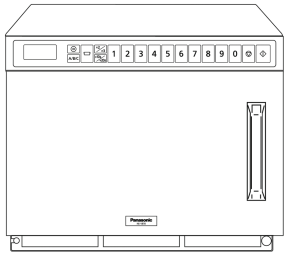
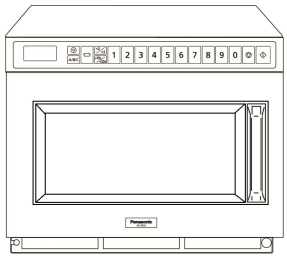
Order Number MOD2504713CE

Service Manual

Microwave Oven





Model No. NE-1878BBQ

Model No. NE-1864BPQ

Destination : United Kingdom

Model No. NE-1878EPG

Model No. NE-1864EPG

Destination : Continental Europe Countries

⚠ WARNING

This service manual is strictly meant to be used by experienced professional repair technicians only and is not designed for use by the general public. Products powered by electricity should be serviced and repaired only by experienced professional repair technicians ("Professionals"). Any attempt to service or repair the product by anyone else could result in serious injury and even death. Panasonic shall not be responsible, to the extent permitted by applicable law, for any damages, losses, costs, expenses, death, injury, claims, decree, proceedings, and/or judgment, arising out of, in connection with, or relating to, any use and/or misuse of this service manual by users other than Professionals.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

•The specifications and the parts of this product are subject to change without notice for performance improvement or other purposes.

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Panasonic®

1 Safety Precautions

⚠ WARNING

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WARNING

* **This product should be serviced only by trained, qualified personnel.**
  This service manual covers products for following markets.
  When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.

  BDQ ... For United Kingdom

⚠ WARNING

Be careful about receiving an electric shock from the high voltage parts.
- Never touch any circuit wiring with your hand nor with an insulated tool during operation.

DO NOT measure the voltage in high voltage circuit including filament voltage of magnetron.
- It is neither necessary nor advisable to attempt measurement of the high voltage.

WARNING

Be careful about receiving an electric shock.
- When doing electric connection service such as voltage measurement, please be careful enough about receiving an electric shock at electric charging parts and cable terminal parts.

Pull out electric plug when doing repair work.
- Disassembling and assembling and replacing parts should be done after pulling out electric plug. Receiving an electric shock or getting an injury may occur.

Please discharge high voltage capacitor.
For 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.
- Process of discharge the high voltage capacitor.
  1. Unplug the oven from its power source and leave it for 30 sec.
  2. Touch chassis side first then short to the high voltage capacitor terminal.

Do not touch any rotating object with hand unless it stops completely.
- Slow rotation may also roll on your hands and cause injure.

Be sure wiring routing structure of cables should be its forme state after doing repair work.
- Do not touch rotating part and high temperature part of lead wires, high voltage part and surface of parts. It may be the cause of failure, smoke, ignition or receiving an electric shock.

CAUTION

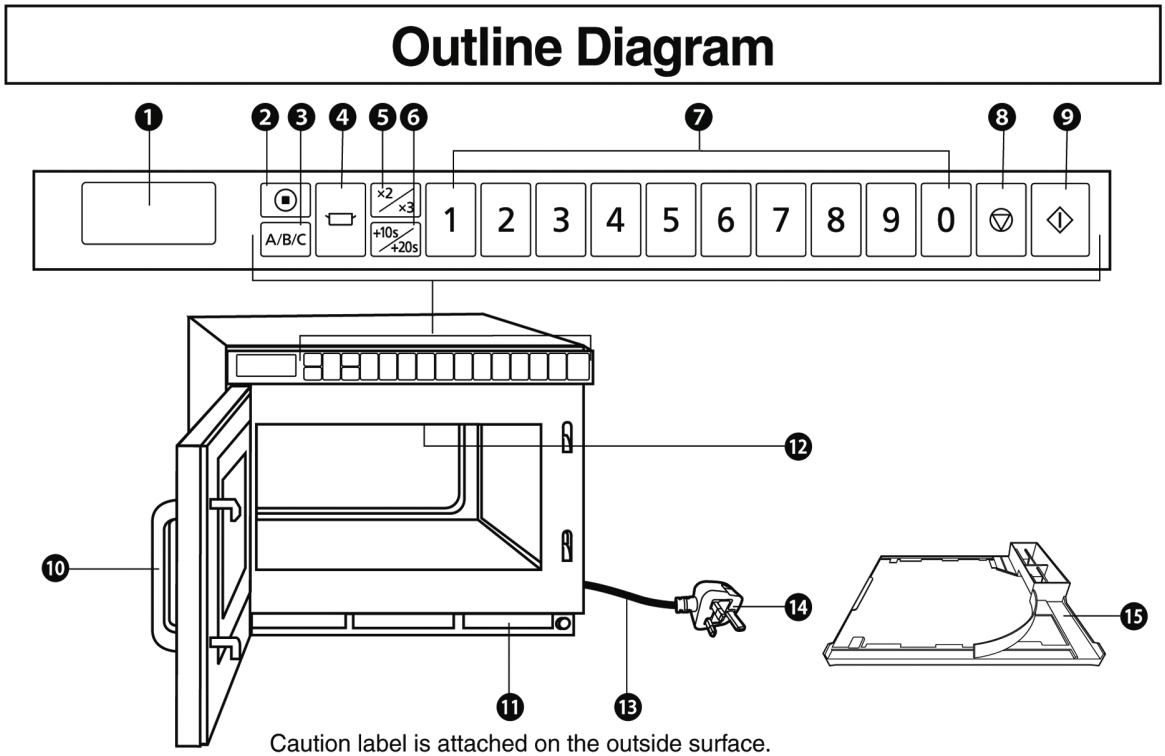
Please wear gloves when disassembling, replacing and assembling.
- Always wear gloves to prevent an injury by the metal end face or an electric shock at the time of the electricity service.

2 Specifications

Models:			**NE-1878 BBQ**	**NE-1864 BPQ**	**NE-1878 EPG**	**NE-1864 EPG**
Power Source:			230-240V AC Single Phase 50 Hz		230V AC Single Phase 50 Hz	
Power Requirement:			2650W, (11.6A)			
*Output:	HIGH	(P10)	1800 W			
	MEDIUM HIGH	(P9) (P8) (P7) (P6)	90% 80% 70% 60%			
	MEDIUM	(P5) (P4)	50% 40%			
	LOW	(P3) (P2)	30% 25%			
	DEFROST	(P1)	340 W			
	OFF	(P0)	0%			
	HEAT FROM TOP DOWN	(PU1) (PU2)	50% 25%			
	HEAT FROM BOTTOM	(PL1) (PL2)	50% 25%			
Frequency:			2,450 MHz			
Outside Dimensions (W×D×H)			422 mm × 476 mm × 337 mm			
Cavity Dimensions (W×D×H)			330 mm × 310 mm × 175 mm			
Net Weight			Approx. 17.5 kg	Approx.17.9kg	Approx.17.5 kg	Approx.17.9kg
Timer:			Maximum programmable time for single stage heating P1 and P0=30 minutes P10-P2, PU1-PL2=15 minutes			
Specifications subject to change without notice.						

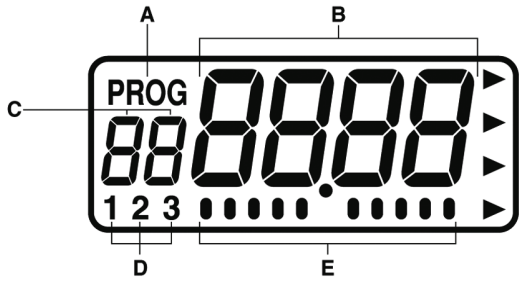
3 Location of Controls and Components

3.1. Outline diagram



Caution label is attached on the outside surface.

❶ **Digital Display Window (see below)**
❷ **Prog (Program) Pad**
❸ **Shift (A/B/C) Pad**
❹ **Power Level Selector Pad**
❺ **Double/Triple Quantity Pad**
❻ **+10s/+20s Pad**
❼ **•Number/Memory Pads**
•Time Input
❽ **Stop/Reset Pad**
❾ **Start Pad**
❿ **Door Handle**
⓫ **Air Filter**
⓬ **Splatter Shield (Set on the top of inner cavity)**
⓭ **Power Cord**
⓮ **Power Plug**
⓯ **Splatter Shield (spare)**



A—Program Display
B—Heating Time Display
(“min. sec.” or “hour min.”)
C—•Memory Pad Number Display
•Heating Stage Indicator
D—Pattern of Buzzer Sound Setting
E—•Calling Programmed Heating: Stage Number Indicator
•Programmed Heating in Progress: Operation Indicator
•Beep Tone Setting: Scale Indicator

This oven is preset at the factory for the following:

1. Manual operation
2. Number Pads preset to P10 power at the indicated heating times for single stage heating.
   A1=10 sec. A2=20 sec. A3=30 sec. A4=40 sec. A5=50 sec.
   A6=1 min. A7=1 min. 15 sec. A8=1 min. 30 sec. A9=1 min. 45 sec. A0=2 min.
3. Program unlock
4. Double Quantity=1.6 times Triple Quantity=2.2 times
5. Cycle counter set to “0” on all pads.
6. Oven Lamp When the door is open = ON Blinking at the end of heating cycle = OFF
7. The default filter cleaning time is set to “0” for the first stage and “500” for the second stage.

If you wish to change these times, consult the operating instructions to find how to program them.

4 Operating Instructions

4.1. Operation procedure

How to Operate

POWER LEVEL SELECTOR PAD

Each time the pad is touched, the Power Level switches as the illustration below.

P10 ➡ P9 ➡ P8 ➡ P7 ➡ P6 ➡ P5 ➡ P4 ➡ P3 ➡

P2 ➡ P1 ➡ P0 ➡ PU1 ➡ PU2 ➡ PL1 ➡ PL2 ➡ P10 again.

HIGH	P10:	1800 W*	**LOW**	P3: P2:	30% 25%
MEDIUM HIGH	P9: P8: P7: P6:	90% 80% 70% 60%	**DEFROST**	P1:	340 W
			OFF	P0:	0%
			HEAT FROM TOP DOWN	PU1: PU2:	50% 25%
MEDIUM	P5: P4:	50% 40%	**HEAT FROM BOTTOM UP**	PL1: PL2:	50% 25%

*IEC Test Procedure

Before operating the oven, make sure it is plugged into a properly earthed electrical outlet.

A. Manual Single Stage Heating

1. Open the door.
   The oven lamp will turn on. “0” will appear in the Digital Display Window.
2. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   The oven lamp will turn off.
   Note: While “0” appears, operation is available. 1 minute after the door is closed, “0” will disappear.

3. Select the desired Power Level by touching Power Level Selector Pad.
   The selected Power Level will be displayed in the Digital Display Window and the single stage heating indicator “1” will start to blink.
   [Example]: Touch Power Level Selector Pad once for P10 power.
   Note: Each time Power Level Selector Pad is touched, the Power Level switches as the above Power Level Selector illustrates.

4. Set the desired heating time by touching the appropriate Number Pads.
   Note: The maximum set time for P1 and P0 is 30 minutes, and 15 minutes for all others.
   [Example]: Touch Number Pads “2”, “0” and “0” for 2 minutes.

5. Touch Start Pad.
   A. Heating will start.
   B. During operation, the indicator appears from the left.
   C. The heating time on digital display will count down.
   When touching Power Level Selector Pad, the current power level will be displayed for 3 seconds.

6. When all time expires, the end of cycle beep tone will sound and all heating will stop. The display will blink “0000” until the door is opened. 1 minute later cooling fan will stop.

(Continued on next page.)

7. Open the door and take the food out.
   The oven lamp will turn on. The digital display will show the originally selected time and heating stage number.

REPEAT FEATURE

1. You can repeat exactly the same manually selected heating time by touching only Start Pad, if you use the oven again within 1 minute.
2. After 1 minute of non-use with the door closed, the repeat feature will be cancelled.

8. Close the door.
   The oven lamp will turn off and 1 minute later the Digital Display Window will go blank.

SPECIAL NOTE: For both single and 5 stage heating.

1. While heating, one touch on Stop/Reset Pad stops the oven. You can restart it by touching Start Pad or a second touch on Stop/Reset Pad will cancel the selected program.
2. While not in a heating cycle, one touch on Stop/Reset Pad cancels the selected program.

B. Manual 2 to 5 Stage Heating

1. Follow Steps 1-4 in “A. Manual Single Stage Heating” on page 5.
2. Select the desired Power Level for the second stage heating by touching Power Level Selector Pad the appropriate number of times.
   The Power Level will be displayed in the Digital Display Window and the second stage indicator “2” will start to blink.
   [Example]: Touch Power Level Selector Pad 8 times for P3 power.

3. Set the desired heating time for the second stage by touching the appropriate Number Pads.
   Note: The maximum set time for P1 and P0 is 30 minutes, and 15 minutes for all others.
   However, the TOTAL TIME can be set up to 25 minutes for continuous heating (1 to 5 stage heating) that excludes P1 and P0.
   [Example]: Touch Number Pads “1”, “0” and “0” for 1 minute.

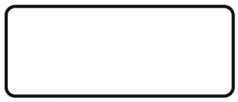
4. Touch Start Pad.
   A. The total time for both stages will be displayed.
   B. During operation, the indicator appears in order from the left.
   C. The heating time for the first stage will count down.

5. After the first stage heating time expires, a single beep tone will sound, the second stage heating indicator “2” will start to blink, and the heating time will continue to count down.

6. When all time expires, the end of cycle beep tone will sound. All heating will stop. The time display will blink “0000” until the door is opened. 1 minute later cooling fan will stop.

(Continued on next page.)

7. Open the door and take the food out.
   The oven lamp will turn on. The digital display will show the originally selected time and heating stage number.



8. Close the door.
   The oven lamp will turn off and 1 minute later the Digital Display Window will go blank.

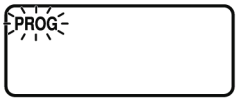
Note: For the heating cycle of the third and later stages, select Power Level once again after Step 2 on page 6 and set a heating time.

See Special Note of “Manual Single Stage Heating”.

C. Programming Memory Pads for Single Stage Heating

The oven can not be programmed until the program lock feature is deactivated.
(See page 11, K. To Deactivate Program Lock.)

1. Open the door and leave it open.



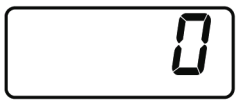
2. Touch Prog Pad.
   “PROG” sign will start to blink in the Digital Display Window.

3. Touch Memory Pad you desire to program.
   The pad number and the previously programmed information will appear in the Digital Display Window. If it is the first time to program the Memory Pad, cooking time will not appear.
   [Example]: Touch Memory Pad “5” (Program No. A-5).
   Note: When you want to program B or C side, touch Shift (A/B/C) Pad before touching Program Number Pad.

4. Select the desired Power Level by touching Power Level Selector Pad.
   The selected power level will be displayed in the window and the single stage heating indicator “1” will start to blink.
   [Example]: Touch Power Level Selector Pad 10 times for P1 power.

5. Set the desired heating time by touching the appropriate Number Pad.
   Note: The maximum set time for P1 and P0 is 30 minutes, and 15 minutes for all others.
   [Example]: Touch Number Pads “1”, “0” and “0” for 1 minute.

6. Touch Prog Pad again.
   The “PROG” sign and the single stage heating indicator “1” will stop blinking. This means that you have completed programming the selected Memory Pad for the single stage heating.



7. 3 seconds after programming is completed, “0” will appear.
8. Program the remaining Memory Pads as desired by repeating Steps 2-6 above.

Note: When the “PROG” Display is blinking, the program can be cancelled and/or one touch on Stop/Reset Pad erased the programmed Number/Memory Pad number.

How to Operate

D. Programming Memory Pads for 2 to 5 Stage Heating

1. Follow Steps 1-5 in “C. Programming Memory Pads for Single Stage Heating” on page 7.

2. Select Power Level for the second stage by touching Power Level Selector Pad. The selected Power Level will be displayed in the window and the second stage heating indicator “2” will start to blink.
   [Example]: Touch Power Level Selector Pad once for P10 power.

3. Set the desired heating time by touching appropriate Number Pads.
   Note: The maximum set time for P1 and P0 is 30 minutes, and 15 minutes for all others.
   However, the TOTAL TIME can be set up to 25 minutes for continuous heating (1 to 5 stage heating) that excludes P1 and P0.
   [Example]: Touch Number Pads “2”, “0” and “0” for 2 minutes.

4. Touch Prog Pad again and the “PROG” sign and the second stage heating indicator “2” will stop blinking. The total time for both stages will be displayed. This means that you have completed programming the desired Memory Pad for the second stage heating.

5. 3 seconds after programming is completed, “0” will appear.
6. Program the remaining pads as desired by repeating the Steps above.

Note: Repeat the above procedure to set Heating for the third stage and later stages.

E. Memory Pad Heating

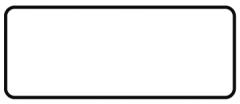
1. Open the door.
   The oven lamp will turn on. “0” will appear in the Digital Display Window.
   Note: While “0” will appear, operation is available. 1 minute after the door is closed, “0” will disappear.
2. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   The oven lamp will turn off.

3. Touch the desired Memory Pad.
   A. The currently programmed information will be indicated.
   [Example]: Touch Memory Pad “5” (Program No. A-5).
   The total number of stages is displayed as “ ” in the bottom.
   The heating program (at P1 power for 1 minute, at P10 power for 2 minutes) as programmed on pages 7-8 is set.
   Note: To use B or C side Program, touch Shift (A/B/C) Pad before touching Program Number Pad.

4. Touch Start Pad.
   A. During operation, the indicator appears in order from the left.
   B. The heating time will count down.
   When touching Power Level Selector Pad, the current power level will be displayed for 3 seconds.
   C. When touching Start Pad, the current stage number will be displayed for 3 seconds instead of Program No.

(Continued on next page.)

5. When all the time expires, the end of the cycle beep tone will sound. All heating will stop. The time display will blink “0000” until the door is opened. 1 minute later, cooling fan will stop.

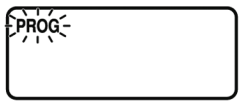


6. Open the door and take the food out.
   The oven lamp will turn on.
7. Close the door.
   The oven lamp will turn off and 1 minute later the Digital Display Window will go blank.

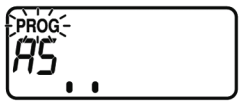
F. Programming Double/Triple Quantity Pad

The oven can not be programmed until the program lock feature is deactivated.
(See page 11, K. To Deactivate Program Lock.)

1. Open the door and leave it open.
   The oven lamp will turn on, and “0” will appear.



2. Touch Prog Pad.
   “PROG” will blink in the Digital Display Window.



3. Touch Memory Pad for the desired program.
   The pad number and the previously programmed information will appear in the display. “PROG” will start to blink.

4. Touch Double/Triple Quantity Pad once.
   The previously selected magnification number will appear in the display.
   [Example]: 1.6 times is “16”. (Double quantity) 2.2 times is “22”. (Triple quantity)

5. Set the desired magnification by touching the appropriate Number Pad.
   [Example]: 1.5 times; Touch Number Pads “1” and “5”.

6. Touch Prog Pad again.
   The “PROG” will stop blinking. This means that you have completed programming the selected Memory Pad for appropriate double quantity.

7. After 3 seconds later, “0” will appear.

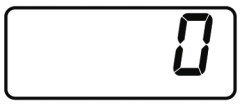
Note: If you want to change appropriate time for triple quantity, you touch Double/Triple Quantity Pad twice as in Step 4 above. The magnification is preset. Each magnification must be programmed separately for alterations.

N.B. Test for correct times when setting the program to achieve correct temperatures.

How to Operate

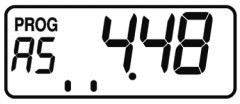
G. Memory Pad Heating for Double/Triple Quantity Heating

Make sure the unit is properly programmed. (See page 9.)



1. Follow Steps 1-2 in “E. Memory Pad Heating” on page 8.

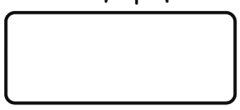
2. Touch Double/Triple Quantity Pad once.
   Note: When you want triple quantity heating, touch Double/Triple Quantity Pad twice.



3. Touch the desired Memory Pad.
   [Example]: Touch Memory Pad 5 (Program No. A-5).
   Note: To use B or C side Program, touch Shift (A/B/C) Pad before touching Program Number Pad.

4. Touch Start Pad.
   A. During operation, the indicator appears in order from the left.
   B. The heating time will count down.
   Note: If program lock is activated, the heating program starts immediately, i.e. there is no need to touch Start Pad. (See page 11.)

5. When all time has expired, the end of the cycle beep tone will sound. All heating will stop. The time display will blink “0000” until the door is opened.



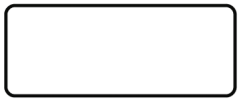
6. Open the door and remove the food. Close the door.
   1 minute later the Digital Display Window will go blank.

H. +10s/+20s Pad Heating

1. Open the door.
   The oven lamp will turn on. “0” will appear in the Digital Display Window.
   Note: While “0” will appear, operation is available. 1 minute after the door is closed, “0” will disappear.
2. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   The oven lamp will turn off.

3. Touch +10s/+20s Pad once.
   A. During operation, the indicator appears in order from the left.
   B. Heating will start on P10 power for 10 seconds.
   [Example]: Touch +10s/+20s Pad once for 10 seconds.
   Touch +10s/+20s Pad twice for 20 seconds.

4. When all the time expires, the end of cycle beep tone will sound. All heating will stop. The time display will blink “0000” until the door is opened. 1 minute later, cooling fan will stop.



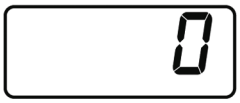
5. Open the door and take the food out.
   The oven lamp will turn on.
6. Close the door.
   The oven lamp will turn off and 1 minute later the Digital Display Window will go blank.

Note: While heating, one touch on Stop/Reset Pad or opening the door will cancel the heating program.

How to Operate

I. To Read the Cycle Counter

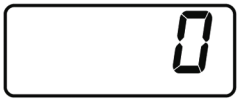
● To display total cooking hours ever used



1. Open the door and leave it open.
   The oven lamp will turn on. “0” will appear in the display.

2. While touching Start Pad, touch Number Pad “3”.
   Total cooking hours ever used will appear.

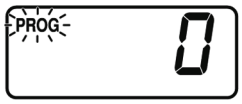
● To display the total number of times ever using oven



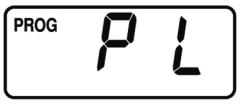
1. Open the door and leave it open.
   The oven lamp will turn on. “0” will appear in the display.

2. While touching Start Pad, touch Power Level Selector Pad.
   The total number of times ever using oven will appear.
   Note: The maximum number of times on the counter will be 3,999,999. The last two digits are dropped and displayed in units of 100 when used over 100 times.

J. To Activate Program Lock



1. Open the door and leave it open.
   The oven lamp will turn on. “0” will appear in the display. While touching Start Pad, touch Prog Pad until the display show “PROG”, “P” and “L” (for more than 2 seconds).



2. Program Lock feature is now activated.

Note: In “Program Lock”

a. The oven is started by touching the desired Memory Pad. There is no need to touch Start Pad.
b. The Interrupt feature is deactivated—opening the door cancels the remaining time on the program.
c. The oven can not be programmed or run manually until the Program Lock feature is deactivated.

K. To Deactivate Program Lock

1. Open the door and leave it open.
   The oven lamp will turn on. “0” will appear in the display. While touching Start Pad, touch Prog Pad until the Digital Display Window show “PROG” and “P” (for more than 2 seconds).

2. Program Lock feature is now deactivated.

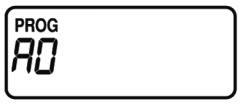
Note: In “Program Unlock”

a. Oven reverts to a two-touch operating mode (Number/Memory Pad + Start Pad).
b. Repeat and interrupt features are operational.
c. Memory Pads can be programmed.
d. Manual heating is operational.
e. Tone loudness control, length control and pitch control (beep tone at the end of heating cycle/filter cleaning alarm) are operational.

How to Operate

L. To Read Program List

1. Open the door and leave it open.



2. While touching Start Pad, touch Number Pad “1”.
   All currently programmed information (the program set into each Number/ Memory Pad (A0 to C9), Beep Tone, Program Lock, Oven Lamp settings when the door is open, Oven Lamp blink settings at the end of heating cycle and Oven Lamp reduction settings during cooking information) will continuously appear.
   Note: When the filter cleaning alarm counter is set, this appears after Program Lock.

How to erase memory content

1. Open the door (keep it open) and touch Prog Pad.
2. Select the memory number you want to erase, and touch Power Level Selector Pad.
3. Touch Stop/Reset Pad, and “0” is displayed to indicate that memory is erased.
   *Memory content is automatically erased if overwritten.

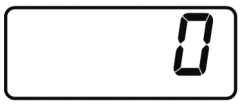
How to Operate

M. To Select Beep Tone Options

The oven can not be programmed until the program lock feature is deactivated.
(See page 11, K. To Deactivate Program Lock.)

The beep tone can be set for loudness—(4 Levels), length of tone—(3 Options), pitch of tone—(3 Options) and pitch of filter cleaning alarm—(3 Options). You can select the combination of loudness, length and pitch that best suits your needs.
The beep tone is set at the factory to the loudest level (#3), to 3 beeps and to normal pitch.
The filter cleaning alarm will sound when the total cooking time reaches the set time (in hours).

To Select Loudness Level

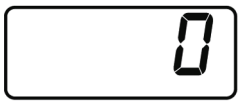


1. Open the door and leave it open.
   The oven lamp will turn on. “0” will appear in the display.

2. Touch Prog Pad first and then touch Start Pad.
   “3 bEEP” and pattern of buzzer sound settings indicator “1” will appear in the Digital Display Window and “PROG” will blink.

3. Select the desired sound loudness level by touching Start Pad.
   Repeated touching of Start Pad will lower the loudness of the tone all the way to silent. The tone will sound at its loudness level and the Digital Display Window will display loudness level in digits (3 to 0—loud to silent) followed by the word “bEEP”.
   [Example]: 3 bEEP—Loudest (Factory Setting) 1 bEEP—Low
   2 bEEP—Mid 0 bEEP—Silent

4. Touch Prog Pad again, and “PROG” will stop blinking, and the set loudness of beep tone will appear for 3 seconds. Then “0” will appear.



To proceed to set length of beep tone, touch Start Pad before “0” is displayed after Step 4.

To Select Length of Tone

There are 3 options for the length of beep tone at the end of heating cycle.
1st. 3 beeps (Factory Setting)
2nd. Short beeps for 60 seconds
3rd. “Beep” sounds for 5 seconds, and then 3 beeps sound 30 seconds later and again 60 seconds later. (Buzzer reminder functions to prevent food from being forgotten in the oven.)

5. Within 3 seconds after touching Prog Pad at Step 4, touch Start Pad.
   A. “PROG” will blink.
   B. Current length of beep tone will blink.
   C. The display changes to 1st, 2nd, and 3rd each time Start Pad is touched (in the bottom left corner).

6. When the desired length of tone has been selected, touch Prog Pad again. “PROG” will stop blinking, and the set length of tone at the end of heating cycle will appear for 3 seconds, then “0” will appear.

To proceed to set pitch of beep tone, touch Start Pad before “0” is displayed after Step 6.

(Continued on next page.)

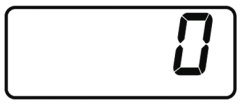
How to Operate

To Select Pitch of Tone

There are 3 options for the pitch of tone at the end of the heating cycle.
▮: Low, ▮▮: Normal (Factory Setting), ▮▮▮: High

7. Within 3 seconds after touching Prog Pad at Step 6, touch Start Pad.
   A. "PROG" will start to blink.
   B. Current pitch of tone will be displayed.
   C. The display changes to "▮", "▮▮", and "▮▮▮" each time Start Pad is touched and the settings change (Under the "bE" in "bEEP").

8. When the desired pitch of tone has been selected, touch Prog Pad again.
   "PROG" will stop blinking, and the set pitch of tone at the end of heating cycle will appear for 3 seconds. Then "0" will appear.



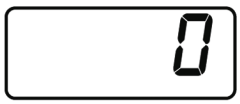
To proceed to set pitch of filter cleaning alarm, touch Start Pad before "0" is displayed after Step 8.

To Select Pitch of Filter Cleaning Alarm

There are 3 options for the pitch of the filter cleaning alarm.
▮: Low, ▮▮: Normal (Factory Setting), ▮▮▮: High

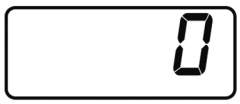
9. Within 3 seconds after touching Prog Pad at Step 8, touch Start Pad.
   A. "PROG" will start to blink.
   B. Current pitch of filter cleaning alarm will be displayed.
   C. The display changes to "▮", "▮▮", and "▮▮▮" each time Start Pad is touched and the settings change (Under the "EP" in "bEEP").

10. When the desired pitch of filter cleaning alarm has been selected, touch Prog Pad again.
    "PROG" will stop blinking, and the set pitch of filter cleaning alarm will appear for 3 seconds. Then "0" will appear.
    Note: When the programmed hour of cleaning Air Filter is "0", the pitch of filter cleaning alarm can not be selected.

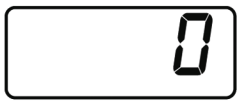


N. Procedure to Program the Air Filter Cleaning Cycle

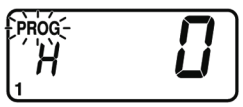
The oven can not be programmed until the program lock feature is deactivated.
(See page 11, K. To Deactivate Program Lock.)



1. Open the door and leave it open.
   The oven lamp will turn on. "0" will appear in the Digital Display Window.



2. While touching Start Pad, touch Number Pad "7".



To Program the First Stage

3. The display will show the length of time (in hours) between cleaning the Air Filter you have programmed in or the original time preset by the manufacturer.

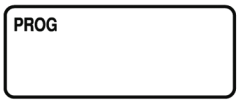
(Continued on next page.)

4. Set the desired cleaning cycle by touching the appropriate Number Pads. (Up to 9999 hours)
   [Example]: Touch Number Pads “1”, “0” and “0” for 100 hours.

To Program the Second Stage

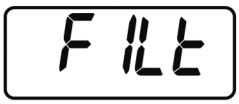
5. Touch Start Pad. The display will show the length of time (in hours) between cleaning the Air Filter you have programmed in or the original time preset by the manufacturer.

6. Set the desired cleaning cycle by touching the appropriate Number Pads. (Up to 9999 hours)
   [Example]: Touch Number Pads “6”, “0” and “0” for 600 hours.

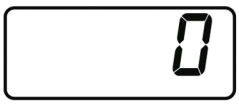


7. Touch Prog Pad.
   This completes the procedure to program time between cleaning of the Air Filter.

8. After 3 seconds, “0” will appear in the Digital Display Window. The oven is now ready for use.



Note: When the total hours used reach the time for the first stage, the beep tone will sound. When the total hours used reach the time for the second stage, “FILt” sign appears in Digital Display Window and the beep tone will sound. Remove the Air Filter and clean it.
Touch Stop/Reset Pad for 2 seconds to clear the display.
The counter will start over from “0” after it is cleared.



To display the filter cleaning alarm counter

1. Open the door and leave it open.
2. While touching Start Pad, touch Number Pad “5”.

After 3 seconds, “0” will appear in the Digital Display Window.

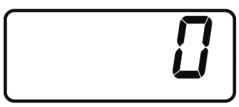
N.B. If the oven cuts out after short operation, check the Air Filter is clean before calling an engineer.

O. Oven Lamp

The oven can not be programmed until the program lock feature is deactivated.
(See page 11, K. To Deactivate Program Lock.)

● Oven Lamp settings when the door is open

To turn Oven Lamp settings OFF



1. Open the door and leave it open.
   The oven lamp will turn on, and “0” will appear.

(Continued on next page.)

2. While touching Start Pad, touch Number Pad “9”.
“PROG” will start to blink. The previously set Oven Lamp settings are displayed.

3. Touch Start Pad.
Note: “on” → “oFF” → “on” is repeated each time the Pad is touched.

4. Touch Prog Pad.
“PROG” will stop blinking, and the Oven Lamp settings will appear for 3 seconds. Then “0” will appear.

To proceed to Step 1 in “Oven Lamp blinks at the end of heating cycle” below, touch Start Pad before “0” is displayed after Step 4.

P. Digital Display Window at the End of Heating Cycle

When all cooking time has expired, the end of the cycle beep tone will sound, and all heating will stop. The time display will blink “0000” until the door is opened.

• Oven Lamp blinks at the end of heating cycle
The oven can not be programmed until the program lock feature is deactivated.
(See page 11, K. To Deactivate Program Lock.)

To turn the blinking Oven Lamp ON at the end of heating cycle

1. Follow Steps 1-4 in “O. Oven Lamp” on pages 15-16.

2. Within 3 seconds after touching Prog Pad at Step 4, touch Start Pad.
“PROG” will start to blink. The previously set Oven Lamp blink settings are displayed.

3. Touch Start Pad.
Note: “oFF” → “on” → “oFF” is repeated each time the Pad is touched.

4. Touch Prog Pad.
“PROG” will stop blinking, and the Oven Lamp blink settings will appear for 3 seconds. Then “0” will appear.

5 Service Mode

To prevent accidents during repair and ensure your safety after the repair, be sure to read or refer to “Safety Precautions” describing precautions that you must observe when repairing.

CAUTION

1. Check grounding before checking for trouble.
2. Be cafeful of the high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
5. Be sure to ground any static electric charge built up in your body, before handling the circuit parts.

5.1. Failure code function

In the event of a failure, a failure code is displayed to stop the operation.

- If the failure code “F97”, “F98”, “FE7” or “FE8" appears once, it is stored in self-diagnostics memory. That prevents the oven from operating even if any part is replaced. The failure code remains appear until the stored code is erased from the memory. Erase the failure code before conducting an operation test.
- The failure code “F97” or “FE7” appears when applicable failures to the codes occur three times in a row. Up to the second time, the display returns to the initial code "0".
- The failure code “F98” or “FE8” appears when applicable failures to the codes occur two times in a row. Up to the first time, the display returns to the initial code "0".
- Even if the failure code “F00”, “U40” or “U41” appears, it is not stored in the memory.

5.1.1. Failure code list

F □□ : Device failure / U □□ : User error

CODE		CONDITIONS	RESET	CAUSES / REMEDIES
Upper circuit	Lower circuit			
F00		• Communication error between the micro-computer and the memory IC.	• Touch "Stop/Reset" pad.	• Control board (D.P.circuit)
F01		• Abnormal rise in the exhaust temperature (120 °C or higher). • Overheating and ignition of food in the oven.	• Reset when the temperature in the oven falls to 60 °C or less.	• Clean the inside of the oven and the exhaust channel. Replace parts if necessary. • Exhaust thermistor (Insulation failure)
F03		• Upon detection of an abnormal voltage for 10 seconds. • Displayed only when the failure code is called up.	• Touch "Stop/Reset" pad.	• Check the power-supply voltage. • Control board (D.P.circuit)
F18	F19	• Error in detection of the secondary current.	• Touch "Stop/Reset" pad.	• Confirm the grounding state of H.V.inverter. • Confirm the grounding state of control board (D.P.circuit). • H.V. inverter (Insufficient cooling)
F32	F22	• Open or short-circuit in the Magnetron thermistor.	-	• Magnetron thermistor (Thermistor BU)
F33		• Open or short-circuit in the exhaust thermistor.	-	• Exhaust thermistor
F44		• Shorted membrane switch. • With a continued press of the same pad for 2 minutes.	• Touch "Stop/Reset" pad.	• Membrane switch
F77		• Lock detection of cooling fan motor.	• Touch "Stop/Reset" pad.	• Fan motor
F90	FE0	• Abnormal temperature in IGBT of H.V.inverter.	• Touch "Stop/Reset" pad.	• Insufficient cooling of H.V.inverter (Fan Motor / Fan motor drive circuit)
F92	FE2	• Magnetron failure (Detection of A-K short circuit.)	• Touch "Stop/Reset" pad.	• Magnetron
F95	FE5	• Inverter actuation signal failure (At startup of inverter, an actuation signal has not been input.)	• Touch "Stop/Reset" pad.	• Inverter connector disconnection • Latch adjustment failure
F96	FE6	• Inverter actuation signal failure. (During non-actuation of inverter, an actuation signal is Lo.)	• Touch "Stop/Reset" pad.	• H.V.inverter • Control board (D.P.circuit)
F97	FE7	• Inverter actuation signal failure. (During actuation of inverter, an actuation signal is Hi) (At startup of inverter, an actuation signal is Hi.)	• Touch "Stop/Reset" pad.	• Absence of any inverter AC input (Door switch / Relay circuit / Relay connector / CN702 disconnection, etc.) • Magnetron
F98	FE8	• Inverter actuation signal failure. (At startup of inverter, an actuation signal is Lo)	• Touch "Stop/Reset" pad.	• H.V.inverter • Magnetron (disconnection of lead wire, heater wire, etc.)
F99	FE9	• If actuation signal is input to the microcomputer when the inverter is not in actuation.	• Touch "Stop/Reset" pad.	• Control board (D.P.circuit)
U30		• Memory cooking with double/triple quantity has exceeded the maximum cooking time.	• Touch "Stop/Reset" pad.	• Check and change the time.
U40		• Abnormal temperature detection of Magnetron when the oven is operated without food (Empty heating detection).	• Touch "Stop/Reset" pad.	• Confirm the inside of the oven. • Magnetron thermistor (Thermistor BU)
U41		• Abnormal secondary current detection of H.V.inverter when the oven is operated without food (Empty heating detection).	• Touch "Stop/Reset" pad.	• Confirm the inside of the oven. • H.V. inverter

5.2. How to erase self-diagnosis memory

- Self-diagnosis memory cannot be erased by turning off the power.
- By "How to erase self-diagnosis memory (1)" , self-diagnosis memory of "F97", "F98", "FE7" and "FE8" cannot be erased. In this case, erase the memory of self-diagnosis by "How to erase self-diagnosis memory (2)" .

How to erase self-diagnosis memory (1) (When failure code other than "F97", "F98", "FE7" or "FE8" appears)

	Procedure	Display	Remarks
1.	Door open.	0	
2.	Touch "Start" pad and number pad "8" at the same time to display the code stored in self-diagnosis memory.	(Example) F33	”0000” is displayed, when there are no failure codes memorized.
3.	While the display is shown, touch "Stop/Reset" pad to erase the memory of self-diagnosis.	0	

How to erase self-diagnosis memory (2) (When failure code "F97", "F98", "FE7" or "FE8" appears)

	Procedure	Display	Remarks
1.	Door open.	0	
2.	Touch "Start" pad and number pad "8" at the same time to display the code stored in self-diagnosis memory.	(Example) F98	”0000” is displayed, when there are no failure codes memorized.
3.	Repeat the procedure "2."	0	

5.3. How to clear ”FILt” sign in the display

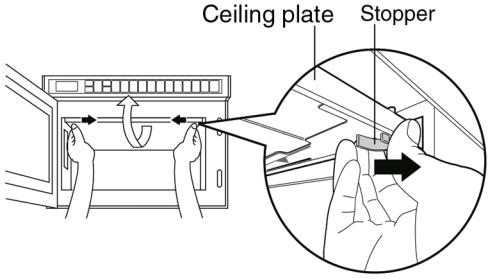
- When the total hours used reach the filter cleaning notification time, “FILt” sign appears.
- After cleaning the air filter, use the following method to clear the "FILt" sign.

	Procedure	Display	Remarks
1.	Keep door closed for 1 minute.	FILt	"FILt" sign appears.
2.	Touch "Stop/Reset" pad for 2 seconds.	0	"FILt" sign is cleared.

5.4. How to clear ”rFL” sign in the display

- When the ceiling plate is removed, "rFL" sign appears.
- Place the ceiling plate securely. The oven is inoperative without it.

	Procedure	Display	Remarks
1.	Ceiling plate is removed.	rFL	"rFL" sign appears.
2.	Place the ceiling plate securely.	0	"rFL" sign is cleared.

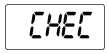
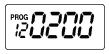
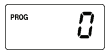


“rFL” is displayed if the Ceiling plate is removed.

Place the Ceiling plate securely after cleaning. The oven is inoperative without it.

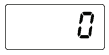
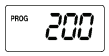
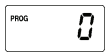
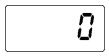
5.5. How to clear ”CHEC” sign in the display

- When the number of times of using magnetron reaches 120,000 times, "CHEC" sign appears after heating.
- If "CHEC" appears once, it appears every time after finishing heating.
  Follow the procedure as mentioned below to clear the "CHEC" sign in the display.

	Procedure	Display	Remarks
1.	After finishing heating with the door closed, leave the condition for 1 minute.		"CHEC" sign appears.
2.	Door open.		
3.	Touch "Start" pad and number pad "4" at the same time.	(Example) 	Number of times of using magnetron is displayed. • The last 2 digits are rounded down and displayed.
4.	Touch "Stop/Reset" pad within 3 seconds.		"CHEC" sign is cleared. • Reset the number of times of use
5.	Display returns to "0" in 3 seconds.		

5.6. How to reset the number of times of using magnetron

- When replacing the magnetron after the failure code such as "F92", "FE2", "F97", "FE7", "F98" or "FE8" appears, the number of times of using magnetron needs to reset.
  Follow the procedure as mentioned below to reset the number of times of using magnetron.

	Procedure	Display	Remarks
1.	Door open.		
2.	Touch "Start" pad and number pad "4" at the same time.	(Example) 	Number of times of using magnetron is displayed. • The last 2 digits are rounded down and displayed.
3.	Touch "Stop/Reset" pad within 3 seconds.		Resetting the number of times of using magnetron is completed. • Reset the number of times of use
4.	Display returns to "0" in 3 seconds.		

6 Troubleshooting Guide

6.1. Precautions when repairing

CAUTION

About lead free solder (PbF)

Distinction of PbF PCB :
PCB (manufactured) using lead free solder will have a PbF stamp on the PCB.
Caution
Pb free solder has a higher melting point than standard solder; Typically the melting point is 50 - 70℉ (30 - 40℃) higher.
Please use a high temperature solder iron and set it to 700 ±20℉ (370 ±10℃).
Pb free solder will tend to splash when heated too high (about 1100℉ / 600℃).

To prevent accidents during repair and ensure your safety after the repair, be sure to read or refer to "Safety Precautions" describing precautions that you must observe when repairing.

6.2. Before repair

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

WARNING

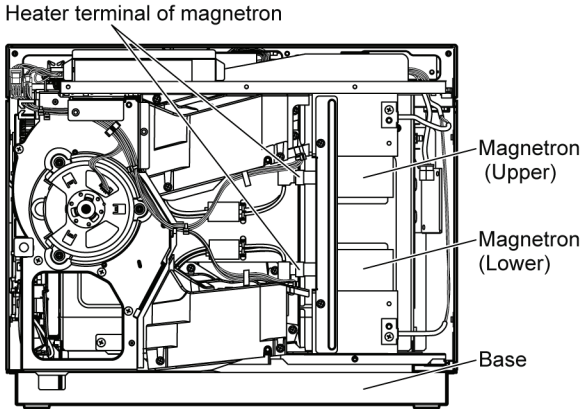
Never touch any circuit wiring with your hand nor with an insulated tool during operation.

6.3. Discharging high-voltage capacitor

When the confirmation of power-on is performed, always discharge the capacitor as shown below.

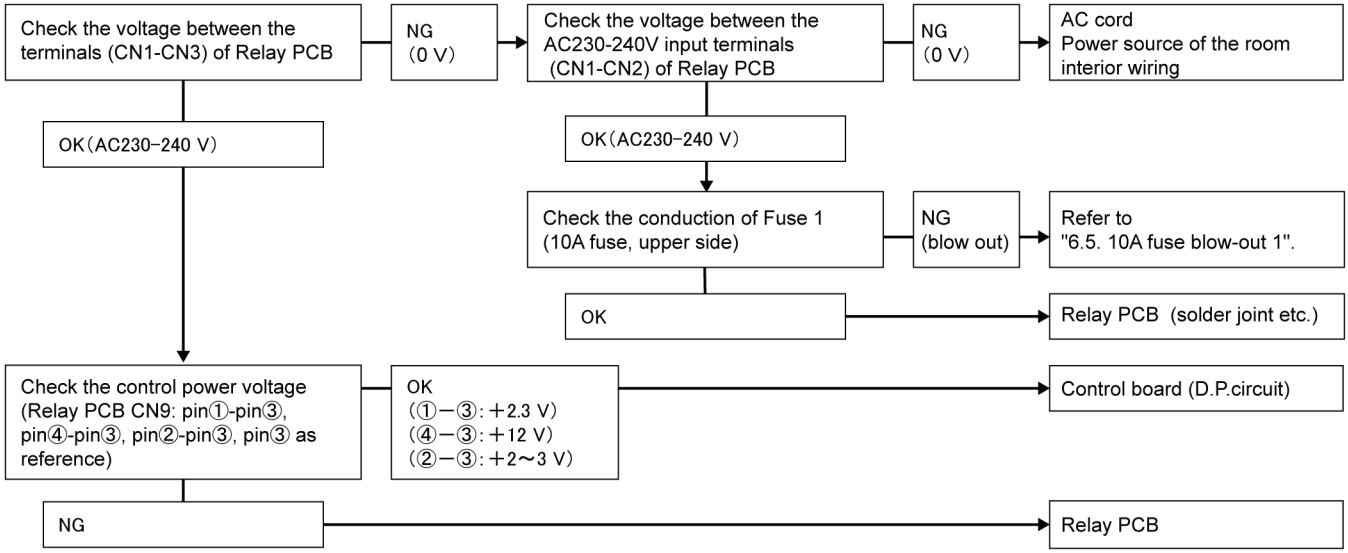
6.3.1. Method of discharging the high-voltage capacitor

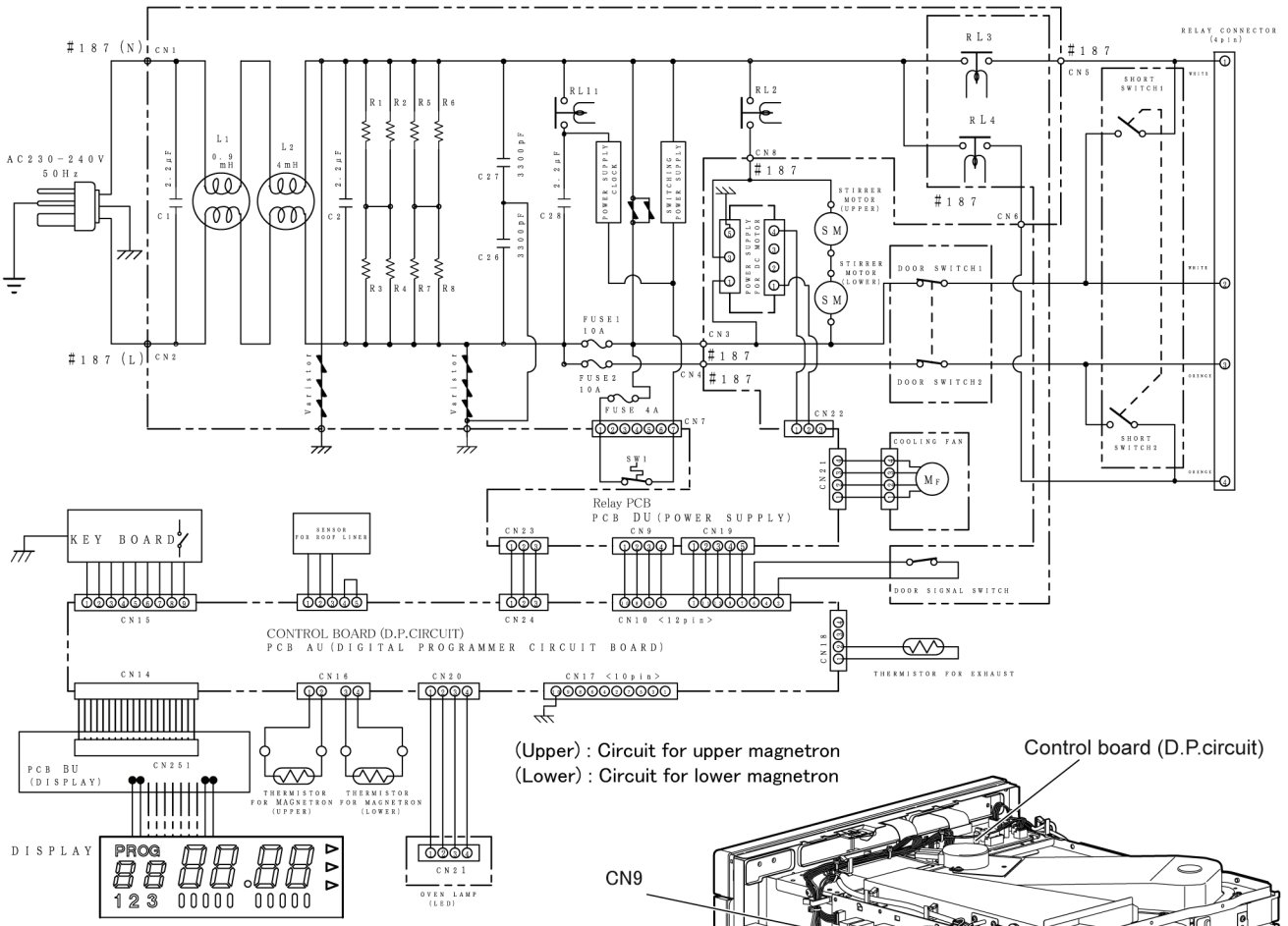
- Be sure to unplug the AC cord, leave it for 30 sec. and then unplug the connectors of Magnetron.
- Short circuit the chassis (Base, Oven U, etc.) and inverter terminals of the high-voltage lead wire, then Heater terminals of magnetron.
  As for the lead wire for short-circuiting, be sure to connect to the chassis side first, and then also connect to the other side.



6.4. Power cannot be turned on

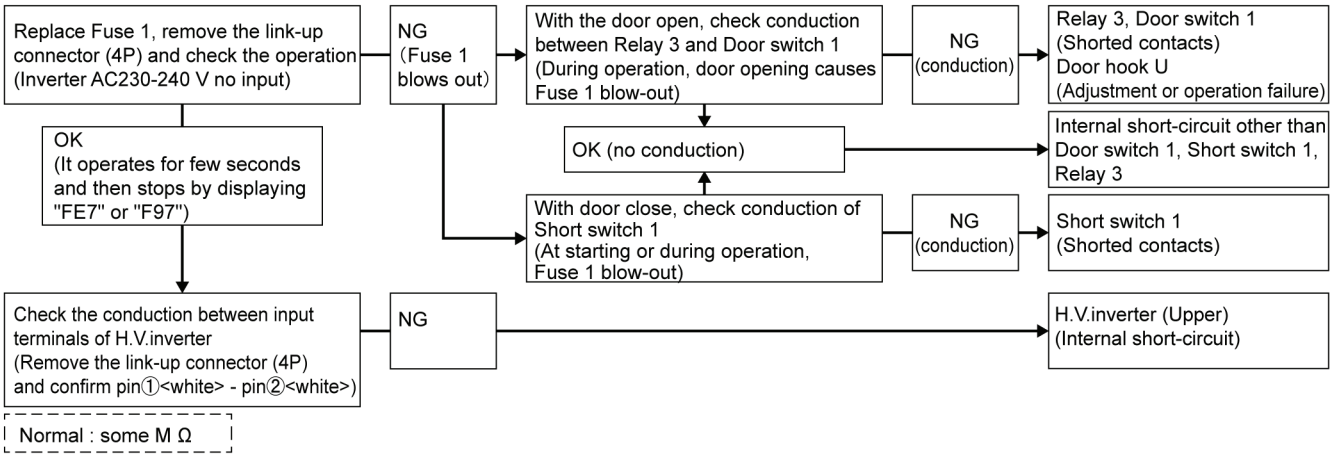
Power cannot be turned on (“0” does not appear in the display even if open the door. Touching the pads do not work.)

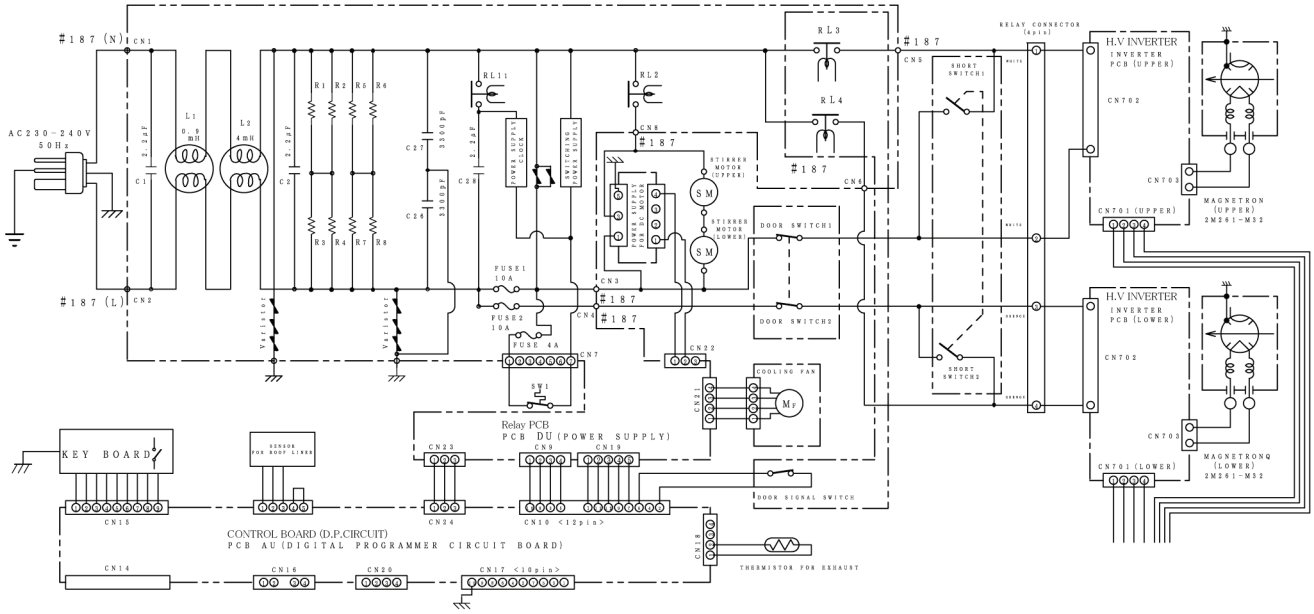




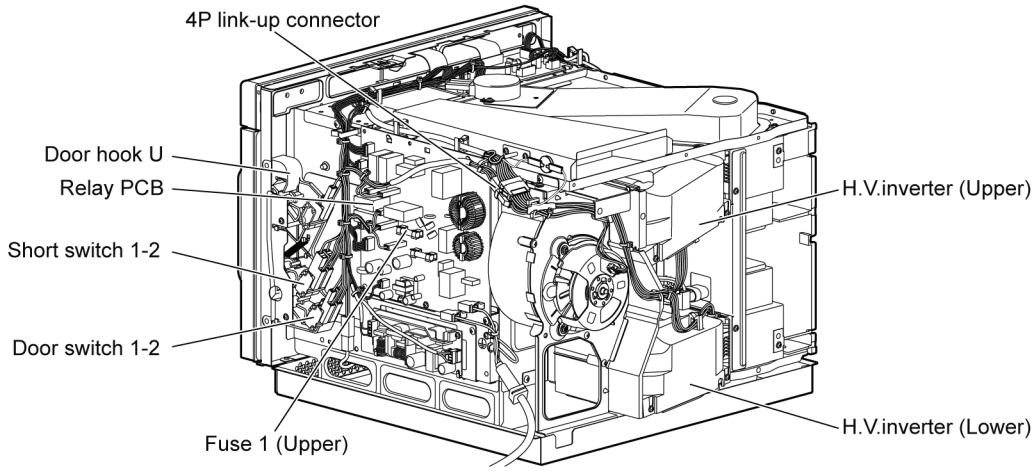
6.5. 10A fuse blow-out 1

Power cannot be turned on (“0” does not appear in the display even if open the door. Touching the pads do not work.)



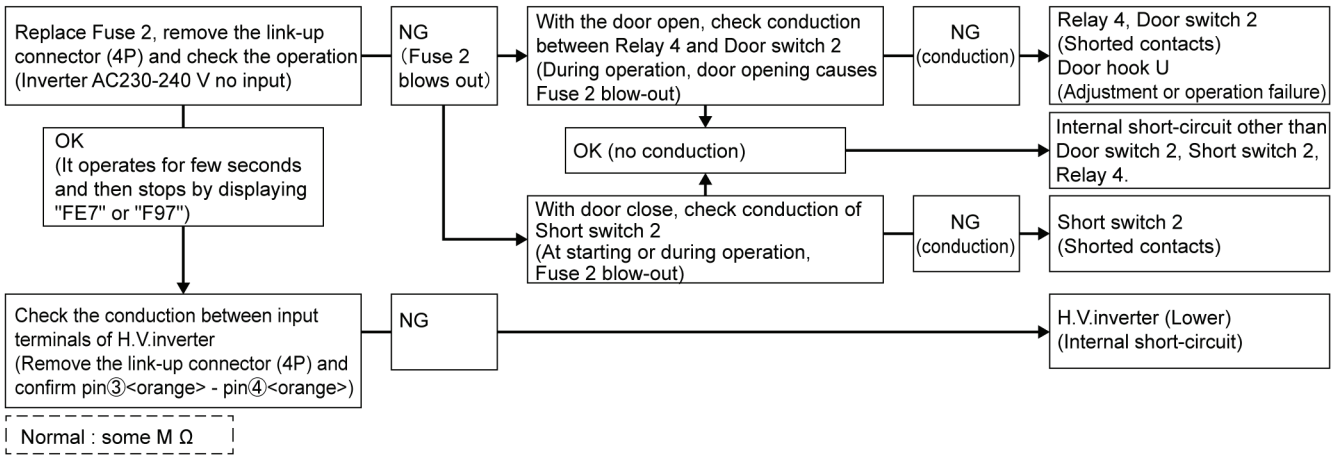


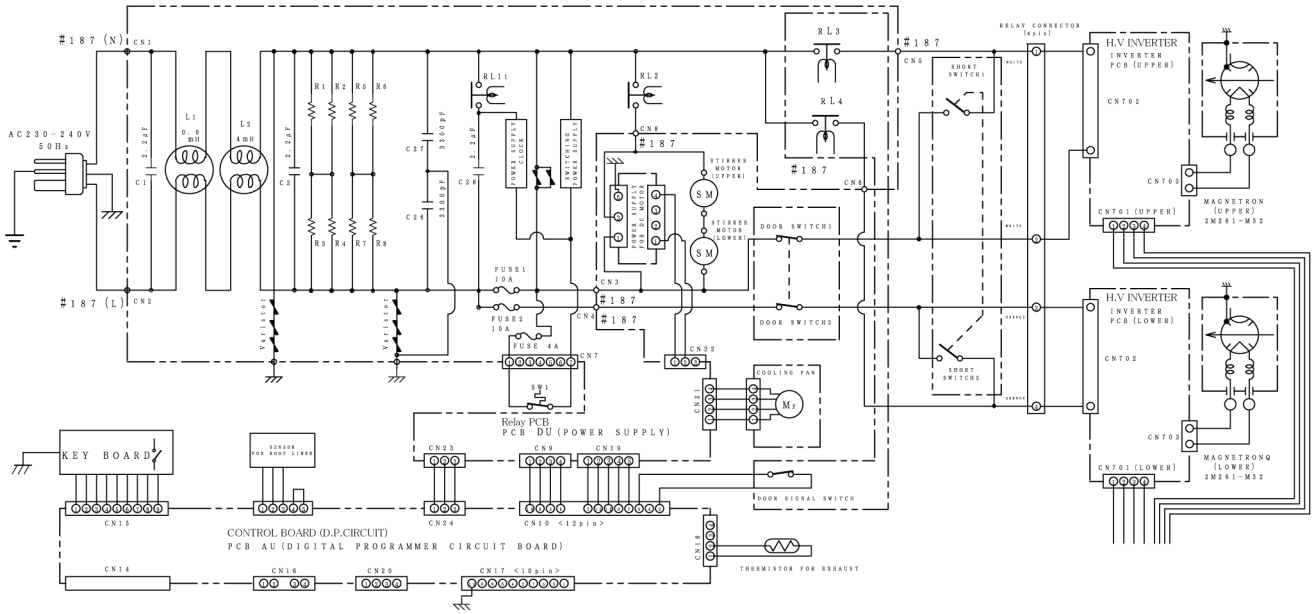
(Upper) : Circuit for upper magnetron
(Lower) : Circuit for lower magnetron



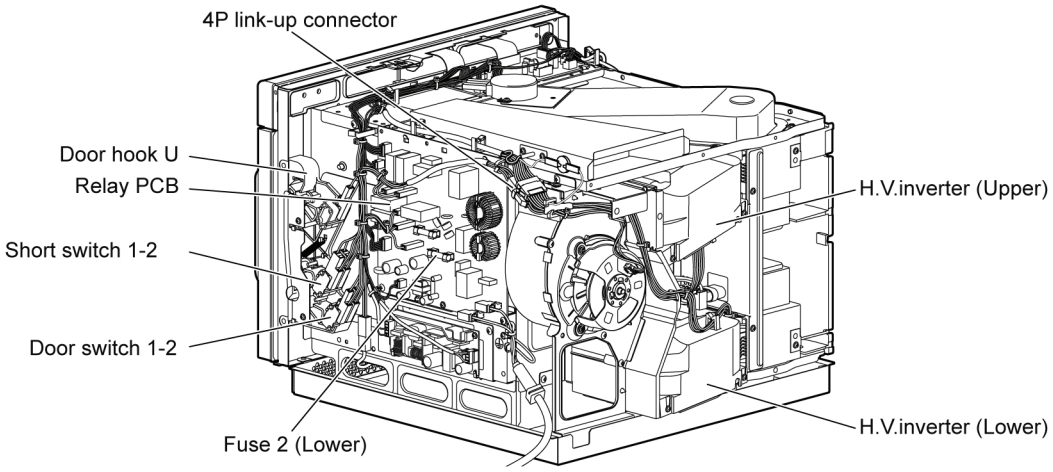
6.6. 10A fuse blow-out 2

In several seconds after starting heating, operation stops with "FE7" displaying.





(Upper) : Circuit for upper magnetron
(Lower) : Circuit for lower magnetron

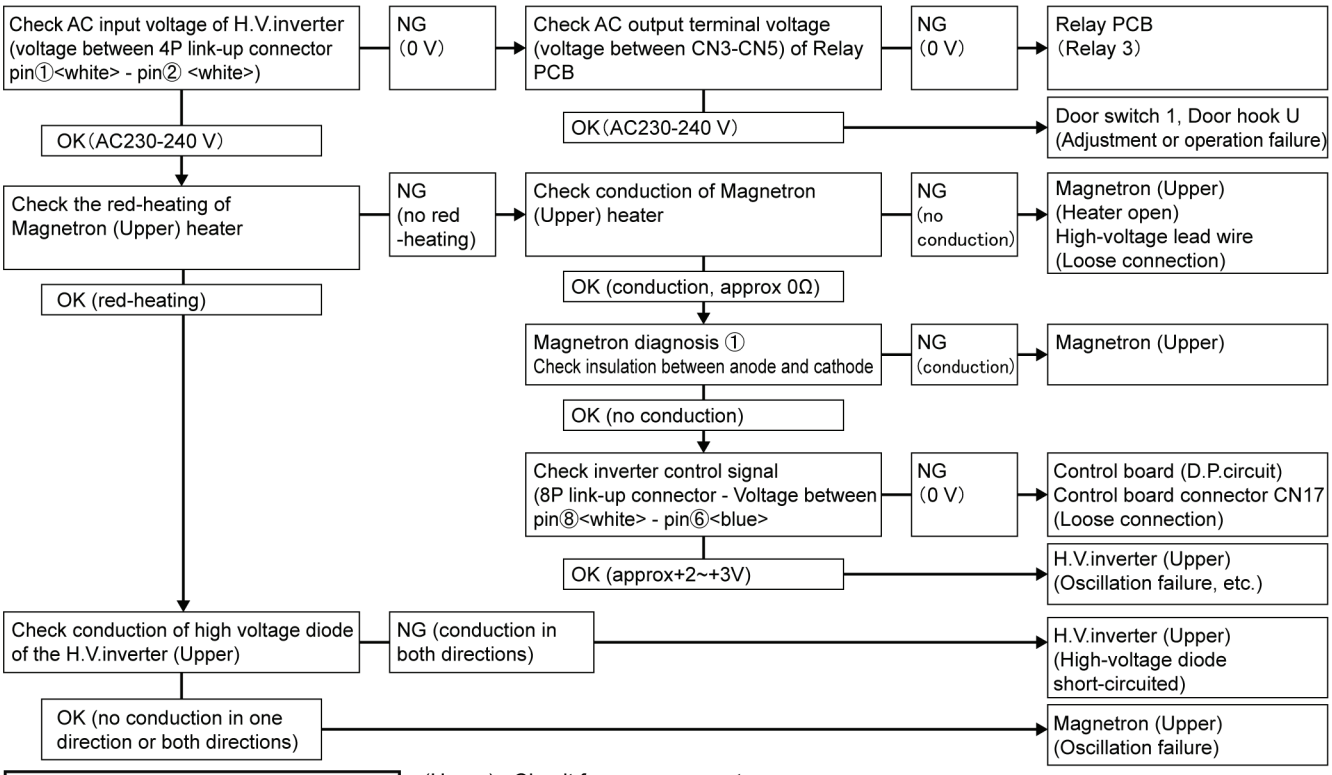


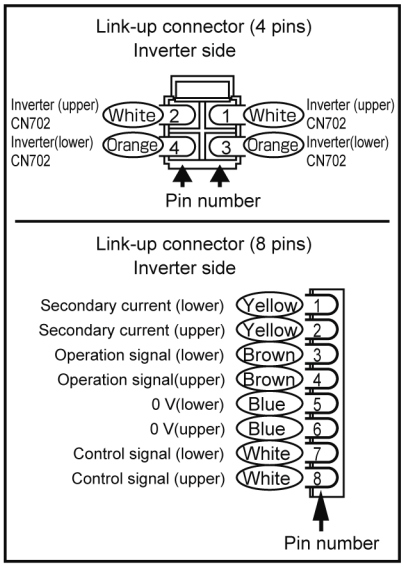
6.7. Oven does not warm up

In several seconds or several 10s seconds after starting heating, operation stops with "F95", " F97", "F98", "FE5", "FE7" or "FE8" displaying.

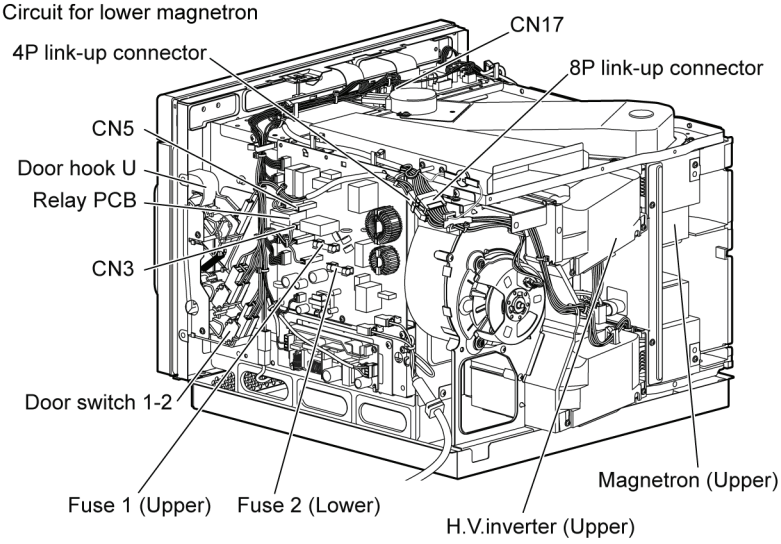
6.7.1. "F95", "F97","F98" display (Check the circuit for upper magnetron)

(In the case of Fuse 1 [10A fuse upper side] blow-out defect, power cannot be supplied)





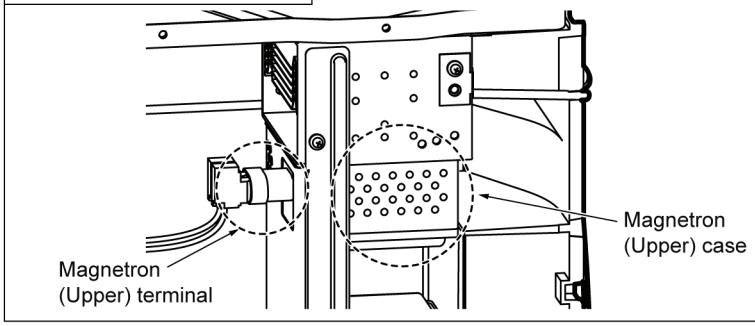
(Upper) : Circuit for upper magnetron
(Lower) : Circuit for lower magnetron



Magnetron diagnosis ①
Insulation diagnosis between anode and cathode

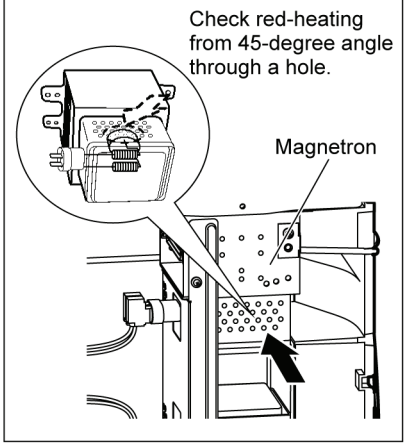
1.Due to high-voltage circuit, do not touch inverter and magnetron for 30 seconds after the microwave oven stopped.
2.Remove the terminal (2 places) connected to the Magnetron (Upper).
3.Measure conduction of the Magnetron (Upper) (insulation diagnosis between anode and cathode) by using a tester.
・Check conduction between Magnetron terminal and Mgnetron case surrounded by dashed line by using a tester as shown to the right. ∞ indicates normal.

Microwave oven (back side)



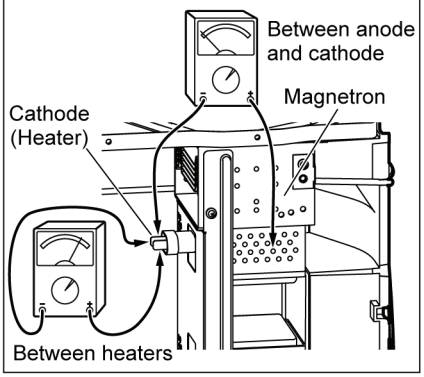
Method of checking the high-voltage part

A. Check the red-heating of magnetron heater



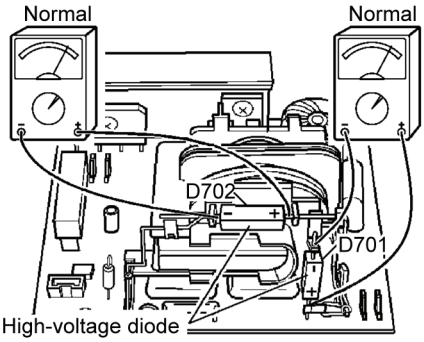
B. Check magnetron

・Insulation between anode and cathode (R×max.)
Normal: ∞ (Conduction indicates insulation failure)
・Heater continuity (R×min.)
Normal: approx. 0Ω

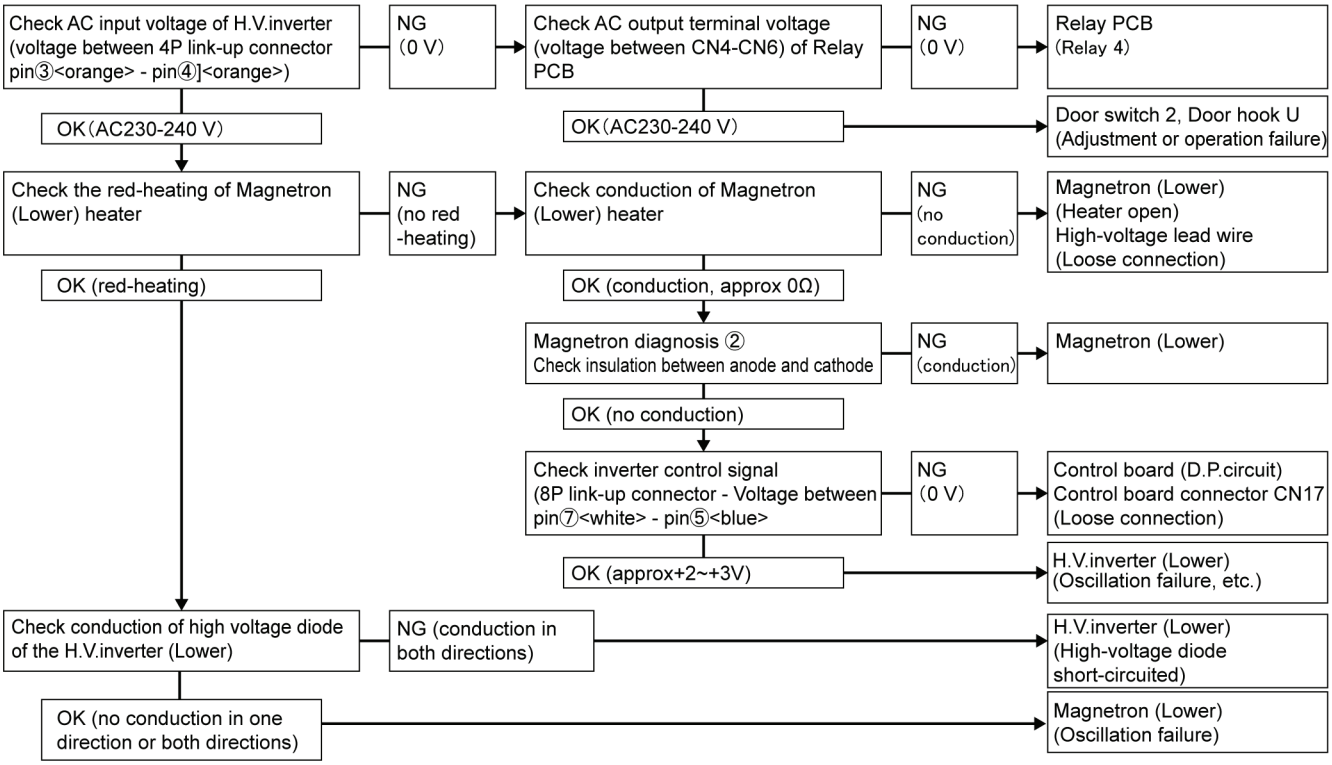


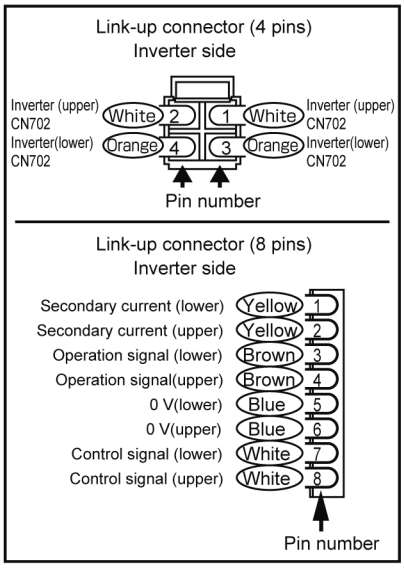
C. Inspection of high-voltage diode

・Measure conduction of the diode - Check between anode and cathode, and cathode and anode
- If conduction is found in both cases, it is insulation failure.
*anode(＋) cathode(－)

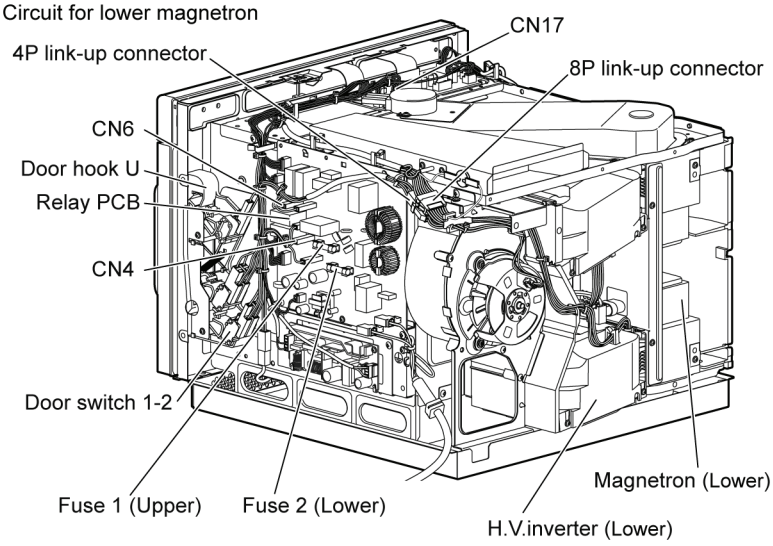


6.7.2. "FE5, "FE7", "FE8" display (Check the circuit for lower magnetron)





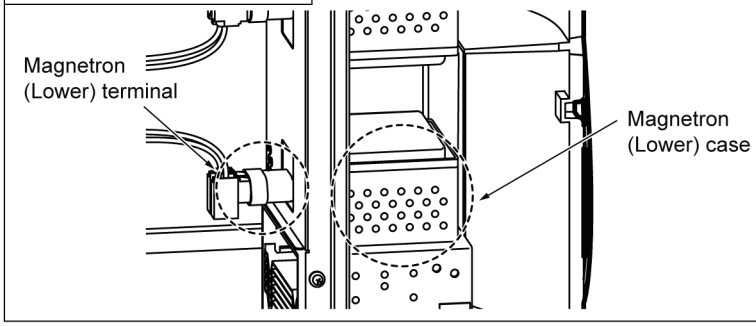
(Upper) : Circuit for upper magnetron
(Lower) : Circuit for lower magnetron



Magnetron diagnosis ②
Insulation diagnosis between anode and cathode

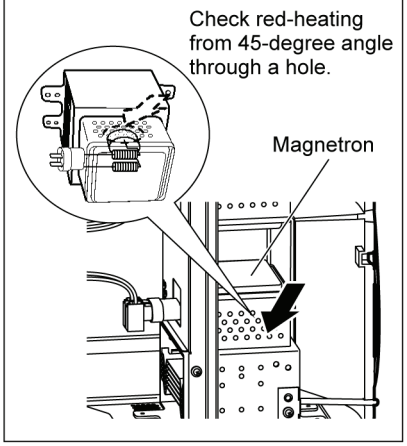
1.Due to high-voltage circuit, do not touch inverter and magnetron for 30 seconds after the microwave oven stopped.
2.Remove the terminal (2 places) connected to the Magnetron (Lower).
3.Measure conduction of the Magnetron (Lower) (insulation diagnosis between anode and cathode) by using a tester.
・Check conduction between Magnetron terminal and Mgnetron case surrounded by dashed line by using a tester as shown to the right. ∞ indicates normal.

Microwave oven (back side)



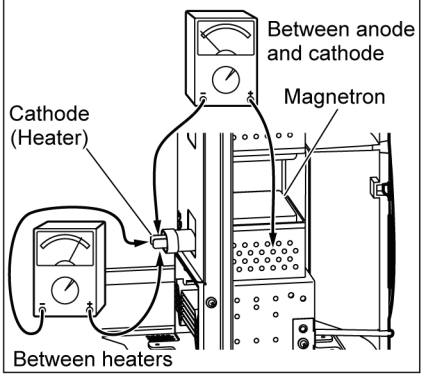
Method of checking the high-voltage part

A. Check the red-heating of magnetron heater



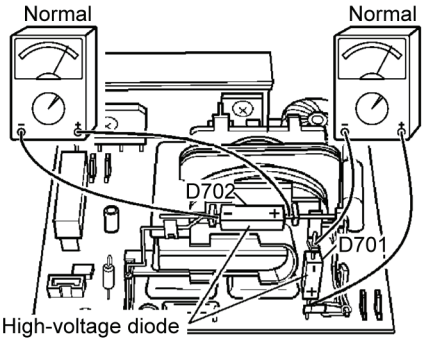
B. Check magnetron

・Insulation between anode and cathode (R×max.)
Normal: ∞ (Conduction indicates insulation failure)
・Heater continuity (R×min.)
Normal: approx. 0Ω



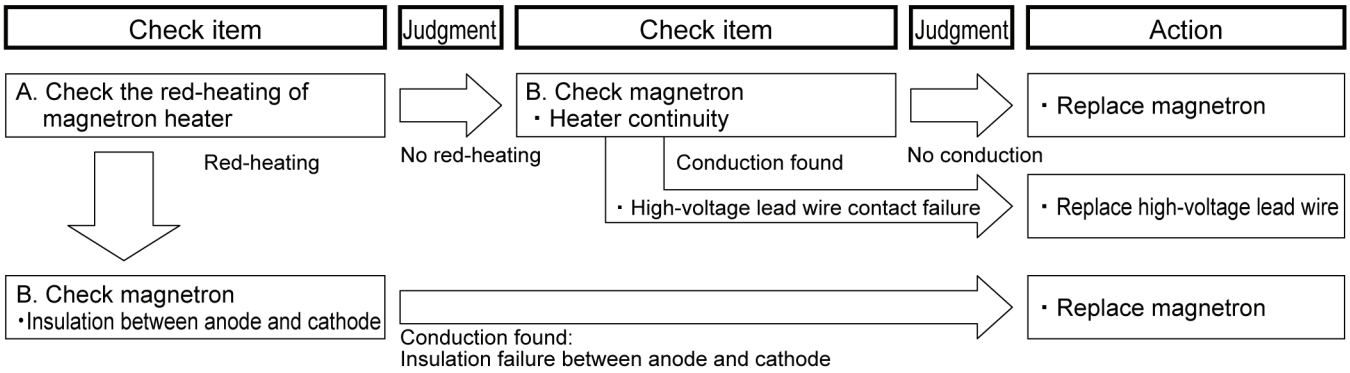
C. Inspection of high-voltage diode

・Measure conduction of the diode - Check between anode and cathode, and cathode and anode
- If conduction is found in both cases, it is insulation failure.
*anode(＋) cathode(－)

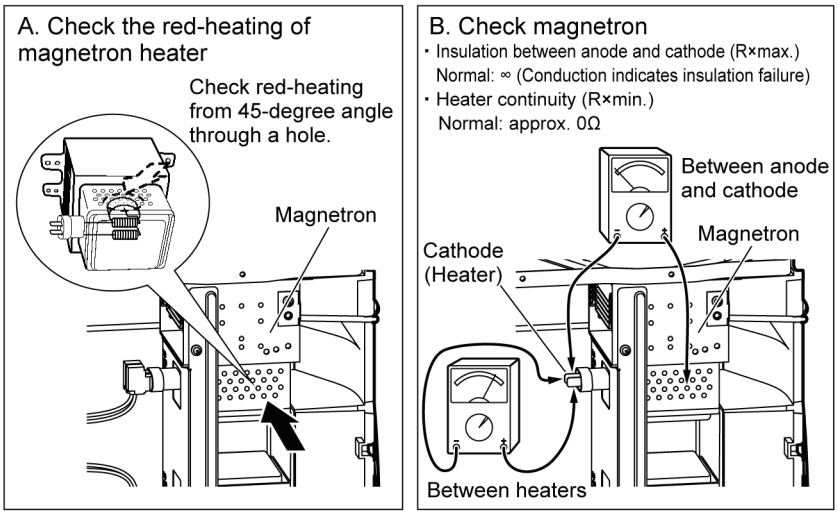


6.7.3. "F92", "FE2" display (Check the magnetron)

If "F92" or "FE2" appears, check by using the following procedure.



Method of checking the magnetron

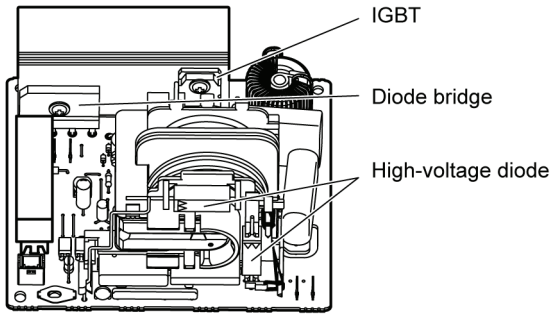


6.7.4. Component test procedure for H.V.inverter and magnetron

Caution: First, remove wiring of the component to be checked to make it a stand-alone condition.

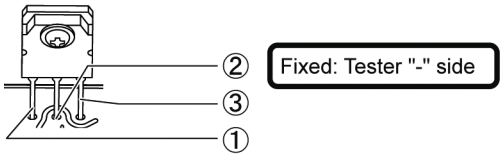
6.7.4.1. H.V.inverter

Check, mainly when the failure code "F97", "FE7", "F98" or "FE8" appears.



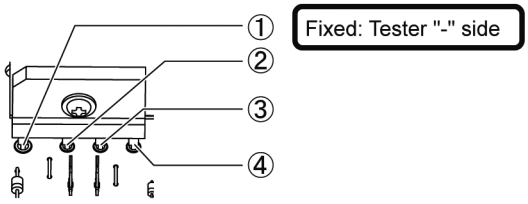
Caution:
Polarity of a tester is shown below.
Use the tester as shown for measurement.
Otherwise, misjudgment may occur.

6.7.4.2. IGBT



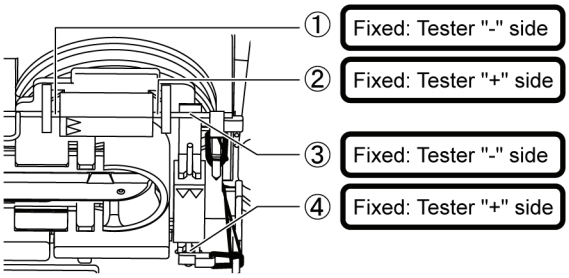
Measured position	Normal	Abnormal	Remarks
Between ②-①	10kΩ or greater	Either one is less than 10kΩ	Keep the tester "-" side fixed
Between ②-③			

6.7.4.3. Diode bridge



Measured position	Normal	Abnormal	Remarks
Between ①−②	10kΩ or greater	Either one is less than 10kΩ	・Keep the tester "-" side fixed ・Abormal standard value guideline is 10Ω or below
Between ①−③			
Between ①−④			

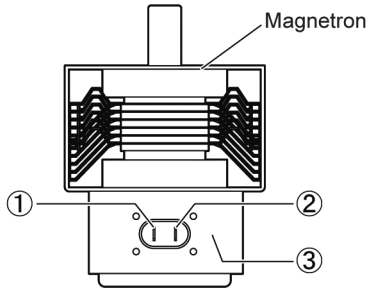
6.7.4.4. High-voltage diode



Measured position	Normal	Abnormal	Remarks
Between ①−②	10MΩ or greater	Either one is less than 10MΩ	・Abormal standard value guideline is 500Ω or below
Between ③−④			

6.7.4.5. Magnetron

Check, mainly when the failure code "F97", "FE7", "F98", "FE8" or particularly "F92", "FE2" appears.



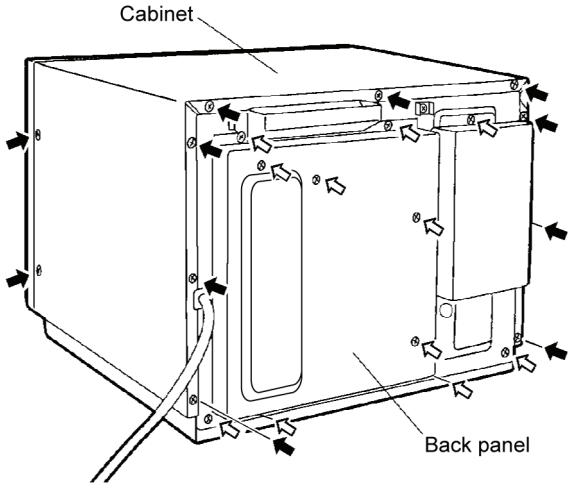
Measured position	Normal	Abnormal	Remarks
Between ①-② (Heater resistance)	Approx. 0 Ω	1 Ω and greater	・Normal standard value guideline is 0 Ω.
Between ②-③ (Between terminal-case)	∞ Ω	some Ω	・Abnormal standard value guideline is some Ω.
Between ①-③ (Between terminal-case)	∞ Ω	some Ω	・Abnormal standard value guideline is some Ω.

7 Disassembly and Assembly Instructions

To prevent accidents during repair and ensure your safety after the repair, be sure to read or refer to “Safety Precautions” describing precautions that you must observe when repairing.

7.1. Cabinet, Back panel

1. Remove the Cabinet. (Black arrow: 2 screws each at the left and right, and 9 screws on the back)
2. Remove the Back panel. (White arrow: 11 screws)

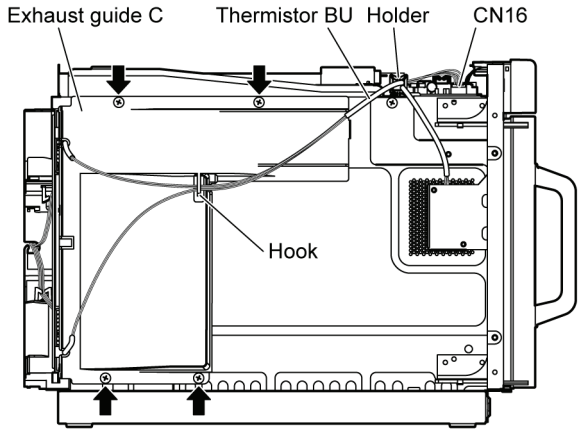


7.2. Magnetron

1. Remove the Cabinet and Back panel.
   (Refer to "7.1.Cabinet, Back panel")

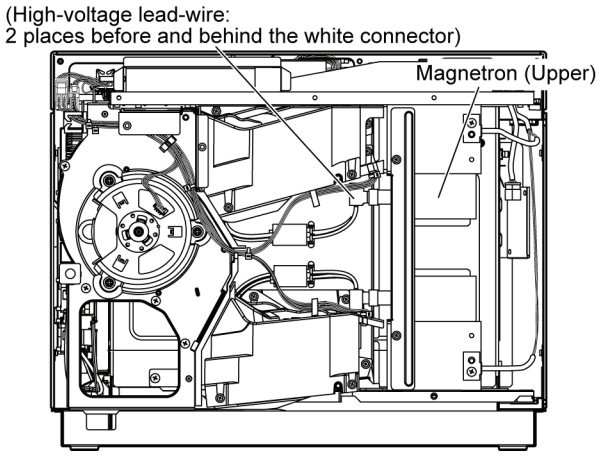
7.2.1. Exhaust guide C

1. Remove the connector (CN16) of Thermistor BU.
2. Unhook the lead wire from the hook and holder.
3. Remove the Exhaust guide C. (Black arrow: 4 screws)

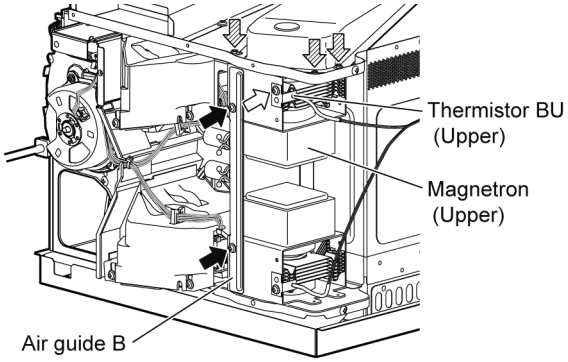


7.2.2. Magnetron (Upper)

1. Remove the high-voltage lead-wire of the Magnetron (Upper).
   (High-voltage lead-wire: 2 places before and behind the white connector)

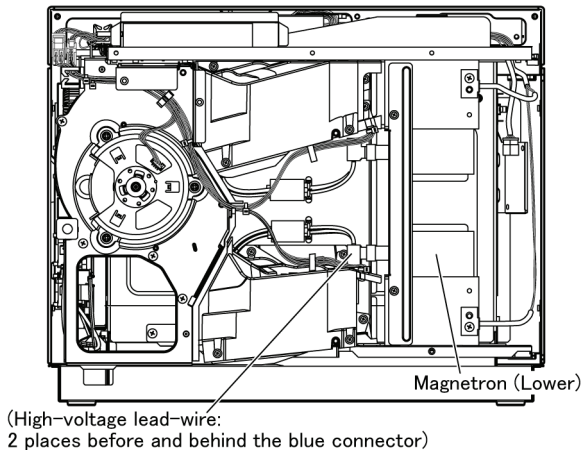


2. Remove the Air guide B. (Black arrow: 2 screws)
3. Remove the Thermistor BU (Upper). (White arrow: 1 screw)
4. Remove the Magnetron. (Tilted arrow: 3 screws)

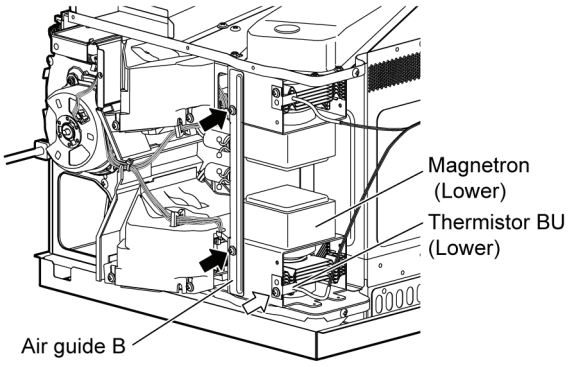


7.2.3. Magnetron (Lower)

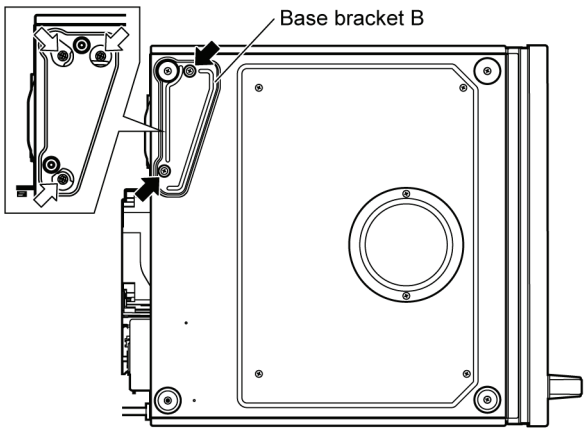
1. Remove the high-voltage lead-wire of the Magnetron (Lower)
   (High-voltage lead-wire: 2 places before and behind the blue connector)



2. Remove the Air guide B. (Black arrow: 2 screws)
3. Remove the Thermistor BU (Lower). (White arrow: 1 screw)



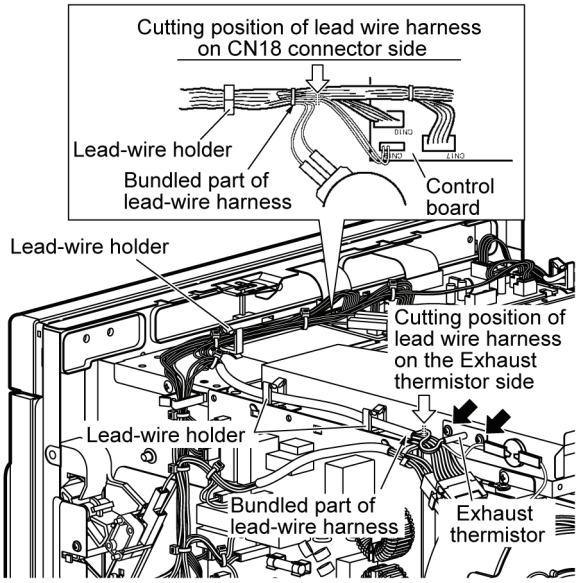
4. Lay the Magnetron down sideways.
5. Remove the Base bracket B. (Black arrow: 2 screws)
6. Remove the Magnetron (Lower). (White arrow: 3 screws)



7.3. Exhaust thermistor

1. Remove the Cabinet. (Refer to 7.1.Cabinet, Back panel)
2. In the lead-wire harness, cut the lead-wire of Exhaust thermistor at the thermistor side bundle.
3. In the lead-wire harness, cut the lead-wire of Exhaust thermistor at the connector side bundle.
4. Remove the Exhaust thermistor. (Black arrow: 2 screws)

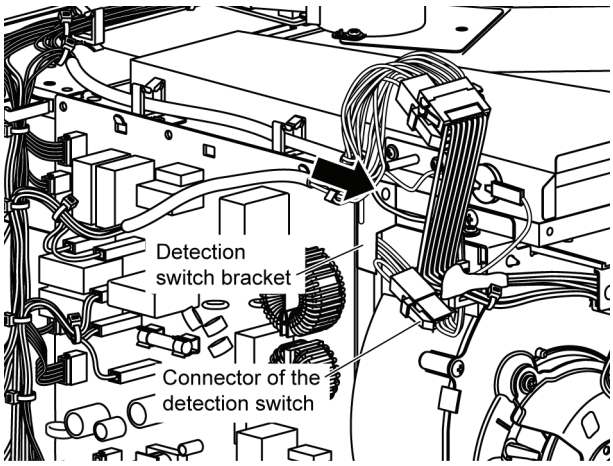
• Leave the remaining lead-wire of the Exhaust thermistor in the lead-wire harness as they are bundled.



• When installing, bundle the lead-wire of the Exhaust thermistor with the lead-wire holder.

7.4. Detection switch

1. Remove the Cabinet and Back panel.
   (Refer to "7.1.Cabinet, Back panel")
2. Remove the connector of the Detection switch.
3. Remove the Detection switch bracket.
   (Black arrow: 1 screw)
4. Remove the Detection switch from the Detection switch bracket.

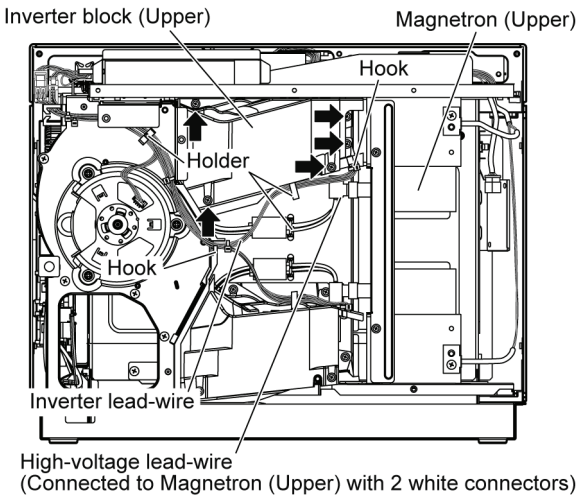


7.5. H.V.inverter

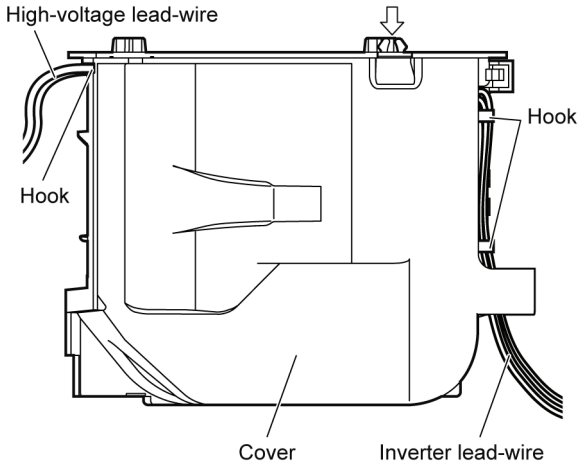
1. Remove the Cabinet and Back panel.
   (Refer to "7.1.Cabinet, Back panel")

7.5.1. H.V.inverter (Upper)

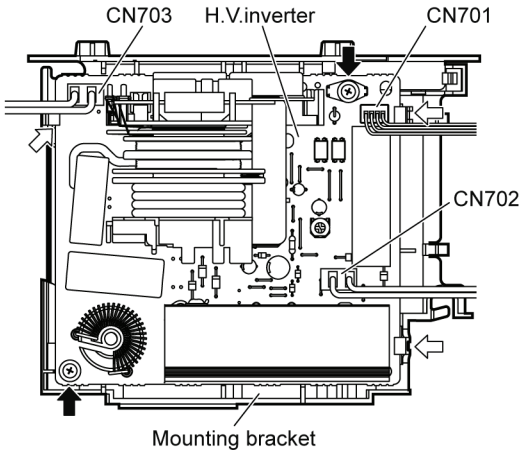
1. Remove the inverter lead-wire and high-voltage lead-wire from each hook and holder.
2. Remove the high-voltage lead-wire from the Magnetron (Upper).
   (Remove the 2 white connectors from the Magnetron (Upper))
3. Remove the Inverter block (Upper). (Black arrow: 5 screws)



4. Remove the inverter lead-wire and high-voltage lead-wire from each hook and holder.
5. Remove the Cover. (White arrow: 1 hook)

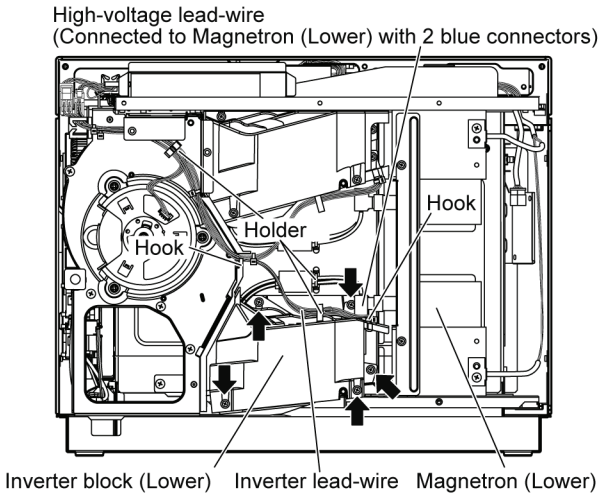


6. Remove connectors (CN701, CN702, CN703).
7. Remove the H.V.inverter. (Black arrow: 2 screws, white arrow: 3 hooks)

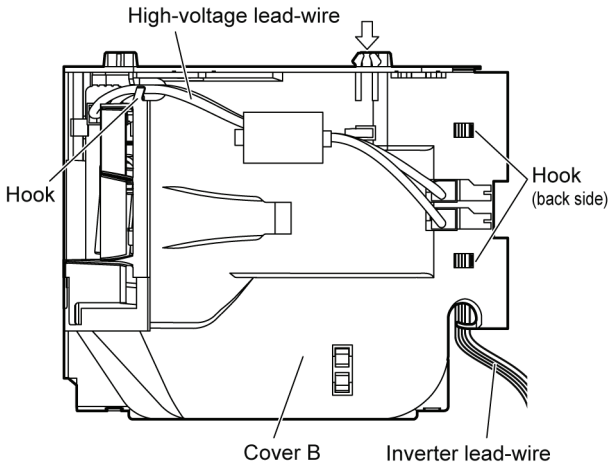


7.5.2. H.V.inverter (Lower)

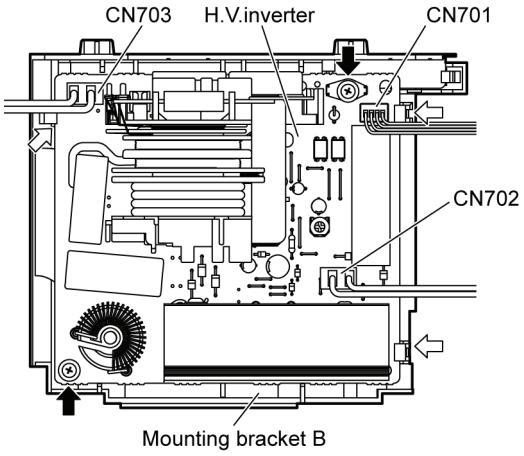
1. Remove the inverter lead-wire and high-voltage lead-wire from each hook and holder.
2. Remove the high-voltage lead-wire from the Magnetron (Lower).
   (Remove the 2 blue connectors from the Magnetron (Lower))
3. Remove the Inverter block (Lower).
   (Black arrow: 5 screws)



4. Remove the inverter lead-wire and high-voltage lead-wire from each hook.
5. Remove Cover B. (White arrow: 1 hook)

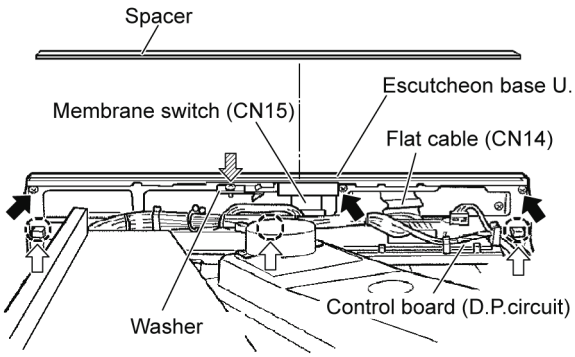


6. Remove connectors (CN701, CN702, CN703).
7. Remove the H.V.inverter. (Black arrow: 2 screws, white arrow: 3 hooks)



7.6. Operation unit (Escutcheon base U)

1. Remove the Cabinet and Back panel.
   (Refer to "7.1.Cabinet, Back panel")
2. Remove the Flat cable (CN14) and the Membrane switch (CN15) connected to the Control board.
3. Remove the Spacer.
   • It will be used for attachment.
4. Remove the washer. (Tilted arrow: 1 screw)
5. Remove the Escutcheon base U. (Black arrow: 3 screws, White arrow/Dashed line circle: 3 hooks)

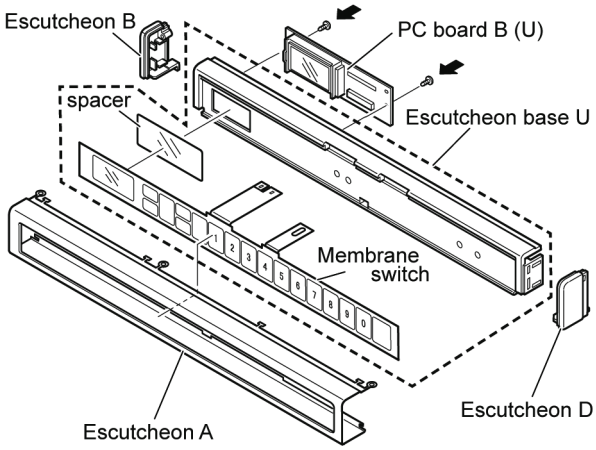


7.6.1. Membrane switch

1. Remove the Escutcheon base U.
   (Refer to "7.6.Operation unit (Escutcheon base U)"
2. Remove the Escutcheon A, B, and D.
   • Flatten the securing hook of the Escutcheon A and remove it from the Escutcheon base U.
3. Separate the Membrane switch from the Escutcheon base U.

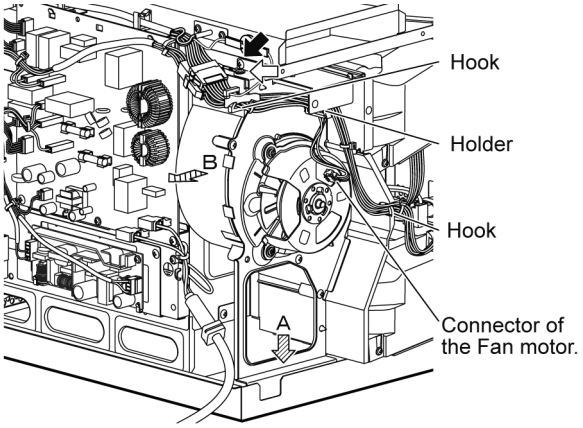
7.6.2. PC board B (U)

1. Remove the Escutcheon base U.
   (Refer to "7.6.Operation unit (Escutcheon base U)"
2. Remove PC board B (U) (Black arrow: 2 screws)



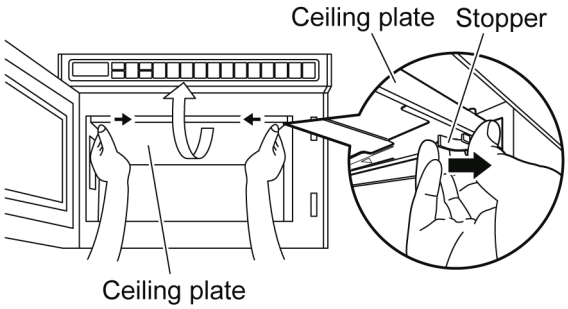
7.7. Fan motor

1. Remove the Cabinet and Back panel.
   (Refer to "7.1.Cabinet, Back panel")
2. Remove the connector of the Fan motor.
3. Unhook the lead wire from the hook and holder.
4. Remove the Fan motor.
   (White arrow: 1 screw, black arrow: 1 screw)
   • Push the Fan motor toward the bottom (tilted arrow A) and tilt it to the side (tilted arrow B) to remove it.



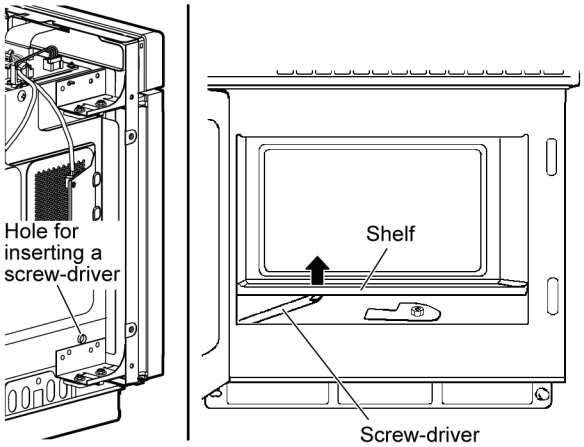
7.8. Ceiling plate

1. Remove the Ceiling plate.
   • Pull the Ceiling plate stopper located on the left and right sides of the Ceiling plate toward inside until disengaged.
   • When installing, align the 3 protrusions on the back, and then engage the hooks on both sides.



7.9. Shelf

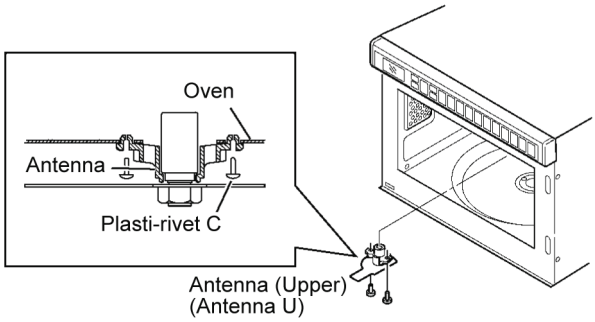
1. Remove the Cabinet and Back panel.
   (Refer to "7.1.Cabinet, Back panel")
2. Remove the Shelf.
   • The screw-driver insertion hole is located on the left of the oven. Insert a screw-driver into the hole and press-down the handle to lift up the Shelf.
   (Hole diameter approx. 8mm)



7.10. Antenna

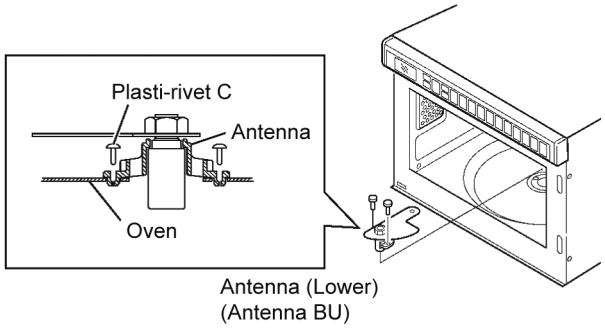
7.10.1. Antenna (Upper)

1. Remove the Ceiling plate.
   (Refer to "7.8.Ceiling plate")
2. Remove the Antenna (Upper). (Plasti-rivet C: 2 pieces)



7.10.2. Antenna (Lower)

1. Remove the Shelf.
   (Refer to "7.9.Shelf")
2. Remove the Antenna (Lower). (Plasti-rivet C: 2 pieces)

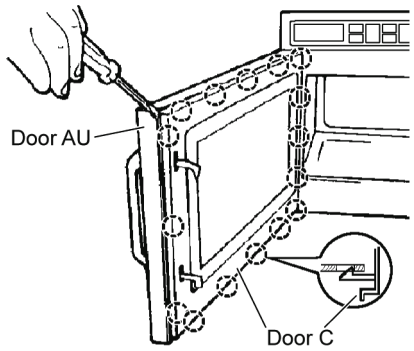


7.11. Door disassembly

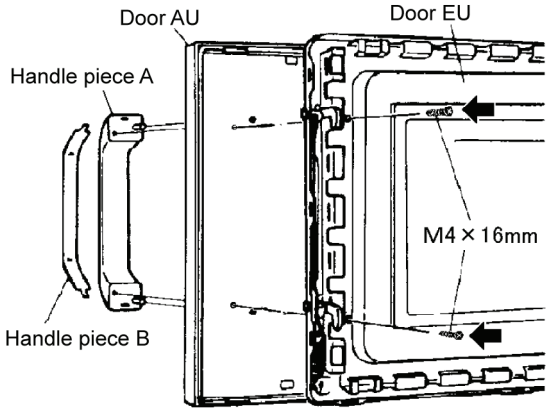
1. Remove the Door C.
   • While inserting a screw-driver between Door AU and Door C, and remove Door C by disengaging the hooks of Door C.

   (Note)

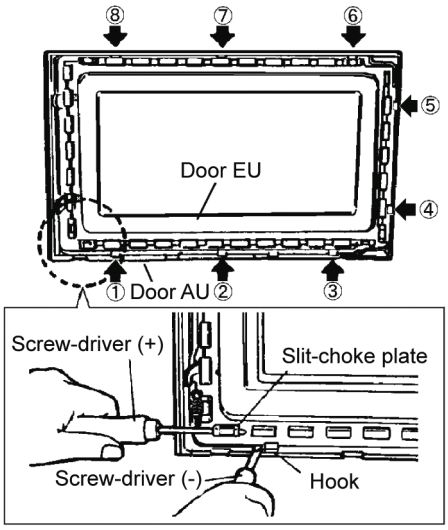
   Door C is held on Door EU by using hooks. When hooks are broken, replace the Door C.



2. Remove the Handle piece A, B. (Black arrow: 2 screws)



3. Remove the Door AU. (Black arrow: 8 hooks)
   • Disengage the hooks of Door AU engaged with Door EU.



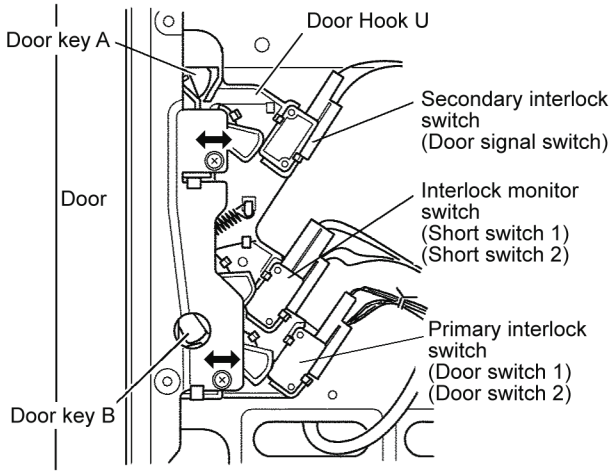
8 Measurements and Adjustments

8.1. Adjustments of Hinge and Door hook U

When the components related to Door and Door hook U are disassembled/assembled or replaced, check the operation of each switch included in Door hook U.

Please confirm that the gap between the switch housing and switch actuator levers is no more than 1.0 mm when the door is closed.

- When operation failure occurs in Door switch, Door signal switch, or short switch, perform adjustment as shown below.
  1. Hinge adjustment
     Close the Door to tightly attach to the oven front surface, and fasten the hinge attachment screws.
  2. Door hook U adjustment
     a. Close the Door and loosen the attachment screws of Door hook U and move the Door hook U backward until it stops and then fasten the screws
     b. Check the Door open/close and the operation of each switch.



8.2. Measurement of microwave output

The output power of magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipmet:

* 1 liter beaker
* Thermometer
* Wrist watch or stopwatch

NOTE:

Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

(A) Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).

(B) Place the beaker on the center of glass cook plate. Set the oven for High power and heat it for exactly one minute.

(C) Stir the water again and read the temperature of the beaker (recorded as T2).

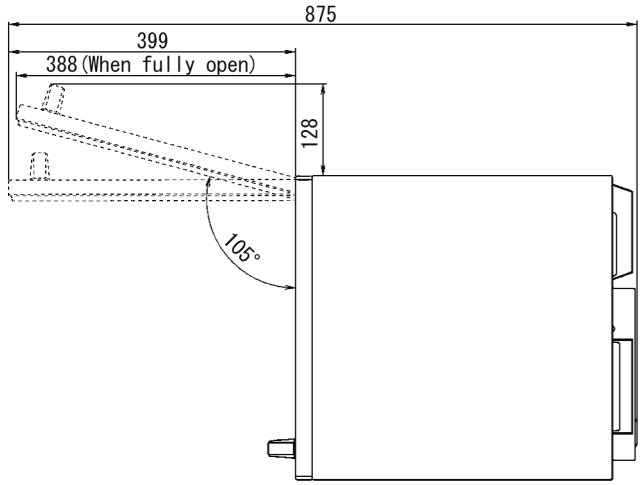
(D) The normal temperature rise (T2-T1) at High power position for each model is as shown in table.

TABLE(1 ℓ - 1min.test)

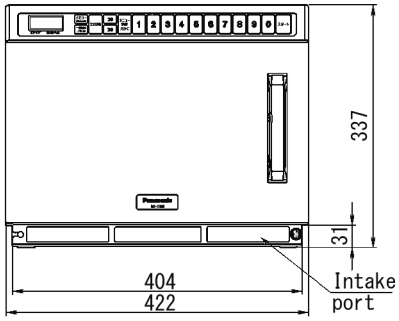
RATED OUTPUT	TEMPERATURE RISE
1800W (IEC-705)	Min. 16.0 °C

9 Dimensions

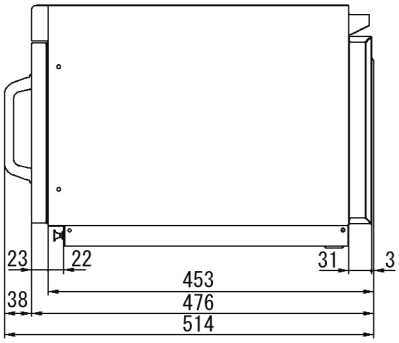
(Unit: mm)



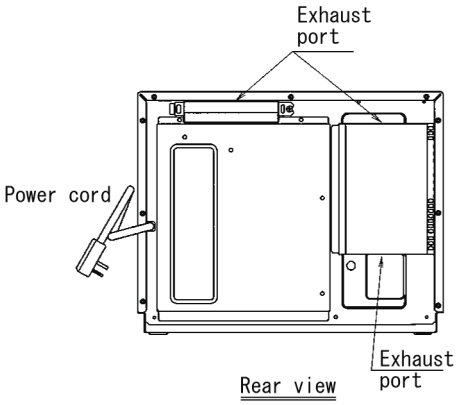
Top view



Front view



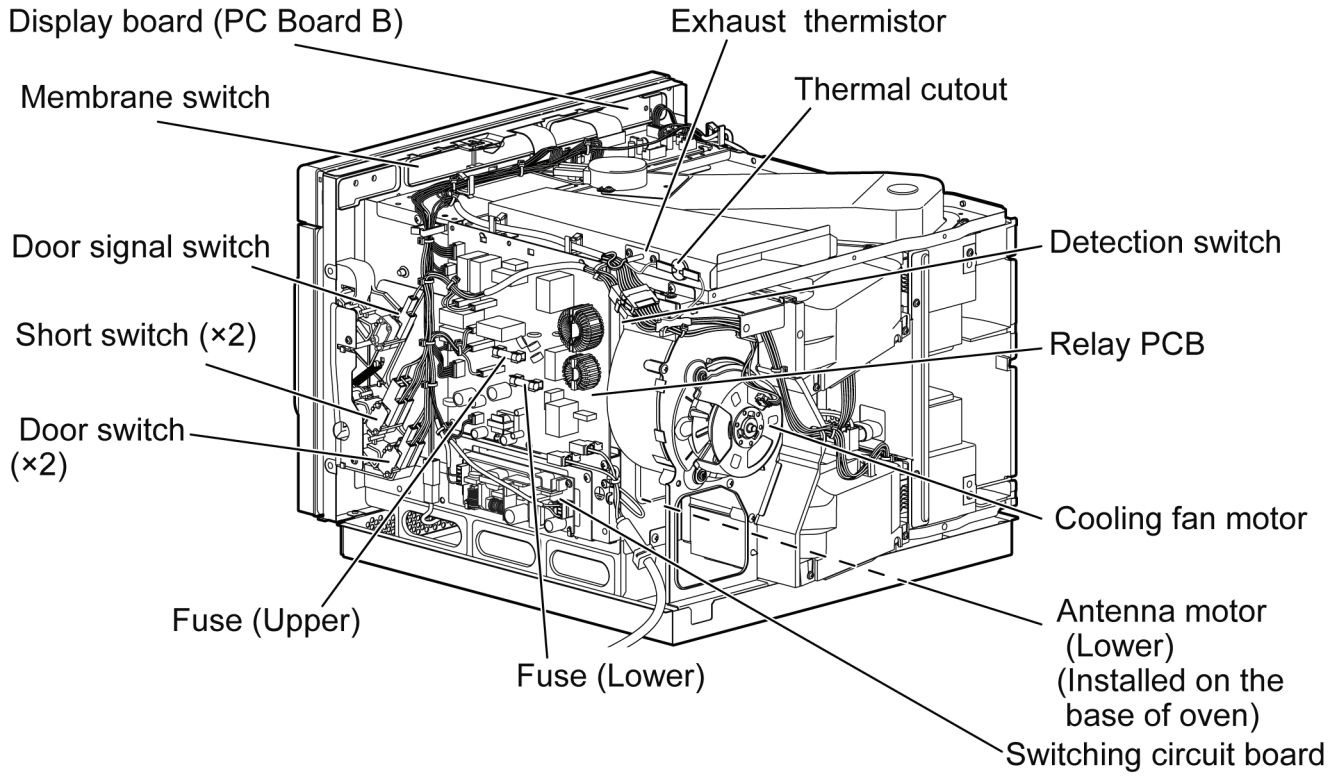
Side view

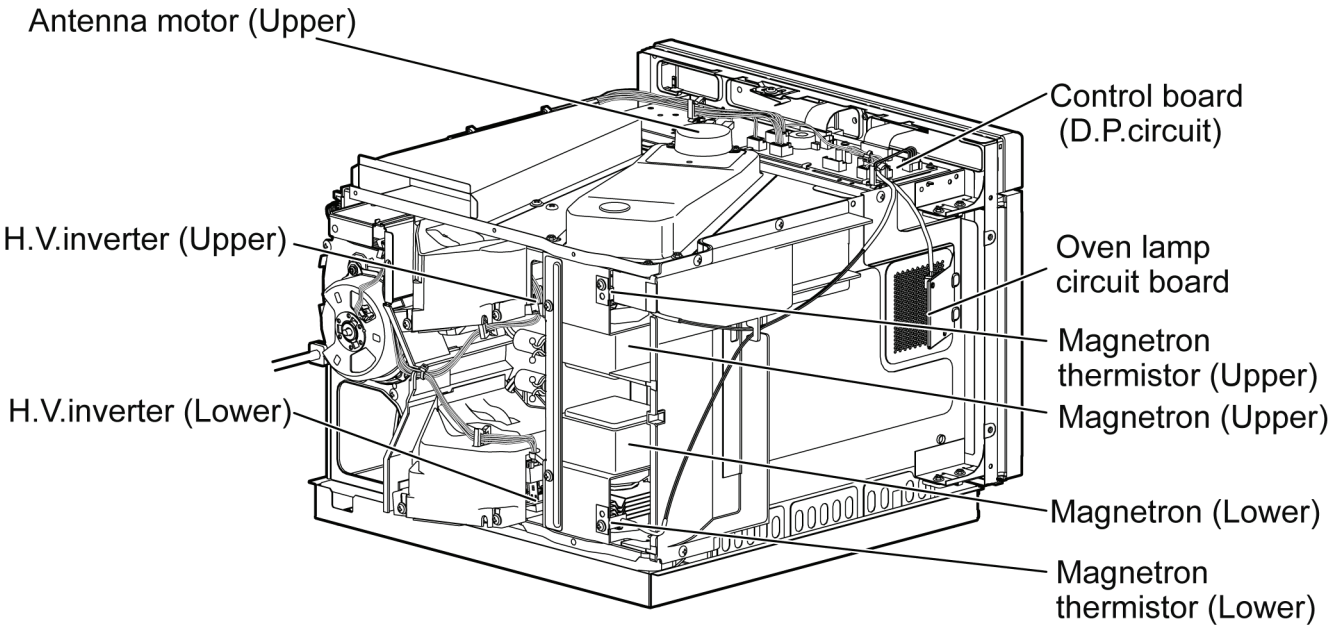


Rear view

10 Block Diagram

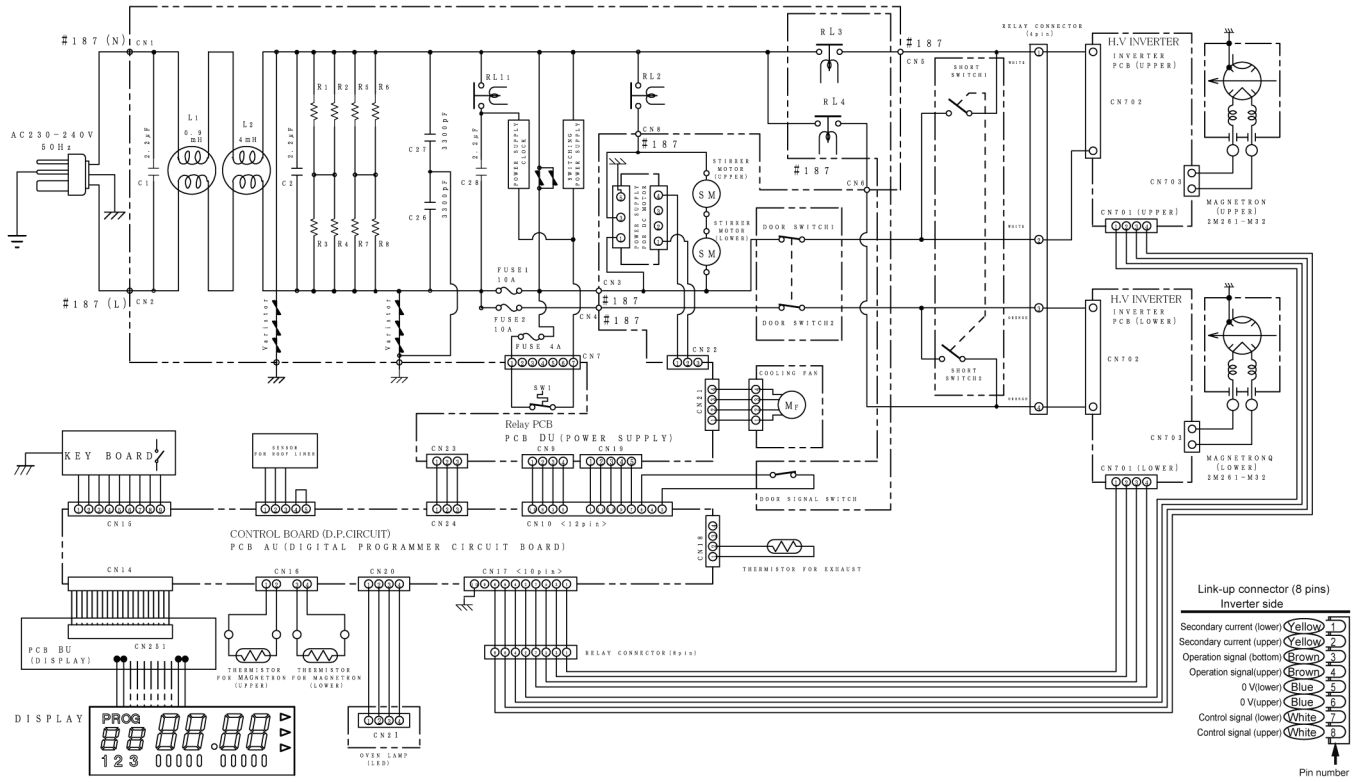
• (Upper) (Lower) correspond to the upper and lower magnetron.





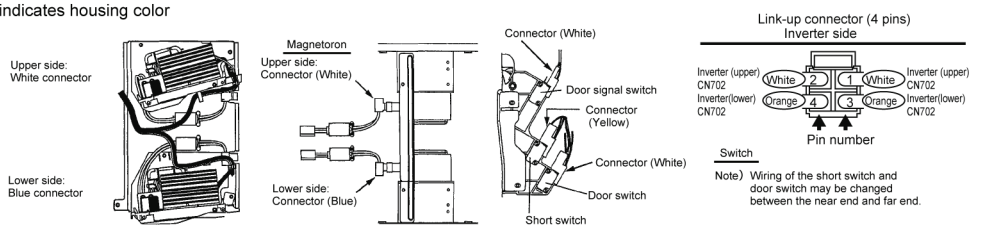
11 Wiring Connection Diagram

11.1. Wiring Connection Diagram

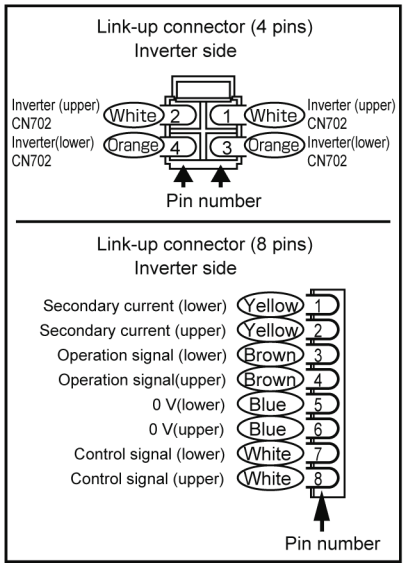


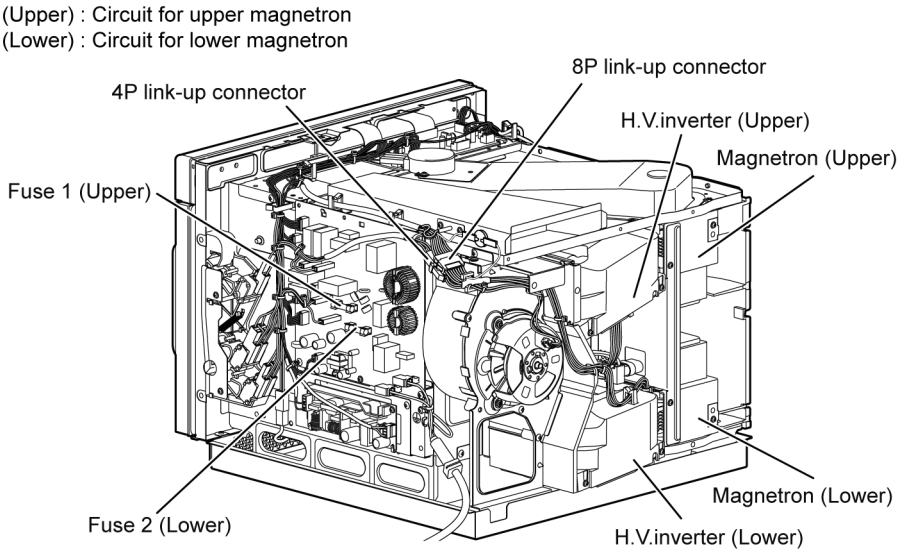
Connection diagram

( ) indicates housing color



Major self-diagnosis indication (upper and lower correspond to that of magnetron.)		
Upper side	Lower side	Condition or checking position
F18	F19	Secondary current serching circuit
F32	F22	Thermistor circuit for magnetron
F90	FE0	Inverter temperature abnormal
F92	FE2	Magnetron A-K short-circuit failure
F95	FE5	Inverter connector abnormal
F96	FE6	Inverter operation signal abnormal (Lo)
F97	FE7	Inverter operation signal abnormal(Hi)
F98	FE8	Inverter operation signal abnormal (Lo)
F99	FE9	When inverter is not operating, operation signal still exists





11.2. Switch Operation

Condition	Door switch 1 Door switch 2	Short switch 1 Short switch 2	Door signal switch
Door open	OFF	ON	OFF
Door close	ON	OFF	ON

11.3. Relay operation

Relay		Role and Operation
Relay 2	RL2	Fan motor, Stirer motor (Antenna motor) ON-OFF
Relay 3	RL3	H.V.inverter (Upper) input (230-240V) ON-OFF (ON:during cooking)
Relay 4	RL4	H.V.inverter (Lower) input (230-240V) ON-OFF (ON:during cooking)

11.4. Oven lamp operation

• When Oven lamp settings is ON.

Condition	Oven lamp
Door open	ON
Door close	OFF

11.5. Cooling fan operation

Condition	Cooling fan
During cooking	Rotation
After cooking	Rotation for 20 sec. (When short cooking time and long cooking interval.) Rotation for 1 min. (When long cooking time or short cooking interval.)

12 Instruction for Stacking

Important

1. Disconnect the power cord from the wall socket before attempting installation.
2. For stacking installation, you must use the Panasonic Joint Plate A1134-3E10 (Available via service route).
3. Combination of the unit for stacking is limited within only the same models.
4. Do not stack more than one oven above bottom oven.

Preparation

Be sure the oven cavity is empty.

Installation

1. Stack the units and remove five screws ⓐ as shown in Fig. 1.
2. Loosen the screw ⓑ.
3. The projection on the Joint Plate must face away from the oven. Place the Joint Plate on the screw ⓑ.
4. Attach and tighten five screws ⓐ and the screw ⓑ. See Fig. 2.
5. Ensure the top oven is at a safe and workable height.

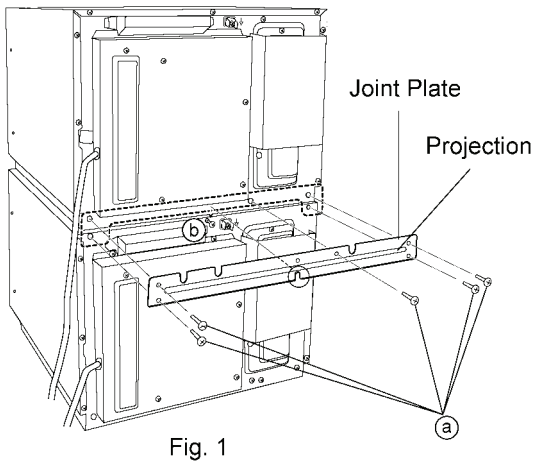


Fig. 1

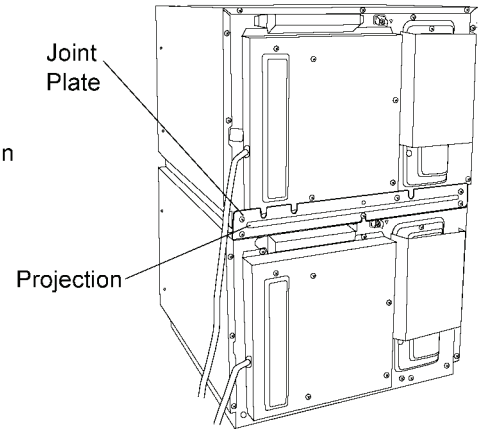
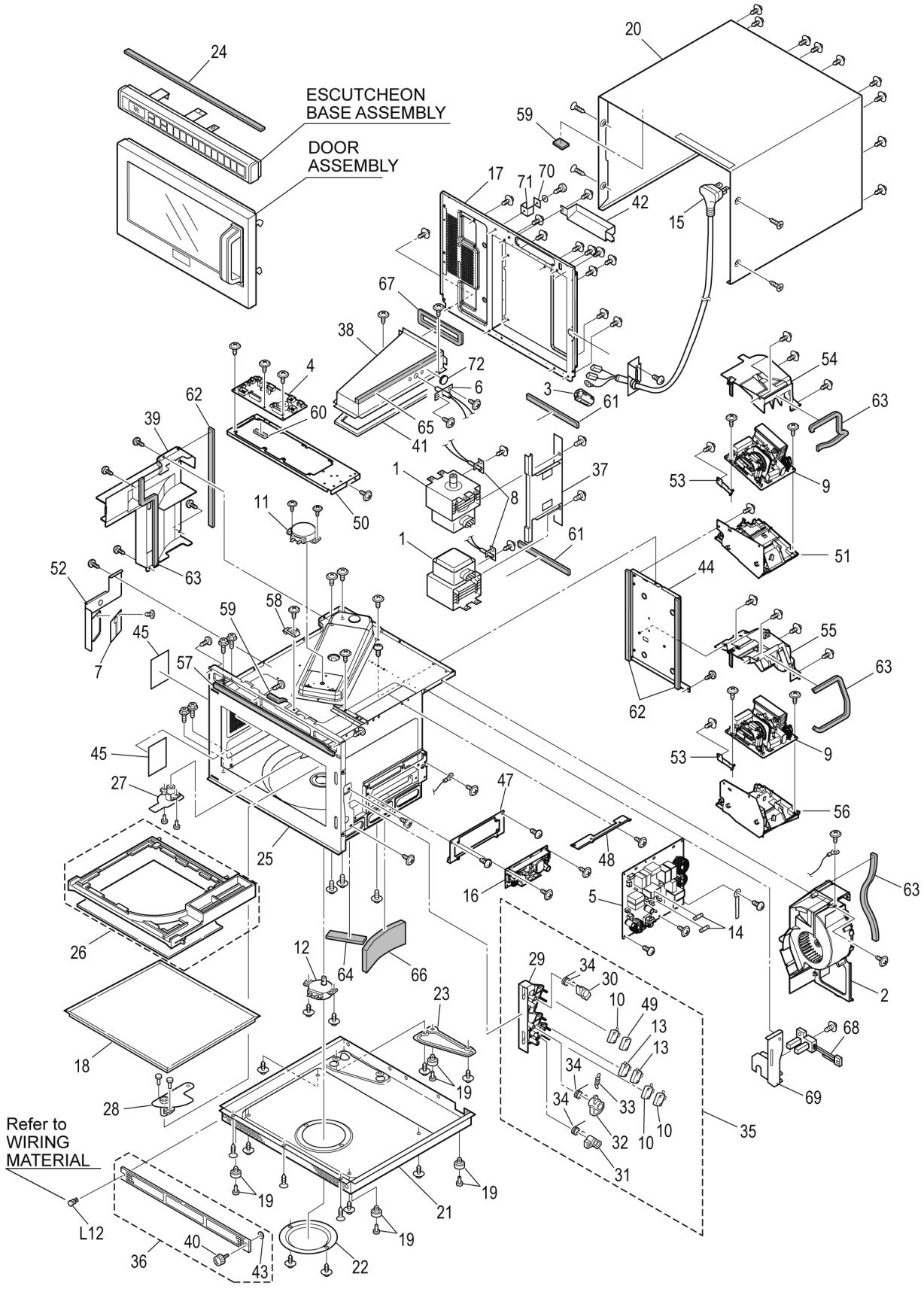


Fig. 2

13 Exploded View and Replacement Parts List

13.1. Exploded view and parts list



PARTS LIST

NOTE 1: When ordering replacement part(s), please use part number(s) shown in this parts list.
Do not use description of the part.

2: Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

3: Alphabet marks in Remarks columns (i.e. BPQ etc) indicate parts applicable to only specified country models as follows.

BBQ, BPQ : United Kingdom
EPG : Continental Europe Countries

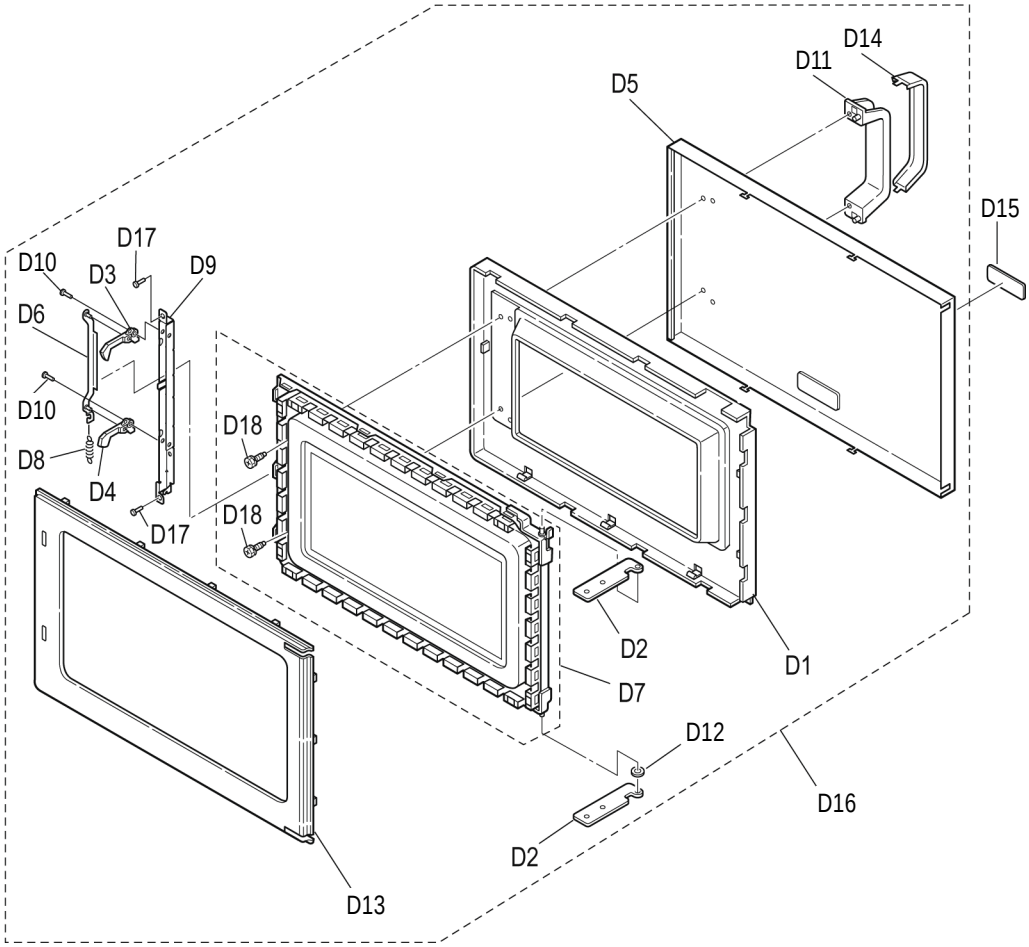
Parts without these marks can be used for all models.

Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
	1	2M261-M32U3Y6-VP	MAGNETRON	2	
	2	H490W3J90BP	FAN MOTOR, DC, 40.8W	1	(40.8W)
	3	F50968K30BP	FERRITE CORE	1	FOR AC CORO W/PLUG (U)
⚠	4	A603L3J9ABP	D.P.CIRCUIT (U)	1	NE-1878BBQ, NE-1864BPQ
⚠	4	A603L3K60EP	D.P.CIRCUIT (U)	1	NE-1878EPG, NE-1864EPG
⚠	5	A603Y3J9ABP	RELAY PCB	1	
	6	A605A-3E10S	EXHAUST THERMISTOR	1	(124°C)
	7	A605S-3J0A	PCB, OVEN LAMP	1	
	8	A605Y-3J00	THERMISTOR BU	1	FOR MAGNETRON
	9	F606Y3G70BPA	H.V.INVERTER	2	
⚠	10	A61424T00AP	MICRO SWITCH	1	(V-16G-3C25-M)
⚠	11	A6144-3E10	ANTENNA MOTOR, AC, Single phase, 3W	1	UPPER, (3W)
⚠	12	A6144-3E20	ANTENNA MOTOR, AC, Single phase, 3W	1	LOWER, (3W)
	13	ANE61784L0AG	MICRO SWITCH	2	(V-16G-2C25)
⚠	14	A62304210BP	FUSE, 10A	2	(10A/250V)
⚠	15	A900C3J90BPS	AC CORO W/PLUG (U)	1	NE-1878BBQ, NE-1864BPQ INCLUDES CORD BUSHING, CORD BRACKET
⚠	15	A900C3K60EPS	AC CORO W/PLUG (U)	1	NE-1878EPG, NE-1864EPG INCLUDES CORD BUSHING, CORD BRACKET
⚠	16	N0AC1GF00002	PCB, POWER SUPPLY	1	
	17	H100Q3J90BP	BACK PANEL	1	
	18	ANE010T8U0AP	SHELF	1	
	19	A1008-3B10	RUBBER FOOT	4	
	20	H1009-3E10	CABINET BODY	1	
	21	H100A3J90BP	BASE	1	
	22	ANE10288U0AP	ANTENNA MOTOR COVER	1	
	23	A1166-3B10	BASE BRACKET B	1	
	24	H11748U0AP	SPACER	1	
⚠	25	H200A-3J00	OVEN U	1	
	26	H2011-3B10S	CEILING PLATE	1	
	27	H202K3E20P6	ANTENNA U	1	UPPER
	28	H202V-3B10	ANTENNA BU	1	LOWER
	29	A3020-3853	DOOR HOOK A	1	
	30	A3136-3470	HOOK SPACER A	1	
	31	A31373F90BP	HOOK SPACER B	1	
	32	A3138-3470	HOOK SPACER C	1	
	33	ANE32398U0AP	SPRING	1	
	34	ANE32628U1AP	SPRING B	3	
⚠	35	A393C-3B10	DOOR HOOK U	1	
	36	H400B-3280S	AIR FILTER KIT	1	
	37	H4026-3B10	AIR GUIDE B	1	
	38	H402N3J90BP	EXHAUST GUIDE AU	1	
	39	H4114-3J00	EXHAUST GUIDE C	1	
	40	A4091-3290	SCREW	1	
	41	H4115-3B10	EXHAUST GUIDE CUSHION A	1	
	42	H4122-3B10	EXHAUST GUIDE F	1	
	43	A6408-3280	WASHER	1	
	44	H6029-3J00	MOUNTING BRACKET	1	
	45	F60408U0AP	OVEN LAMP SHEET	2	
	47	H6068-3J00	MOUNTING BRACKET	1	FOR POWER SUPPLY
	48	H6229-3J00	MOUNTING BRACKET	1	FOR RELAY PCB
	49	A62383230GP	SPACER	1	
	50	H6585-3B10	MOUNTING BRACKET	1	FOR D.P.CIRCUIT (U)
	51	H6585-3J00	MOUNTING BRACKET	1	FOR H.V.INVERTER (UPPER)
	52	A6603-3E10	LAMP BRACKET	1	FOR LAMP

Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
	53	H6662-3J00	BRACKET, EARTH	2	FOR H.V.INVERTER
	54	H6720-3J00	COVER	1	FOR H.V.INVERTER (UPPER)
	55	H6721-3J00	COVER B	1	FOR H.V.INVERTER (LOWER)
	56	H6763-3J00	MOUNTING BRACKET	1	FOR H.V.INVERTER (LOWER)
	57	H8251-3180	SPACER	1	
	58	A6408-3280	WASHER	1	FOR EARTH
	59	H0922000CC	CUSHION RUBBER C	2	
	60	H0922000AD	CUSHION RUBBER C	1	
	61	H0922000AL	CUSHION RUBBER C	2	
	62	H0922000AP	CUSHION RUBBER C	3	
	63	H0922000AV	CUSHION RUBBER C	4	
	64	H0922000CU	CUSHION RUBBER C	1	
	65	H0962000AT	CUSHION RUBBER C	1	
	66	H092B000BS	CUSHION RUBBER C	1	
	67	H0962000AT	CUSHION RUBBER D	1	
	68	A611K3J90BP	DETECTION SWITCH	1	
	69	H22133J90BP	DETECTION SWITCH BRACKET	1	
	70	H66623170GP	BRACKET, EARTH	1	
	71	XWNANE65GV	BRACKET	1	
	72	A61454050AP	THERMAL CUTOUT, 105°C 15A	1	
		A1134-3E10	JOINT PLATE	1	OPTIONAL ACCESSORY FOR STACKING
		H05243J90BB	NAME LABEL	1	NE-1878BBQ
		H05243J90EP	NAME LABEL	1	NE-1878EPG
		H05243K60BP	NAME LABEL	1	NE-1864BPQ
		H05243K60EP	NAME LABEL	1	NE-1864EPG
		H01703J90BP	DOOR LABEL	1	
		H00064080BP	CAUTION LABEL	1	
		H01723F90EU	CAUTION LABEL S	1	
		XTW3+6EFJ	SCREW	4	(3x6) FOR ANTENNA MOTOR
		XTWANE3+8EX	SCREW	4	(3x8) FOR EXHAUST THERMISTORx2, THERMAL CUTOUTx2
		XTW3+10EFJ	SCREW	1	(3x10) FOR DETECTION SWITCH
		XTT4+8RDNV1	SCREW	2	(4x8) FOR EXHAUST GUIDE (F), WASHER(Ref No.58)
		XTWANE4+8BN	SCREW	7	(4x8) FOR EXHAUST GUIDE (AU)x3, FAN MOTOR, PCB (OVEN LAMP), DETECTION SWITCH BRACKET, MOUNTING BRACKET(Ref NO.48)
		XTW4+8PFJ	SCREW	2	(4x8) FOR H.V.INVERTER
		XTW4+8LHJ	SCREW	9	(4x8) FOR AIR GUIDE Bx2, THERMISTOR BUx2, H.V.INVERTER(EARTH)x2, BRACKET(EARTH)x2, LEAD WIRE HARNESS(EARTH)
		XTC4+10BC	SCREW	7	(4x10) FOR CABINET BODYx4, BASEx3
		XYC4+FJ10FJ	SCREW	1	(4x10) FOR RELAY PCB
		XTQ4+10JFJ	SCREW	8	(4x10) FOR MOUNTING BRACKET (Ref No.44)x2, COVERx3, COVER Bx3 FOR H.V.INVERTER
		XTN4+12GGJ	SCREW	3	(4x12) FOR ESCUTCHEON BASE U
		XTTANE4+12BN	SCREW	37	(4x12) FOR BASEx4, BACK PANELx11, EXHAUST GUIDE (C)x4, MOUNTING BRACKET (Ref No.50), LAMP BRACKET, MOUNTING BRACKET(Ref No.44)x2, RELAY PCBx2, MOUNTING BRACKET(Ref No.47)x2, etc.
		XTW4+12TJV1	SCREW	2	(4x12) FOR DOOR HOOK U
		XSQ5+10FJ	SCREW	4	(5x10) FOR HINGE
		XYF5+AF10J	SCREW	6	(5x10) FOR MAGNETRON
		XYE6+F20FJ	SCREW	1	(6x20) FOR BACK PANEL
		XTWANE4+12DN	SCREW	9	(4x12) FOR CABINET BODY
		XYC3+FF8FJ	SCREW	5	(3x8) FOR D.P.CIRCUIT (U)x3, PCB,POWER SUPPLYx2
		XYD4+EE12FJ	SCREW	1	(4x12) FOR AC CORO W/PLUG(EARTH)
		XTWA4+8BJ	SCREW	1	(4x8) FOR WASHER(Ref No.58)

13.2. DOOR ASSEMBLY

NE-1878



∗1 Door U（H390L3J90BP）and Door AU（A301A3J90BP）does not include Door panel and Door label. When ordering the Door U or Door AU, please order Door panel and Door label together.

∗2 When door is disassembled, Door C hook is broken and cannot be used again. When ordering door components, please make sure that you order the Door C（F3085CL00XP）together.

Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
	D1	F3003CL00BPS	DOOR FRAME (U)	1	
	D2	H3007-3J00	HINGE	2	
	D3	F3018CL00XP	DOOR KEY A	1	UPPER
	D4	F3019CL00XP	DOOR KEY B	1	LOWER
	D5	A301A3J90BP	DOOR AU	1	
	D6	H301H-3850	DOOR KEY LEVER BU	1	
⚠	D7	F301Q3J90BP	DOOR EU	1	
	D8	F3021CL00XP	DOOR KEY SPRING	1	
	D9	F3023CL00XP	DOOR KEY MOUNTING PLATE	1	
	D10	ANE30562Q0AP	HANDLE PIN A	2	
	D11	F30703170GP	HANDLE PIECE A	1	
	D12	ANE3081P60AP	DOOR HINGE SPACER	1	
	D13	F3085CL00XP	DOOR C	1	
	D14	ANE31348U1AP	HANDLE PIECE B	1	
	D15	H31863J90BP	DOOR PANEL	1	
⚠	D16	H390L3J90BP	DOOR U	1	
	D17	XTT4+8RDNV1	SCREW	2	(4x8) FOR DOOR KEY MOUNTING PLATE
	D18	XYEA4+C16TSJ	SCREW	2	(4x16) FOR HANDLE PIECE A

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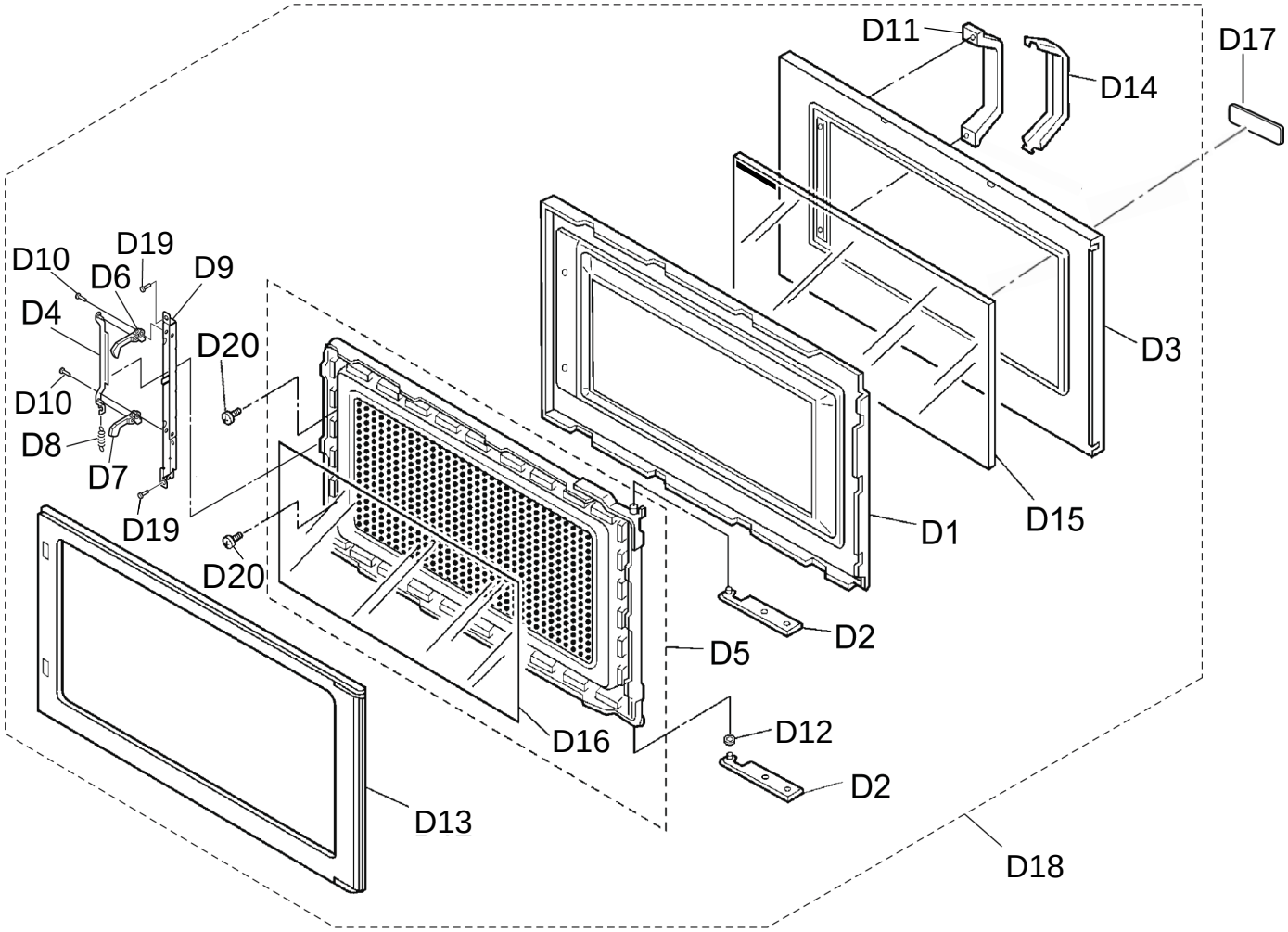
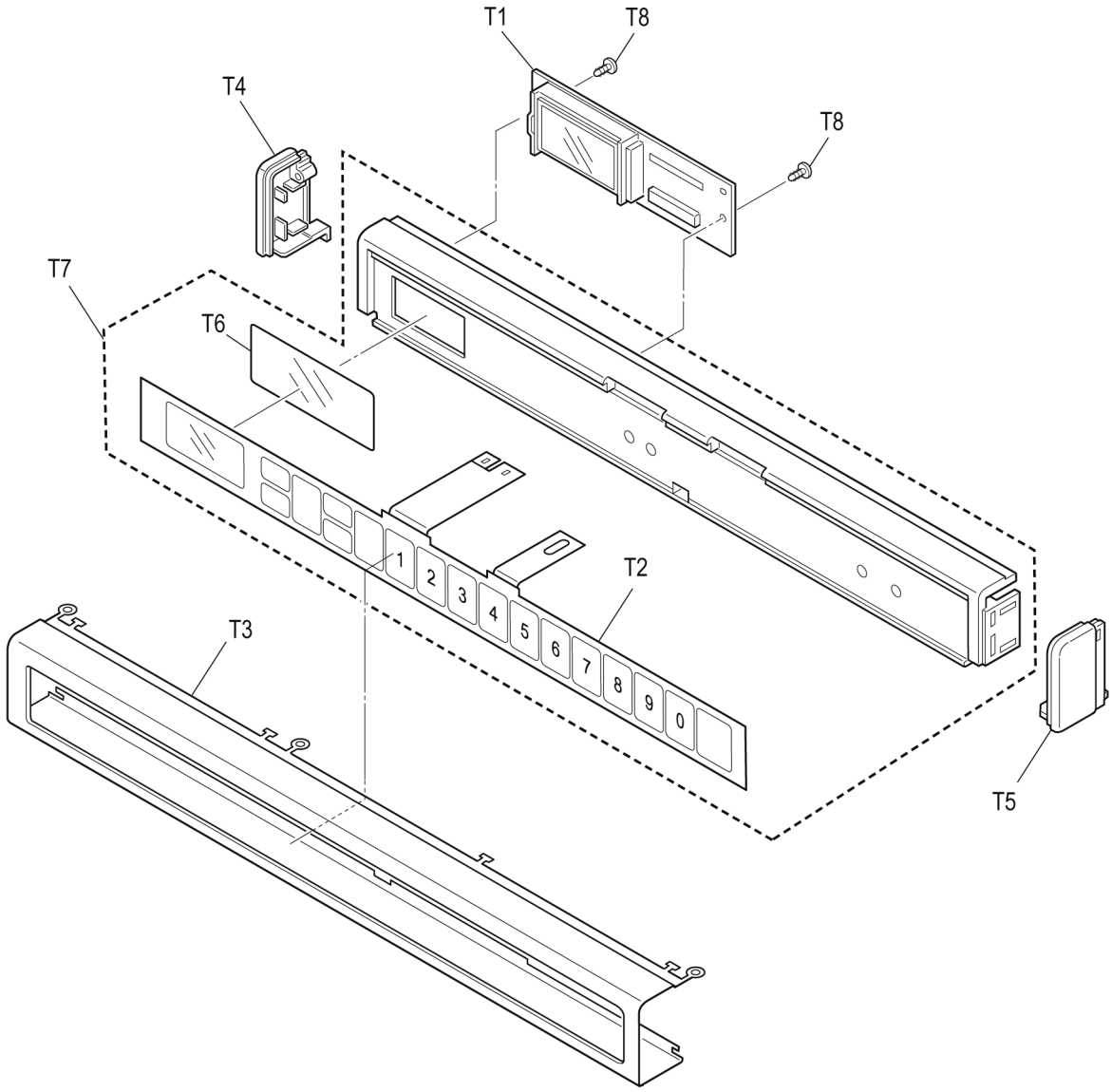


∗1 Door U（H390L3J90BP）and Door AU（A301A3J90BP）does not include Door panel and Door label.
When ordering the Door U or Door AU, please order Door panel and Door label together.

∗2 When door is disassembled, Door C hook is broken and cannot be used again.
When ordering door components, please make sure that you order the Door C（F3085CL00XP）
together.

Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
	D1	F3003CL00XPS	DOOR FRAME (U)	1	
⚠	D2	H3007-3J00	HINGE	2	
⚠	D3	F301ACL00XP	DOOR AU	1	
	D4	H301H-3850	DOOR KEY LEVER BU	1	
⚠	D5	F301Q-3500	DOOR EU	1	NOT INCLUDE DOOR SCREEN A
	D6	F3018CL00XP	DOOR KEY A	1	
	D7	F3019CL00XP	DOOR KEY B	1	
	D8	F3021CL00XP	DOOR KEY SPRING	1	
	D9	F3023CL00XP	DOOR KEY MOUNTING PLATE	1	
	D10	ANE30562Q0AP	HANDLE PIN A	2	
	D11	F30703170GP	HANDLE PEICE A	1	
	D12	ANE3081P60AP	DOOR HINGE SPACER	1	
	D13	F3085CL00XP	DOOR C	1	
	D14	ANE31348U1AP	HANDLE PEICE B	1	
⚠	D15	F3145-3B10	DOOR SCREEN A	1	
	D16	A3146-3J00	DOOR SCREEN B	1	
	D17	H31863J90BP	DOOR PANEL	1	
⚠	D18	H390L-3500	DOOR (U)	1	
	D19	XTT4+8RDNV1	SCREW	2	(4X8) FOR DOOR KEY MOUNTING PLATE
	D20	XYEA4+C16TSJ	SCREW	2	(4X16) FOR HANDLE PEICE A

13.3. ESCUTCHEON BASE ASSEMBLY



Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
	T1	A603M-3J0A	PC BOARD B (U)	1	
	T2	H630Y3F90EUS	MEMBRANE SWITCH	1	
	T3	H801N8U0APS	ESCUTCHEON A	1	INCLUDES SPACER(Ref No.24) AND SPACER(Ref No.57)
	T4	H80023E20P6	ESCUTCHEON B	1	
	T5	H80063E20P6	ESCUTCHEON D	1	
	T6	A80163F80AP	SPACER	1	
	T7	H800L3F90EUS	ESCUTCHEON BASE U	1	
	T8	XTN4+12GGJ	SCREW	2	(4x12) FOR PC BOARD B (U)

13.4. PACKING AND ACCESSORIES

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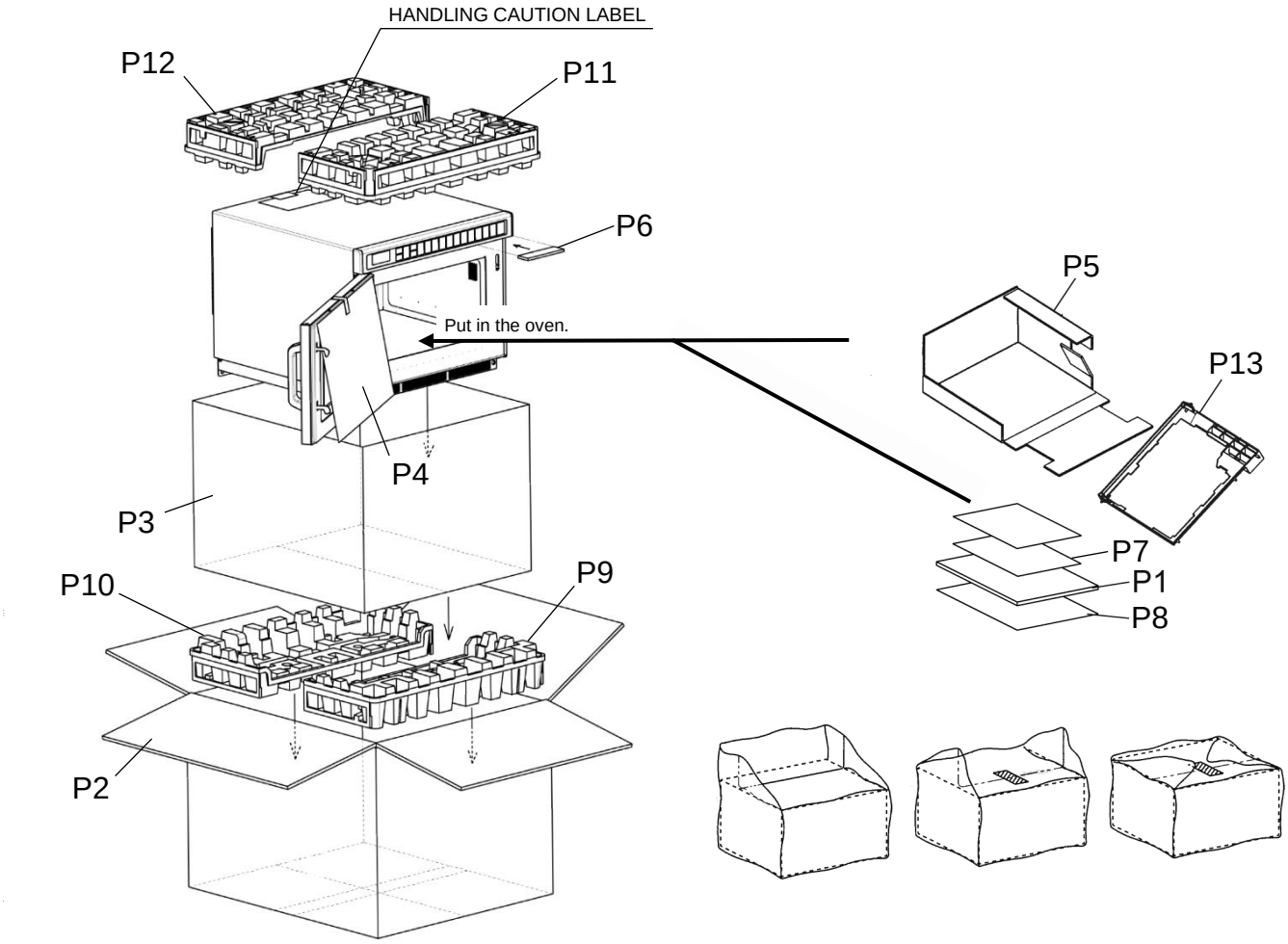
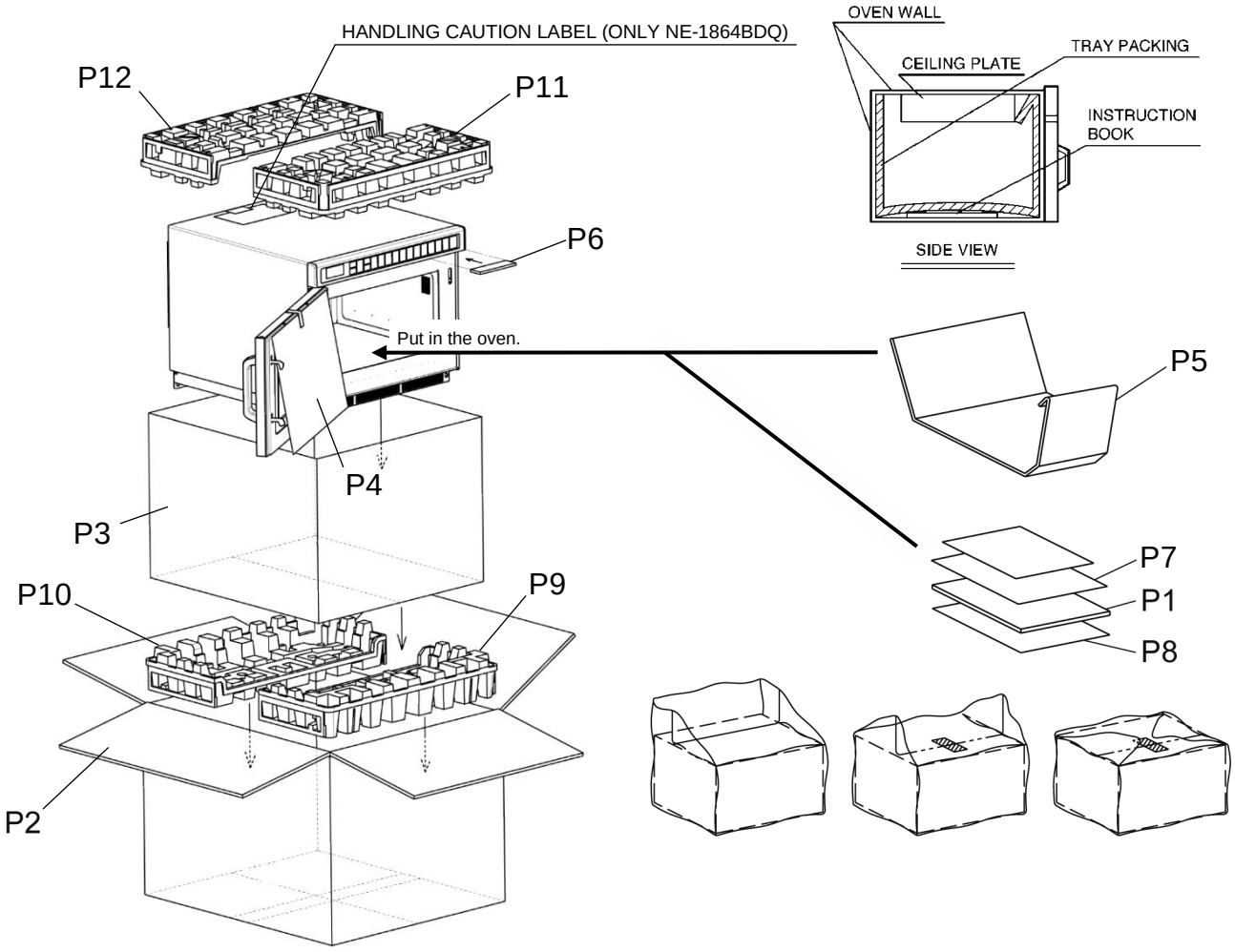


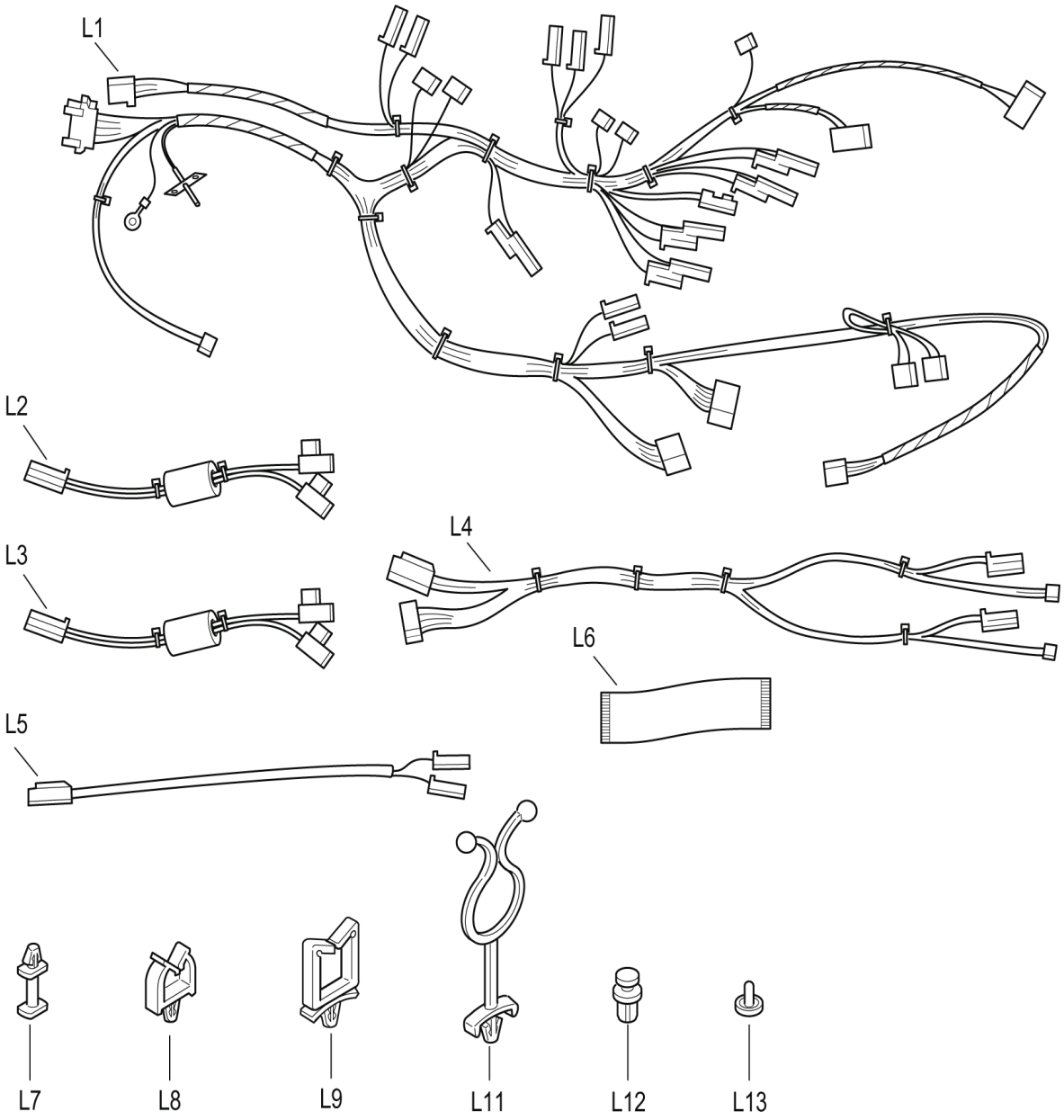
Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
⚠	P1	H00033J90BP	INSTRUCTION BOOK	1	
	P2	H01023J90BBS	PACKING CASE, PAPER	1	
	P3	H01065200AP	VINYL COVER	1	
	P4	H01072Q00AP	DOOR SHEET	1	
	P5	H01083J90BP	TRAY PACKING	1	
	P6	H01453E20P6	DOOR SHEET B	1	
	P7	H01723F90EU	WARNING LABEL	1	
	P8	H04203J90BP	OPERATING GUIDE	1	
	P9	H05633J90BP	LOWER BUFFER MATERIAL A	1	
	P10	H05643J90BP	LOWER BUFFER MATERIAL B	1	
	P11	H05653J90BP	UPPER BUFFER MATERIAL A	1	
	P12	H05663J90BP	UPPER BUFFER MATERIAL B	1	
	P13	H2011-3B10S	CEILING PLATE	1	

NE-1864BDQ, NE-1878EPG, NE-1864EPG



Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
⚠	P1	H00033J90BP	INSTRUCTION BOOK	1	NE-1864BPQ
⚠	P1	H00033K60EP	INSTRUCTION BOOK	1	NE-1878EPG, NE-1864EPG
	P2	H01023J90BPS	PACKING CASE, PAPER	1	
	P3	H01065200AP	VINYL COVER	1	NE-1864BPQ
	P3	H01065200APS	VINYL COVER	1	NE-1878EPG, NE-1864EPG
	P4	H01072Q00AP	DOOR SHEET	1	NE-1864BPQ
	P4	H01072Q00APS	DOOR SHEET	1	NE-1878EPG, NE-1864EPG
	P5	H01083E20P6	TRAY PACKING	1	NE-1864BPQ
	P5	H01083E20P6S	TRAY PACKING	1	NE-1878EPG, NE-1864EPG
	P6	H01453E20P6	DOOR SHEET B	1	
	P6	H01453E20P6S	DOOR SHEET B	1	
	P7	H01723F90EU	WARNING LABEL	1	
	P8	H04203J90BP	OPERATING GUIDE	1	NE-1864BPQ
	P9	H05633J90BP	LOWER BUFFER MATERIAL A	1	
	P10	H05643J90BP	LOWER BUFFER MATERIAL B	1	
	P11	H05653J90BP	UPPER BUFFER MATERIAL A	1	
	P12	H05663J90BP	UPPER BUFFER MATERIAL B	1	

13.5. WIRING MATERIAL



Safety	Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
⚠	L1	F030A3J90BP	LEAD WIRE HARNESS	1	
⚠	L2	H030E-3J00	LEAD WIRE	1	FOR H.V.INVERTER AND MAGNETRON (LOWER)
⚠	L3	H030E-3J10	LEAD WIRE	1	FOR H.V.INVERTER AND MAGNETRON (UPPER)
⚠	L4	A030F-3J00	LEAD WIRE HARNESS B	1	FOR H.V.INVERTER
	L5	A0352-3E10	LEAD WIRE	1	FOR ANTENNA MOTOR (LOWER)
	L6	A6590-3E20	FLAT CABLE	1	FOR PC BOARD B (U) AND D.P.CIRCUIT (U)
	L7	A8311-3B10	SPACER B	2	
	L8	ANE9071-3M0	LEAD WIRE HOLDER B	1	
	L9	ANE9071-730	LEAD WIRE HOLDER B	6	
	L11	ANE9072-400	LEAD WIRE HOLDER C	2	
	L12	ANE90828U0AP	CLIP (BLACK)	1	
	L13	ANE91658V0AP	CLIP C	4	