">N°</th> <th colspan="2">CONTROL</th> <th rowspan="2">Application (M-PCB)</th> <th rowspan="2">Micom inout Voltage (6PIN)</th> <th rowspan="2">Etc.</th> </tr> <tr> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-0.5°C</td> <td>-4.5°C</td> <td>-</td> <td>0 V</td> <td>Default</td> </tr> <tr> <td>2</td> <td>0.53°C</td> <td>-3.5°C</td> <td>J6 cut</td> <td>2.5 V</td> <td>1.0 deg</td> </tr> <tr> <td>3</td> <td>1.5°C</td> <td>-2.5°C</td> <td>J6, R29 cut</td> <td>5V</td> <td>2.0 deg</td> </tr> </tbody> </table> </div>	N°	CONTROL		Application (M-PCB)	Micom inout Voltage (6PIN)	Etc.	ON	OFF	1	-0.5°C	-4.5°C	-	0 V	Default	2	0.53°C	-3.5°C	J6 cut	2.5 V	1.0 deg	3	1.5°C	-2.5°C	J6, R29 cut	5V	2.0 deg
N°	CONTROL			Application (M-PCB)	Micom inout Voltage (6PIN)				Etc.																			
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NO	CONTROL FUNCTION	CONTENTS																								
12	R-sensor off point adjusting option	<p>- When refrigerator is over-cool or weak-cool, it is adjusted the option condition by R42 and R43(after deleting j7)</p>  <table border="1" data-bbox="986 474 1425 745"> <tr> <td>Micom input (V)</td> <td>0V</td> <td>1.0V</td> <td>1.5V</td> <td>2.0V</td> <td>2.5V</td> <td>3.7V</td> <td>5.0</td> </tr> <tr> <td>Off point variation (deg)</td> <td>-0.5 °C</td> <td>1.0</td> <td>2.0</td> <td>3.0</td> <td>1.0</td> <td>2.0</td> <td>3.0</td> </tr> <tr> <td>R42, R43 (KG)</td> <td>default</td> <td>R42:40 R43:10</td> <td>R42:23.3 R43:10</td> <td>R42:163 R43:10</td> <td>R42:10 R43:10</td> <td>R42:3.5 R43:10</td> <td>R42:10 R43:-</td> </tr> </table>	Micom input (V)	0V	1.0V	1.5V	2.0V	2.5V	3.7V	5.0	Off point variation (deg)	-0.5 °C	1.0	2.0	3.0	1.0	2.0	3.0	R42, R43 (KG)	default	R42:40 R43:10	R42:23.3 R43:10	R42:163 R43:10	R42:10 R43:10	R42:3.5 R43:10	R42:10 R43:-
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13	Functions of low temperature	<ol style="list-style-type: none"> <li>1) Low temp.: RT SENSOR 24°C</li> <li>2) Hysteresis DIFFERENCE: 1°C             <ol style="list-style-type: none"> <li>1- Mode of low temp. : RT SENSOR 24°C</li> <li>2- Mode of general temp.: RT SENSOR 25°C</li> <li>3- Mode of just before control : 24 RT-S&lt;25°C                 <ol style="list-style-type: none"> <li>ex) 1- Mode of general control when is arriving to 24°C</li> <li>2- Mode of low control when is arriving to 25°C</li> </ol> </li> </ol> </li> <li>3) Control             <ol style="list-style-type: none"> <li>1- When comp. is on, R-s HTR is off</li> <li>2- The comp can't be on whiting 30 min after comp. off</li> <li>3- At general temp. Mode of RT error, R-s HTR is off</li> <li>4- At low temp. mode, R-s off point increase 2 degrees (ex) -0.5 to 1.5 C</li> </ol> </li> <li>4) R-s heater initial Operation             <ol style="list-style-type: none"> <li>1- R-s heater turn on and off four times for 8 sec.</li> </ol> </li> </ol>																								
14	Time charts of low temperature	<ol style="list-style-type: none"> <li>1. LOW RT MODE (RT-S 24°C )             <ol style="list-style-type: none"> <li>A) D-S 3.5°C &amp; R-S ON point condition (Initial operation)</li> </ol> </li> </ol> 																								

NO	CONTROL FUNCTION	CONTENTS
15	Time charts of low temperature	<p>B) D-S 3.5°C &amp; R-S OFF point condition (Initial operation)</p> <p>C) D-S 3.5°C &amp; R-S ON point condition (Initial operation)</p> <p>D) D-S &gt; 3.5°C &amp; R-S OFF point condition (Initial operation)</p>



NO	CONTROL FUNCTION	CONTENTS
15	Time charts of low temperature	<p>E) General mode of Low temp. (RT 24°C)</p>  <p>F) General MODE (RT 25°C): deleting low temp function</p> 



# 14. TROUBLE SHOOTING

## 1. TROUBLE SHOOTING PROCEDURE OF THE BREAKDOWN

SYMPTOM	CHECK POINT	CAUSE	ACTION
LAMP OFF COMP OFF	Power receptable	Power failure	
	power plug	Connection is not good	Adjust
	connectors	Housing connector bad assy, with URT, terminals bent	Adjust
FAN ON COMP OFF	Comp	Short circuit on coil	Replace comp
	PTC relay	Bad connection, bad assembled	Adjust
	running capacitor (R/C)	Bad connection, bad assembled	Adjust
LAMP OFF COMP ON	Component	Lamp broken or bad assy	replace it
	Door switch	Door switch broken or bad assy	Adjust
FAN OFF COMP ON	Component	Fan motor broken, fan obstruction replace it	
	connectors	Housing connector bad assy, with URT, terminals bent	Adjust
DEFROST PROBLEMS	Heater	Component broken	replace it
	fuse	broken (find broke down reason)	replace it
	d-sensor/bi-metal	incorrect open/close temperature	replace it
	connectors	Housing connectors bad assy, with URT, terminals bent	adjust
	M-pcb	htr relay broken	replace it
	Timer	timer broken or bad connection	Adjust
UNDERCOOLING	Temperature control	The control button setting is not proper	set temp
	closing/opening door	Closing/opening door is too frequent, or door is open	close door
	Food storage conditions	Excesive storage	Arrange
		Hot food has been stored	Prevent this
	Food location	Food close outlet air ducts	Reorganizate food
	Location setting	Ref is located under direct sun light or heat.	Move it
		Surrounding is blocked (no gap between walls)	Move it
	Electric problems	Compressor, sensor, thermostat problems	General inspection
	Air circulation	Air ducts obstruction	Clean and repair
	Fan	Fan broken or obstructed	Replace it
	Refrigerant	Low charge	Recharge
		Gas leak	Repair/recharge
Lamp	Lamp always on because door switch problems	Adjust	
OVER COOLING	Temperature control	The control button setting is not proper	set temp
	Food location	The wet food is placed in front of the outlet of the duct	Reorganizate food
	R-sensor, thermostat	Componet broken or disadjusted	replace
	Chilled case	(Chilled case has 0°C under specification)	

### CONFIRMATION PROCEDURE ON REFRIGERANT INSUFFICIENT

SYMPTOM	DECISION	REPAIRS
Complete leaking	Remove louver a and b. No frost will be produced at the inlet of evaporator after passing approximately 4 minute operation of the comp	- Check for a leakage after vacuuming
Refrigerant insuficient	1) Frost condition: frost condition in the inlet pipe is extremely different from the outlet pipe.	- Inject proper amount of refrigerant
	2) Measurement of the temperature: When the inside temperature is stable, a 5°C temperature difference occurs between the inlet pipe and the outlet pipe.	