International Commercial Microwave—Technical Information

230 VAC, 50 Hz Models

RC520S	**P1327601M**	**RC518SU**	**P1327602M**
RC5MCSP	**P1327608M**	**RC5MCSS**	**P1327609M**
MRC518SU	**P1327613M**	**MRC520S**	**P1327614M**

- Due to possibility of personal injury or property damage, always contact an authorized technician for servicing or repair of this unit.
- Refer to Service Manual 16022149 for installation, operating, testing, troubleshooting, and disassembly instruction.

⚠ CAUTION

All safety information must be followed as provided in Service Manual 16022149.

⚠ WARNING

To avoid the risk of electrical shock, personal injury or death; disconnect power to oven and discharge capacitor before servicing, unless testing requires power.

Models	RC5MCSP	RC5MCSS	RC518SU, MRC518SU	RC520S, MRC520S
Power Source				
Voltage AC	230 VAC	230 VAC	230 VAC	230 VAC
Amperage (Single Unit)	19 A	19 A	19 A	19 A
Frequency	50 Hz	50 Hz	50 Hz	50 Hz
Single Phase, 3 wire grounded	X	X	X	X
Receptacle	IEC309	IEC309	IEC309	IEC309
Plug	CEE-309 – 16A	Marechal DS-32A	BS1363A – 13A	CEE 7/7 – 16A
Power Output – Microwave				
Nominal microwave energy (IEC705)	1800 Watts	1800 Watts	1800 Watts	1800 Watts
Operating Frequency	2450 MHz	2450 MHz	2450 MHz	2450 MHz
Power Consumption				
Microwave only	2800 Watts	2800 Watts	2800 Watts	2800 Watts
Dimensions				
Cabinet (in cm)				
Width	19 1/4" 49 cm	19 1/4" 49 cm	19 1/4" 49 cm	19 1/4" 49 cm
Height	18 1/4" 46 cm	18 1/4" 46 cm	18 1/4" 46 cm	18 1/4" 46 cm
Depth	26 1/4" 67 cm	26 1/4" 67 cm	26 1/4" 67 cm	26 1/4" 67 cm
Oven Interior (in cm)				
Width	13" 33 cm	13" 33 cm	13" 33 cm	13" 33 cm
Height	8 1/2" 22 cm	8 1/2" 22 cm	8 1/2" 22 cm	8 1/2" 22 cm
Depth	15" 38 cm	15" 38 cm	15" 38 cm	15" 38 cm
Weight				
Uncrated	94 lbs. 42.6 Kg	94 lbs. 42.6 Kg	94 lbs. 42.6 Kg	94 lbs. 42.6 Kg
Crated	101 lbs. 45.8 Kg	101 lbs. 45.8 Kg	101 lbs. 45.8 Kg	101 lbs. 45.8 Kg

Component Testing Procedures

⚠ WARNING

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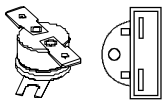
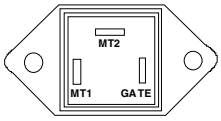
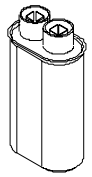
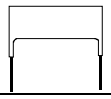
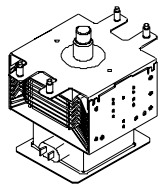
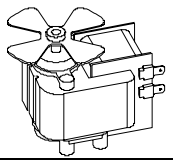
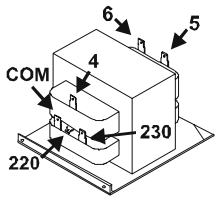
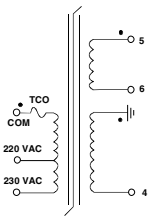
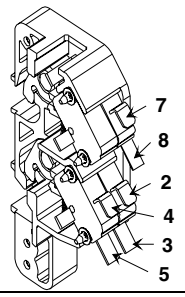
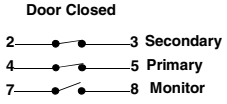
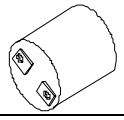
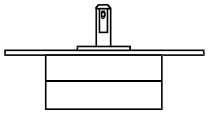
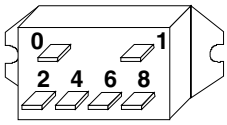
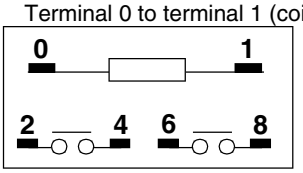
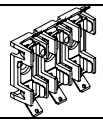
Illustration	Component	Test	Results
	Thermal cutout	Disconnect all wires from TCO. Measure resistance across terminals. Magnetron TCO ..... Relay TCO ..... Cavity TCO	 Open at 280°F (138°C) and closed at 180°F (82°C) Open at 235°F (113°C) and closed at 150°F (66°C) Opens at 219°F (104°C)
	Diode	**Discharge Capacitor** Remove diode lead from capacitor and connect ohmmeter. Reverse leads for second test.	Infinite resistance should be measured in one direction and 50KΩ or more in the opposite direction. **NOTE:** Ohmmeter must contain a battery of 6 volts minimum.
 Triac 1 (center) Triac 2 (left) Triac 3 (right	Triac	**Resistance Check** Disconnect wires to triac. Measure resistance from: MT1 to MT2 ..... MT1 to Gate ..... MT2 to Gate ..... All terminals to ground ..... **Voltage Check** Measure voltage from: MT1 to Gate	**Caution - Do not operate oven with wire to terminal MT2 removed.** Infinite Approximately 60 Ω Infinite Infinite 0.8 VAC when energized. If no voltage, check H.V. board and wiring.
	Capacitor Some units may use more then one type of capacitor. Refer to Parts Manual for correct capacitor quantity.	**Discharge Capacitor** Remove wires from capacitor terminals and connect ohmmeter, set on highest resistance scale to terminals. Also check between each terminal and capacitor case.	 Between Terminals: Meter should momentarily deflect towards zero then return to over 5 MΩ. If no deflection occurs, or if continuous deflection occurs, replace capacitor. Terminal to Case: Infinite resistance
	Snubber assembly	Disconnect wires to snubber. Measure resistance across terminals	 Infinite
	Magnetron	**Discharge Capacitor** Remove wires from magnetron and connect ohmmeter to terminals. Also check between each terminal and ground.	Between Terminals: Less than 1 Ω Each terminal to ground measures Infinite resistance. **Note:** This test is not conclusive. If oven does not heat and all other components test good replace the magnetron and retest.
	Blower motor	Remove all wires from motor. Measure resistance across coil	 Approximately 30 Ω

Component Testing Procedures

⚠ WARNING

To avoid risk of electrical shock, personal injury or death; disconnect power to oven and discharge capacitor before servicing, unless testing requires power.

Illustration	Component	Test	Results
	Transformer 	**Discharge Capacitor** Remove all wires from terminals. Measure resistance from: 230 to COM..... 220 to COM..... 230 to Ground ..... 220 to Ground ..... Terminal 5 to 6 ..... Terminal 4 to Ground	 Less than 1 Ω Less than 1 Ω Infinite Infinite Less than 1 Ω Approximately 70 Ω
	Interlock switch 	Disconnect wires to switch. With door open measure resistance from: Terminal 2 to 3 ..... Terminal 4 to 5 ..... Terminal 7 to 8 ..... With door closed measure resistance from: Terminal 2 to 3 ..... Terminal 4 to 5 ..... Terminal 7 to 8	 Infinite Infinite Indicates continuity Indicates continuity Indicates continuity Infinite
	Lamp receptacle	Test continuity of receptacle terminals.	Indicates continuity if bulb is good and screwed in.
	Stirrer motor	Remove all wires from terminals. Measure resistance from: Terminal to terminal.....	 Approximately 23K Ω
	Relay This relay contains a diode in the coil circuit.	Measure resistance from: Terminal 0 to terminal 1 (coil)..... 	 Approximately 6 to 7 MΩ **NOTE:** Analog meter is recommended for measurement. **NOTE:** If using a digital meter it must contain a battery of 6 volts minimum.
	Line filter	Disconnect wire from terminals. Measure resistance of the following terminals: White to Blue..... Black to Brown	 < 1 Ω < 1 Ω
	Terminal block	Visual check.	Verify fuse holding terminals are not damaged. Verify terminals are not damaged.
Refer to Parts Manual for proper power cord part number.	Power cord	Measure resistance of wires.	Continuity should be indicated on each wire. Verify polarity and grounding.

Component Testing Procedures

⚠ WARNING

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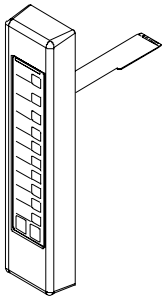
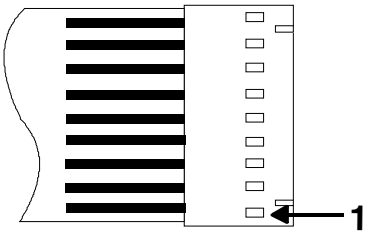
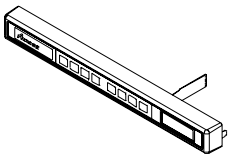
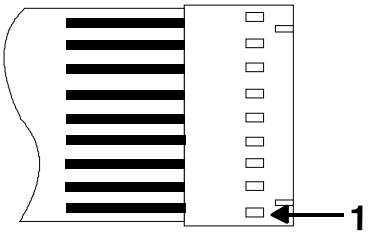
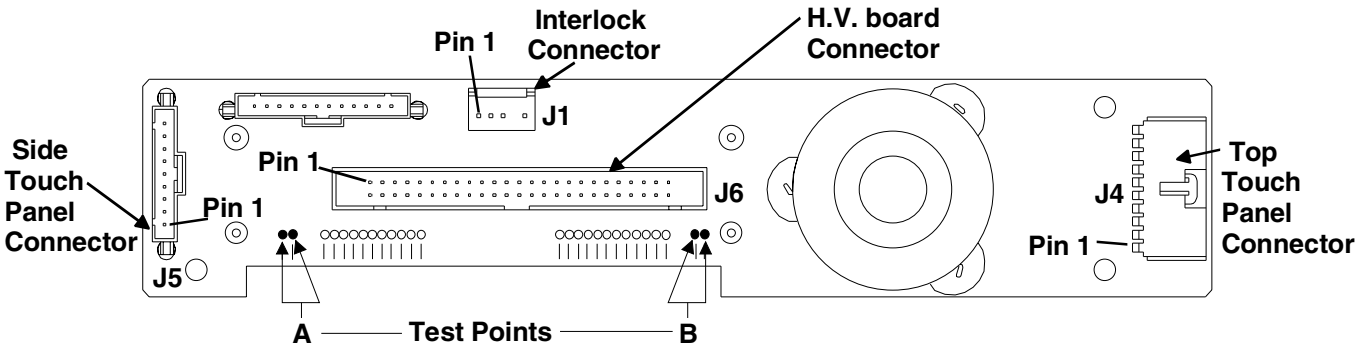
Illustration	Component	Test	Results		
	Side touch panel	Continuity is indicated as 100 Ω and below. 	**Pad** 1 2 3 4 5 6 7 8 9 0 Start Stop/Reset	**Trace** 3 & 5 3 & 6 3 & 7 3 & 8 3 & 9 4 & 5 4 & 6 4 & 7 4 & 8 4 & 9 5 & 6 6 & 9	**Measurement** Continuity Continuity Continuity Continuity Continuity Continuity Continuity Continuity Continuity Continuity Continuity Continuity
	Top touch pane	Removal of touch panel is required to perform test. Continuity is indicated as 100 Ω and below. 	**Pad** Time Entry Power Level Stage Program Save Quantity Menu Hidden Pad	**Trace** 5 & 7 5 & 8 5 & 9 6 & 7 6 & 8 7 & 9 8 & 9	**Measurement** Continuity Continuity Continuity Continuity Continuity Continuity Continuity

Display board



Function	Test Set-Up	Meter Setting	Probe Placement	Results
Input to Display Board	At Display Board	Volts	Test points A and B	3.0 VAC If voltage is present and no display is indicated, replace display board. If no voltage is present, check wire harness connections and H.V. board.

Component Testing Procedures

⚠ WARNING

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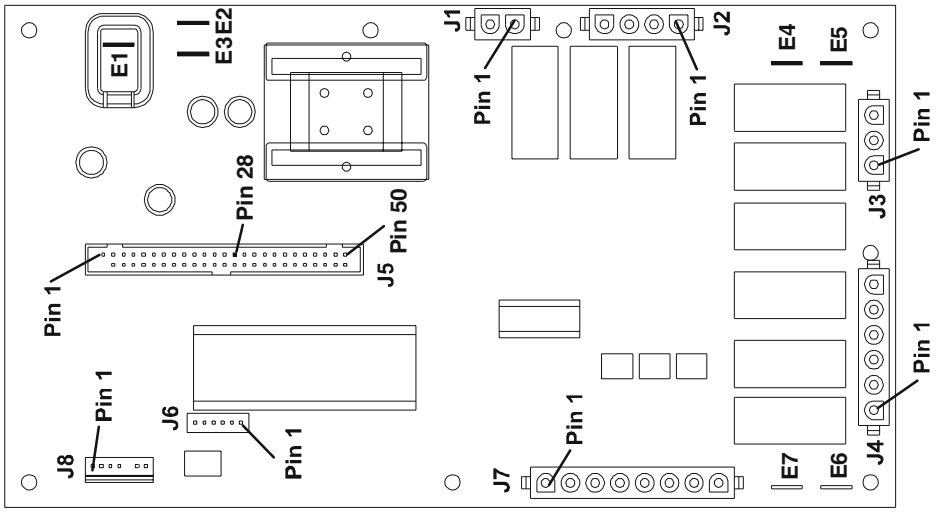
H.V. board



Function	Test Set-Up	Meter Setting	Probe Placement	Results
Input to H.V. board	At H.V. board	Volts	J1 pin 1 (Brown wire) & J1 pin 2 (White wire)	Line voltage
Output to display board	Disconnect J5 connector, blower runs continuously	Volts	J5 pin 28 & J5 pin 50	- 24 VDC

NOTE: For the following test, place oven in Service Test Mode (see page 9).

Relay	Function	Test Set-Up	Meter Setting	Probe Placement	Results
K1 at 230 VAC line voltage	Blower motor Antenna motor Cavity light	Disconnect J2 connector	Ohms	J1 pin 1 (Brown wire) & J2 pin 4	Test mode 5 off – no continuity Test mode 5 on – < 1 Ω

H.V. Board – Relay Test

Two Magnetron Model

Relay	Function	Test Set-Up	Meter Setting	Probe Placement	Results
K8	Magnetron **1** (Top rear) at 230 VAC	All wires connected to H.V. board	VAC	E5 (Red wire) & J4 pin 2 (Red wire)	Test mode 1 off – line voltage Test mode 1 on – 0 volts
K6	Magnetron **3** (Bottom) at 230 VAC	All wires connected to H.V. board	VAC	J4 pin 4 (Black wire) & J4 pin 6 (Black wire)	Test mode 3 off – line voltage Test mode 3 on – 0 volts

Component Testing Procedures

⚠ WARNING

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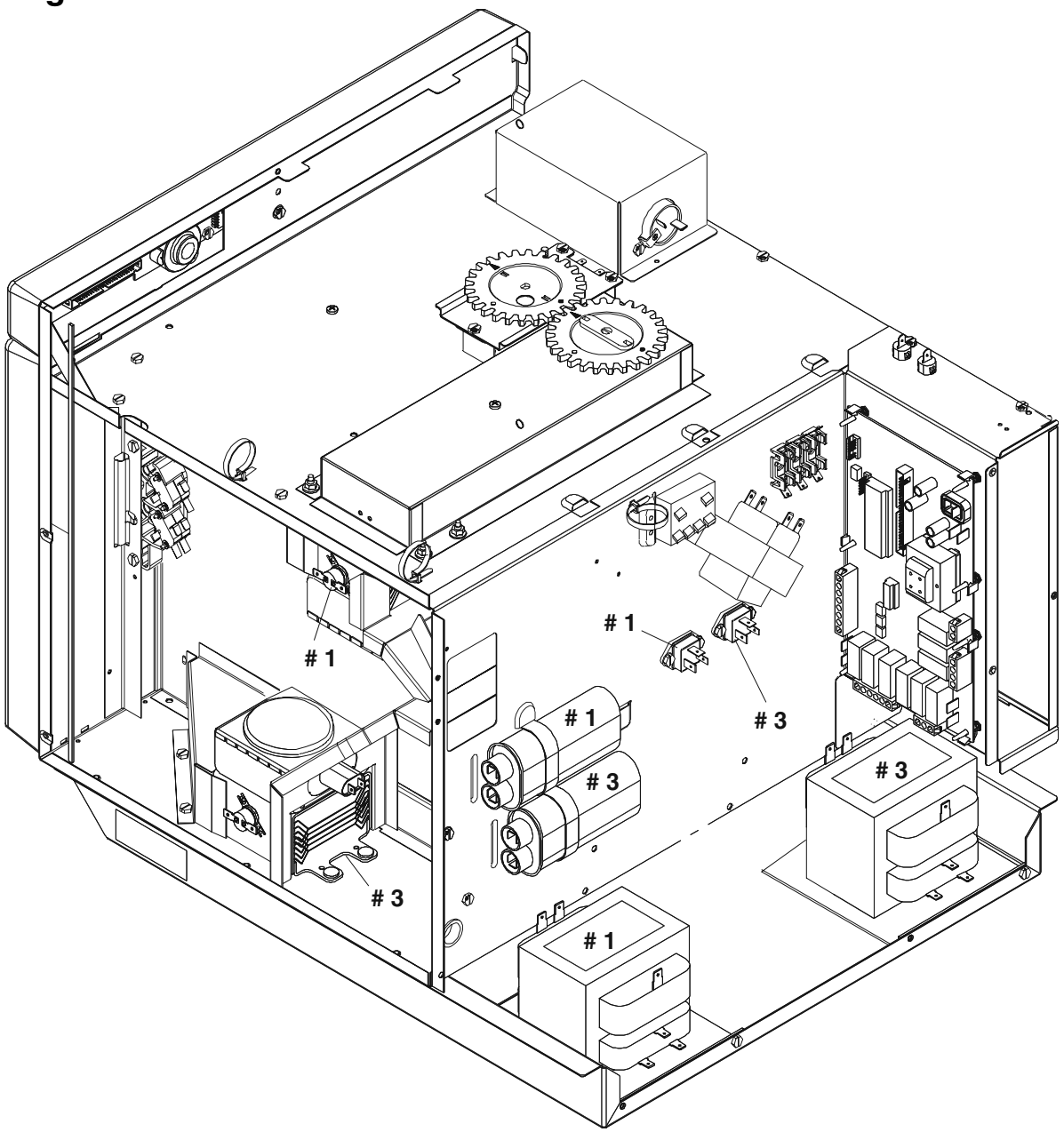
Two Magnetron Models



H.V. System # 1	H.V. System # 3
Top Rear Magnetron Left Transformer Top Capacitor Diode Left Triac	Bottom Magnetron Right Transformer Bottom Capacitor Diode Right Triac

Power Testing Procedure

⚠ WARNING

To avoid risk of electrical shock, personal injury or death; disconnect power to oven and discharge capacitor before servicing, unless testing requires power.

Power Test (Traditional Test Method)

Test equipment required is Amana power test kit R0157397 (Fahrenheit), or
Menumaster power test kit M95D5 (Celsius).

1. Fill the plastic container to the 1000 ml. line with cool tap water.
2. Using the thermometer; stir the water, measure, and record the water temperature.
   Initial water temperature should be approximately 60°F (16°C).
3. Place container on the center of the oven shelf and heat the water for
   33 seconds for ovens with more than 1550 watts or **63 seconds for ovens with less than 1550 watts**.

NOTE: Use a watch second hand, not the oven timer.

4. Stir the water, measure and record the temperature of the water after heating time is complete.
5. Subtract the starting water temperature (Step 2), from the ending water temperature (Step 4) to obtain the temperature rise (ΔT).
6. See the Traditional Power Test Temperature Chart below.

NOTES:
- The IEC-705 test method requires precision measurements and equipment. It is not practical to perform the IEC test in the field. To convert the traditional power test results to the approximate IEC-705 rating, take the traditional power test results and add 100 watts per magnetron for the unit being tested.

  Example: 1550 — watts output using the traditional power test for model RC5MCSP
  + 200 — watts (2 magnetrons X 100 watts)
  1750 — Approximate IEC-705 results

- Always perform power test three times for accuracy, changing the water after each test is performed.
- Variation or errors in the test procedure will cause a variance in the temperature rise. Additional power tests should be made if temperature rise appears marginal.
- Low line voltage will cause lower temperature rise.

Traditional Power Test Temperature Chart

THIRTY-THREE (33) SECONDS run time chart for units more than 1550 Watts cooking power

Fahrenheit				Celsius			
ΔT (°F)	Cooking Power Output	ΔT (°F)	Cooking Power Output	ΔT (°C)	Cooking Power Output	ΔT (°C)	Cooking Power Output
16	1240	27	2092	9	1260	15	2100
17	1317	28	2170	9.5	1330	15.5	2170
18	1395	29	2247	10	1400	16	2240
19	1472	30	2325	10.5	1470	16.5	2310
20	1550	31	2402	11	1540	17	2380
21	1627	32	2480	11.5	1610	17.5	2450
22	1705	33	2557	12	1680	18	2520
23	1782	34	2635	12.5	1750	18.5	2590
24	1860	35	2712	13	1820	19	2660
25	1937	36	2790	13.5	1890	19.5	2730
26	2015	37	2867	14	1960	20	2800
				14.5	2030	20.5	2870

Display Diagnostics

⚠ WARNING

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⚠ CAUTION

All repairs as described in this troubleshooting section are to be performed only after the caution procedures one through eight listed below have been followed.

1. Check grounding before checking for possible causes.
2. Be careful 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.
5. Do not touch any parts of the circuitry on the P.C. Board circuit since static electric discharge may damage this control panel. Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. 230 VAC is present in the high voltage circuit board, power relay and primary circuit of low voltage transformer.
7. When troubleshooting, be cautious of possible electrical hazard.
8. When testing convection operation, convection fan may start at any time or if oven is hot.

Error Codes

During operation, the display may show the following service codes:

NOTE: Before scheduling service for any error codes, instruct customer to unplug oven for 1 minute, reconnect power, and retest. If unit operates properly, no service call is required.

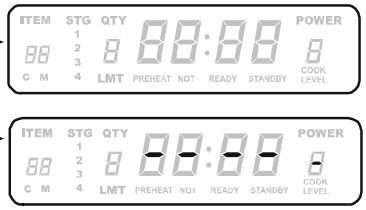
Display	Description	Corrective Action
Err1	Failed H.V. Board	Replace H.V. board.
Err2	Failed H.V. Board Shorted Touch Panel Shorted Display Board Shorted Cable HV to Display Board	Replace H.V. board. Replace Touch Panel. Replace Display Board. Replace Cable.
Err3	Failed H.V. Board	Replace H.V. board.
Err4	Failed H.V. Board	Replace H.V. board.
Err5	Shorted Touch Panel	**NOTE:** If Touch Panel is pressed for more than 30 seconds, this error code will appear. 1. Disconnect oven from power supply. 2. Disconnect side touch panel connector from display board (J5). 3. Reconnect oven to power supply. 4. If “Err5” reappears after 30 seconds, replace top touch panel. 5. If “Err5” does not reappear after 30 seconds, replace side touch panel.
Err6	Failed H.V. Board	Replace H.V. board.
HOT		• Open TCO (magnetron). • Blower motor inoperative. • Restricted air filter. • High ambient temperature. • Oven operated empty or with light loads. • Broken or loose wire. • H.V. board inoperative.
Door	Door Interlock Primary Switch	• Verify latch mechanism moves freely on door. • Verify J1 connector on display board is properly seated. • Test interlock switch assembly and perform door adjustment if necessary. • Replace interlock switch assembly.

Service Test

NOTE: Unit must be in OFF condition

or

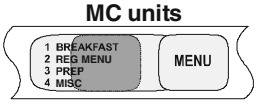
INITIAL power up mode.



To Enter Service Test Mode, oven door must be closed.

NOTE: Pads will not beep when accessing Service Test Mode.
To EXIT Service Test Mode press STOP/RESET pad.

MC units



Hidden Pad

Press Hidden Pad as indicated above on touch panels.

Then **1** **3** **5** **7** **9**

Press → **Display**

Component Evaluation

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0 = Deactivated
1 = Activated

Indicates Service Mode

High Voltage System # 1

1 →

Toggles Magnetron 1 (Top Rear) ON/OFF.

Displays actual Amperage, will vary by model

Timer counts up to 62 seconds and unit shuts off.

If no Amperage, check for line voltage at H.V. transformer primary winding.
If no voltage, check:
- **Interlock switch (secondary)**
- **Triac 1**
- **H.V. board (relay K8 if 230 VAC, and triac 1 drive voltage T1 - G)**
- **Wiring**

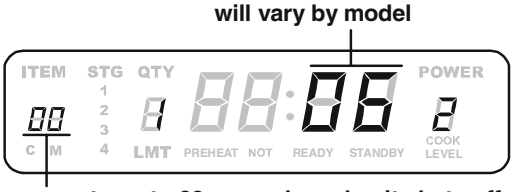
If voltage is present, check:
- **H.V. components and wiring.**

High Voltage System # 2

2 →

Toggles Magnetron 2 (Top Front) ON/OFF.

Displays actual Amperage, will vary by model



Timer counts up to 62 seconds and unit shuts off.

If no Amperage, check for line voltage at H.V. transformer primary winding.
If no voltage, check:
- **Interlock switch (secondary)**
- **Triac 2**
- **H.V. board (relay K4 if 230 VAC, and triac 2 drive voltage T1 - G)**
- **Wiring**

If voltage is present, check:
- **H.V. components and wiring.**

High Voltage System # 3

3 →

Toggles Magnetron 3 (Bottom) ON/OFF.

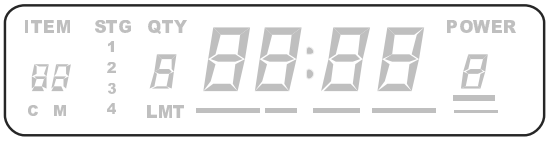
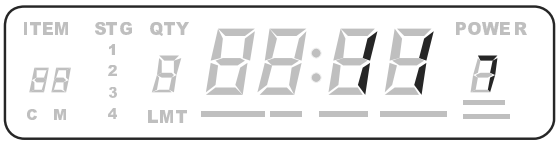
Displays actual Amperage, will vary by model

Timer counts up to 62 seconds and unit shuts off.

If no Amperage, check for line voltage at H.V. transformer primary winding.
If no voltage, check:
- **Interlock switch (secondary)**
- **Triac 3**
- **H.V. board (relay K6 if 230 VAC, and triac 3 drive voltage T1 - G)**
- **Wiring**

If voltage is present, check:
- **H.V. components and wiring.**

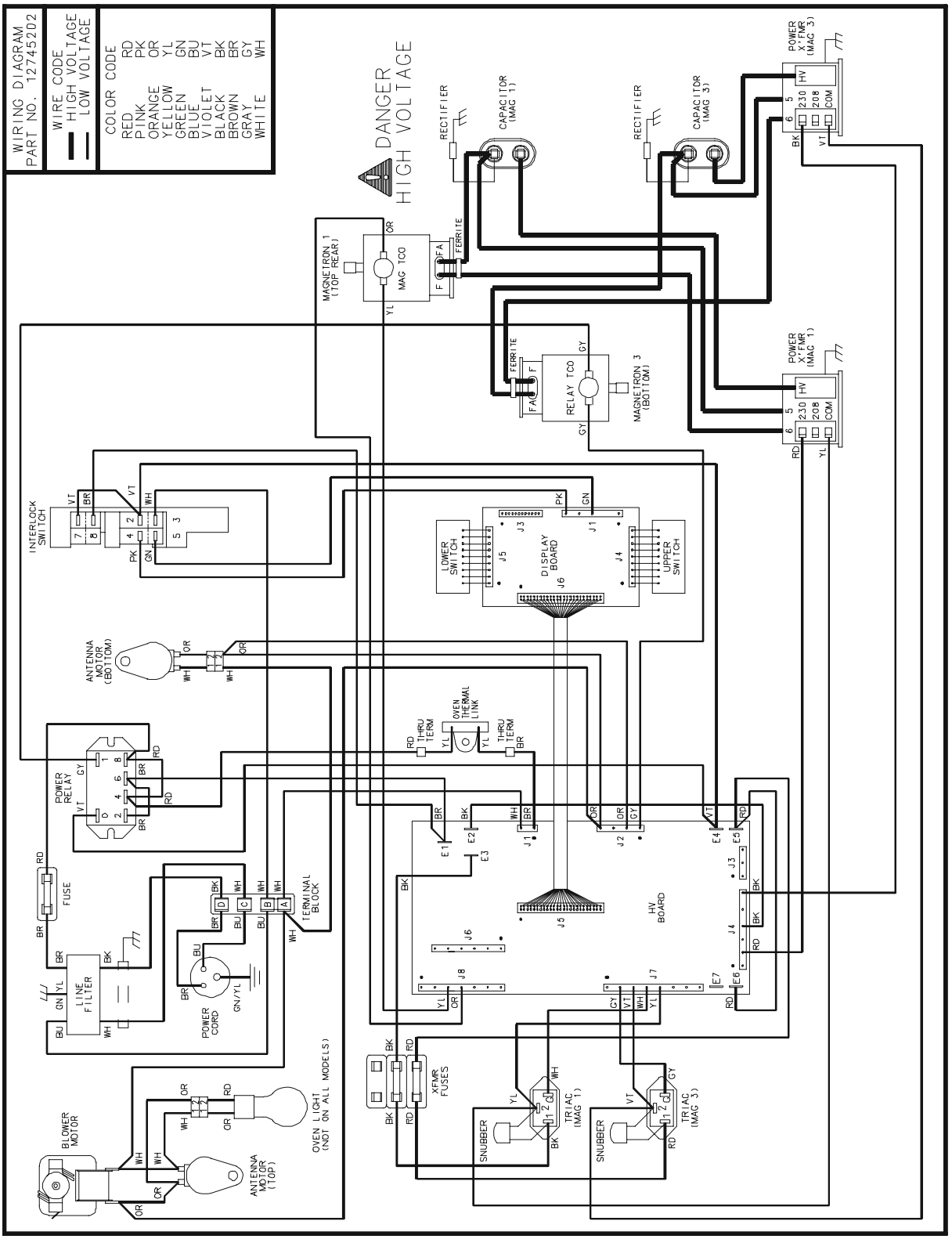
Service Test

Press →	Display	Component Evaluation
4 → NOT ACTIVE		• This mode is NOT active with these models.
5 → Toggles Blower Motor Antenna Motor(s) Cavity Light (if applicable) ON/OFF.		If no fan operation, check: • Blower motor and wheel • Antenna motor • Cavity light (if applicable) • H.V. board relay K1 - 230 V • Wiring
6 → NOT ACTIVE		• This mode is NOT active with these models.
7 → Displays # of Magnetron Hours.		
8 → Displays # of Door Cycles with a 1 to 1 ratio rounded to the nearest ten		
9 → Clears Hours and Cycles (press START to activate) (Resets to 0).		
0 → Pressing 0 will clear CALL SERVICE display.	 	• CALL is displayed for 1 second SErv is displayed for 1 second. Then the display will be OFF for 5 seconds. • This will continue until Call Service is cleared from the display.

Wiring Diagram and Schematic

WARNING

To avoid risk of electrical shock, personal injury or death; disconnect power to oven and discharge capacitor before servicing, unless testing requires power.



Wiring Diagram and Schematic

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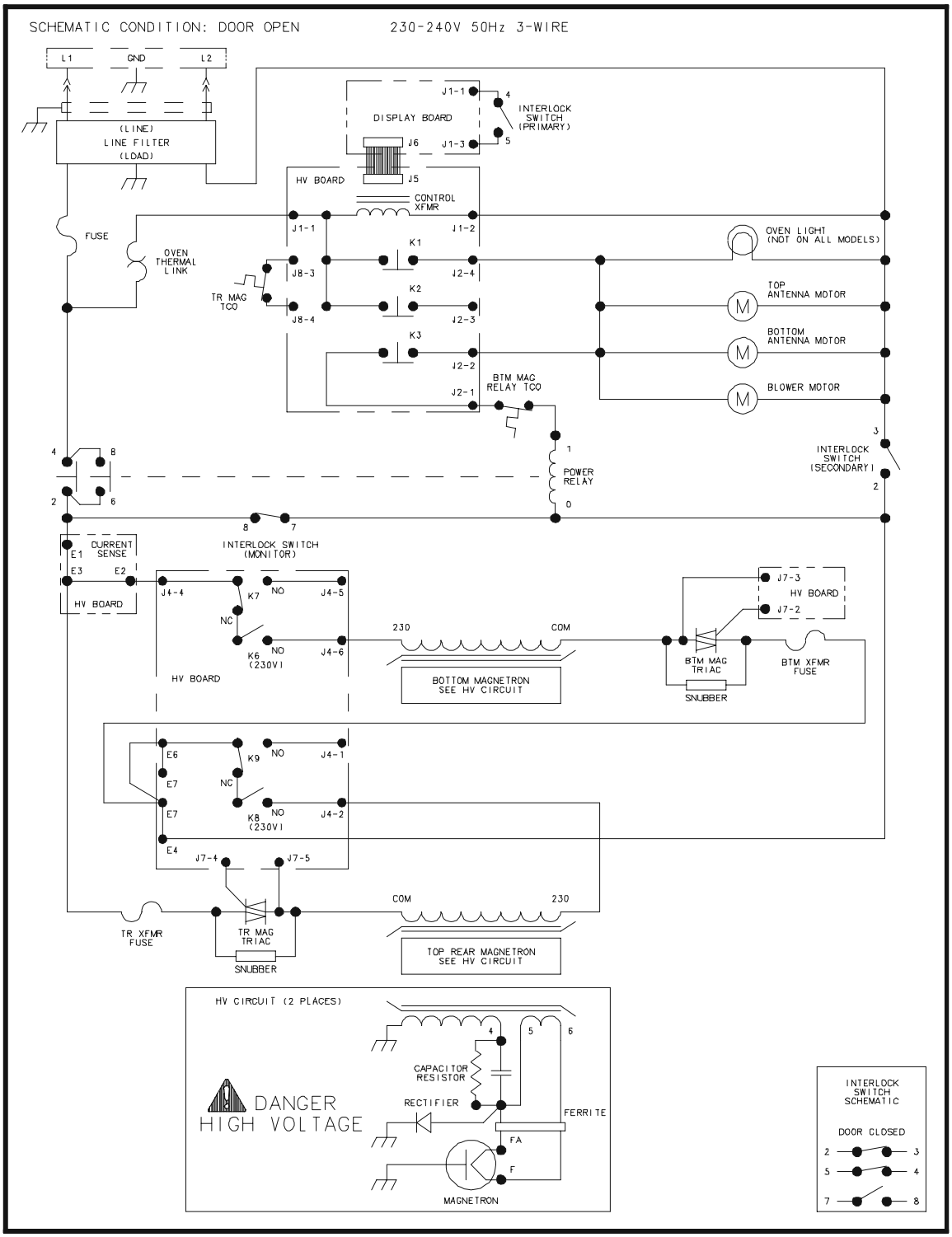

DANGER

HIGH VOLTAGE