

# Commercial Microwave—Technical Information

## 208 / 240 V, 60 Hz Models

**RFS18TS      P2001003M**

**MFS18TS**

**P2001008M**

**MFS18TSSA      P2001009M**

- 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 for installation, operating, testing, troubleshooting, and disassembly instruction.



### CAUTION

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



### WARNING



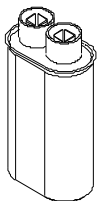
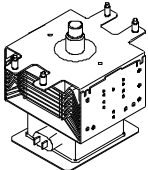
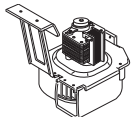

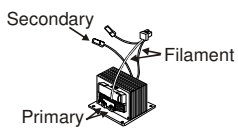
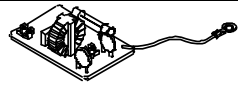

To avoid the risk of electrical shock, personal injury or death, disconnect power to oven and discharge capacitor before servicing, unless testing requires it.

Models	RFS18TS	MFS18TS	MFS18TSSA
<b>Power Source</b>			
Voltage AC	208 / 240 VAC		208 / 240 VAC
Amperage (Single Unit)	20 A		20 A
Frequency	60 Hz		60 Hz
Single Phase, 3 wire grounded	X		X
Receptacle	6-20R		BS1363/A
Plug	6-20P		BS1363/A
<b>Power Output</b>			
Nominal microwave energy (IEC705)	1800 Watts		1800 Watts
Minimum temperature rise ( $\Delta T$ )	18°F / 7.7°C		18°F / 7.7°C
Operating Frequency	2450 MHz		2450 MHz
<b>Power Consumption</b>			
Cook Condition Microwave	3000 Watts / 15.3 Amps		3000 Watts / 13 Amps
<b>Dimensions</b>			
<b>Cabinet</b>			
Width	21 3/4"	55 cm	21 3/4" 55 cm
Height	14 1/4"	36.2 cm	14 1/4" 36.2 cm
Depth	20 1/4"	51.4 cm	20 1/4" 51.4 cm
<b>Oven Interior</b>			
Width	14 1/4"	36.2 cm	14 1/4" 36.2 cm
Height	9"	22.6 cm	9" 22.6 cm
Depth	16 3/8"	41.6 cm	16 3/8" 41.6 cm
<b>Weight</b>			
Crated	73 lbs.	33 kg	73 lbs. 33 kg
Uncrated	67 lbs.	30 kg	67 lbs. 30 kg

# Component Testing Procedures

## ⚠ WARNING

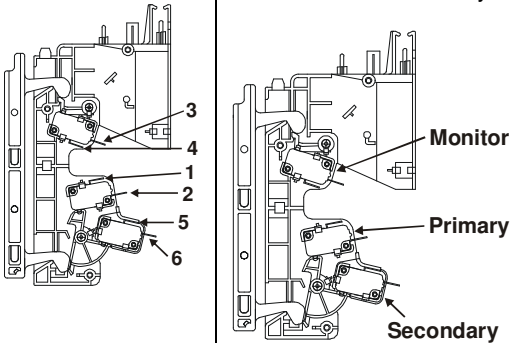
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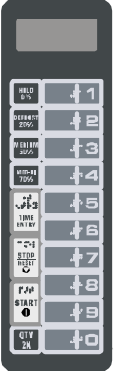
Illustration	Component	Testing	Results
	Thermal cutout	Disconnect all wires from TCO. Measure resistance across terminals. Cavity TCO .....  Magnetron TCO .....	Opens at 230°F (110°C)  Closed at 140°F (60°C) and Opens at 320°F (160°C)
	Diode	<b>Discharge Capacitor</b>  Remove diode lead from capacitor and connect ohmmeter.  Reverse leads for second test.	Infinite resistance should be measured in one direction and 50KΩ or more in the opposite direction.  <b>NOTE:</b> Ohmmeter must contain a battery of 6 volts minimum.
	Capacitor	<b>Discharge Capacitor</b>  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
	Magnetron	<b>Discharge Capacitor</b>  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. <b>Note:</b> 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 28 – 35 Ω
	Stirrer motor	Remove all wires from motor.  Measure resistance across terminals....	Approximately 12 – 14 KΩ
	Transformer	<b>Discharge Capacitor</b> Remove all wires from terminals.  Measure resistance from: Primary..... Filament..... Secondary to Ground screw on transformer stack.....	Less than <1 Ω Less than <1 Ω  Approximately 70-80 Ω
	Noise filter board	Power In terminals ..... Power Out terminals.....	240 VAC 240 VAC If no power in, check power outlet. If no power out, check fuses.
	Circuit Protector	Measure resistance across terminals....	Between Terminals: Less than 1 Ω

# Component Testing Procedures

## ! WARNING

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Illustration	Component	Testing	Results
	Interlock switch assembly	<p>Disconnect wires to switch.</p> <p>With door open measure resistance from:            Monitor - Terminal 3 - 4 .....            Primary - Terminal 1 - 2 .....            Secondary - Terminal 5 - 6 .....</p> <p>With door closed measure resistance from:            Monitor - Terminal 3 - 4 .....            Primary - Terminal 1 - 2 .....            Secondary - Terminal 5 - 6 .....</p> <p><b>After verifying or replacing the module, reconnect wires to switch and check operation of monitor circuit before operating the oven.</b></p>	<p>Indicates continuity            Infinite Ω            Infinite Ω</p> <p>Infinite Ω            Indicates continuity            Indicates continuity</p>
	Lamp receptacle	Test continuity of receptacle terminals.	Indicates continuity with bulb installed.
	Wire Harness	Test continuity of wires	Indicates continuity

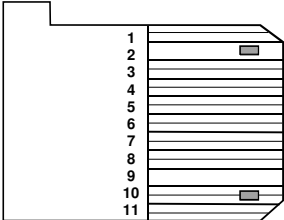
Electronic Control Panel			
	<b>Service Test Mode:</b>	<p><b>Open door, Press and Hold pad 3 for 5 seconds to enter service test mode.</b></p> <p>Press Pad 1 .....            Press Pad 2 .....            Press Pad 3 .....            Press Pad 4 .....            Press Pad 5 .....            Press Pad 6 .....            Press Pad 7 .....            Press Pad 8 .....            Press Pad 9 .....            Press Pad 0 .....            Stop/Reset Pad.....</p>	<p>SERVICE appears in the display</p> <p>Indicates number of hours magnetron has been turned on</p> <p>Indicates number of times magnetron tube has been turned on and off</p> <p>Indicates number of door cycles CLEAR (Press START pad to reset service data.)</p> <p>Indicates amperage (Top Mag)</p> <p>Indicates amperage (Bottom Mag)</p> <p>RESET (Clear Service Alarm)</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>Exit Service Test Mode</p>
	<b>Error codes:</b>	<p><b>E-08</b> .....  <b>E-09</b> .....  <b>E-10</b> .....</p>	<p>Replace Control Board</p> <p>Replace Control Board</p> <p>Shorted or Open Keypad – Test and replace if necessary</p>

# Component Testing Procedures



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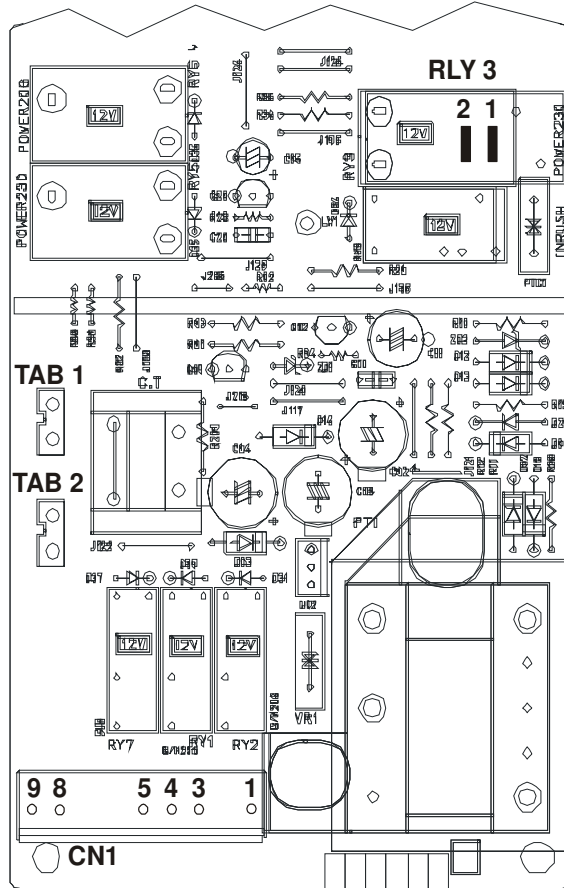
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Illustration	Component	Testing	Results																																																								
Electronic Control  RFS18TS	Keyboard assembly  	Continuity is indicated as 100 Ω and below.	<table border="1"> <thead> <tr> <th data-bbox="959 401 1149 426">Pad</th> <th data-bbox="1154 401 1260 426">Trace</th> <th data-bbox="1265 401 1421 426">Measurement</th> </tr> </thead> <tbody> <tr><td>0</td><td>1 &amp; 8</td><td>Continuity</td></tr> <tr><td>1</td><td>2 &amp; 8</td><td>Continuity</td></tr> <tr><td>2</td><td>3 &amp; 8</td><td>Continuity</td></tr> <tr><td>3</td><td>4 &amp; 8</td><td>Continuity</td></tr> <tr><td>4</td><td>5 &amp; 8</td><td>Continuity</td></tr> <tr><td>5</td><td>6 &amp; 8</td><td>Continuity</td></tr> <tr><td>6</td><td>7 &amp; 8</td><td>Continuity</td></tr> <tr><td>7</td><td>1 &amp; 9</td><td>Continuity</td></tr> <tr><td>8</td><td>2 &amp; 9</td><td>Continuity</td></tr> <tr><td>9</td><td>3 &amp; 8</td><td>Continuity</td></tr> <tr><td>HOLD (0%)</td><td>1 &amp; 10</td><td>Continuity</td></tr> <tr><td>DEFROST (20%)</td><td>2 &amp; 10</td><td>Continuity</td></tr> <tr><td>MEDIUM (50%)</td><td>3 &amp; 10</td><td>Continuity</td></tr> <tr><td>MED-HI (70%)</td><td>4 &amp; 10</td><td>Continuity</td></tr> <tr><td>TIME ENTRY</td><td>5 &amp; 10</td><td>Continuity</td></tr> <tr><td>STOP/RESET</td><td>6 &amp; 10</td><td>Continuity</td></tr> <tr><td>START</td><td>7 &amp; 10</td><td>Continuity</td></tr> </tbody> </table>	Pad	Trace	Measurement	0	1 & 8	Continuity	1	2 & 8	Continuity	2	3 & 8	Continuity	3	4 & 8	Continuity	4	5 & 8	Continuity	5	6 & 8	Continuity	6	7 & 8	Continuity	7	1 & 9	Continuity	8	2 & 9	Continuity	9	3 & 8	Continuity	HOLD (0%)	1 & 10	Continuity	DEFROST (20%)	2 & 10	Continuity	MEDIUM (50%)	3 & 10	Continuity	MED-HI (70%)	4 & 10	Continuity	TIME ENTRY	5 & 10	Continuity	STOP/RESET	6 & 10	Continuity	START	7 & 10	Continuity		
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# Component Testing Procedures

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Function	Test Set-Up / Condition	Meter Setting	Probe Placement	Results
Power to current transformer	All Conditions	Volts	Tab 1 to CN1 Pin 3	208 / 240 VAC
Power from current transformer	All Conditions	Volts	Tab 2 to CN1 Pin 3	208 / 240 VAC
Power from Oven TCO	All Conditions	Volts	CN1 – Pin 1 (Black wire to ground)	208 / 240 VAC
Power to Oven Light	Standby .....	Volts	CN1 – Pin 4 to Pin 1 .....	208 / 240 VAC
	Ready .....	Volts	CN1 – Pin 4 to Pin 1 .....	0 VAC
	Cook .....	Volts	CN1 – Pin 4 to Pin 1 .....	0 VAC
Power to Blower Motor	Standby .....	Volts	CN1 – Pin 5 to Pin 1 .....	208 / 240 VAC
	Ready .....	Volts	CN1 – Pin 5 to Pin 1 .....	0 VAC
	Cook .....	Volts	CN1 – Pin 5 to Pin 1 .....	0 VAC
Secondary Interlock Switch	Door Closed .....	Ohms	CN1 – Pin 8 to Pin 9 .....	Continuity
	Door Opened .....	Ohms	CN1 – Pin 8 to Pin 9 .....	Infinite
Power to Relay 3	Standby .....	Volts	Relay 3 – Pin 1 to Pin 2 .....	208 / 240 VAC
	Ready .....	Volts	Relay 3 – Pin 1 to Pin 2 .....	208 / 240 VAC
	Cook .....	Volts	Relay 3 – Pin 1 to Pin 2 .....	0 VAC

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All Amana and Menumaster microwave oven power outputs are rated using the IEC705 standards. Using the IEC705 test method requires precision measurements and equipment that is not practical to be performed in the field. Using the test shown below will indicate if the oven performance is satisfactory.

### Test equipment required:

- 1000 ml test container and thermometer.
- Digital watch / watch with a second hand for use on ovens with electromechanical timers.

### Important Notes:

- Low line voltage will cause low temperature rise / power output.
- Ovens must be on a dedicated circuit, properly grounded, and polarized. Other equipment on the same circuit may cause a low temperature rise / power output.
- This test and results are not a true IEC705 test procedures and are only intended to provide servicers with an easy means of determining if the microwave oven cooking output is correct.

### Procedure

1. Fill the test container to the 1000 ml line with cool tap water.

**NOTE:** Water temperature should be approximately 60°F / 16°C

2. Using the thermometer, stir water for five to ten seconds; measure, and record the temperature (T1).
3. Place test container of water in the center of oven cavity and close door.
4. Heat the water for a 33-second full power cycle.

**NOTE:** Use a digital watch or a watch with a second hand for ovens with electromechanical timers.

5. At end of the cycle, remove test container. Using the thermometer, stir water for five to ten seconds and record temperature (T2).
6. Subtract the starting water temperature (T1), from the ending water temperature (T2) to obtain the temperature rise ( $\Delta T$ ).
7. If the temperature rise ( $\Delta T$ ) meets or exceeds the minimum, the test is complete. If the temperature rise ( $\Delta T$ ) fails to meet the minimum temperature rise, test the line voltage to verify it is correct. Then repeat steps 1 - 6 making sure to change the water. If the temperature rise ( $\Delta T$ ) fails to meet the minimum temperature rise again the oven will require service.

**Minimum Temperature Rise at Thirty -Three (33) Seconds Run Time**

$\Delta T$ (°F)	Cooking Power Output	$\Delta T$ (°F)	Cooking Power Output	$\Delta T$ (°C)	Cooking Power Output	$\Delta T$ (°C)	Cooking Power Output
10 .....	1000	20 .....	2000	5 .....	1000	11 .....	2000
11 .....	1100	21 .....	2100	5.5 .....	1100	11.5 .....	2100
12 .....	1200	22 .....	2200	6.5 .....	1200	12 .....	2200
14 .....	1400	24 .....	2400	7.5 .....	1400	13 .....	2400
17 .....	1700	25 .....	2500	9.5 .....	1700	13.5 .....	2500
18 .....	1800	27 .....	2700	10 .....	1800	15 .....	2700
19 .....	1900	30 .....	3000	10.5 .....	1900	16.5 .....	3000

