

M9, M9D, M11, M11D STERILIZER QUICK REFERENCE SHEET

Serial Number Prefixes
(RN, RP, RR, RS, RT, RV, RW, RX, RY, RZ)

When calling for service please always have the following information available:

- Model Number
- Serial Number
- Description of problem

PHONE NUMBER.....1-800-MIDMARK (643-6275)

- PARTS ORDERING {ext. 8911}
- MEDICAL TECH SERVICE {ext. 8912}
- DENTAL TECH SERVICE {ext. 8913}

SERVICE DEPT. FAX NUMBER.....1-877-249-1793

COMPONENT	CHECK	CORRECTION
1) Door Gasket	Check for water leaking around door.	Clean or replace door gasket (Ref. to para. 4.8).
2) Vent Valve	Check for water leaking from outlet of condensing coil (2a).	Clean or replace vent valve. (Ref. to para. 4.18).
3) Fill Valve	Check for water leaking back into reservoir thru fill line (3a), raising reservoir water level or bubbles coming from bottom of reservoir.	Clean or replace fill valve. (Ref. to para. 4.18).
4) Air Valve	Check for excessive steam exhausting from outlet of condensing coil (4a). NOTE: During the <i>HEAT</i> & <i>VENT</i> modes, steam will be exhausted from the condensing coil .	Clean or replace Air Valve (Ref. to para. 4.15).
5) Pressure Relief Valve	Check for water or steam leakage beneath back (5a) of sterilizer from pressure relief valve.	Replace Pressure Relief Valve (Ref. to para 4.17). NOTE: Run a Pressure Relief Valve Test before replacing valve (Ref. to para. 4.16) .
6) Pressure Sensor Hose	Check for steam leakage onto Main PC Board where Pressure Sensor Hose connects (6a) to Pressure Transducer.	Secure pressure sensor hose to pressure transducer with high temperature cable tie.

NORMAL STERILIZER OPERATION

(NSO)

Unit Plugged Into Outlet

AUDIBLE	DISPLAY	ACTION / NOTES
Audible beeps	INITIALIZING SYSTEM	Note: The fan <u>may</u> run if the temperature <u>inside cabinet</u> is 130°F [54°C] (+/- 8°F [4.4°C]) or greater. Total number of cycles that have been run on Sterilizer. Model Number* system is set up, Software version number. (*System can be set for M9, M9D, M11 or M11D using SW1 [switch2]). • Fill Valve - Closed • Vent Valve - Open • Air Valve - Energized [Open for 10 minutes or until Cycle started] • Heater - Off
	TOTAL CYCLES XXXX M9*, vX.XX	
	SELECT CYCLE	

Press Cycle Key (i.e. UNWRAPPED)

AUDIBLE	DISPLAY	ACTION / NOTES
	UNWRAPPED 270° F 3:00 MINUTES FAST VENT 30 MINUTE DRY	The sterilization program, temperature, time period, type of venting and dry cycle time is displayed. • Fill Valve - Closed • Vent Valve - Open • Air Valve - Energized [Open for 10 minutes or until Cycle started] • Heater - Off

Press start Key

AUDIBLE	DISPLAY	ACTION / NOTES
Audible beeps	FILLING CHAMBER	• Fill Valve - Energized [Open] • Vent Valve - Energized [Closed] • Air Valve - Energized [Open] • Heater - Off
	CHAMBER IS FULL	Water reaches level of Water Level Sensor sending signal back to main P.C. board. • Fill Valve - De-energized [Closed] • Vent Valve - Energized [Closed] • Air Valve - Energized [Open] • Heater - Off
	HEATING - UNWRAPPED XXX° F XX.X PSI (temp) (pressure)*	• Fill Valve - De-energized [Closed] • Vent Valve - Energized [Closed] • Air Valve - Energized (*) [Open] • Heater - Off (* The air valve will open 3 times at approximately one half of the operating (sterilization) pressure and closes between 38 & 72 seconds {dependent on selected cycle and model of unit [M9 / M11]}.)
	STERILIZING 03:00 270° F 27.1 PSI	Displayed sterilization time begins to count down. • Fill Valve - De-energized [Closed] • Vent Valve - Energized [Closed] • Air Valve - De-energized [Closed] • Heater - Cycles On & Off
	READY TO VENT 00:10 270° F 27.1 PSI	In final 10 seconds of Sterilization Mode "READY TO VENT" blinks on & off in display. • Fill Valve - De-energized [Closed] • Vent Valve - Energized [Closed] • Air Valve - De-energized [Closed] • Heater - Cycles On & Off
	FAST VENT XXX° F XX.X PSI (temp) (pressure)	Chamber vents into reservoir. • Fill Valve - De-energized [Closed] • Vent Valve - De-energized [Open] • Air Valve - De-energized [Closed] • Heater - Off
Audible beeps (Occurs 5 seconds before Door opens.)	DOOR TO OPEN XXX° F XX.X PSI (temp) (pressure)	When pressure in chamber reaches .7 PSig [5 kPa] "DOOR TO OPEN" blinks on & off in display. • Fill Valve - De-energized [Closed] • Vent Valve - De-energized [Open] • Air Valve - Energized [Open] • Heater - Off • Door Opening Motor - Energizes, rotating the motor lever arm, unlatching the door. Door opens to partial open position then motor automatically reverses back to original position.
	DRYING 30:00 (time)	Displayed drying time begins to count down. • Fill Valve - De-energized [Closed] • Vent Valve - De-energized [Open] • Air Valve - De-energized [Closed] • Heater - Cycles On & Off
Audible beeps for 10 seconds	DRYING CYCLE COMPLETE	• Fill Valve - De-energized [Closed] • Vent Valve - De-energized [Open] • Air Valve - De-energized [Closed] • Heater - Off
	SELECT CYCLE	Unit is ready for another operation.

SPECIFICATIONS

A separate (dedicated) circuit is recommended for this sterilizer. The sterilizer **should not** be connected to an electrical circuit with other appliances or equipment unless the circuit is rated for the additional load. May use 15 amp surge protector.

Electrical Requirements:

- 115 VAC Unit.....50/60 HZ, 15 amp, single phase
- 230 VAC Unit.....50/60 HZ, 15 amp, single phase

Power Consumption:

- 115 VAC Unit.....1425 Watts, 12 amps @ 120 VAC
- 230 VAC Unit.....1500 Watts, 7 amps @ 230 VAC

Fuse Rating:

- 115 VAC Unit.
 F1.....0.250 Amp, 250 v, Slo-blo, (1/4" X 1 1/4")
 F2.....15 Amp, 250 v, Fast Acting, (1/4" X 1 1/4")
- 230 VAC Unit.
 F1.....0.125 Amp, 250 v, Slo-blo, (5 X 20mm)
 F2.....8 Amp, 250 v, Fast Acting, (5 X 20mm)

Important Cleaning Recommendations:

- **Weekly**.....Drain water and refill with new distilled water.
- **Monthly**.....Run Speed-Clean solution through sterilizer.

Chamber Pressures:

- Operating.....27-31 PSI (186-215 kPag)
- Max. Pressure @ Door Release.....0.7 PSig (5 kPag)
- Max. Pressure [Safety Valve opens].....40 PSig (276 kPag)

Specific Chamber Operating Temperature /Time:

- Unwrapped.....270-275°F / 3 Min (132-135°C) / 3 Min
- Pouches.....270-275°F / 5 Min (132-135°C) / 5 Min
- Handpieces.....270-275°F / 6 Min (132-135°C) / 6 Min
- Packs.....250 - 255°F / 30 Min (121-124°C) / 30 Min
- O/L Temp. settings.....Opens 450°F (232°C) ± 25°F
 Closes 350°F (177°C) ± 25°F

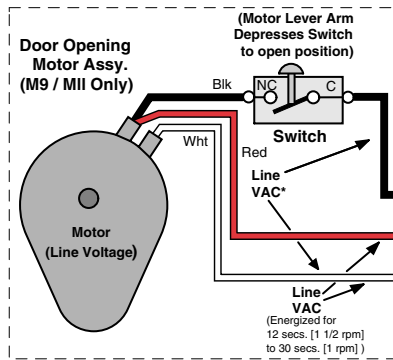
Test Points (TP)

- TP2 - TP1** 12 VDC supply to K1 - K5 relay coils.
- TP2 - TP3** 5 VDC supply to low voltage circuit components.
- TP2 - TP4** 5 VDC supply to Temp. & Pressure Sensors.
- TP2 - TP5** 5 VDC supply to Printer.

SW1 Settings

- Switch**
- 1 On for Service Diagnostics
 - 2 On for Model Designation
 - 3, 4, 5 Not Used, leave Off
 - 6 On for Communication Port hook-up to computer.
 - 7 Off-English, On-Metric
 - 8 Not Used, Leave Off

* Constant Voltage
 ** Voltage Present Only During Component Operation
Note:
 Disconnect plug connector when checking voltage.



(*) NOTE:
 Some Solenoid Coils may be marked FWR (Full Wave Rectified) Use the **Mohms** scale to measure these coils. If reading is 0.2 Mohms or above, coil is **GOOD**. If OL is displayed, coil is **BAD**.

115 VAC Electrical Requirements
 104 to 127 VAC
 50 / 60 Hz
 Dedicated 15 Amp Supply Circuit

Fuses
F1: 0.250 Amp, 250 V. Slow Blow, 1/4"x1 1/4"
F2: 15 Amp, 250 V. Fast Acting, 1/4"x1 1/4"

Resistances (Ohms) Cold (+/- 10%)

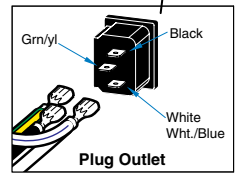
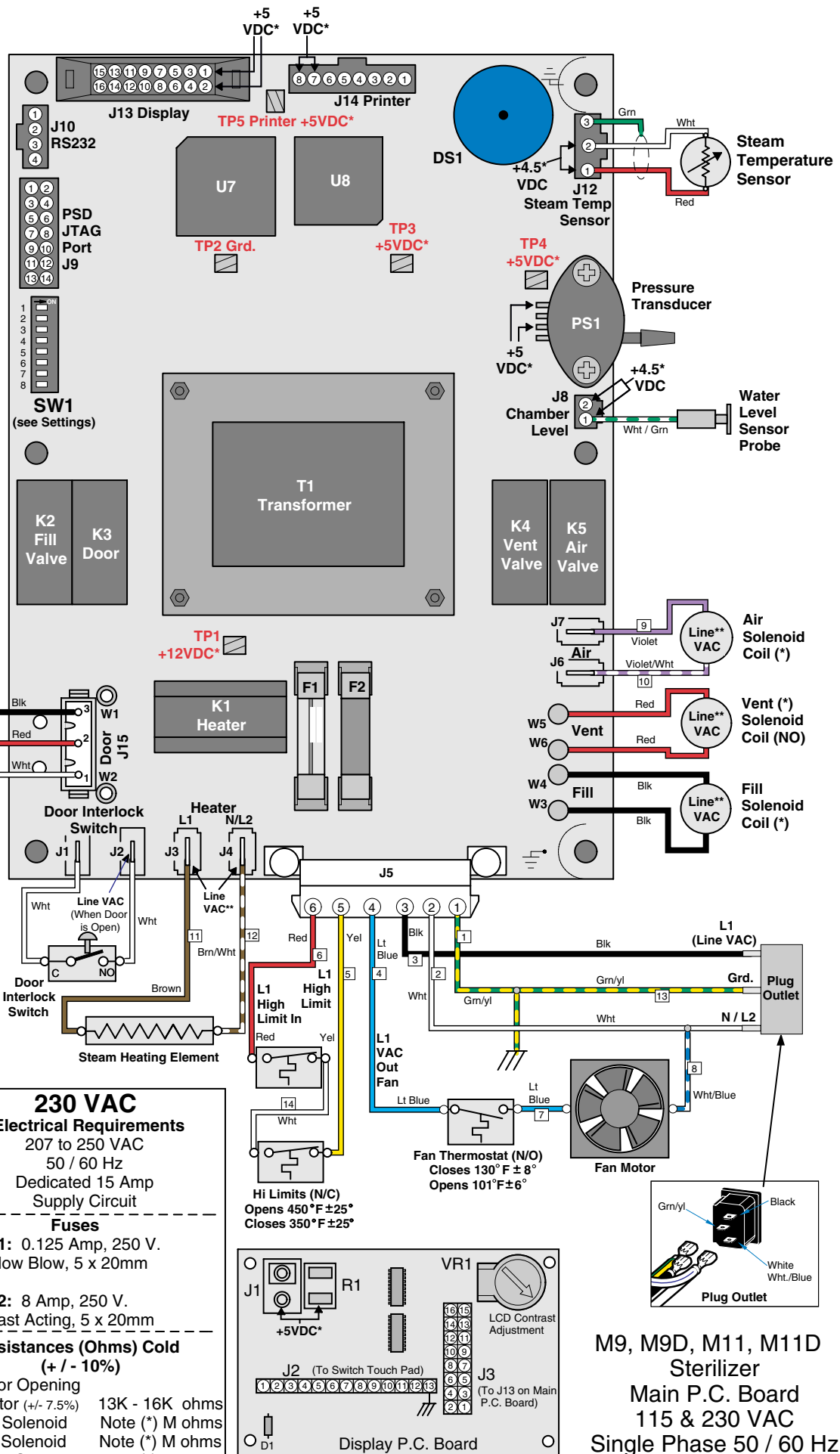
Door Opening Motor (+/- 7.5%) 6000 - 9300 ohms
 Fill Solenoid Note (*) M ohms
 Air Solenoid Note (*) M ohms
 Vent Solenoid Note (*) M ohms
 Heating Element 10 Ohms

230 VAC Electrical Requirements
 207 to 250 VAC
 50 / 60 Hz
 Dedicated 15 Amp Supply Circuit

Fuses
F1: 0.125 Amp, 250 V. Slow Blow, 5 x 20mm
F2: 8 Amp, 250 V. Fast Acting, 5 x 20mm

Resistances (Ohms) Cold (+/- 10%)

Door Opening Motor (+/- 7.5%) 13K - 16K ohms
 Fill Solenoid Note (*) M ohms
 Air Solenoid Note (*) M ohms
 Vent Solenoid Note (*) M ohms
 Heating Element 38 Ohms



M9, M9D, M11, M11D Sterilizer Main P.C. Board
 115 & 230 VAC
 Single Phase 50 / 60 Hz

ERROR CODES CHART (ECC)

NOTES:

This is an abbreviated listing of Error Codes.
(For a more in-depth list refer to your Service manual [Section 2])

Always run Service Diagnostics
(SW1, Switch 1 must be ON).

Check and record last 5 Error Codes when in Service Diagnostics.

If a C099 code is displayed in the Error Codes, ignore it. It was generated at the factory and nothing is wrong.

(Refer to Service Manual for complete instructions.)

Component	Problem	When
1st DIGIT = SYSTEM	2nd DIGIT = SYMPTOM	3rd DIGIT = MODE***

General Codes (C010, C060)

- Supply power interrupted due to storm, etc.

(0) General System	(1) Power Loss (6) Hardware	(0) Power Up
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Stop Button Codes (C100 Series)

- Operator pressed Stop button.

(1) Stop Key Pressed	(0) [Blank]	(2) Fill (3) Heat Up (4) Sterilization (5) Vent (6) Door Open
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Water Fill Codes (C200 Series)

- Reservoir water low.
- Filter screen in chamber clogged.
- Water Fill Level Sensor dirty.
- Fill Valve restricted, open coil or harness.
- Check J8 (Water Level Sensor) harness and plug connection.

(2) Water Fill Sensor	(3) Low	(2) Fill
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Door Latch Codes (C300 Series)

- Door remains closed after door opening motor has operated.
- Door interlock switch malfunctioning.
- Door open during specific mode of operation.

(3) Door Latch Sensor	(2) Closed (8) Open	(2) Fill (3) Heat Up (4) Sterilization (5) Vent (6) Door Open
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Steam Temperature Codes (C500 Series)

- Unit not level.
- Steam heater malfunctioning
- Steam leakage from chamber. Check fittings, Vent, Fill, Air and Pressure Relief valves, gaskets, etc.
- Steam Temperature Sensor malfunctioning.
- Water Level Sensor shorted because:
 - Tray rack in backwards
 - Dirty sensor
 - Wet sensor
- Door not open during Dry Mode.
- Pressure Transducer (Main PCB) malfunctioning.

(5) Steam Temp. Sensor	(3) Low Temp (4) High Temp (6) Hardware (7) Over Limit	(0) Power Up (1) Select (2) Fill (3) Heat Up (4) Sterilization (5) Vent (7) Dry
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Pressure Codes (C600 Series)

- Door not fully opening.
- Air or Vent Valve malfunctioning or lines restricted.
- Filter Screen(s) in chamber clogged.
- Steam Temperature Sensor malfunctioning or dirty.
- Pressure Transducer (Main PCB) malfunctioning.

(6) Pressure sensor	(3) Low Temp (4) High Temp (6) Hardware (7) Over Limit	(0) Power Up (1) Select (2) Fill (3) Heat Up (4) Sterilization (5) Vent (7) Dry
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High Limit Codes (C900 Series)

- Condensing coil outlet beneath reservoir water level.
- High Limit Switch(es) malfunctioning.
- Wire connections broken or loose on High Limit(s).
- Temperature surpassing 475°F (246°C). Run Service Diagnostics to determine probable cause.

(9) High Limit	(8) Open	(0) Power Up (1) Select (2) Fill (3) Heat Up (4) Sterilization (5) Vent (7) Dry
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TROUBLE SHOOTING CHART (TSC)

No Power

- Is unit plugged in to wall and back of unit?
- Is there supply voltage to unit (check outlet).

Has Power, No Display or Touchpad

- Check F1, F2 fuses (Main PCB).
- Check harness (J13 Main PCB to J3 Display PCB).
- Display PCB is malfunctioning

Has Power, No Display

- Check J2 harness & plug (Display PCB).

Instruments Not Drying

- Sterilizer overloaded.
- Door fully open before completion of Dry Cycle.
- Pouches placed paper side up.
- Sterilizer not level.
- Filter screen(s) in chamber clogged.
- Vent Valve malfunctioning or lines clogged.
- Steam Heater malfunctioning.
- High Limit (O/L) switch(es) malfunctioning.

Biological Strips Show Unsterile

- Sterilizer overloaded.
- Improper operation by end user.
- Instrument trays not made for sterilizer or operation.
- Wrong type of biological strips being used.
Must use strips for *Gravity Displacement Steam Sterilizers*.
- Chemical indicator has been in contact with water.
- Strips stored in damp / hot environment.

Printer Does Not Print

- Printer out of paper.
- Cartridge ribbon dry.
- Printer wire harness disconnected.
- Printer wire harness has broken or open leads.
- Printer malfunctioning.