

NORMAL STERILIZER OPERATION (NSO)		
Unit Plugged Into Outlet		
AUDIBLE	DISPLAY	ACTION / NOTES
Audible beeps	INITIALIZING SYSTEM	<b>Note:</b> 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, M11 or M9D, M11D using SW1 [switch2]). • <b>Fill Valve</b> - Closed • <b>Air Valve</b> - Energized [Open for 10 minutes or until Cycle started] • <b>Heater</b> - 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. • <b>Fill Valve</b> - Closed • <b>Air Valve</b> - Energized [Open for 10 minutes or until Cycle started] • <b>Heater</b> - Off

Press Start Key		
AUDIBLE	DISPLAY	ACTION / NOTES
Audible beeps	FILLING CHAMBER	• <b>Fill Valve</b> - Energized [Open] • <b>Air Valve</b> - Energized [Open] • <b>Vent Valve</b> - Energized [Closed] • <b>Heater</b> - Off
	CHAMBER IS FULL	Water reaches level of Water Level Sensor sending signal back to main P.C. board. • <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - Energized [Open] • <b>Vent Valve</b> - Energized [Closed] • <b>Heater</b> - Off
	HEATING - UNWRAPPED XXX° F XX.X PSI (temp) (pressure)*	• <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - Energized (*) [Open] • <b>Vent Valve</b> - Energized [Closed] • <b>Heater</b> - On
	STERILIZING 03:00 270° F 27.1 PSI	Displayed sterilization time begins to count down. • <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - De-energized [Closed] • <b>Vent Valve</b> - Energized [Closed] • <b>Heater</b> - 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. • <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - De-energized [Closed] • <b>Vent Valve</b> - Energized [Closed] • <b>Heater</b> - Cycles On & Off
	FAST VENT XXX° F XX.X PSI (temp) (pressure)	Chamber vents into reservoir. • <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - De-energized [Closed] • <b>Vent Valve</b> - De-energized [Open] • <b>Heater</b> - 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. • <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - Energized [Open] • <b>Vent Valve</b> - De-energized [Open] • <b>Heater</b> - Off
	DOOR TO OPEN XXX° F XX.X PSI (temp) (pressure)	• <b>Door Opening Motor</b> - 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. • <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - De-energized [Closed] • <b>Vent Valve</b> - De-energized [Open] • <b>Heater</b> - Cycles On & Off
Audible beeps for 10 seconds	DRYING CYCLE COMPLETE	• <b>Fill Valve</b> - De-energized [Closed] • <b>Air Valve</b> - De-energized [Closed] • <b>Vent Valve</b> - De-energized [Open] • <b>Heater</b> - Off
	SELECT CYCLE	Unit is ready for another operation.

SPECIFICATIONS	
A separate (dedicated) circuit is recommended for this sterilizer. The sterilizer <b>should not</b> 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.	
<b>Electrical Requirements:</b>	
• 115 VAC Unit.....50/60 HZ, 15 amp, single phase	
• 230 VAC Unit.....50/60 HZ, 15 amp, single phase	
<b>Power Consumption:</b>	
• 115 VAC Unit.....1425 Watts, 12 amps @ 120 VAC	
• 230 VAC Unit.....1500 Watts, 7 amps @ 230 VAC	
<b>Fuse Rating:</b>	
• 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)	
<b>Important Cleaning Recommendations:</b>	
• <b>Weekly</b> .....Drain water and refill with new distilled water.	
• <b>Monthly</b> .....Run Speed-Clean solution through sterilizer.	
<b>Chamber Pressures:</b>	
• Operating.....27-31 PSI (186-215 kPa)	
• Max. Pressure @ Door Release.....0.7 PSig (5 kPa)	
• Max. Pressure [Safety Valve opens].....40 PSig (276 kPa)	
<b>Specific Chamber Operating Temperature /Time:</b>	
• 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	



ERROR CODES CHART (ECC)

**NOTES:**  
This is an abbreviated listing of Error Codes.  
(For more in-depth list refer to your Service manual [Section A])  
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.  
• Check all connections between outlet to PC board.  
• Unplug for 60 seconds to reset unit.

(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.  
• Check door springs and possibly add another for more opening force.  
• 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.		
(5) Steam Temp. Sensor	(3) Low (4) High (6) Hardware (7) Over Limit	(0) Power Up (1) Select (2) Fill (3) Heat Up (4) Sterilization (5) Vent (7) Dry

**C533 - C534 – C544 Steam temperature low/high**  
• Check for internal and external steam and water leaks (see leakage chart).  
• Check resistance on heater (see schematics).  
• Check for resistance on steam temp probe (see schematics).  
• Check for 5.0VDC between TP2 & TP4 test points on the board.

- Remove J12 and check for voltage on the 1<sup>st</sup> & 2<sup>nd</sup> pin. Should be 4.5 VDC.
- C560 to C567 Steam temp hardware**
- Check J12 plug and conditions of wires. Be sure this is a solid connection.
- Check for resistance on steam temp probe (see schematics).
- Check for 5.0VDC between TP2 & TP4 test points on the board
- Remove J12 and check for voltage on the 1<sup>st</sup> & 2<sup>nd</sup> pin. Should be 4.5 VDC.
- Allow sterilizer to reach room temperature before operating.

**C570 to C577 Steam temp over limit**  
• Check for internal and external steam and water leaks (see leakage chart)  
• Check for resistance on steam temp probe (see schematics).  
• Check for 5.0VDC between TP2 & TP4 test points on the board.  
• Remove J12 and check for voltage on the 1<sup>st</sup> & 2<sup>nd</sup> pin. Should be 4.5 VDC.  
• Check for restriction in tubing and chamber access hole for pressure transducer.

**Pressure Codes (C600 Series)**  
• Door not fully opening.  
• Air or Vent Valve malfunctioning or lines restricted.

(6) Pressure sensor	(3) Low (4) High (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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**C633 Pressure low**  
• Check for internal and external steam and water leaks (see leakage chart).  
• Check for resistance on heating element (see schematics).  
• Check for 5.0VDC between TP2 & TP4 test points on the board.  
• Check water sensor to be clean and dry.

**C645 Pressure high (vent mode)**  
• Check and clean chamber filters  
• Check vent solenoid for proper operation and restriction.  
• Check for 5.0VDC between TP2 & TP4 test points on the board.

**C647 Pressure high (dry mode)**  
• All the above must be checked plus the following.  
• Check door springs and possibly add another for more opening force.  
• Do diagnostic on door motor to ensure proper operation.  
• Clean door gasket and surface it mates against.

**C670 to C671 Pressure over limit (power up mode)**  
• Check vent solenoid for function and make sure plunger is releasing.  
• Check for 5.0VDC between TP2 & TP4 test points on the board.  
• Check test points on the board for the pressure transducer. Refer to schematics for test point.

**C672 to C675 Pressure over limit (fill, sterilization, vent mode)**  
• Air valve malfunctioning. Not opening to release air  
• Check for resistance on steam temp probe (see schematics).  
• Check for 5.0VDC between TP2 & TP4 test points on the board.  
• Make sure chamber filter is clean.

**C677 Pressure over limit (door open mode)**  
• Door not fully opening. Check door springs  
• Clean door gasket and surface it mates against.  
• Run service diagnostic on door. Monitor and check for faults.  
• Check vent solenoid for proper operation.

High Limit Codes (C900 Series)

- Skip fill cycle.
- Condensing coil outlet beneath reservoir water level.
- High Limit Switch(es) malfunctioning (normally closed).
- Wire connections broken or loose on High Limit(s).
- Temperature surpassing 450°F (232°C). Run Service Diagnostics to determine probable cause.
- Water Level Sensor shorted because:
  - Tray rack in backwards
  - Dirty sensor
  - Wet sensor

(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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**C980 to C987 Hi limit open**  
• Make sure water level sensor is clean and dry  
• Check for internal and external leaks. (See leakage chart)

TROUBLE SHOOTING CHART (TSC)

**No Power**  
• Is unit plugged in to wall and back of unit?  
• Is there supply voltage to unit (check outlet)?  
• Check F1, F2 fuses (Main PCB).

**Has Power, No Display or Touchpad**  
• Check harness (J13 Main PCB to J3 Display PCB).  
• Display PCB is malfunctioning  
• Check adjustment on display board.

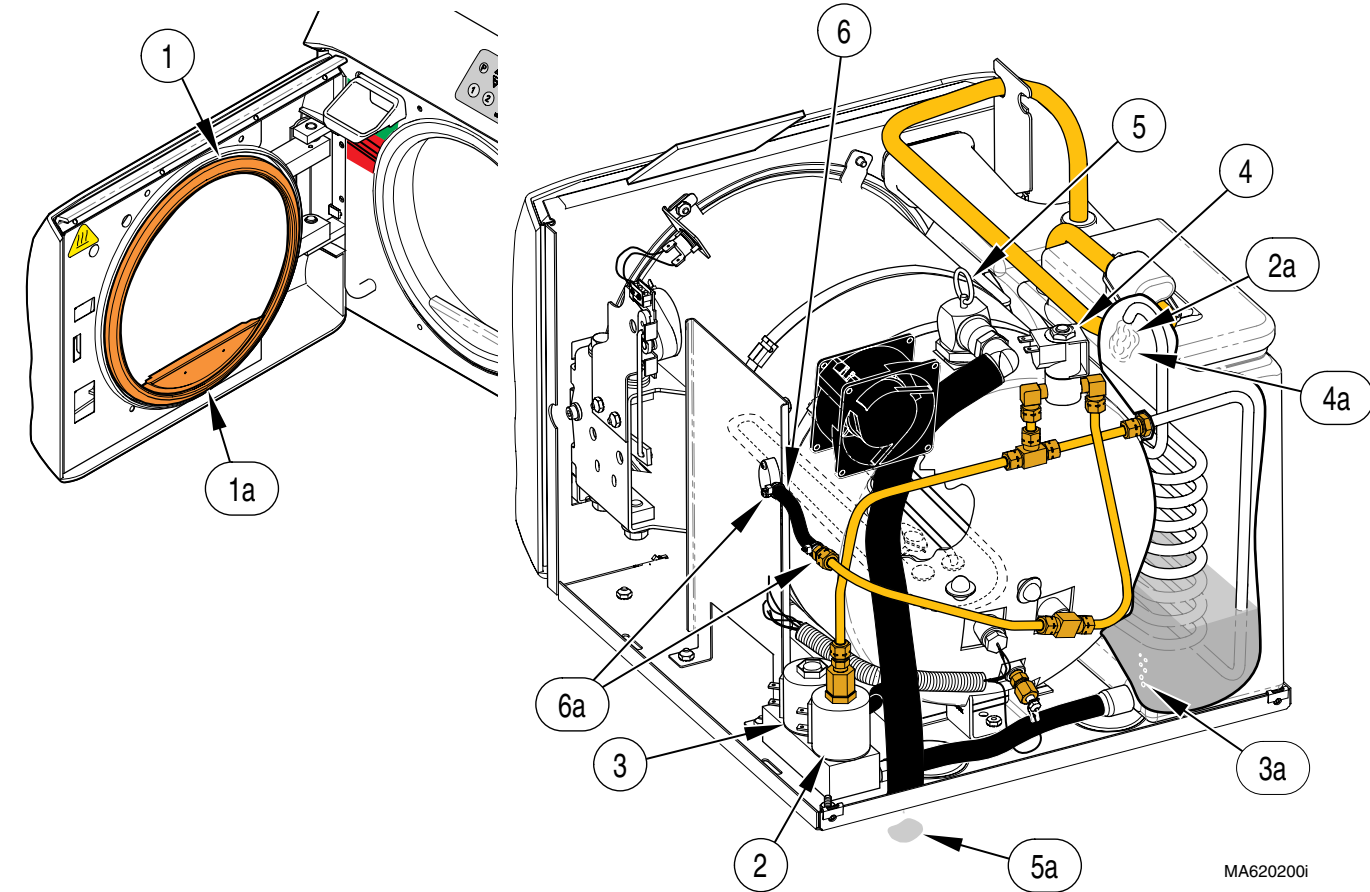
**Has Power, No Display**  
• Check J2 harness & plug (Display PCB).  
• Check adjustment on display board.

**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?

**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?

LEAKAGE CHECK CHART (LCC)



COMPONENT	CHECK	CORRECTION
1) Door Gasket	Check for water leaking around door.	Clean or replace door gasket
2) Vent Valve	Check for water leaking from outlet of condensing coil (2a).	Clean or replace vent valve. (Ref. to page B-17).
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 page B-17).
4) Air Valve	Check for excessive steam exhausting from outlet of condensing coil (4a). <b>NOTE:</b> During the <i>HEAT &amp; VENT</i> modes, steam will be exhausted from the condensing coil .	Clean or replace Air Valve (Ref. to page B-17).
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 page B-19). <b>NOTE:</b> Run a Pressure Relief Valve Test before replacing valve (Ref. to page B-18) .
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.



M9, M9D, M11, M11D  
STERILIZER QUICK  
REFERENCE SHEET

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

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)

- MEDICAL TECH SERVICE {ext. 8912}
- DENTAL/VET TECH SERVICE {ext. 8913}

SERVICE DEPT. PARTS FAX NUMBER

- MEDICAL SERVICE FAX.....1-877-725-6495
- DENTAL/ VET SERVICE FAX..1-800-365-8631