

TP210 Rev. A

Leak Check

Door Tray Gasket

- Check for water or steam leakage from around Door / Tray
- Clean or replace Door / Tray Gasket.

Vent Valve

- Check Plastic tube connecting unit to the external condensing tank for a flow of steam and hot water in between vent valve operations.
- Clean or replace Vent Valve.

Pressure Relief Valve

- Check for water or steam leakage from under the back left hand corner of sterilizer.
- Pop off & re-seat, or replace Pressure Relief Valve.

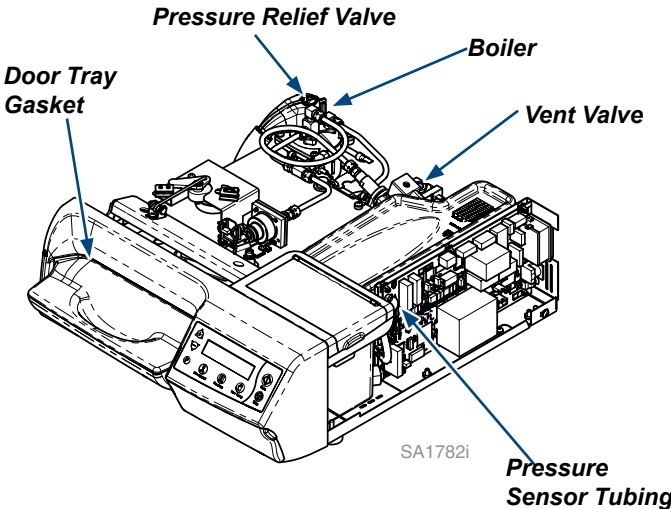
Pressure Sensor Tubing

- Check for water or steam leakage onto main PC board where pressure sensor tubing attaches to pressure transducer..
- Reattach or replace Pressure Sensor Tubing.

Fittings

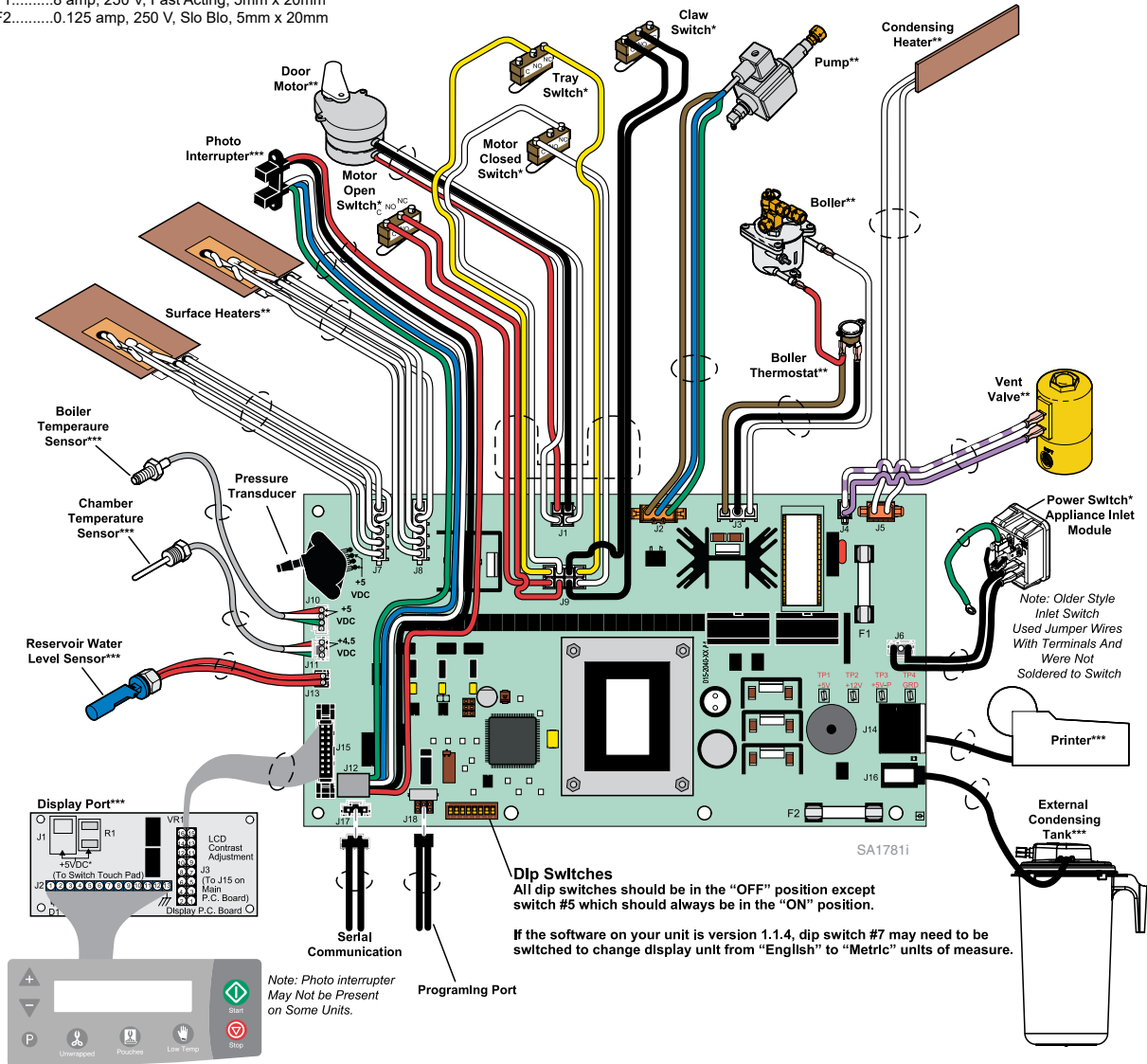
- Check all plumbing fitting connections for leakage.
- Tighten or replace fittings.

Note: Do not energize water pump for more then 20 seconds at a time.



Fuses:
115 VAC models:
F1.....15 amp, 250 V, Fast Acting, 1/4" x 1 1/4"
F2.....0.25 amp, 250 V, Slo Blo 1/4" x 1 1/4"

230 VAC models:
F1.....8 amp, 250 V, Fast Acting, 5mm x 20mm
F2.....0.125 amp, 250 V, Slo Blo, 5mm x 20mm



(*) Denotes constant voltage.
(**) Denotes voltage present only during component operation.
(***) Denotes rectified DC voltage present during operation.
Always disconnect plug connector when checking voltage.

Normal Sterilizer Operation Sequence

Plug Sterilizer into outlet:

Operating Mode	Display Reads	What is happening...
Power Up	INITIALIZING SYSTEM	Line voltage is supplied to the power switch. Switch ON - powers the PC board thru F1 fuse. (F2 fuse provides protection for PC board transformer).
	TOTAL CYCLES XXXX M3 vX.XX	A running count of all cycles run on this sterilizer is shown, as well as the model number, and the control software version number.
Select Cycle	SELECT CYCLE	Select cycle indicates that the unit is ready for the user to press a cycle button.

Press a Cycle Button: (Unwrapped for example)

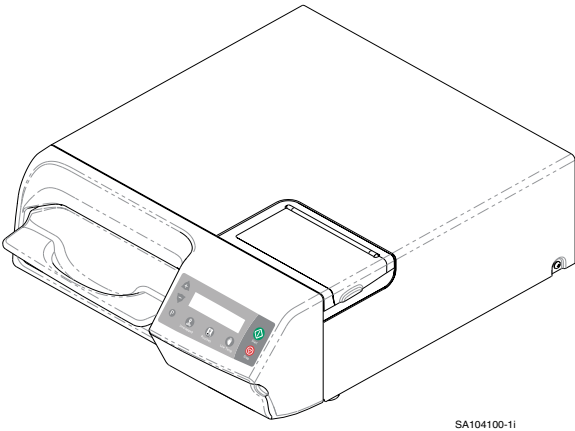
	UNWRAPPED 270° F 3.5 MINUTES 25 MINUTE DRY	The parameters for the selected cycle are displayed (temperature / sterilization time / drying time).
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Press (Start)

Door Close	CLOSING CHAMBER	• Tray Switch - Closed • Door Motor - Energizes • Door Claw Switch - Open • Condensation Heater - On • Door Open Switch - Opens • Door Closed Switch - Closes • Vent Valve - Opens • Boiler - cycles On/Off
	CHAMBER CLOSED	• Tray Switch - Closed • Door Motor - De-energized • Door Claw Switch - Closed • Condensation Heater - On • Door Open Switch - Opened • Door Closed Switch - Closed • Vent Valve - Opened • Boiler - cycles On/Off
Heat Up	HEATING - UNWRAPPED XXX° F XX.X PSI	• Pump - cycles On/Off • Boiler - cycles On/Off • Vent Valve - cycles Open/Closed • Condensation Heater - On Pump is initially On for 1.5 sec., then Off for 12 sec., then cycles On/Off. Boiler maintains target temp. of 18° F above sterilization temperature. Vent Valve opens until chamber reaches 212° F, then closes.
Sterilize	STERILIZING X:XX Min XXX° F XX.X PSI	• Pump - cycles On/Off • Boiler - cycles On/Off • Vent Valve- cycles Open/Closed • Condensation Heater - On
Vent	VENTING XXX° F XX.X PSI	• Vent Valve - Opens • Condensation Heater - ON • Door Motor - De-energized (Until chamber pressure decreases to 0.5 PSI)
Door Open	DOOR TO OPEN	• Door Motor - Energizes • Condensation Heater - ON • Door Closed Switch - Opens • Door Open Switch - Closes
Dry	DRYING X:XX	• Dry Heaters- cycle On/Off • Condensation Heater - ON • Boiler - cycles On/Off NOTE: Dry Heaters are inaccessible and non-servicable. Boiler is On if dry heaters are Off and boiler temperature is <240° Boiler is Off if dry heaters are On or boiler temperature is >240°



M3 Steam Sterilizer® Dental Handpiece Sterilizer



Quick Reference Guide

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).

Note

Refer to the Service manual for complete instructions.

Error Codes (abbreviated list)			
Reference the Service Manual for complete list of Error Codes and trouble shooting information.			
Digit	First Digit (Component)	Second Digit (Problem)	Third Digit (Mode)
0	General System	Blank*	Power Up Mode
1	Stop Button	Power Loss	Select Cycle Mode
2	Water Level Sensor	Closed	Door Close Mode
3	Door Switch	Low	Heat Up Mode
4	Ext. Condensing Tank	High	Sterilize Mode
5	Temp. Sensor	Tray Switch Open	Vent Mode
6	Pressure Sensor	Hardware	Door Open Mode
7	Boiler Temperature	Over Limit	Dry Mode
8	Dry Heater Temp.	Open	Complete Mode
9	High Limit Thermostat	(not used)	Miscellaneous
*In the 100 Series Errors a 0 indicates  was Pressed			
C010 POWER UP MODE SYSTEM POWER LOSE: - Power interruption -any mode -sterilization may be compromised. - Powered off during Chamber Close, Heat Up, or Sterilization mode. - Unit <i>must be</i> plugged into a dedicated, 20 amp circuit.			
C060 POWER UP MODE SYSTEM HARDWARE: - At power up, memory, or hardware not initializing. - Power has been rapidly cycled off /on (was there a storm? a power outage?)			
C10X STOP KEY: - The stop key was sensed. - Did user press  during the cycle? - Check touchpad membrane switch.			

C23X WATER LOW: - Reservoir sensor detects the supply water is low. - Reservoir water is low. - Level sensor connections loose or disconnected. - Faulty water level sensor.
C32X DOOR CLOSED: - Check Door Motor Open Switch. - Check for physical obstruction to door movement. - Is door motor cam making contact with the Door Open Switch? - Is there still too much pressure in chamber? - Is Pressure Interlock Assembly. stuck open? Verify that chamber pressure is zero. - Check for obstruction in plastic tube to external condensing tank. - Is copper coil in external condensing tank blocked or damaged? - Check vent port in chamber for blockage. - Check filter for blockage. Clean or replace. - Check vent valve for blockage. Clean or replace vent valve. - Is Door Open Switch stuck in the closed state? - Check if photo interrupter is defective.
C44X EXTERNAL TANK FULL: - Water level sensor in external tank detected water level is too high to perform next cycle. - External condensing tank is full. - Look for corrosion on condensing tank level sensors. Clean sensors. - Water level sensors or attached wiring damaged. - System is not processing data properly.
C53X STEAM TEMP LOW: - During Heatup, sterilization mode is not reached within 15 minutes. - During Sterilization Mode, steam temp. drops lower than or equal to the set point for the selected cycle. - Low water in reservoir. Fill reservoir with distilled water. - Low water in reservoir not caught by a C23x error. - Water pump not primed. - Chamber temperature sensor not functioning properly. - Boiler temperature sensor not functioning properly. - Boiler not functioning properly.

C54X STEAM TEMP HIGH: - During Sterilization Mode, steam temp. rises higher than or equal to the selected cycle set point + 8° F. - Steam not being released from chamber. Is tubing to external condensing tank obstructed? Is copper coil in ext. condensing tank blocked or damaged? Is vent port in chamber blocked? Is filter blocked? Is vent valve blocked? Clean or replace vent valve. - Steam leakage. See leak check procedure. - Chamber temp. sensor not functioning properly. - Boiler temperature sensor not functioning properly. C56X STEAM TEMP HARDWARE: - A/D converter on PC Board reports a steam temperature input value outside the limits. - Steam leakage. See leak check procedure. - Chamber temperature sensor disconnected from J11 on PC Board. - Chamber temperature sensor not functioning properly. C57X STEAM TEMP OVER LIMIT: - Steam temperature greater than 285° F - Steam not being released from chamber. Is tubing to external condensing tank obstructed? Is copper coil in ext. condensing tank blocked or damaged? Is vent port in chamber blocked? Is filter blocked? Is vent valve blocked?. Clean or replace vent valve. - Steam leakage. - Chamber temp. sensor not functioning properly. - Boiler temperature sensor not functioning properly. C63X PRESSURE LOW: - In Heatup Mode, first vent valve open must occur within 10 minutes. - Low water in reservoir. - Low water in reservoir not caught by a C23x error. - Water pump not primed. - Steam leakage. See Leak check procedure. - Chamber temp. sensor not functioning properly. - Boiler temperature sensor not functioning properly. - Boiler not functioning properly. - Pressure transducer tubing damaged, blocked or disconnected. - Is pressure lock assembly obstructed? - Photo interrupter not functioning properly.

C64X PRESSURE HIGH: - Is gauge pressure in the chamber greater than 2.0 PSig (13.8 kPag) when it should be near zero? - Steam not being released from chamber. Is tubing to external condensing tank obstructed? Is copper coil in external condensing tank blocked or damaged? Is vent port in chamber blocked? Is filter blocked? Is vent valve blocked? Clean or replace vent valve. - Pressure is being read abnormally high by pressure transducer. C66X PRESSURE HARDWARE: - A/D converter reports a gauge pressure input value outside limits. - Steam not being released from chamber. Is tubing to external condensing tank obstructed? Is copper coil in external condensing tank blocked or damaged? Is vent port in chamber blocked? Is filter blocked? Is vent valve blocked?. Clean or replace vent valve. - Steam leakage. See Leak check procedure. - Chamber temperature sensor not functioning properly. - Boiler temperature sensor not functioning properly. C67X PRESSURE OVER LIMIT: - Gauge chamber pressure greater than 40 PSI. - Steam not being released from chamber. Is tubing to external condensing tank obstructed? Is copper coil in external condensing tank blocked or damaged? Is vent port in chamber blocked? Is filter blocked? Is vent valve blocked?. Clean or replace vent valve. - Steam leakage. See Leak check procedure. - Chamber temp. sensor not functioning properly. - Boiler temp. sensor not functioning properly. C76X BOILER TEMP HARDWARE: - A/D converter reports boiler temp. input value outside limits. - Boiler temp. sensor disconnected at J10 on PC board. - Boiler temp. sensor not functioning properly. - Boiler not functioning properly.

C77X BOILER TEMP OVER LIMIT: - Boiler temperature is greater than 340° F. - Steam not being released from chamber. Is tubing to external condensing tank obstructed? Is copper coil in external condensing tank blocked or damaged? Is vent port in chamber blocked? Is filter blocked? Is vent valve blocked?. Clean or replace vent valve. - Boiler temp. sensor disconnected at J10 on PC board. - Boiler temp. sensor not functioning properly. C86X DRYER TEMP HARDWARE: - A/D converter reports a dry heater temp. input value outside limits. - Chamber temperature sensor not functioning properly. - Dry heater(s) disconnected from J7 or J8 on PC board. - Verify heater operation. If the condition persists, contact Midmark Technical Service Department. C87X DRYER TEMP OVER LIMIT: - Dry heater temperature greater than 325° F. - Chamber temperature sensor not functioning properly. - Dry heater(s) disconnected from J7 or J8 on PC board. - Verify heater operation. If the condition persists, contact Midmark Technical Service Department. C88X DRYER HI-LIMIT OPEN: - Dry heater high-limit thermostat has opened for at least 0.25 seconds. - Dry heater(s) disconnected from J7 or J8 on PC board. Perform: Dry Heater Voltage Test. Perform: Dry Heater Resistance Test. If the condition persists, contact Midmark Technical Service Department. C98X BOILER HI-LIMIT OPEN: - Boiler overheat thermostat has opened for at least 0.25 seconds and needs to be manually reset. - Water pump not primed. - Boiler temperature sensor not functioning properly. - Boiler overheat thermostat disconnected at J13 on PC board. - Loose or broken wire connections at boiler overheat thermostat. - Boiler overheat thermostat tripped open prematurely. Replace thermostat.

Trouble Shooting
<u>Sterilizer has no power.</u> - Sterilizer not plugged in. - Power switch turned off. - No power at wall outlet. - F1 fuse on PC board is blown or open. - Inlet switch module may be faulty. <u>Sterilizer has power. but touchpad and display do not work.</u> - F2 fuse on PC board is blown or open. - Ribbon cable from J15 on main PC board to J3 on display PC board is loose or disconnected. - J15 / J3 ribbon cable has open lead(s). <u>Sterilizer is not drying instruments properly.</u> - Sterilizer is not level. - Sterilizer is over loaded. - Were pouches placed with paper side up? - Door tray was removed from chamber and reinserted. - Steam not being released from chamber. <u>Printer (Optional) does not print.</u> - Printer is out of paper. - Printer cartridge is dry. - Printer wire harness is disconnected. - Printer wire harness has broken or open leads. 5 VDC at TP3 & TP4 on main PC board? <u>Positive biological indicator.</u> <u>No color change, or incomplete change has occurred on chemical indicator strip.</u> - Sterilizer overloaded. - Improper usage. - Wrong type of indicator being used for this type of sterilizer. - Chemical indicator has come into contact with water in sterilizer. - Indicator strips are being stored in a damp and / or hot environment. - Indicators used have expired (past their shelf life date).