1.1 Specifications

MODEL	NR-B472TZ-S5		
SPECIFICTIONS	NIX-D47212-33		
	448 L (PC : 338 L,FC : 110 L)		
Storage Capacity			
Gross Capacity	468 L (PC : 356 L,FC : 112 L)		
Outside dimensions	007		
Width	697 mm		
Depth	754 mm		
Height	1828 mm		
Net weight	72 kg		
Туре	Frost-free refrigerator		
Temperature control	Micro-computer control (FC : FCC sensor) / Full-automatic direct control (PC : Damper thermo.)		
Defrosting	Full-automatic control Start : micro-computer ; Finish : Defrost sensor		
Defrost water disposal	Full-automatic (Forcible evaporated into the air)		
Exterior finish	Polyester coated finish		
Inner liner	Vacuum formed ABS resin		
Insulation	Polyurethane foam (cabinet & door)		
Power source	110 V / 60 Hz , 110 V / 50 Hz , 120 V / 60 Hz , 120 V / 50 Hz		
SEALED UNIT			
Compressor	EFI100E13DGH		
(Winding Resistance	(U-W) 8.44 Ω		
measured at 20°C)	(U-V) 8.44 Ω		
	(V-W) 8.44 Ω		
Evaporator	Fin tube type		
Condenser	Wrapper type (Consealed condenser)		
Refrigerant charge	R600a , 60g		
Oil charge	215ml		
ELECTRIC PARTS			
Overload protector	MM3-71CCQ		
FCC Sensor	R-20 19.09 KΩ B:3850K		
DEF. Sensor	R13 3.4338 KΩ B:3850K		
Fan motor	4515JL-09W-B36-GF6		
Fuse	E4A00072C , 250V / 10A / 72°C or SF70E,250V / 10A / 73°C		
Defrost heater	127V/180W/ 89.6 Ω		
PC damper thermo.	SD-0306		
LED Lamp	d.c 12V / 1.5 W		
Door switch (PC) 125 V / 5 A 250 V / 2.5 A			

1.2 Specifications

MODEL	NR-B412TZ-S5			
SPECIFICTIONS	NR-641212-33			
Storage Capacity	388 L (PC : 278 L,FC : 110 L)			
Gross Capacity	408 L (PC : 296 L,FC : 112 L)			
Outside dimensions				
Width	697 mm			
Depth	754 mm			
Height	1646 mm			
Net weight	65 kg			
Туре	Frost-free refrigerator			
Temperature control	Micro-computer control (FC : FCC sensor) / Full-automatic direct control (PC : Damper thermo.)			
Defrosting	Full-automatic control Start : micro-computer ; Finish : Defrost sensor			
Defrost water disposal	Full-automatic (Forcible evaporated into the air)			
Exterior finish	Polyester coated finish			
Inner liner	Vacuum formed ABS resin			
Insulation	Polyurethane foam (cabinet & door)			
Power source	110 V / 60 Hz , 110 V / 50 Hz , 120 V / 60 Hz , 120 V / 50 Hz			
SEALED UNIT				
Compressor	EFI100E13DGH			
(Winding Resistance	(U-W) 8.44 Ω			
measured at 20°C)	(U-V) 8.44 Ω			
	(V-W) 8.44 Ω			
Evaporator	Fin tube type			
Condenser	Wrapper type (Consealed condenser)			
Refrigerant charge	R600a , 60g			
Oil charge	215ml			
ELECTRIC PARTS				
Overload protector	MM3-71CCQ			
FCC Sensor	R-20 19.09 KΩ B:3850K			
DEF. Sensor	R13 3.4338 KΩ B:3850K			
Fan motor	4515JL-09W-B36-GF6			
Fuse	E4A00072C , 250V / 10A / 72°C or SF70E,250V / 10A / 73°C			
Defrost heater	127V/180W/ 89.6 Ω			
PC damper thermo.	SD-0306			
Lamp bulb	d.c 12V / 1.5 W			
Door switch (PC)	125 V / 5 A , 250 V / 2.5 A			

1.3 <u>TEMPERATURE CHARACTERISTIC</u>

TEMPERATURE OF EACH COMPARTMENT, COMPRESSOR RUNNING RATIO

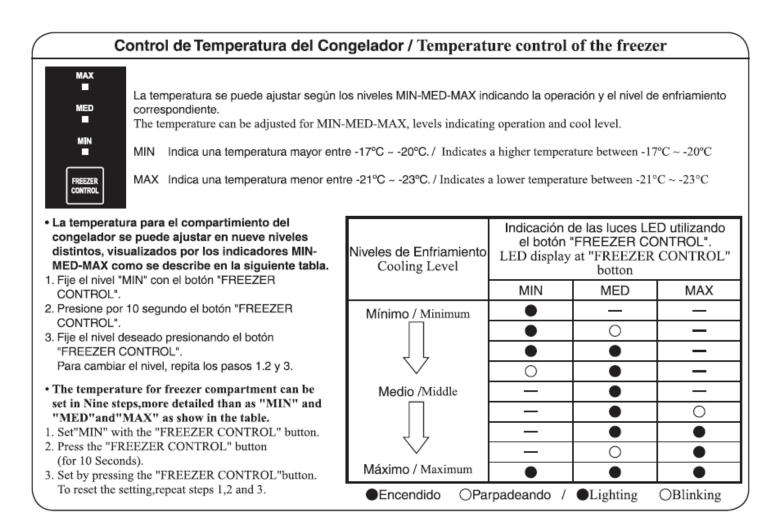
Temperature	FREEZER COMPARTMENT	MIN	MED	MAX
Adjuetment	REFRIGERATOR COMPARTMENT	1	MED	7
Freezer compartment (FC) Temp.(degree)			-18.0	-20.0
Refrigerator compartment (PC) Temp.(degree)			4.0	0.0
Fine Freesh room (FF) Temp.(degree)		3.5	1.0	-1.0
Compressor running ratio (%)			65.0%	68.0%

(CONDITION)

Atmosphere Temperature : 32 degree

NO LOAD (NO FOODS), NO DOOR OPEN AND CLOSE

These indicating temperature is stable condition. (Approximately)



2.Introduction FUNCTION OF ELECTRONIC CONTROL

2.1 FREEZER TEMPERATURE CONTROL

It actuates the compressor, FC fan motor ,and cooling system switch according to temperature variation in the freezer compartment. And atmosphere temperature by processing the input from, FC temperature sensor and adjustment of temperature control.

2.2 COMPRESSOR ROTATION SPEED CONTROL

According to changing inside temperature, the motor runs in the difference speed. In normal, the motor run in the low speed. (Energy saving & lower noise.)

When powerful cooling is required, motor run in rapid speed.

CONDITION	NR-B472TZ ROTATION SPEED(rps)	
When to plug in	42	
Quick freezing	42 \ 71	
Normal operation	32 、 36 、 42 、 52 、 58 、 71	

2.3 QUICK FREEZING FUNCTION

Press "QUICK FREEZING"button, and then quick function starts and LED sign comes on. It actuates the compressor continuously for certain period regardless of compartment temperature, by processing the input from AT temperature sensor. (AT temperature : Atmosphere temperature)

ATC	NR-B472TZ continuous run	
under than 18°C	60 minutes/42rps	
More than 19°C	150 minutes/71rps	

When the blue light is blinking after pressing the "QUICK FREEZING" button, the function of quick freezing is waiting .The situation of refrigerator is processing as below:

a. The refrigerator is defrosting .

b.The compressor is stopped, because temperature of the freezing compartment reachs setting of temperature. When the above situation is solved, quick-freeze will be started automatically, then the "QUICK FREEZING" light bright is on.

2.4 FC DEFROSTING CONTROL

Cumulating the compressor running time of certain period or time after defrosting according to AT temperature, FC defrosting cycle starts. (AT temperature : Atmosphere temperature)

Termination is detected by defrost sensor ,but maximum defrosting time is 60 minutes (Defrosting forcibly stops).

Accumulating time for defrosting			
Compressor protection(IPD) 15 hours			
initially starts	4 hours		
Power Interruption	Continue cycle		

ATC	After defrosting	Accumulation of compressor run time
under than 22°C	13 hours	—
More than 33°C	_	8 hours

2.5 WAITING CONTROL FOR COMPRESSOR RE-STARTING

To re-start the compressor smoothly after compressor stops and after defrosting, it does not actuate the compressor for certain period.

Waiting time for compressor starting				
10 minutes After compressor stops				
3 minutes	After defrosting			

Caution

At once unplug, wait for 10 minutes, then plug in.

2.6 FAN MOTOR CONTROL IN FREEZER COMPARTMENT

The fan motor (near FC evaporator)is controlled under below condition.

compartment is closed.Rotation speed changes on 3 degree according to atmosphere temperature and refrigerator compartment.

2.7 PROTECTION OF INVERTER CIRCUIT

When supply voltage drops, IPM protection operates, and compressor protection operates continuously, compressor stops at the moment and indicates code"H41".

CODE	Operation PCB Display	
	"MAX"LED: light off	
H41	"MED"LED: light on	
	"MIN"LED: light on	
	"QUICK FREEZING" LED: light off	

2.8 DOOR ALARM

When the door of refrigerator compartment is opened after 5 minute ,"QUICK FREEZING"light is red. "QUICK FREEZING"light is off, when the door of refrigerator compartment is closed.

DOOR OPENING	Buzzer sounds
after 1 minute	Pee,Pee
after 3 minutes	Pee,Pee,Pee,Pee
after 5 minutes	Pee,Pee,Pee,

2.9 SELF DIAGNOSIS FUNCTION

If the unit have any problem ,the sign is appeared on LED. (When "QUICK FREEZING" LED indicate red bright. Press "QUICK FREEZING" + "FREEZER CONTROL" both bottons 9~13 sec plus than going into SELF DIAGNOSIS FUNCTION.)

(Example:Code"H07")

CODE	Operation PCB Display
	"MAX"LED: light off
	"MED"LED: light on
H07	"MIN"LED: light off
	"QUICK FREEZING" LED: light off

2.10 AUTO ROOM LED LIGHTS OFF

If PC door opens for 1 hour, room led lights automatically comes off. Once closing PC door, this function is reset.

3. Operation Instructions

SELF DIAGNOSIS FUNCTION

*When "QUICK FREEZING" LED indicate red bright. Press "QUICK FREEZING" + "FREEZER CONTROL" both bottons 9~13 sec plus than going into SELF DIAGNOSIS FUNCTION.

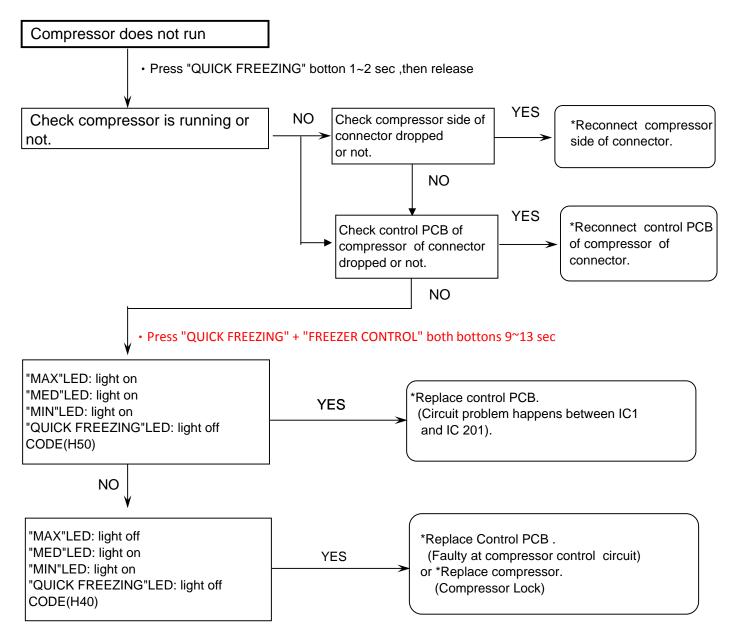
No	CODE	Operation PCB Display	Content	Symptom	Confirm point	Solve
1	U10	"MAX"LED: light off "MED"LED: light off "MIN"LED: light off "QUICK FREEZING" LED : light on	Door opened alarm.	Refrigerator have not cooling	 The door of refrigerator compartment is opened. Door switch is breakdown. Control PCB is breakdown. 	 Close the refrigerator compartment door Replace door switch Replace Control PCB
2	H01	"MAX"LED: light off "MED"LED: light off "MIN"LED: light on "QUICK FREEZING" LED : light off	Freezer compartment of sensor was open circuit. Freezer compartment of sensor was short circuit. Freezer compartment of sensor put error of	Compressor is stopped. Refrigerator have not cooling at all. Compressor is running all the time. Refrigerator is over cooling at all. Refrigerator have not cooling at all,or over	 Check freezer compartment of sensor. Check Control PCB of connector. Control PCB is breakdown. 	 Replace freezer compartment of sensor. Replace Control PCB. Replace Control PCB.
3	H05	"MAX"LED: light off "MED"LED: light off "MIN"LED: light on "QUICK FREEZING" LED : light on	position Defrost of sensor was open circuit. Defrost of sensor was short circuit. Defrost of sensor put error of position	cooling at all. Thermal fuse was cut off in freezer compartment The refrigerator have not defrosting . Evaporator have over frost Refrigerator have not cooling at all.	 Check defrost of sensor. Check Control PCB of connector. Control PCB is breakdown. 	1.Replace defrost of sensor. 2.Replace Control PCB. 3.Replace Control PCB.
4	H07	"MAX"LED: light off "MED"LED: light on "MIN"LED: light off "QUICK FREEZING" LED : light off	ATC of sensor was open circuit*. ATC of sensor was short circuit*.	Refrigerator is over cooling at all. Refrigerator have not cooling at all.	 Check ATC of sensor. Check Control PCB of connector. Control PCB is breakdown. 	 Replace defrost of sensor. Replace Control PCB. Replace Control PCB.
5	H31	"MAX"LED: light on "MED"LED: light on "MIN"LED: light on "QUICK FREEZING" LED : light on	Freezer compartment defrost abnormal	Refrigerator have not defrosting.	 Check defroster of heater. Check Control PCB of connector. Control PCB is breakdown. Thermal fuse was cut off in freezer compartment. 	 Replace defroster of heater Replace Control PCB. Replace Control PCB.

*ATC sensor is to measure atmosphere temperature . ATC sensor put on operation board.

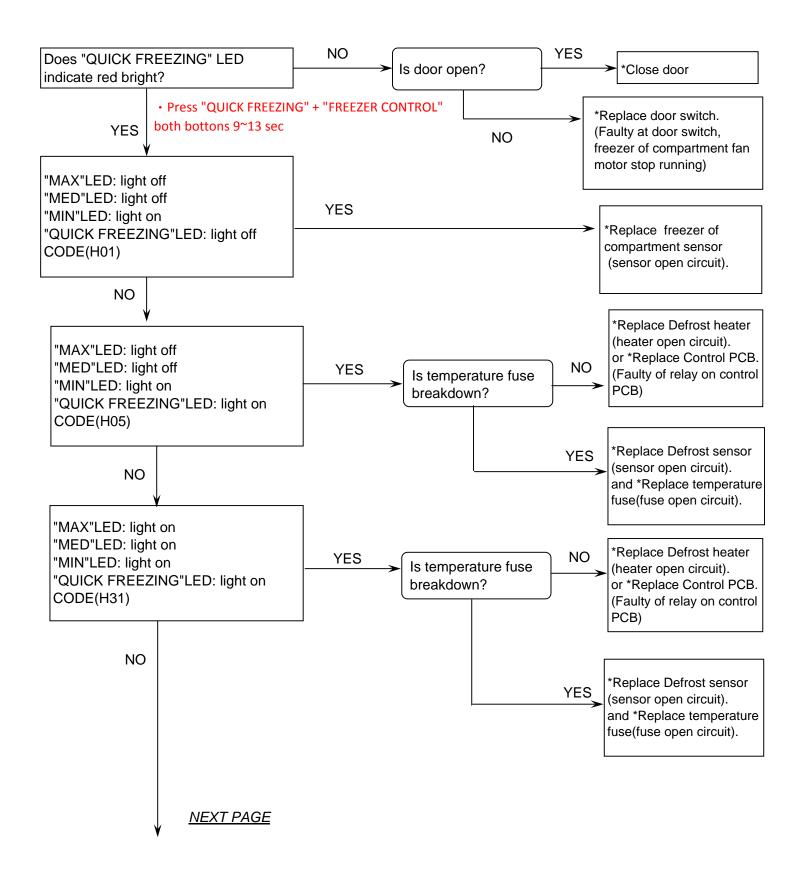
No	CODE	Operation PCB Display	Content	Symptom	Confirm point	Solve	
8	H40	"MAX"LED: light off "MED"LED: light on "MIN"LED: light on "QUICK FREEZING" LED : light off	Protection of IPM for compressor lock	 "QUICK FREEZING" LED indicate red bright. 	1.Control PCB is breakdown.	1.Replace Control PCB.	
9	H50	"MAX"LED: light on "MED"LED: light on "MIN"LED: light on "QUICK FREEZING" LED : light off	Control PCB of communication is abnormal.	1. "QUICK FREEZING" LED indicate red bright.	1.Control PCB is breakdown.	1.Replace Control PCB.	
10	H35	"MAX"LED: light on "MED"LED: light off "MIN"LED: light on "QUICK FREEZING" LED : light off	Control PCB is abnormal. (DFC of sensor less then -41°C)	 "QUICK FREEZING" LED indicate red bright. Refrigerator have not cooling. 	1.Control PCB is breakdown. 2.Check DFC of sensor.	1.Replace Control PCB. 2.Replace DFC of sensor	
11	H36	"MAX"LED: light on "MED"LED: light off "MIN"LED: light on "QUICK FREEZING" LED : light on	Control PCB is abnormal. (DFC of sensor more then 41℃)	 "QUICK FREEZING" LED indicate red bright. Refrigerator have over cooling. 	1.Control PCB is breakdown. 2.Check DFC of sensor.	1.Replace Control PCB. 2.Replace DFC of sensor	
12	H64	"MAX"LED: light on "MED"LED: light on "MIN"LED: light off "QUICK FREEZING" LED : light on	Ambient brightness sensor was open circuit. Ambient brightness sensor was short circuit.		 Check Ambient brightness Check Control PCB of connector. 	1.Replace Control PCB.	

4.Troubleshooting Guide

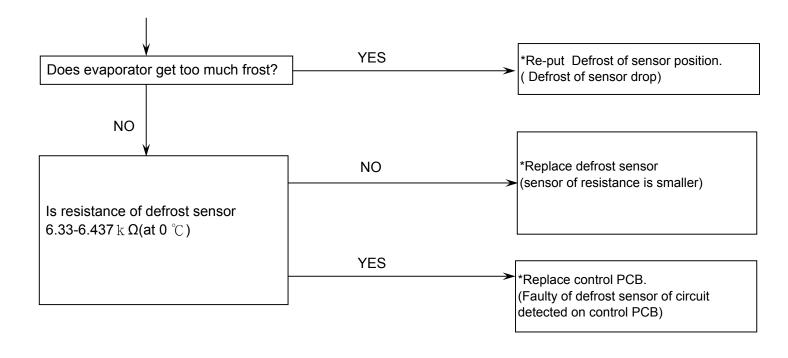
4.1 Symptom 1. Refrigerator have not cooling at all.



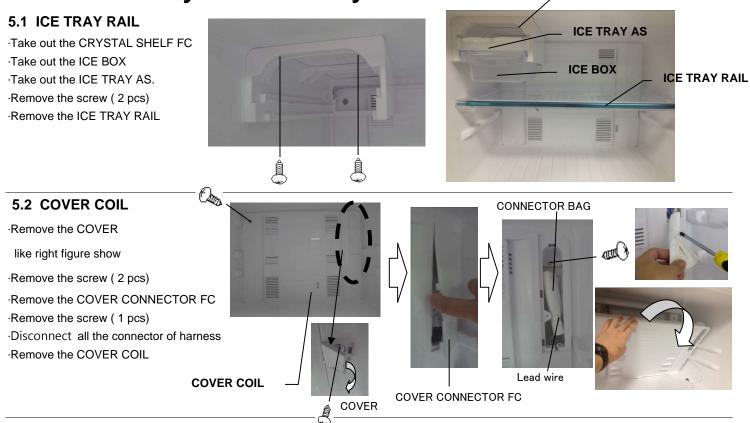
4.2 Symptom 2. poor cooling.



4.3 Symptom 2. FC/PC are poor cooling.



5. Disassembly and Assmbly Instructions



5.3 DC FAN MOTOR

Remove the COVER COIL

To replace the DC fan motor

- Insert the DC fan motor case into the COVER COIL BACK
- Connect the terminal.

5.4 FCC SENSOR

Remove the screw (1 pcs) and remove the Al tape

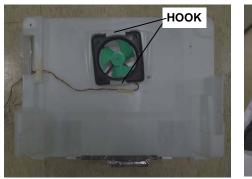
 $\cdot \textsc{Disassembly}$ the hook around side

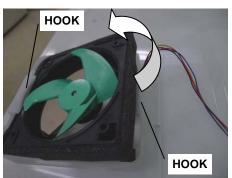
Disassembly the COVER COIL FRONT and COVER COIL BACK

Remove the FCC SENSOR



·Remove the AI tape





ICE TRAY RAIL

To replace the FCC SENSOR

• FCC SENSOR should be hooked in plate.

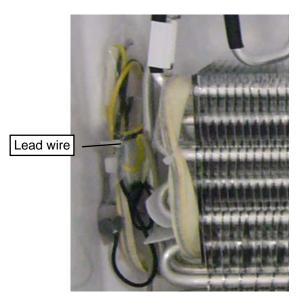


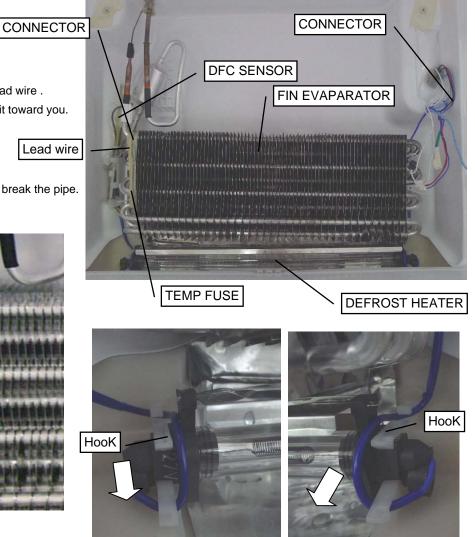
5.5 DEFROST HEATER

- · Remove the cover coil as.
- · Remove the lead wire .
- · Disconnect both side connector of heater lead wire .
- · Lifting the evaporator at right gradually, pull it toward you.
- Remove the DEFROST HEATER.

NOTE :

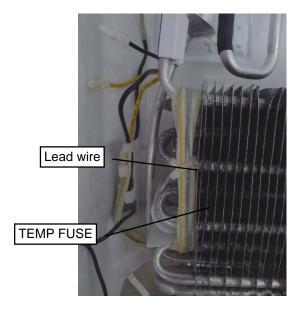
Special care should be taken not to twist and break the pipe.

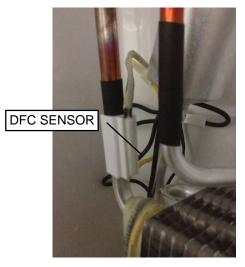




5.6 TEMP FUSE & DFC SENSOR

- Remove the Lead wire
- Disconnect the connector of TEMP FUSE.
- Remove the TEMP FUSE.

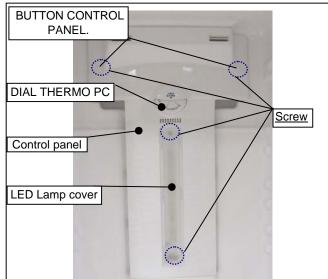




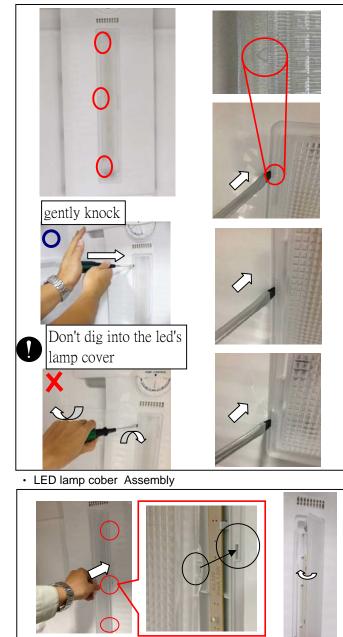
To replace the DFC SENSOR

DFC SENSOR should be hooked in plate.

5.7 LED COVER & LED LAMP PCB



Use a slotted screwdriver to unhook the LED lamp cover

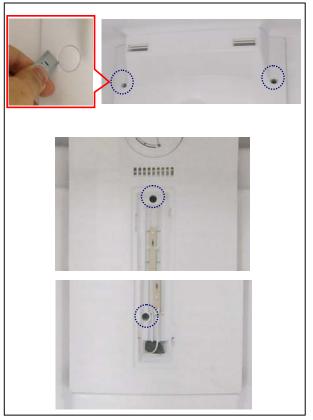


5.8 CONTROL PANEL PC

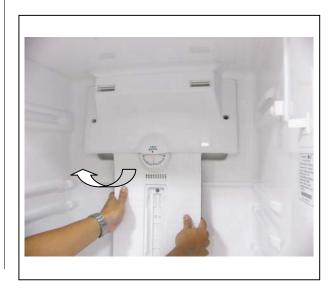
Remove the LED pcb connector



• Remove the screw(4pcs).



Take the control panel AS.

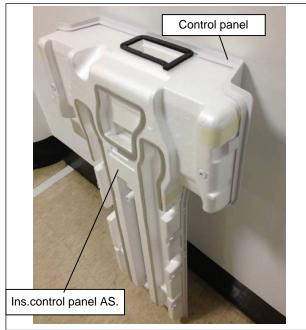


5.9 DAMPER THERMOSTAT

• Remove Control panel and pull out the



- · Disconnect the terminal.
- Disconnect the ins. control panel AS. & control panel.



· Remove the thermostat dial.



• Tear off the tapes on insulation.

Open the insulation from the front side pull the upper portion. • Remove the damper thermostat from insulation.

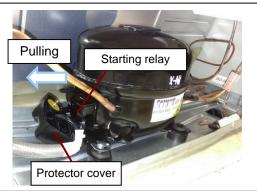


To replace damper thermo.

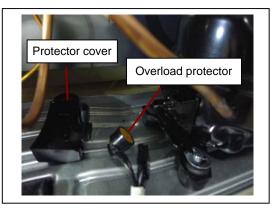
- Sealing dial should be put in place.
- Seal the gap between the front insulation and the back insulation by putting tape.
- Hook the sensor bulb in place.

5.10 STARTING RELAY & OVERLOAD PROTECTOR

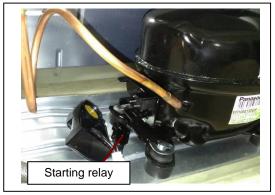
· Pull the potector cover leftwards to remove.



• Pull out the overload protector.



· Pull the starting relay leftwards to remove.



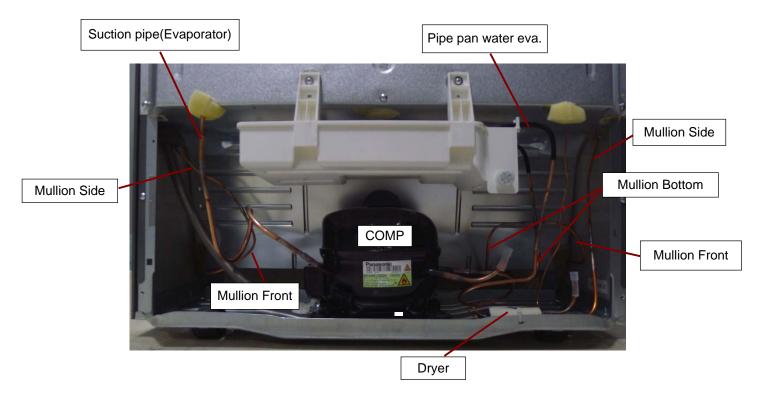
To replace starting relay

- · Insert the starting relay into comp. pin.
- Install the overload protector into protector cover.
- Pushing the protector cover into comp.

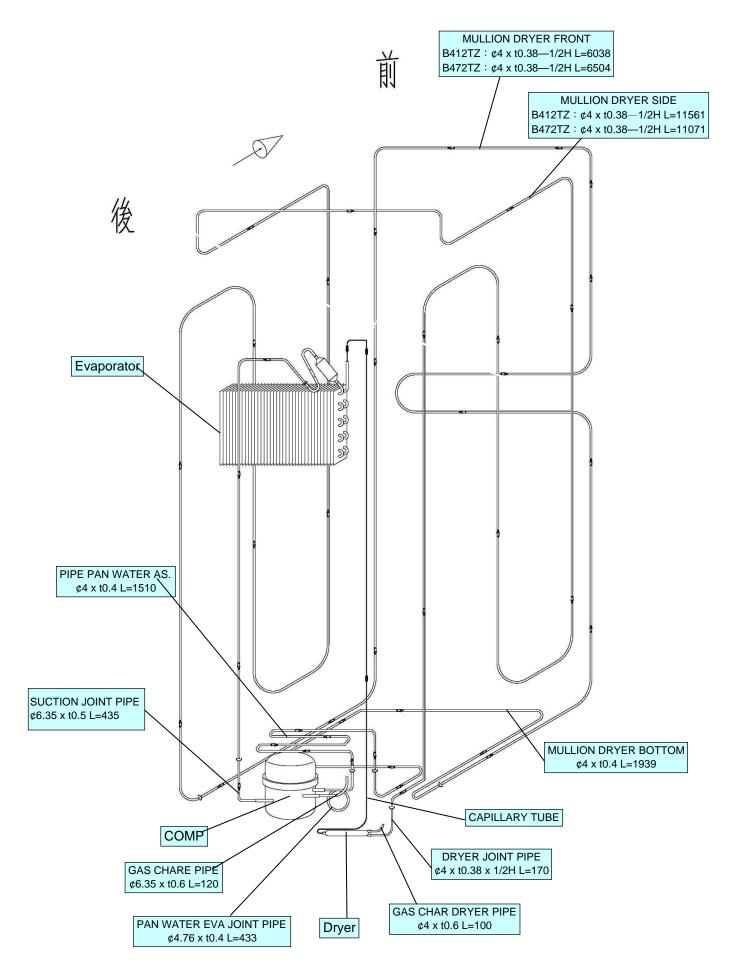


REFRIGERANT FLOW DIAGRAM

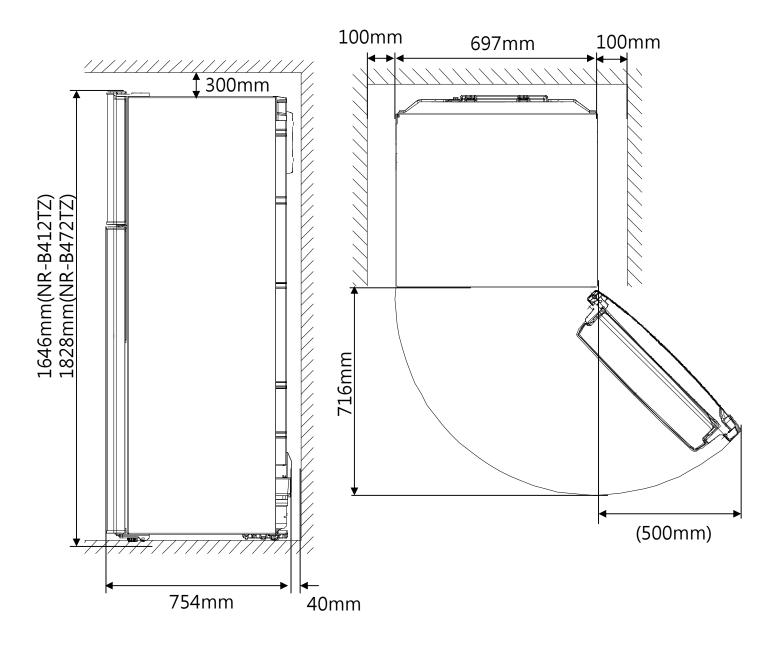
- Refrigerant flows in the refrigerating units as shown in the figure.
- Number in the figure of " PIPE LAYOUT " corresponds to number in the refrigerant flow diagram.



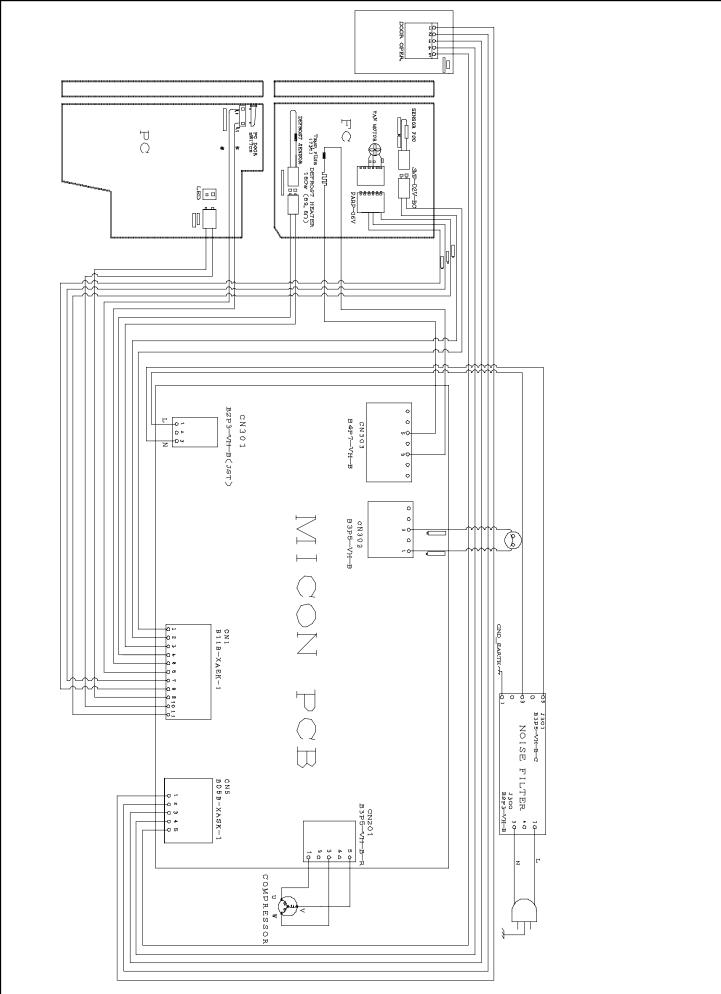
5.11 Refrigeration system diagram



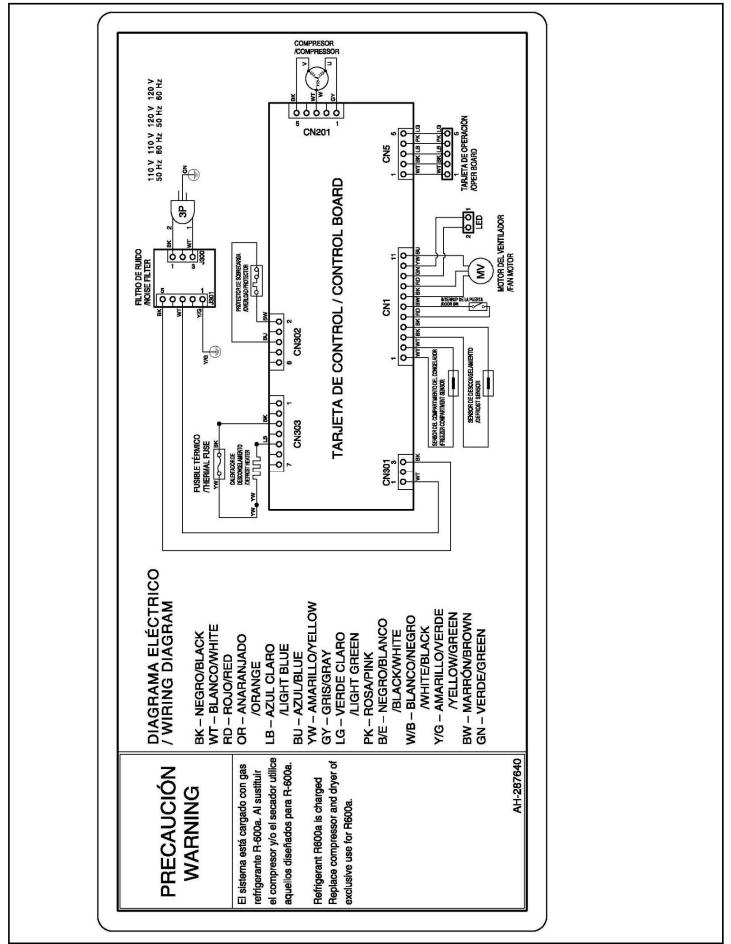
6. Installation Dimensions



7. Wiring Connection Diagram

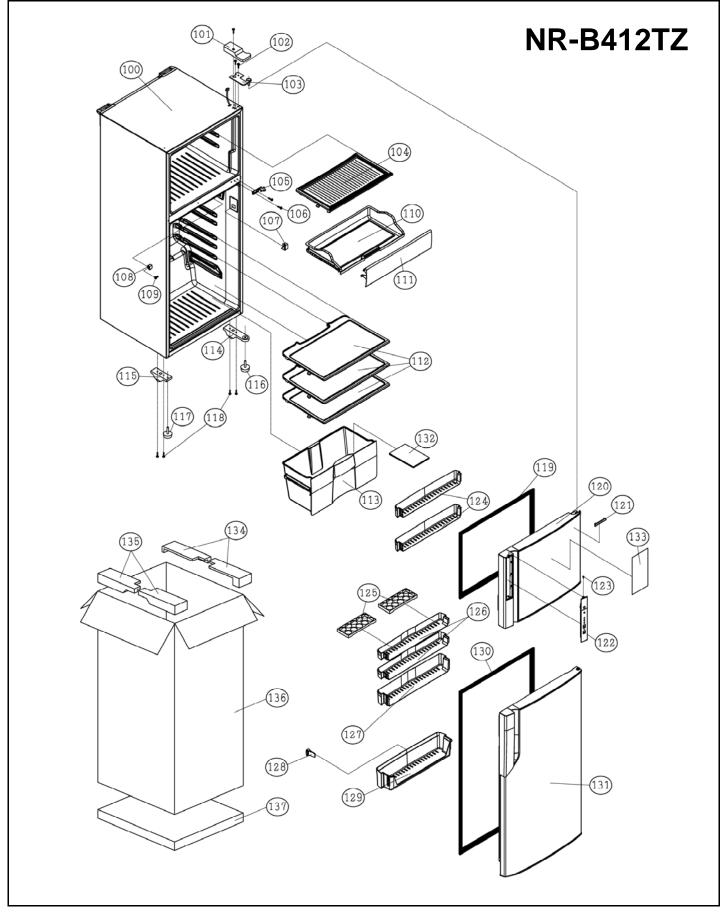


8. Schematic Diagram

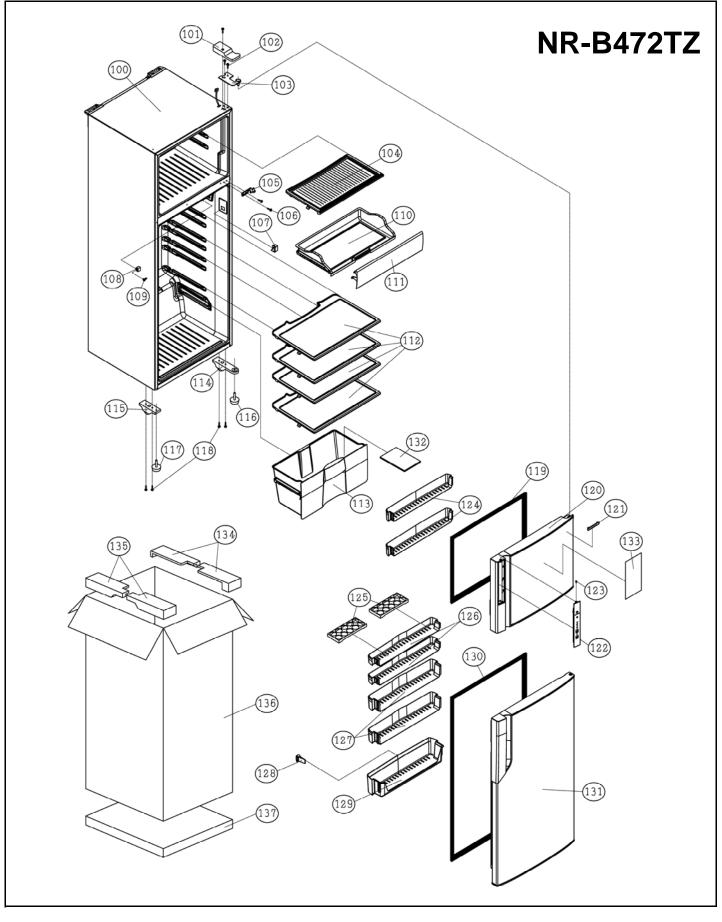


9. Location and Replacement Parts List

9.1.1 Location of Parts



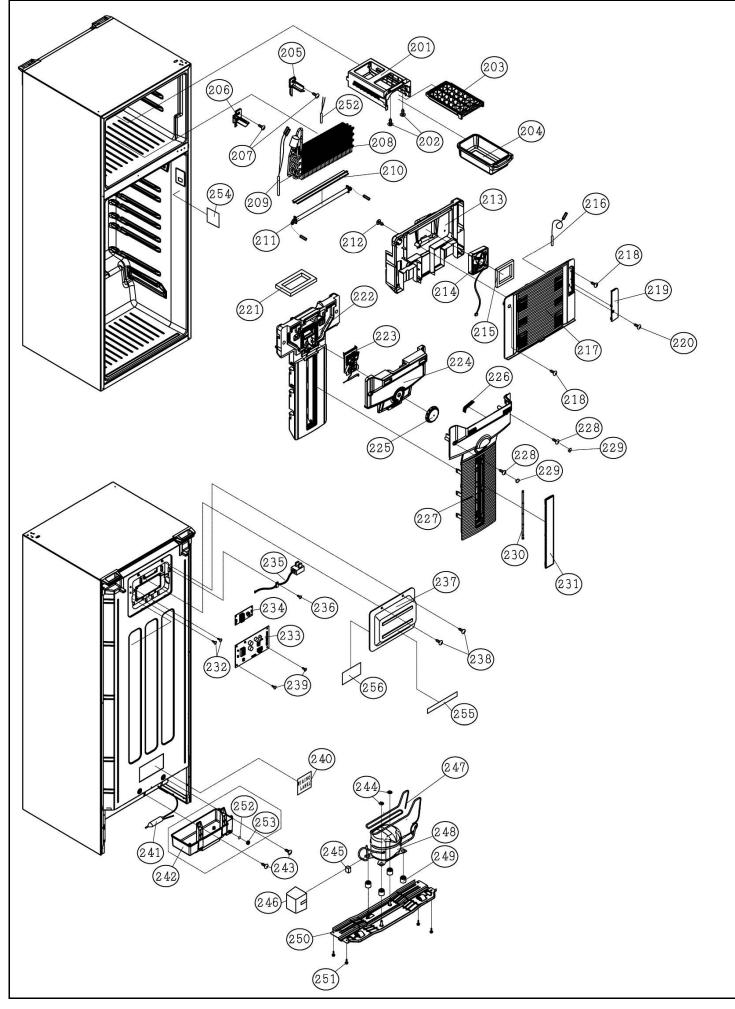
9.1.2 Location of Parts



9.1.3 Replacement Parts List

Ref.No	Service Parts No.	Parts Name & Description	B412TZ-S5	B472TZ-S5	PCS/SET	NOTE
100	CNRBC-33918S	SHELL N LINER AS.(FOAM)	0	_	1	
100	CNRBC-33921S	SHELL N LINER AS.(FOAM)	_	0	1	
101	CNRAD-33380DH COVER HINGE TOP		0	0	1	
102	CNR38-193801T FLANGE N HEXAGON 5 TS 14		0	0	3	
103	CNRAE-11710T	HINGE TOP R	0	0	1	
104	CNRBH-14171B	CRYSTAL SHELF FC AS.	0	0	1	
105	CNRAE-11663T	HINGE CENTER	0	0	1	
106	CNR38-193801T	FLANGE N HEXAGON 5 TS 14	0	0	2	
107	CNRAG-16606T	DOOR SW.	0	0	1	
108	CNRAH-13282W	MEAT TRAY STOPPER	0	0	2	
109	CNRXTT4+12AV	TRUSS 4 TS 12AV	0	0	2	
110	CNRAH-28654B	MEAT TRAY	0	0	1	
111	CNRAH-28653B	MEAT TRAY DOOR	0	0	1	
110	CNRAH-28697T	GLASS SHELF PC	0	0	3	B412TZ
112					4	B472TZ
113	CNRAH-28655B	CRISPER	0	0	1	
114	CNRBC-33895Z	NRBC-33895Z CASTER AS R.		0	1	
115	CNRBC-16959Z CASTER AS. L		0	0	1	
116	CNRAC-18337T ADJUSTER BOLT R		0	0	1	
117	CNRAC-24022T ADJUSTER BOLT		0	0	1	
118	CNR38-193801T FLANGE N HEXAGON 5 TS 14		0	0	4	
119	CNRAD-34582T			0	1	
120	CNRBD-35229S	DOOR AS. FC (FOAM)	0	0	1	
121	CNRAD-33980T	EMBLEM MARK PLATE	0	0	1	
122	CNRBD-35233B	OPERATION PANEL AS	0	0	1	
123	CNRXTT4+12AV	TRUSS 4 TS 12AV	0	0	1	
124	CNRAH-28644B			0	2	
125	CNRAD-13785B	TRAY EGG 10	0	0	2	
126	CNRAH-28645B	EGG SHELF	0	0	2	
407	CNRAH-28646B	FREE RACK		0	1	B412TZ
127			0		2	B472TZ
128	CNRAD-34628T	SLIDE STOPPER PC	0	0	1	
129	CNRAH-28647B	BOTTLE SHELF PC	0	0	1	
100	CNRAD-34602T	PC DOOR GASKET	0	_	1	
130	CNRAD-34598T	PC DOOR GASKET	_	0	1	
404	CNRBD-35231S	DOOR AS. PC(FOAM)	0	_	1	
131	CNRBD-35227S	DOOR AS. PC(FOAM)		0	1	
132	CNRAD-34681B	OPERATION SHEET	0	0	1	
133	CNRAK-15304T	OPERATION MANUAL	0	0	1	
134	CNRAK-15222T	CORNER ROCK TOP R	0	0	1	
135	CNRAK-15223T	CORNER ROCK TOP L	0	0	1	
	CNRAK-15307S	PACKING CASE	0	_	1	
136	CNRAK-15306S	PACKING CASE		0	1	
137	CNRAK-153320	POLYLON BOTTOM BASE	0	0	1	

9.2.1 Location of Parts



9.2.2 Replacement Parts List

			.			1
Ref.No	Service Parts No.	Parts Name & Description	B412TZ-S5	B472TZ-S5	PCS/SET	NOTE
201	CNRAH-13309W	ICE TRAY RAIL	0	0	1	
202	CNRXTT4+12AV	NRXTT4+12AV TRUSS 4 TS 12AV		0	2	
203	CNRBH-10241W ICE TRAY AS.		0	0	1	
204	CNRAH-13308B	ICE BOX	0	0	1	
205	CNRAC-22768T	EVA HOLDER R.	0	0	1	
206	CNRAC-22769T	EVA HOLDER L.	0	0	1	
207	CNRXTT4+12AFJ	TRUSS 4 TS 12	0	0	2	
208	CNRAF-17324T	FIN EVAPARATOR	0	0	1	
209	CNRBG-19005T	TEMP. FUSE AS.	0	0	1	
210	CNRAG-17160T	COVER RADIANT HEATER	0	0	1	
211	CNRAG-17272T	DEFROST HEATER	0	0	1	
212	CNRXTN4+10AFJ	TRUSS 4 TS 10	0	0	1	
213	CNRAC-22736T	COVER COIL BACK	0	0	1	
214	CNRAG-17174T	FC FAN MOTOR 6P	0	0	1	
215	CNRAJ-14076T	FAN MOTOR PU FOAM	0	0	1	
216	CNRBG-19158T	FCC SENSOR AS	0	0	1	
	CNRAC-22737T	COVER COIL FRONT	0	0	1	
	CNRXTT4+16A	TRUSS 4 TS 16	0	0	2	
219	CNRAC-22754T	COVER CONNECTOR FC	0	0	1	Ì
	CNRXTT4+12AFJ	TRUSS 4 TS 12	0	0	1	
221	CNRAJ-14088T	SEAL PU FOAM	0	0	1	
	CNRAC-22751T	INS. CONTROL PANEL B	0		1	
222	CNRAC-22739T	INS. CONTROL PANEL B		0	1	
223	CNRAG-17190T	BAFFLE THER	0	0	1	
223	CNRAC-22738T	INS. CONTROL PANEL F	0	0	1	
	CNRAH-28763T	DIAL THERMO PC	0	0	1	
225	CNRAH-24552T	AG BIO FILTER	0	0	1	
	CNRAH-245521 CNRAH-28663T		0	0	1	
227	CNRAH-28640T	CONTROL PANEL		0	1	
228	CNRXTT4+12AFJ	TRUSS 4 TS 12	0	0	4	
220	CNRAH-13267W	BUTTON CONTROL PANEL	0	0	4 2	
~~3 3	CNRBG-18819T	LED LAMP PCB AS.	0		2	
230	CNRBG-188191 CNRBG-15194T	LED LAMP PCB AS.			1	
	CNRAH-28665T	LED LAMP POB AS.		0	1	
231	CNRAH-286651 CNRAH-28642T	LED LAMP COVER	0		1	
232	CNRAH-286421 CNRXSB4D8BNS	BIND 4 SCREW 8		0	1	
			0	0	2	<u> </u>
233 234	CNRBG-19022T	MICON PCB AS NOISE FILTER AS.	0	0	1	<u> </u>
	CNRBG-18048T		0	0		
235	CNRBG-19184T	AC CORD AS.	0	0	1	
236	CNRXTT4+12AV	TRUSS 4 TS 12AV	0	0	1	
237	CNRBE-10924T	COVER PLATE PCB BASE AS.	0	0	1	
238	CNRC4585-480AJ		0	0	2	
240	CNRAK-15175T		0	0	1	
241	CNRAF-14103T	2 WAY DRYER 5g	0	0	1	
242	CNRBF-13811T	PAN WATER EVA AS.	0	0	1	
243	CNRAJ-10222T	FLANGE N TRUSS 4 TS 13	0	0	2	
244	CNR39-03011T		0	0	2	
245	CNR06-59529R	OVERLOAD PROTECTOR	0	0	1	
246	CNRGD-12208T	PROTECTOR COVER	0	0	1	ļ
247	CNRBF-11363T	PIPE PAN WATER EVA.AS.	0	0	1	
248	CNR91-23682T	СОМР	- 0	0	1	(exclude oil)
_	CNR91-23682A	СОМР				(include oil)
249	CNR39-941120T	RUBBER GROMMET	0	0	4	ļ
250	CNRBF-15607T	COMP. BASE N ROLLER AS.	0	0	1	
251	CNR08-21784A	FLANGE N HEXAGON 5 TS 18	0	0	4	
252	CNRAG-16608T	DFC SENSOR	0	0	1	