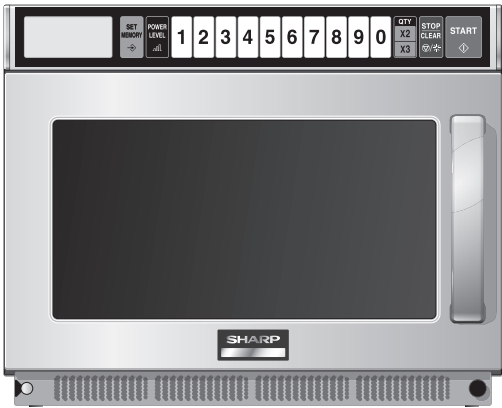


SHARP SERVICE MANUAL

S5902R7500PH/T



COMMERCIAL MICROWAVE OVEN

MODEL R-7500AT

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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BEFORE SERVICING

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information. It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW ----- EARTH

BLUE ----- NEUTRAL

BROWN ----- LIVE

CAUTION MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "⚠" on parts guide are used at voltage more than 250V.

Removal of the outer wrap gives access to potential above 250V.

All the parts marked "*" on parts guide may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

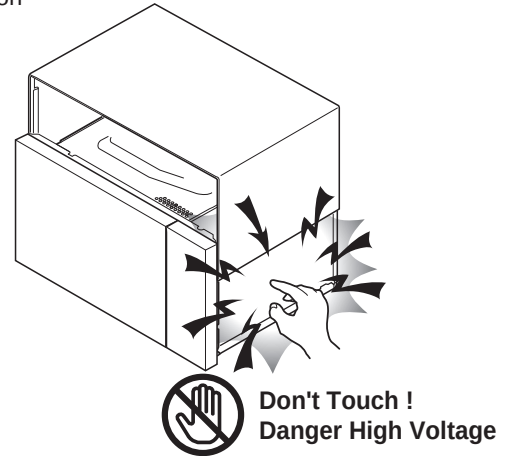
WARNING TO SERVICE PERSONNEL

The ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock.

(Example)

Inverter unit, Magnetron, High Voltage Harness etc..

Read the Service Manual carefully and follow all instructions.



BEFORE SERVICING

1. Disconnect the power supply cord, and then remove the outer case cabinet and the back plate assembly.
2. Open the door and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitors of the inverter unit.
4. Disconnect the high voltage wire from the magnetron terminal with insulated pliers.
5. Make the terminal (metal part) of the high voltage wire contact to the magnetron body with insulated pliers.
6. Now, the capacitors of the inverter unit are discharged.
7. Reconnect the high voltage wire to the magnetron terminal after discharging.

WARNING: Use the pliers that the portions of their handles are insulated completely to avoid an electric shock.

WARNING: RISK OF ELECTRIC SHOCK. DISCHARGE THE HIGH-VOLTAGE CAPACITOR BEFORE SERVICING.

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds.

Whenever troubleshooting is performed the power supply must be disconnected. It may, in some cases, be necessary to connect the power supply after the outer case cabinet has been removed, in this event,

1. Disconnect the power supply cord, and then remove the outer case cabinet and the back plate assembly.
2. Open the door and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitors of the inverter unit.
4. Disconnect the high voltage wire from the magnetron terminal with insulated pliers.
5. Make the terminal (metal part) of the high voltage wire contact to the magnetron body with insulated pliers.
6. Now, the capacitors of the inverter unit are discharged.
7. Reconnect the high voltage wire to the magnetron terminal after discharging.

WARNING: Use the pliers that the portions of their handles are insulated completely to avoid an electric shock.

8. Disconnect the inverter harness from the main harness.
9. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
10. After that procedure, reconnect the power supply cord.

WHEN THE TESTING IS COMPLETED

1. Disconnect the power supply cord, and then remove the outer case cabinet and the back plate assembly.
2. Open the door and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitors of the inverter unit.
4. Disconnect the high voltage wire from the magnetron terminal with insulated pliers.
5. Make the terminal (metal part) of the high voltage wire contact to the magnetron body with insulated pliers.
6. Now, the capacitors of the inverter unit are discharged.
7. Reconnect the high voltage wire to the magnetron terminal after discharging.

WARNING: Use the pliers that the portions of their handles are insulated completely to avoid an electric shock.

8. Reconnect all leads removed from components during testing.
9. Reinstall the outer case cabinet and the back plate assembly.
10. Reconnect the power supply cord after the outer case cabinet and the back plate assembly are installed.
11. Run the oven and check all function.

AFTER REPAIRING

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case cabinet (cabinet) and the back plate assembly.
3. Reconnect the power supply cord after the outer case cabinet and the back plate assembly are installed.
4. Run the oven and check all functions.

Oven should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the ceramic oven floor, close the door and set the power to 100% and set the microwave timer for one (1) minute. When the one minute has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and microwave leakage test should be carried out.

BEFORE REPLACING THE PRINTED WIRING BOARD

Some normal boards are found in board units that have been returned due to oven failure. So, most of board replacements may arise from poor harness connection. Accordingly, before replacing any board that was judged to require its replacement, use the following procedure to re-check that the connection terminal of a connector has been properly inserted:

1. When the connectors have been incorrectly inserted to the control unit.

CONNECTOR	Symptom
CN-A	The oven can not be powered on. Antenna motor(s) does not run. Blower motor(s) does not run.
CN-B	The oven can not be powered on. No heating can be done. LED light does not illuminate.
CN-D, CN-F	No indication, no key insertion and no buzzer sound.
CN-G	The power level can not be varied. MGT thermistor(s) does not work. Magnetron(s) does not work. ER-ROR(s) shows.

2. When latch switch adjustment is incorrect

When latch switch adjustment is incorrect, symptoms such as no heating, no heating start, no activation even with start button pressed, etc. will occur.

PRECAUTIONS FOR USING LEAD-FREE SOLDER

Employing lead-free solder

The "Main PWB" of this model employs lead-free solder. This is indicated by the "LF" symbol printed on the PWB and in the service manual. The suffix letter indicates the alloy type of the solder.

Example:

LFa
Sn-Ag-Cu

Indicates lead-free solder of tin, silver and copper

LFn
Sn-Cu-Ni

Indicates lead-free solder of tin, copper and nickel

Using lead-free wire solder

When repairing a PWB with the "LF" symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.)

As the melting point of lead-free solder is approximately 40°C higher than tin/lead alloy solder, it is recommended that a dedicated bit is used, and that the iron temperature is adjusted accordingly.

Soldering

As the melting point of lead-free solder (Sn-Ag-Cu, Sn-Cu-Ni) is higher and has poorer wettability, (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved. The high content of tin in lead free solder will cause premature corrosion of the bit. To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required.

Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult. It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.

PRODUCT SPECIFICATIONS

AC Line Voltage	Single phase 230V, 50 Hz
AC Power Required	2.85 kW 12.2 A
Output Power.....	1800 W (IEC 60705)
Microwave Frequency	2450 MHz* (Group 2 / Class B)
Sound level.....	less than 70dB (A)
Outside Dimensions	420(W) x 337(H) x 480(D) mm (Single) 420(W) x 674(H) x 480(D) mm (Two ovens stacked)
Cavity Dimensions.....	332(W) x 171.5(H) x 330(D) mm
Oven Capacity	19 litres
Cooking Uniformity	Rotary antenna system
Weight	Approx. 20kg

- As part of a policy of continuous improvement, we reserve the right to alter design and specification without notice.

* This Product fulfils the requirement of the European standard EN55011. In conformity with this standard, this product is classified as group 2 class B equipment. Group 2 means that the equipment intentionally generates radio-frequency energy in the form of electromagnetic radiation for heating treatment of food. Class B equipment means that the equipment suitable to be used in domestic establishments. This product is designed for commercial application only and as such it falls outside the scope of Regulation (EC) 1275/2008 implementing EU Directive 2005/32/EC on eco-design requirements for standby and off mode electric power consumption. Sharp do not recommend the product for domestic application and will not accept any liability for such use.

NOTE: External Equipotential Earthing Terminal
Equipment has secondary earthing terminal. Terminal provides external earthing connection used in addition to earthing prong on plug. Located on outside of oven back, terminal is marked with symbol shown on the right side.



INSTALLATION INFORMATION

When this commercial microwave oven is installed near other commercial electrical appliances, connect a lead wire to each equivalent potential terminal with equipotential marking between them (insert a lead wire between a washer and an earth angle, and screw them), as shown in Fig. A-1, to make sure that they are at equivalent potential. If any lead wire is not connected between them, when person touch them he/she will get a electric shock.

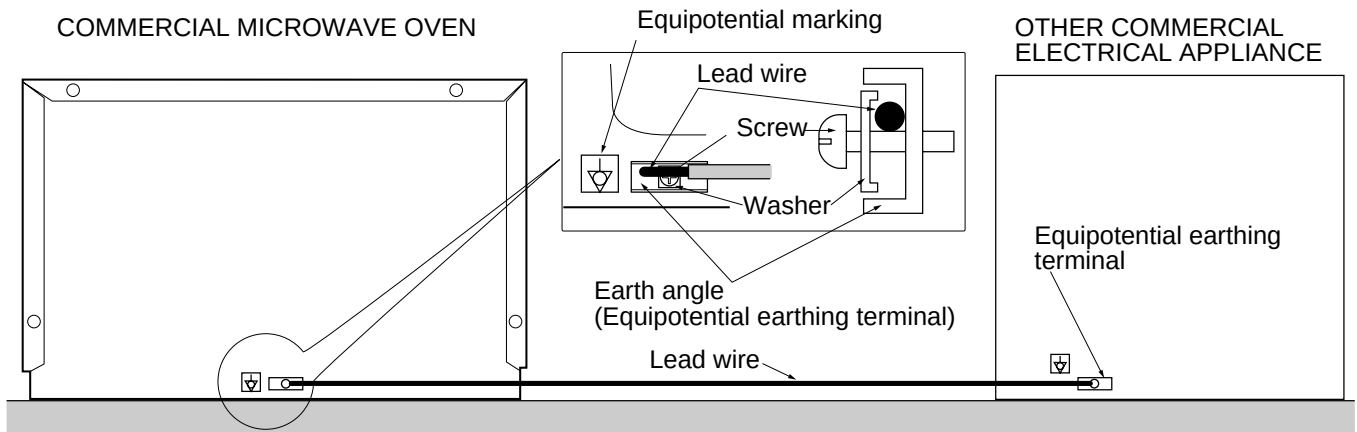


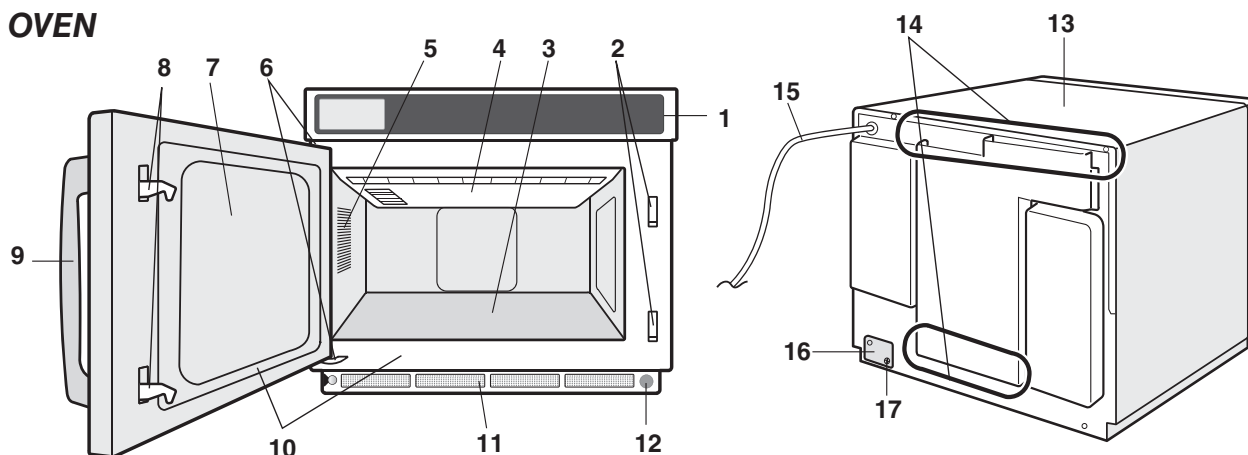
Fig. A-1

GENERAL INFORMATION

OVEN DIAGRAM

PART NAMES

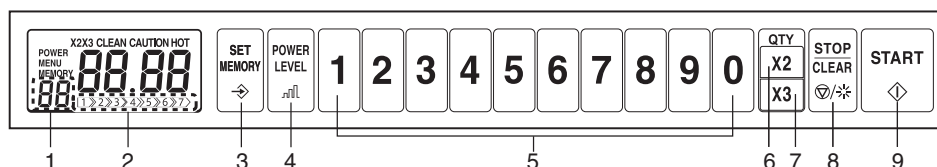
OVEN



1. Control panel
2. Door latch openings
3. Ceramic shelf
4. Splash cover
5. Oven lamp
6. Door hinges
7. Door (glass)
8. Door latches
9. Door handle

10. Door seals and sealing surfaces
11. Air intake filter (air intake openings)
12. Filter knob
13. Outer cabinet
14. Ventilation openings
15. Power supply cord
16. Mounting plate
17. Screw for mounting plate

CONTROL PANEL



DISPLAY INFORMATION

MEMORY : MEMORY will appear when saving, checking or deleting memory programs. It is also shown during Program Lock, Oven Lamp or Audible Signal Sound setting.

MENU : MENU will appear when selecting memory number.

POWER : POWER will appear when selecting microwave power level.

X2, X3 : X2 or X3 will appear when selecting double or triple quantity.

CLEAN CAUTION : CLEAN CAUTION will appear when the cleaning of the air intake filter should be necessary.

HOT: HOT will appear when the oven is very hot.

1. Memory number/Power level indicator
2. Cooking stage indicators

OPERATING PADS

3. SET MEMORY pad
4. POWER LEVEL pad
5. Ten number pads
6. DOUBLE QUANTITY pad
7. TRIPLE QUANTITY pad
8. STOP/CLEAR pad
9. START pad

ACCESSORIES

Check to make sure the following accessories are provided:

- Operation manual
- Touch guide
- Caution sheet
(SPECIAL INSTRUCTIONS AND WARNINGS)

NOTE:

- When you order accessories, please mention the two items: part name and model name to your dealer or SHARP authorized service agent.
- The model name is printed on the door of the microwave oven.

TEST PROCEDURES

[1] INTERLOCK SWITCH -1 AND/OR -2 TEST

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door full assy and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitor of the inverter unit.
4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the secondary interlock switch.
5. Reconnect all leads removed from components during testing.
6. Reinstall the outer case (cabinet).
7. Reconnect the power supply cord after the outer case are installed.
8. Run the oven and check all functions.

[2] INTERLOCK SYSTEM TEST

1. DOOR SENSING SWITCH

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door full assy and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitor of the inverter unit.
4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the door sensing switch.
5. Reconnect all leads removed from components during testing.
6. Reinstall the outer case (cabinet).
7. Reconnect the power supply cord after the outer case are installed.
8. Run the oven and check all functions.

2. INTERLOCK RELAY RY1

1. Disconnect the power supply cord, and then remove outer case .
2. Open the door full assy and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitor of the inverter unit.
4. Disconnect two (2) wire leads from the male tab terminals of the Interlock Relay RY1. Check the state of the relay contacts using a ohmmeter. The relay contacts should be open. If the relay contacts are closed, replace the circuit board entirely .
5. Reconnect all leads removed from components during testing.

6.Reinstall the outer case (cabinet).

7. Reconnect the power supply cord after the outer case are installed.

8. Run the oven and check all functions.

[3] G: MONITOR SWITCH -1 AND/OR -2 TEST

1.Disconnect the power supply cord, and then remove outer case and rear cabinet.

2.Open the door full and block it open.

3.Wait for 60 seconds to discharge the high voltage capacitor of the inverter unit.

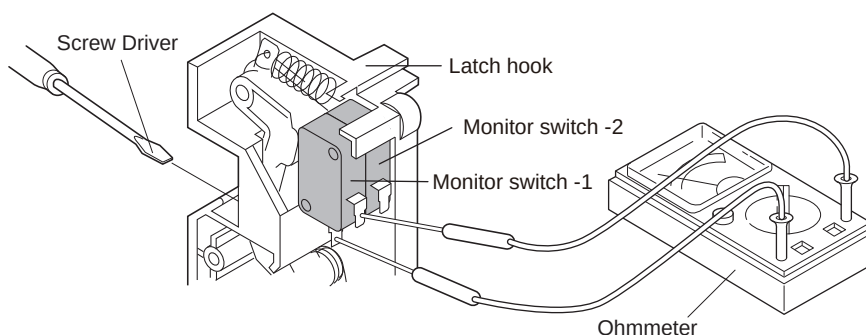
4.Before performing this test, make sure that the interlock switches -1, -2 and the interlock relay RY1 are operating properly, according to the above Switch Test Procedure. Disconnect the wire lead from the monitor switches -1, -2 (COM) terminals. Check the monitor switches -1, -2 operation by using the ohmmeter as follows. When the door is open, the meter should indicate a closed circuit. When the monitor switch actuator is pushed by a screw driver through the upper latch hole on the front plate of the oven cavity with the door opened (in this condition the plunger of the monitor switch is pushed in), the meter should indicate an open circuit. If improper operation is indicated, the switch may be defective. After testing the monitor switches, reconnect the wire lead to the monitor switch (COM) terminals and check the continuity of the monitor circuit.

5.Reconnect all leads removed from components during testing.

6.Reinstall the outer case (cabinet).

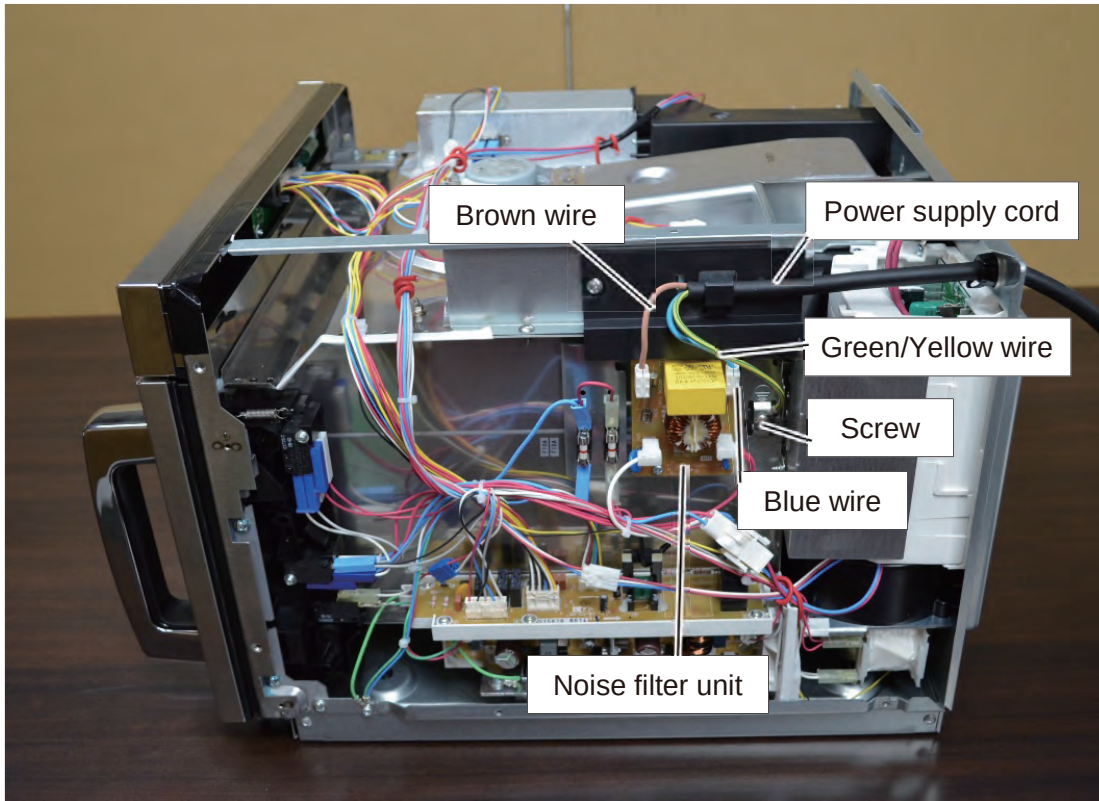
7. Reconnect the power supply cord after the rear cover and the outer case are installed.

8. Run the oven and check all functions.

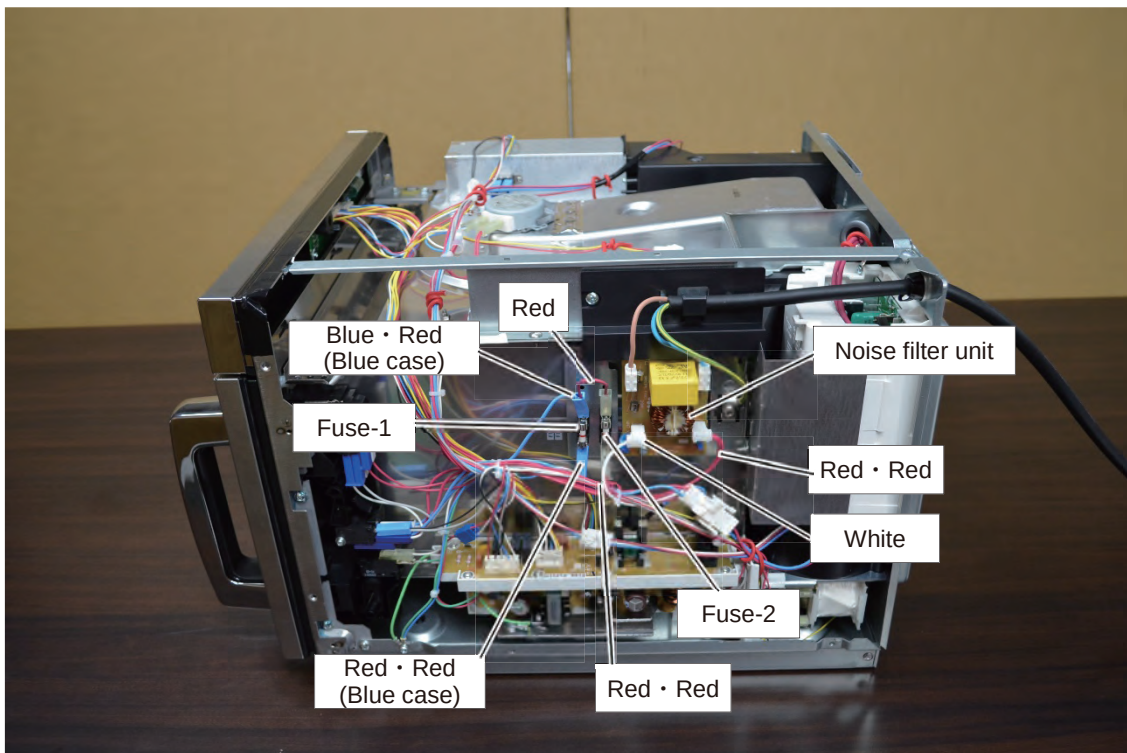


WIRING

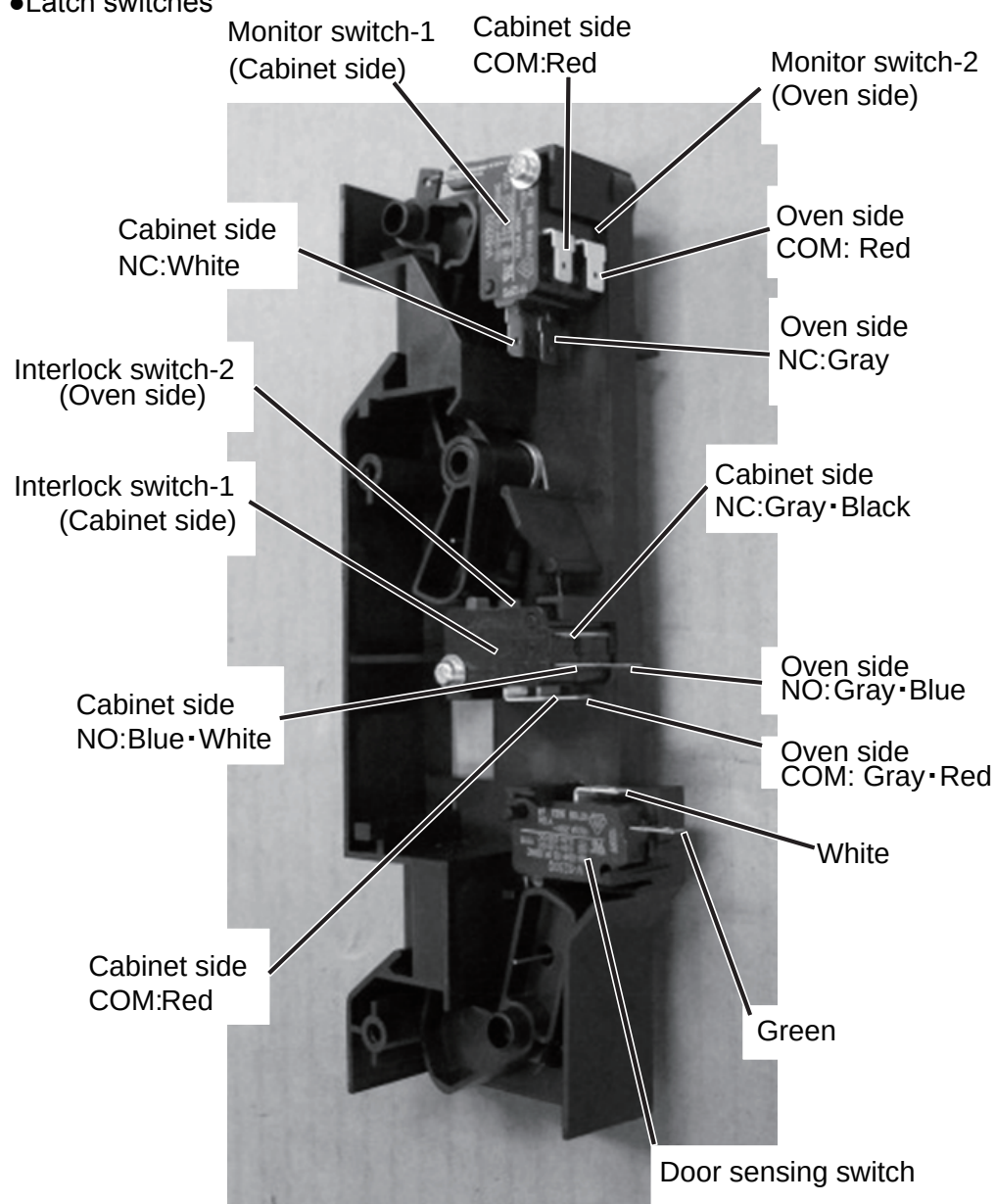
●Power supply cord



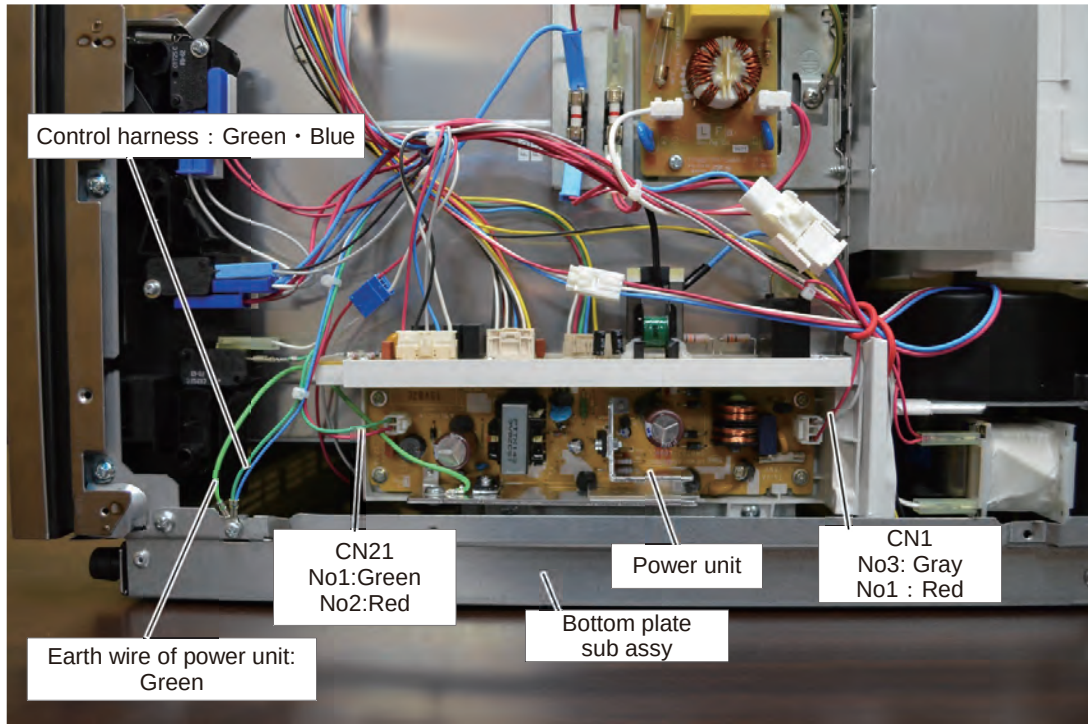
●Noise filter unit and Fuses F10A



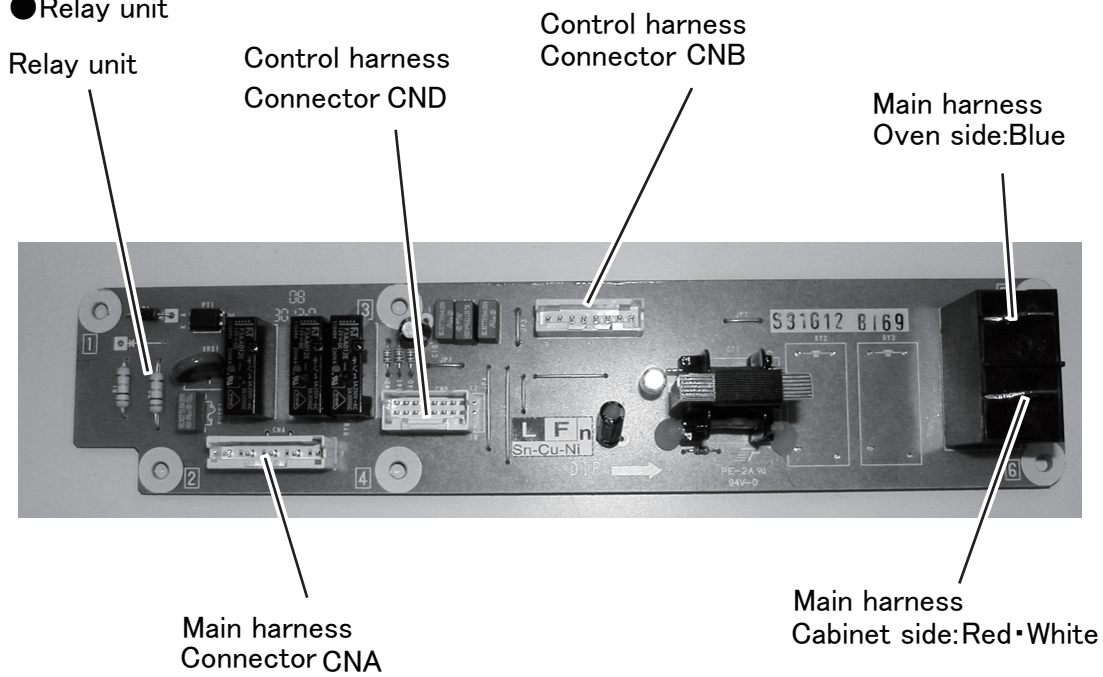
●Latch switches



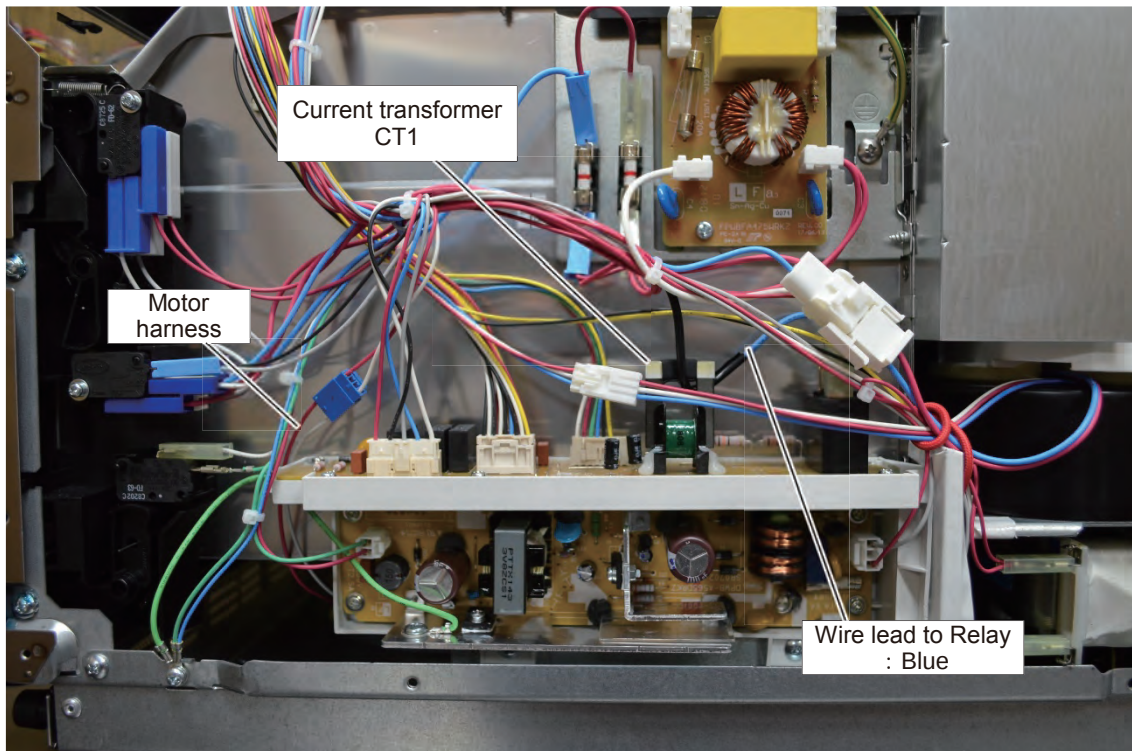
● Power unit



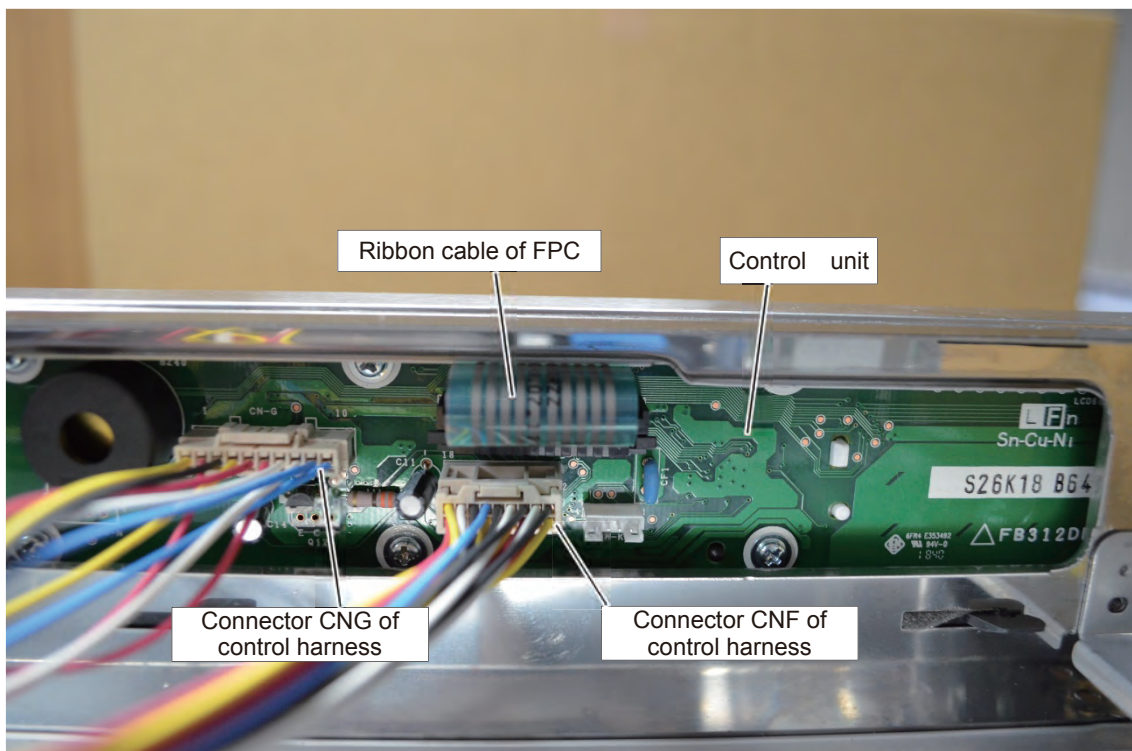
● Relay unit



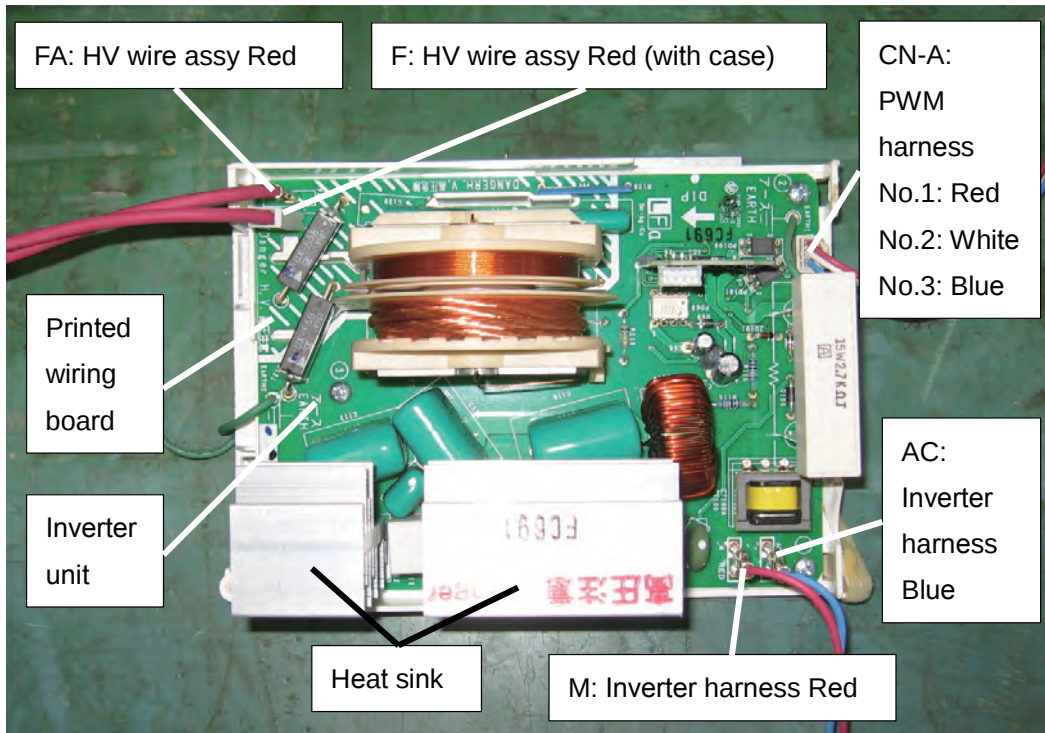
- Wiring to Relay and motor harness



- Control unit



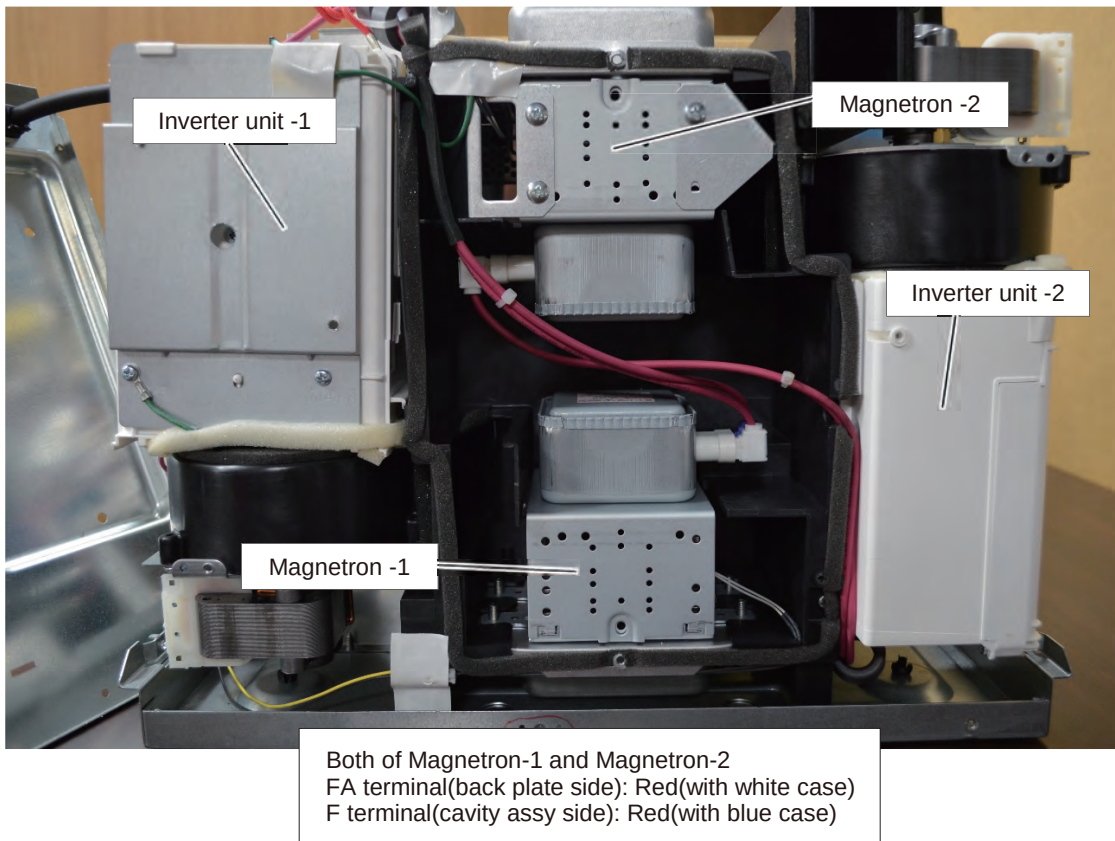
●Inverter unit



Warning: Disconnect power supply before servicing.

The inverter unit contain circuitry capable of producing very high voltage and current, contact with the heat sinks, FA terminal, F terminal, printed wiring board and other portions may result in a severe, possibly fatal, electrical shock.

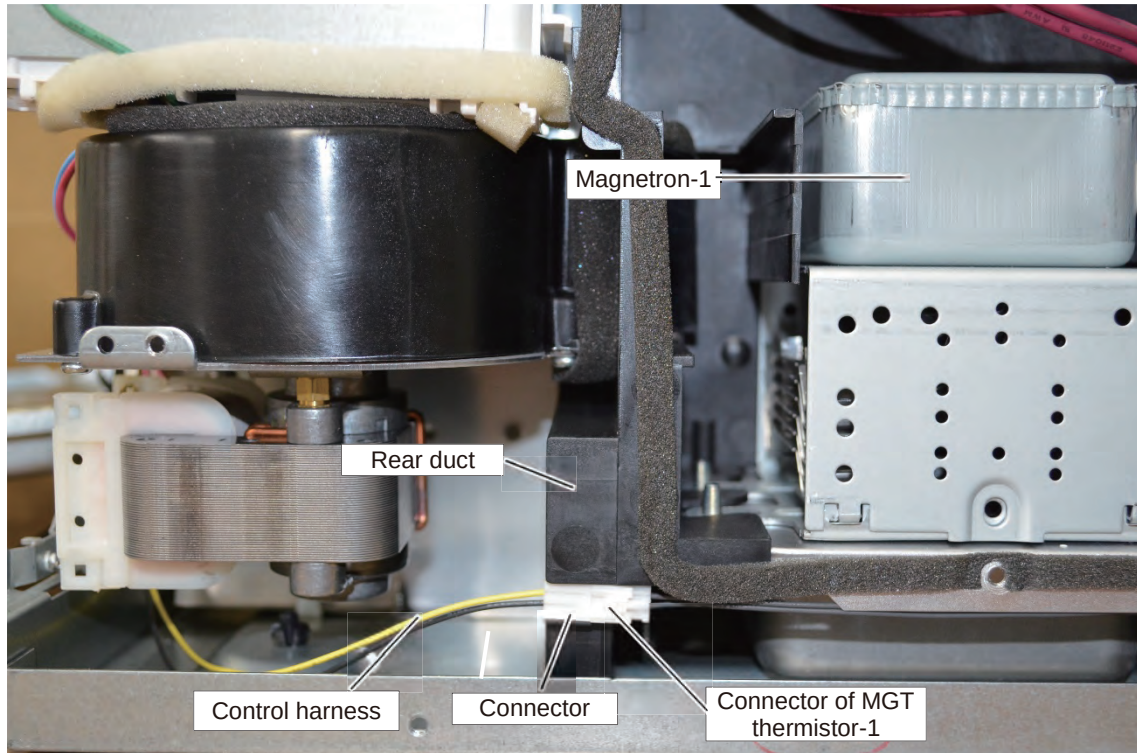
●Magnetron



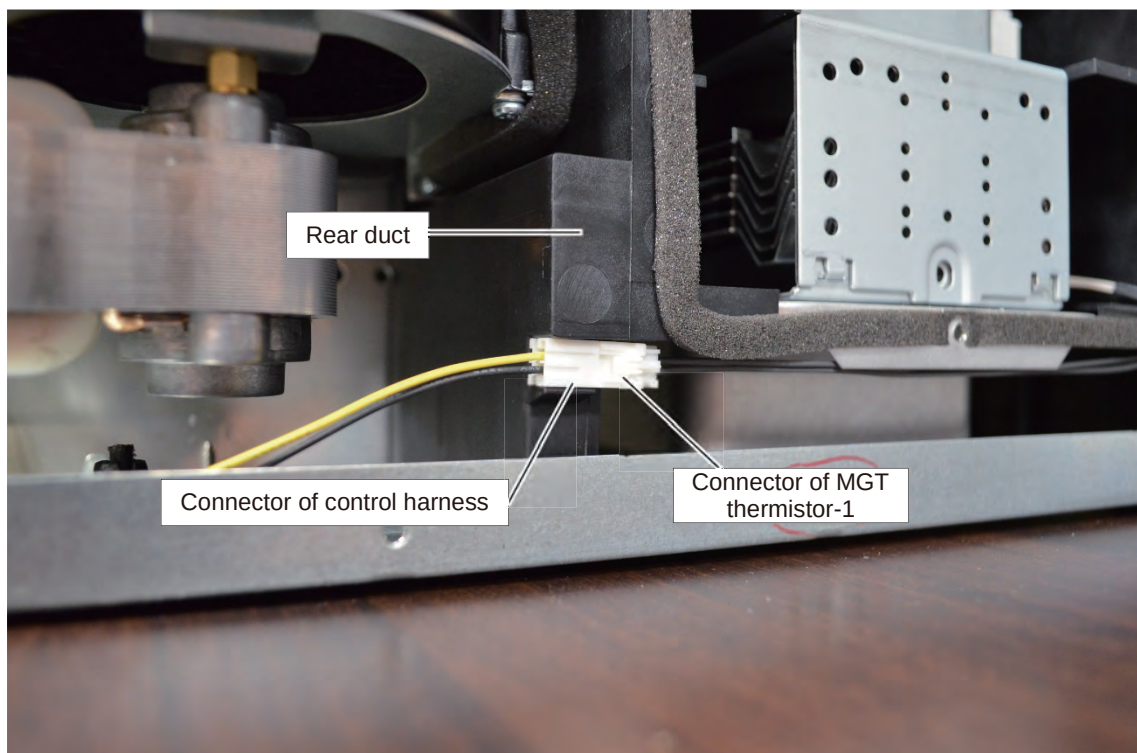
Warning: Disconnect power supply before servicing.

●Wiring to MGT thermistor-1

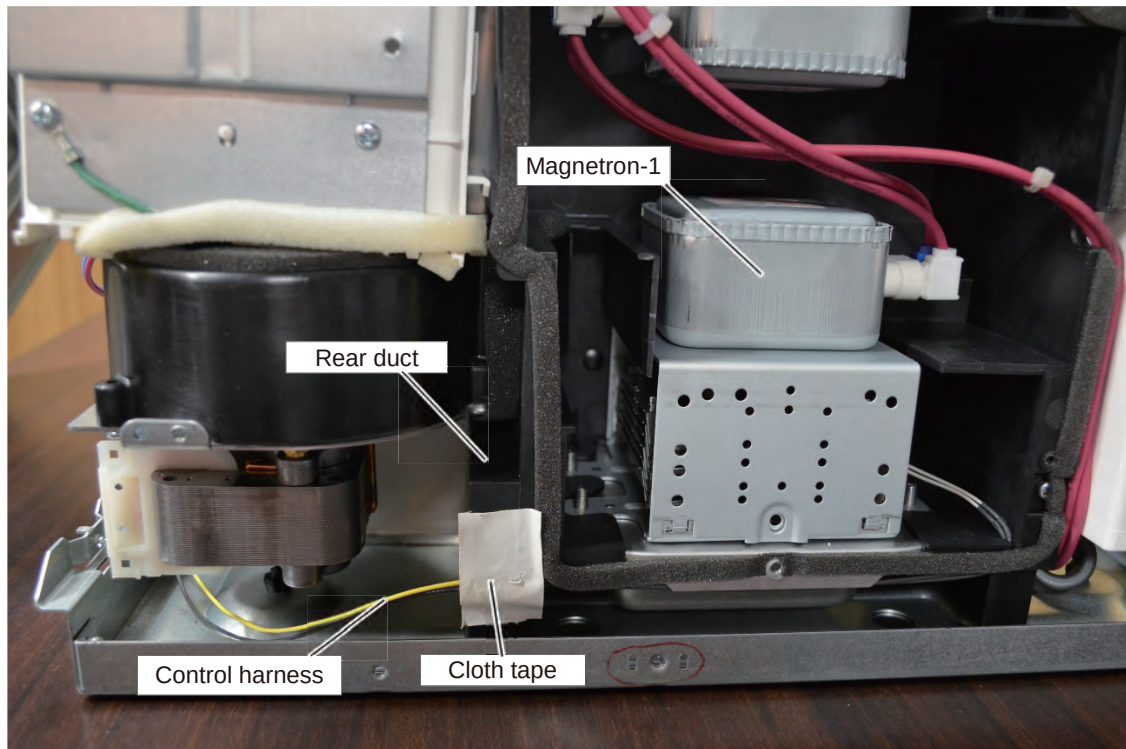
- ①Connect the connector of MGT thermistor-1 to the connector of the control harness.
- ②Insert the connected connectors into the hole of the rear duct.
- ③Put the cloth tape on the portion where the connectors are inserted at the rear duct.



(Wiring inside the tape at rear side)

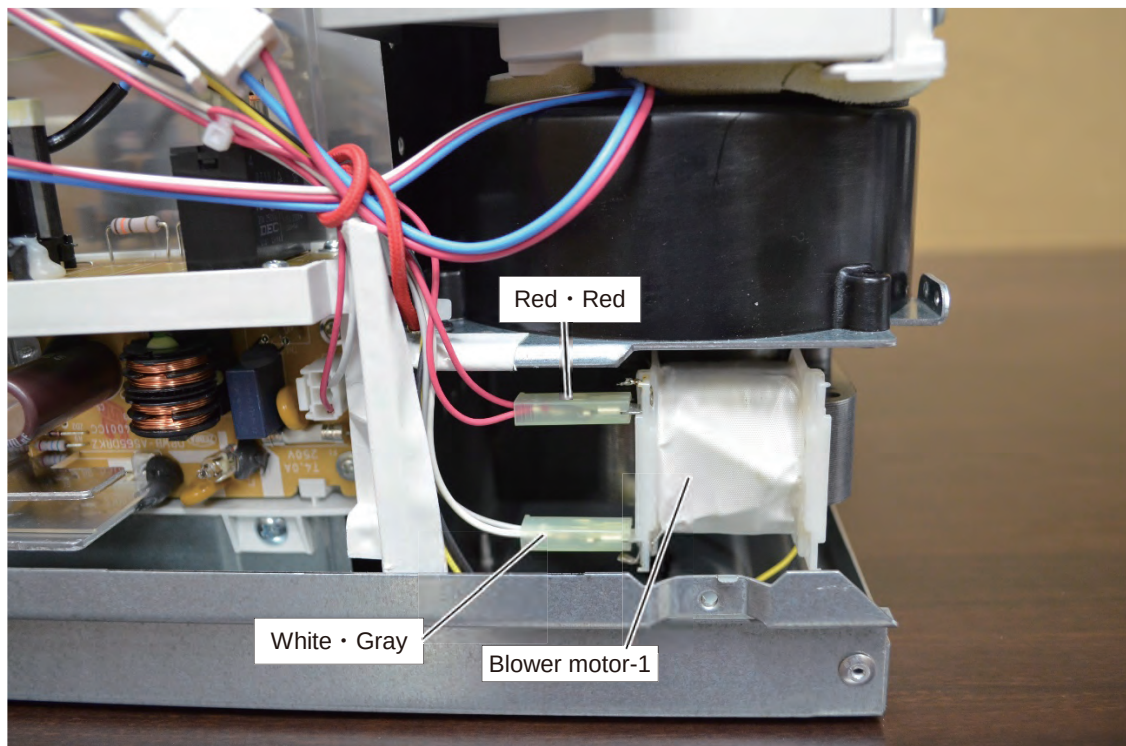


(Wiring of connection at rear side)

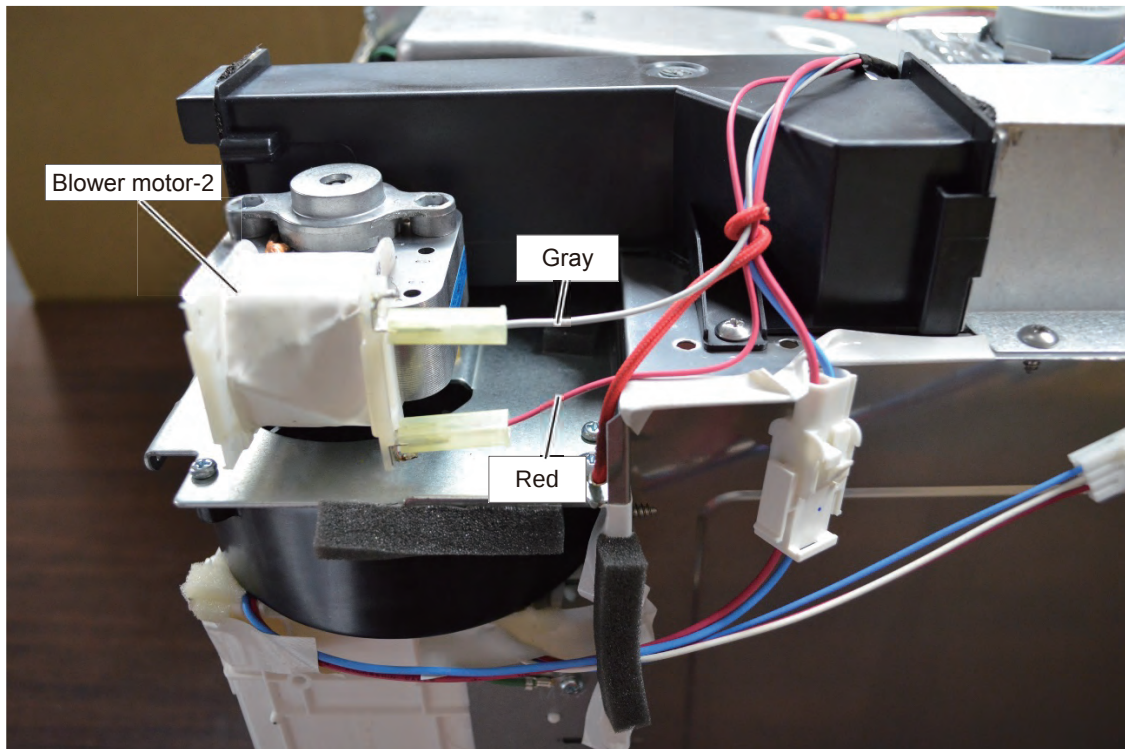


(Wiring with tape at rear side)

•Blower motor-1

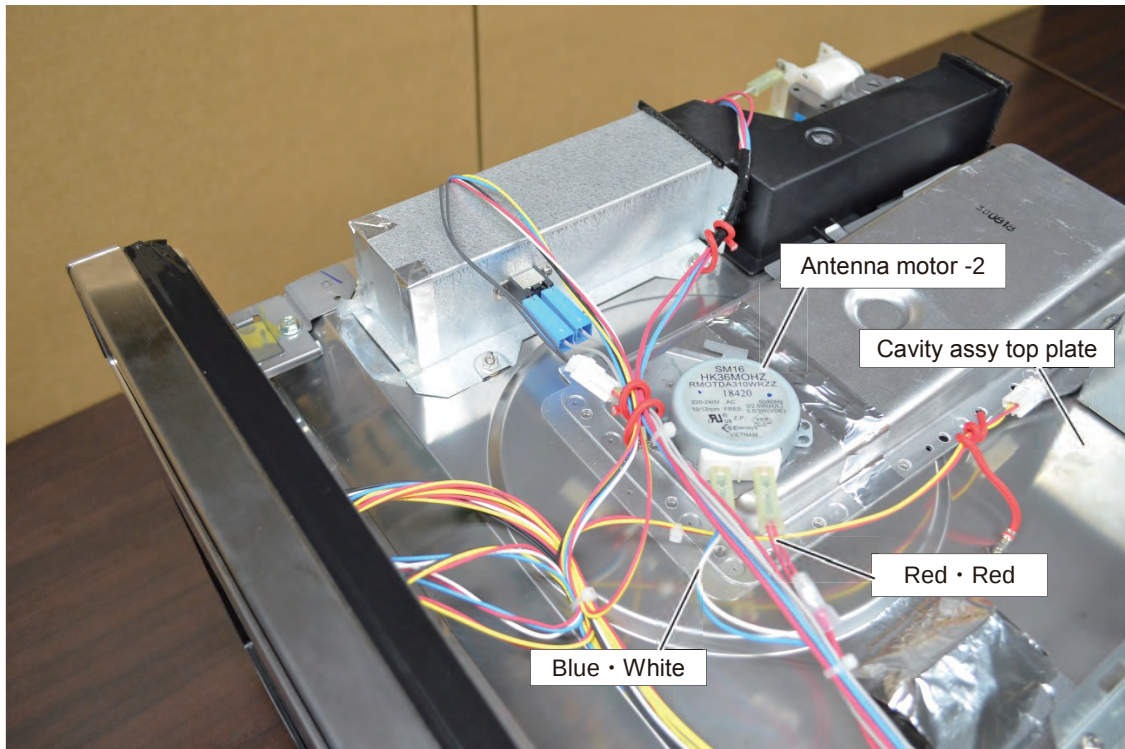


•Blower motor-2

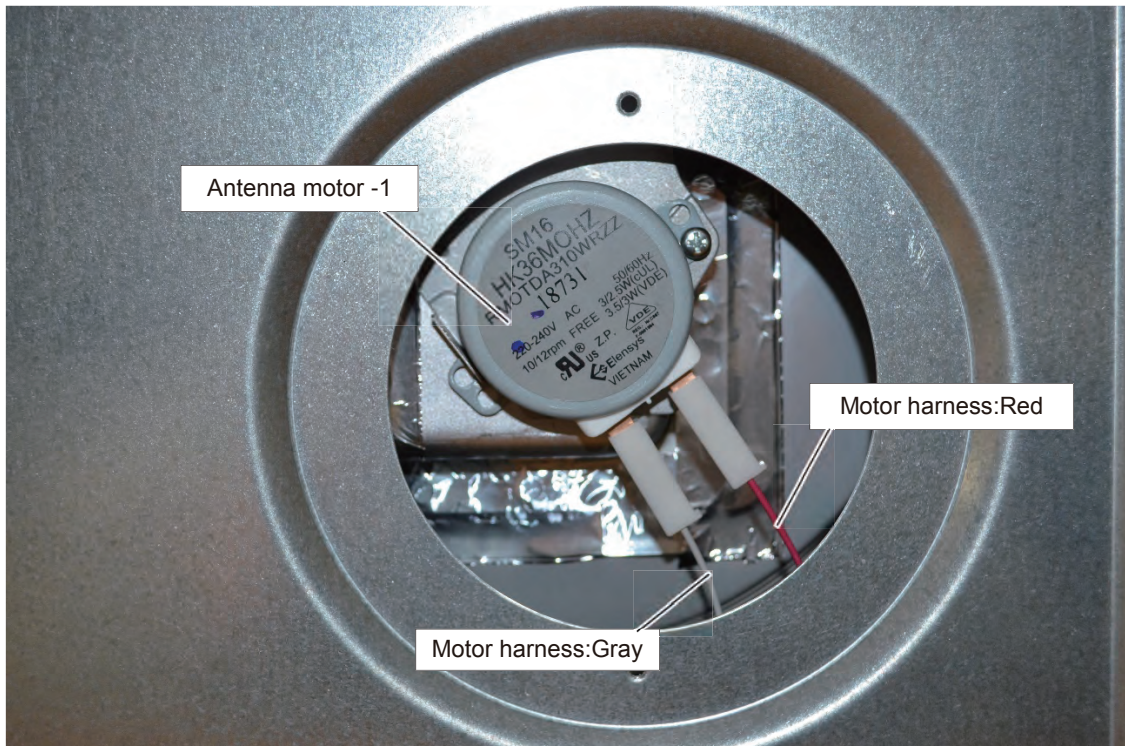


Wiring(Antenna motor)

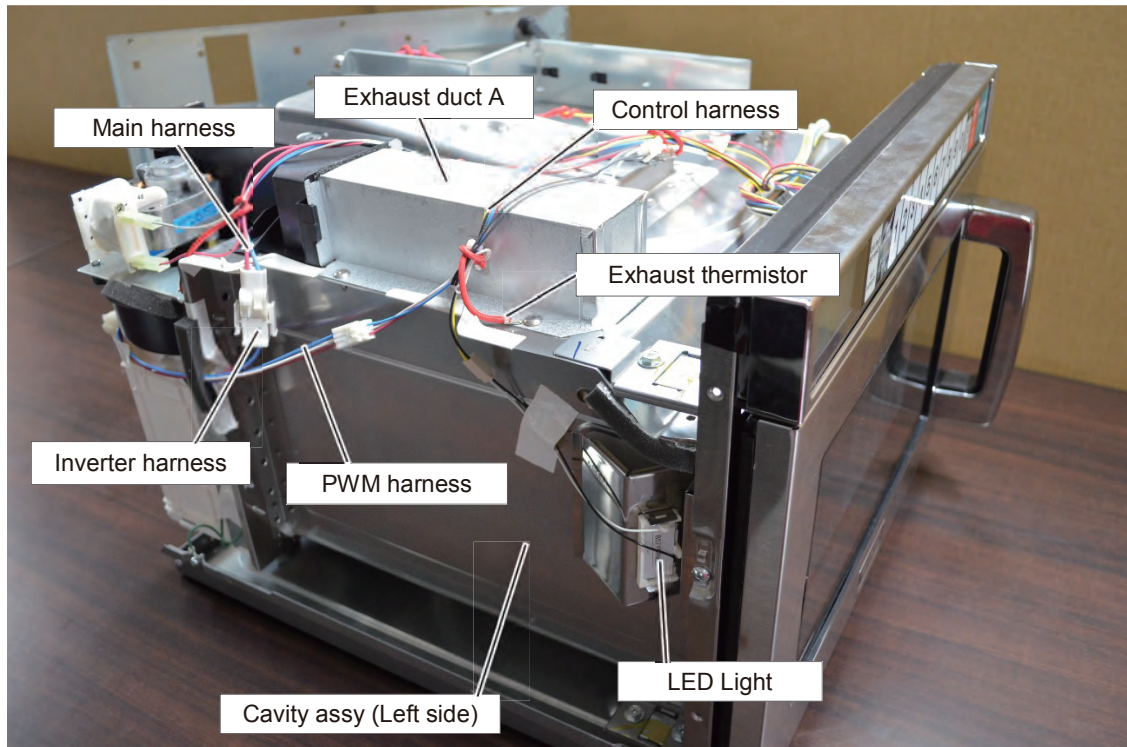
• Antenna motor-2



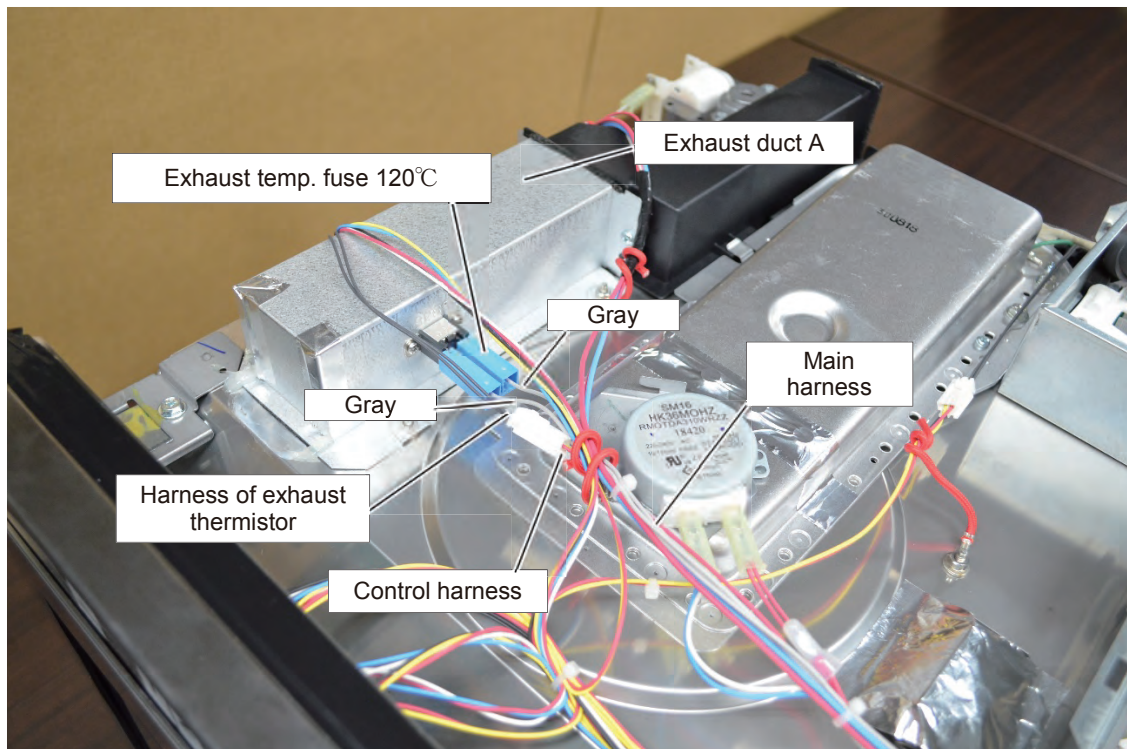
• Antenna motor-1



●Exhaust thermistor

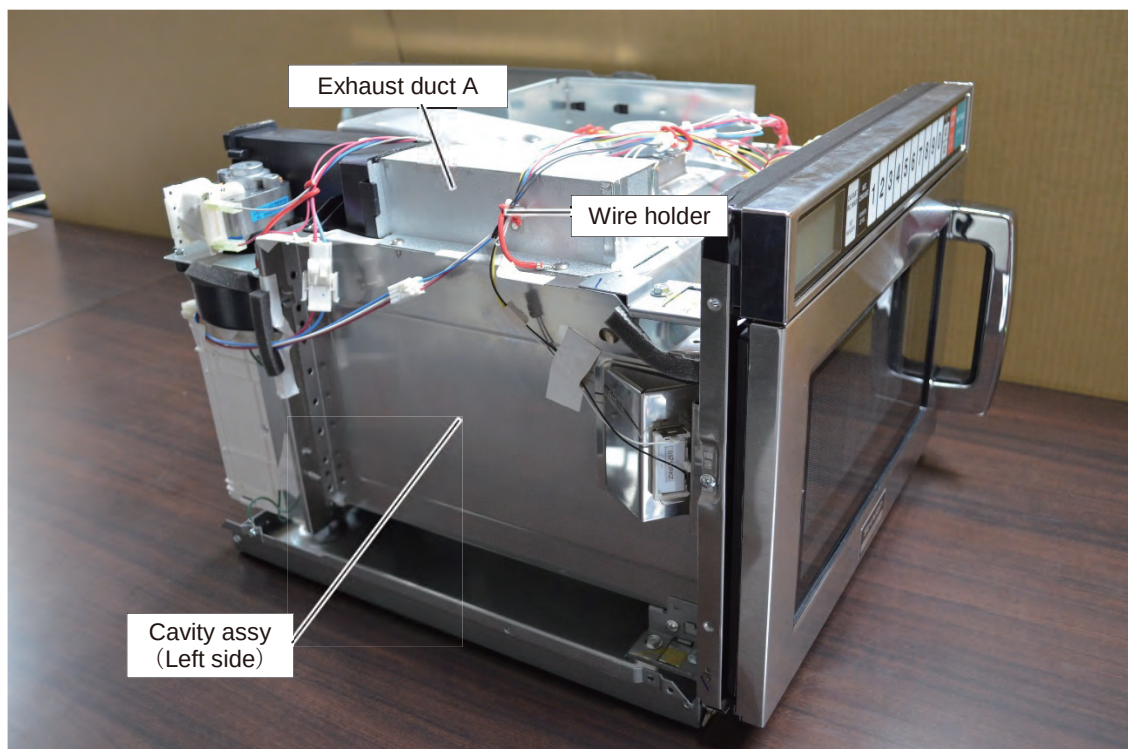
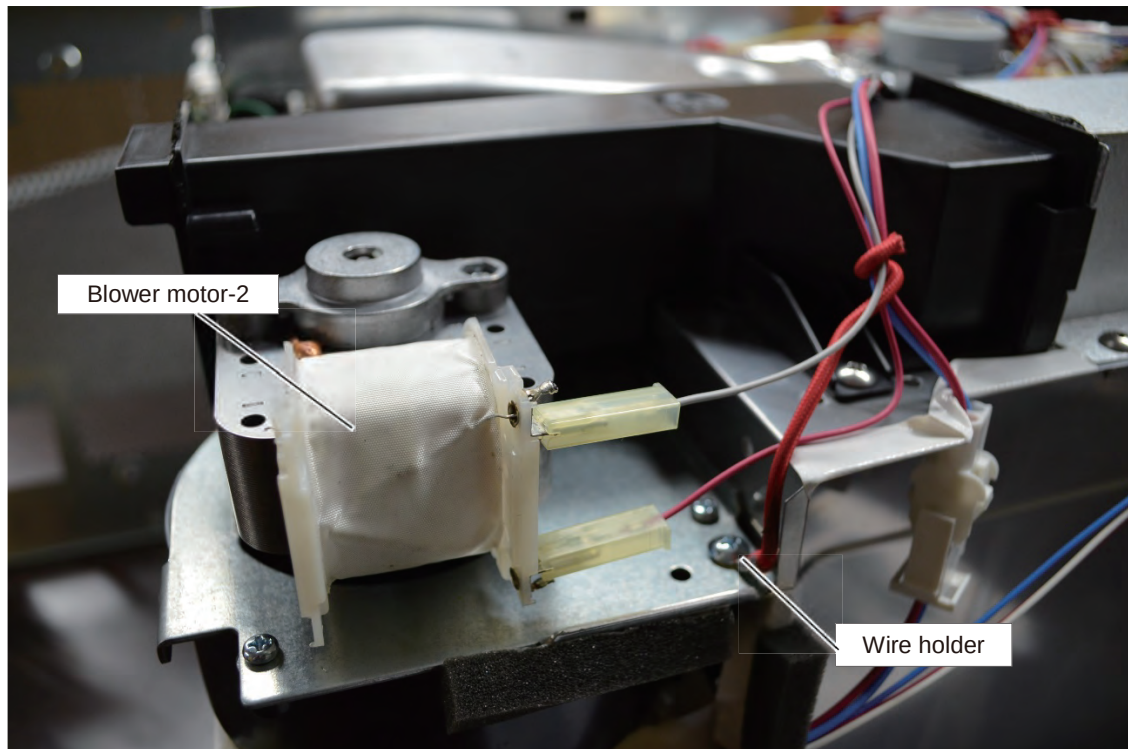


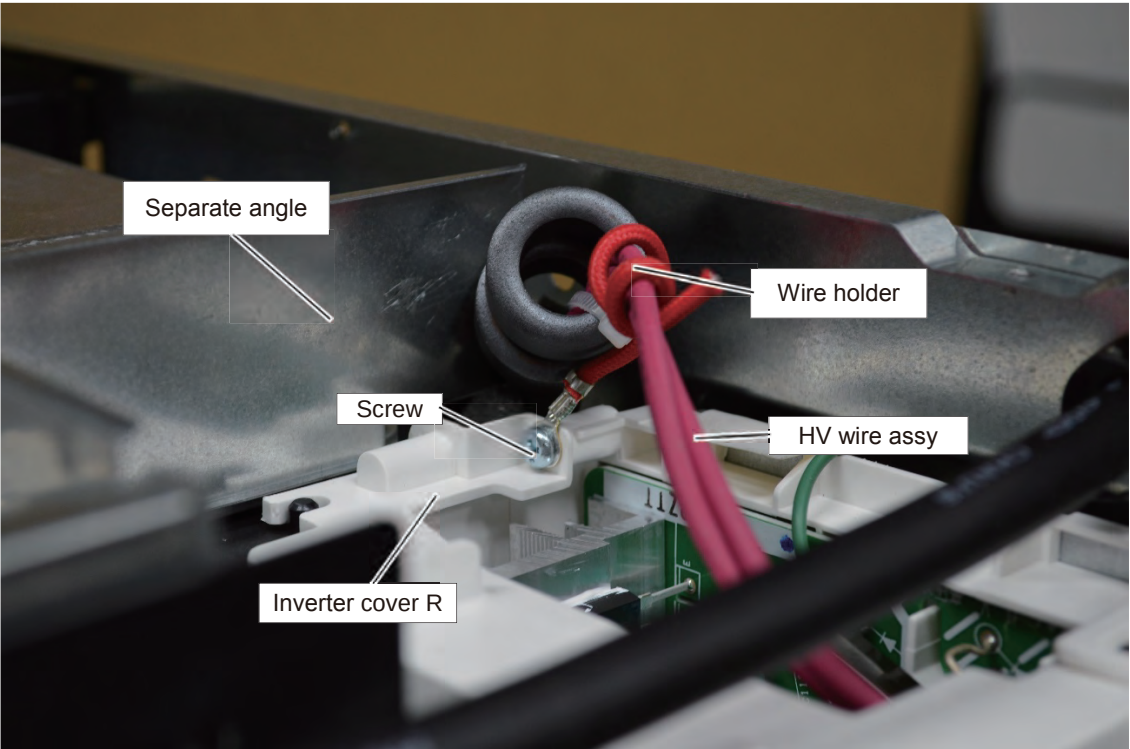
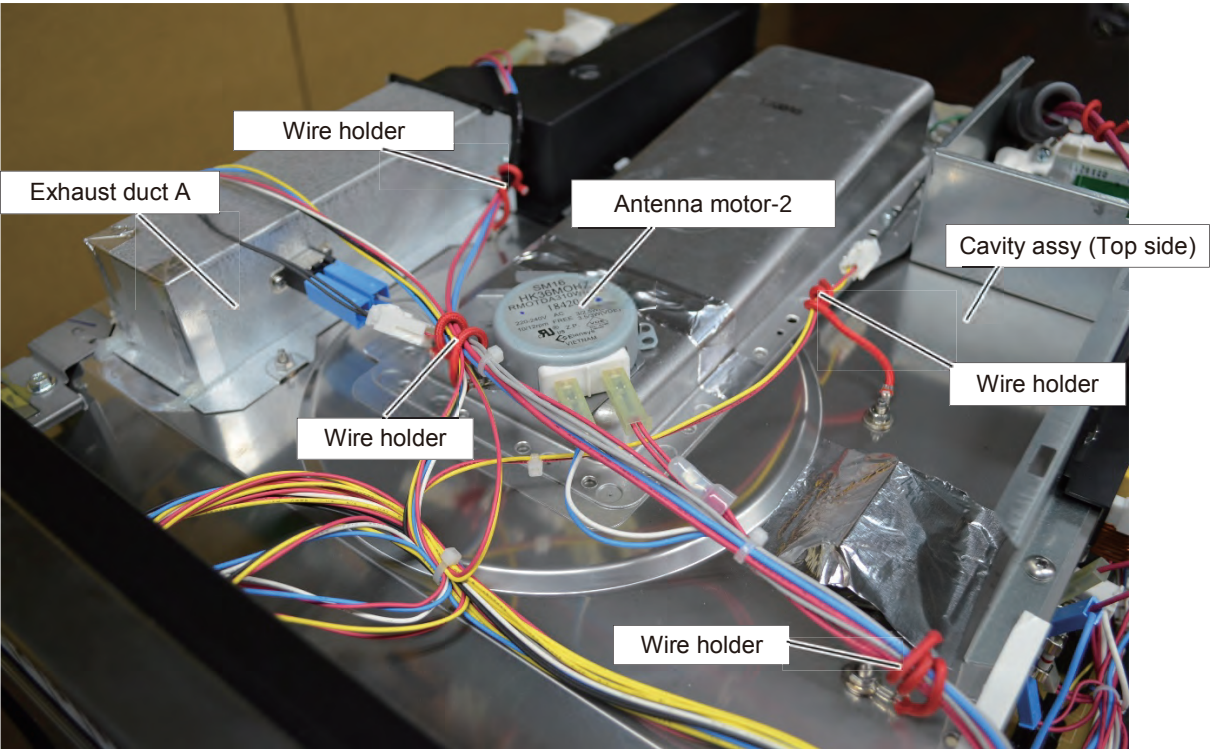
●Exhaust temp. fuse 120°C

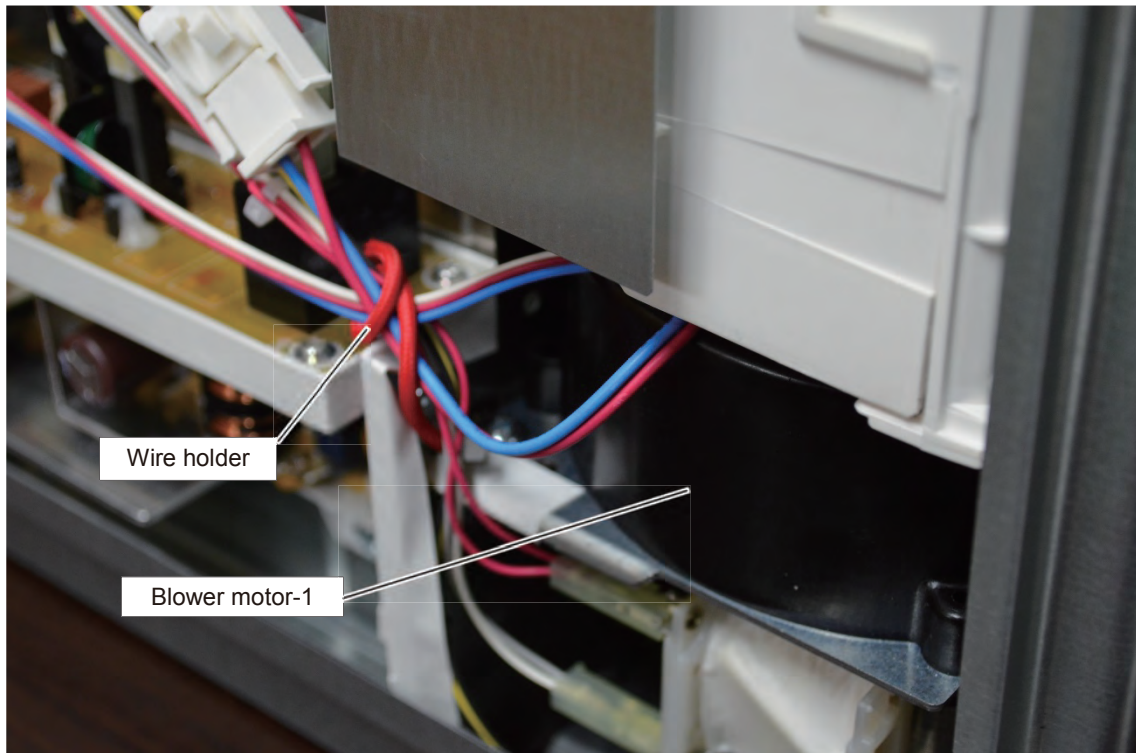


- Positions of wire holders

- At the following eight(8) positions, hold the wire leads with wire holders so that the wire leads do not touch to any sharp edges.

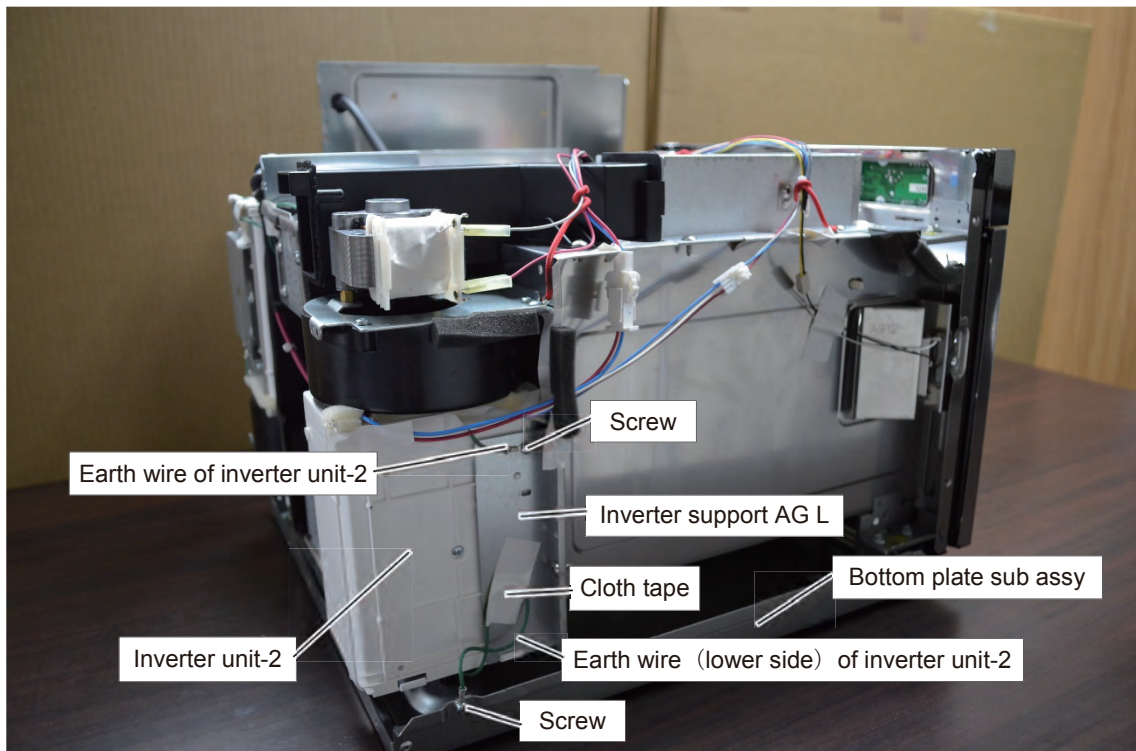






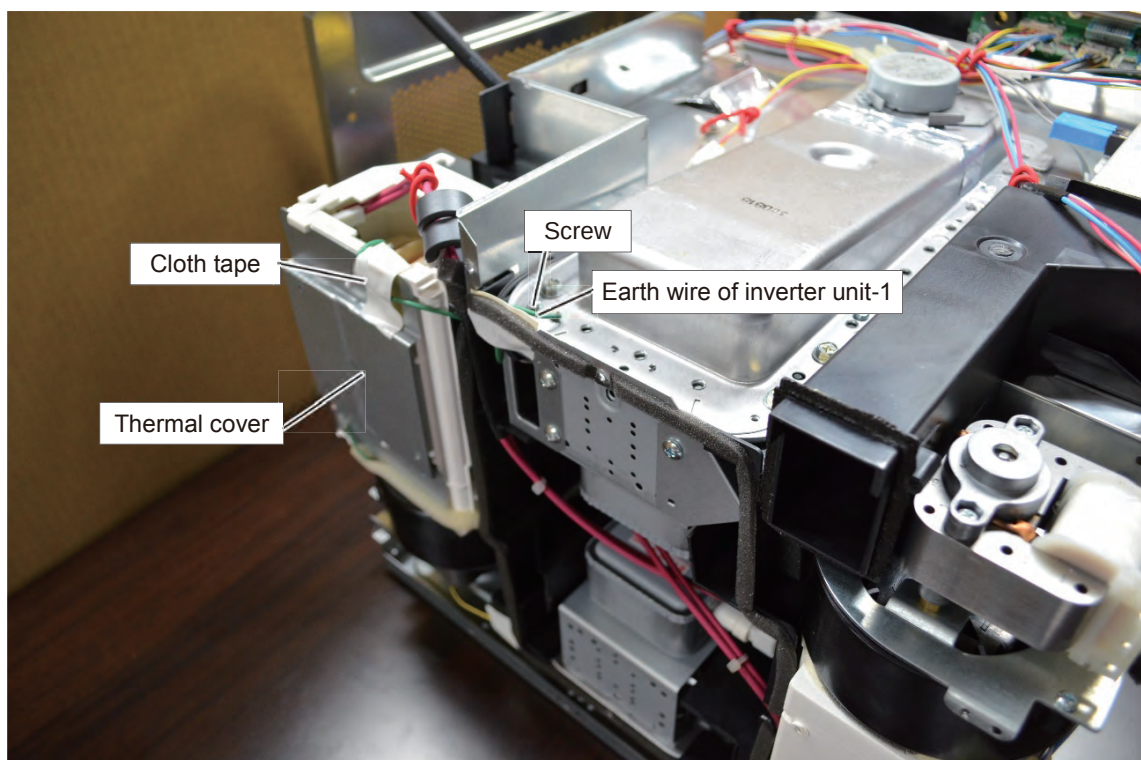
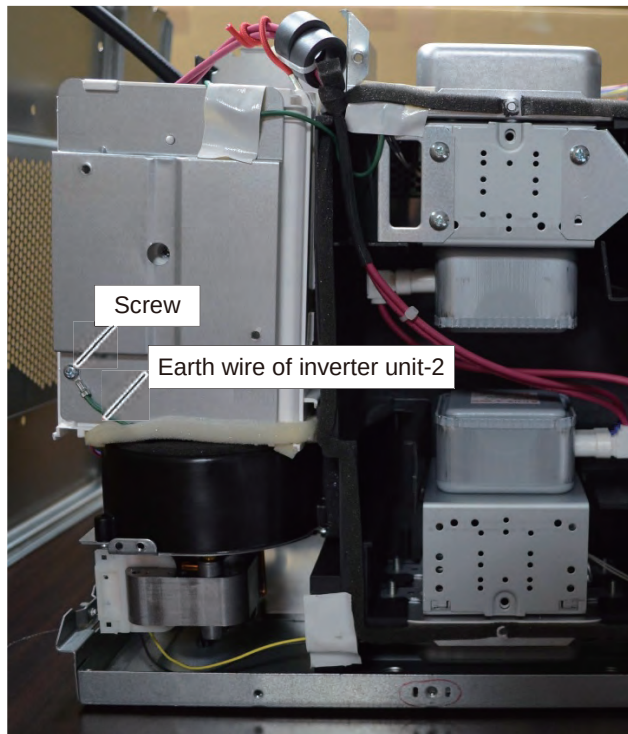
●Wiring of earth wires of inverter unit-2

- ①Secure the two (2) earth wires of the inverter unit-2 to the inverter support AG L and the bottom plate sub assy with the two (2) screws.
- ②After the earth wire is fixed to the bottom plate sub assy with the one (1) screw, hold the earth wire to the inverter support AG L with the cloth tape, as shown in the picture. This is to prevent that the earth wire is caught in the outer case cabinet.

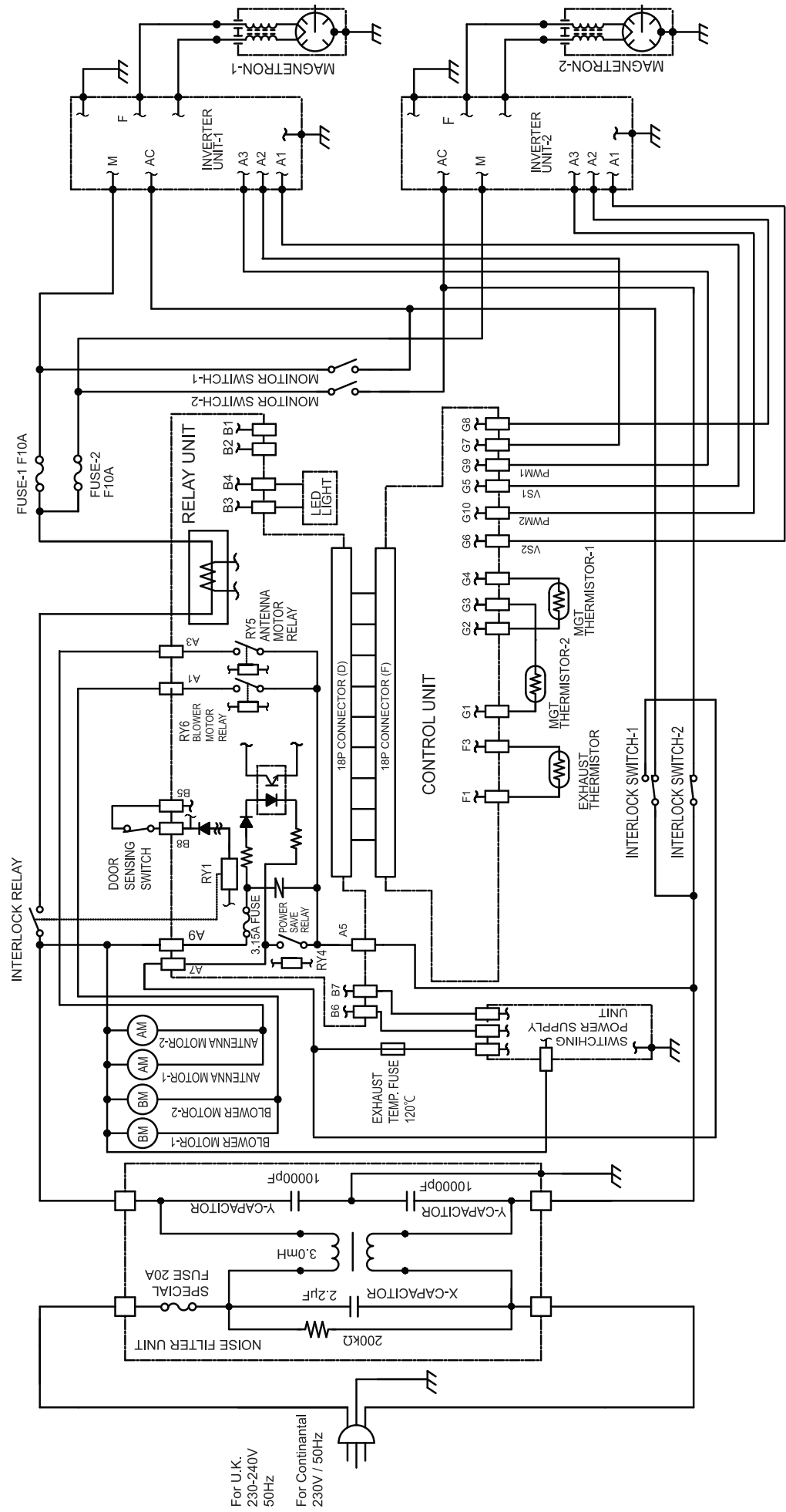


●Wiring of earth wires of inverter unit-1

- ①Secure the two(2) earth wires of the inverter unit-1 to the thermal cover and the waveguide of the cavity assy with the two(2) screws.
- ②After the earth wire is fixed to the waveguide of the cavity assy,hold the earth wire to the thermal cover with the cloth tape,as shown in the picture. This is to prevent that the earth wire is caught in the outer case cabinet.

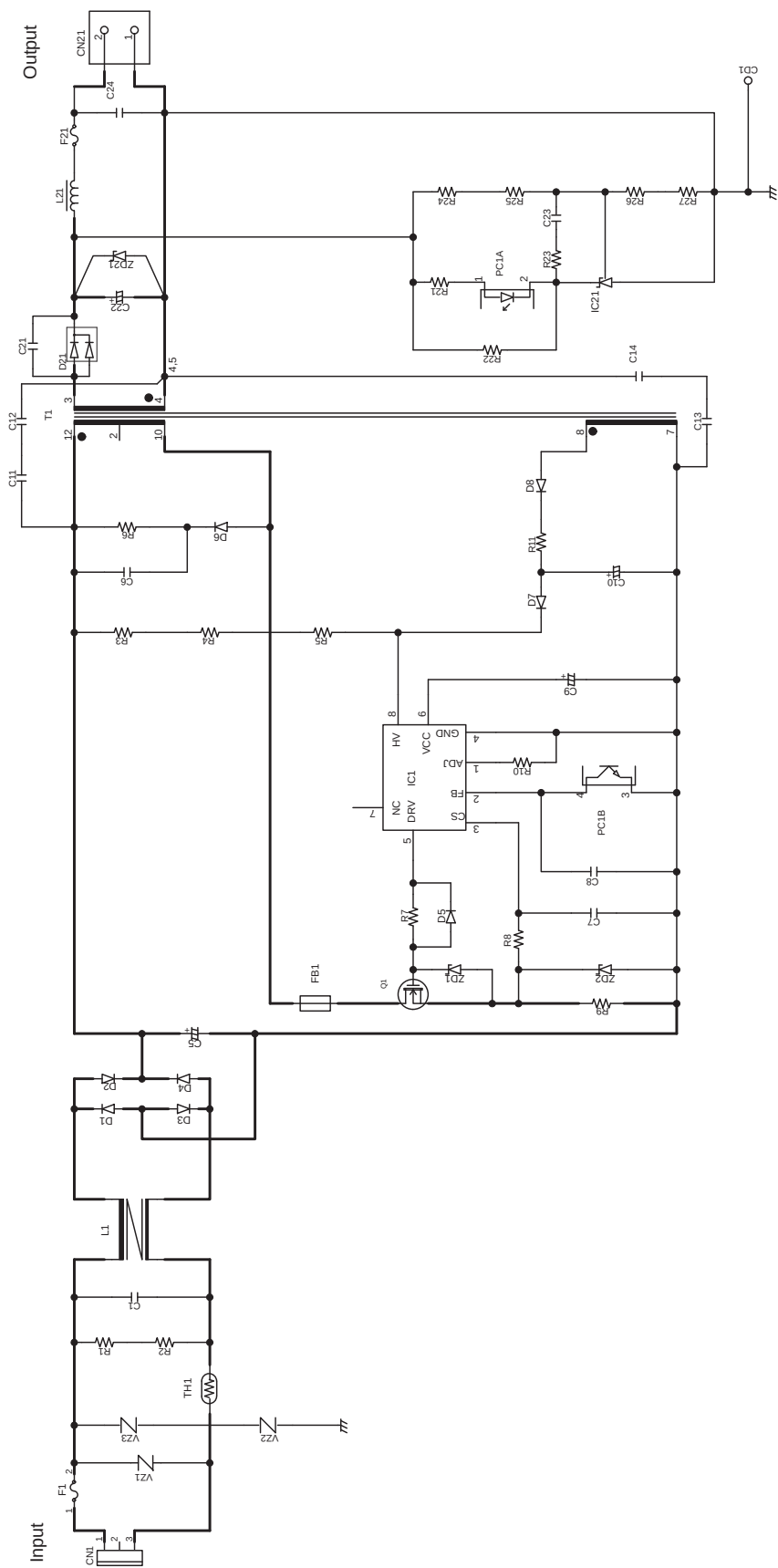


CIRCUITS

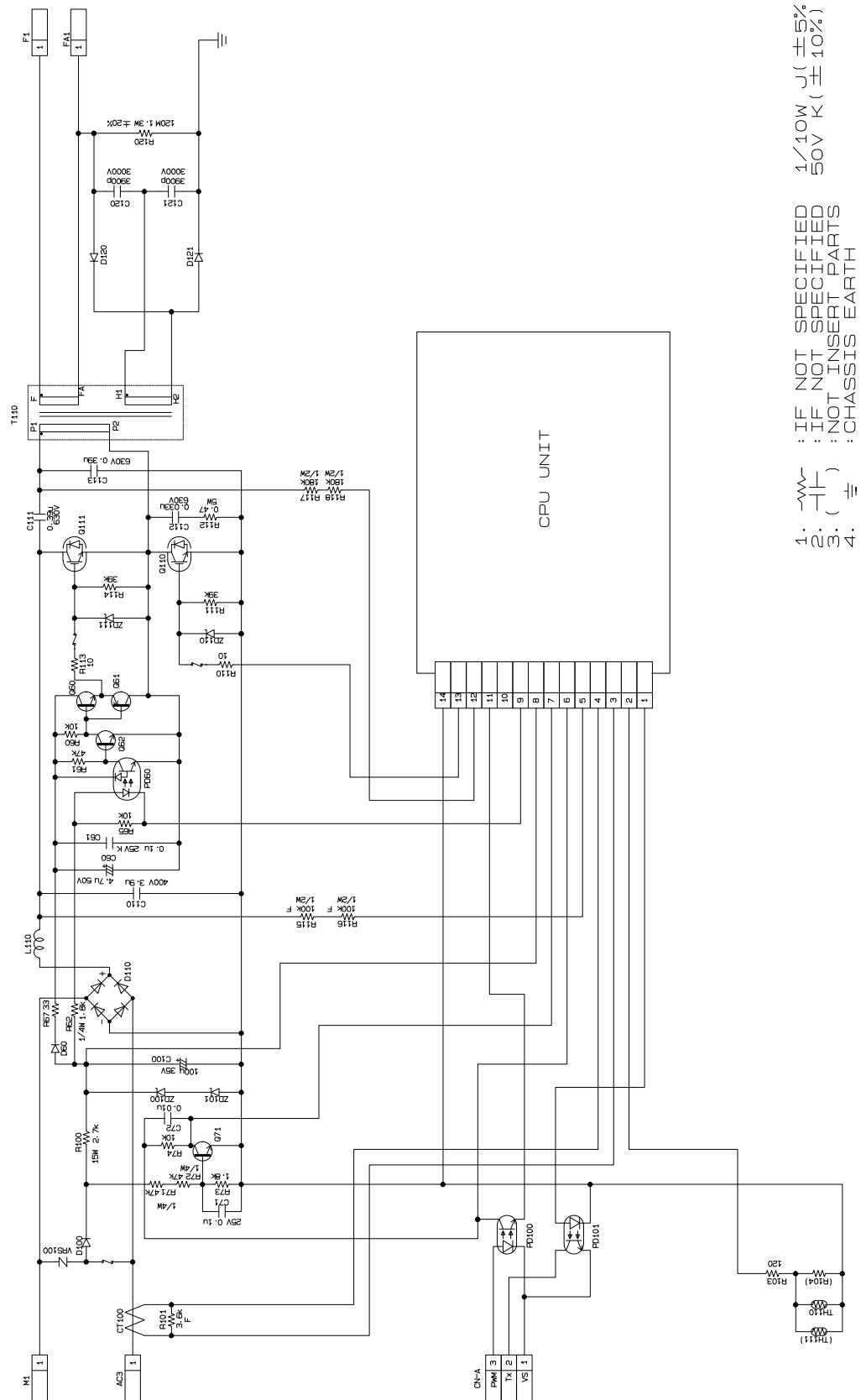


[1] SCHEMATIC DIAGRAM

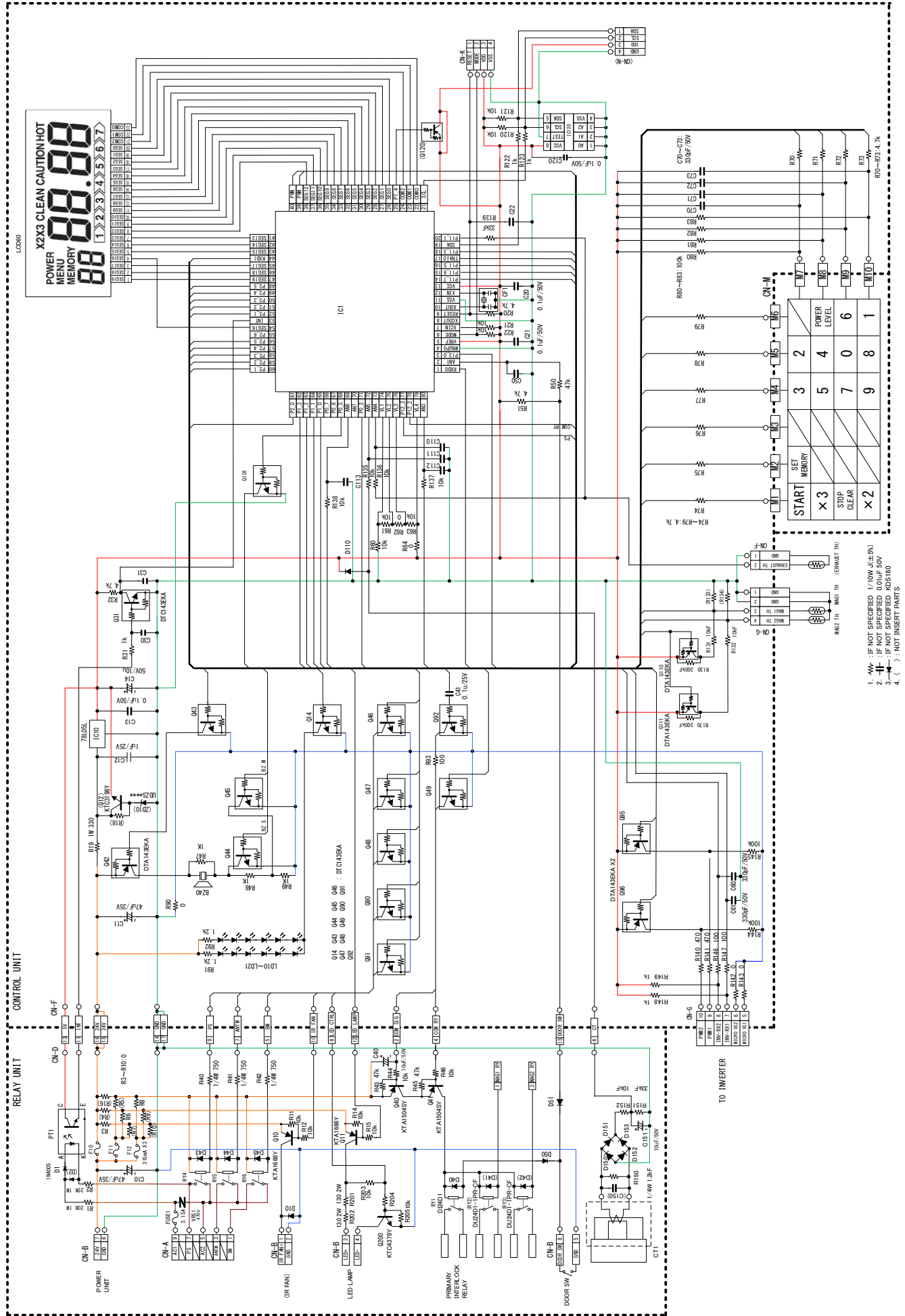
[2] POWER UNIT CIRCUIT



[3] INVERTER UNIT CIRCUIT



[4] RELAY UNIT AND CONTRL UNIT CIRCUITS



TROUBLESHOOTING

[illegible]

- ①: Wiring of the magnetron-1 drive circuit is opened.
- ②: Wiring of the magnetron-2 drive circuit is opened.
- ③: The control harness is opened.

Information for the troubleshooting
The systems to drive the magnetron-1 and the magnetron-2 are separated into the two (2) systems. So, please refer to the following table.

1. Parts for the circuit to drive the magnetron-1	2. Parts for the circuit to drive the magnetron-2
▪Magnetron-1 ▪Inverter unit-1 ▪Interlock switch-1 (Blue cases) ▪Monitor switch-1 (Blue cases) ▪Fuse-1 F10A (Blue cases) ▪Blower motor-1 ▪Antenna motor-1 ▪MGT thermistor-1	▪Magnetron-2 ▪Inverter unit-2 ▪Interlock switch-2 (White cases) ▪Monitor switch-2 (White cases) ▪Fuse-2 F10A (White cases) ▪Blower motor-2 ▪Antenna motor-2 ▪MGT thermistor-2

[2] Error list

1. Error for failure of oven or parts			MG1: Magnetron-1		MG2: Magnetron-2		CT: Current transformer	
Error No.	Content of error	Error condition	Detecting method	Check timing	Note			
EE 1	Failure of MG1	Detection value of CT is low when MG1 operates.	CT	8 sec after a heating start or subsequent ones	If MG1 or both of MG1 and MG2 reach their exchange time, CC1 or "CC3" and "EE1" will appear alternately.			
EE 2	Failure of MG2	Detection value of CT is low when MG2 operates.	CT	8 sec. after a heating start or subsequent ones	If MG2 or both of MG1 and MG2 reach their exchange time, CC2 or "CC3" and "EE2" will appear alternately.			
EE 3	Failure of MG1 and MG2	Detection value of CT is low when MG1 and MG2 operate.	CT	8 sec. after a heating start or subsequent ones	If MG1, MG2 or both of MG1 and MG2 reach their exchange time, "CC1", "CC2" or "CC3" and "EE3" will appear alternately.			
EE 10	Failure of EEPROM	Reading data of EEPROM and/or wiring data on EEPROM can not be done. Written data is different from read data.	EEPROM	When power is on. When reading and/or writing is done.				
EE 16	Open/short of MGT thermistor-1	MGT thermistor-1 is open or short.	MGT thermistor-1	When power is on. Right after heating start.	Open: when power is on or right after heating start Short: right after heating start			
EE 26	Open/short of MGT thermistor-2	MGT thermistor-2 is open or short.	MGT thermistor-2	When power is on. Right after heating start.	Open: when power is on or right after heating start Short: right after heating start			
EE 17	Temperature of MG1 or MG2 is too high. (No-load recognition)	Temperature of MGT thermistor-1 or MGT thermistor-2 is too high.	MGT thermistor-1 MGT thermistor-2	5 sec after a heating start or subsequent ones	"EE17" and "HOT" will appear.			
EE 20	Burned of food Overheating	Temperature of exhaust thermistor is too high.	Exhaust thermistor	5 sec after a heating start or subsequent ones	"EE20" and "HOT" will appear. ("HOT" will disappear when "STOP/CLEAR" key is pressed.)			
EE 29	Open/short of exhaust thermistor	Exhaust thermistor is open or short.	Exhaust thermistor	When power is on. Right after heating start.				

Note: 1. To clear error message, press "STOP/CLEAR" key.

2. When error message appears, refer to the troubleshooting tabe (page 27) and carry out troubleshooting.

2. Error for maintenance

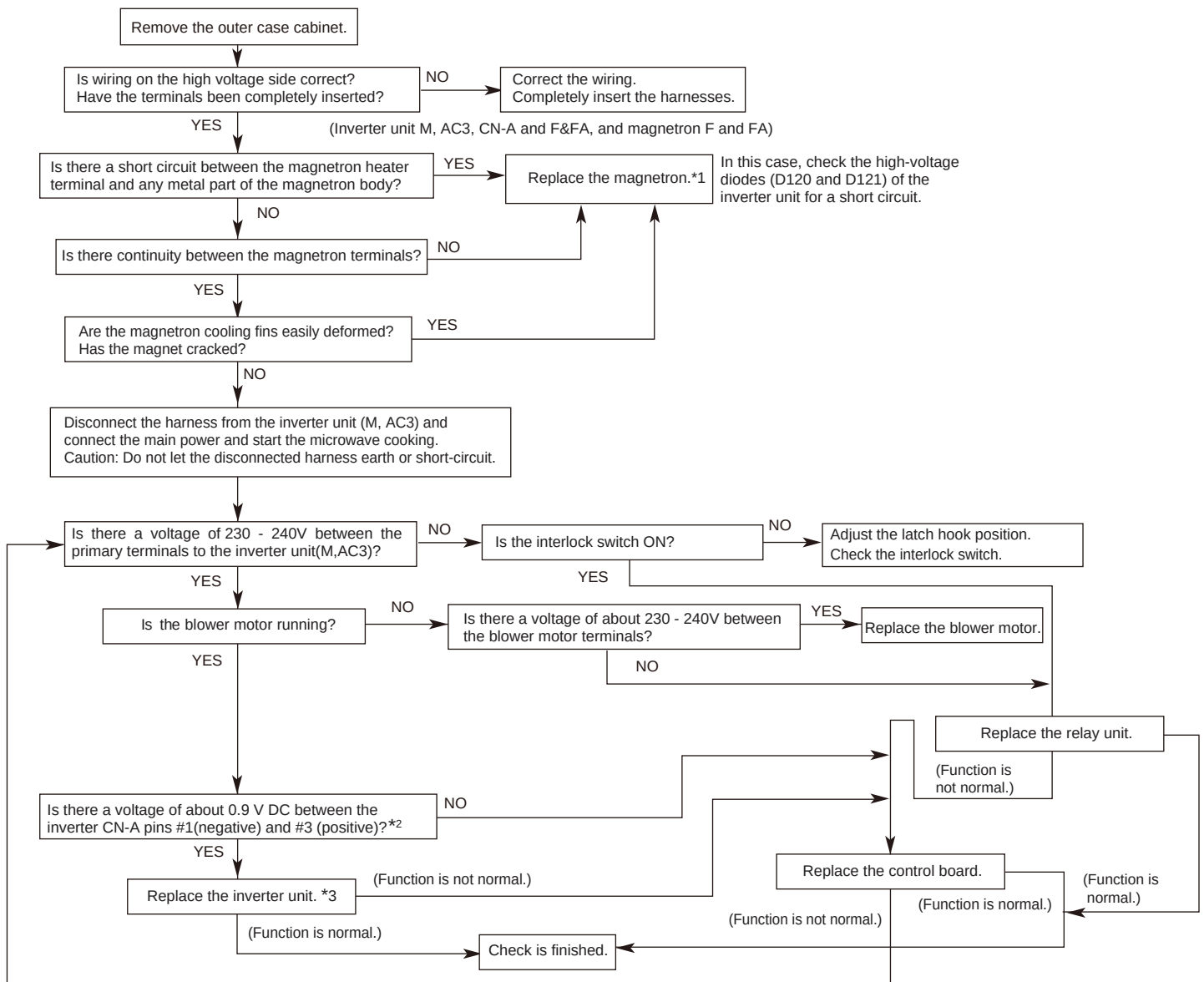
Display	Content of information	Condition	Detecting method	Check timing
CC 1	MG1 exchange time information	Total operating time of MG1 is over 1250 hours.	Operating time of MG1	Door is opened after heating is finished
CC 2	MG2 exchange time information	Total operating time of MG2 is over 1250 hours	Operating time of MG2	Door is opened after heating is finished
CC 3	MG1 and MG2 exchange time information	Total operating time of MG1 or MG2 is over 1250 hours and the other is over 1200 hours.	Operating time of MG1 and MG2	Door is opened after heating is finished
CC 4	Inverter unit-1 exchange time information	Total operating time of inverter unit-1 is over 2000 hours.	Operating time of MG1	Door is opened after heating is finished
CC 5	Inverter unit-2 exchange time information	Total operating time of inverter unit-2 is over 2000 hours.	Operating time of MG2	Door is opened after heating is finished
CC 6	Inverter unit-1 and inverter unit-2 exchange time information	Total operating time of inverter unit-1 or inverter unit-2 is over 2000 hours and the other is over 1900 hours.	Operating time of MG1 & MG2	Door is opened after heating is finished
CC 7	Relay unit exchange time information	Number of times of use of relay is over 150,000 times.	Number of times of use of an interlock relay	Door is opened after heating is finished

Note:

1. It can be selected by test mode "SET MEMORY"【8】, if CC error is indicated or not.
2. CC1, CC2, CC3, CC4, CC5, CC6 and CC7 can occur at the same time. In that case, maintenance informations are displayed in turn every 1 sec.
3. Maintenance information is displayed for 1min.
4. To clear error message, refer to Related items of Service counter table (page 37).

[3] Check in the event of no microwave cooking

Check of high voltage sections is very dangerous. Therefore, disconnect the main power and wait for at least one (1) minute before starting the check.



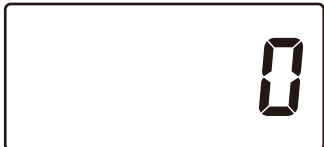
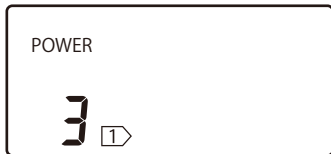
*1 In case of the magnetron failure, check the operation of the antenna lower assy and/or the antenna upper assembly after replacing the magnetron.

*2 Disconnect only the inverter unit terminals M and AC3. Then measure voltage between CN-A pins #1 and #3 with an analog tester while performing heating operation.

*3 Connect the harness to the inverter unit (M, AC3) and put the water load into the oven cavity and start the microwave cooking.

[4] Check procedure for normal operation (operation of display and parts)

In case of the setting at the time of factory shipments

Order	Procedures	Display	Operation
1	Close the door and then connect the power supply cord.		• The display does not show anything.
2	Open the door and put a cup of water into the center of the cavity assy.		• The display shows.
3	By pressing the power level key eleven times, select the power level to 3 (500W or its equivalent).		• The key input sound can be heard.
4	By pressing the number keys "4" and "5", set the heating time to 45 seconds.		• The key input sound can be heard.
5	Press the start key.		• The key input sound can be heard. • LED light is turned on. • Antenna motors rotate. • Blower motors rotate. • Microwave heating starts.
6	Heating is over.		• Information sound sounds. • Blower motors rotate for a while. • Antenna motors stop. • LED light is turned out.
7	Open the door and take out a cup of water from inside of the cavity assy.		• LED light is turned on when the door is opened. • Water becomes hot.

TEST MODE AND INPUT CURRENT ADJUSTMENT

[1] Test mode

How to enter to test mode

(Power on and door closed) → [STOP/CLEAR] → [x3] → [POWER LEVEL] → (Door opened and closed) → (Version Display) → [Each key]

└── within 2sec ─┘

Each key	Test name	Detail of test	Example of display
1	Frequency of power supply	Frequency of power supply is displayed.	50 50Hz
4	Antenna check	Antenna motor works even if door is opened. Microwave doesn't work.	-- -- Displayed blinking
8	Adjustment of full power microwave output	Present data is displayed. Oven operates at full power in microwave cooking for 5 minutes. While microwave working. by pushing [X2], by pushing [X3], -10 ≤ value ≤ 10 by pushing [START]. Changed value is written into EEPROM and "MEMORY" appears in LCD. If EEPROM doesn't work correctly, "EE 10" is displayed.	01 DATA IS CHANGED
SET MEMORY ↗	Display and reset of the counter for the maintenance	By inputting memory number, each counter is displayed as follows; (When "1" is pressed once, the contents of memory No.1 is displayed. When "1" is pressed twice, the contents of memory No.11 is displayed. When "1" is pressed third time, the contents of memory No.21 is displayed.) [1] using time of magnetron-1(hour) (difference between [1] and [12]) [11] total using time of magnetron-1(hour) [21] using time of magnetron-1(hour) when exchanging it [2] using time of magnetron-2(hour) (difference between [12] and [22]) [12] total using time of magnetron-2(hour) [22] using time of magnetron-2(hour) when exchanging it [3] magnetron maintenance time(CC1, CC2) [13] magnetron maintenance time(CC3) [4] using time of inverter unit-1(hour) [14] using time of inverter unit-2(hour) [5] inverter unit maintenance time(CC4, CC5) [15] inverter unit maintenance time(CC6) [6] usage count of relay [16] relay maintenance count [7] using time of air filter [17] air filter warning time	MEMORY xx yy xx yy: hour (e.g.) 192hours: xx=1, yy=92 MEMORY yy zz xx xxyyzz: usage count or hour (e.g.) 12340 count or hour xx=1, yy=23, zz=40 MEMORY yy zz xx xxyy: hour, zz: min (e.g.) 2hour30min: xx=2, yy=30

Each key	Test name	Detail of test	example of display
		To clear the display of CLEAN CAUTION press "STOP/CLEAR" key for 2 seconds after CLEAN CAUTION is displayed. CC error indication for maintenance By pressing [SET MEMORY] for 2sec, ON/OFF of CC error indication for maintenance can be changed.	MEMORY On 8 On: CC error indication can be displayed. MEMORY OFF 8 OFF: CC error indication can NOT be displayed.
POWER LEVEL ⏻	Display of error history	Error history (previous 10 errors) is displayed. By pushing [X3], the older error is displayed, by pushing [X2] the newer error is displayed. ※ If the same error occurs continuously, it is displayed as one time. (1) the newest error (2) the second newest error (3) the third newest error . . . (10) the oldest error	Error occurred MEMORY EE xx yy xx: error number, yy: error history (e.g.) Error 17, history 2 : xx=17, yy=2 No error MEMORY --- --
START ◇	Memory reset	By pressing [SET MEMORY] for 2 seconds, the functions which user can change and the display which user can check are reset. ※ This is to be used at maintenance. The contents which can be reset are as follows; •The contents of memory cooking •Setting of sound and LED light •Condition of memory lock •Usage count which user can clear (usage count of manual cooking and memory cooking) •Using time which user can clear •Using time and the warning time of air filter The following contents can not be cleared. •Counter for maintenance (e.g. CC1) •Counter which can not be reset •Error history	Before initialized MEMORY 88 88 88 After initialized MEMORY 00 00 00

[2] ADJUSTMENT PROCEDURE OF INPUT CURRENT

After at least one of the inverter units, control unit and magnetrons is exchanged, adjustment of the input current is necessary to make the rating microwave output power to 1800W by following procedure.

1. Ammeter to be used

The ammeter should be HIOKI 3284 CLAMP ON AC/DC HiTESTER or the ammeter beyond the following specification.

Specification of current measurement (HIOKI 3284)

AC current Arms (True effective value indication)

Current range (Accuracy range)	Resolution	Accuracy	
		45 ~ 66Hz	10 ~ 45Hz, 66Hz ~ 2kHz
20A (1.00 ~ 20.00A)	0.01A	$\pm(1.3\% \text{rdg.} + 3 \text{dgt.})$	$\pm(2.0\% \text{rdg.} + 5 \text{dgt.})$

2. Adjustment procedure

1) Connect the power supply cord to the ammeter.

In case of using a clamp type ammeter, remove the outer case cabinet and clamp the brown wire of the power supply cord. And then measure the current.

2) Place the container filled with 1000cc water at the center of the flat table of the oven. And close the door.

3) Press "STOP/CLEAR" key.

4) Press "X3" key.

5) Press "POWER LEVEL" key. } within 2 seconds

6) Open and close the door.

7) Press "8" key. (Microwave cooking will start.)

8) Adjust the current with "X2" key or "X3" key so that the center of the ammeter's deflection shows $12.2 \pm 0.2\text{A}$, referring to the ammeter.

When "X2" is pressed once, the input current will increase about 0.1A every.

When "X3" is pressed once, the input current will decrease about 0.1A every.

9) When the input current is adjusted to $12.2 \pm 0.2\text{A}$, press "START" key.

10) When "MEMORY" is displayed, the adjustment is completed.

Press "STOP/CLEAR" key to stop the oven.

Because at this time the adjustment is finished but the oven still continues to operate in microwave cooking mode. (The oven operates for 5 minutes after start.)

SERVICE COUNTERS

[1] Clear and input of service counters

1. When the following parts are exchanged, clear (make into zero) the count (using time or using count).

About the operation method, refer to each reset method of the service counter table

- Magnetron-1
- Magnetron-2
- Inverter unit-1
- Inverter unit-2
- Relay unit

2. When the control unit is exchanged, input the count (using time or using count) of the old control unit into the new control unit.

Input procedure

- 1) Before exchanging the control unit, write down the data of memory No.3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 21 and 22. of the old control unit.

To know the data, set the test mode "SET MEMORY" and refer to the "Key" of the service counter table then input the key.

- 2) After installing the new control unit, input the data into the new control unit which are known at item 1) above.

About the input method, refer to the editing method of the service counter table.

Service counter table

Keys to be pressed	Memory values for service	Indication (sample)	Initial value	Each reset method	Editing method	Related items	Maximum value that can be memorized
Service counter (After setting the test mode "SET MEMORY", input the following keys)							
Pressing "1" once. (Memory No.1)	Using time of magnetron-1 (difference between 11 and 21)	1234	0	Pressing "SET MEMORY" for 2 sec.	—	When using time exceeds maintenance time, "CC1" and "CC3" are displayed. By resetting this memory, total using time (of memory No.11) is copied to total using time when exchanging the magnetron (of memory No.21). And "CC1" and "CC3" disappear.	9999hours, 59minutes and 59seconds
Pressing "1" twice. (Memory No.11)	Total using time of magnetron-1	12 3456	0	—	" POWER LEVEL "key Number keys " POWER LEVEL "key		99999hours, 59minutes and 59seconds
Pressing "1" three times. (Memory No.21)	Total using time of magnetron-1 when exchanging it	12 3456	0	—	" POWER LEVEL "key Number keys " POWER LEVEL "key		99999hours, 59minutes and 59seconds
Pressing "2" once. (Memory No.2)	Using time of magnetron-2 (difference between 12 and 22)	1234	0	Pressing "SET MEMORY" for 2 sec.	—	When using time exceeds maintenance time, "CC2" and "CC3" are displayed. By resetting this memory, total using time (of memory No.12) is copied to total using time when exchanging the magnetron (of memory No.22). And "CC2" and "CC3" disappear.	9999hours, 59minutes and 59seconds
Pressing "2" twice. (Memory No.12)	Total using time of magnetron-2	12 3456	0	—	" POWER LEVEL "key Number keys " POWER LEVEL "key		99999hours, 59minutes and 59seconds
Pressing "2" third times. (Memory No.22)	Total using time of magnetron-2 when exchanging it	12 3456	0	—	" POWER LEVEL "key Number keys " POWER LEVEL "key		99999hours, 59minutes and 59seconds
Pressing "3" once. (Memory No.3)	Magnetron maintenance time (CC1,CC2)	1234	1250	—	" POWER LEVEL "key Number keys " POWER LEVEL "key	The time which "CC1", "CC2" or "CC3" should be displayed is memorized.	9999hours
Pressing "3" twice. (Memory No.13)	Magnetron maintenance time (CC3)	1234	1200	—	" POWER LEVEL "key Number keys " POWER LEVEL "key	The time which "CC3" should be displayed is memorized.	9999hours
Pressing "4" once. (Memory No.4)	Using time of inverter unit-1	1234	0	Pressing "SET MEMORY" for 2 sec.	" POWER LEVEL "key Number keys " POWER LEVEL "key	When using time exceeds maintenance time, "CC4" and "CC5" is displayed. By resetting this memory, "CC4" and "CC5" disappear.	9999hours, 59minutes and 59seconds
Pressing "4" twice. (Memory No.14)	Using time of inverter unit-2	1234	0	Pressing "SET MEMORY" for 2 sec.	" POWER LEVEL "key Number keys " POWER LEVEL "key	When using time exceeds maintenance time, "CC5" and "CC6" is displayed. By resetting this memory, "CC5" and "CC6" disappear.	9999hours, 59minutes and 59seconds
Pressing "5" once. (Memory No.5)	Inverter unit maintenance time (CC4,CC5)	1234	2000	—	" POWER LEVEL "key Number keys " POWER LEVEL "key	The time which "CC4", "CC5" and "CC6" should be displayed is memorized.	9999hours

Pressing "5" twice. (Memory No.15)	Inverter maintenance time (C06)	1234	1900	—	" POWER LEVEL "key Number keys "key POWER LEVEL "key	Time which "C06" should be displayed is memorized.	9999hours
Pressing "6" once. (Memory No.6)	Usage count of relay	12 3456	0	Pressing "SET MEMORY" for 2 sec.	" POWER LEVEL "key Number keys "key POWER LEVEL "key	When usage count exceeds maintenance count, "C07" is displayed. By resetting this memory, "C07" disappear.	99999 times
Pressing "6" twice. (Memory No.16)	Usage count of relay for maintenance	12 3456	15 0000	—	" POWER LEVEL "key Number keys "key POWER LEVEL "key	Usage count which "C07" should be displayed is memorized.	99999 times
Pressing "7" once. (Memory No.7)	Using time of air filter	12.34	. 0	Pressing "STOP/CLEAR" for 2 sec. after CLEAN CAUTION indicated.	" POWER LEVEL "key Number keys "key POWER LEVEL "key	When using time exceeds 30hours and 00minutes, "CLEAN CAUTION" is displayed 1 minute after heating is finished.	9999hours, 59minutes and 59seconds
Pressing "7" twice. (Memory No.17)	Air filter warning time	12.34	30.00	—	" POWER LEVEL "key Number keys "key POWER LEVEL "key	Time which "CLEAN CAUTION" should be displayed is memorized.	9999hours and 59minutes
Pressing "9" once. (Memory No.9)	Total using time (unable to be reset)	12 3456	0	—	" POWER LEVEL "key Number keys "key POWER LEVEL "key	Unable to be reset	999999hours, 59minutes and 59seconds
Pressing "0" once. (Memory No.10)	Total usage count (unable to be reset)	12 3456	0	—	" POWER LEVEL "key Number keys "key POWER LEVEL "key	Unable to be reset	999999 times
Error history (After setting test mode "POWER LEVEL", carry out following procedure.)							
Setting Test mode "POWER LEVEL"	Newest error	1 EE 17	—	—	—	—	—
Pressing "X3" once or "2" nine times	Second newest error	2 EE 17	—	—	—	—	—
Pressing "X3" nine times or "X2" once	Tenth newest error (Oldest error)	10 EE 17	—	—	—	—	—
User counter							
With the door opened, press "STOP/CLEAR" for 2sec. Then press "X3".	Total heating time	1234 H	0	Pressing "SET MEMORY" for 2 sec.	—	9999hours, 59minutes and 59seconds	
With the door opened, press "STOP/CLEAR" for 2sec. Then press "X2".	Total number of use	12 3456	0	Pressing "SET MEMORY" for 2 sec.	—	999999 times	
With the door opened, press "STOP/CLEAR" sec. Then press "X2". And then press "POWER LEVEL".	Number of use of manual operation	12.34	0	Pressing "SET MEMORY" for 2 sec.	—	9999 times	
With the door opened, press "STOP/CLEAR" sec. Then press "X2". At this time, memory No.1~30 by pressing the number keys 1~0.	Number of use of memories 1~30	12.34	0	Pressing "SET MEMORY" for 2 sec.	—	9999 times	

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

[1] WARNINGS

WARNING AGAINST HIGH VOLTAGE:

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in severe, possibly fatal, electric shock.

(Example)

Inverter unit, High Voltage Harness etc..

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. Disconnect the power supply cord.
 2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then pull the door handle lever with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
 3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).
- Carry out any remedial work that is necessary before operating the oven.
- Do not operate the oven if any of the following conditions exist;
1. Door does not close firmly.
 2. Door hinge, support or latch hook is damaged.
 3. The door gasket or seal is damaged.
 4. The door is bent or warped.
 5. There are defective parts in the door interlock system.
 6. There are defective parts in the microwave generating and transmission assembly.
 7. There is visible damage to the oven.
- Do not operate the oven:
1. Without the RF gasket (Magnetron).
 2. If the wave guide or oven cavity are not intact.
 3. If the door is not closed.
 4. If the outer case (cabinet) is not fitted.

WARNING FOR WIRING

To prevent an electric shock, take the following precautions.

1. Before wiring,
 - 1) Disconnect the power supply cord.
 - 2) Open the door block it open.
 - 3) Wait for 60 seconds to discharge the high voltage capacitors of the inveter units.
2. Don't let the wire leads touch to the following parts;
 - 1) High voltage parts:
Magnetrons, inverter units and High voltage wire.
 - 2) Hot parts:
Magnetrons, and inverter units.
- 3) Sharp edge:
Bottom plate, Oven cavity, Waveguide flange Chassis support and other metallic plate.
- 4) Movable parts (to prevent a fault)
Blower fan blade, Blower fan motor, Switches, Switch levers, Antenna motor and antennas.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector until its pin is locked and make sure that the wire leads do not come off even if the wire leads are pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

Please refer to "OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS", when carrying out any of the following removal procedures:

[2] NECESSARY TOOLS

Screw driver

Long shaft screw driver(The length of a shaft is 25cm or more.)

Needle nose pliers

Nut driver(opposite side 7mm)

Nut driver(opposite side 8mm)

Bushing pliers

Double suction lifter(to remove oven tray)