

S/M No. : FR580NT010

DAEWOO

Service Manual

Refrigerator

Model: FR-580N/NT
FR-660N/NT



DAEWOO ELECTRONICS CO., LTD.

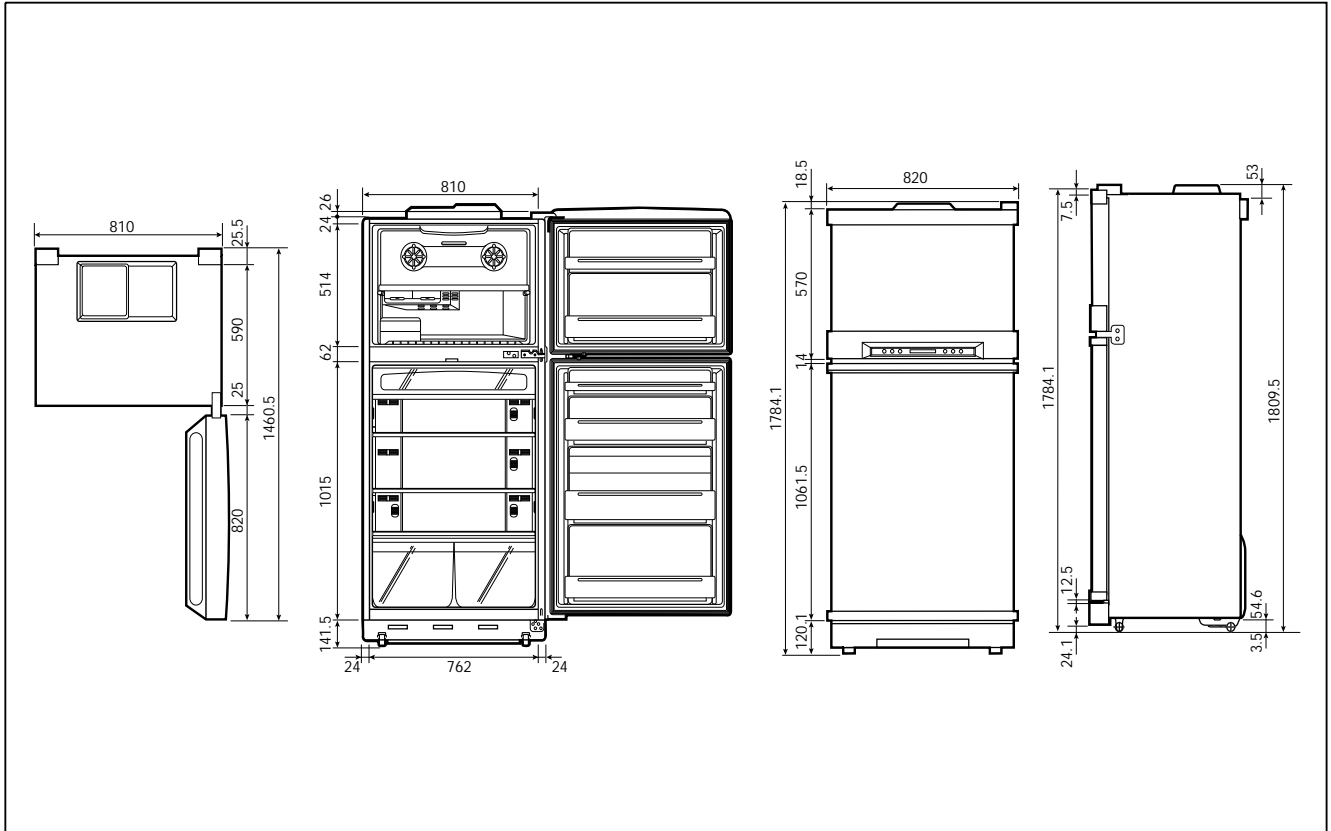
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1. SPECIFICATION

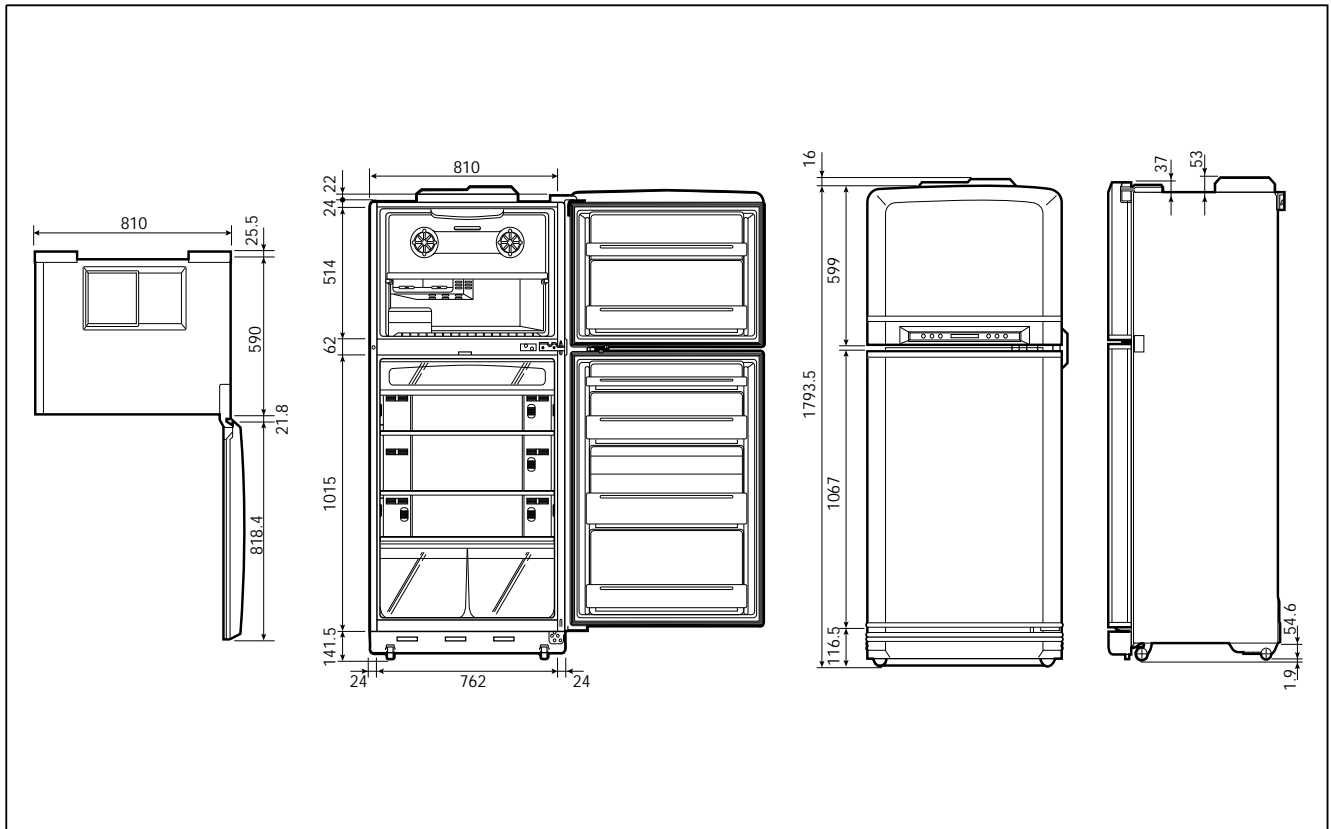
MODEL NAME		FR-580N	FR-580NT	FR-660N	FR-660NT
Refrigerant	R12	200g	200g	200g	200g
	R134a	160g	160g	160g	160g
Cooling System		Fan Cooling Convection			
Refrigeration System		Air Forced Convection			
Defrost System		Fin Evaporator Forced			
Defrost Operation		Automatic Start & Stop			
Cold Control		Adjustable Button			
Capacity	Freezer	133 ℓ	133 ℓ	147 ℓ	147 ℓ
	Refrigerator	337 ℓ	337 ℓ	352 ℓ	352 ℓ
	Total	470 ℓ	470 ℓ	499 ℓ	499 ℓ
External Dimension	Height	1784mm	1787mm	1784mm	1787mm
	Width	820mm	821mm	820mm	821mm
	Depth	692mm	703mm	732mm	743mm
Net Weight		97Kg	101Kg	100Kg	104Kg

2. EXTERNAL VIEWS

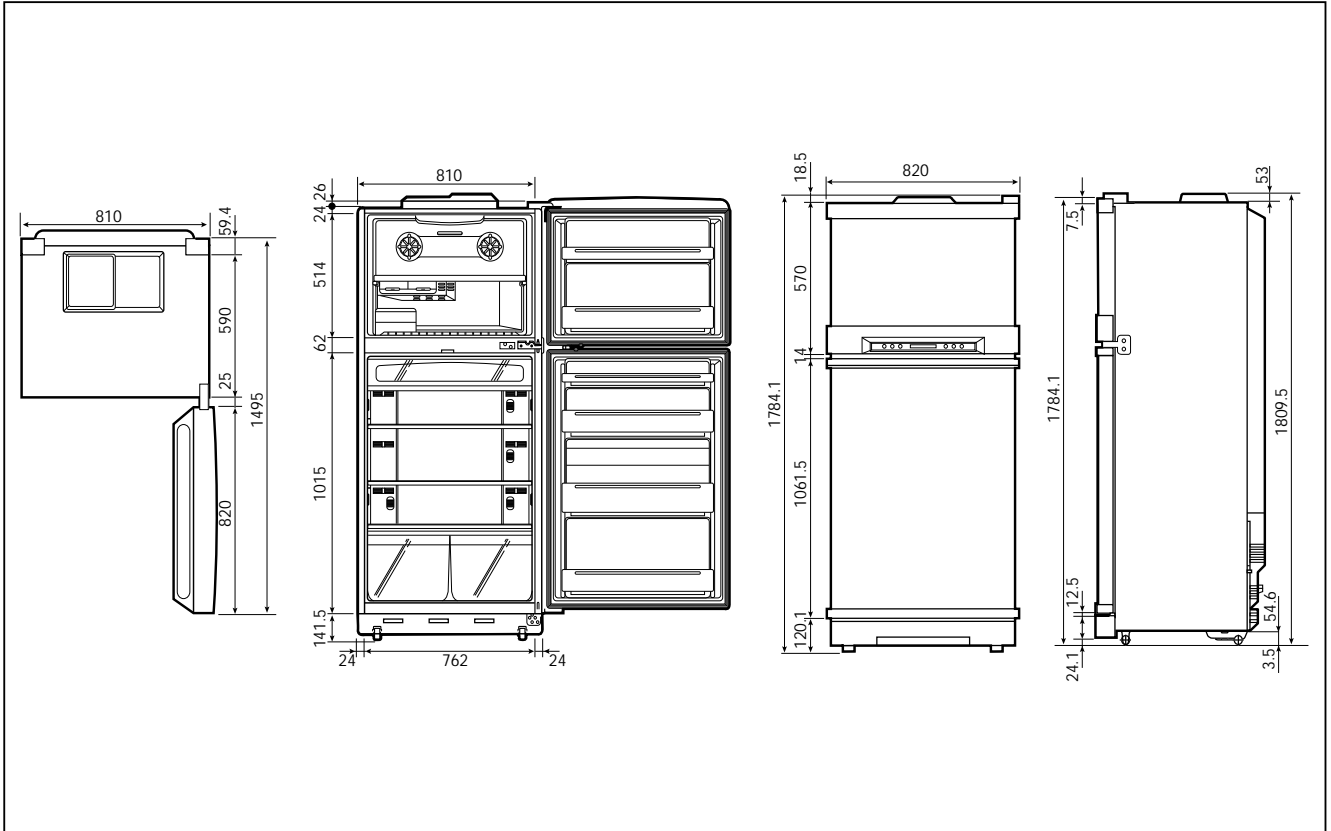
1. FR-580N



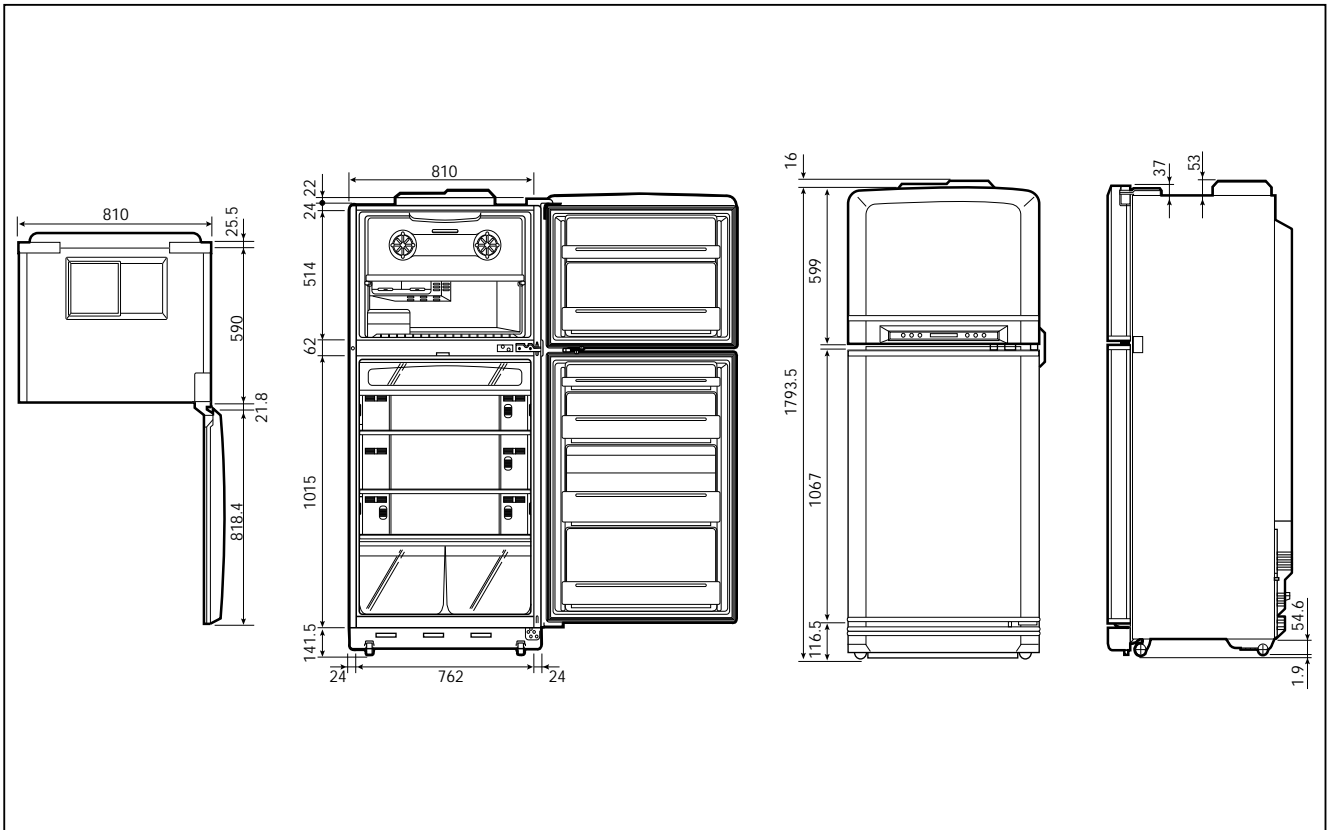
2. FR-580NT



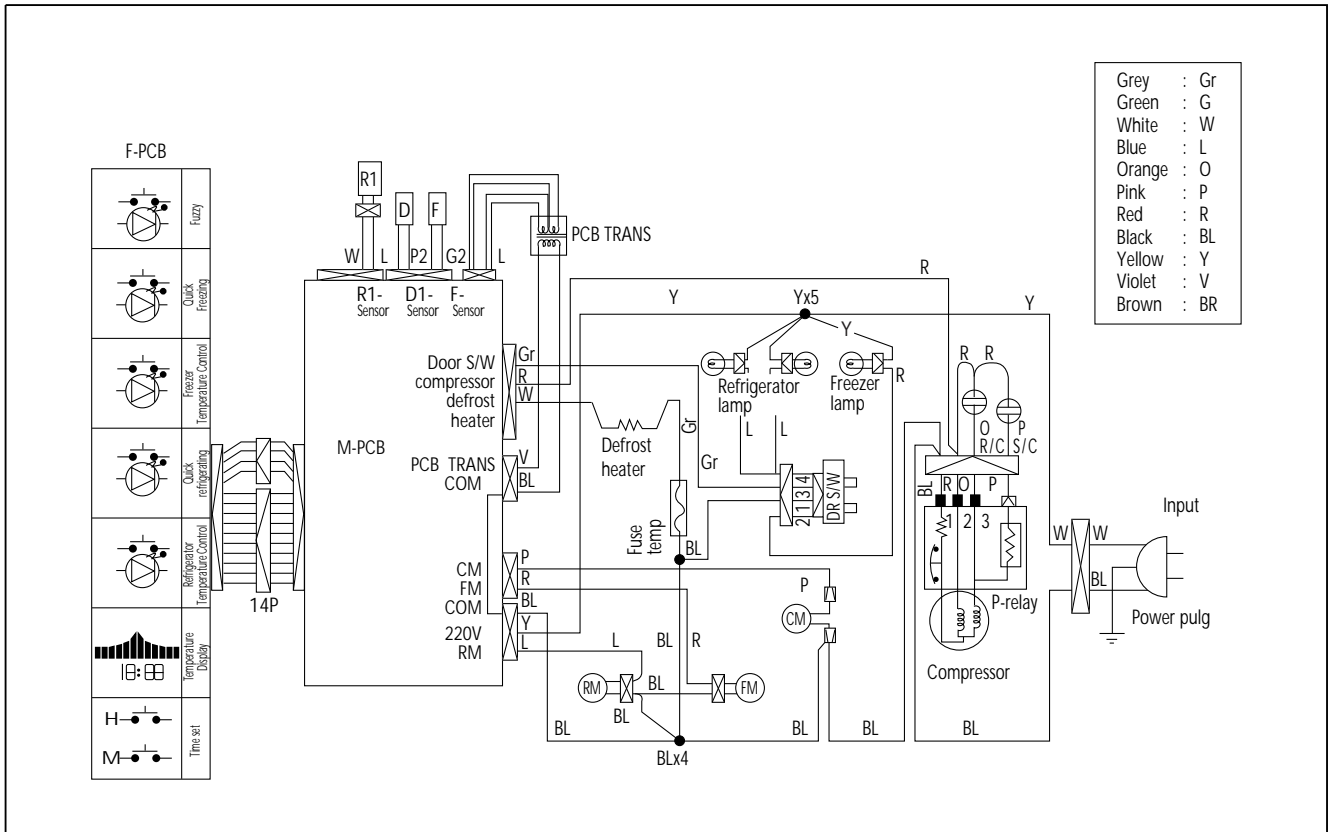
3. FR-660N



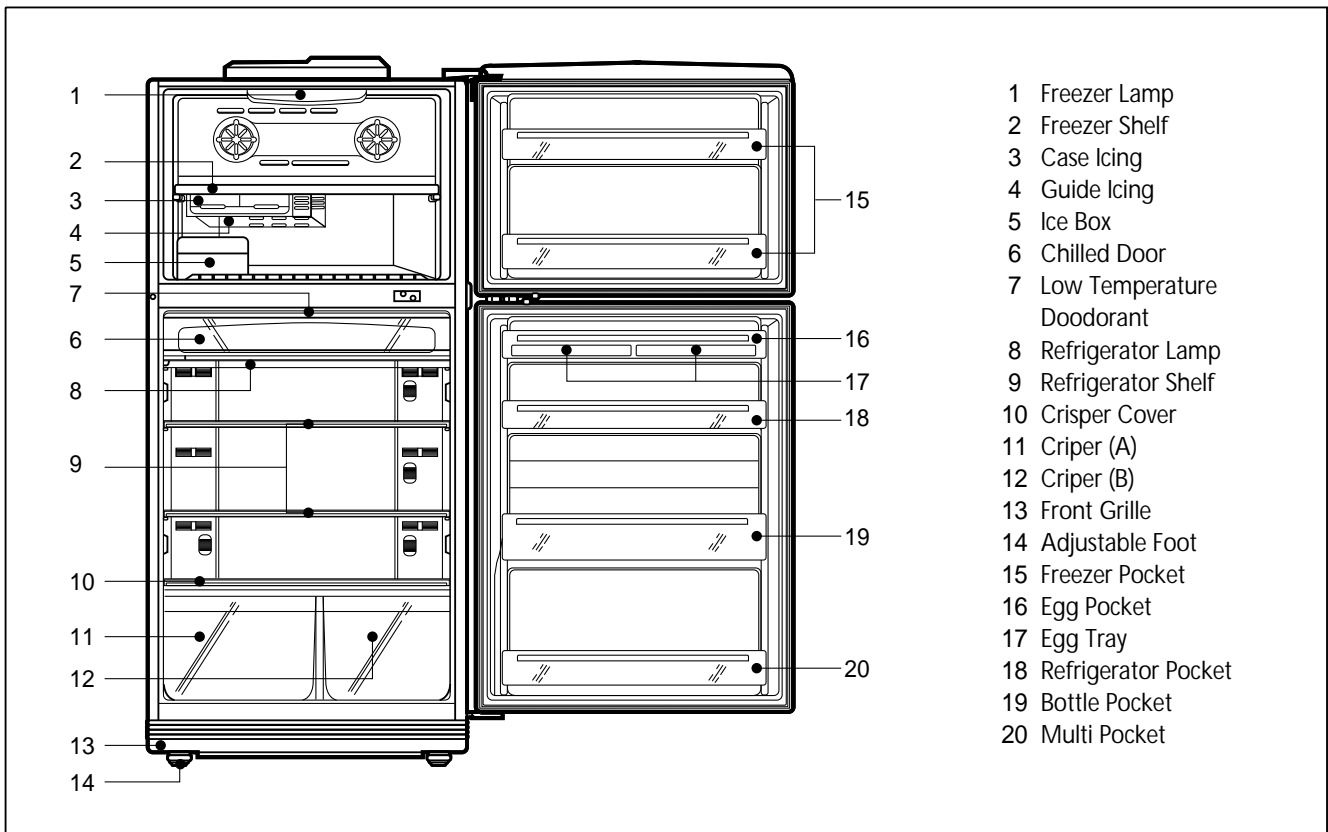
4. FR-660NT



3. WIRE DIAGRAM



4. NAME OF PARTS



5. AIR FLOW DIAGRAM

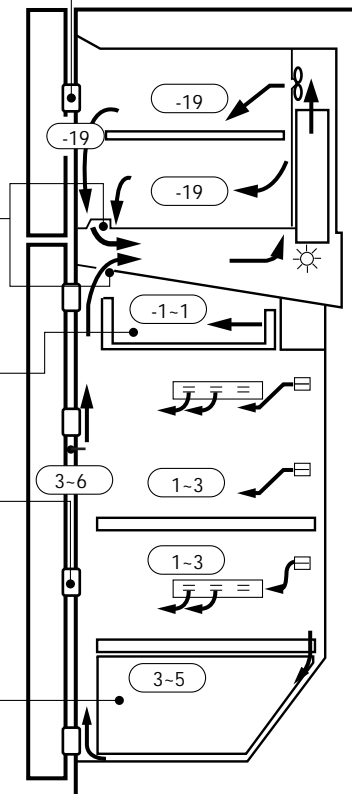
Freezer pocket
 Please don't put long term storing items such as ice cream etc. It might be melted because of opening the door frequently.

Inlet of cooling air
 It should not be blocked with food etc. as it is the inlet where cooling air returns.

Chilled room
 It is good for the storage of fishes and meats.

Refrigerator pocket
 It is good for the storage of beer and beverage etc.

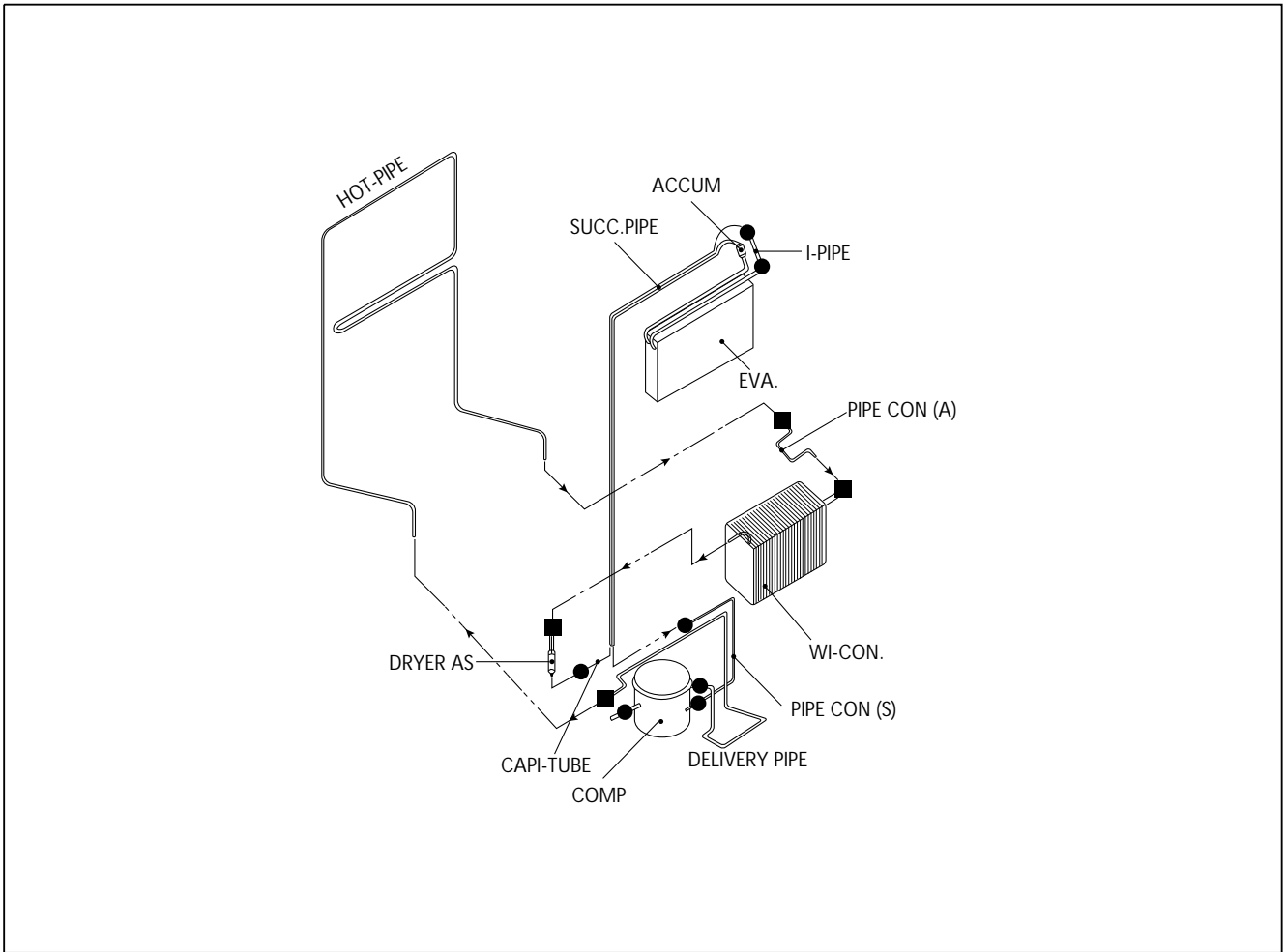
Crisper
 It is suitable to store vegetable and fruit.
 The moisture panel which is attached to the cover maintains the humidity properly.
 Vegetable and fruit would be better to be packed with clean wrap foils.



Freezer
 Please don't put bottles such as beer, beverage etc. It might be broken because of freezing.

Multiple outlet of cooling air
 Please don't put in vegetable etc, which contain moisture. It might be frozen because of low temperature.

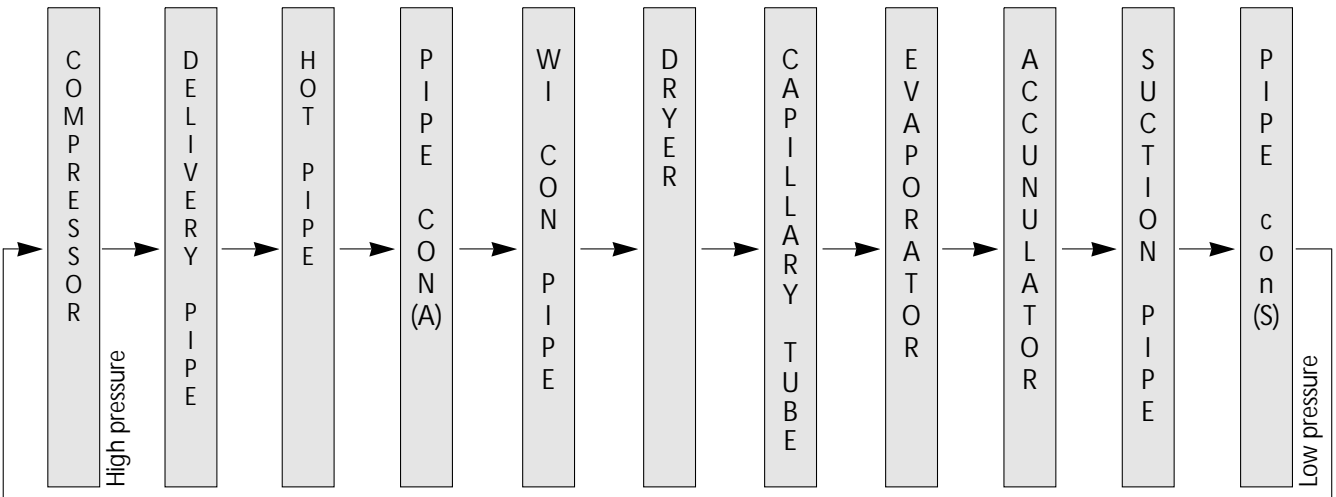
6. REFRIGERANT CYCLE DIAGRAM



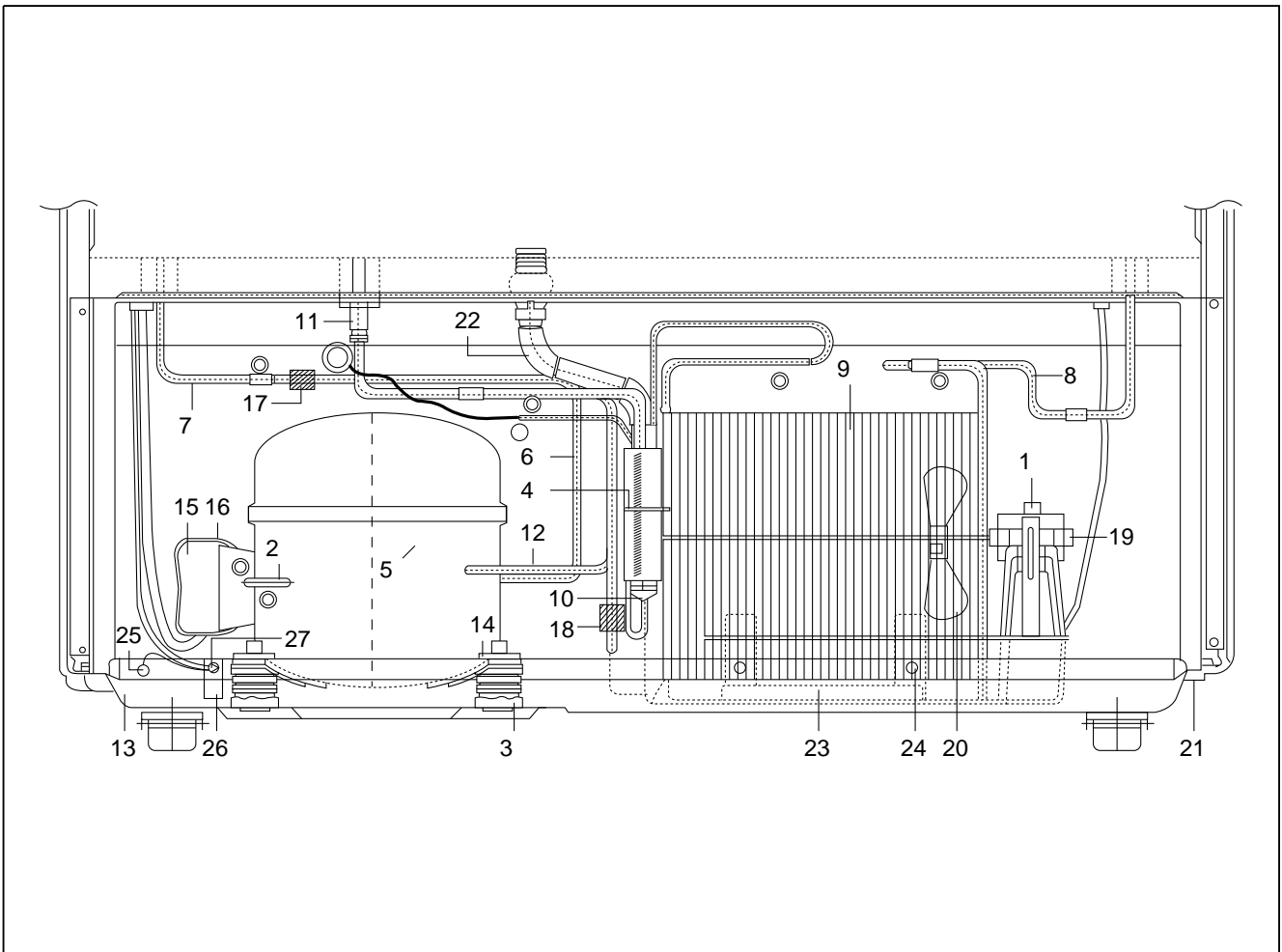
◆ Welding Specifications

i	WELD 5% SILVER
§	WELD 35% SILVER

◆ Freezing Cycle



7. MACHINE ROOM VIEW AND PART LIST



NO	PART NAME	NO	PART NAME	NO	PART NAME
1	FIXTURE C MOTOR AS	10	DRYER	19	MOTOR C
2	PIPE SERVICE	11	PIPE SUCTION AS	20	FAN
3	ABSORBER	12	PIPE SUC CONN	21	BOLT SPECIAL
4	CABLE TIE	13	BASE COMP AS	22	HOSE DRN B
5	COMPRESSOR	14	WASHER SPECIAL	23	CASE VAPORI
6	PIPE CONN A	15	SWITCH P-RELAY AS	24	SCREW TAPPING
7	PIPE HOT	16	CLAMP BAND RELAY	25	SCREW MACHINE
8	PIPE CONN B	17	ABSORBER PIPE B	26	CORD POWER AS
9	PIPE WICON AS	18	ABSORBER PIPE A	27	SCREW TAPPING

8. MAIN COMPONENTS

1. COMPRESSOR

Refrigerant	R12							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Comp. model	X	BL27YE-3	←	BL27YE-2	SL28YE-5	PL25YE-4	SL28YE-5	←
Part code	X	3952127A30	←	3952127A20	3954128A50	3956125A40	3954128A50	←
Strating type	X	CSR	←	CSR	RSIR	RSCR	RSIR	←

Refrigerant	R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Comp. model	X	HBL27YE-3	←	X	HSL27YE-5	X	HSL27YE-5	←
Part code	X	3952127G30	←	X	3954128G50	X	3954128A50	←
Strating type	X	CSR	←	X	RSIR	X	RSIR	←

2. RELAY ASSEMBLY

Refrigerant	R12							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Relay model	X	444THBZZ-52	←	←	276THBYY-52	197SHBYY-52	276THBYY-52	←
Part code	X	3018111900	←	3018112500	3018112800	3018113000	3018112800	←

Refrigerant	R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Relay model	X	783RHBZZ-52	←	X	276THBYY-52	X	276THBYY-52	←
Part code	X	3018112700	←	X	3018112800	X	3018112800	3018112800

3. RUNNING CAPACITOR

Refrigerant	R12							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	230V/10 μ F	←	300V/7 μ F	X	350V/5 μ F	X	X
Part code	X	400EL15130	←	386100400	X	400EL15110	X	X

Refrigerant	R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	230V/10 μ F	←	300V/7 μ F	X	X	X	X
Part code	X	400EL15130	←	386100400	X	X	X	X

4. STARTING CAPACITOR

Refrigerant	R12							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	200V/100μF	←	←	X	350V/25μF	X	X
Part code	X	3016400100	←	←	X	400EL16110	X	X

Refrigerant	R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	200V/100μF	←	←	X	290V/50μF	X	X
Part code	X	3016400100	←	←	X	4124G62020	X	X

5. F-FAN MOTOR

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	ORM-1001L1 IS-3211DWBFN	←	ORM-1001D1 IS-3211DWBVF	ORM-1001B2 IS-23211DWBFR	ORM-1005B1 IS-23211DWBFI	ORM-1001H2 IS-3211DWBFT	←
Part code	X	3015902520	←	3015902530	3015902540	3015902510	3015902550	←

6. R-FAN MOTOR

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	ORM-1002L1 IS-3211DWBFM	←	ORM-1002D1 IS-3211DWBFU	ORM-1002B2 IS-3211DWBFO	ORM-1006B1 IS-23211DWBFE	ORM-1002H2 IS-3211DWBFS	←
Part code	X	3015902620	←	3015902630	3015902640	3015902610	3015902650	←

7. C-FAN MOTOR

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	RF111EAC03	←	RF111SAC03	RF111BAC03	RF111GAC03	RF111HAC03	←
Part code	X	3015902720	←	3015902730	3015902740	3015902700	3015902750	←

8. DEFROST HEATER

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	180W	←	←	180W	←	←	←
Part code	X	3010006721	←	←	3010006711	←	←	←

9. LAMP ASSEMBLY

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	120V/15W	←	←	240V/15W	←	←	←
Part code	X	3013600010	←	←	3013600030	←	←	←

10. PCB TRANSFORMER

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Part code	X	5EPK057660	←	5EPK057621	5EPK057670	←	5EPK057710	5EPK057680

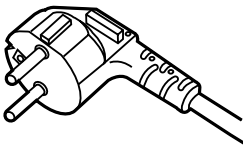
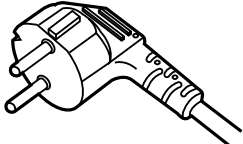
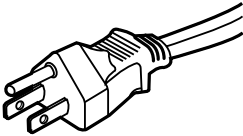
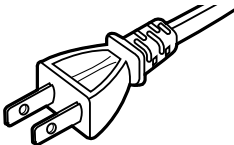
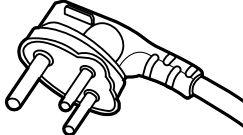
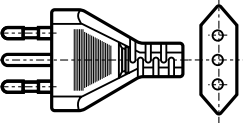
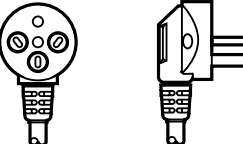
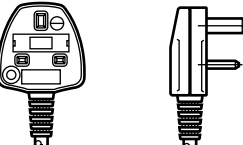
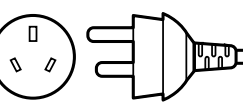
11. MAIN PCB ASSEMBLY

Refrigerant	R12, R134a							
Voltage	100V/50,60Hz	110V/60Hz	115, 120V/60Hz	127V/60Hz	220V/50Hz	220V/60Hz	230V/50Hz	240V/50Hz
Spec.	X	N803	←	←	←	←	←	←
Part code	X	3014303520	←	←	3014302501	←	←	←

12. DRYER

Refrigerant	R12	R134a
Spec.	10 g	15 g
Part code	3016802100	3016801211

POWER CORD SPECIFICATION

NO	SHAPE OF POWER CODE	PART CODE	DESCRIPTION	REMARK
1		3011315000	CP-2PIN	FOR EUROPEAN COUNTRY
2		401RA17200	CP-2PIN	FOR OTHER COUNTRY
3		4006D17101	KP-30	FOR AMERICA
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 for lead wire, without any kinds of terminal or housing.

9. DOOR COLOR SPECIFICATION

1. ASSEMBLY URETHAN FREEZER DOOR

1) FR-580N, 660N

Refrigerant	R12				R134a			
	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM
Part code	X	X	X	PWFT005A40	X	X	X	PWFT005A50

2) FR-580NT, 660NT

Refrigerant	R12				R134a			
	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM
Part code	X	X	X	PWFT005A20	X	X	X	PWFT005A30

2. ASSEMBLY URETHAN REFRIGERATOR DOOR

1) FR-580N, 660N



Refrigerant	R12				R134a			
	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM
Part code	X	X	X	PWRT005A40	X	X	X	PWRT005A50

1) FR-580NT, 660NT

Refrigerant	R12				R134a			
	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM	Dull lamina sheet	High glossy lamina sheet	Normal PCM	High glossy bright PCM
Part code	X	X	X	PWRT005A20	X	X	X	PWRT005A30

COLOR TABLE

1. PCM type

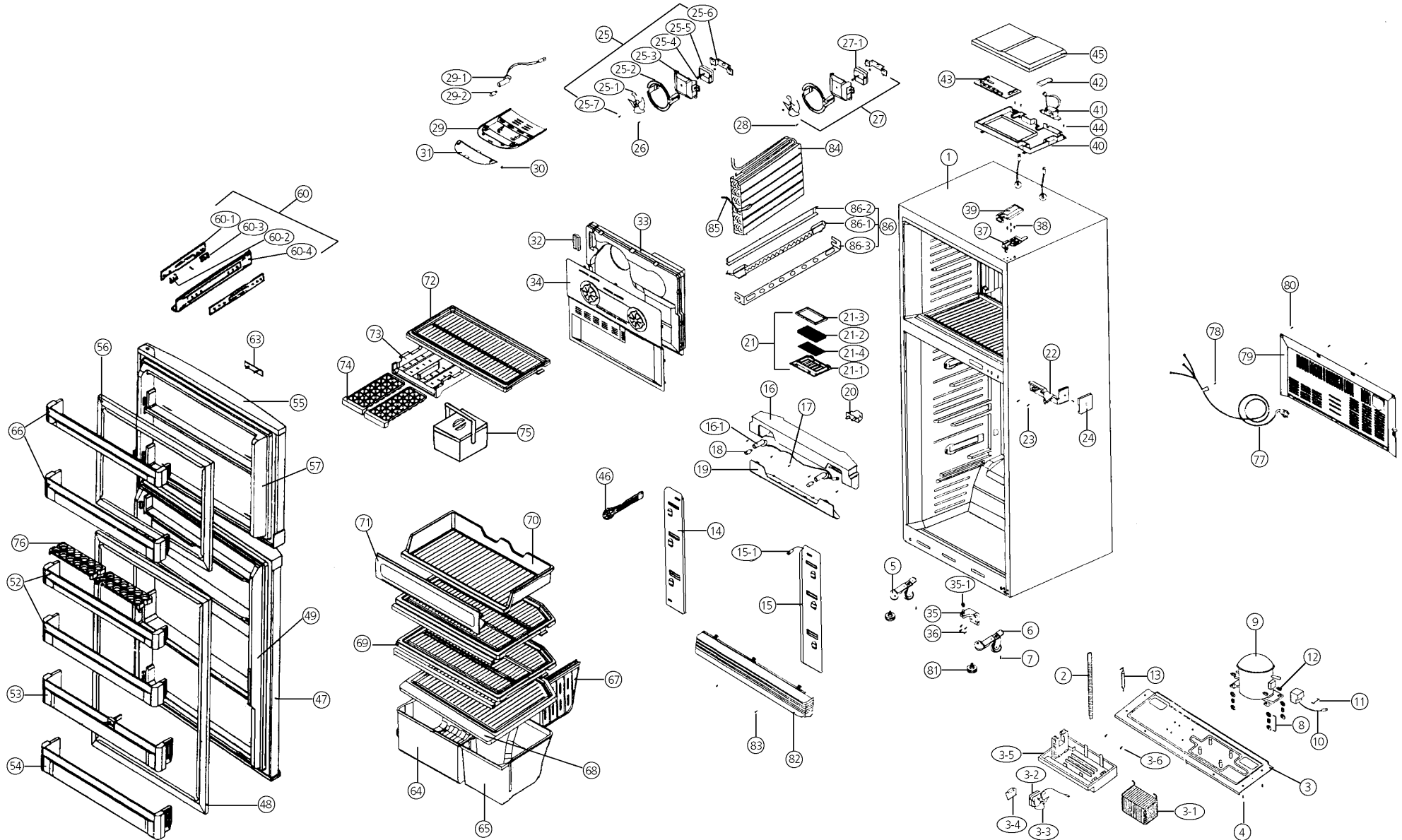
NO	COLOR CHIP	COLOR NAME
1		P/WITH (WH069)
2		'94 L/GRAY (GY158)
3		'95 L/GRAY (GY259)
4		'94 M/GRAY (GY331)
5		'95 M/GRAY (GY335)
6		'97 M/GRAY (GY267)
7		M. D/GRAY (GY750)
8		N/BLUE (BL718)
9		MINT GREEN (GN206)
10		'97 BEIGE (BE215)

2. Lamina sheet type

NO	COLOR CHIP	COLOR NAME
1		P/WITH (WH069)
2		'94 L/GRAY (GY158)
3		'95 L/GRAY (GY259)
4		'94 M/GRAY (GY331)
5		'95 M/GRAY (GY335)
6		'97 M/GRAY (GY267)
7		M. D/GRAY (GY750)
8		N/BLUE (BL718)
9		MINT GREEN (GN206)
10		S/GOLD
11		G/GREEN

10. EXPLODED VIEWS AND PARTS LIST

1. Exploded views



2. Parts list

1) FR-580N, 660N

NO	PART NAME	PART CODE		DESCRIPTION	Q'ty	REMARK
		FR-580N	FR-660N			
35	ASSY *U HI	30100A0180	←		1	
37	HINGE *T AS	3012907600	←		1	
39	COVER *T HI	3011419900	←	PP	1	
47	ASSY R DR TOTAL				1	REFER TO # 13
49	ASSY R DR LINER	3010036020	←	ABS	1	
53	POCKET BOTTLE	3011406901	←	GP	1	
55	ASSY F DR TOTAL				1	REFER TO # 13
57	ASSY F DR LINER	3010038720	←	ABS	1	
82	COVER CAB BRKT	3019000801	←	ABS	1	

¥All other parts except the above part list are same as 580NT and 660NT.

The exploded view may be a little different in shapes from the NT standard type.

2) FR-580NT, 660NT

NO	PART NAME	PART CODE		DESCRIPTION	Q'ty	REMARK
		FR-580NT	FR-660NT			
1	ASSY CAB URT				1	
2	HOSE DRAIN (B)	3013202200	←	PP	1	
3	BASE COMP AS	3010309100	←		1	
3-1	PIPE WI-CON AS	3014415500	←		1	
3-2	MOTOR C AS				1	REFER TO # 10
3-3	FAN	3011800400	←	ABS (φ 110mm)	1	
3-4	FIXTURE C MOTOR AS	3012006000	←		1	
3-5	CASE VAPORI	3011111700	←	PP	1	
3-6	SCREW TPING	7112401211	←	T1 TRS 4 x12 MFZN	2	
4	SPECIAL BOLT	3016003300	←	T2 6.5 x 20	4	
5	FOOT *F *L AS	3012700700	←		1	
6	FOOT *F *R AS	3012100600	←		1	
7	BOLT HEX	3016000700	←	M6 x 15	2	
8	ABSORBER COMP AS	3010101440	←		4	
9	COMPRESSOR				1	REFER TO # 9
10	SWITCH P RELAY AS				1	REFER TO # 9
11	RELAY BAND	3816100100	←	SK-5 T0.7	1	
12	SPECIAL WASHER	3016002500	←	SK-5 T0.8	4	
13	DRYER AS				1	REFER TO # 11
14	ASSY R*S LUVR *L	3010028804	3010028814		1	
15	ASSY R*S LUVR *R	3010028822	3010028832		1	
15-1	SENSOR R1 AS	3014701140	←		1	

NO	PART NAME	PART CODE		DESCRIPTION	Q'ty	REMARK
		FR-580NT	FR-660NT			
16	DUCT CHILD AS	3010029532	3011128931		1	
16-1	SOCKET R LAMP AS	3017900860	←		1	
17	SCREW TAPPING	7112401611	←	T2 TRS 4 x 16 MFZN	3	
18	LAMP AS				2	REFER TO # 11
19	WINDOW R	3015501600	3015500800	GPPS	1	
20	SWITCH DR	3018100020	←	2BUTTON/4PIN	1	
21	CASE DEO AS	3011101800	←		1	
21-1	CASE DEO AS	3011102501	←	PP	1	
21-2	DEODORANT	3018700600	←		1	
21-3	SEALING DEO	3017714600	←	F-US	1	
21-4	DEODERANT SHEET	3018700700	←		1	
22	HINGE *M AS	30100A0170	←	SCP-1 T3.2	1	
23	SPECIAL BOLT *M	3016001220	←	6B-1 6 x 20	4	
25	MOTOR F AS				1	
25-1	FAN	3011800400	←	ABS (ϕ 110mm)	1	
25-2	MOUSE BELL	3018500100	←	HIPS	1	
25-3	COVER MOTOR C	4017Z32233	←	HIPS	1	
25-4	ABSORBER MOTOR	4017Z08430	←	EPR-B3(H40)	1	
25-5	MOTOR F				1	REFER TO # 10
25-6	COVER MOTOR B	4017Z32244	←	HIPS	1	
25-7	FIXTURE FAN	4004Q10060	←	STS27	1	
26	SCREW TAPPING	7112401611	←	T2 TRS 4 x 16 MFZN	2	
27	MOTOR R AS				1	
27-1	MOTOR R				1	REFER TO # 10
28	SCREW TAPPING	7112401611	←	T2 TRS 4 x 16 MFZN	2	
29	COVER F M/F DUCT A	3011406600	3011414300	ABS	1	
29-1	SOCKET *F LAMP AS	3017900820	←	250V/1A	1	
29-2	LAMP AS				1	REFER TO # 11
30	SCREW TAPPING	7112401611	←	T1 TRS 4 x 12 MFZN	2	
31	WINDOW F	3015500400	←	GPPS	1	
32	BRACKET F SENS	4017Z29010	←	SCP-1 T3.2	1	
33	INSULATOR F LOUVER AS	3013321400	←	F-PS	1	
34	LOUVER F AS	3018903400	←	PP	1	
35	ASSY *U HI	3012900130	←		1	
35-1	WASHER PLAIN	7400108511	←	PW-1-8.5	1	
36	SPECIAL BOLT	3016001201	←	6B-1 6 x 20	4	
37	HINGE *T AS	3012907800	←		1	
38	SPECIAL BOLT T/U	3016001230	←	6B-1 6 x 20	4	
39	COVER *T HI	3011417400	←	PP	1	
40	BOX M/PCB	3010511700	←	PP	1	
41	TRANS POWER				1	REFER TO # 11
42	CAPACITOR				1	REFER TO # 9
43	PCB MAIN AS				1	REFER TO # 11
44	SCREW TAPPING	7112401211	←	T1 TRS 4 x 12 MFZN	3	
45	COVER M/PCB BOX	3011425300	←	PP	1	

NO	PART NAME	PART CODE		DESCRIPTION	Q'ty	REMARK
		FR-580NT	FR-660NT			
46	COVER CUBIC/C	3011424400	←	ABS	4	
47	ASSY R DR TOTAL				1	REFER TO # 13
48	GASKET R DR AS	3012302610	←	PVC+MAGNET	1	
49	ASSY R DR LINER	3010036000	←	ABS	1	
52	POCKET SM	3019002301	←	GP	2	
53	POCKET JUMBO	3018000500	←	GP	1	
54	POCKET M	3019000901	←	GP	1	
55	ASSY F DR TOTAL				1	REFER TO # 13
56	GASKET F DR AS	3012302500	←	PVC+MAGNET	1	
57	ASSY F DR LINER	3010038700	←	ABS	1	
60	ASSY FCP	3010063000			1	
60-1	PCB *F AS	3014303750		ABS	1	
60-2	BUTTON FCP (A)	3016300040	←		1	
60-3	BUTTON FCP (B)	3016300080	←	TT2 BIN 3 x 10 MFZN	1	
60-4	PANEL F CONTROL	3014202610	←	ABS	2	
63	PLATE NAME TANK	3014512500	←	ABS+CR	1	
64	CASE VEGETB A	3011104500	←	SAN	1	
65	CASE VEGETB B	3011101300	←	SAN	1	
66	POCKET F *T	3019001801	←	GP	2	
67	SUPOTR VEGETB COVER	3015301003	←	SAN	1	
68	COVER V/CASE	3011407001	3011404701	SAN	1	
69	SHELF R AS	3010051200	3010051100	SAN	2	
70	CASE CHILD	3011105200	←	SAN	1	
71	DOOR CHILD CASE	3011716700	←	SAN	1	
72	SHELF F	3017808300	3017808400	SAN	1	
73	GUIDE ICING	3011403600	3012504300	HIPS	1	
74	CASE ICING	3011106100	←	PP	2	
75	BOX ICE CASE	4010E99100	←		1	
76	CASE EGG	3011107900	←	SAN	2	
77	CORD POWER AS				1	REFER TO # 12
78	SCREW TAPPING	7112401211	←	T1 TRS 4 x 12 MFZN	1	
79	GRILLE	3012400100	3012400600		1	
80	SCREW TAPPING	7112401211	←	T1 TRS 4 x 12 MFZN	5	
81	FOOT ADJ AS	3012100400	←	PP	2	
82	COVER CAB BRKT	3011419501	←	ABS	1	
83	SCREW TAPPING	7112401211	←	T1 TRS 4 12 MFZN	2	
84	EVAPORATOR	3017000923	←		1	
85	FUSE TEMP AS	3017200101	←	SW-103T (77°C)	1	
86	ASSY D HTR				1	
86-1	HEATER D AS				1	REFER TO # 10
86-2	COVER HTR *T	3011408201	←	AL 1200P-H24 T0.4	1	
86-3	COVER HTR *U	3011408100	←	AL 1200P-H24 T0.4	1	

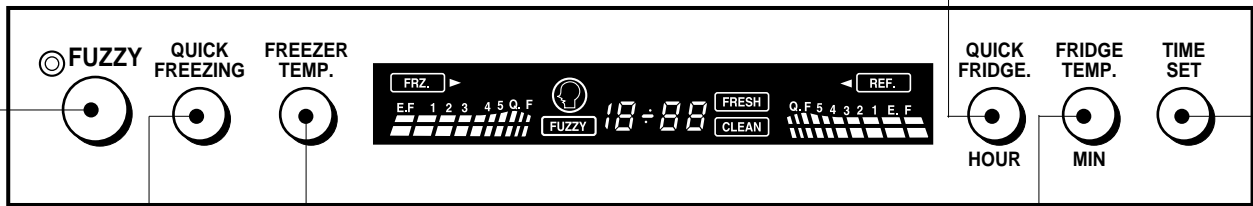
11. ELECTRONIC FUNCTION

1. FR-540N

1) How to use the panel

- The temperature inside the freezer and refrigerator room is controlled automatically according to the customer's purpose of use.
- The temperature inside the freezer and refrigerator room can not be controlled manually. Quick freezing is operative.
- This function continues until the user releases it.

- The comp and fan in the refrigerating room operate for 40 min.
- Quick fridge time appears for the first 5 sec. and then returns to clock time.
- Quick fridge remaining time is shown if the switch is pressed.



- Freezer Temp. can be controlled by the user.
- Not controllable during "FUZZY" mode.
- Initial mode is "3" and pressing the button changes the temp. range as follows:

→ 3 → 4 → 5 → E.F → 1 → 2






- Fridge Temp. can be controlled easily from outside.
- Not controllable during 'FUZZY' mode.
- Initial mode is "3" and pressing the button changes the temp. range as follows:

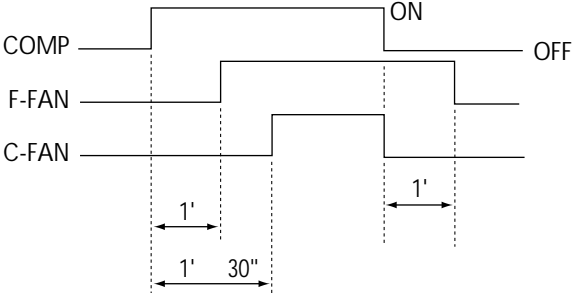



→ 3 → 4 → 5 → E.F → 1 → 2


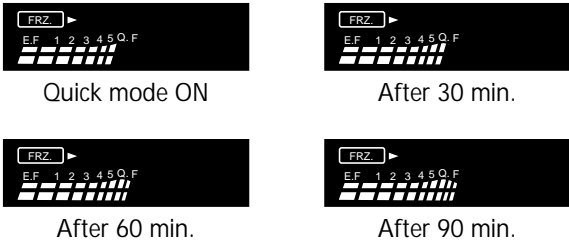

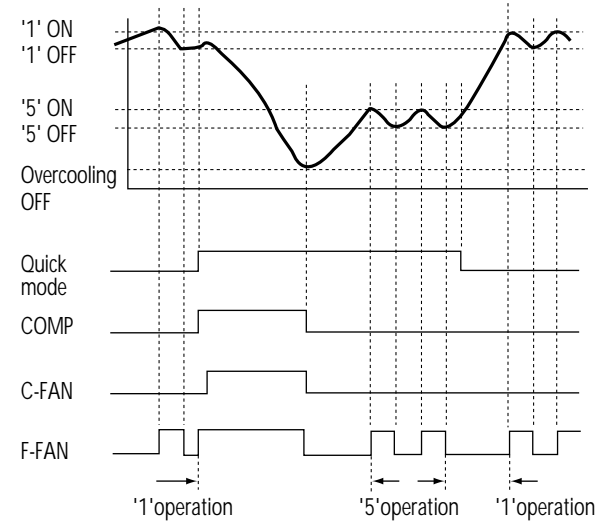


- The comp operates continuously for 150 min. during quick freezing.
- Quick freezing time appears for the first 5 sec and then returns to clock time.
- Quick freezing remaining time is shown if the switch is pressed.






- This button is for setting clock time. "HOUR" and "MIN." can be adjusted at the same time.
- Adjust the time by pressing "HOUR" and "MIN." button.

2) Function table

NO.	Control Function	Control Objects	Contents	Remark
1	Initial operation	Time Temperature control	<p>1. In the initial operation, the temperature of FRZ. and REF. automatically set at 3/3.</p> <p>2. The clock is set at 12:00.</p> 	
2	Clock function	LED	<p>1. The time is set at 12:00 in initial operation.</p> <p>2. Time setting</p> <ol style="list-style-type: none"> 1) When the time set button is pressed, the hour/min. indicator blinks with 0.5 sec. interval. 2) Adjust the time with hour button and min. button. 3) If the clock is set to desired time, press the time set button again. 4) If the hour and min. button are not used in 5 sec. during the blink, and then the clock setting function is canceled automatically. 	
3	Freezer temperature control	COMP. F-fan C-fan LED	<p>1. The temperature can be controlled by 6 steps with the freezer temperature button.</p> <p>3 → 4 → 5 → E.F → 1 → 2 → 3</p>  <p>2. The bar LED will indicate according to the freezer temperature button. The bar LED is fully illuminated once and then illuminated up to the each temperature level.</p> <p>3. A single upper bar LED on/off according to the COMP. off/on.</p> <p>COMP ON ► </p> <p>COMP OFF ► </p>	

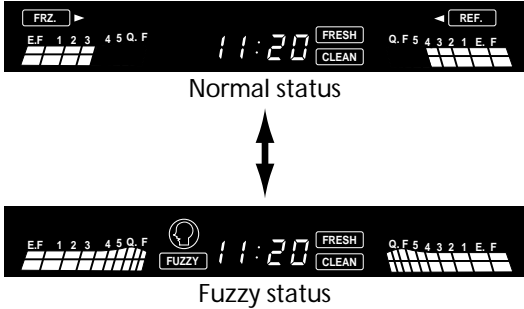

NO.	Control Function	Control Objects	Contents	Remark																					
			<p>4. Time chart of each device.</p>  <p>5. COMP. on/off temperature (Temperature °C/Resistance kΩ)</p> <table border="1" data-bbox="604 824 1278 936"> <thead> <tr> <th></th> <th>E.F</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>COMP. OFF</td> <td>-21/23.6</td> <td>-21/23.6</td> <td>-22/25.0</td> <td>-23/26.4</td> <td>-24/27.9</td> <td>-25/29.6</td> </tr> <tr> <td>COMP.ON</td> <td>-16/17.9</td> <td>-16/17.9</td> <td>-17/18.9</td> <td>-18/20.0</td> <td>-19/21.1</td> <td>-20/22.3</td> </tr> </tbody> </table>		E.F	1	2	3	4	5	COMP. OFF	-21/23.6	-21/23.6	-22/25.0	-23/26.4	-24/27.9	-25/29.6	COMP.ON	-16/17.9	-16/17.9	-17/18.9	-18/20.0	-19/21.1	-20/22.3	
	E.F	1	2	3	4	5																			
COMP. OFF	-21/23.6	-21/23.6	-22/25.0	-23/26.4	-24/27.9	-25/29.6																			
COMP.ON	-16/17.9	-16/17.9	-17/18.9	-18/20.0	-19/21.1	-20/22.3																			
4	Refrigerator temperature control	R-fan LED	<p>1. The temperature can be controlled by 6 steps with the fridge temperature button.</p> <p>3 → 4 → 5 → E.F → 1 → 2 → 3</p>  <p>2. The bar LED will indicate according to the fridge temperature button. The bar LED is fully illuminated once and then illuminated up to the each temperature level.</p> <p>3. A single upper bar LED on/off according to the R-fan off/on.</p> <p>R-FAN ON ► </p> <p>R-FAN OFF ► </p> <p>4. Range of R-fan on/off (Temperature °C/Resistance kΩ)</p> <table border="1" data-bbox="604 1711 1278 1823"> <thead> <tr> <th></th> <th>E.F</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>R-fan off</td> <td>0.7/29.1</td> <td>0.7/29.1</td> <td>-0.3/30.3</td> <td>-1.3/31.6</td> <td>-2.3/33.2</td> <td>-3.3/34.8</td> </tr> <tr> <td>R-fan on</td> <td>2.05/27.4</td> <td>1.05/28.7</td> <td>0.05/30.0</td> <td>-0.95/31.1</td> <td>-1.95/32.7</td> <td>-2.95/34.2</td> </tr> </tbody> </table> <p>5. In case of D-sensor error, R-fan operation is connected with the COMP.</p> <p>6. When the COMP. is off and the temperature of the D-sensor is above -3°C, the R-fan turns off regardless of the R-sensor.</p> <p>7. The R2-sensor is only used in detecting low cooling.</p>		E.F	1	2	3	4	5	R-fan off	0.7/29.1	0.7/29.1	-0.3/30.3	-1.3/31.6	-2.3/33.2	-3.3/34.8	R-fan on	2.05/27.4	1.05/28.7	0.05/30.0	-0.95/31.1	-1.95/32.7	-2.95/34.2	
	E.F	1	2	3	4	5																			
R-fan off	0.7/29.1	0.7/29.1	-0.3/30.3	-1.3/31.6	-2.3/33.2	-3.3/34.8																			
R-fan on	2.05/27.4	1.05/28.7	0.05/30.0	-0.95/31.1	-1.95/32.7	-2.95/34.2																			

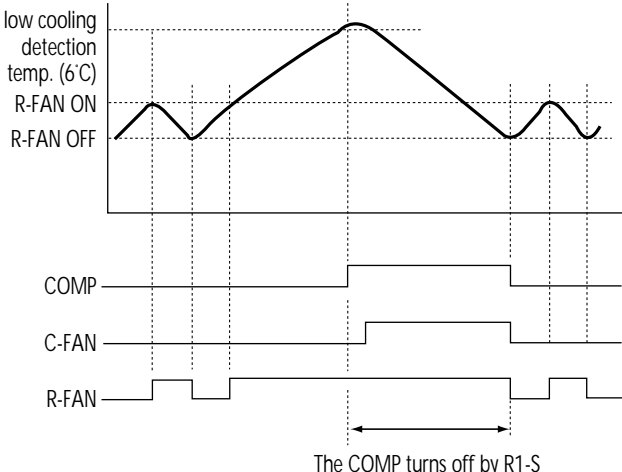
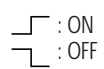

NO.	Control Function	Control Objects	Contents	Remark
5	Quick freezing	COMP. F-fan C-fan LED	<p>1. If quick freezing button is pressed, the clock mode is changed to quick freezing time mode.</p>  <p>2. The bar LED is illuminated 3 times in a row.</p>  <p>3. The COMP., F-fan operate continuously for 150 min.</p> <p>4. If the quick freezing button is pressed during quick freezing mode, the remaining time is indicated on the clock indicator for 5 sec. (After 5 sec. it returns to the current time)</p> <p>5. If press the quick freezing button twice in 5 sec., then quick freezing mode is canceled.</p>	
6	Quick fridge	COMP. F-fan C-fan R-fan LED	<p>1. If press the quick fridge button, the clock mode is changed to quick fridge time mode. (Quick fridge mode is worked for 40 min.)</p>  <p>2. Time chart of the quick fridge mode.</p>  <p>Legend:  : ON  : OFF</p>	



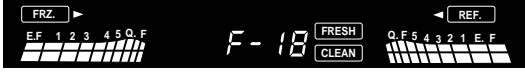
NO.	Control Function	Control Objects	Contents	Remark																								
			<p>3. The bar LED is illuminated 3 times in a row.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Quick mode ON</p> </div> <div style="text-align: center;">  <p>After 30 min.</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;">  <p>After 60 min.</p> </div> <div style="text-align: center;">  <p>After 90 min.</p> </div> </div> <p>4. If the quick fridge button is pressed during the quick fridge mode, then remaining time is indicated on the clock indicator for 5 sec. (After 5sec., it returns to the current time.)</p> <p>5. If press the quick fridge button twice in 5 sec. then quick fridge mode is canceled.</p>																									
7	Fuzzy	COMP. Fan C-fan R-fan LED	<p>1. If the fuzzy button is pressed, the fuzzy indicator is illuminated and the FRZ. and REF. indicator is turned off.</p>  <p>2. The bar LED is fully illuminated twice in a row, and then it is illuminated according to the temperature range.</p> <p>3. If the fuzzy button is pressed again, the fuzzy function is canceled. At the same time, the freezer and fridge temperature level is set 3/3.</p> <p>4. Control the freezer and fridge temperature during the fuzzy function.</p> <p>1) After the power is loaded, accumulated door (freezer and fridge door) open time is recorded every 2 hours for 24 hours. ◆ The data are recorded until the power is off.</p> <p>2) Averaged data are classified according to following table.</p> <table border="1" data-bbox="604 1565 1281 1718"> <thead> <tr> <th>Accumulated door open time</th> <th>Data classification</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>Below 30 sec.</td> <td>MIN. unit(good condition)</td> <td>Rarely opened</td> </tr> <tr> <td>30 sec.-3 min.</td> <td>MID. unit</td> <td></td> </tr> <tr> <td>Above 3 min.</td> <td>MAX. unit (bad condition)</td> <td>Frequently opened</td> </tr> </tbody> </table> <p>3) In fuzzy function, it operates by predicting the condition in 2 hours with above data.</p> <table border="1" data-bbox="604 1803 1281 2013"> <thead> <tr> <th>Data classification</th> <th>Freezer/Fridge temperature</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>MIN. unit</td> <td>2/3</td> <td>'3' when outside temperature is above 26°C</td> </tr> <tr> <td>MID. unit</td> <td>3</td> <td></td> </tr> <tr> <td>MAX. unit</td> <td>3/5</td> <td>'3' when outside temperature is below 14°C</td> </tr> </tbody> </table>	Accumulated door open time	Data classification	Remark	Below 30 sec.	MIN. unit(good condition)	Rarely opened	30 sec.-3 min.	MID. unit		Above 3 min.	MAX. unit (bad condition)	Frequently opened	Data classification	Freezer/Fridge temperature	Remark	MIN. unit	2/3	'3' when outside temperature is above 26°C	MID. unit	3		MAX. unit	3/5	'3' when outside temperature is below 14°C	In fuzzy mode, quick mode is operative.
Accumulated door open time	Data classification	Remark																										
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NO.	Control Function	Control Objects	Contents	Remark																																				
8	Determination of defrost		<p>1. Defrost function is started by the following 4 conditions.</p> <p>Condition 1 : Accumulated COMP. on time (MAX. and MIN. time)</p> <p>Condition 2 : Accumulated door open time (different from the accumulated door open time in fuzzy function)</p> <p>Condition 3 : COMP. operation ratio (calculated by the time divided by 150 min. after defrost)</p> <p>Condition 4 : The door open data every 2 hours interval same as fuzzy function</p> <p>2. Method of determination defrost</p> <div data-bbox="608 804 1281 960" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> </div> <p>ϕ..Order of judgement</p> <ol style="list-style-type: none"> 1) In [C], it goes directly to defrost mode if the COMP. operation ratio from [B] to [C] is over 80%. 2) In [D], it goes directly to defrost mode if the COMP. operation ratio from [B] to [D] is over 80%. 3) In [E], it enters to defrost mode unconditionally. 																																					
9	Defrost function	COMP. F-fan C-fan R-fan Heater	<p>1. Defrost step</p> <table border="1" data-bbox="608 1323 1281 1928"> <thead> <tr> <th></th> <th>Pre-cool</th> <th>R-fan defrost</th> <th>D-heater defrost</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>off</td> <td>on</td> </tr> <tr> <td>F-fan</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>off</td> </tr> <tr> <td>R-fan</td> <td>on</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> </tr> <tr> <td>D-heater</td> <td>off</td> <td>off</td> <td>on</td> <td>off</td> <td>off</td> </tr> <tr> <td></td> <td> ⚡Time : 30 min. ⚡Quick mode is prior </td> <td> ⚡Time : 10 min. ⚡Regardless of door open ⚡If D-sensor temperature is over 10°C, R-fan goes off and it skips to pause step. ⚡Defrost is prior </td> <td> ⚡Time : 90 min. ⚡If D-sensor temperature is over 10°C, D-heater goes off. ⚡If D-sensor is in error, it is on for 45 min. unconditionally ⚡Defrost is prior </td> <td> ⚡Time : 7 min. ⚡Defrost is prior </td> <td> ⚡Time : 5 min. ⚡Defrost is prior </td> </tr> </tbody> </table>		Pre-cool	R-fan defrost	D-heater defrost	Pause	Fan delay	COMP.	on	off	off	off	on	F-fan	on	off	off	off	off	R-fan	on	on	off	off	off	D-heater	off	off	on	off	off		⚡Time : 30 min. ⚡Quick mode is prior	⚡Time : 10 min. ⚡Regardless of door open ⚡If D-sensor temperature is over 10°C, R-fan goes off and it skips to pause step. ⚡Defrost is prior	⚡Time : 90 min. ⚡If D-sensor temperature is over 10°C, D-heater goes off. ⚡If D-sensor is in error, it is on for 45 min. unconditionally ⚡Defrost is prior	⚡Time : 7 min. ⚡Defrost is prior	⚡Time : 5 min. ⚡Defrost is prior	
	Pre-cool	R-fan defrost	D-heater defrost	Pause	Fan delay																																			
COMP.	on	off	off	off	on																																			
F-fan	on	off	off	off	off																																			
R-fan	on	on	off	off	off																																			
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NO.	Control Function	Control Objects	Contents	Remark
			<pre> graph TD Start([Deciding defrosting period]) --> Q1{Is it min. accumulated COMP ON time?} Q1 -- NO --> Start Q1 -- YES --> Q2{Is the percentage of operation, so far, above 80%?} Q2 -- YES --> End([Entering defrosting mode]) Q2 -- NO --> Q3{Is it max. accumulated COMP ON time?} Q3 -- YES --> End Q3 -- NO --> Q4{Is the resuting accumulated door open time, 10 min?} Q4 -- YES --> Q5{Is the percentage of operation, so far, above 80%?} Q4 -- NO --> Start Q5 -- YES --> End Q5 -- NO --> Q6{Will it be min. door open time in 6 hours?} Q6 -- YES --> Q7{Is it max. accumulated door open time?} Q6 -- NO --> Start Q7 -- YES --> End Q7 -- NO --> Start </pre>	
10	Forced defrost	COMP. F-fan R-fan C-fan Heater	<p>1. When press freezer temperature button, press quick freezing button 5 times. Then start forced defrost function.</p> <p>2. Forced defrost function starts from the D-heater step without Pre-cool and R-fan defrost step.</p> <p>3. Control method of each device is same as in defrosting mode.</p> <p>4. After forced defrost, the normal defrost is enabled in 14 hours of accumulated COMP. on time.</p>	

NO.	Control Function	Control Objects	Contents	Remark									
11	Device test function	COMP. F-fan R-fan Heater	<p>1. Pressing the SW01 on M-PCB enables device test function.</p> <p>2. Pressing the SW01 proceeds the operation of device as follows.</p> <p style="padding-left: 40px;">COMP. → D-heater → break → F-fan → R-fan → return</p> <p>3. Each device is on for 1 min. and returns to be off.</p> <p>4. During device test function, all custom LED of F-PCB is illuminated.</p> <p>◆ Custom LED check function</p>										
12	Demo function	F-fan R-fan LED	<p>1. If the CN10 of M-PCB is shorted, it changes to demo function.</p> <p>2. F-PCB indicates the normal status and fuzzy status alternately in 15 sec. intervals.</p> <div style="text-align: center;">  <p>Normal status</p> <p>↕</p> <p>Fuzzy status</p> </div> <p>3. F-fan and R-fan operation is same as below</p> <table border="1" data-bbox="608 1272 1284 1525"> <thead> <tr> <th></th> <th>Normal status</th> <th>Demo status</th> </tr> </thead> <tbody> <tr> <td>Door open</td> <td>OFF F-fan and R-fan is off at the same time.</td> <td>ON F-fan and R-fan is on at the same time</td> </tr> <tr> <td>Door close</td> <td>ON F-fan : ON after 2 sec. R-fan : ON after 1 sec.</td> <td>OFF F-fan : OFF after 2 sec. R-fan : OFF after 1 sec.</td> </tr> </tbody> </table>		Normal status	Demo status	Door open	OFF F-fan and R-fan is off at the same time.	ON F-fan and R-fan is on at the same time	Door close	ON F-fan : ON after 2 sec. R-fan : ON after 1 sec.	OFF F-fan : OFF after 2 sec. R-fan : OFF after 1 sec.	
	Normal status	Demo status											
Door open	OFF F-fan and R-fan is off at the same time.	ON F-fan and R-fan is on at the same time											
Door close	ON F-fan : ON after 2 sec. R-fan : ON after 1 sec.	OFF F-fan : OFF after 2 sec. R-fan : OFF after 1 sec.											
13	Delivery function	COMP. F-fan R-fan LED	<p>1. This function operates when fridge temperature and quick fridge button are pressed, and plug the power code.</p> <div style="text-align: center;">  </div> <p>2. At this time, the custom LED is normal and all devices are off.</p> <p>3. After 10 min., all devices operate normally.</p>										

NO.	Control Function	Control Objects	Contents	Remark
14	Low cooling prevent function	COMP. R-fan	<p>1. The low cooling prevention function will be operating if the temperature of R1-sensor or R2-sensor goes above 6°C.</p> <p>2. Time chart</p>  <p>low cooling detection temp. (6°C) R-FAN ON R-FAN OFF</p> <p>COMP C-FAN R-FAN</p> <p>The COMP turns off by R1-S</p> <p>3. R1 and R2-sensor detects the low cooling prevention function, but only R1-sensor returns the normal function.</p>	
15	COMP. restart prevent	COMP.	<p>1. The COMP. can not be on within 6 min. after COMP. off.</p> <p>2. During Pre-cool step in defrost mode. 6 min. delay is unavailable.</p>	
16	Error display	LED	<p>1. Press the quick freezing button 3 times when press the quick fridge and fridge temperature button.</p>  <p>2. If press the freezer temperature button, then stage changed like follow. R1-sensor temperature → D-sensor temperature → F-sensor temperature → Error code</p> <p>3. Auto return to the normal time is 8 min. without pressing the freezer temperature button.</p>	

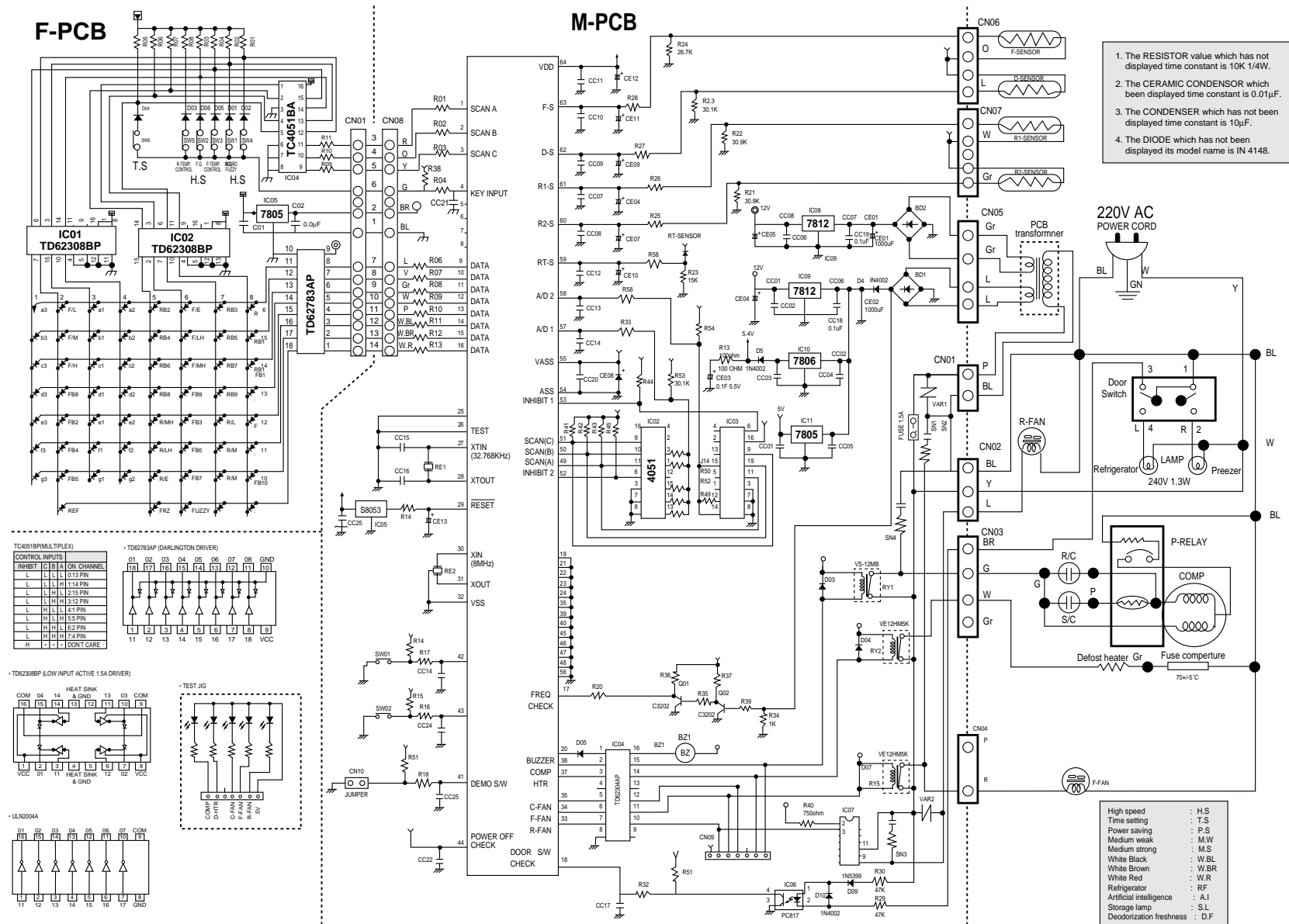
NO.	Control Function	Control Objects	Contents	Remark
			<p>4. Sensor's temperature indication is as follow.</p> <p>1) R-sensor (when 1°C)</p>  <p>2) D-sensor (when -23°C)</p>  <p>3) F-sensor (when -18°C)</p>  <p>5. Error code is referred to 3) Self-diagnosis table</p>	
17	Alarm function	Buzzer	<p>1. Alarm buzzes 1 sec. after 3 sec. of initial power on.</p> <p>2. Alarm buzzes whenever each switch in F-PCB is pressed.</p> <p>3. If the door is opened for more than 1 min., chirpy sound alarm buzzes.</p>	

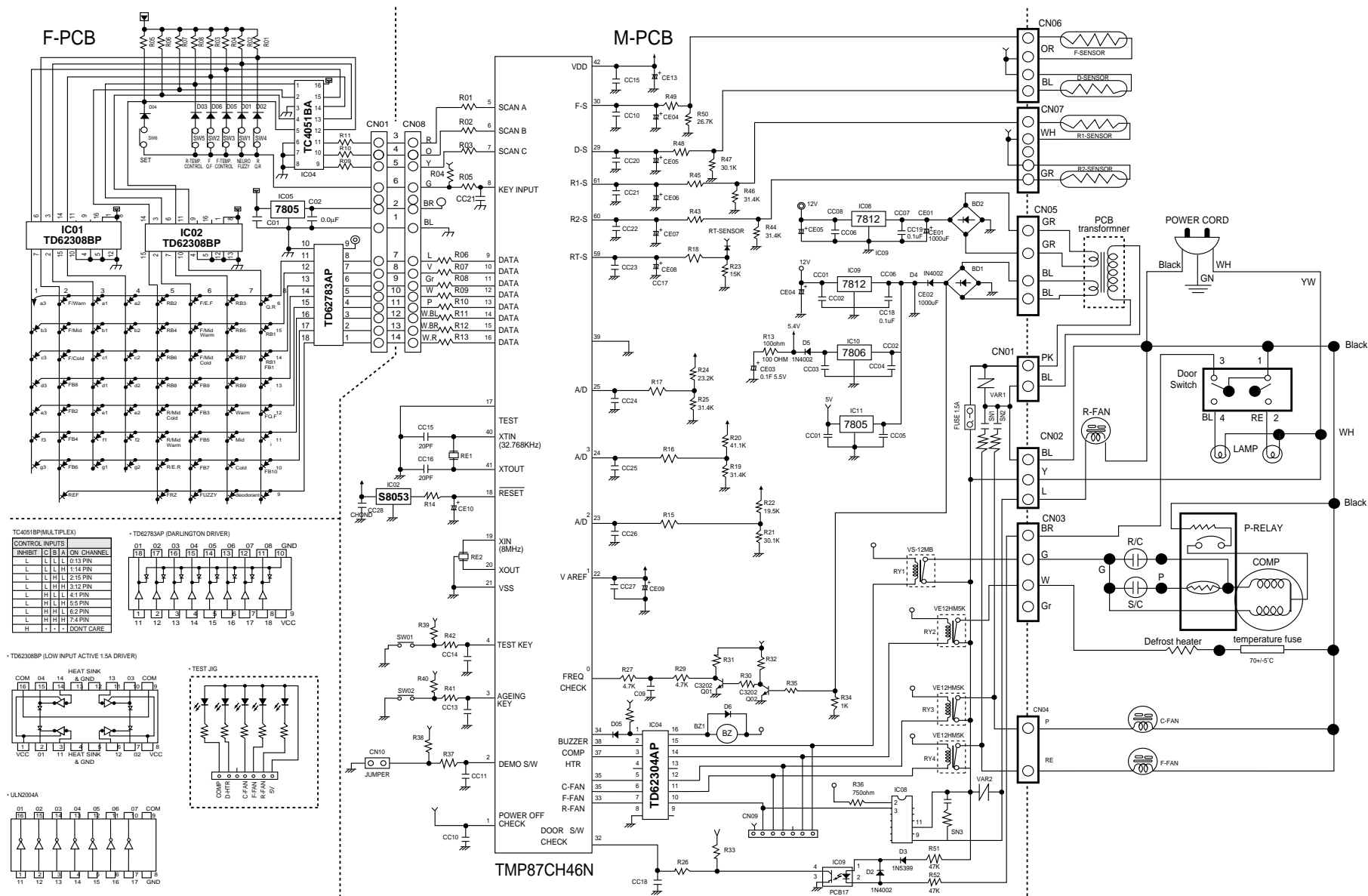
3) Self-diagnosis table

Code	Content	Perception method	Refrigerator operation state
F 1	F-sensor malfunction	<ul style="list-style-type: none"> - Short circuit - Wire disconnection 	<ul style="list-style-type: none"> - The refrigerator is run at 60% power with a 40 minute period. - When the refrigerator compartment is over frosted, the operation is forcibly stopped, then returns to a 40 minute period operation.
R T	RT-sensor malfunction	<ul style="list-style-type: none"> - Short circuit - Wire disconnection 	<ul style="list-style-type: none"> - In fuzzy mode, control temperature according to the outside temperature is disable.
R 1	R1-sensor malfunction	<ul style="list-style-type: none"> - Short circuit - Wire disconnection 	<ul style="list-style-type: none"> - Operated by R2-sensor
R 2	R2-sensor malfunction	<ul style="list-style-type: none"> - Short circuit - Wire disconnection 	<ul style="list-style-type: none"> - Low cooling prevention function by R2-sensor is disable.
D 1	D-sensor malfunction	<ul style="list-style-type: none"> - Short circuit - Wire disconnection - When the D-sensor temperature is over -5°C while the compressor is off. 	<ul style="list-style-type: none"> - Heater turns on for 45 minutes irrespective of D-sensor - R-fan can be on/off by R1-sensor only when compressor on.
D 0	Door switch malfunction	<ul style="list-style-type: none"> - When the door switch is left open continually for an hour. 	<ul style="list-style-type: none"> - The R-fan and F-fan operates irrespective of the door switch when the compressor is on.
F 3	Defrost malfunction	<ul style="list-style-type: none"> - When the D-sensor turns off not by 13°C but by a 90 minutes period while the heater is on. 	<ul style="list-style-type: none"> - Normal operation.
C 1	Cycle malfunction Compressor malfunction	<ul style="list-style-type: none"> - When the temperature of the D-sensor is over -5°C although the compressor has been running for 3 hours non-stop. 	<ul style="list-style-type: none"> - Normal operation.

◆ All error code will be reset, if they become normal.

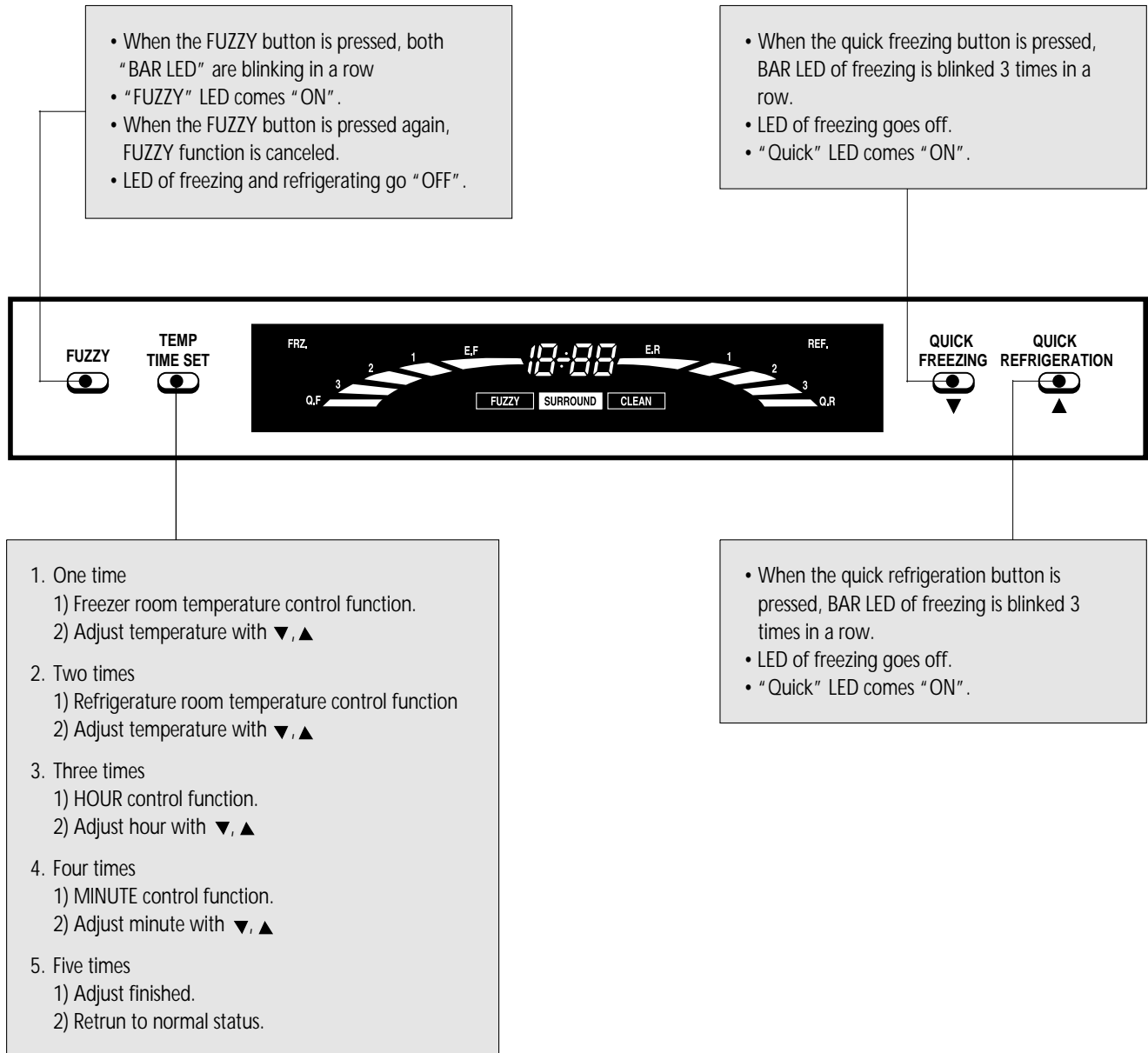
4) Circuit and Wiring Diagram N802










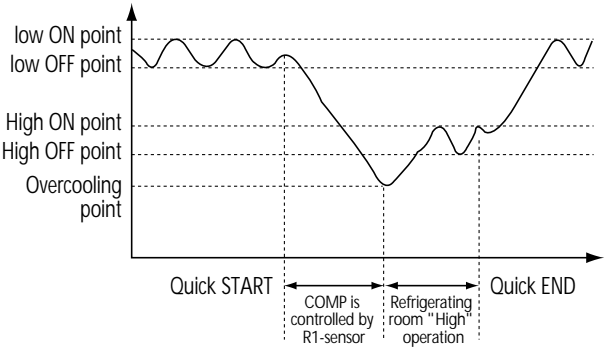
2. FR-540NT


1) How to use the panel

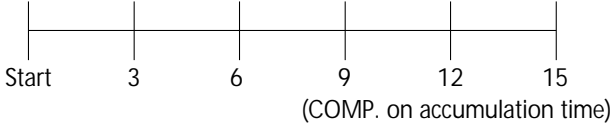
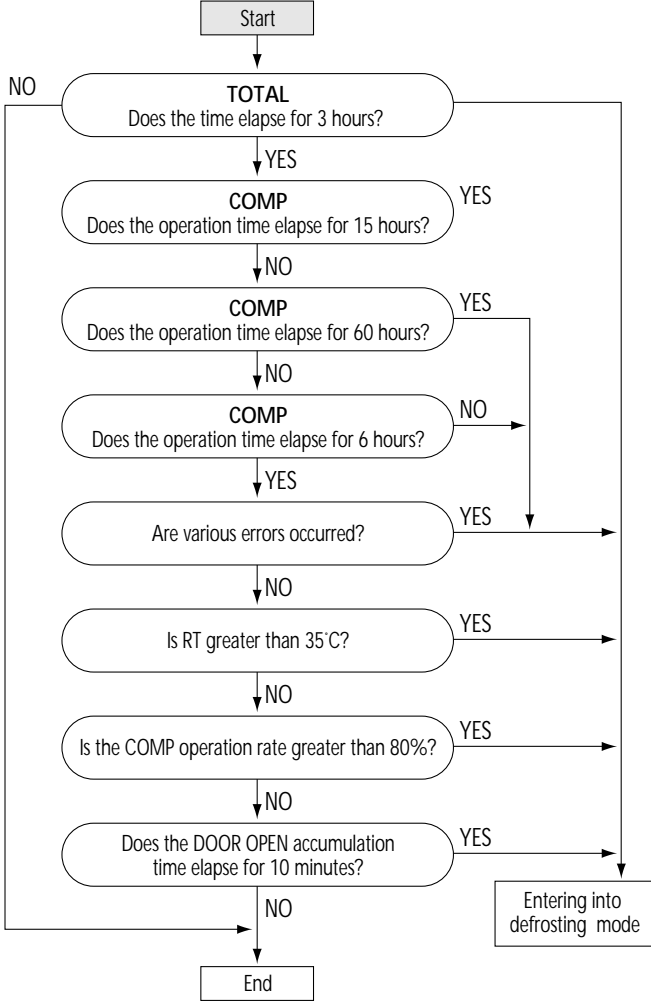


2) Function table

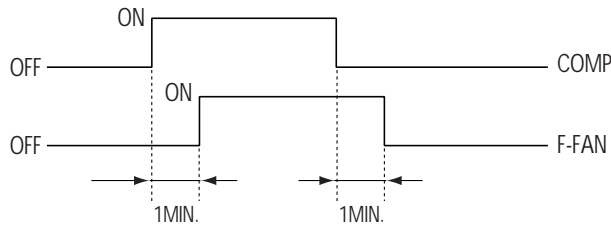
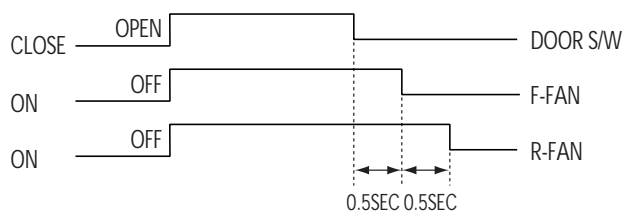
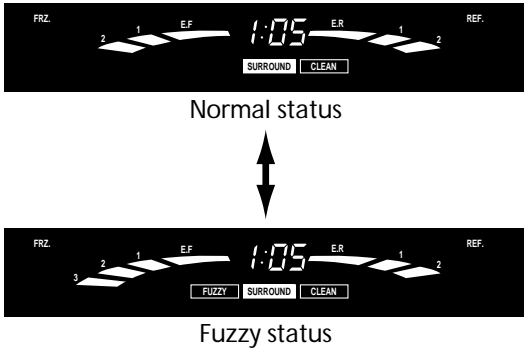
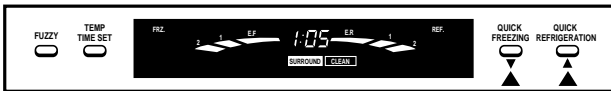
NO.	Control Function	Control Objects	Contents	Remark															
1	Clock function	LED	<p>1. The time is set at 12:00 in initial operation</p>  <p>2. Time setting</p> <ol style="list-style-type: none"> 1) When the temperature/time set button is pressed 3 times, Hour blinks. 2) Adjust HOUR with ▼, ▲ button. 3) When the temperature/time set button is pressed 4 times, MIN blinks 4) Adjust MIN with ▼, ▲ button. 																
2	Freezer temperature control	COMP. F-fan LED	<p>1. When press the temperature/time control button, freezer temperature range blinks. Then can control freezer temperature with ▼, ▲ button.</p>  <p>2. COMP. on/off temperature (Temperature iC/Resistance k?)</p> <table border="1"> <thead> <tr> <th></th> <th>E.F</th> <th>1 (low)</th> <th>2 (mid)</th> <th>3 (high)</th> </tr> </thead> <tbody> <tr> <td>COMP. on</td> <td>-17.5/19.4</td> <td>-18.5/20.6</td> <td>-19.5/21.7</td> <td>-21.5/24.3</td> </tr> <tr> <td>COMP. off</td> <td>-22.5/25.7</td> <td>-23.5/27.2</td> <td>-24.5/28.8</td> <td>-26.5/32.3</td> </tr> </tbody> </table> <p>3. Bar LED is not related with on/off point.</p> <p>4. If push the temperature/time control button in fuzzy mode, then fuzzy mode is canceled.</p>		E.F	1 (low)	2 (mid)	3 (high)	COMP. on	-17.5/19.4	-18.5/20.6	-19.5/21.7	-21.5/24.3	COMP. off	-22.5/25.7	-23.5/27.2	-24.5/28.8	-26.5/32.3	
	E.F	1 (low)	2 (mid)	3 (high)															
COMP. on	-17.5/19.4	-18.5/20.6	-19.5/21.7	-21.5/24.3															
COMP. off	-22.5/25.7	-23.5/27.2	-24.5/28.8	-26.5/32.3															
3	fridge temperature control	COMP. R-fan LED	<p>1. When press the temperature/time control button, fridge temperature range blinks. Then can control fridge temperature with ▼, ▲ button.</p>  <p>2. Main sensor of fridge room is R1-sensor.</p> <p>3. R2-sensor is used for preventing low cooling.</p> <p>4. R-fan on/off temperature (Temperature iCResistance k?)</p> <table border="1"> <thead> <tr> <th></th> <th>E.R</th> <th>1 (low)</th> <th>2 (mid)</th> <th>3 (high)</th> </tr> </thead> <tbody> <tr> <td>R-fan on</td> <td>1.35/28.4</td> <td>0.35/29.7</td> <td>-0.65/30.9</td> <td>-2.65/33.8</td> </tr> <tr> <td>R-fan off</td> <td>1.0/28.7</td> <td>0.0/30.0</td> <td>-1.0/31.4</td> <td>-3.0/34.3</td> </tr> </tbody> </table>		E.R	1 (low)	2 (mid)	3 (high)	R-fan on	1.35/28.4	0.35/29.7	-0.65/30.9	-2.65/33.8	R-fan off	1.0/28.7	0.0/30.0	-1.0/31.4	-3.0/34.3	
	E.R	1 (low)	2 (mid)	3 (high)															
R-fan on	1.35/28.4	0.35/29.7	-0.65/30.9	-2.65/33.8															
R-fan off	1.0/28.7	0.0/30.0	-1.0/31.4	-3.0/34.3															


NO.	Control Function	Control Objects	Contents	Remark
			<p>5. When the low cooling is detected, COMP. goes on regardless of F-sensor.</p> <p>6. When the fridge temperature goes R-fan off point, COMP. is controlled by F-sensor and R-fan goes off.</p> <p>7. Low cooling is detected by R1-sensor or R2-sensor, its cancellation can be done by R1-sensor only.</p> <p>8. Bar LED is not related with on/off point.</p> <p>9. If push the temperature/time control button in fuzzy mode, then fuzzy mode is canceled.</p>	
4	Quick freezing	COMP. F-fan LED	<p>1. When the quick freezing button is pressed, it becomes quick freezing mode.</p>  <p>2. The quick freezing mode works for 150 min.</p> <p>3. The quick freezing time shows for 5 sec.</p> <p>4. COMP. and F-fan go on regardless of F-sensor during the quick freezing mode.</p> <p>5. The quick freezing mode is operative even in fuzzy mode.</p>	
5	Quick fridge	COMP. R-fan LED	<p>1. When the quick fridge button is pressed, it becomes quick fridge mode.</p>  <p>2. The quick fridge mode works for 40 min.</p> <p>3. The quick fridge time shows for 5 sec.</p>  <p>4. COMP. and R-fan are on until R1-sensor detects over cooling temperature (-7°C).</p> <p>5. The quick fridge mode is operative even in fuzzy mode.</p>	

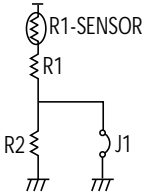

NO.	Control Function	Control Objects	Contents	Remark																																																																																																																																															
6	Fuzzy	COMP. R-fan F-fan LED	<p>1. When press the fuzzy button, predictable cooling of freezer and fridge room is started.</p>  <p>2. How to predict freezer and fridge room temperature.</p> <p>1) Checking accumulated door open time every 2 hours.</p> <p>2) Decision of open door frequency is as follow</p> <ul style="list-style-type: none"> • Above 30 sec. : Door is opened frequently. (1) • Below 30 sec. : Door is not opened frequently. (0) <p>3) Decision of data is for 8 days.</p> <ul style="list-style-type: none"> • If the accumulated open door time of 30 sec. is more than 6 times for 8 days, then data decision will be high. • If RT-sensor < 14°C, it is operated mid instead of high. <p>4) Example</p> <table border="1" data-bbox="606 996 1276 1433"> <thead> <tr> <th>Date \ Hour</th> <th>2</th> <th>4</th> <th>6</th> <th>8</th> <th>10</th> <th>12</th> <th>14</th> <th>16</th> <th>18</th> <th>20</th> <th>22</th> <th>24</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>3</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>4</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>6</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>7</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>8</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>Frequency</td> <td>3</td> <td>2</td> <td>7</td> <td>7</td> <td>5</td> <td>1</td> <td>2</td> <td>6</td> <td>6</td> <td>6</td> <td>4</td> <td>4</td> </tr> <tr> <td>Data decision</td> <td>M</td> <td>M</td> <td>H</td> <td>H</td> <td>M</td> <td>M</td> <td>M</td> <td>H</td> <td>H</td> <td>H</td> <td>M</td> <td>M</td> </tr> </tbody> </table>	Date \ Hour	2	4	6	8	10	12	14	16	18	20	22	24	1	1	0	1	1	1	0	0	0	1	1	0	1	2	0	0	1	1	1	0	0	0	0	1	0	1	3	0	0	1	1	1	0	0	1	1	0	1	0	4	0	1	1	1	0	1	1	1	1	1	0	0	5	0	0	0	0	1	0	0	1	1	1	1	0	6	1	0	1	1	0	0	0	1	0	1	0	1	7	0	1	1	1	0	0	1	1	1	0	1	0	8	1	0	1	1	1	0	0	1	1	1	1	1	Frequency	3	2	7	7	5	1	2	6	6	6	4	4	Data decision	M	M	H	H	M	M	M	H	H	H	M	M	
Date \ Hour	2	4	6	8	10	12	14	16	18	20	22	24																																																																																																																																							
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Data decision	M	M	H	H	M	M	M	H	H	H	M	M																																																																																																																																							
7	Determination defrost		<p>1. Necessary condition of determination defrost</p> <p>1) COMP. operation accumulation time (6, 9, 12, 15 hours)</p> <p>2) COMP. operation ratio (COMP. accumulation time is divided by 3 hours)</p> <p>3) Door open accumulation time.</p> <p>4) Total time (COMP. on time+COMP. off time) is 60 hours.</p> <p>5) Outside temperature is above 35°C.</p> <p>6) Various error</p> <ul style="list-style-type: none"> • D-sensor error • F-sensor error • RT-sensor error • Door switch error 																																																																																																																																																

NO.	Control Function	Control Objects	Contents	Remark
			<p>2. Description</p>  <p>1) It enters into the defrost mode at 15 hours unconditionally.</p> <p>2) It enters into the defrost mode at 6, 9, 12 hours conditionally.</p> <p>3) Flow chart of determination defrost mode.</p> 	
8	Defrost mode	COMP. F-fan R-fan Heater	<p>1. Pre-cool step</p> <p>1) Time : 50 min.</p> <p>2) COMP. and F-fan are on.</p> <p>3) R-fan controls normally with temperature 1°C higher than the off point which controls R-fan in normal status.</p>	

NO.	Control Function	Control Objects	Contents	Remark																																										
			<p>4) If the F-sensor $\leq -27^{\circ}\text{C}$ even the time elapsed is less than 50 min., the Pre-cool step goes off.</p> <p>2. D-heater+R-fan defrost</p> <p>1) D-heater and R-fan are on.</p> <p>2) When D-sensor is higher than 2°C, R-fan goes off, and D-heater stays on continuously.</p> <p>3) When D-sensor is higher than 10°C, D-heater goes off.</p> <p>4) Total limit time is 88 min.</p> <p>5) If D-sensor is error, R-fan goes off and D-heater is on for 35 min.</p> <p>3. Pause</p> <p>1) Time : 4 min.</p> <p>2) All devices are off.</p> <p>4. F-fan delay</p> <p>1) Time : 8 min.</p> <p>2) Only COMP. and R-fan are on.</p> <p>5. R-fan delay</p> <p>1) Time : 10 min.</p> <p>2) Only COMP. and F-fan are on.</p> <p>6. Output control of each step and time limit.</p> <table border="1" data-bbox="604 1301 1278 1644"> <thead> <tr> <th></th> <th>Pre-cool</th> <th>Heater +R-fan defrost</th> <th>Heater defrost</th> <th>pause</th> <th>F-fan delay</th> <th>R-fan delay</th> </tr> </thead> <tbody> <tr> <td>COMP.</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> </tr> <tr> <td>F-fan</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>off</td> <td>on</td> </tr> <tr> <td>R-fan</td> <td>controlled</td> <td>on</td> <td>off</td> <td>off</td> <td>on</td> <td>off</td> </tr> <tr> <td>Heater</td> <td>off</td> <td>on</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> </tr> <tr> <td>Time limit</td> <td>50 min.</td> <td colspan="2">1) 80 min. 2) 35 min. in case of D-sensor error</td> <td>4 min.</td> <td>8 min.</td> <td>10 min.</td> </tr> </tbody> </table>		Pre-cool	Heater +R-fan defrost	Heater defrost	pause	F-fan delay	R-fan delay	COMP.	on	off	off	off	on	on	F-fan	on	off	off	off	off	on	R-fan	controlled	on	off	off	on	off	Heater	off	on	on	off	off	off	Time limit	50 min.	1) 80 min. 2) 35 min. in case of D-sensor error		4 min.	8 min.	10 min.	
	Pre-cool	Heater +R-fan defrost	Heater defrost	pause	F-fan delay	R-fan delay																																								
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Time limit	50 min.	1) 80 min. 2) 35 min. in case of D-sensor error		4 min.	8 min.	10 min.																																								
9	Testing device	COMP. F-fan R-fan Heater LED	<p>1. If press SW01 on M-PCB, the electric devices become on in order as follows.</p> <p>COMP. → Heater → Pause → F-fan → R-fan → COMP.</p> <p>2. At this time, all the custom LED become on.</p> <p>3. Automatic return time is 1 min.</p>																																											

NO.	Control Function	Control Objects	Contents	Remark									
10	Electric device delay	Door S/W COMP. F-fan R-fan	<p>1. F-fan on or off time is delayed, when COMP. is on or off.</p>  <p>2. F-fan and R-fan on or off time is delayed, when door switch is on or off.</p> 										
11	Demo function	COMP. R-fan F-fan Door S/W	<p>1. If CN10 terminal on M-PCB is shorted, all electric devices go off except F-fan, R-fan.</p> <p>2. Fan control</p> <table border="1" data-bbox="606 1164 1284 1355"> <thead> <tr> <th></th> <th>Normal status</th> <th>Demo status</th> </tr> </thead> <tbody> <tr> <td>Door open</td> <td>F-fan : off R-fan : off</td> <td>F-fan : on R-fan : on</td> </tr> <tr> <td>Door close</td> <td>F-fan : on R-fan : on</td> <td>F-fan : off R-fan : off</td> </tr> </tbody> </table> <p>3. F-PCB indicates the normal status and fuzzy status alternately in 15 sec. intervals.</p> 		Normal status	Demo status	Door open	F-fan : off R-fan : off	F-fan : on R-fan : on	Door close	F-fan : on R-fan : on	F-fan : off R-fan : off	
	Normal status	Demo status											
Door open	F-fan : off R-fan : off	F-fan : on R-fan : on											
Door close	F-fan : on R-fan : on	F-fan : off R-fan : off											
12	Delivery function	COMP. F-fan R-fan LED	<p>1. If press the quick freezing and quick refrigerating button for 3 sec. after power on, then delivery function will start.</p> 										

NO.	Control Function	Control Objects	Contents	Remark
			2. The electric devices are off for 2 hours in delivery function. 3. The custom LED is on normally.	
13	Power failure back-up function	COMP. Clock	1. M-PCB reserves all functions for 3 hours after power failure. 2. Time running in power failure is as follow. 1) Clock 2) Preventing COMP. restarting 3) Pause time during defrosting	
14	COMP. restart prevent	COMP.	1. After COMP. is off, the COMP. is not on even though the F-sensor is at on point for 6 min.	
15	Buzzer function	Buzzer	1. Alarm buzzes 3 sec. after initial power on. 2. Alarm buzzes whenever each switch in F-PCB is pressed. 3. If the door is opened for more than 1 min., chirpy sound alarm buzzes. 4. If adjust temperature, the fuzzy button will be not operative and the buzzer will be off.	
16	First defrost	COMP. F-fan R-fan Heater	1. When power is loaded for the first time, it enters into defrost mode if D-sensor $\leq 3.5^{\circ}\text{C}$. (Defrost mode starts from Pre-cool step.)	
17	Forced defrost	COMP. F-fan R-fan Heater	1. Press the fuzzy button 5 times, when press temperature/time control button. After that can enter the forced defrost mode.  2. Forced defrost mode. 1) The Pre-cool step is omitted. 2) Start from heater+R-fan defrost. 3. After forced defrost, the normal defrost is enabled in 15 hours of accumulated COMP. on time.	
18	Adjust R1-sensor off point		1. When the temperature in fridge room is low (Low temperature even though R-fan and COMP. are operating properly), following functions are operating for easy after service.	

NO.	Control Function	Control Objects	Contents	Remark						
			<p>1) </p> <p>R1 : Off point determination in normal operation R2 : Decreases off point determination J1 : If remove J1, the off point will be decreased.</p> <p>2) Resistance value R1 : 31.4 kΩ R2 : 2.15 kΩ</p> <p>3) Off point temperature</p> <table border="1" data-bbox="608 770 1283 893"> <thead> <tr> <th colspan="2">Off point temperature</th> </tr> </thead> <tbody> <tr> <td>J1 shorted</td> <td>-1.0°C</td> </tr> <tr> <td>J1 opened</td> <td>-2.5°C</td> </tr> </tbody> </table>	Off point temperature		J1 shorted	-1.0°C	J1 opened	-2.5°C	
Off point temperature										
J1 shorted	-1.0°C									
J1 opened	-2.5°C									
19	Error display	LED R-fan	<p>1. Press the fuzzy button 3 times, when press the quick freezing and the quick refrigerating button. After that error mode.</p>  <p>2. If press the temperature/time control button, then will change the status on custom LED. R1-sensor temperature → F-sensor temperature → D-sensor temperature → Error code (If there is no error, then error code will not occur.)</p> <p>3. All error code will be reset, if they become normal.</p> <p>4. Error code is referred to 3) Self-diagnosis table.</p>							

3) Self-diagnosis table

Error mode	Defect function	Check method
F 1	F-sensor	- Compressor & F-fan is on for 24 minutes. - Compressor & F-fan is off for 16 minutes.
R 1	R1-sensor	- Regarded by R2-sensor.
R 2	R2-sensor	- Detecting weak cooling is impossible.
D 1	D-sensor	- Heater is on only for 35 minutes.
RT	RT-sensor	
D 0	Door switch	
C 1	Cooling cycle (check after first defrost mode)	
F 3	Heater	- Natural defrost for 80 minutes.

- ◆ If both R1 and R2-sensor are out of order, then RT-sensor control R-fan.
- Room temperature $\leq 14^{\circ}\text{C}$: R-fan is off
 - Room temperature $\geq 26^{\circ}\text{C}$: R-fan is on for 15 minutes, R-fan is off for 5 minutes
 - $14^{\circ}\text{C} < \text{Room temperature} < 26^{\circ}\text{C}$: R-fan is on for 2 minutes, R-fan is off for 18 minutes

4) Circuit and wiring diagram

