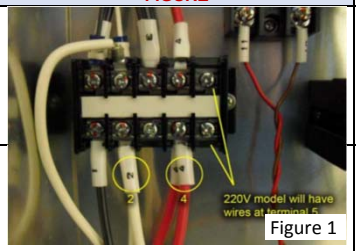
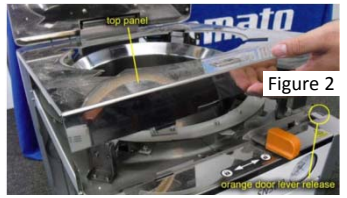
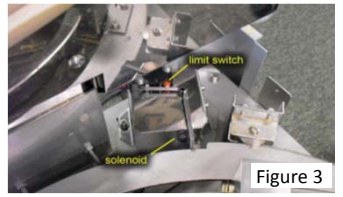
STERILIZER - SN / SQ SERIES
ERROR CODE TROUBLESHOOTING GUIDE

ERROR CODE	PRINCIPLE	POSSIBLE CAUSES	SOLUTIONS	FIGURE
ERROR 3 **Heater Error**	-	**Disconnected heater**	1. Turn off circuit breaker and unplug the sterilizer. 2. Remove back panel by removing the screws and sliding it down. 3. Locate the heater wires (see Figure 1). Note that the 220 V model will have a wire connected at terminal 5 while the 120V model will not. 4. Make sure all the wires are properly connected and the screws are tightened. 5. If the wires are connected properly and Error 3 remains, proceed to Step B titled	 Figure 1
		Defective heater	1. Using a multimeter, check heater resistance. For 120 V models: Check resistance at wire 2 and 4. Note that there are two sets of wires. Check both sets. For 220 V models: Check resistance first at wire 2 and 4 then at wire 4 and 5. 2. For both models, if the multimeter reads a resistance of OL (overload), the heater is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725.	
ERROR 4 **Cover Lock Error** Note: This error occurs during operation, likely at the start, when the chamber fails to lock.	When a cycle starts, the solenoid and the limit switch are switched to the off position. The door lock lever cannot be moved at this time because the solenoid plate prevents the lock lever from moving. When Error 4 occurs, the solenoid incorrectly remains in the on position and fails to push out. This prevents the door from locking during the operation and the unit displays Error 4.	**Defective limit switch (locking mechanism)**	1. To access the locking mechanism, remove the sterilizer's back panel and both side panels. Each panel slides down after its screws have been removed. 2. Open the sterilizer door and remove the top panel from the unit. See Figure 2. 3. Locate the locking mechanism which consists of the limit switch and the solenoid assembly. See Figure 3. 4. Manually check the limit switch by pressing the lever that depresses the button. If the button depresses and produces an audible click, the limit switch is working properly 5. Continue to Step B titled Defective solenoid	 Figure 2
		Defective solenoid	1. Locate the solenoid assembly. See Figure 3. 2. When working properly, the solenoid will extend out of the locking mechanism to prevent the orange door lever from sliding and unlocking the door during operation. 3. To manually check if the solenoid is working properly, first move the orange door lever to the lock position. To do this while the sterilizer door is open, press down on the orange door lever release (see Figure 2) and slide the lever left 4. The solenoid should now be free to extend into the position as shown in Figure 3. 5. If the solenoid does not extend, it is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725.	 Figure 3

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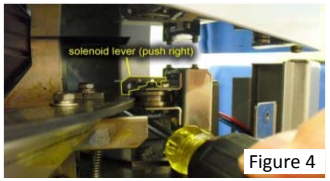
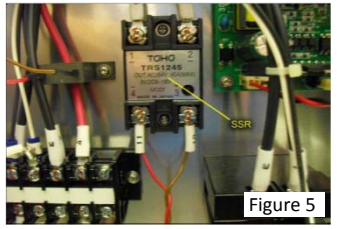
ERROR CODE	PRINCIPLE	POSSIBLE CAUSES	SOLUTIONS	FIGURE
ERROR5 **Cover Unlock Error** Note: This error occurs in standby mode, not during operation, when the chamber fails to unlock.	When an operation ends or the unit is in standby mode with the circuit breaker on, the solenoid and the limit switch are in the on position. The door lock lever can be moved at this time. When Error 5 occurs, the solenoid incorrectly remains in the off position and is pushed out, preventing the door lock lever from moving.	**Improper Use**	1. Error 5 will sometimes appear when the orange door lock lever is pushed right prior to the solenoid moving into the unlock position. 2. To avoid this, do not try to unlock the oven before the solenoid moves into the unlock position. There will be an audible when this happens.	
		Circuit breaker is off	1. If the door will not unlock, check if the unit is turned on. 2. If the unit is off, turn the circuit breaker on, wait 5-10 seconds, then unlock the door. Note: The unit needs power for the locking mechanism to release. If the unit is off, the locking mechanism will not release the door lever. 3. If the unit has power and remains locked, proceed to Step B titled Defective solenoid.	
		Defective solenoid	1. The solenoid is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235- 7725. 2. If you need to remove a sample that is inside the oven, follow steps 3-7 to manually unlock the sterilizer cover. 3. Remove the sterilizer's right-side panel. 4. Once removed, locate the solenoid lever (see Figure 4). 5. Using a screwdriver, push the solenoid lever to the right. 6. Unlock the sterilizer cover while holding the solenoid lever to the right. 7. You may now remove any sample that was stuck in the oven.	 Figure 4
ERROR 6 **Incorrect drain bottle position**	-	**The drain bottle is positioned incorrectly**	Drain bottle is positioned incorrectly Open the cabinet door and position the drain bottle so that it depresses the limit switch on the side of the compartment. If Error 6 remains after performing the troubleshooting steps listed above, please email technical support at technical@yamato-usa.com	
ERROR 7 **Overheat error**	-	**Defective SSR**	1. To check if the SSR is defective, turn the circuit breaker off and unplug the unit. 2. Remove the back panel. 3. Locate the SSR (see Figure 5). 4. Using a multimeter, test the resistance between terminals 1 and 2. 5. If the resistance reads anything other than OL (overload), then the SSR is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725.	 Figure 5

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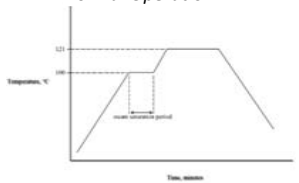
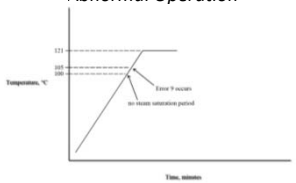
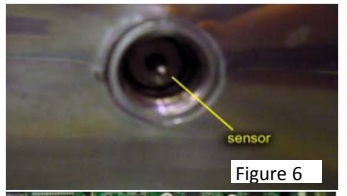
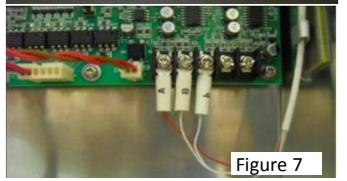
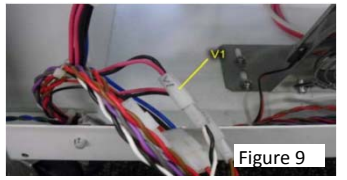
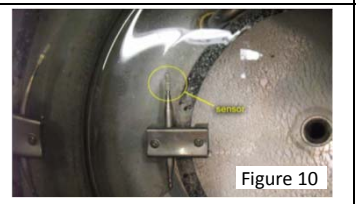
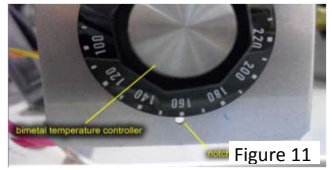
ERROR CODE	PRINCIPLE	POSSIBLE CAUSES	SOLUTIONS	FIGURE
ERROR 9 **Saturation Point Error**	Proper operation of the unit involves a ramp up time for the temperature, a steam saturation point at approximately 100°C, and a final ramp up to 121°C. If there is no saturation point, Error 9 appears at 105°C. See the graphs below for a comparison of normal and abnormal operation. (see ERROR9 principle figure) *Normal Operation*  *Abnormal Operation* 	**Improper use**	1. If the unit is being used too soon after a previous cycle, the chamber does not have time to cool down. This causes improper ramp up in heat inside the chamber and causes Error 9. 2. To remedy this, please let the chamber cool down before using the unit. 3. In addition to letting the chamber cool down, make sure that the chamber does not contain too much material. Otherwise, the sensor becomes insulated and cannot read the correct temperature. 4. Finally, make sure that there is enough water in the chamber so that it can reach the saturation point. 5. Start the operation again. If Error 9 remains after following the operational guidelines above, continue to Step B and C.	 Figure 6
		Defective sensor	1. If the unit is being used properly and Error 9 appears, the sensor in the chamber wall (see Figure 6) may be defective. 2. To test if the sensor is defective, remove the back panel on the unit. 3. Remove sensor connections labeled A, B, and b (See Figure 7 on the next page) 4. Using a multimeter, check sensor resistance. One multimeter probe should be on A and the other should be on B and b simultaneously. 5. At 25°C, the resistance should read approximately 110 ohms. a. If the resistance reads OL (overload) or 0, the sensor is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725. b. If the resistance is approximately 110 ohms, the CPU board is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725.	 Figure 7
		Defective solenoid valve	1. To check if the solenoid valve is defective, open the right side panel on the unit. 2. Locate the exhaust solenoid valve (See Figure 8) and its corresponding connector labeled V1 (See Figure 9). 3. Disconnect the V1 connector and check the voltage using a multimeter set to DC voltage. a. If there is no voltage, the CPU board is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725. b. If the voltage reads approximately 24 V DC, the CPU board is working properly. Reconnect the V1 connector and listen for the solenoid valve to move into place. An audible click should be heard. If there is no sound, the solenoid is defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725.	 Figure 8  Figure 9
ERROR 20 **Water level error**	The water level is checked by the temperature sensor near the heater. See Figure 10 for the sensor location. If there is not enough water, the sensor temperature will incorrectly increase and Error 20 will occur.	**Water level is too low**	If the water level is too low, the sensor near the heater reads excessive temperature and Error 20 occurs. Make sure that the water level is above the heater to prevent this error. See Figure 10 for sensor location and the minimum water level required to avoid Error 20.	 Figure 10
		Sensor is defective	If the water level is above the heater and Error 20 remains, check the bimetal temperature controller setting (See Figure 11). The control setting is at the bottom of the unit behind the back panel. You must remove the back panel in order to access it. If the bimetal temperature controller is properly set at the notch to 160° C, the sensor may be defective and needs to be replaced. Please contact Yamato Scientific customer service at (408) 235-7725.	 Figure 11

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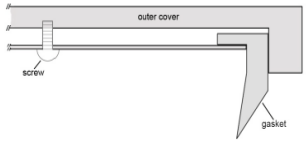
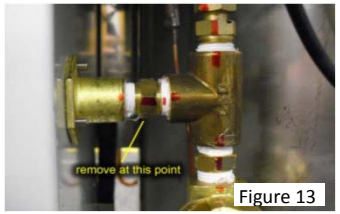
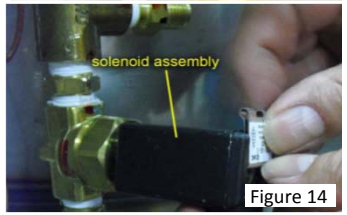
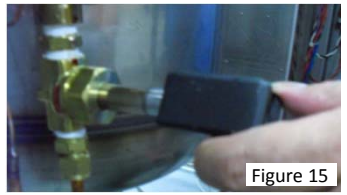
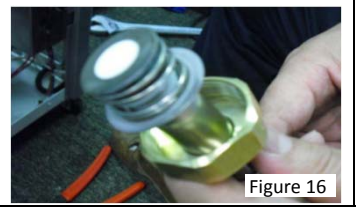
ERROR CODE	PRINCIPLE	POSSIBLE CAUSES	SOLUTIONS	FIGURE
Steam leaking through cover	-	Gasket not properly situated	1. Open the sterilizer door and ensure that the gasket is properly situated. A gasket that is not properly installed will allow steam to leak through the door. See the figure below to see proper gasket positioning. 2. If the gasket is loose, locate the screws on the inside of the door and remove them. This will allow the gasket to be removed and adjusted. 3. Place the gasket tightly into its groove. 4. If the gasket is properly installed and steam continues to leak, the valves and pipes may require cleaning. Improper Positioning  Proper Positioning 	 Figure 12  Figure 13
		Valves and pipes require cleaning	1. To clean the valves and pipes, first remove the right-side panel of the machine. Warning: When performing steps 2-11, grip the section(s) of pipe attached to the section being removed. Failure to do so may damage the pipes due to excessive torque. 2. Using a wrench, remove the section of the pipe assembly highlighted in Figure 12. 3. Clean the section using compressed air and by flushing it out with clean water. Set the pipe aside. 4. Remove the pipe assembly that contains the black solenoid housings (See Figure 13). 5. Remove both solenoid coils by first sliding out the stainless steel lock at the ends of the housings (See Figure 14). 6. Pull the housing coils off the solenoid assemblies. (See Figure 15) 7. Remove the solenoid valves using a wrench. 8. Clean the solenoids and ensure that the springs are functional. (See Figure 16) 9. Set the solenoids aside and clean the pipe section. 10.Open the front cabinet and remove the rubber tube that connects to the pipe. Clean the pipe section. 11.Reassemble the pipes. Use Figure 12 as a reference. If steam continues to leak after performing the troubleshooting steps listed above, please email technical support at technical@yamato-usa.com	 Figure 14  Figure 15  Figure 16