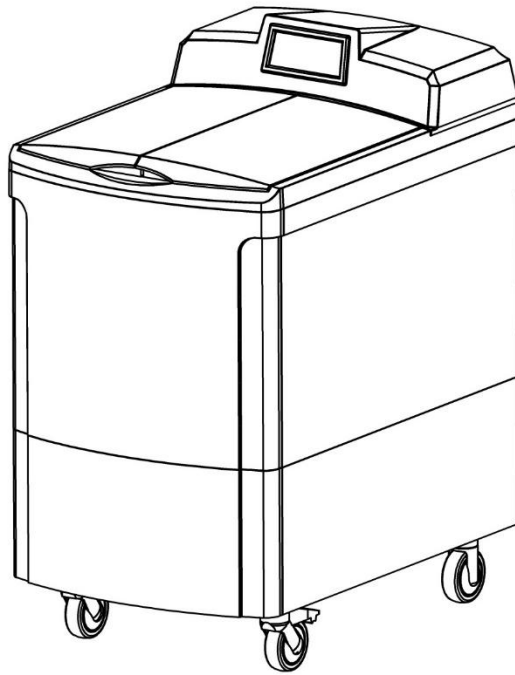


sca3600



Repair Manual

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I. PRELIMINARY STEPS

Follow these steps before attempting to service the SCA



Power off and disconnect the SCA from the main power.

Allow the SCA to cool completely.



Attach a hose to the front valve and drain the tank completely.

Always disconnect the SCA from the main power and drain the tank completely before servicing.

II. QUICK TROUBLESHOOTING

The SCA has been designed to allow the end user to resolve most operating problems. When a problem is encountered, please read through the troubleshooting section below. The 3600 Repair Manual can be found on our website at <https://www.oryxadditive.com/products/sca3600>. Please check if a newer version is available. If a resolution is not found, please contact Technical Support at support@oryxadditive.com or call 1.833.817.3533.



High Risk of Electrical Shock
Always disconnect the unit from power
before removing the back panel!



ALWAYS WEAR PROTECTIVE GLOVES AND EYEWEAR WHEN WORKING INSIDE THE TANK OR HANDLING COMPONENTS THAT ARE COVERED IN CLEANING SOLUTION.

NEVER PLACE YOUR FACE NEAR THE TANK WHEN REMOVING THE LID, VAPORS FROM THE CLEANING SOLUTION MAY CAUSE EYE AND RESPIRATORY IRRITATION.

Problem	Possible Causes	What to Do
No apparent power to the SCA	Power switch is not "On"	Press rocker switch at the back to the ON position (LED lit).
	Power cord is not connected to unit or wall	Check the power cord and make sure it is pushed all the way into the receptacle on the system and is securely connected to a grounded wall socket.
	Fuse is blown	Possible Pump or PCB failure (See No Power to SCA Troubleshooting Section XII E).
	Power circuit has tripped	Check your building circuit breakers for a tripped circuit breaker or blown fuse. Reset or replace the breaker or fuse as required.
	Power Switch has failed	Check the continuity of the Power Switch (See No Power to SCA Troubleshooting Section XII E).
	Control Panel has a loose connection	Reseat the J6 ribbon cable connector on the PCB (See No Power to SCA Troubleshooting Section XII E).
	Thermal Cutoff Switch (TCO) is tripped	Check the TCO (See No Power to SCA Troubleshooting Section XII E).
Pump and Heater will not start	Power is not on	Press rocker switch at the back to the ON position (LED lit).
	Start/Pause button not pressed	Press the Start/Pause button  on the Control Panel to enable the Pump and Heater.
	Timer has not been set and started	The system will only run when the Timer is counting down. Check the Timer display on the Control Panel. - If it is not counting down, press the Start/Pause button . - If the time being displayed is 00:00, then add time and start the system.

Problem	Possible Causes	What to Do
Pump will not start	Control Panel has a loose connection	Reseat the J6 ribbon cable connector on the PCB (See Pump Troubleshooting Section XII A).
	Defective Run Capacitor	Check the capacitance of the Run Capacitor (See Pump Troubleshooting Section XII A).
	Defective Pump	Check the resistance of the Pump and the mechanical rotation of the Pump Shaft (See Pump Troubleshooting Section XII A).
	Defective PCB	Check the input voltage to the Pump (See Pump Troubleshooting Section XII A).
Pump starts but appears weak and ineffective	Clogged Intake Screen	Drain the SCA or remove the Pump (See How to Remove the Pump Assembly Section IV A). Remove the Pump Intake Screen at the bottom of the Pump (See Pump Troubleshooting Section XII A) and inspect for buildup at the impeller. Clean out any debris that will hamper the flow of the water through the Pump.
	Clogged Nozzle	Remove the Nozzle from the pump (See How to Replace the Nozzle Section VI A). Remove any buildup and clean out the Nozzle.
	Bath water saturated with support material	When the bath water becomes saturated with support material, the water is denser than normal. This saturation of the water restricts the flow of the water through the Pump and may appear that the Pump is not functioning optimally. Drain the tank and add fresh water and cleaning solution as described in the “ Operation ” section of the 3600 User Manual.
	Run Capacitor is defective	The Run Capacitor provides half the voltage to the Pump and gives the Pump an initial punch to allow the Pump to start and turn in the proper direction. If the Run Capacitor is defective, the Pump may or may not turn on. If it does turn on, it will only receive half of the input voltage and therefore will only run at half speed. Check the capacitance of the Run Capacitor (See Pump Troubleshooting Section XII A).
Heater will not start	Heater Elements is defective	If the water is not heating at all, check the resistance of the Heater Elements (See Heater Troubleshooting Section XII B).
	Control Panel has a loose connection.	Reseat the J6 Control Panel ribbon cable (See Heater Troubleshooting Section XII B).
	PCB is defective	Check the AC Voltage to the Heater Elements. Check the Heater Control Signal (See Heater Troubleshooting Section XII B).

Problem	Possible Causes	What to Do
Bath heats up but does not reach the Set Temperature or takes a long time to reach the Set Temperature	Heater Element is defective	Check the resistance of the Heater Elements (See Heater Troubleshooting Section XII B).
	Temperature Sensor defective	The Control Panel detects the current temperature of the bath through the Temperature Sensor and displays it on the Control Panel. The bath should heat up 3 minutes per degree to the Set Temperature. If it takes longer to heat up or never reaches the Set Temperature, check the resistance of the Temperature Sensor (See Temperature Sensor Troubleshooting Section XII C).
	Control Panel is defective	The Control Panel may be interpreting the Temperature Sensor inaccurately. Use a thermometer to determine the actual temperature of the bath. Check the resistance of the Temperature Sensor and compare the value to the values in the chart (See Temperature Sensor Troubleshooting Section XII C). If the resistance of the Temperature Sensor and the actual temperature of the bath correspond to each other, the Control Panel may be defective.
	PCB is defective	Check the AC Voltage to the Heater Elements (See Heater Troubleshooting Section XII B). If the voltage is not correct, check the input voltage or replace the PCB.
Alarm is sounding  Warning Indicator flashing: Water Level Indicator flashing	Liquid level is too high or too low High Water  Low Water  Indicator Flashing	Check the indicator lights on the right side of the control panel. If either level indicator is lit, add or remove water from the tank until the indicators turn off. ALWAYS WEAR PROTECTIVE GLOVES AND EYEWEAR WHEN ADDING OR REMOVING LIQUID FROM THE TANK.
Alarm is sounding  Error Code Displayed: EO Over Temperature What It Means: The temperature of the bath has been detected to exceed 5°C over the Set Temperature	Exothermic Reaction from Sodium Hydroxide	Sodium Hydroxide (WaterWorks) creates an Exothermic Reaction (heating effect) when introduced to water. Sodium Hydroxide should only be added to bath water below 50°C. Adding Sodium Hydroxide to hot water can cause heated water to increase temperature quickly and may result in an EO Error if the bath is currently at or near the Set Temperature. This can also cause a dangerous spattering effect. DO NOT ADD SODIUM HYDROXIDE TO HOT WATER. Open the lid and lift the part basket from the tank. Let the liquid return to its set temperature. ALWAYS WEAR PROTECTIVE GLOVES AND EYEWEAR WHEN ADDING SOLUBLE CONCENTRATES OR MANIPULATING THE PART BASKET. NEVER PLACE YOUR FACE NEAR THE TANK WHEN REMOVING THE LID, VAPORS FROM THE CLEANING SOLUTION MAY CAUSE EYE AND RESPIRATORY IRRITATION.
	Defective Temperature Sensor	If the error occurs again, check the resistance of the Temperature Sensor (See Temperature Sensor Troubleshooting Section XII C).
	Defective Control Panel	If the Temperature Sensor resistance is correct, the water temperature can be measured using a thermometer. If the actual temperature of the water, as measured with the thermometer, is different than what is displayed on the Control Panel, the Control Panel may be defective.
	Defective PCB	The Heater Relay contacts may get stuck closed when “pitting” starts to occur because of the age of the mechanical relay and the constant cycling off and on during the normal operation of the SCA. This can cause constant voltage to the Heater Element. The voltage to the Heater Element should be removed when the temperature of the bath reaches 1°C above the Set Temperature. If there is constant voltage to the Heater Element when the temperature of the bath exceeds 2°C above the Set Temperature, the Heater Relay may be stuck in the energized condition even though the Control Panel is not enabling it. The PCB may be defective.

Problem	Possible Causes	What to Do
Alarm is sounding  Error Code Displayed: E5 12V DC Out of Range What It Means: The Control Panel is detecting an abnormal DC voltage from the PCB.	Loose Control Panel ribbon cable	Reseat the J6 Control Panel connector on the PCB (See No Power to SCA Troubleshooting Section XII E).
	Defective DC Power Supply on the PCB	Check the DC voltage between TP10 and TP12 (See No Power to SCA Troubleshooting Section XII E). This voltage should be greater than 10V DC.
	Input Power to the PCB Incorrect	Check the input power to the PCB (See No Power to SCA Troubleshooting Section XII E). There should be 207V AC → 253V AC (230 VAC +/- 10%).
	Control Panel is defective	If the incoming power is correct, and the DC power is correct, the Control Panel may be defective.
Alarm is sounding  Error Code Displayed: r1 Abnormal Temperature Sensor resistance detected What It Means: The Control Panel is detecting abnormal resistance from the Temperature Sensor.	Loose Control Panel ribbon cable	Reseat the J6 Control Panel connector on the PCB (See Temperature Sensor Troubleshooting Section XII C).
	Loose NTC Connector (Temperature Sensor) on the PCB	Reseat the NTC connector on the PCB (See Temperature Sensor Troubleshooting Section XII C).
	Defective Temperature Sensor	Check the Temperature Sensor resistance (See Temperature Sensor Troubleshooting Section XII C).
	Defective Control Panel	Use a thermometer to determine the actual temperature of the bath (See Temperature Sensor Troubleshooting Section XII C). If the temperature of the bath corresponds to the resistance of the Temperature Sensor, the Control Panel may be defective.
Alarm is sounding  Error Code Displayed: r2 Abnormal High Water Sensor resistance detected What It Means: The Control Panel is detecting abnormal resistance from the High Water Sensor.	Loose Control Panel ribbon cable	Reseat the J6 Control Panel connector on the PCB (See Water Level Sensor Troubleshooting Section XII D).
	Loose WLS-H Connection (High Water Sensor) on the PCB.	Reseat the WLS-H connector on the PCB (See Water Level Sensor Troubleshooting Section XII D).
	Defective Water Level Sensor	Check the Water Level Sensor resistance (See Water Level Sensor Troubleshooting Section XII D).
	Defective Control Panel	If the Water Level Sensor resistance is correct, the Control Panel may be defective.
Alarm is sounding  Error Code Displayed: r3 Abnormal Low Water Sensor resistance detected What It Means: The Control Panel is detecting abnormal resistance from the Low Water Sensor.	Loose Control Panel ribbon cable	Reseat the J6 Control Panel connector on the PCB (See Water Level Sensor Troubleshooting Section XII D).
	Loose WLS-L Connection (Low Water Sensor) on the PCB.	Reseat the WLS-L connector on the PCB (See Water Level Sensor Troubleshooting Section XII D).
	Defective Water Level Sensor	Check the Water Level Sensor resistance (See Water Level Sensor Troubleshooting Section XII D).
	Defective Control Panel	If the Water Level Sensor resistance is correct, the Control Panel may be defective.

III. REMOVING TOP COVER AND BACK PANEL

A. How to Remove the Back Panel

1. **Remove the Back Panel**
 - a. With the SCA unplugged from power, remove the two screws from the top center and bottom center of the Back Panel (*See Figure 1*).
 - b. Loosen the remaining six M4 screws holding the Back Panel.
 - c. Push up on the Back Panel and remove.

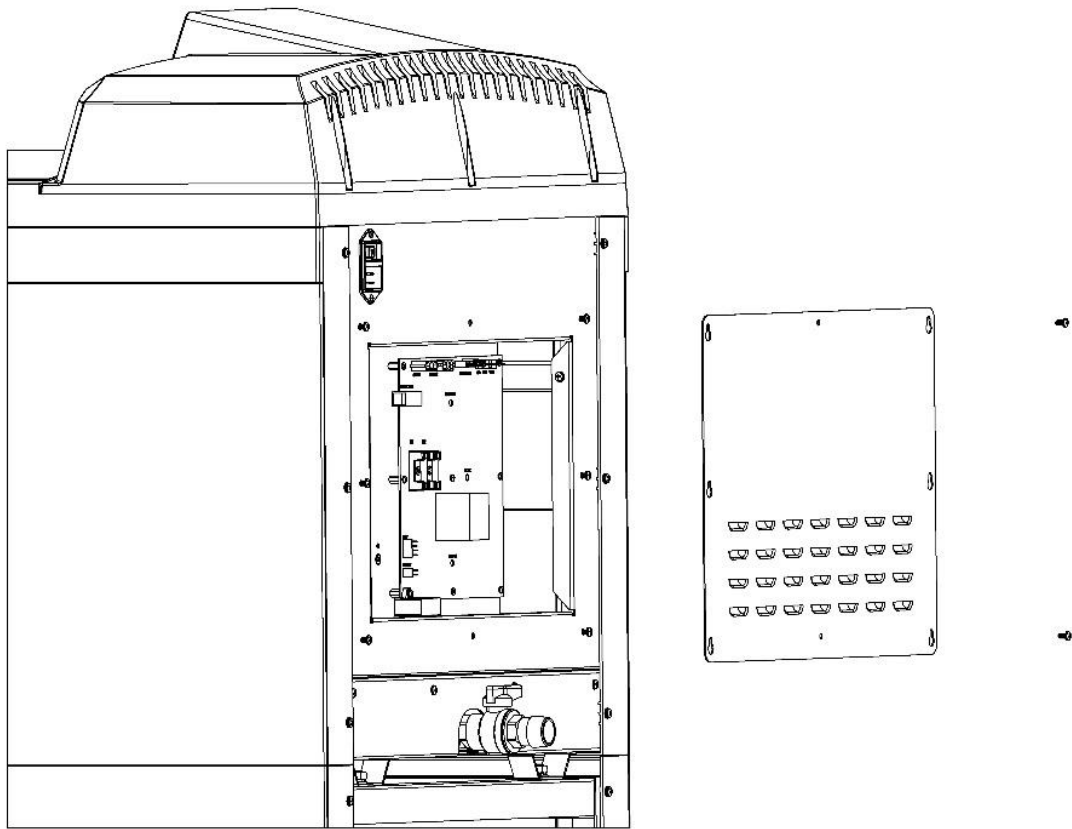


Figure 1 – Removing the Back Panel

B. How to Remove the Top Cover

1. Remove the Top Cover

- With the SCA unplugged from power, remove the J6 Control Panel ribbon cable from the PCB (*See Figure 2*).
- Remove the three M5 screws.
- Remove the cover by pushing lightly on the back of the cover and pull off, carefully pulling the J6 ribbon cable through the Bridge Slot.

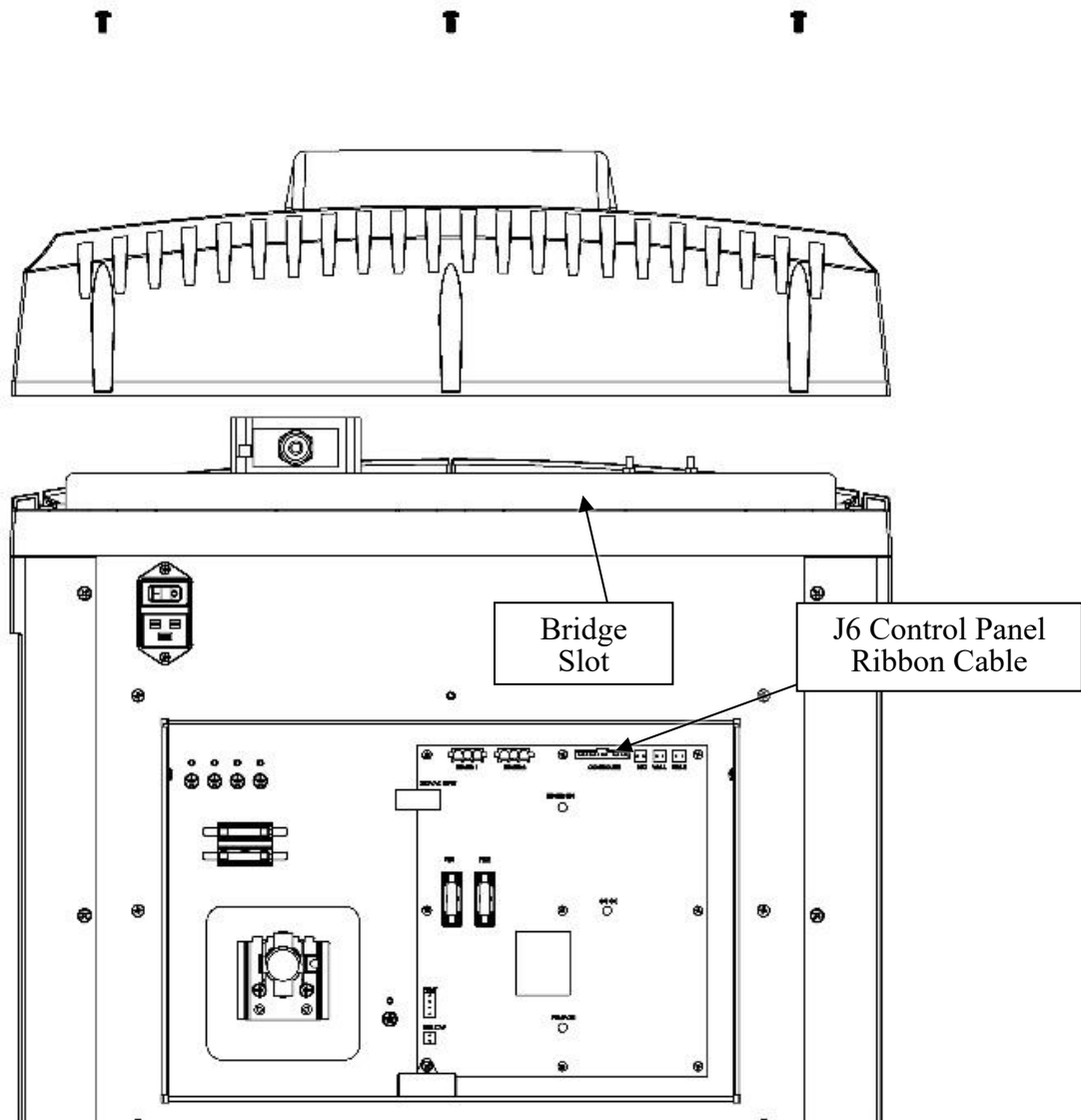


Figure 1 – Removing the Top Cover

IV. PUMP ASSEMBLY REPLACEMENT

A. How to remove the Pump Assembly

1. **Remove the Pump Assembly**
 - a. Unplug the SCA from power and remove the Back Panel (See [How to Remove the Back Panel Section III A](#)).
 - b. Remove the Top Cover (See [How to Remove the Top Cover Section III B](#)).
 - c. Disconnect the Pump Motor connector from the PCB Assembly (See [Figure 3](#)).
 - d. Remove the screw holding the motor ground wire to the frame.
 - e. Gently pull the motor wires through the Bridge Slot.
 - f. Unplug the three sensor connectors from the PCB and pull through the Bridge Slot. Ensure the labels do not get damaged.

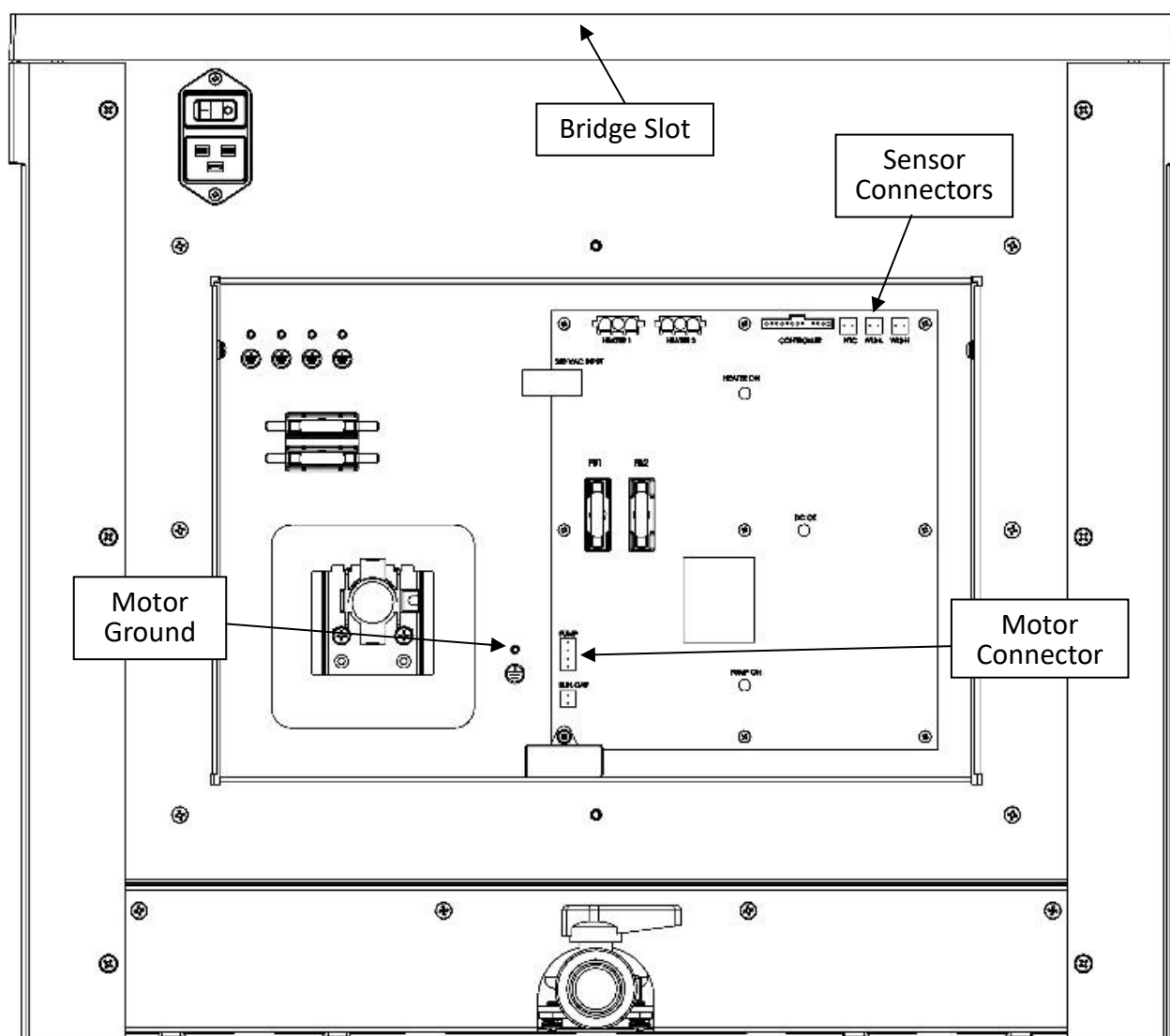


Figure 3 – Pump Motor and Sensor Connectors

- g. Remove the four M5 screws holding the Pump Assembly and ground wire (**See Figure 4**).
- h. Grip the Pump Assembly by the motor and carefully guide the Pump Assembly through the hole in the Bridge.

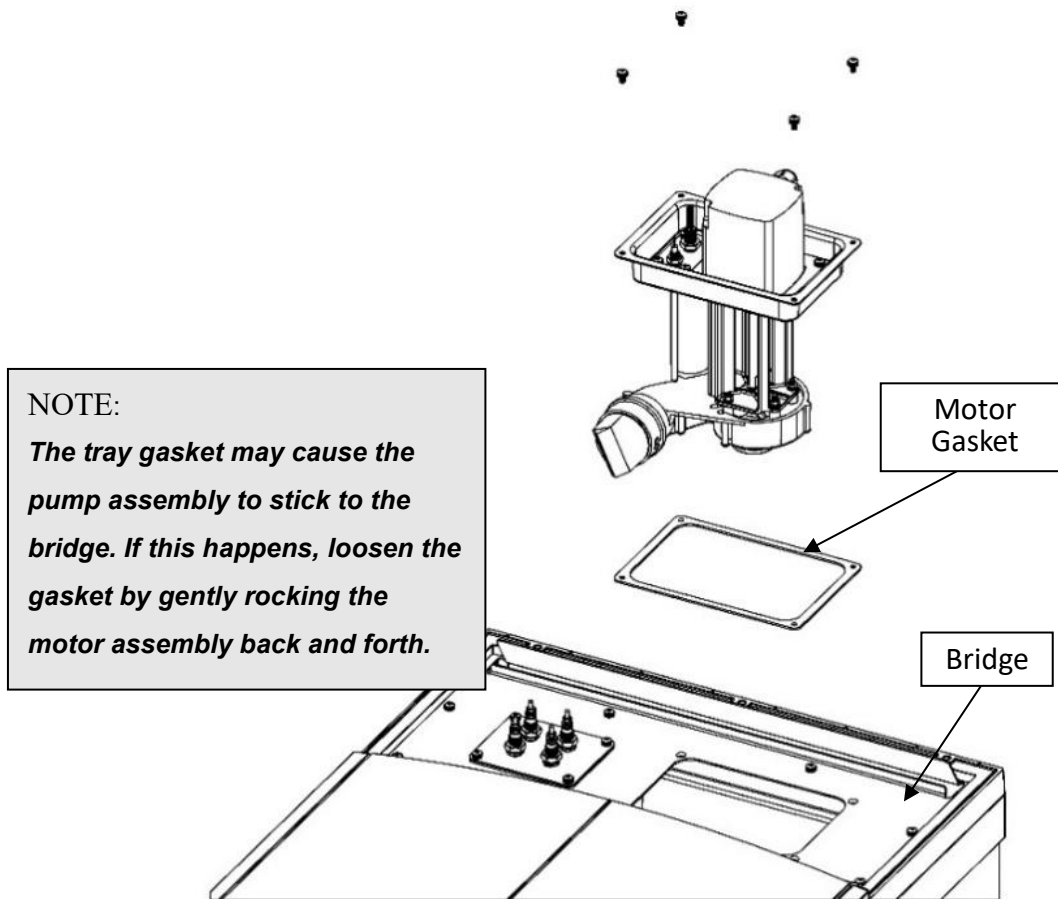


Figure 4 – Pull the Pump

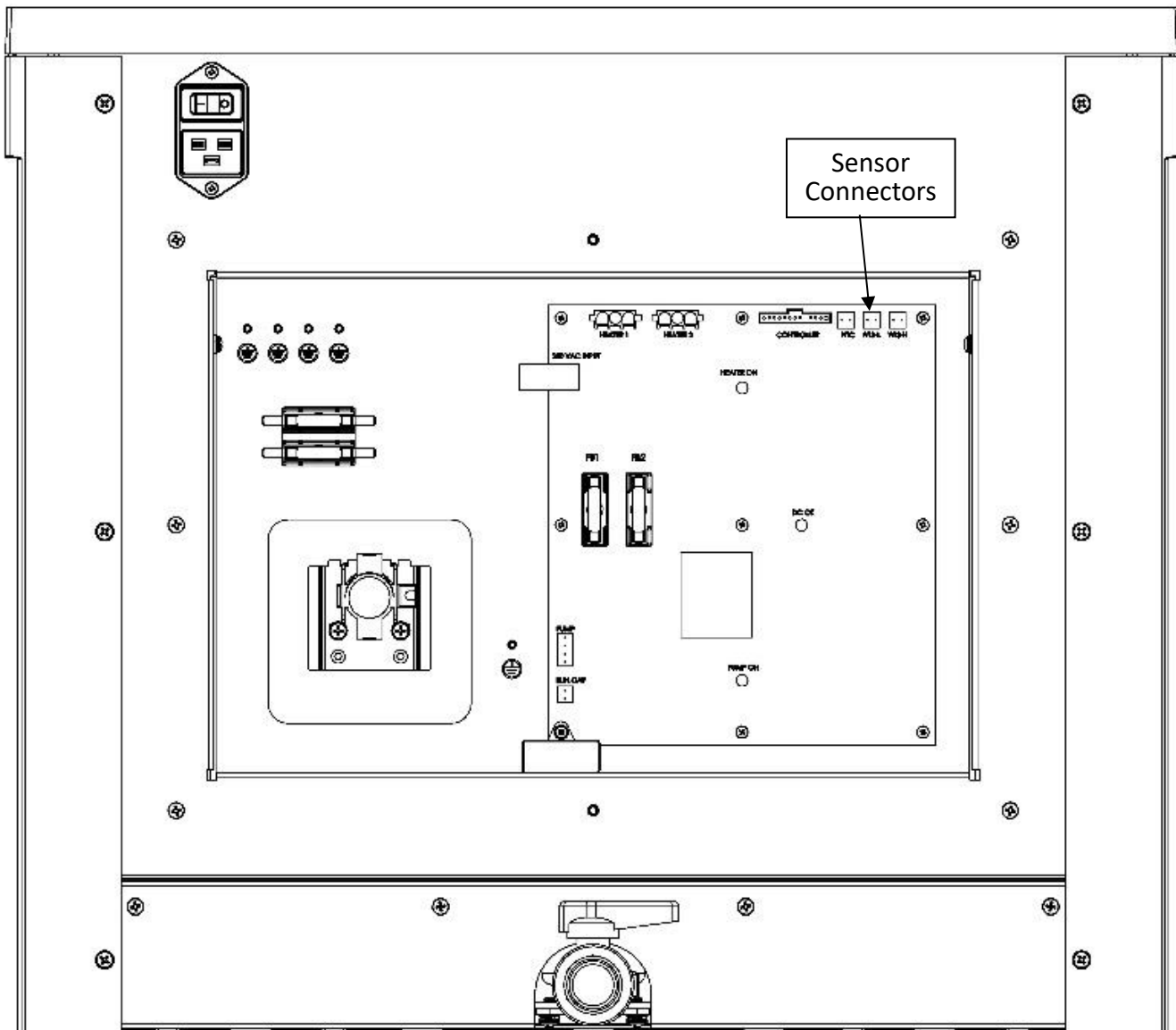
B. How to install the Pump Assembly

1. **Install the Pump Assembly**
 - a. Place the gasket on Bridge and align the holes with the 4 screw threads. Grip the Pump Assembly by the motor and carefully guide the Pump through the Bridge until the Motor Tray is seated on the gasket.
 - b. Mount the Pump Assembly to the Bridge using the four M5 mounting screws and washers and attach the ground wires to the tray.
 - c. Thread the motor wires through the Bridge Slot.
 - d. Attach the ground wire from the motor to the frame.
 - e. Plug in the connector from the motor to the PCB.
 - f. Thread the 3 sensor connectors through the Bridge Slot.
 - g. Plug in the 3 sensor connectors to the appropriate slots on the PCB (ensure the connectors are in the appropriate slots or an "r" error will occur).
 - h. Slide the Back Panel on and secure (**See How to Remove the Back Panel Section III A**).
 - i. Plug ribbon cable from the Control Panel back into the PCB.
 - j. Place Top Cover back on the SCA and secure (**See How to Remove the Top Cover Section III B**).

V. SENSOR ASSEMBLY REPLACEMENT

A. How to Remove the Sensor Assembly

1. **Remove the Sensor Assembly**
 - a. Remove the Back Panel (See [How to Remove the Back Panel](#) Section III A).
 - b. Remove the Top Cover (See [How to Remove the Top Cover](#) Section III B).
 - c. Unplug the three sensor connectors from the PCB (See [Figure 5](#)).



- d. Remove the four M5 screws holding the Sensor Assembly (*See Figure 6*).
- e. Carefully pull the sensor wires through the Bridge Slot.
- f. Remove the Sensor Assembly from SCA. A Flat Head screwdriver may be used to pry up the Sensor Assembly from the tray if it sticks.

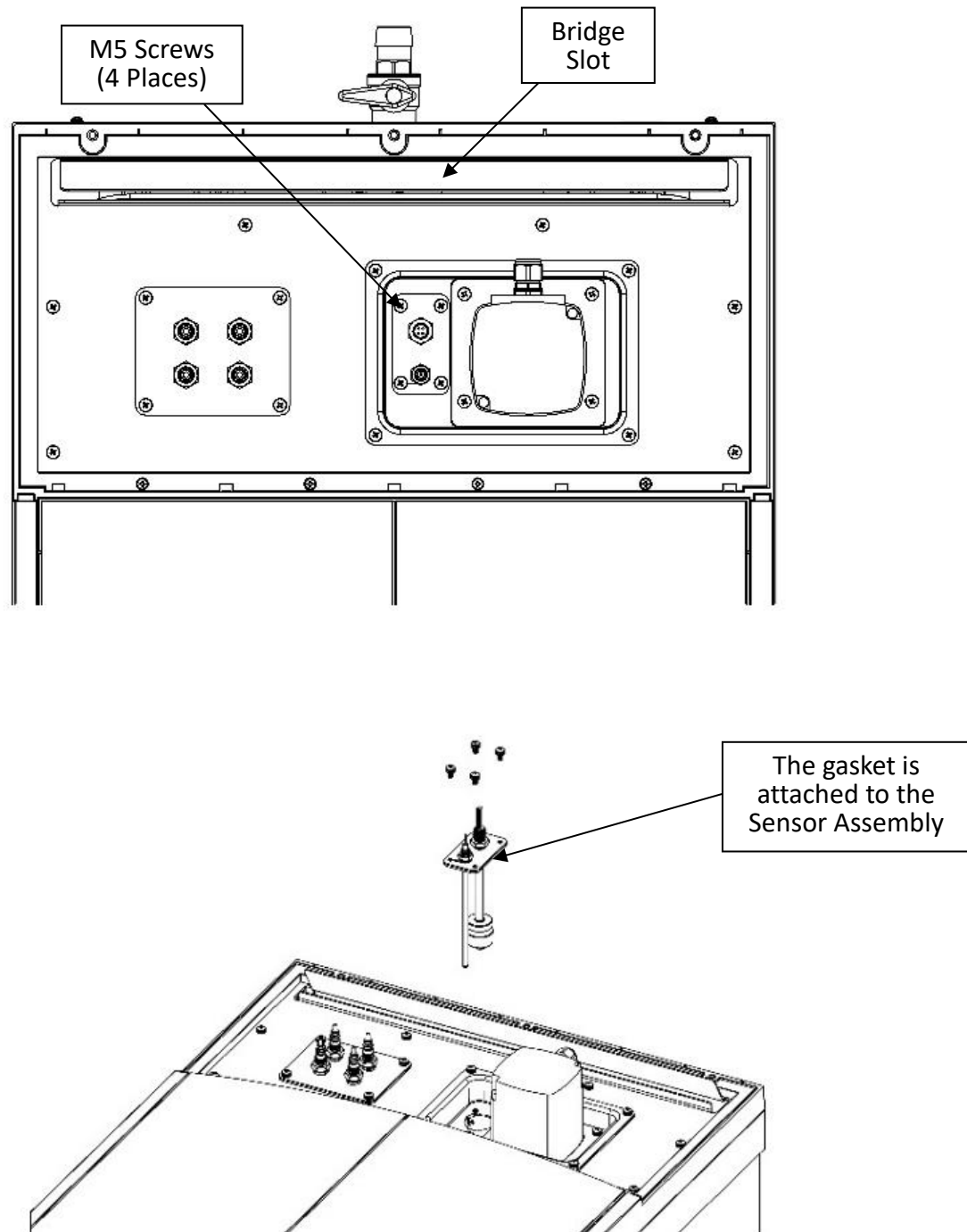


Figure 7 – Remove the Sensor Assembly

B. How to install the Sensor Assembly

1. **Install the Sensor Assembly**
 - a. Insert the Sensor Assembly into the Motor Tray.
 - b. Mount the Sensor Assembly using the four M5 screws.
 - c. Carefully thread sensor wires through the Bridge.
 - d. Plug in the 3 sensor connectors into the appropriate slots on the PCB.
 - e. Plug in the J6 ribbon cable back into the PCB.
 - f. Slide the Back Panel on and secure (**See How to Remove the Back Panel Section III A**).
 - g. Slide the Top Cover on and secure (**See How to Remove the Top Cover Section III B**).

VI. SPRAY NOZZLE REPLACEMENT

A. How to Replace the Nozzle

1. **Replace the Nozzle**
 - a. The 3600 has a Bayonet Style Nozzle that latches on to the outlet of the Pump. Twist the Nozzle counterclockwise to unlatch (*See Figure 8*).
 - b. Ensure the Nozzle is orientated correctly (*See Figure 9*). Twist the Nozzle clockwise to latch. Ensure the O-Ring is in place, or the Nozzle will not latch correctly.

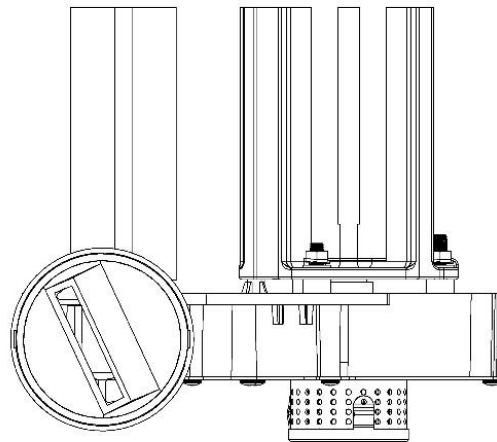
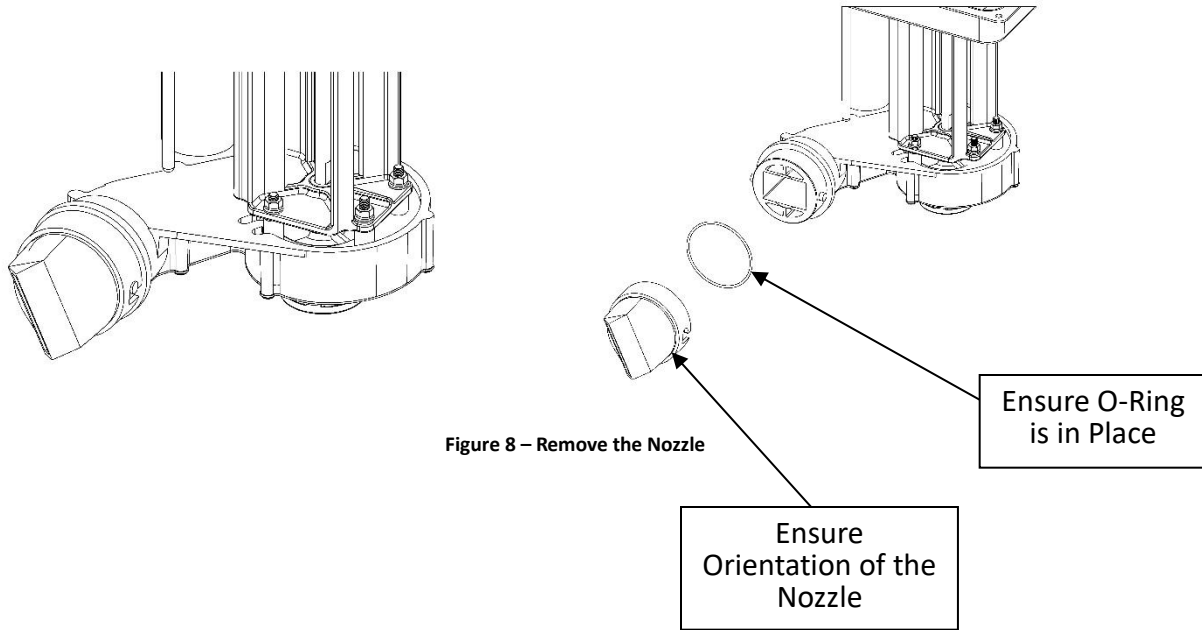


Figure 9 – Proper Orientation of the Nozzle

VII. HEATER ASSEMBLY REPLACEMENT

A. How to Remove the Heater Assembly

1. **Remove the Heater Assembly**
 - a. Unplug the SCA from power and remove the Back Panel (See [How to Remove the Back Panel](#) Section III A).
 - b. Remove the Top Cover (See [How to Remove the Top Cover](#) Section III B).



SHOCK HAZARD! PLEASE ENSURE POWER PLUG IS REMOVED FROM THE SCA.

- c. Unplug the Heater Assembly's two connectors from the PCB Assembly (See [Figure 10](#)).

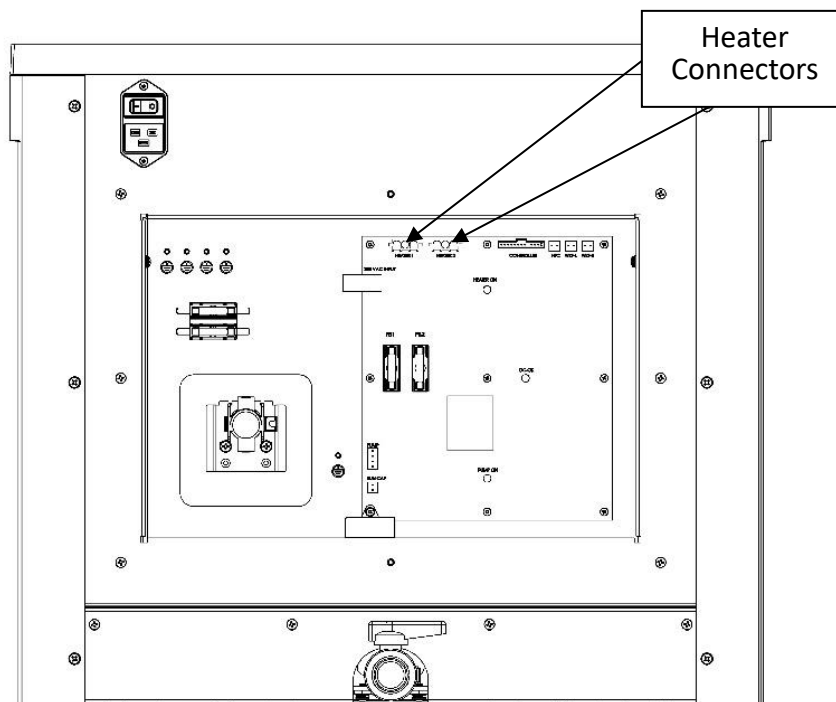


Figure 10 – Heater Connectors

- d. Gently pull the Heater wires through the Bridge Slot.
 - e. Remove the four M5 screws holding the Heater Assembly and ground wire (See [Figure 11](#)).



ALLOW THE HEATING ELEMENT FOR COMPLETELY COOL BEFORE REMOVING.

- f. Carefully remove the Heater Assembly from SCA.

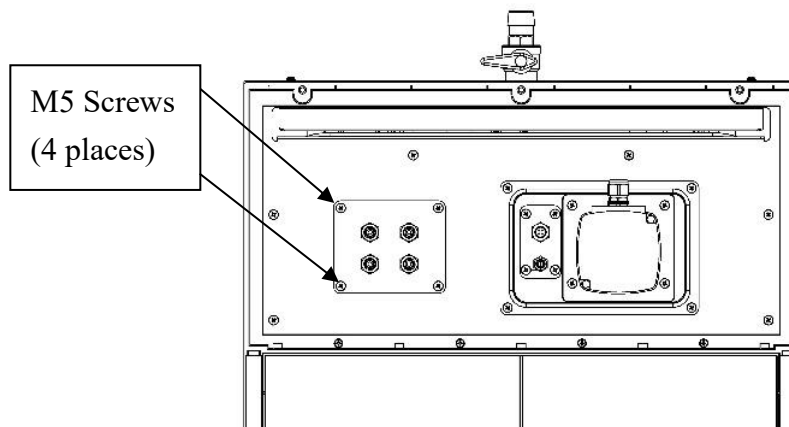


Figure 11 – Top View of the SCA with the Top Cover Removed

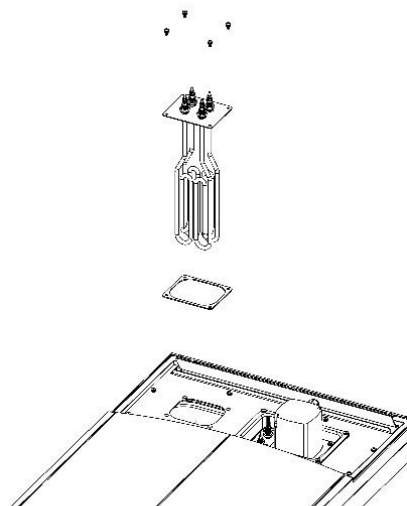


Figure 12 – Remove the Heater Assembly

B. How to Install the Heater Assembly

1. Install the Heater Assembly

- a. Carefully guide the Heater Assembly through the hole in the Bridge until the plate is seated on the gasket on top of the Bridge.
- b. Mount the Heater Assembly to the Bridge using the four M5 mounting screws and attach the ground wire to the tray.
- c. Carefully pull the Heater wires through the Bridge.
- d. Plug the three Heater wire connectors back into the PCB.
- e. Place the Back Panel on to the SCA (**See How to Remove the Back Panel Section III A**).
- f. Place the Top Cover back on and secure with the six screws (**See How to Remove the Top Cover Section III B**).

VIII. DISPLAY CONTROL PANEL REPLACEMENT

A. How to Remove the Display Control Panel

1. **Remove the Display Control Panel**
 - a. Unplug the SCA from power and remove the Back Panel (See [How to Remove the Back Panel Section III A](#)).
 - b. Remove the Top Cover (See [How to Remove the Top Cover Section III B](#)).
 - c. Disconnect the J6 Control Panel ribbon cable from the PCB.
 - d. Remove the J6 Control Panel ribbon cable supports from the posts.
 - e. Remove the six M4 screws from inside that hold the Control Panel (See [Figure 13](#)).

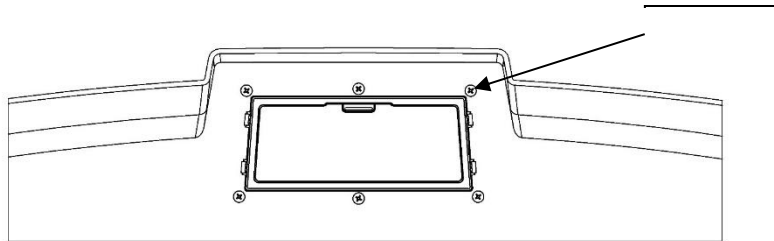
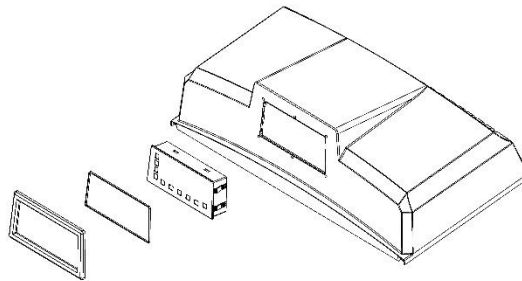


Figure 13 – Remove the Screws

- f. Slide the Control Panel out of the cover.



B. How to Install the Display Control Panel

1. **Install the Display Control Panel**
 - a. Thread the ribbon cable through the hole on the front of the Top Cover where the display will be mounted.
 - b. Check the orientation of the Control Panel and proceed to press the panel into the Top Cover.
 - c. Turn cover over and secure the Control Panel with the six M4 screws
 - d. Mount the Control Panel ribbon cable supports to the posts using the four M5 screws.
 - e. Plug the ribbon cable from Control Panel back into the PCB.
 - f. Place the Top Cover back on and secure (See [How to Remove the Top Cover Section III B](#)).
 - g. Place the Back Panel on SCA and secure (See [How to Remove the Back Panel Section III A](#)).

VIII. PCB ASSEMBLY REPLACEMENT

A. How to Remove the PCB Assembly

1. **Remove the PCB Assembly**
 - a. Remove Back Panel (See [How to Remove the Back Panel](#) Section III A).
 - b. Check the wires to make sure the labels are on the wires connected to the PCB.
 - c. Remove all the wire connectors from the PCB, be careful not to rip off a wire label.
 - d. Remove the nine screws that hold the PCB in place (See [Figure 14](#)).

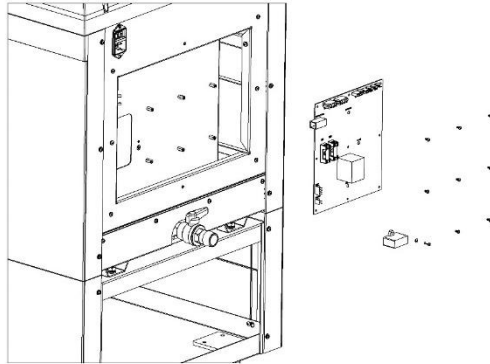


Figure 14 – Remove the Screws and Remove PCB

- e. Grip the edge of the circuit board and carefully slide the board out. Make sure not to damage any wires as you remove the board.

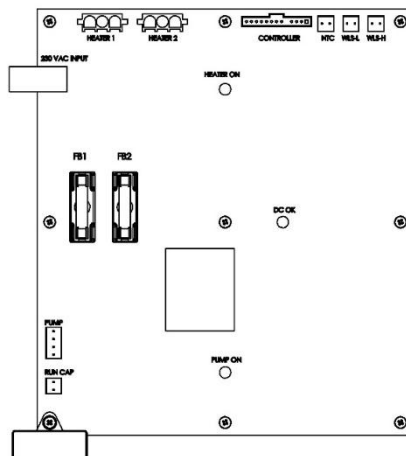


Figure 15 – PCB

B. How to Install the PCB Assembly

1. **Install the PCB Assembly**
 - a. Slide the PCB in at an angle as you guide the board onto the supports for the board. Make sure not to damage any wires as the board is placed. Make sure no wires get behind the board.
 - b. Mount the PCB with the nine screws.
 - c. Connect the wires to their proper locations by referencing the labels on the wires and the circuit board.
 - d. Place the Back Panel on SCA and secure (See [How to Remove the Back Panel](#) Section III A).

X. POWER SWITCH REPLACEMENT

A. How to Remove the Power Entry Module (PEM) Switch

1. Remove the PEM

- Remove the Back panel (See [How to Remove the Back Panel Section III A](#)).
- Disconnect the PEM wire connectors from the fuse terminals.

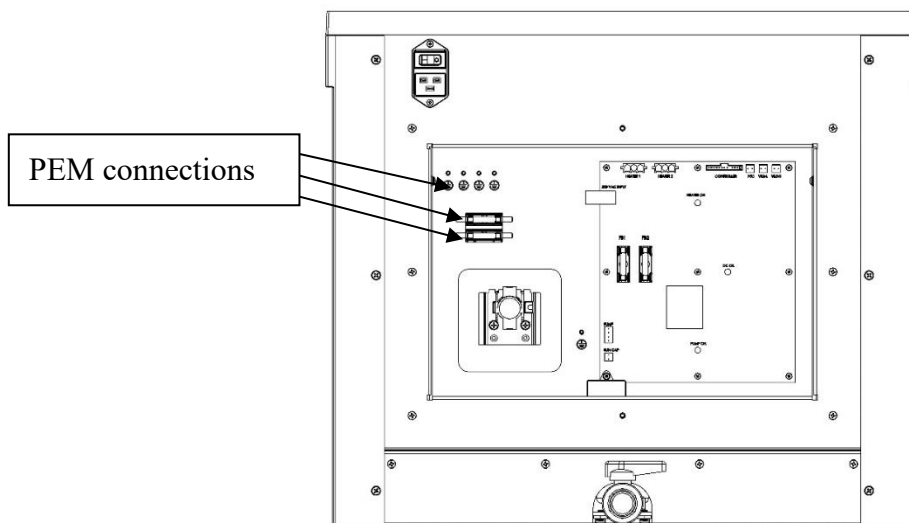


Figure 16 – Location of Switch Wires

- Remove the two M3 screws on the switch and remove the switch.

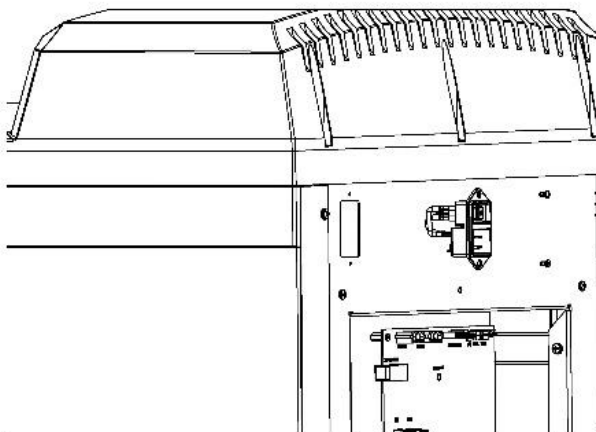


Figure 17 – Remove the Power Switch

B. How to Install the Power Entry Module (PEM) Switch

1. Install the PEM

- Press the switch back into the case and secure with the two M3 screws.
- Connect the wires from the switch and secure the ground wire with the M3 screw.
- Place the Back Panel on SCA and secure (See [How to Remove the Back Panel Section III A](#)).

XI. FUSE REPLACEMENT

A. How to Replace the Fuses

1. Replace the F1/F2 Fuse

- Remove the Back Panel (See [How to Remove the Back Panel](#) Section III A).
- Pry the fuse out of the clips. A small flathead screwdriver can help. Pry closer to the metal ends.
- Replace the damaged fuse with a new fuse of the same rating.
- Place the Back Panel on (See [How to Remove the Back Panel](#) Section III A).

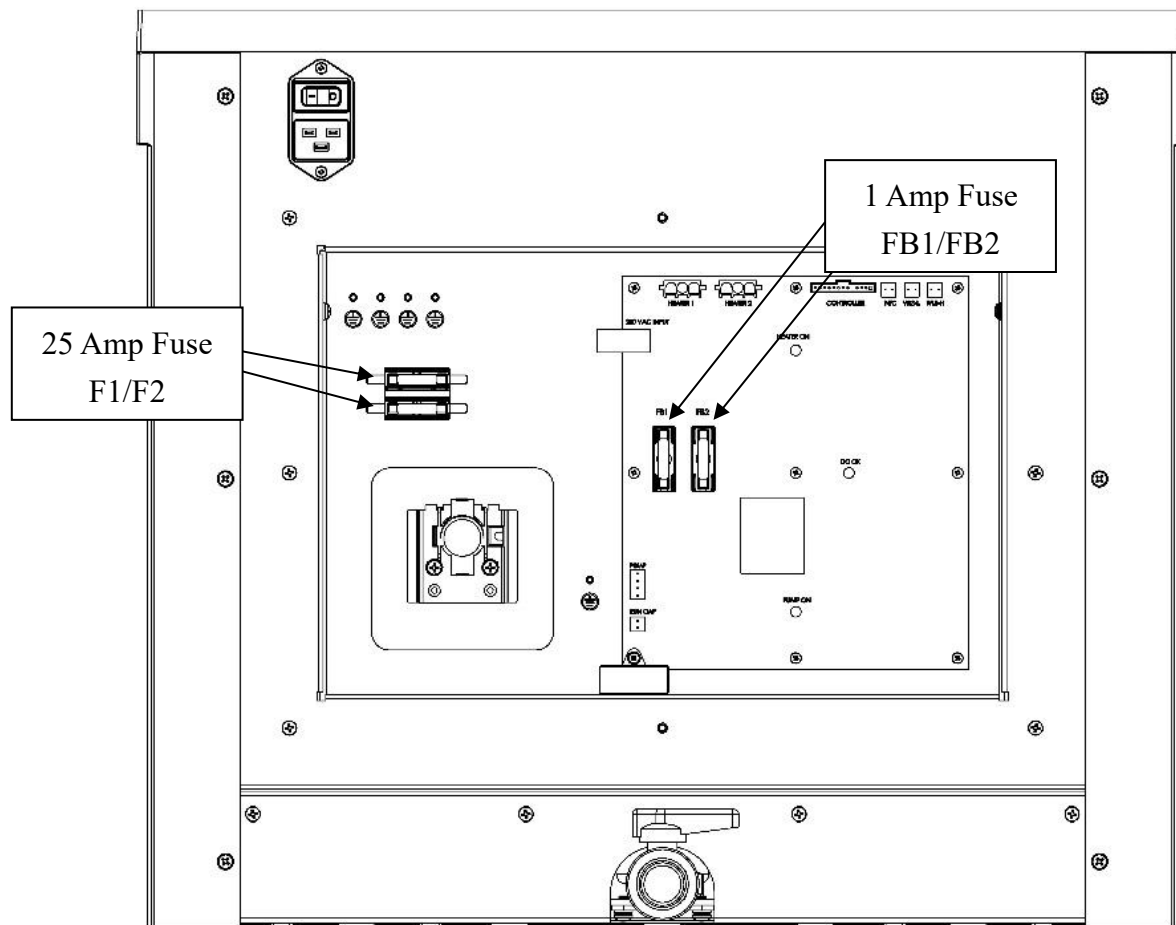


Figure 18 – Remove the Power Switch

2. Replace the FB1 and FB2 1 Amp Fuses

- Remove the Back Panel (See [How to Remove the Back Panel](#) Section III A).
- Pry the fuse out of the clips. A small flathead screwdriver can help. Pry closer to the metal ends.
- Press the new fuse into the clips
- Place the Back Panel on (See [How to Remove the Back Panel](#) Section III A).

XII. TROUBLESHOOTING STEPS

NOTE:

The symbol “~” prefixing the measured value denotes “**approximate**”. Most measurements will not be completely accurate with the values represented in this manual, but the SCA will function normally. Usually, measurements that are extremely different from the indicated measurements will represent a possible failure in the component. All measurements should be verified several times to ensure the test probes are contacting the connector pins properly.

Before troubleshooting individual components, it is recommended that all connectors on PCB Board be reseated (unplugged and plugged back in) to eliminate the possibility of a loose connection.

Recommended Tools

Digital Multimeter with Capacitance Selection (See red circle on Multimeter image)

.7mm Test Probes (Helpful measuring inside connector contacts)

Test Hooks (Helpful for clamping on to pins on the PCB)



Test Hooks



.7 mm Test Probes

Digital Multimeter with Capacitance Selection

A. Pump Troubleshooting

Symptom: Pump Not Starting, Pump Starting but has Low Circulation

Theory: The Water Pump uses a 230 VAC motor that circulates the water from the intake at the bottom of the Pump out through the Nozzle using an impeller attached to the Motor Shaft. The Run Capacitor gives the Pump an initial punch to rotate the Pump Motor Shaft in the proper direction as well as supply half the voltage to the Pump.

Steps:

1. Check the “PUMP ON” Green LED

- Remove the back panel ([See How to Remove the Back Panel Section III A](#)).
- Power on the SCA and press the Start Button  on the Control Panel. The “PUMP ON” LED should light up when the Start Button is pressed. Check if the “PUMP ON” LED is illuminated ([See Figure 19](#)).
 - If the “PUMP ON” LED is lit when the Start Button is pressed, the Control Panel is functioning correctly. Skip to the next section (Section 2).
 - If the “PUMP ON” LED is *not* lit when pressing the Start Button, continue to the next step (Step c).

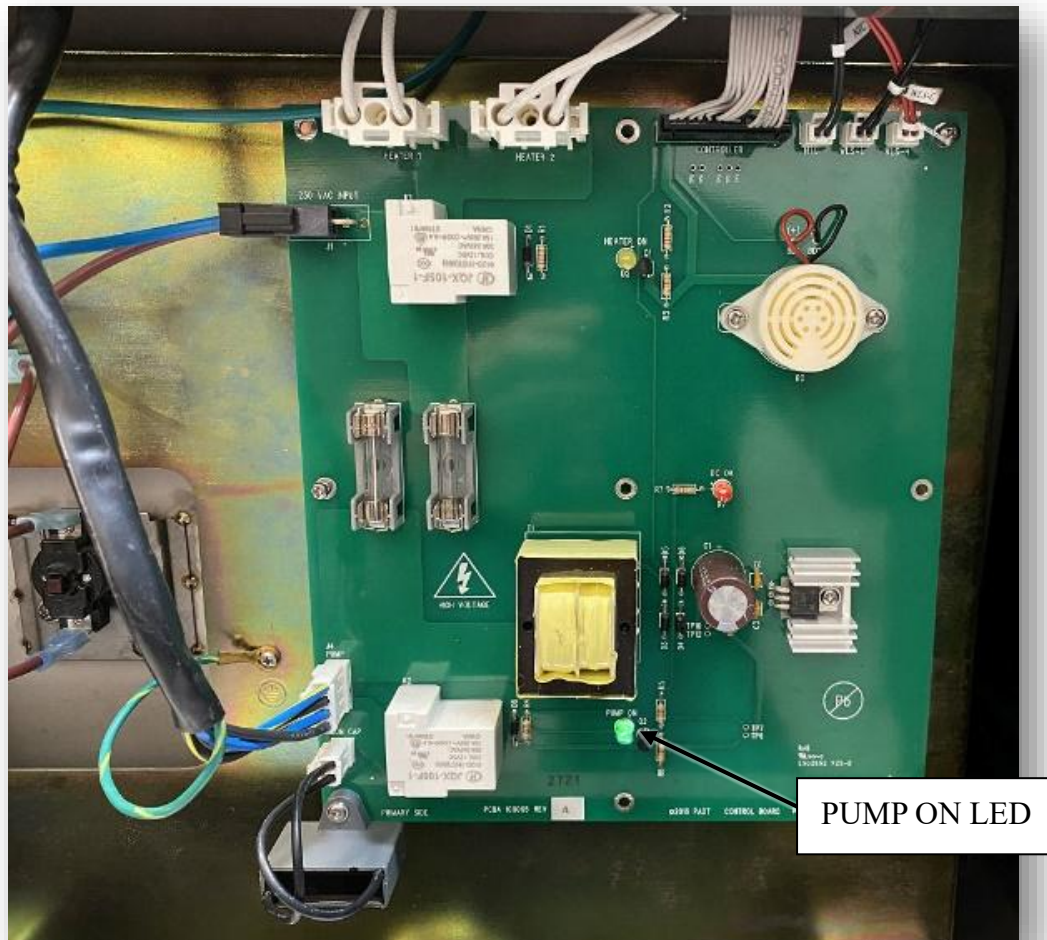


Figure 19 – Pump On LED

- c. Unplug the SCA from power and reseat (unplug and plug back in) the J6 “CONTROLLER” ribbon cable (**See Figure 20**). The latch must be released to remove the ribbon cable. Press the latch with a thumbnail and wiggle the connector out of the slot. Plug the ribbon connector back into the PCB slot and ensure it snaps securely. Power on the SCA and press the Start Button .
 - i. If the “PUMP ON” LED lights up, there was probably just a loose connection from the Control Panel to the PCB. Ensure the Pump is turning on and operating correctly.
 - ii. If the “PUMP ON” LED does *not* light up, continue to the next step (Step d).



Figure 20 – J6 Ribbon Cable

- d. Set the multimeter to the DC Voltage Selection  and check the Motor Enable Signal on the PCB. The Pump Motor Enable Signal to the Pump Motor Relay can be measured between TP7 (Motor Enable Signal) and TP6 (**See Figure 21**).
 - i. If the multimeter reads ~ 12.0 VDC, the Control Panel is operating correctly. Replace the PCB.
 - ii. If the multimeter reads ~ 0.00 VDC, replace the Control Panel. Ensure the J6 connector is snapped in securely and re-verify the voltage.

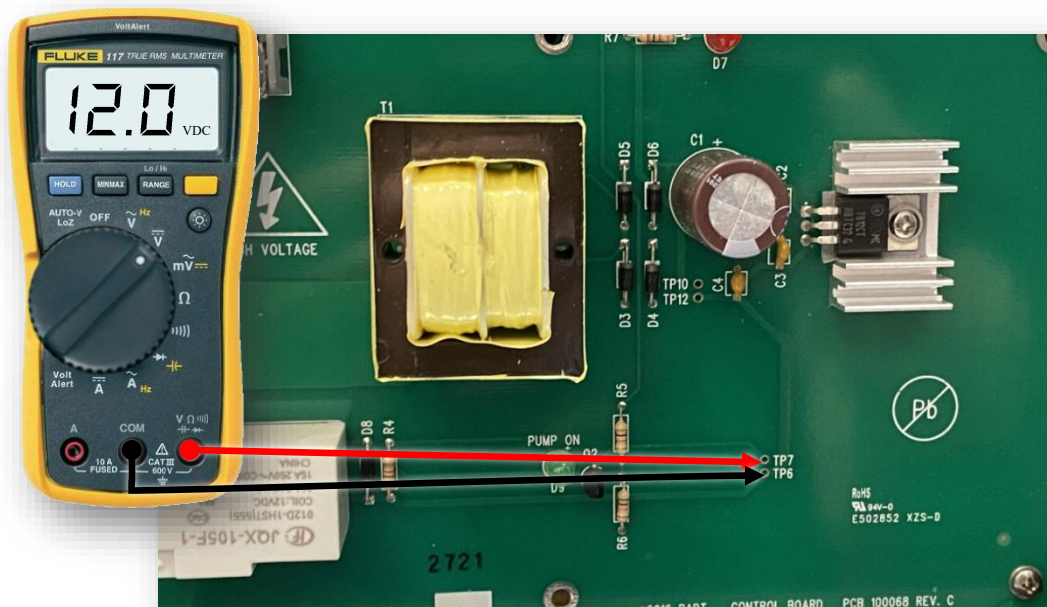


Figure 21 – Pump Enable Signal

2. Check the Pump Motor Resistance

- a. Unplug the SCA from power and remove the “PUMP” connector from the PCB. Choose the Resistance Selection Ω on the multimeter. Check the resistance of the Pump between pins 1 and 3 (See Figure 22).
 - i. If the multimeter reads $\sim 176.0 \Omega$, continue to the next step (Step b).
 - ii. If the multimeter reads 0.00Ω (shorted) or OL (open), replace the pump. Verify initial measurement.

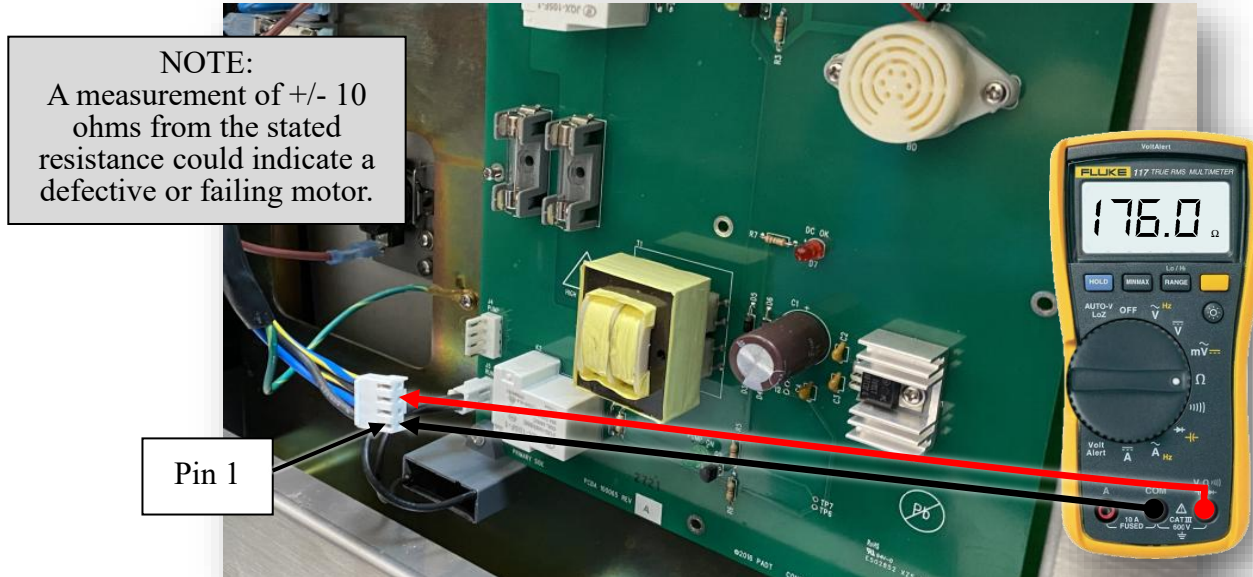


Figure 22 – Pins 1 and 3 (Pump Motor Winding Resistance)

- b. Check the resistance of the Pump between pins 2 and 4 (See Figure 23).
 - i. If the multimeter reads $\sim 113.0 \Omega$, continue to the next section (Section 3).
 - ii. If the multimeter reads 0.00Ω (shorted) or OL (open), replace the pump. Verify initial measurement.

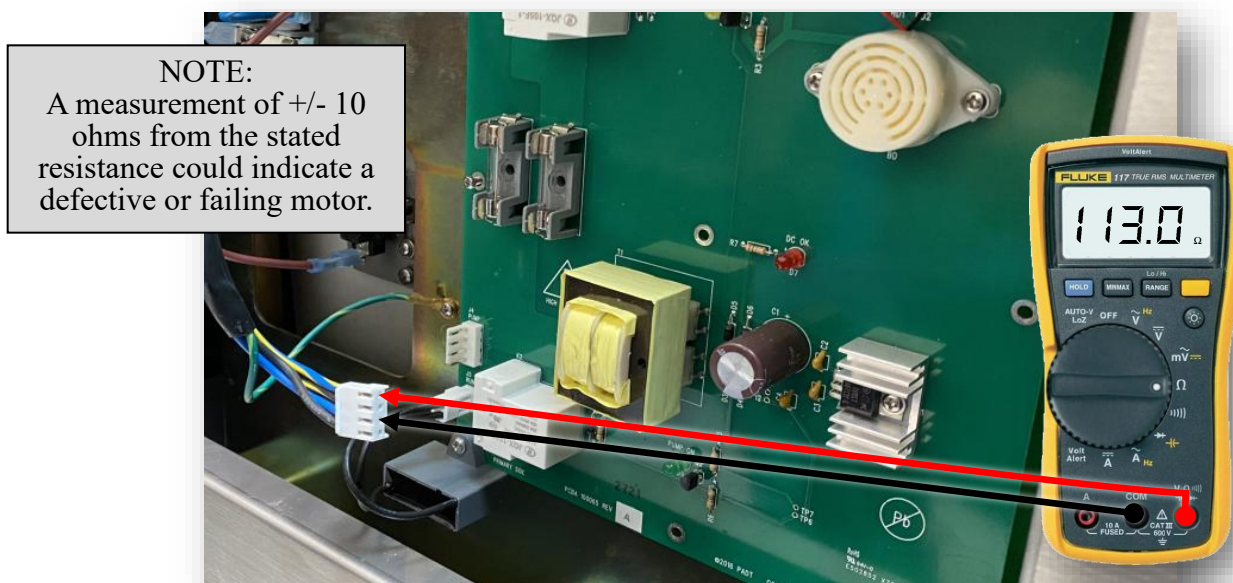


Figure 23 – Pins 2 and 4 (Pump Motor Winding Resistance)

3. Test the Input Voltage to the Pump

- a. With the SCA still unplugged from power and the “PUMP” disconnected from the PCB, place one lead of the multimeter Test Hooks to pin 1 and the other Test Hook to pin 3 on the PCB connector. Set the multimeter to the AC Voltage Selection $\tilde{V}$. Plug the SCA into power and power on. Press the Start Button ⏻ on the Control Panel to enable the Pump. Check the voltage to the Pump between pins 1 and 3 (*See Figure 24*).
 - i. If the multimeter reads ~ 208 VAC (~ 230 VAC EU), continue to the next step (Step b).
 - ii. If the multimeter reads ~ 0.00 VAC, this is an indication that the PCB is defective.



Figure 24 – Pins 1 and 3 (Pump Motor Winding Input Voltage)

- b. Unplug the SCA from power and place one lead of the multimeter Test Hooks to pin 2 and the other Test Hook to pin 4. Plug the SCA into power and power on. Press the Start Button on the Control Panel to enable the Pump. Check the voltage to the Pump between pins 2 and 4 (*See Figure 25*).
 - i. If the multimeter reads ~ 208 VAC (~ 230 VAC EU), continue to the next step (Step c).
 - ii. If the multimeter reads ~ 0.00 VAC, this is an indication that the Run Capacitor is defective.

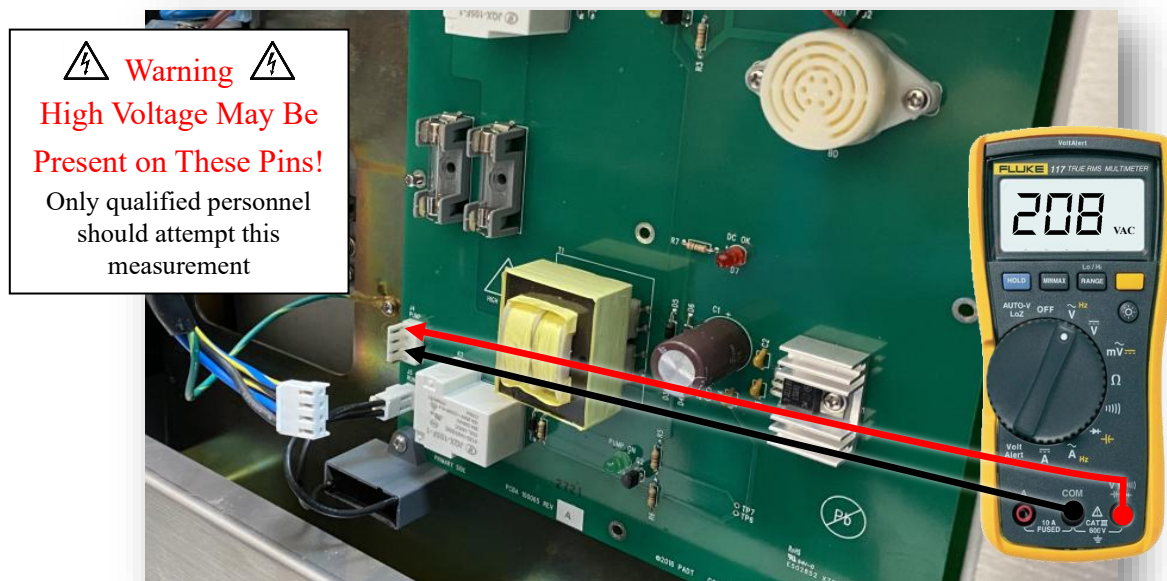


Figure 25 – Pins 2 and 4 (Pump Motor Winding Input Voltage)

- c. If there is no voltage between pins **1** and **3** and pins **2** and **4** and the “PUMP ON” LED is lit, replace the PCB.
- d. If there is voltage between pins **1** and **3**, and no voltage between pins **2** and **4**, the Run Capacitor may be defective. Skip to the next section (Section 4) to check the Run Capacitor.

4. Visually Inspect the Run Capacitor

- a. The Run Capacitor gives the Pump Motor an initial punch to get the Pump Motor Shaft rotating correctly and in the proper direction. It also supplies half the voltage to the Pump Motor. If the Pump Motor starts, and the Run Capacitor is defective, the motor will continue to run but will only run at approximately half strength and will not have sufficient power to agitate the water well. A visual inspection of the Run Capacitor may help determine if it is defective. If it appears there is a leak in the capacitor (a bulge, bubble or strings extruding) the capacitor is leaking Electrolyte and should be replaced.

5. Check the Capacitance of the Run Capacitor

- a. The capacitance can be measured with a multimeter that has a Capacitance Selection μF . The Selection Button on the multimeter may need to be pressed to enable the Capacitance measurement (**See Figure 26**). Remove the Run Capacitor connector and measure the Capacitance across both wires. The multimeter should read $\sim 1.5 \mu F$ (microfarads). Capacitors do degrade over time. A capacitor with lower capacitance measurement may function just fine. However, it is recommended to replace the capacitor when replacing the Pump or PCB due to the low retail cost, and the possibility that the capacitor will degrade to a point where the Pump will no longer start.



Figure 26 – Run Capacitor

6. Inspect the Pump

- a. If the Pump resistance, voltage and control signals are valid, remove and inspect the mechanical properties of the Pump (**See How To Remove the Pump Assembly Section IV A**).
- b. Remove and inspect the Pump Intake Screen at the bottom of the Pump for any build up or build material that may be clogging up the holes in the screen (**See Figure 27**). Clean off any buildup on the screen. **A clogged screen can lead to future Pump failure. It should be checked regularly to ensure the Pump is operating unrestrained.**



Figure 27 – Clogged Pump Intake Screen

- c. Rotate the Pump Shaft (**See Figure 28**). The shaft should rotate extremely easily and smoothly by rolling a finger across it. There should be no stiffness, rough spots or binds. If there is stiffness or it feels bound, inspect around the Impeller for any obvious buildup that can bind up the Impeller. To thoroughly inspect for any buildup around the Impeller, the Manifold Plate can be removed (seven screws). Clean up any buildup around and behind the Impeller and check the rotation of the shaft again. If there is still binding, the bearings may be worn, and the pump will need to be replaced. The impeller can also be removed. To remove the impeller, use a $\frac{1}{4}$ " open end wrench to secure the Pump Motor Shaft at the flat spot on the shaft. Unscrew the 7mm nut at the bottom of the impeller while locking down the shaft with the $\frac{1}{4}$ " open end wrench. When placing the Impeller back on the shaft, ensure the washers are in their appropriate positions (thick and thin washers between the Impeller and nut, thick and thin washers between the Impeller and Manifold). Rotate the shaft after reattaching the Impeller and Manifold Cover. If there is any metal-on-metal sound while turning the shaft, loosen the seven screws that secure the Manifold Cover and tighten one at a time to ensure the impeller lip is not rubbing against the Manifold Cover. There is very little space tolerance between these two components.

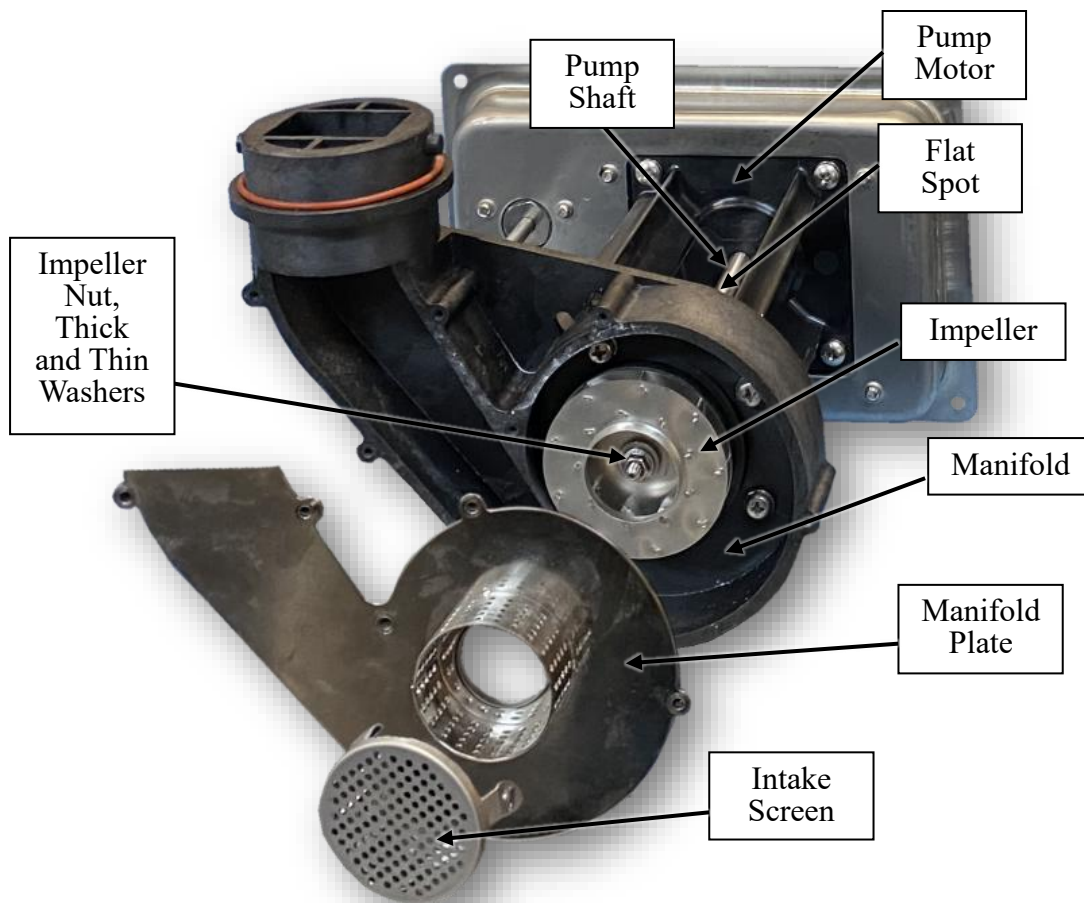


Figure 28 – Pump Exploded View

B. Heater Troubleshooting

Symptom: Not Heating, Not Reaching the Set Temperature, EO Over Temperature Error

Theory: The Heating Elements have an internal resistance that create heat when current flows through. When submerged in water, the heat is transferred to the water. It should take approximately 3 minutes per degree to heat up the bath. Voltage is applied to the Heater Elements upon starting the initial ramp up to the Set Temperature. When the temperature of the bath exceeds the Set Temperature by 1°C, voltage is removed from the Heating Elements and the bath is allowed to cool. When the temperature of the bath drops 2°C below the Set Temperature, voltage is then applied to the Heating Elements to increase the bath temperature. This process continuously cycles back and forth. An audible click can be heard as the Heater Relay energizes and de-energizes during the normal operation of the SCA.

Steps:

1. Check the “HEATER ON” Yellow LED
 - a. Unplug the SCA from power.
 - b. Remove the Back Panel (See [How to Remove the Back Panel Section III A](#)).
 - c. Power on the SCA, select a temperature and press the Start Button  on the Control Panel. The “HEATER ON” LED (See [Figure 29](#)) illuminates when a temperature has been selected, and the Start Button is pressed (provided the temperature of the bath does not equal the current Set Temperature).
 - i. If the “HEATER ON” LED does not light up when the Start Button is pressed, continue to the next step (Step d).
 - ii. If the “HEATER ON” LED lights up when the Start Button is pressed skip to the next section (Section 2).

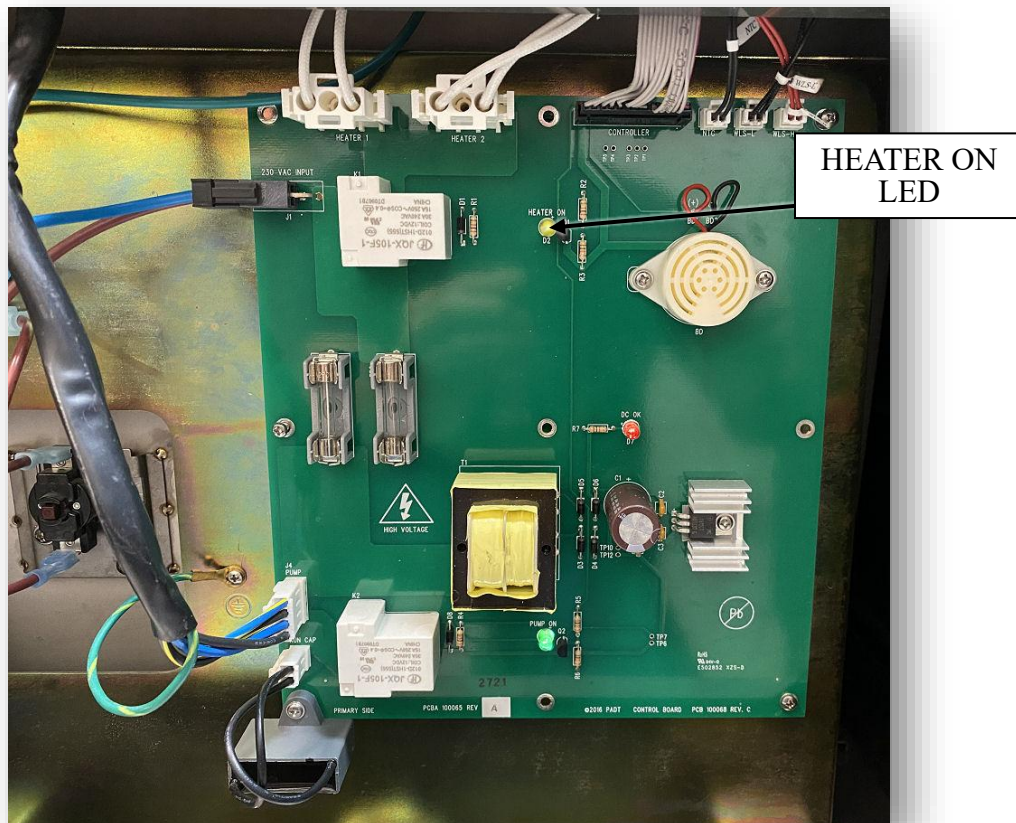


Figure 29 – HEATER ON LED

- d. Unplug the SCA from power and reseat (unplug and plug back in) the J6 “CONTROLLER” ribbon cable (**See Figure 30**). The latch must be released to remove the ribbon cable. Press the latch with a thumbnail and wiggle the connector out of the slot. Plug the ribbon connector back into the PCB slot and ensure it snaps securely. Power on the SCA and press the Start Button .
 - i. If the “HEATER ON” LED is lit when the Start Button is pressed, there was probably a loose connection.
 - ii. If the “HEATER ON” LED is still *not* lit when the Start Button is pressed, continue to the next step (Step e).

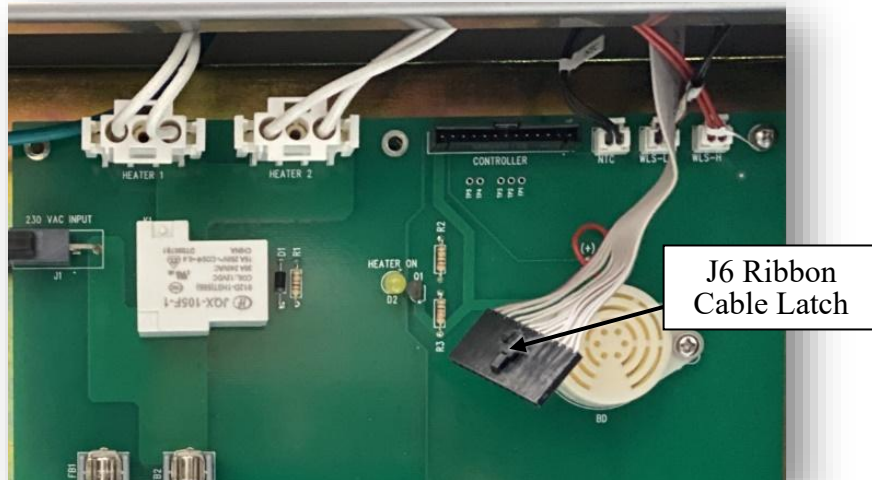


Figure 30 – Reseat the J6 Ribbon Cable

- e. Set the multimeter to the DC Voltage Selection  and check the Heater Enable Signal on the PCB (**See Figure 31**). The Heater Enable signal can be measured across R2 (Heater Enable) and R3 (Ground).
 - i. If the multimeter reads ~12.0 VDC across resistors R2 and R3 when the Start Button is pressed, the Control Panel is operating correctly. If the “HEATER ON” LED is still not lit, the PCB may be defective.
 - ii. If the multimeter reads ~0.00 VDC, the Control Panel or the Temperature Sensor may be defective. Check the Temperature Sensor (**See Temperature Sensor Troubleshooting Section XII B**) or replace the Control Panel.

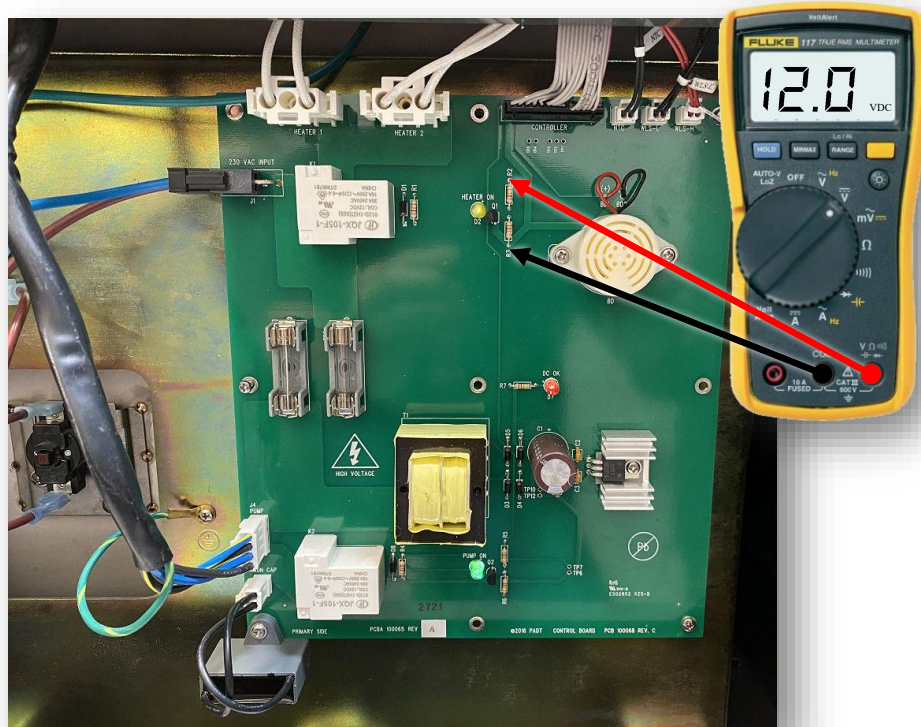


Figure 31 – Reseat the J6 Ribbon Cable

2. Heater Element Resistance Test

- a. If the "HEATER ON" LED is lit, and the SCA is not heating up properly or not at all, unplug power from the SCA.
- b. Remove the "Heater Element 1" Connector. Set the multimeter to the Resistance Selection Ω . Measure the resistance across the outside wires of the Heater 1 Connector (**See Figure 32**).
 - i. If the multimeter reads $\sim 34.0 \Omega$ across Heater Element wires, the Heater Element is electrically good.
 - ii. If the multimeter reads $\sim 0.00 \Omega$ (shorted) or ∞L (open) between Heater Element wires, replace the Heater Assembly.
- c. Remove the "Heater Element 2" connector and measure the resistance across both wires.
 - i. If the multimeter reads $\sim 34.0 \Omega$ across Heater Element wires, the Heater Element is electrically good. Continue to the next section (Section 3).
 - ii. If the multimeter reads $\sim 0.00 \Omega$ (shorted) or ∞L (open) between Heater Element wires, replace the Heater Assembly.

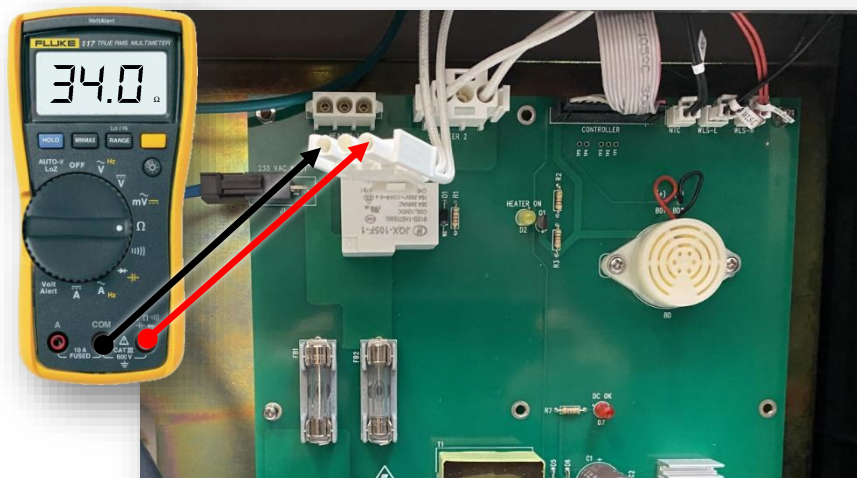
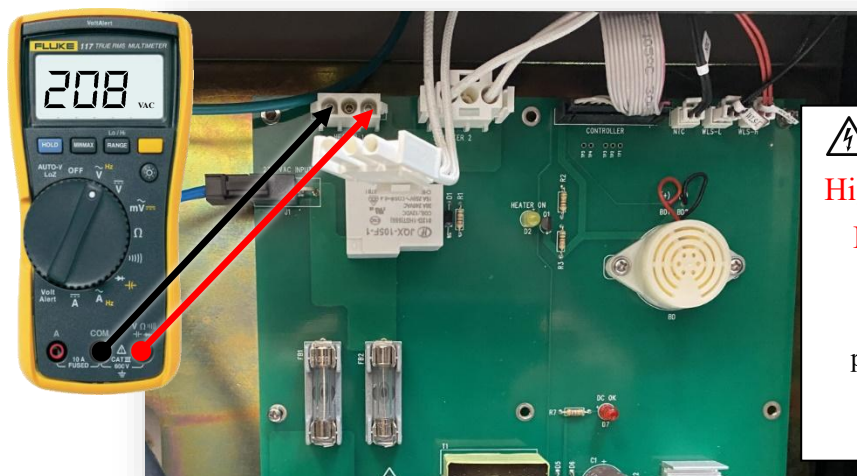


Figure 32 – Heater Element Resistance

3. Heater Element Voltage Test

- a. Set the multimeter to the AC Voltage Selection $\tilde{V}$. With power applied and a heat setting selected, press the Start Button  and check the voltage to the Heating Elements on the PCB (**See Figure 33**). **NOTE: Voltage will only be applied to the Heater Elements when the temperature of the bath is not at the Set Temperature (temperature is ramping up to the Selected Temperature).**
 - i. If the multimeter reads $\sim 208 \text{ VAC}$ (230 VAC EU) across the outside pins of "Heater 1" on the PCB, check the voltage across both pins for "Heater 2" on the PCB. If both Heaters are receiving the proper voltage, the Control Panel and the PCB are operating correctly.
 - ii. If the multimeter reads $\sim 0.00 \text{ VAC}$ across both Heater Elements and the "HEATER ON" LED is lit, replace the PCB.



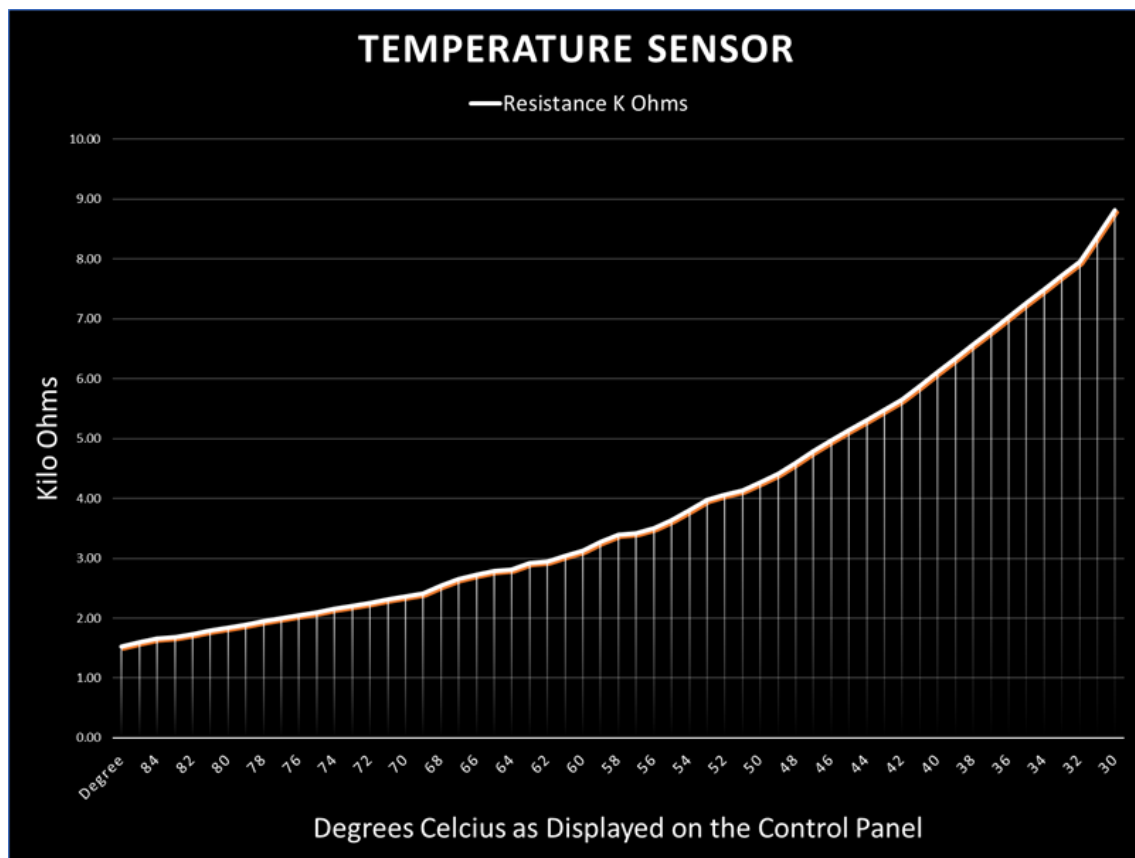
 **Warning** 
**High Voltage May
Be Present on
These Pins!**
Only qualified
personnel should
attempt this
measurement

Figure 33 – Heater Element Voltage

C. Temperature Sensor Troubleshooting

Symptom: Not Heating, Inconsistent Heating, Not Reaching the Set Temperature, Over Heating, r1 Error

Theory: The Temperature Sensor changes resistance according to the temperature of the water. As the temperature increases, the resistance of the sensor decreases. The Control Panel uses this resistance to determine the temperature of the bath. If the Temperature Sensor is defective (giving false resistance measurements), the Control Panel may display a different temperature than the actual temperature of the bath. A thermometer in Celsius may help verify the temperature of the bath corresponds to what is displayed on the Control Panel. An r1 error (abnormal resistance detected) may result if the resistance detected by the Control Panel is too low (defective sensor) or too high (defective sensor or the NTC connector is unplugged or has loose connection with the pins on the PCB).



If the Temperature Sensor is defective (giving inaccurate resistance measurements):

- The actual bath temperature (as measured with a thermometer) may not reach the Set Temperature.
- The bath may overheat, possibly tripping the Thermal Cutoff Switch (TCO).
- There may be an r1 error (abnormal resistance value).

Steps:

1. Reseat the Connectors

- Unplug the SCA from power and remove the Back Panel ([See How to Remove the Back Panel Section III A](#)).
- Reseat (unplug and plug back in) the NTC Connector on the PCB. The NTC Connector has a latch that must be depressed to unlock the connector from the slot. Press the latch with a thumbnail and pull the connector out of the slot. Press the connector firmly back into the slot and ensure it snaps in securely. ([See Figure 34](#)).

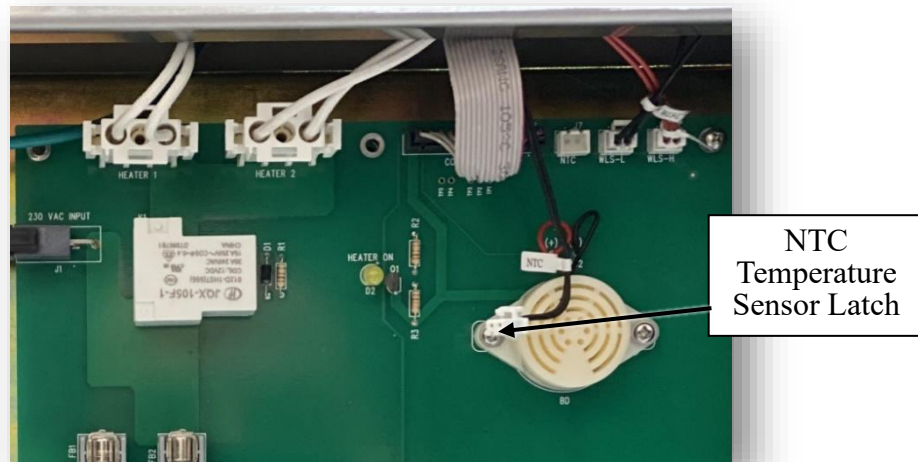


Figure 34 – Reseat the NTC Connector

- Reseat the J6 Control Panel ribbon cable. Press the latch with a thumbnail ([See Figure 35](#)) and wiggle the connector out of the slot. Press the connector back into the slot and ensure it snaps in securely. Power on the SCA and see if the issue is resolved.

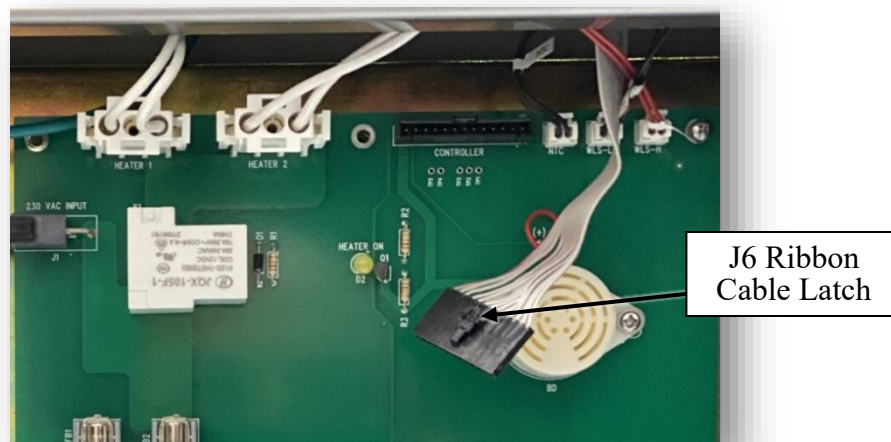


Figure 35 – Reseat the J6 Connector

2. Check the resistance of the Temperature Sensor

- Unplug power from the SCA.
- Unplug the NTC connector from the PCB.
- Set the multimeter to the Resistance Selection Ω and check the resistance of the Temperature Sensor across both wires on the NTC connector using the .7mm probes ([See Figure 36](#)). Small staples can also be used by pushing them into the connector pin slots if the .7mm probes are unavailable. At room temperature, the resistance should measure between 12k and 8k (depending on what the actual room temperature is). Plug the NTC connector back in and power on the SCA.

3. Check the resistance at 50°C

- A thermometer with a Celsius selection can be used to determine whether the temperature of the bath is displayed correctly on the Control Panel. Set the SCA to 50°C and press the Start Button . When the bath heats up and the Control Panel displays 50°C, check the temperature of the bath with a thermometer. If the actual temperature of the bath does not correlate with the Control Panel, ensure the Temperature Sensor is operating correctly. Unplug the SCA from power. Unplug the NTC connector and measure the resistance across both wires. The multimeter should read ~4.41 kΩ.
- If the resistance of the Temperature Sensor does not correlate with the actual temperature of the bath as measured with a thermometer, replace the Temperature Sensor.
- If the resistance of the Temperature Sensor *does* correlate with the actual temperature of the bath as measured with a thermometer, but the Control Panel does *not* display the actual temperature of the bath, replace the Control Panel. The table below shows the relationship between the resistance of the Temperature Sensor and the actual temperature of the bath (*See Table 1*).

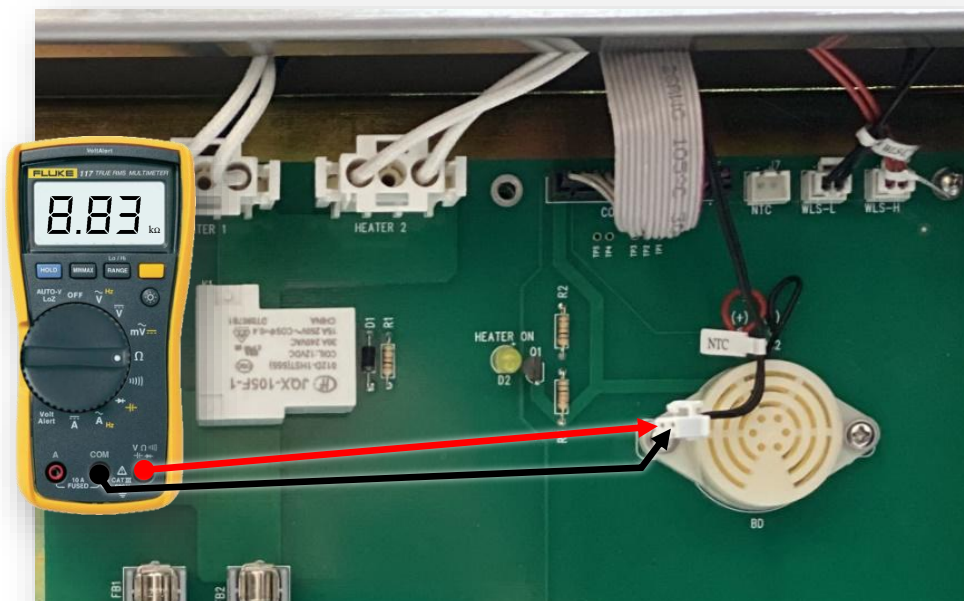
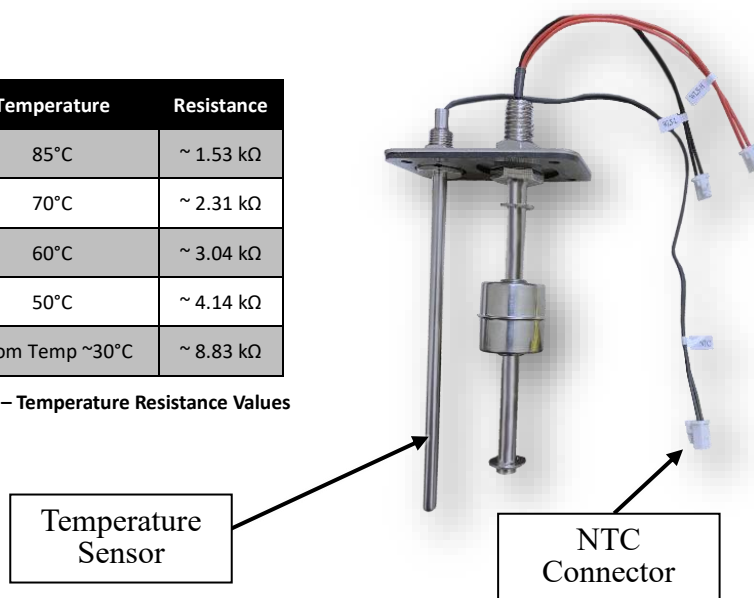


Figure 36 – Temperature Sensor Resistance at Room Temperature

Temperature	Resistance
85°C	~ 1.53 kΩ
70°C	~ 2.31 kΩ
60°C	~ 3.04 kΩ
50°C	~ 4.14 kΩ
Room Temp ~30°C	~ 8.83 kΩ

Table 1 – Temperature Resistance Values



D. Water Level Sensor Troubleshooting

Symptom: High or Low Water LED Flashing on the Control Panel, r2, r3 Error

Theory: The Water Level Sensor uses two internal switches within a hollow rod straddled by a watertight stainless-steel float that slides along the rod as the water level changes. If the water level is at the minimum or maximum level, the magnetic property of the float closes an internal switch, which generates an error. A loose connection of the WLS-L and WLS-H connectors on the PCB can generate an r2 or r3 error.

Steps:

1. Reseat the Connectors

- Remove the back panel (See [How to Remove the Back Panel Section III A](#)).
- Reseat (unplug and plug back in) the **WLS-L** and the **WLS-H** Connectors on the PCB. These connectors have a latch that must be depressed to unlock the connector from the slot. Press the latch with a thumbnail and pull the connector out of the slot. Press the connector back into the slot firmly and ensure it snaps in securely. (See [Figure 37](#)).

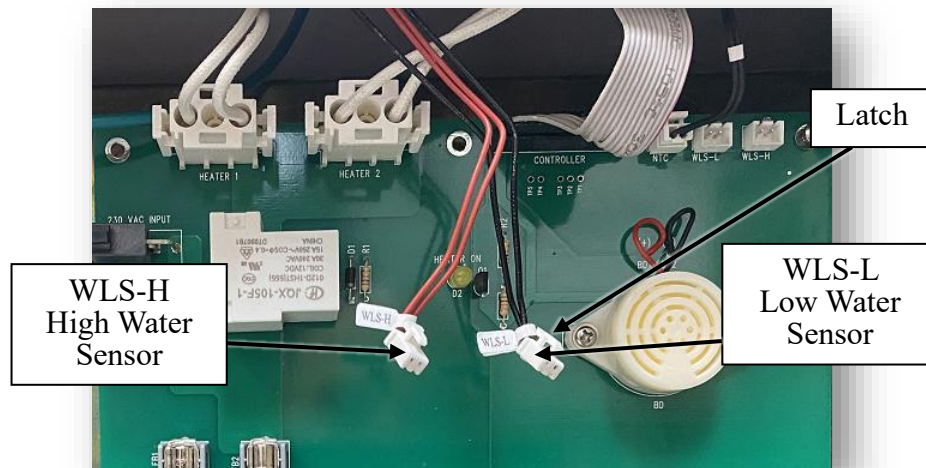


Figure 37 – High Water and Low Water Level Sensors

- Reseat the J6 Control Panel ribbon cable (See [Figure 38](#)). Press the latch with a thumbnail (See [Figure 38](#)) and wiggle the connector out of the slot. Press the connector back into the slot and ensure it snaps in securely. Power on the SCA and see if the issue is resolved.

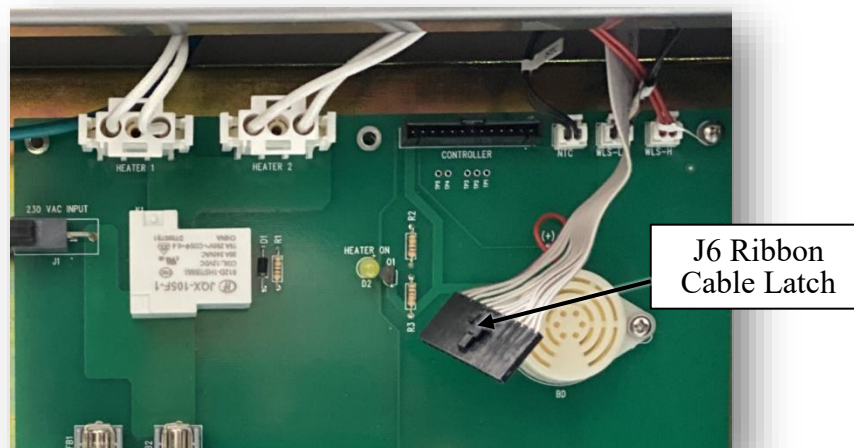


Figure 38 – J6 Ribbon Cable

2. Check the resistance of the Water Level Sensor

- a. Remove the sensor from the Motor Tray (**See Sensor Assembly Replacement Section V**).
- b. Visually inspect the Water Level Sensor Assembly. If there is a buildup on the shaft that inhibits the free up and down motion of the float, clean off the buildup. A soft scrub pad can be used to remove any buildup on the shaft. Ensure the float moves freely from the bottom to the top of the shaft.
- c. Set the multimeter to the Resistance Selection Ω and check the resistance across both wires of the **WLS-H** connector. If the resistance measured does not approximate the values below, replace the Water Level Sensor.
 - i. Move the float to the middle of the shaft.
 - Multimeter should read ~ 22.0 k Ω (**See Figure 39**).
 - ii. Move the float to the top of the shaft.
 - Multimeter should read 0.00 Ω (continuous) (**See Figure 40**).

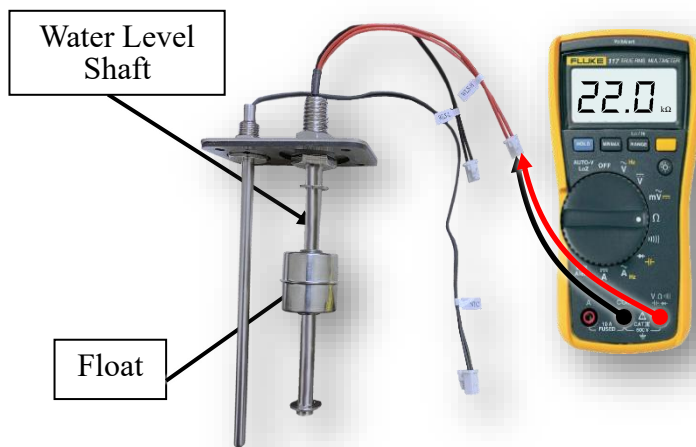


Figure 39 – WLS-H Resistance



Figure 40 – WLS-H Resistance

- d. Check the resistance across the **WLS-L** connector.
 - i. Move the float to the middle of the shaft.
 - Multimeter should read ~ 22.0 k Ω (**See Figure 41**).
 - ii. Move the float to the bottom of the shaft.
 - Multimeter should read 0.00 Ω (continuous) (**See Figure 42**).



Figure 41 – WLS-L Resistance

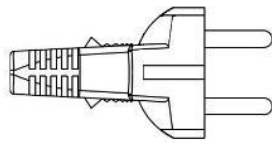
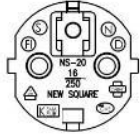


Figure 42 – WLS-L Resistance

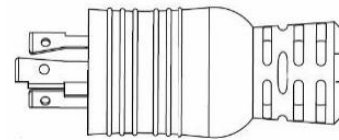
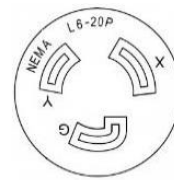
E. No Power to SCA Troubleshooting

Symptom: SCA Appears to have no Power

Theory: The SCA 3600 requires 230VAC +/- 10% single phase power. The acceptable voltages for this SCA are 207 VAC → 253 VAC. The U.S. generally uses 208 VAC, but a voltage of 220 VAC is not uncommon. The EU generally uses a voltage of 230 VAC. The common power plugs are shown below.



Europe - (CEE 7) 230VAC, 50Hz, 16A, Single phase



US – (L6-P20) 208VAC, 60Hz, 20A, single phase

Steps:

1. Check the Power Switch LED

- a. The Power Switch (Power Entry Module or PEM) has a Power Indicator LED imbedded into the switch that indicates whether it is receiving power or not (**See Figure 43**). Toggle the Power Switch to the left “On”.
 - i. If the Power Switch LED is *not* lit, continue to the next step (Step b).
 - ii. If the Power Switch LED is lit, skip to the next section (Section 2).



Figure 43 – Power Entry Module (PEM)

- b. Set the multimeter to the AC Voltage Selection $\tilde{V}$ and check the voltage at the building's outlet between the Y and X sockets (North America) or the N and L socket (Europe) (**See Figure 44**).
 - i. If the multimeter reads ~ 208 VAC (NA) or ~ 230 VAC (EU), ensure the power cord is securely inserted into the outlet and check for voltage at the female end of the power cord (between the two top slots). Replace the power cord if no voltage is present.
 - ii. If the Multimeter reads ~ 0.00 VAC, check the buildings circuit breakers.

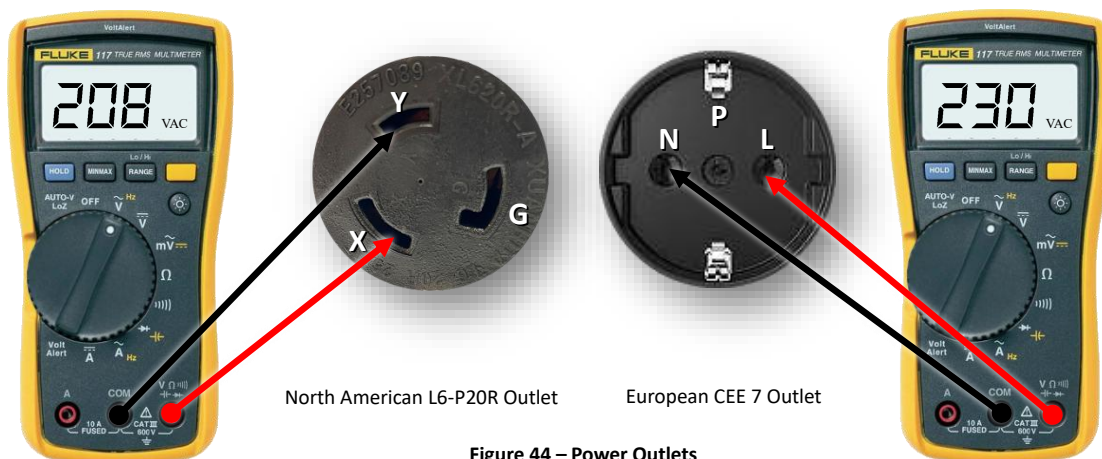


Figure 44 – Power Outlets

2. Check the 12V DC OK LED on the PCB

- a. Toggle the Power Switch to the right “Off” position and unplug the SCA from power.
- b. Remove the Back Panel (**See How to Remove the Back Panel Section III A**).
- c. Plug the SCA into power and toggle the Power Switch to the left. Check if the 12V DC OK LED is lit on the PCB (**See Figure 45**). This LED will illuminate once the Power Switch is toggled on.
 - i. If the 12V DC OK LED is lit, the PCB is receiving power, the Control Panel may not be receiving power. Continue to the next step (Step d).
 - ii. If the 12V DC OK LED is *not* lit, continue to the next section (Section 3).

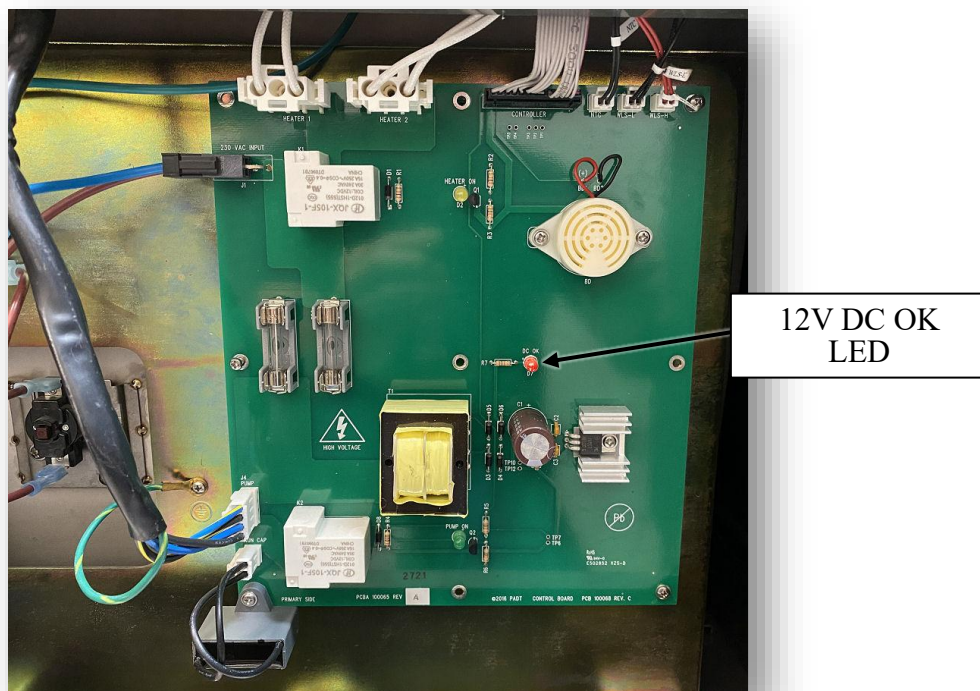


Figure 45 – 12V DC OK LED

- d. Unplug the SCA from power and reseal the J6 Control Panel ribbon cable. Press the latch with a thumbnail (**See Figure 46**) and wiggle the connector out of the slot. Press the connector firmly back into the slot and ensure it snaps in securely. Power on the SCA and see if the issue is resolved. If there still is no apparent power to the Control Panel, and the 12V DC OK LED is lit, replace the Control Panel.

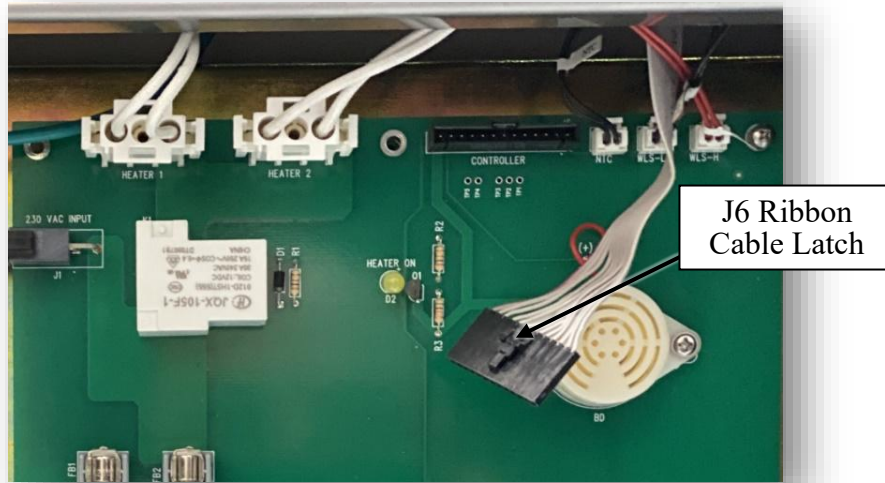


Figure 46 – J6 Ribbon Cable

3. Measure the Input Power to the PCB

- a. Unplug power from the SCA and disconnect the J1 connector from the PCB (**See Figure 47**).
- b. Plug the SCA into power and toggle the Power Switch to the left “On” position.
- c. Set the multimeter to the AC Voltage Selection $\tilde{V}$ and check the voltage across both wires of the J1 Connector.
 - i. If the multimeter reads ~ 208 VAC (NA) or ~ 230 VAC (EU), continue to the next step (Step d).
 - ii. If the multimeter reads ~ 0.00 VAC, skip to the next section (Section 4).

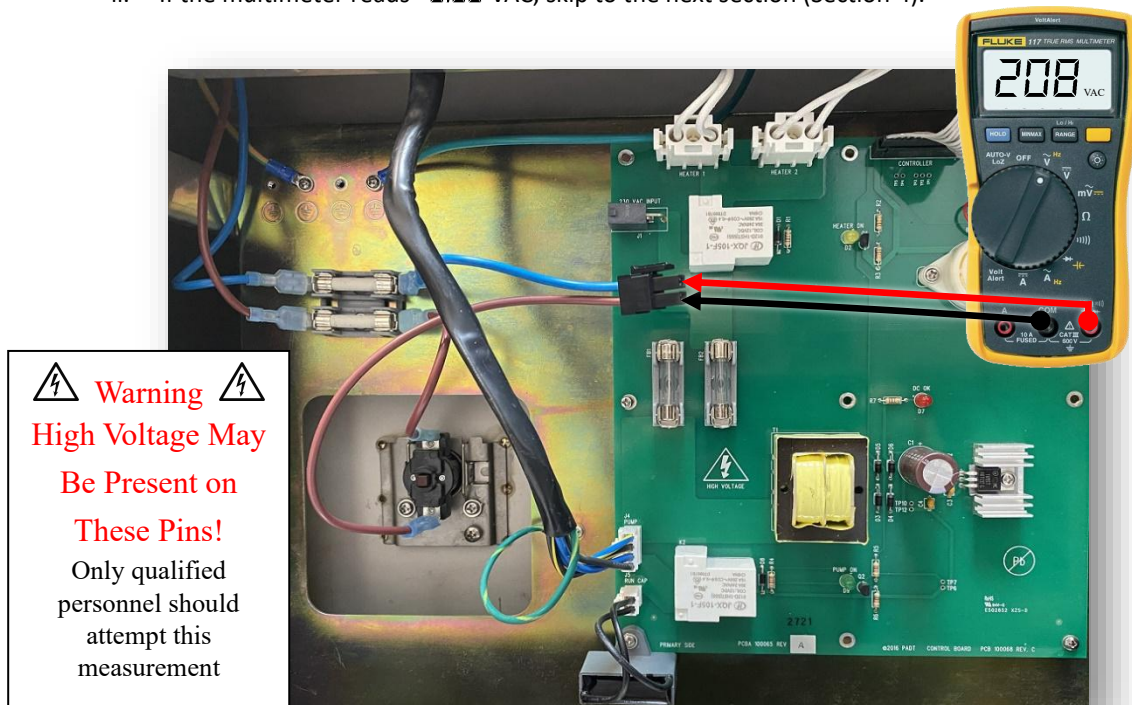


Figure 47 – J1 PCB Input Power

- d. Unplug the SCA from power. Set the multimeter to Diode Test Mode $\rightarrow$.
- e. Check the continuity of fuses FB1 and FB2 (*See Figure 48*).
 - i. If the multimeter reads ~ 0.00 , the fuses are good, replace the PCB.
 - ii. If the multimeter reads ∞ , replace the fuse. Plug J1 back into the PCB and power up the SCA. If the fuse blows again, continue to the next step (Step f).

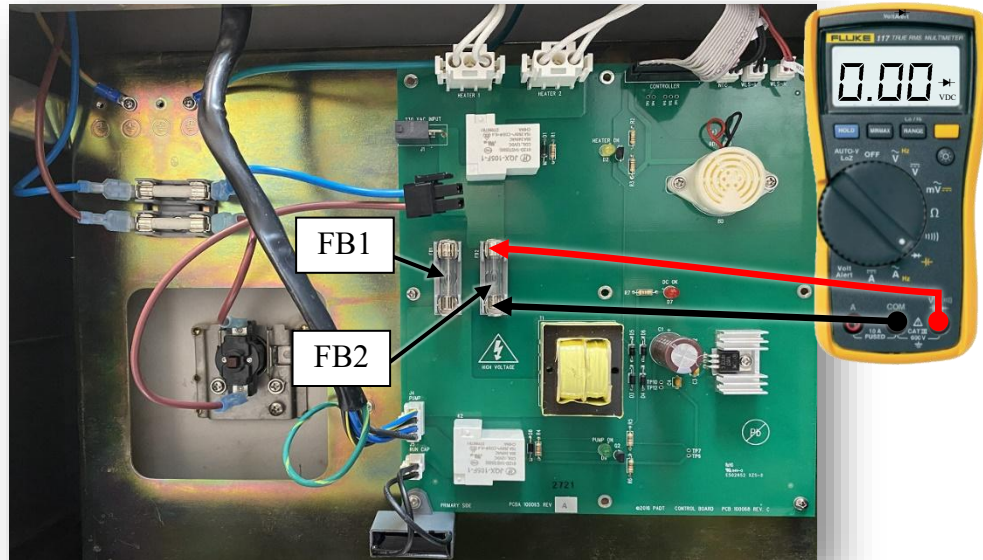


Figure 48 – FB1 and FB2

- f. If the fuse continues to blow when replacing it, unplug the Pump and Heater connectors from the PCB and replace the fuse. Turn on the SCA with both of these components disconnected from the PCB.
 - i. If one or both fuses blow immediately upon powering up the SCA, or when pressing the Start Button on the Control panel, with the Pump and Heaters disconnected from the PCB, replace the PCB.
 - ii. If none of the fuses blow with the Pump and Heater Elements disconnected from the PCB, troubleshoot the Pump or Heater Elements. Plugging in one connector at a time and seeing if it blows a fuse can help isolate which component is causing the issue. Generally, a mechanically bound Pump or a Pump with a low resistance would be the main culprit for blowing fuses.
4. **Check the continuity of the Thermal Cutoff Switch (TCO)**
- a. Unplug the SCA from power and check the Reset Button on the Thermal Cutoff Switch (*See Figure 49*).

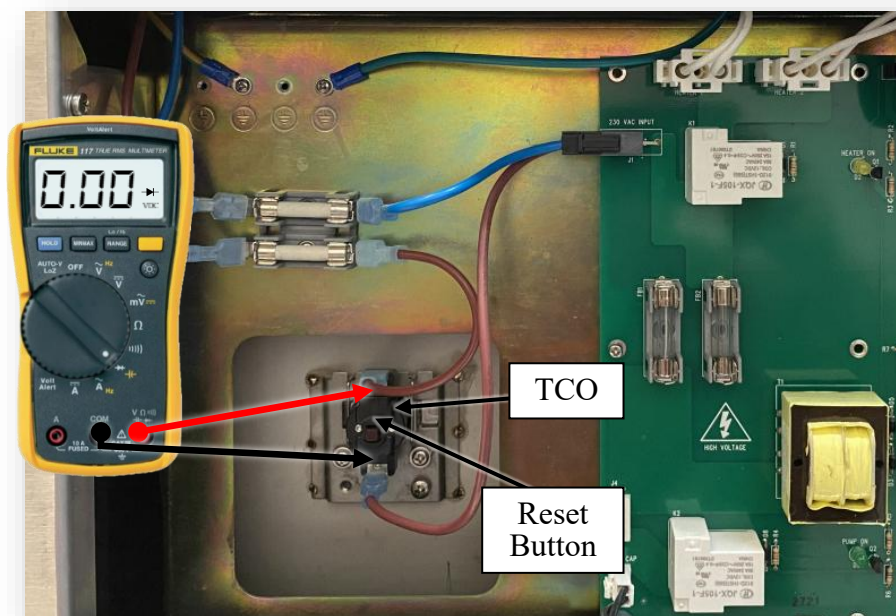


Figure 49 – Thermal Cutoff Switch (TCO)

- b. The TCO can trip (open) if the temperature of the bath exceeds 90°C. This removes all incoming power to the PCB. Press the red square button in the middle of the TCO (ensure the SCA is unplugged from power and the temperature of the bath is less than 80°C). If a slight click can be felt, the TCO was tripped. Apply power to the SCA and see if the issue was resolved.
- c. The TCO can also be checked for continuity. With the SCA still unplugged from power, and the multimeter set to Diode Test Mode $\rightarrow$, check for continuity across both exposed terminals of the TCO.
 - i. If the multimeter reads ~ 0.00 , the TCO is good, continue to the next section (Section 5).
 - ii. If the multimeter reads ∞ , try pressing the red reset switch. If the TCO still measures open, replace the TCO.

5. Check the continuity of Fuse F1 and F2

- a. Unplug the SCA from power, and set the multimeter Diode Test Mode $\rightarrow$. Check the continuity across F1 and F2 (See Figure 50).
 - i. If the multimeter reads ∞ (open), continue to the next step (Step b).
 - ii. If the multimeter reads ~ 0.00 , (continuous) the fuses are good, skip to the next section (Section 6).

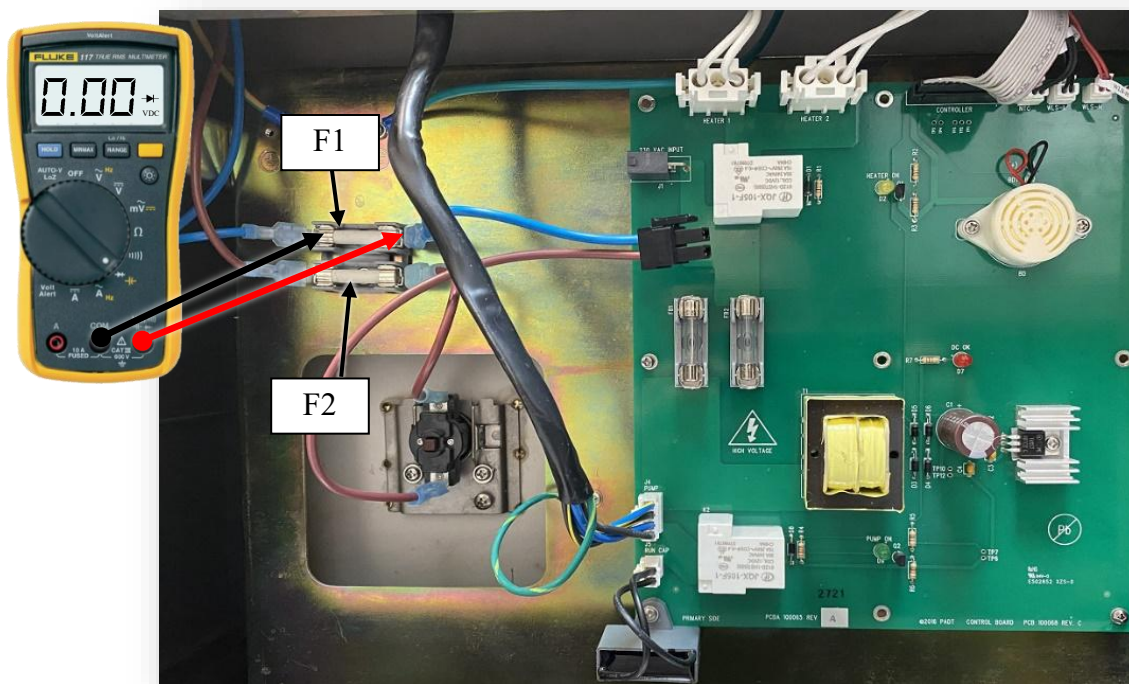


Figure 50 – Thermal Cutoff Switch (TCO)

- b. With the SCA still disconnected from power, unplug the J1 connector from the PCB. Replace the blown fuse (6.3mm X 32mm, 25A, 250V). Power up the SCA and see if the fuse blows again.
 - i. If the fuse blows with the J1 connector unplugged from the PCB, continue to the next section (Section 6).
 - ii. If the fuse does *not* blow with the J1 connector unplugged from the PCB, replace the PCB.
- ## 6. Check the Continuity from the Power Switch (PEM) to the Fuse Block
- a. A defective PEM can cause the F1 and/or F2 fuses to blow. Visibly check the wire terminals from the PEM, to the fuse block, TCO and to the J1 connector. Any discoloration of the wire terminals (dark colors on the blue wire terminals) can indicate over heating. This can result from a defective PEM or a shorted out PCB.
 - b. Unplug the SCA from power, and set the Multimeter Diode Test Mode $\rightarrow$.
 - c. Disconnect the blue and brown wiring from the fuse blocks (See Figure 51). Ensure that the positions of each wire terminal is noted. Swapping the position of these wires can destroy the PCB.

- d. Insert one multimeter lead into the wire terminal connected to the input of fuse F1 and touch the other lead to the left prong of the PEM.
- i. Toggle the power switch to the "On" position (left).
 - If the multimeter reads 0.00 (continuous), continue to the next step.
 - If the Multimeter reads OL (open), replace the PEM.
- ii. Toggle the power switch to the "Off" position (right).
 - If the Multimeter reads 0.00 (shorted), replace the PEM.
 - If the Multimeter reads OL (open), continue to the next step (Step e).
- e. Insert one Multimeter lead into the wire terminal connected to the input of fuse F2 and touch the other lead to the right prong of the PEM.
- i. Toggle the power switch to the "On" position (left).
 - If the Multimeter reads 0.00 (continuous), continue to the next step.
 - If the Multimeter reads OL (open), replace the PEM.
- ii. Toggle the power switch to the "Off" position (right).
 - If the Multimeter reads 0.00 (shorted), replace the PEM.
 - If the Multimeter reads OL (open), the PEM is good.

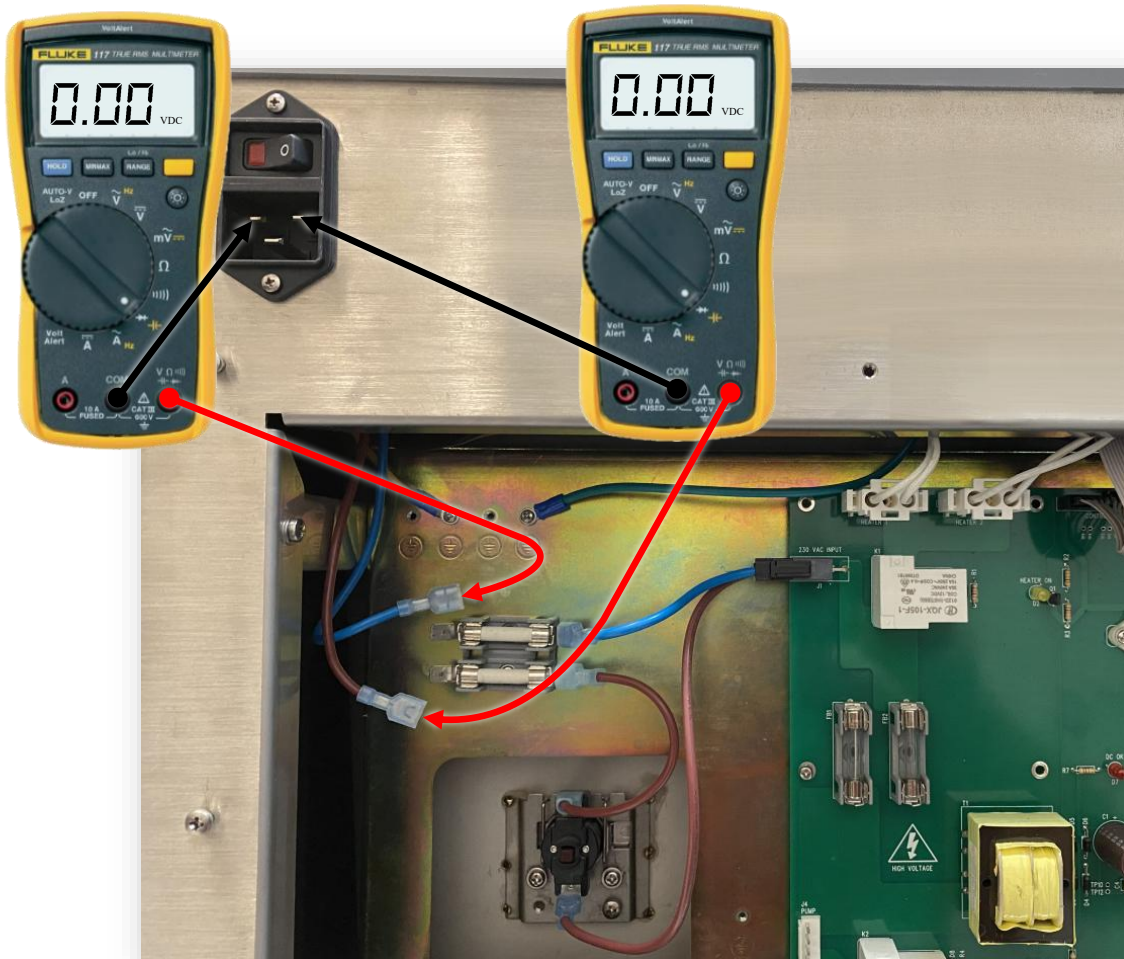


Figure 51 – PEM Continuity Test

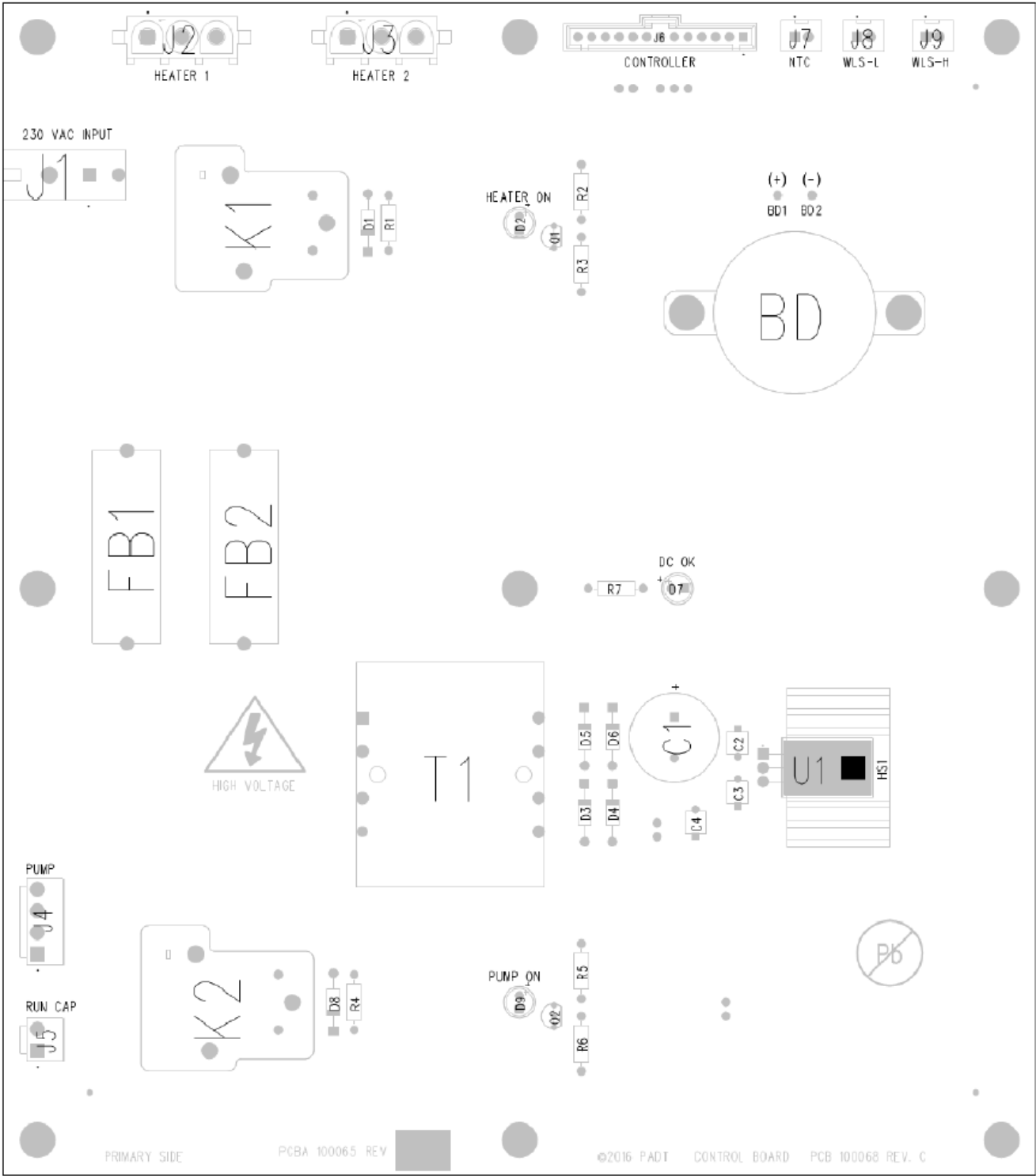
XIII. DOCUMENTATION

A. Error Codes

ES	12VDC out of range, power supply error for the display	(See <u>No Power to Display Troubleshooting Section XII E</u>).
EO	Over temperature	The temperature of water exceeds set temperature by more than 5 degrees Celsius. This can be caused by an exothermic reaction to soluble cleaning solutions. Let the tank return to its set temperature. Error will not re-set until SCA is powered down. (See <u>Temperature Sensor Troubleshooting Section XII C</u>).
r1	Temperature Sensor failure	The Control Panel detects very high resistance on the sensor. (See <u>Temperature Sensor Troubleshooting Section XII C</u>).
r2	High Water Level Sensor failure	The Control Panel detects very high resistance on the sensor. (See <u>Water Level Sensor Troubleshooting Section XII D</u>).
r3	Low Water Level Sensor failure	The Control Panel detects very high resistance on the sensor. (See <u>Water Level Sensor Troubleshooting Section XII D</u>).

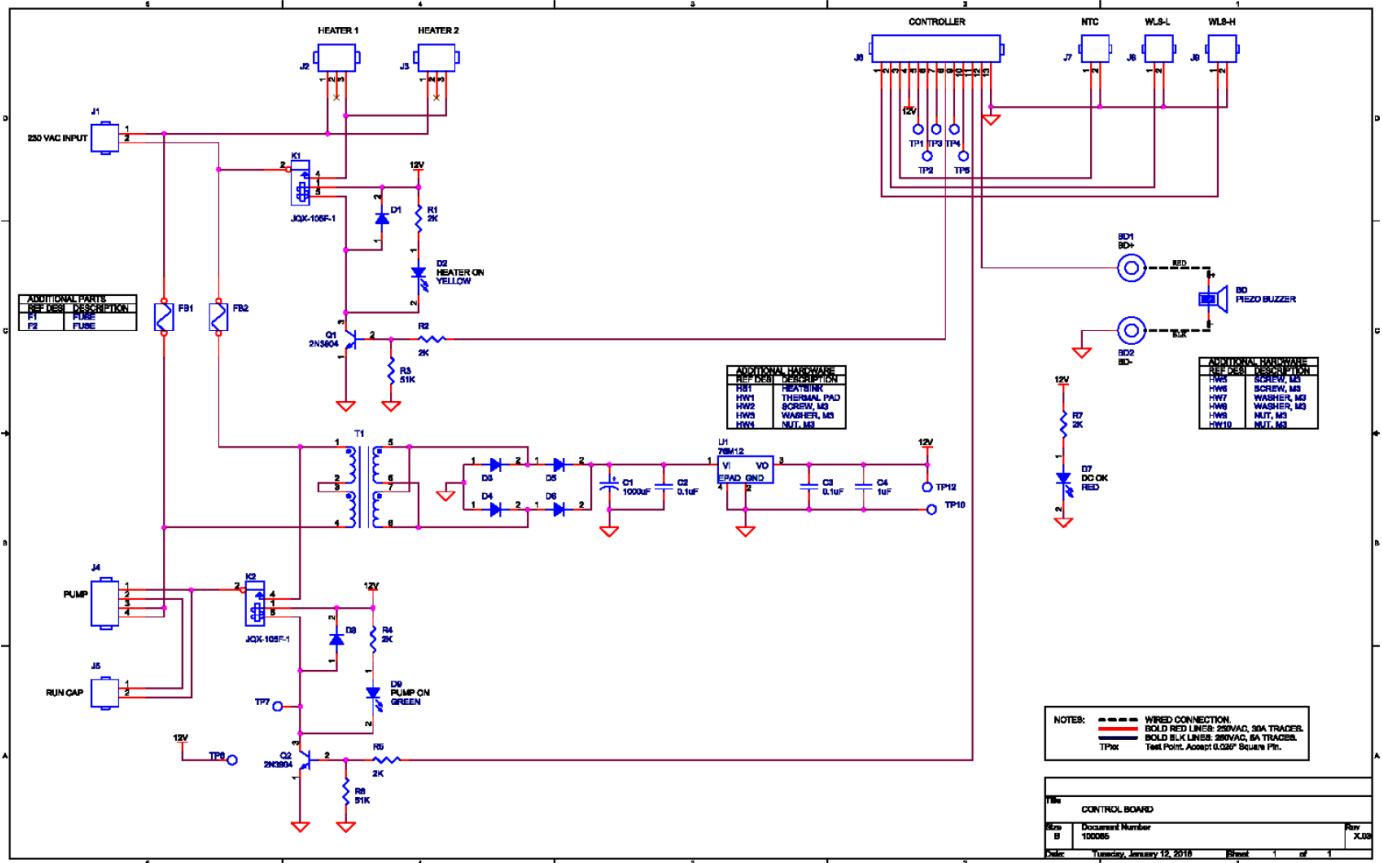
B. Schematics

ASSEMBLY DRAWING PRIMARY SIDE



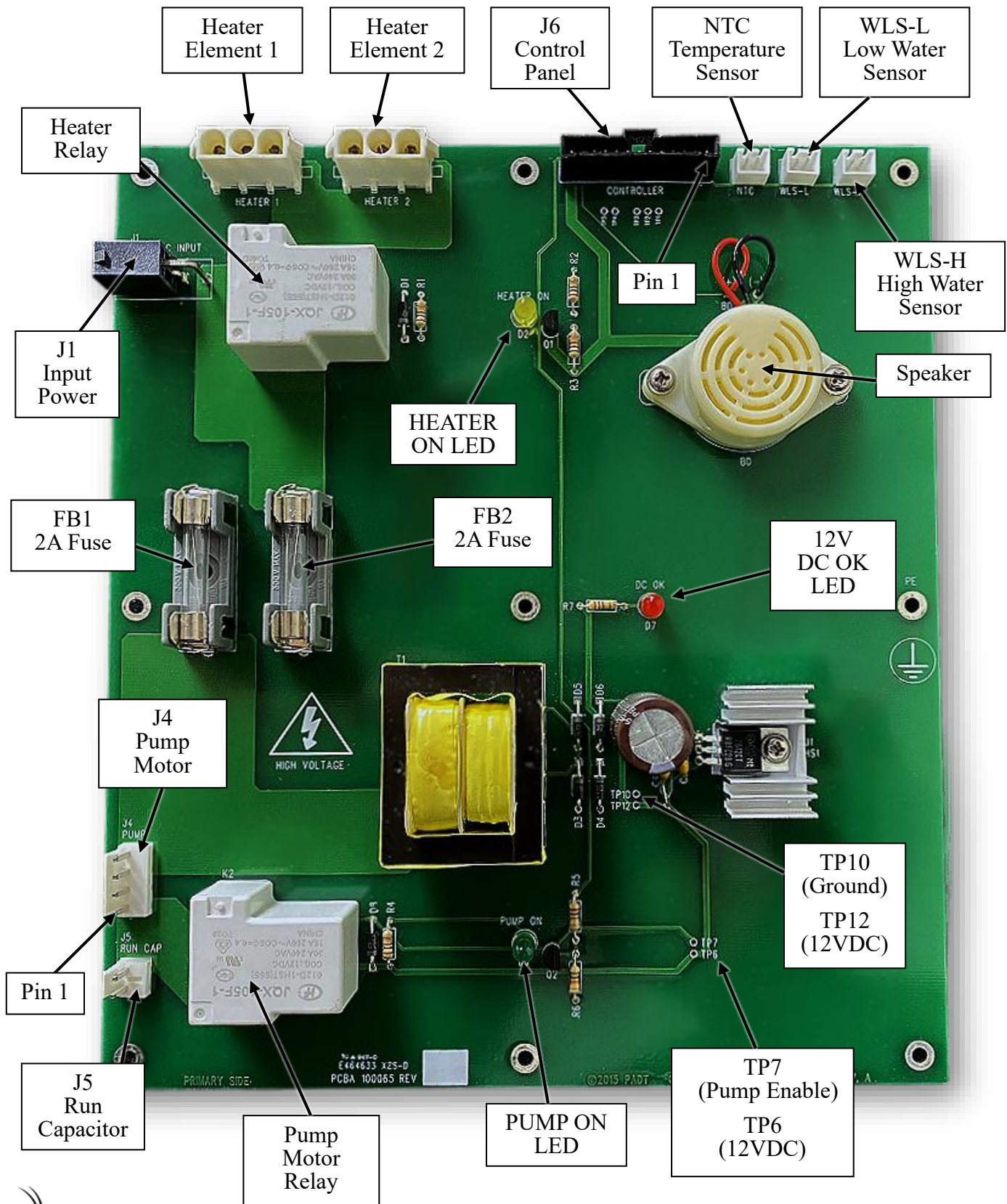
Physical Layout of PCB





Electronic Schematics

C. PCB Layout

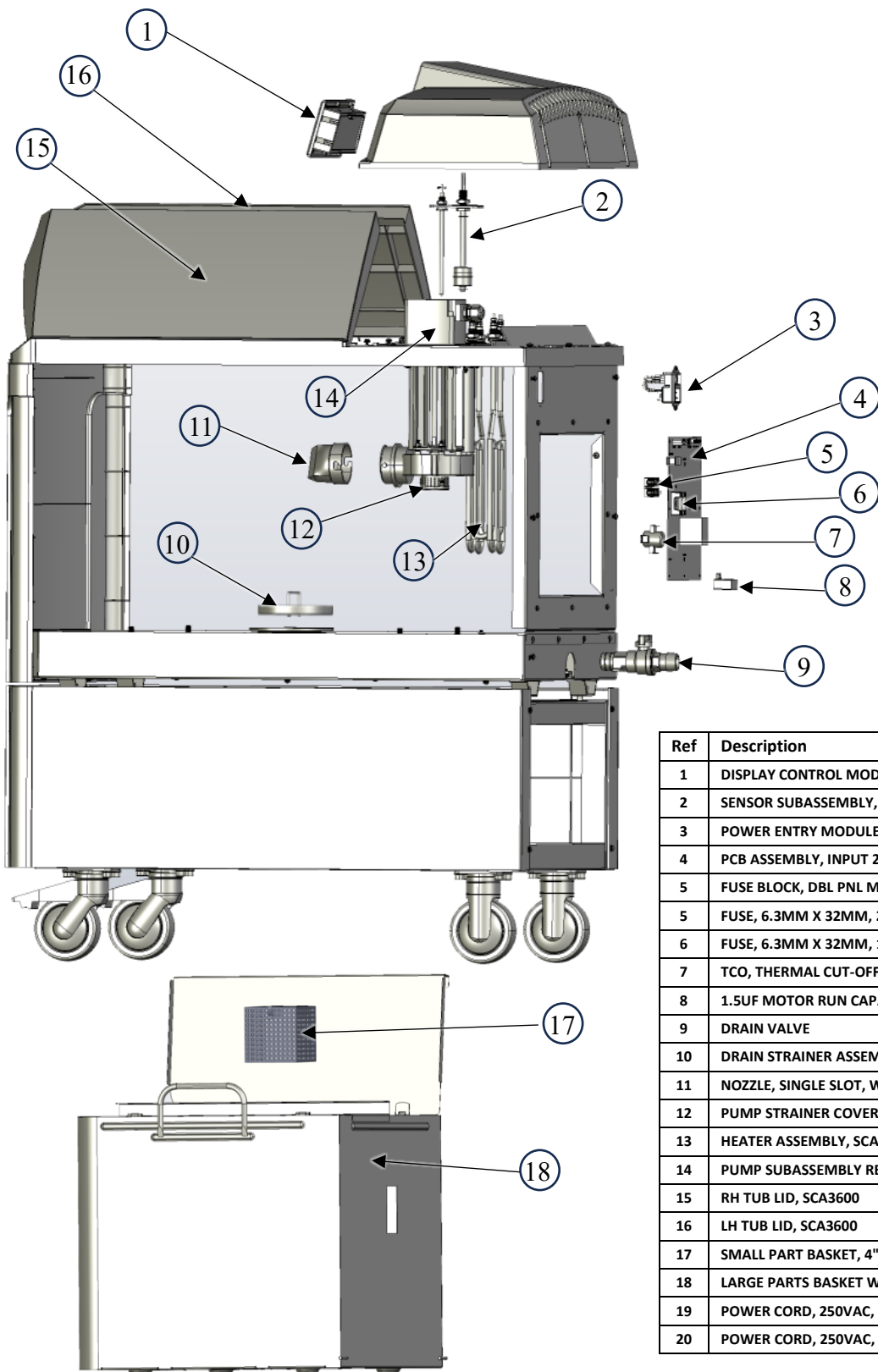


D. J6 Control Panel Pinout

- Low → ~0V DC
- High → ~12V DC

J6 Control Panel Connector			
<u>Pin</u>	<u>Description</u>	<u>Low</u>	<u>High</u>
1	Water Level High Sensing	NA	NA
2	Water Level Low Sensing	NA	NA
3	Temperature Sensing	NA	NA
4	Display VCC ~12V DC	Power Off	Power On
5	Unused	NA	NA
6	Unused	NA	NA
7	Unused	NA	NA
8	Heater Control	Heater Enable Off	Heater Enable On
9	Unused	NA	NA
10	Unused	NA	NA
11	Pump Motor Control	Pump Enable Off	Pump Enable On
12	Buzzer control signal output	Buzzer On	Buzzer Off
13	DC GND	NA	NA

E. Commonly Used Parts



Ref	Description	Part #
1	DISPLAY CONTROL MODULE REPAIR KIT	100128
2	SENSOR SUBASSEMBLY, SCA3600	100078
3	POWER ENTRY MODULE (PEM)	100129
4	PCB ASSEMBLY, INPUT 230VAC +/- 10%	100065
5	FUSE BLOCK, DBL PNL MNT, 30A 300V	100064
5	FUSE, 6.3MM X 32MM, 25A, 250V	100123
6	FUSE, 6.3MM X 32MM, 1A, 250V	100106
7	TCO, THERMAL CUT-OFF, 90 DEG C	100070
8	1.5UF MOTOR RUN CAPACITOR	100104
9	DRAIN VALVE	100508
10	DRAIN STRAINER ASSEMBLY, W/HANDLE	100127
11	NOZZLE, SINGLE SLOT, W/GASKET,	100130
12	PUMP STRAINER COVER	100126
13	HEATER ASSEMBLY, SCA3600, 220VAC	100007
14	PUMP SUBASSEMBLY REPAIR KIT	100006
15	RH TUB LID, SCA3600	100022
16	LH TUB LID, SCA3600	100021
17	SMALL PART BASKET, 4"X4"X4"	04098-01
18	LARGE PARTS BASKET W/HINGED LID	100005
19	POWER CORD, 250VAC, 16A, EU (not shown)	100107
20	POWER CORD, 250VAC, 16A NA (not shown)	100108

F. Specifications

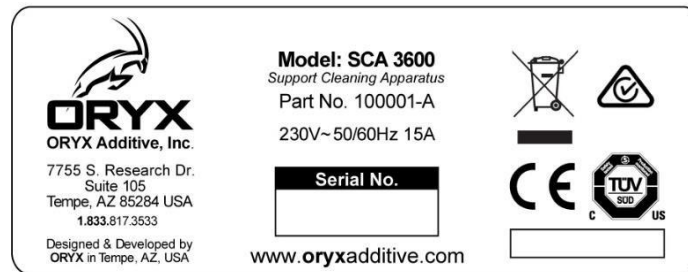
Model Number	SCA 3600
Power Requirements	Grounded Electrical Outlet Within 6ft (2m) of the SCA 230VAC +/- 10%, 50/60 Hz, 20A, 3400W
Regulatory Compliance	CE, cTUVus, RCM, RoHS, WEEE
Tank Capacity	27 gal (102 L)
Physical Dimensions	36.5L x 22.8W x 42.8H inches (92.7 x 57.8 x 108.6 cm)
Shipping Package Dimensions	41.3 D x 27.6 W x 51.0 H in (105.0 X 70.0 x 129.5 cm)
Weight / Shipping Max	160.6 lbs. (73 kg) / 204.6 lbs. (93 kg)
Large Parts Basket Capacity	16x16x14 in (40.6 x 40.6 x 35.6 cm)
Small Parts Basket Capacity	4 x 4 x 4 inches (10 x 10 x 10 cm)
Operating Environment Ranges	Temperature: 5°C - 40°C Humidity: 0% - 80% RH Altitude: 0 M – 2000 M
Temperature Control Accuracy	± 2°C
Pump Max Flow Rate	10 GPM / 38 LPM
Temperature Display	Digital LED Readout
Timer Display	Digital LED Readout
Liquid Level Checking	Fixed liquid level sensors with separate lamp indicators for high and low level and audible alarm for both.
Temperature Checking	Over temperature sensor, alerts at 5°C above the set temperature, audible alarm and lamp indicator. Thermal cutoff factory set at 90°C.
Pump and Heater Safety Lockouts	Low liquid level, high liquid level, over temperature, no time on timer.
Ventilation Requirements	Must be operated in a well-ventilated space
Measurement (Installation) Category:	Installation Category II
Pollution Degree	2
Protection Class	Class I
Marked Degree of Protection for IEC	For Indoor Use Only, IP20

Specifications are subject to change without notice.

G. Technical Support

Technical support for this product is provided by **Oryx Additive, Inc.** Before contacting Technical Support, please do the following:

1. Try the Quick Troubleshooting table at the beginning of this manual.
2. View the Troubleshooting Steps in this manual. This manual can also be found at www.oryxadditive.com/support. Click on the 3600 model and scroll down to select the sca3600 Repair Manual. This manual may be updated regularly, please check for a newer version.
3. If Technical Support is needed, write down the SCA model number, part number, and serial number (found on the back of the unit).



If the unit is covered by an extended warranty, contact the Authorized Reseller from whom the unit was purchased. Otherwise, to receive technical support do one of the following:

1. Go to www.oryxadditive.com/contact. Fill out the “Request More Information” form and click SUBMIT
2. Send an e-mail to: support@oryxadditive.com.
3. Call **1-833-817-3533** and ask for SCA Technical Support.

Please include your full name, company name, phone number and SCA model and serial number.

Replacement and Accessory Parts

Parts can be ordered through our online store or by contacting Technical Support. It is highly recommended that Technical Support be contacted prior to ordering parts online to ensure the correct part is ordered to fix the specific issue.

- Visit our online store at: <https://www.oryxadditive.com/store/> Select “Parts & Accessories” and choose the model of the SCA needing parts.
- Send an email to support@oryxadditive.com.
- Call **1-833-817-3533** for information on obtaining replacement parts.

Regulatory Compliance Documents

Visit our website at <https://www.oryxadditive.com/products/sca3600> for the latest regulatory compliance certificates.



H. Supplemental Information

SCA 3600 Support Cleaning Apparatus Limited Warranty

Product	Limited Warranty Period
SCA 3600 Support Cleaning Apparatus	1 year

All new Support Cleaning Apparatus (SCA) systems are warranted exclusively by Oryx Additive, Inc.'s ("Manufacturer") limited warranty as follows:

Each Support Cleaning Apparatus system ("System") and its components ("Components"), except those listed below under limits and exclusions, is warranted against defects in the materials and workmanship for a period of one (1) year from the date of installation at the end user's ("Customer") facility.

Repair or replacement only: manufacturer's liability under this agreement shall be limited to repairing or replacing, at the discretion of manufacturer, parts, or components sufficient to return the system to conform to the marketing specifications of the system.

Components subject to wear during normal use and overtime such as paint, finish, light bulbs, seals, etc., are excluded from this warranty.

This warranty is void if the system is subjected to mishandling, misuse, neglect, accident, improper installation, improper maintenance, or improper operation or application, or if the machine was improperly repaired or serviced by the customer. This warranty is void if the system is not installed by a certified distributor and the proper installation documentation provided by the manufacturer has not been submitted.

Liability, whether based on warranty, negligence or other cause, arising out of and/or incidental to sale, use or operation of the system, or any part thereof, shall not in any case exceed the cost of repair or replacement of the defective equipment, and such repair or replacement shall be the exclusive remedy of the purchaser, and in no case will manufacturer be responsible for any and/or all consequential or incidental damages including without limitation, and/or all consequential damages arising out of commercial losses.

This warranty is transferable from the original end user to another party if the machine is sold via private sale before the end of the warranty period.

The foregoing is a limited warranty, and it is the only warranty by manufacturer. MANUFACTURER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

