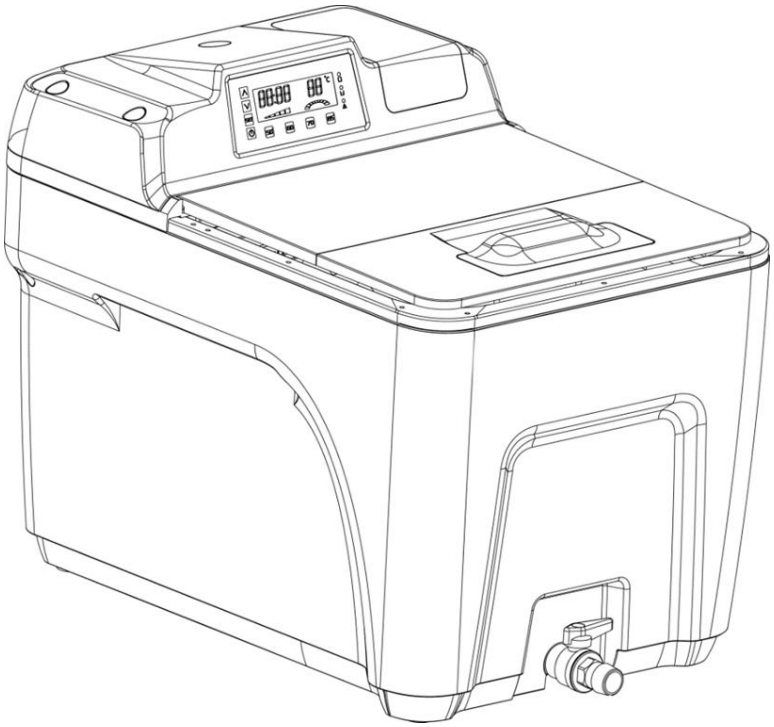
sca1200ht



Repair Manual

Oryx Additive Inc.

7755 S. Research Drive Ste. 120

Tempe, AZ 85284

1.833.817.3533

www.OryxAdditive.com

info@OryxAdditive.com

support@OryxAdditive.com

Rev 2.26

March 14, 2024

Table of Contents

I. PRELIMINARY STEPS ..... - 4 -

II. QUICK TROUBLESHOOTING ..... - 5 -

III. REMOVING TOP COVER AND BACK PANEL ..... - 10 -

A. How to Remove the Top Cover ..... - 10 -

B. How to Remove the Back Panel ..... - 11 -

IV. PUMP ASSEMBLY REPLACEMENT [PART # 04803-01] ..... - 12 -

A. How to Remove the Pump Assembly ..... - 12 -

B. How to Install the Pump Assembly ..... - 14 -

V. SENSOR ASSEMBLY REPLACEMENT [PART # 04810-01] ..... - 15 -

A. How to Remove the Sensor Assembly ..... - 15 -

B. How to Install the Sensor Assembly ..... - 16 -

VI. SPRAY NOZZLE REPLACEMENT [PART # 04809-01] ..... - 17 -

A. How to Replace the Nozzle ..... - 17 -

VII. HEATER ASSEMBLY REPLACEMENT [PART # 04805-01] ..... - 18 -

A. How to Remove the Heater Assembly ..... - 18 -

B. How to Install the Heater Assembly ..... - 19 -

VIII. DISPLAY CONTROL PANEL REPLACEMENT [PART # 100039] ..... - 20 -

A. How to Remove the Display Control Panel ..... - 20 -

B. How to Install the Display Control Panel ..... - 21 -

IX. PCB ASSEMBLY REPLACEMENT [PART # 04807-01] ..... - 22 -

A. How to Remove the PCB Assembly ..... - 22 -

B. How to Install the PCB Assembly ..... - 23 -

X. POWER SWITCH REPLACEMENT [PART # 04813-01] ..... - 24 -

A. How to Remove the Power Switch (Power Entry Module (PEM)) ..... - 24 -

B. How to Install the Power Entry Module (PEM) Switch ..... - 24 -

XI. FUSE REPLACEMENT ..... - 25 -

A. How to Replace the F1 15A 250V Fuse [Part # 04801-01] ..... - 25 -

B. How to Replace the F2 2-amp 250V Fuse [Part # 04802-01] ..... - 26 -

XII. TROUBLESHOOTING STEPS ..... - 27 -

A. Pump and Transformer Troubleshooting ..... - 28 -

B. Heating Element Troubleshooting ..... - 37 -

C. Thermal Cutoff Switch (TCO) Troubleshooting ..... - 41 -

D. Temperature Sensor Troubleshooting ..... - 42 -

E. Water Level Sensor Troubleshooting ..... - 45 -

F. No Power to SCA Troubleshooting ..... - 46 -

G. No Power to Display Troubleshooting ..... - 50 -

XIII. DOCUMENTATION ..... - 52 -

A. Error Codes ..... - 52 -

B. Schematics ..... - 53 -

C. PCB Layout ..... - 57 -

D. Controller Cable Connectors ..... - 58 -

E. Commonly Used Parts ..... - 61 -

F. Specifications ..... - 62 -

G. Customer Support ..... - 63 -

H. Supplemental Information ..... - 64 -

I. Preliminary Steps

Follow these steps before attempting to service the SCA

Power off and disconnect the SCA from the main power.

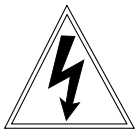
Allow the SCA to cool completely.

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.

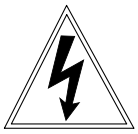
II. Quick Troubleshooting

The SCA has been designed to allow the end user to resolve most operating problems. When a problem is encountered, please read through this repair manual. If a resolution is not found in this manual, please contact technical support.



High Risk of Electrical Shock

Always disconnect the unit from power before removing any cover!



Problem	Probable Causes	What to Do
No Power To SCA.	Power switch is not “On”	Press rocker switch on the right-hand side of the unit to the “On” position (I).
	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.
	F2 Fuse is blown	With power disconnected, check fuse F2 (2A 250V) on the PCB. It may be visibly blown or use a Multimeter to check the continuity. If the resistance shows infinity (open), (**See How to Replace the F2 2A 250V Fuse Section XI**). If the new fuse blows again, troubleshoot the pump and transformer. (See **Pump and Transformer Troubleshooting Section XII A**).
	Power circuit breaker has tripped	Check for ~110V AC (230V AC Europe) at the power plug and outlet. If there is no voltage, check your building’s circuit breakers and any power strips that the unit is plugged into for a tripped circuit breaker or blown fuse. Reset or replace the breaker or fuse as required. (See **No Power to SCA Troubleshooting Section XII F**).

Problem	Probable Causes	What to Do
Pump will not start, SCA is powered up, display panel is lit.	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 ⏻ button. If the time being displayed is 00:00, then add time and start the system as described in the User Manual.
	Pump or transformer is defective	(**See Pump and Transformer Troubleshooting Section XII A**).
	Start Cap is defective	(**See Pump and Transformer Troubleshooting Section XII A**).
	PCB is defective	(**See Pump and Transformer Troubleshooting Section XII A**).
	Start / Pause switch is defective	Replace Control Panel. (**See Display Control Panel Replacement Section VIII**).

Problem	Probable Causes	What to Do
Warning Indicator  Flashing High Water  or Low Water  Indicator Flashing	Liquid level is too high or too low	Check the indicator lights on the right side of the display Control Panel. If either level indicator is on, add or remove water from the tank until the indicator turns off. The SCA will need to be powered off and then back on to reset the error. ALWAYS WEAR PROTECTIVE GLOVES AND EYEWEAR WHEN ADDING OR REMOVING LIQUID FROM THE TANK.
	Basket is raised or lowered too quickly	If the basket is lowered into or raised out of the cleaning solution too quickly, the solution does not fill or empty out fast enough to maintain even water level throughout the tank. This causes a temporary high or low water level condition. Power off and power back on to reset the error.
	Float is stuck on shaft	Remove Float (See **Sensor Assembly Replacement Section V**) and inspect. If there is a buildup on the shaft that inhibits the free up and down motion of the Float, clean off the shaft. 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.
	Water level sensor is defective	(**See Water Level Sensor Troubleshooting Section XII E**).

Problem	Probable Causes	What to Do
Warning Indicator  Flashing Error Code Displayed	Internal Error	Sensor failure, power supply failure, Heater failure or pump failure. (**See Error Codes Section XIII**). **Error Codes:** *EP = Pump motor current fault *EH = Heater current fault ES = 12VDC out of range, power supply error EO = Over temperature r1 = Temperature sensor failure r2 = High level sensor failure r3 = Low level sensor failure *Only displayed on the original controllers *without* the "No Heat" option
Not Heating, no errors, pump is circulating	15A 250V F1 Fuse is blown.	(**See How to Replace the F1 15A 250V Fuse Section XI A**).
	Heater Elements have failed	(**See Heating Element Troubleshooting Section XII B**).
	Thermal Cutoff switch has been tripped or failed.	A resettable thermal cutoff switch located on the back wall of the tank by the main power switch disables the Heater Element if the temperature of the bath exceeds 90ºC. To reset the switch, allow the temperature to drop below 80ºC and press the red reset button between the wire terminals. (**See Thermal Cutoff Switch Troubleshooting Section XII C**).
	Temperature sensor is defective	(**See Temperature Sensor Troubleshooting Section XII D**).

Problem	Probable Causes	What to Do
The flow in the tank appears less than normal. Flow from nozzle is not uniform. White deposits noticeable on dark-colored parts	The cleaning solution is likely saturated with support material.	Drain the tank and add fresh water and cleaning solution as described in the User Manual. Generally, when the PH balance of the bath reaches 11.5, the effectiveness of the dissolution drops dramatically.
	Type of cleaning agent.	If using Eco Works, try switching to Waterworks. Both are sold by Stratasys resellers. Waterworks is a more efficient cleaning concentrate.
Power Cord gets very hot	PEM is defective	Contact support at support@oryxadditive.com.
	The Power Cord is defective, or the wrong Power Cord is being used.	The 1200ht uses a Power Cord that is certified and rated specifically for this model. Oryx does not advise using any 3rd party Power Cords. Use of 3rd party Power Cords can result in damage to the SCA and may invalidate any warranty. Please order any Power Cords directly from Oryx.

III. Removing Top Cover and Back Panel

A. How to Remove the Top Cover

1. **Remove the Top Cover**
    a. Unplug the SCA from power and pry out the rubber plugs from the Top Cover.
    b. Remove the six M5 Phillips head screws holding the Top Cover.

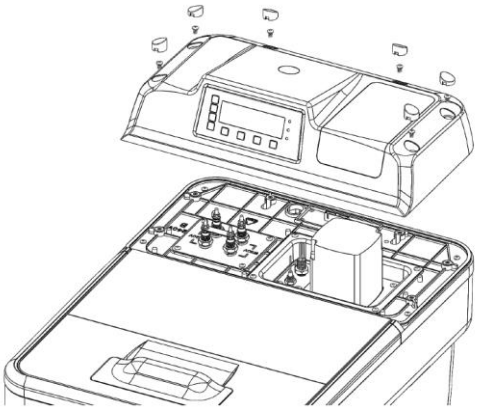


Figure 1 - Removing Plugs and Screws

    c. Carefully lift the cover from the SCA and disconnect the Display ribbon cable from the Connector PCB.

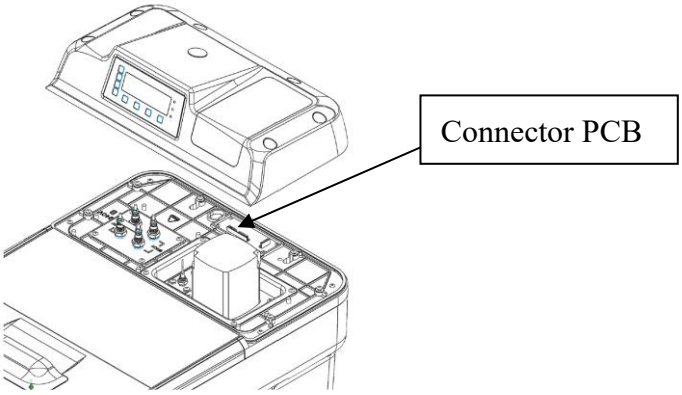


Figure 2 - Remove Top Cover

B. How to Remove the Back Panel

1. **Remove the Back Panel**
    a. Unplug the SCA from power and remove the two M5 screws holding the Back Panel.
    b. Pull down on the Back Panel and remove.

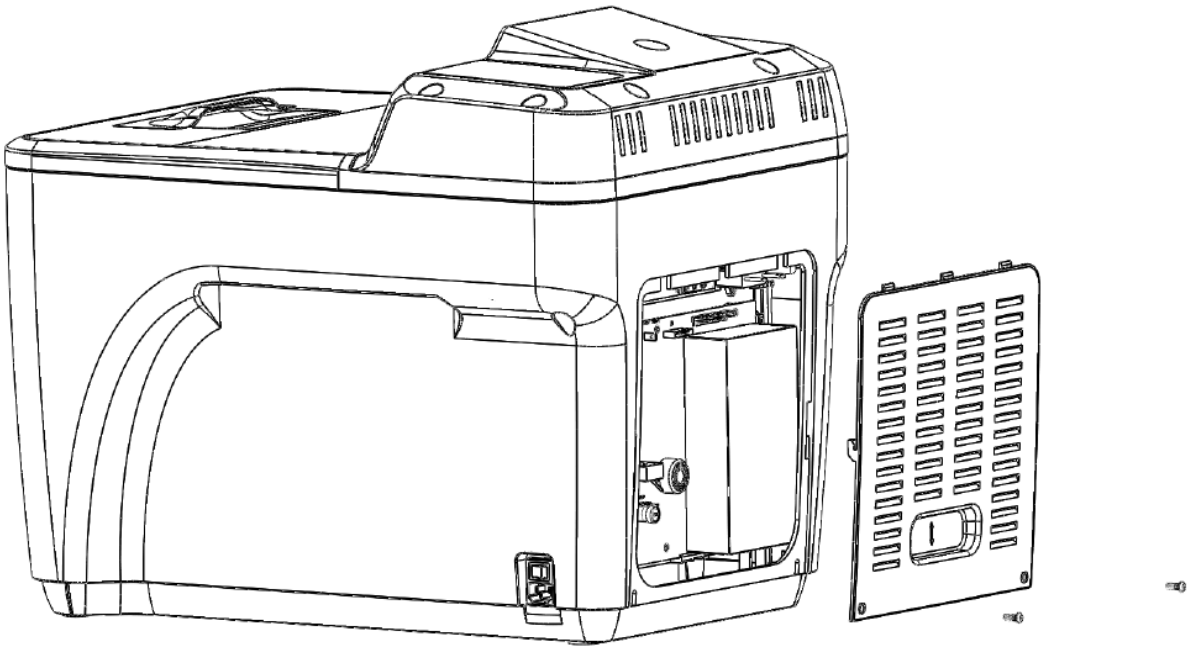


Figure 3 - Remove Back Panel

IV. Pump Assembly Replacement [Part # 04803-01]

A. How to Remove the Pump Assembly

1. **Remove The Top Cover**
   a. Unplug the SCA from power and remove the Top Cover (**See How to Remove the Top Cover Section III A**).
2. **Remove the Back Panel**
   a. Remove the Back Panel (**See How to Remove the Back Panel Section III B**).
3. **Remove the Wire Connections**
   a. Disconnect the Pump Motor connector from the PCB Assembly.

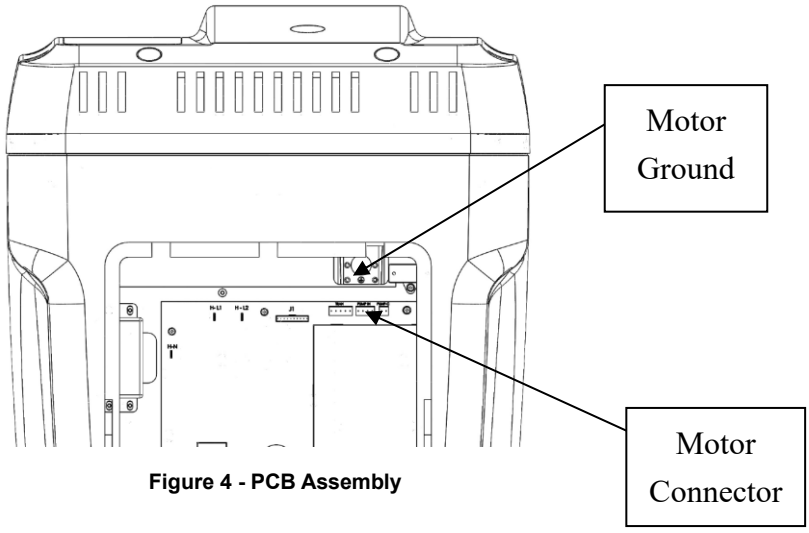


Figure 4 - PCB Assembly

   b. Remove the screw holding the Pump Motor ground wire.
   c. Gently pull the motor wires through the Bridge.

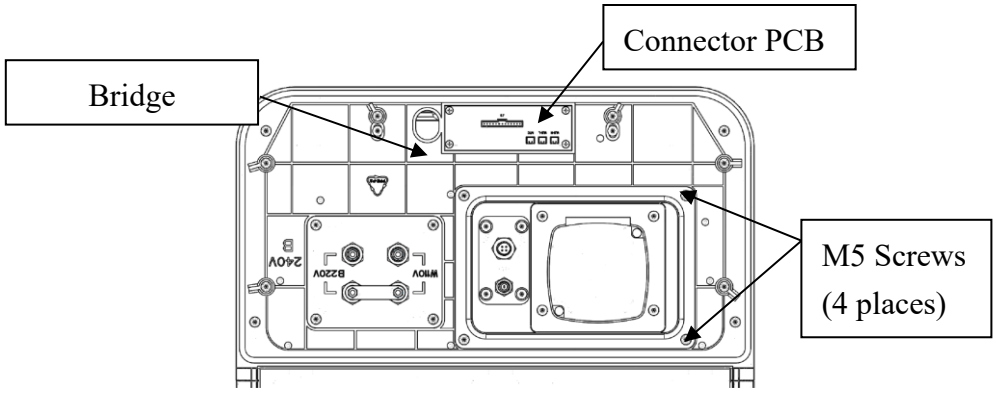


Figure 5 - Top View of SCA with Top Cover Removed

d. Unplug the three white 2-wire connectors for the sensors that connect to the Connector PCB.

4. **Remove the Pump**

a. Remove the four M5 screws holding the Pump Assembly and the ground wire.

NOTE:
The tray gasket may cause the Pump Assembly to stick to the Bridge. If this happens, loosen the gasket by gently rocking the Pump Assembly back and forth.

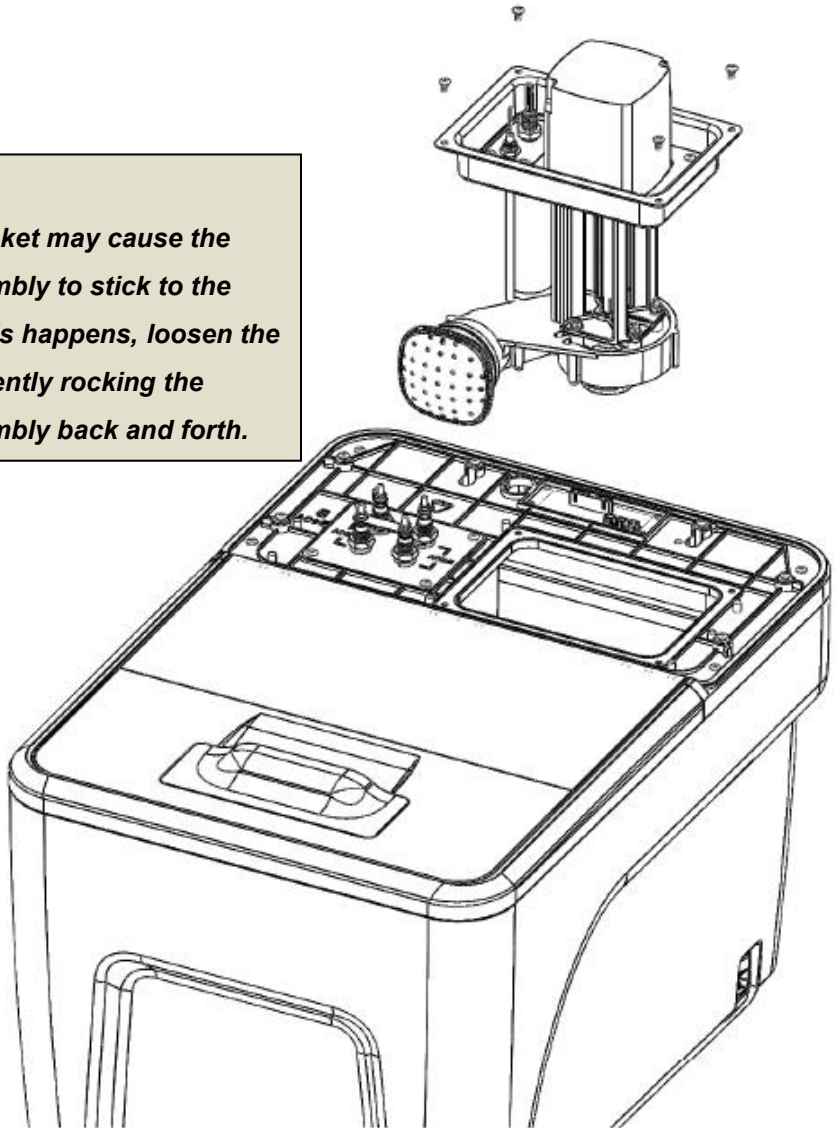


Figure 6 - Remove the Pump Assembly

b. Grip the Pump Assembly by the motor and carefully guide the Pump Assembly through the hole in the Bridge and remove.

B. How to Install the Pump Assembly

1. **Mount the Pump Assembly**
    a. Mount the Pump Assembly to the Bridge using the four M5 mounting screws and attach the ground wire to the tray.
2. **Attach the Pump Assembly Connectors**
    a. Thread the motor wires through the Bridge.
    b. Attach the ground wire from the motor to the grounding bracket.
    c. Plug in the connector from the motor to the PCB.
    d. Plug in the three sensors to the appropriate connectors on the Connector PCB.
3. **Attach the Covers**
    a. Slide the Back Panel back onto the SCA and secure with the two M5 screws.
    b. Plug the ribbon cable from the Display back into the Connector PCB.
    c. Place the Top Cover back on the SCA and secure with the six M5 screws.
    d. Push the plugs back into the corresponding holes.

V. Sensor Assembly Replacement [Part # 04810-01]

A. How to Remove the Sensor Assembly

1**. Remove Top Cover**

a. Unplug the Power Cord and remove the top cover (**See How to Remove the Top Cover Section III A**).

2. **Remove the Sensor Assembly Connectors**

a. Unplug the three white two-wire connectors for the sensors that are attached to the Connector PCB.

b. Remove the four M5 screws holding the Sensor Assembly.

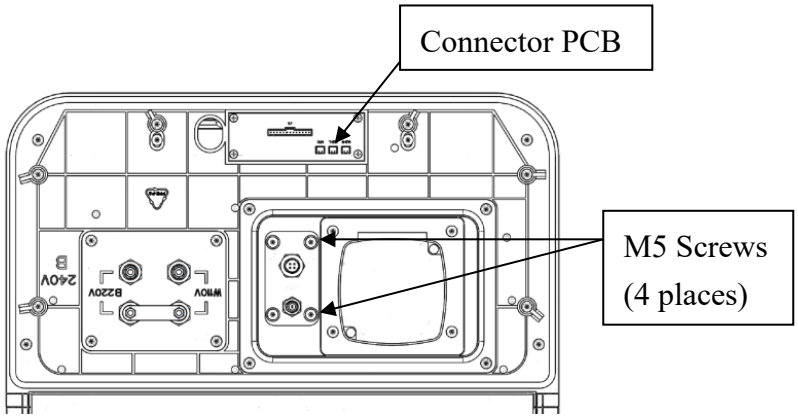


Figure 7 - Top View of SCA with Top Cover Removed

c. Carefully remove the Sensor Assembly from SCA.

NOTE: ***The gasket is attached to the Sensor***

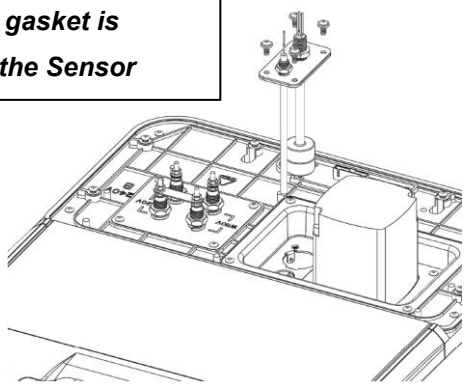


Figure 8 - Remove Sensor Assembly

B. How to Install the Sensor Assembly

1. **Mount the Sensor Assembly**
    a. Insert the Sensor Assembly into the motor tray.
    b. Mount the Sensor Assembly using the four M5 screws.
2. **Attach the Connectors**
    a. Plug in the three sensors to the appropriate connectors on the Connector PCB.
    b. Plug the ribbon cable from the Display back into the Connector PCB.
3. **Attach the Covers**
    a. Place the Top Cover back on the SCA and secure with the six screws.
    b. Push the plugs back into the corresponding holes.

VI. Spray Nozzle Replacement [Part # 04809-01]

A. How to Replace the Nozzle

1. **Replace the Nozzle**
    a. The 1200ht has an old style and a new style nozzle.
        i. The old-style nozzle (Threaded style [**04809-01 Rev A**]) was present on SCAs from Serial Numbers HT00001 – HT01974. SCAs after SN HT01974 and new motors now have the Bayonet style nozzles included and are not compatible with the older threaded nozzles. To remove the older threaded style nozzles, simply rotate counterclockwise. Rotate clockwise to screw the nozzle back on. Ensure the nozzle lines up with the square opening in the large parts basket.
        ii. The new nozzle (Bayonet style [**04809-01 Rev B**.]) has a latch that twists on the motor output opening. Twist the nozzle counterclockwise to unlatch and clockwise to latch. Ensure that Bayonet style nozzle has the O-ring in place, or it will not securely snap into place.

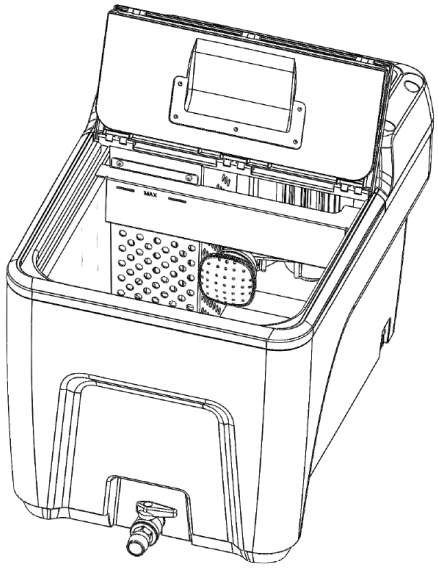


Figure 9 – Replacing the Spray Nozzle

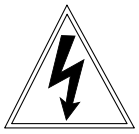
Threaded Style Nozzle

Bayonet Style Nozzle

VII. Heater Assembly Replacement [Part # 04805-01]

A. How to Remove the Heater Assembly

1. **Remove the Top Cover**
   a. Unplug the SCA from power and remove the top cover (**See How to Remove the Top Cover Section III A**).
2. **Remove the Back Panel**
   a. Remove the Back Panel (**See How to Remove the Back Panel Section III B**).



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

3. **Remove the Heater Assembly Connectors**
   a. Unplug the Heater Assembly's three connectors from the PCB Assembly.

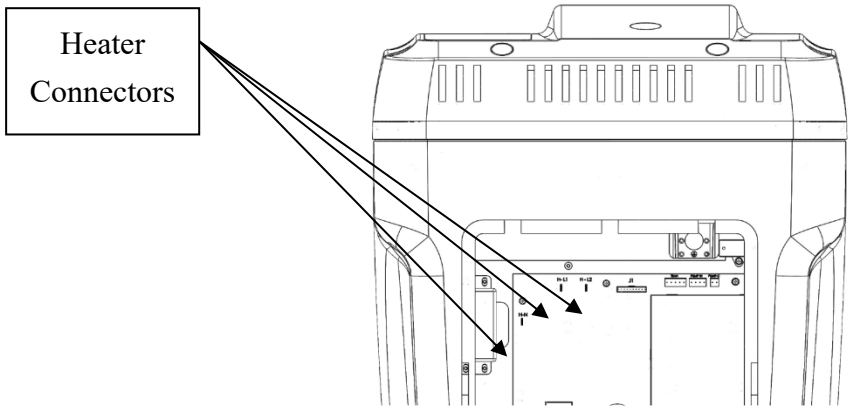


Figure 10 – PCB Assembly

   b. Gently pull the Heater Assembly wires through the Bridge.
4. **Remove the Heater Assembly**
   a. Remove the four M5 screws holding the Heater Assembly and ground wire.

ALLOW THE HEATING ELEMENT FOR COMPLETELY COOL BEFORE REMOVING.

b. Carefully remove the Heater Assembly from SCA.

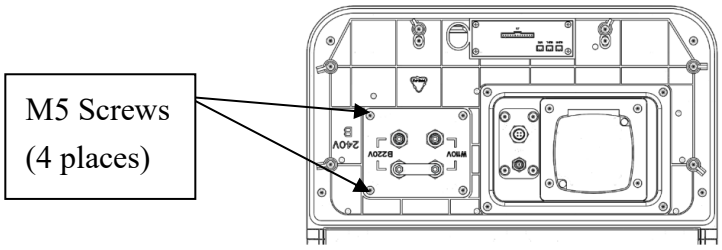


Figure 11 – Top View of SCA with the Top Cover Removed

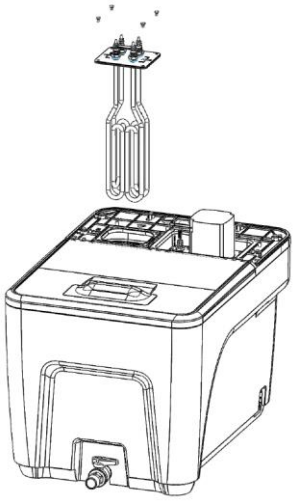


Figure 12 – Remove the Heater Assembly

B. How to Install the Heater Assembly

1. **Mount 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 wires to the tray.
2. **Attach the Heater Assembly Connectors**
   a. Thread the Heater Assembly wires through the Bridge.
   b. Connect the three Heater Assembly wire connectors to the PCB.
3. **Attach the Covers**
   a. Slide the Back Panel back on the SCA and secure with the two screws.
   b. Plug the ribbon cable from the Display back into the Connector PCB.
   c. Place the Top Cover back on the SCA and secure with the six screws.
   d. Push the rubber plugs back in the corresponding holes.

VIII. Display Control Panel Replacement [Part # 100039]

A. How to Remove the Display Control Panel

1. **Remove the Top Cover**
   a. Remove the Top Cover (See **How to Remove the Top Cover Section III A**).
2. **Remove the Display Control Panel**
   a. Turn the cover over and remove the four screws holding the ribbon cable.

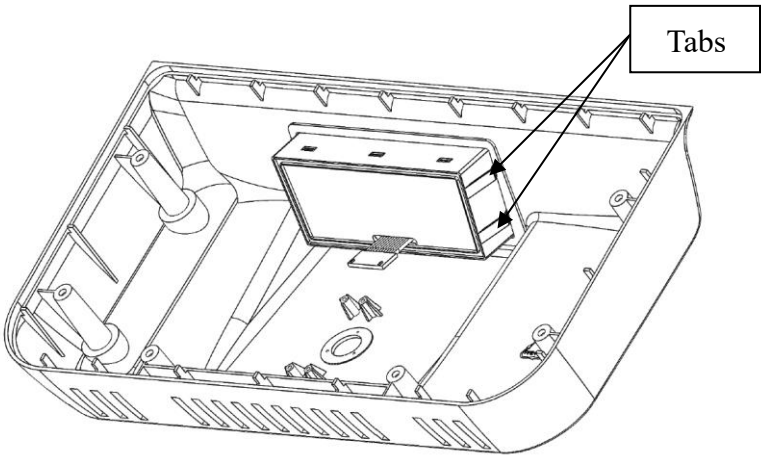
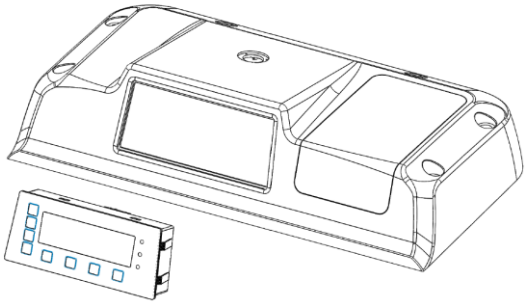


Figure 13 – Display Control Panel Tabs

b. Press the four tabs (two on each side of the display) on the side of the display and press the display 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 display and proceed to press the display into the top cover. The display should snap into place.
    c. Place the ribbon cable between the posts on the inside of the cover.
    d. Mount the supports to the post using the four M5 screws.
    e. Plug the ribbon cable from display back into the Connector PCB
2. **Attach the Top Cover**
    a. Place the Top Cover back on SCA and secure with the six screws.
    b. Push the rubber plugs back into the corresponding holes.

IX. PCB Assembly Replacement [Part # 04807-01]

A. How to Remove the PCB Assembly

1. **Remove the Back Panel**
   a. Remove the back panel (**See How to Remove the Back Panel Section III B**).
2. **Remove the PCB Connectors**
   a. Check to make sure the labels are on the wires connected to the PCB.
   b. Remove all the wire connectors to the PCB, be careful not to rip off a wire label.
   c. Remove the six screws that hold the PCB in place.

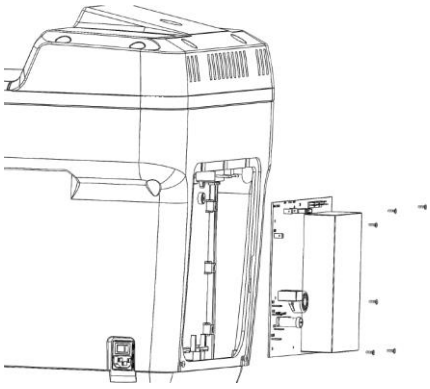


Figure 14 - Remove Screws and Remove PCB

3. Grip the edge of the circuit board and carefully slide the board up and to the left. As the PCB is removed, angle the board to clear the transformer. Make sure not to damage any wires as the board is removed.

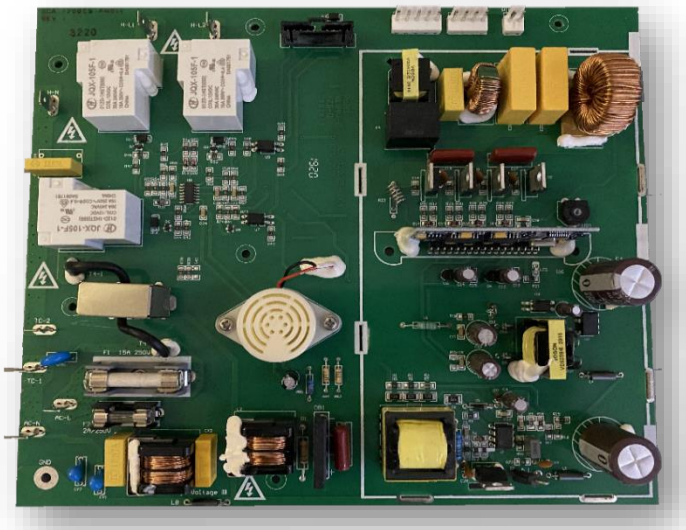


Figure 15 - PCB

B. How to Install the PCB Assembly

1. **Mount the PCB Assembly**
    a. Slide the PCB in at an angle and guide the board onto the supports at the bottom. Make sure not to damage any wires as the board is placed. Make sure no wires get behind the board before securing the screws.
    b. Mount the circuit board with the six screws.
2. **Attach the PCB Connectors**
    a. Attach the wire connectors to their proper locations by referencing the labels on the wires and the circuit board.
3. **Attach the Back Panel**
    a. Slide the Back Panel back on the SCA and secure with the two screws.

X. Power Switch Replacement [Part # 04813-01]

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

1. **Remove the Back Panel**
    a. Ensure the power is unplugged from the SCA.
    b. Remove the Back Panel (**See How to Remove the Back Panel Section III B**).
2. **Remove the PEM Connectors**
    a. Remove the PEM red and black wires connectors from the PCB.
    b. Remove the ground wire from the tank.

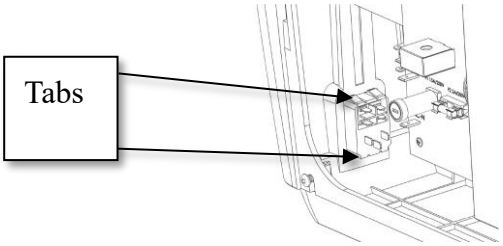


Figure 16 – Press on Tabs on Back of Switch

3. **Remove the PEM**
    a. Press the four tabs on the top and bottom of the switch and press the switch out of the case. This is usually not an easy process. If the PEM is defective and is being replaced, it is generally easier to just snap off the tabs from the PEM with a small flathead screwdriver before pulling it out. The new PEM will simply snap in.

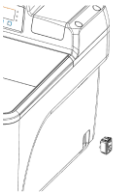


Figure 17 - Remove Switch

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

1. **Mount the PEM**
    a. Press the switch back into the case. Make sure the switch and the locking tabs are seated properly.
    b. Connect the PEM wires to the PCB. Red connects to the AC-L tab.
2. **Attach the Back Panel**
    a. Slide the Back Panel on SCA and secure with the two screws.

XI. Fuse Replacement

A. How to Replace the F1 15A 250V Fuse [Part # 04801-01]

1. **Remove the Back Panel**
    a. Ensure the power is unplugged from the SCA.
    b. Remove the Back Panel (**See How to Remove the Back Panel Section III B**).
2. **Remove the Fuse**
    a. Older models will have a plastic fuse holder (***See Figure 18***).
    b. Newer models will have a clip that holds this fuse. Simply pry out the old fuse and replace it.

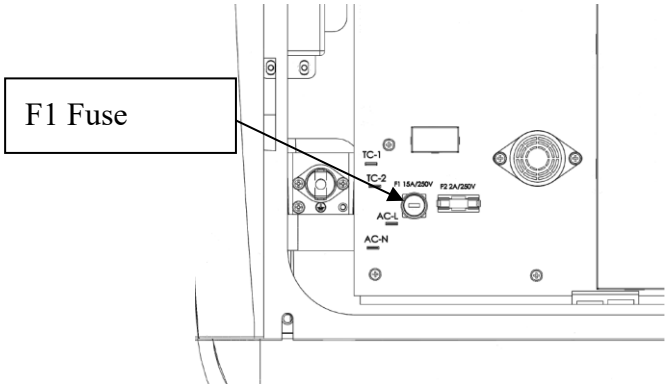


Figure 18 – F1 Fuse Holder (Olde Style)

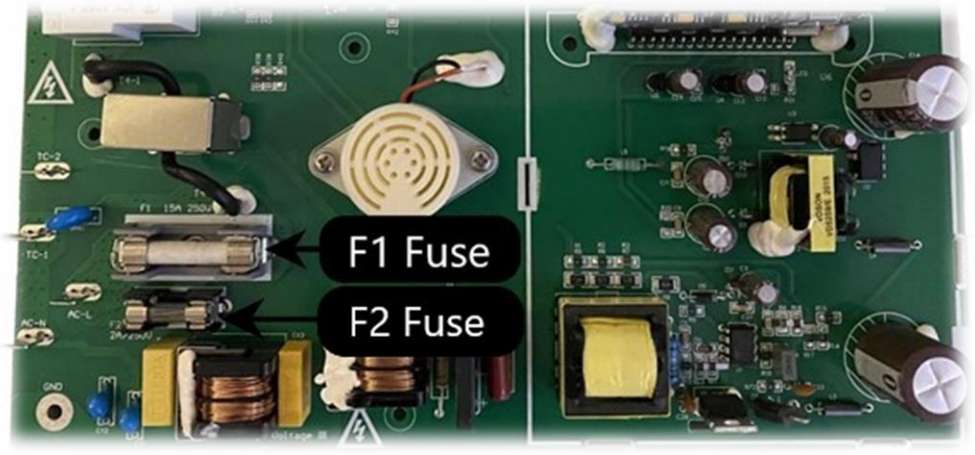


Figure 19 - F1 Fuse Holder (New Style)

3. **Attach the Back Panel**
    a. Slide the Back Panel on SCA and secure with the two screws.

B. How to Replace the F2 2-amp 250V Fuse [Part # 04802-01]

1. **Remove the Back Panel**
    a. Ensure the power is unplugged from the SCA.
    b. Remove the Back Panel (**See <u>Removing the Back Panel</u> Section III B**).
2. **Replace the Fuse**
    a. Pry out the 2-amp fuse.

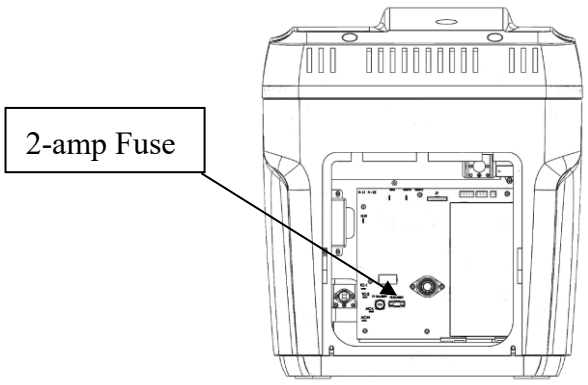


Figure 20 - Fuse Location

    b. Press the new fuse into the clips.

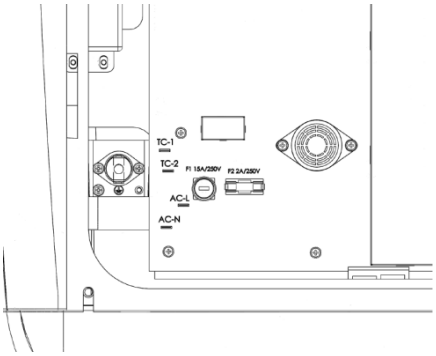


Figure 21 - Fuse Clip

3. **Attach the Back Panel**
    a. Slide the Back Panel on SCA and secure with the two screws.

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 and Connector 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)

Digital Multimeter with Capacitance Selection

Test Hooks

.7 mm Test Probes

A. Pump and Transformer Troubleshooting

Tools Needed:

Multimeter

Test Hooks

.7mm Test Probes

Phillips Screwdriver

Symptom: **Pump Inoperable, EP error**

Theory: The Water Pump uses a 115VAC 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 Transformer is used to isolate the Water Pump from the rest of the circuitry and to reduce Electro Magnetic Interference (EMI).

Steps:

1. **Check the Inverter Circuit LED**
    a. The LED on the PCB (***See Figure 22***) should be constantly lit when the SCA is powered up. If it is blinking, it indicates there is an error on the Inverter Circuit. This can point to a probable defective PCB.

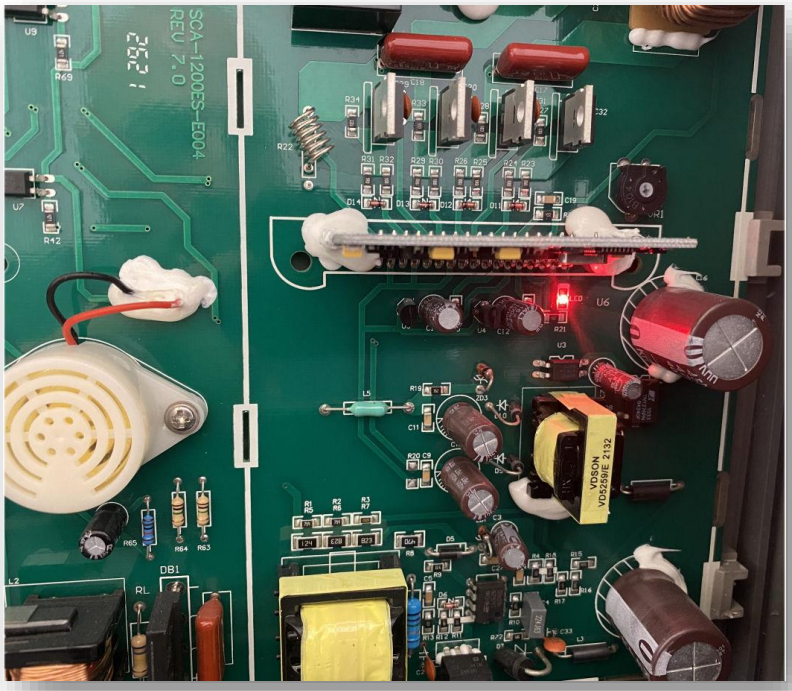


Figure 22 – Inverter LED

2. **Inspect Water Pump Motor and Components**

   a. Disconnect Power

   b. Remove and inspect the nozzle and the Water Pump Input Screen for any kind of buildup (**See Spray Nozzle Replacement Section VI**). The Input Screen is found at the bottom of the Water Pump intake. It is a round screen and simply pulls off. If either has a lot of buildup, remove the buildup, and see if the Water Pump circulates water (***See Figure 23***).

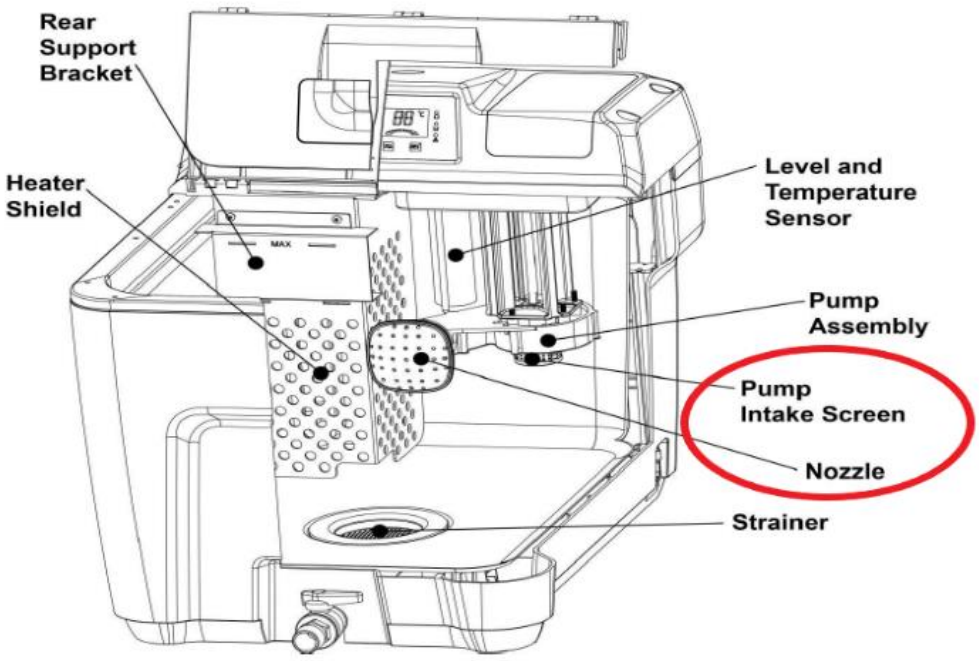


Figure 23 - Pump Screen and Nozzle

3. **Measure Water Pump Motor Resistance**

   a. Remove power from the SCA. Remove the connector for the Water Pump from the “PUMP IN” connector on the PCB and measure the resistance of the pump using the .7mm Test Probes. If these probes are not available, the contact pins can be reached from the back side of the connector, or some small staples may be used by inserting them into the connector. Choose the Resistance Setting **Ω** on the Multimeter. Check the resistance of the Water Pump between the wires on pins 1 & 3 on the *cable connector* (***See Figure 24***).

Figure 24 – Water Pump Resistance Measurement (pins 1 and 3)

i. If the Multimeter reads ~31.0 Ω, continue to the next step (Step b).

ii. If the Multimeter reads 0.0 Ω or OL, replace the Water Pump. Verify initial measurement.

NOTE: A measurement of +/- 10 ohms from the stated resistance could indicate a defective or failing motor.

b. Check the resistance of the Water Pump between the wires on pins 2 & 4 on the *cable connector* (***See Figure 25***).

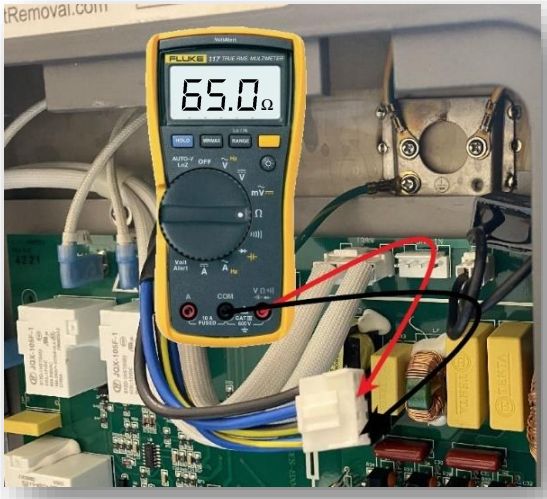


Figure 25 – Water Pump Resistance Measurement (pins 2 and 4)

i. If the Multimeter reads ~65.0 Ω, continue to the next section (Section 4).

ii. If the Multimeter reads 0.0 Ω or OL, replace the Water Pump. Verify initial measurement.

NOTE: A measurement of +/- 10 ohms from the stated resistance could indicate a defective or failing motor.

4. **Measure the Resistance of the Transformer**

   a. Unplug the Transformer from the “TRAN” connector on the PCB and measure the resistance. Check the resistance between the red wires on the Transformer *cable connector* (***See Figure 26***).

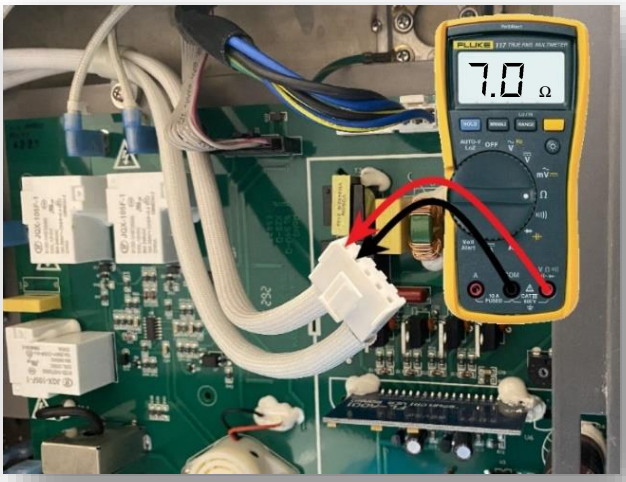


Figure 26 – Transformer Resistance Measurement (red wires)

   i. If the Multimeter reads ~7.0 Ω, continue to the next step (Step b).

   ii. If the Multimeter reads 0.0 Ω or OL, replace the Transformer. Verify initial measurement.

   b. Check the resistance between the black wires on the Transformer *cable connector (**See Figure 27)***.

Figure 27 - Transformer Resistance Measurement (black wires)

   i. If the Multimeter reads ~8.5 Ω, continue to the next section (Section 5).

   ii. If the Multimeter reads 0.0 Ω or OL, replace the Transformer. Verify initial measurement.

5. **Check the Mechanical Rotation of the Pump Motor Shaft**
    a. Reach into the top of the tub and rotate the shaft of the Water Pump Motor by rolling a finger across the shaft (***See Figure 28***). The Water Pump Motor Shaft should rotate extremely easily, with no dead spots in the rotation. If the motor shaft is bound or feels rough when rotating, it should be removed for closer inspection.

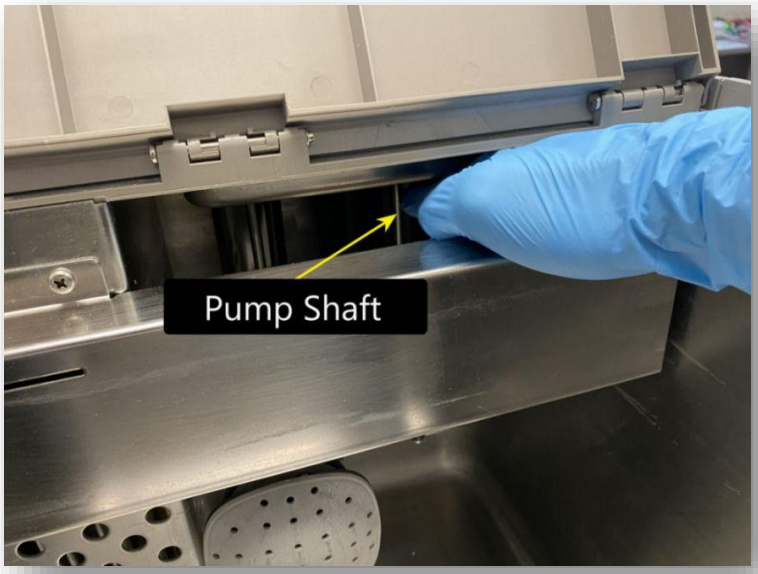


Figure 28 – Rotate the Water Pump Motor Shaft

6. **Quick Check the Run Capacitor**
    a. With all connectors plugged in and the SCA powered up, press the Start Button ⏻. Roll a finger across the Water Pump Motor Shaft as in the previous test to rotate the shaft. If the Water Pump Motor starts up, this is an indicator that the Run Capacitor is defective. The Run Capacitor gives the Water Pump Motor an initial punch to get the Pump Motor 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.

7. **Check the Capacitance of the Run Capacitor**
    a. The capacitance can be measured with a Multimeter that has a capacitance measurement setting ⊣⊢. The Selection Button on the Multimeter may need to be pressed to enable the Capacitance setting (***See Figure 29***). The Multimeter should read ~4.0 uF.

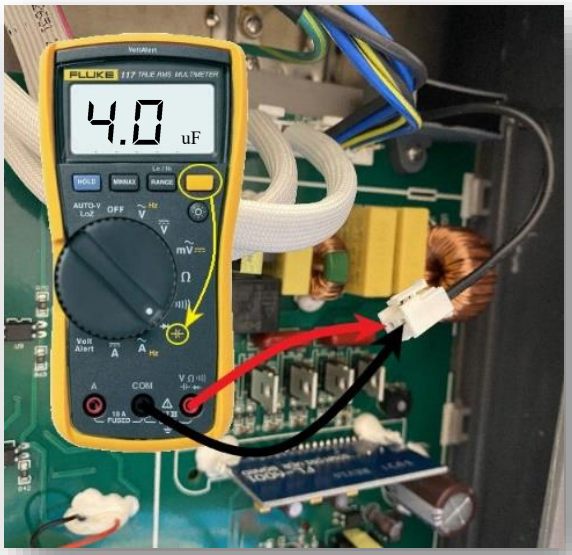


Figure 29 - Capacitance Check on Run Capacitor

b. If a capacitance option is not available on the Multimeter, the resistance can be tested.

i. Set the Multimeter to Ohms **Ω** .

ii. Short the leads of the Run Capacitor initially (***See Figure 30***).

Figure 30 - Short the Capacitor Leads

iii. After shorting the capacitor leads, measure between both wires at the highest resistance setting of the Multimeter. The resistance of the capacitor will increase from low resistance to infinity in a few seconds on a normally operating capacitor. If the Multimeter reads 0.0Ω (shorted), the capacitor is defective. If the Multimeter reads OL (open) a*fter* shorting the leads of the capacitor and there is no initial ramp up from 0Ω, the capacitor is probably defective.

8. **Test the Input Voltage to the Water Pump Motor**

a. Set the Multimeter to AC voltage Ṽ. With the power off, unplug the motor connector from the PCB. Attach the Multimeter test hooks to pins 1 and 3 on the “Pump In” pins on the PCB (***See Figure 31***).

WARNING: High Voltage May Be Present on These Pins!

b. Power on the SCA and press the Start Button ⏻ to enable the Pump Motor. Measure the AC voltage across pins 1 and 3.

Figure 31 – Pump Output Voltage (pins 1 and 3)

i. If the Multimeter reads ~120 VAC (~230 VAC EU), continue to the next step (Step c).

ii. If the Multimeter reads ~0 VAC, Check the input voltage to the Transformer (**See <u>Measure the Input Voltage to the Transformer</u> Section XII A 8**).

c. Measure the AC Voltage across pins 2 and 4 (***See Figure 32***).

Figure 32 – Water Pump Output Voltage (pins 2 and 4)

i. If the Multimeter reads ~120 VAC (~230 VAC EU), continue to the next section (Section 9).

ii. If the Multimeter reads ~0 VAC, this is an indication that the Run Capacitor is defective.

iii. If the voltage on pins 1 and 3 and pins 2 and 4 of the "Pump In" connector on the PCB are correct, the Transformer, PCB and Control Panel are operating correctly. If the voltages are not present, skip to the next section (Section 9)

9. **Measure the Input Voltage to the Transformer**

a. If the resistance and capacitance checks were valid, ensure power is removed from the SCA and unplug the Transformer Connector from the PCB. Set the Multimeter to AC voltage $\tilde{V}$ and attach the Multimeter test hooks to pins 1 and 2 of the Transformer pins on the PCB (***See Figure 33***).

Ensure they do not touch each other! WARNING: High Voltage May Be Present on These Pins!

b. Power on the SCA and press the Start Button ⏻ to enable the Pump Motor. Measure the voltage between pins 1 and 2 on the PCB.

Figure 33 - Transformer Input Voltage

i. If the Multimeter reads ~115 VAC (~230 VAC EU), the PCB and Control Panel are operating correctly.

ii. If the Multimeter reads ~0 VAC, the PCB or Control Panel is defective. Continue to the next section (Section 10).

10. **Check the Motor Enable Signal**

a. Remove the top cover (**See <u>Removing the Top Cover</u> Section III A**) and check the Motor Enable voltage from the Control Panel on the Connector Board to the PCB.

b. Set the Multimeter to DC voltage ⩛. Press the Start Button ⏻ on the Control Panel to enable the Pump Motor and measure the voltage across pin 2 (GND) and pin 4 (Motor Control Signal) on the connector J2 solder joints (***See Figure 34***). When the motor is enabled, the control signal transitions from a low (~0V DC) to a high (~12V DC).
   i. If the Multimeter reads ~12.0 VDC, the Display Control Panel is operating correctly.
   ii. If the Multimeter reads ~0 VDC, continue to the next step (Step c).

Figure 34 - Connector Board Motor Control Signal J2

c. Reseat (unplug and plug back in) connectors J1 on the PCB and J2 and J3 on the Connector Board (***See Figure 35***). To access J2, the 4 Phillips head screws on the Connector Board can be removed to access the underside of the Connector Board.
d. If there is still ~0V DC when the motor is enabled, replace the Control Panel. Verify initial measurements.

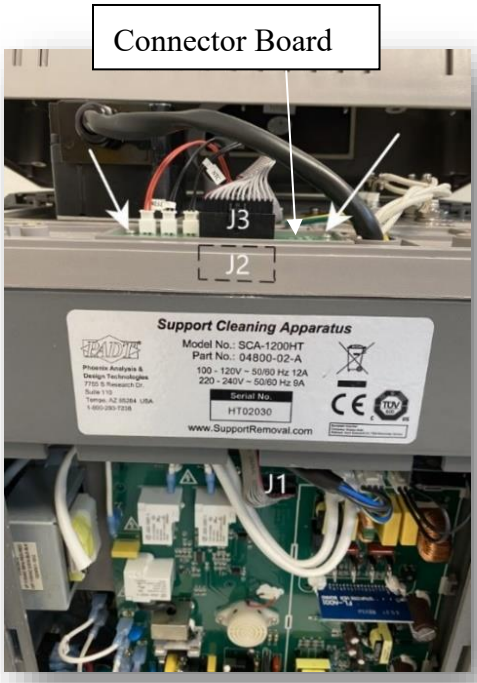


Figure 35 – J1, J2, and J3 Connectors

B. Heating Element Troubleshooting

Tools Needed:

Multimeter

Phillips Screwdriver

Symptom: **Not Heating, Over Heating, Under Heating**

Theory: The Heating Element has an internal resistance that creates 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 Element 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 Element 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 Element 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. **F1 Fuse and TCO Test**
    a. If the SCA does not heat up at all, check fuse F1. If the fuse is blown, replace with same value and rating as original (15-amp 250V) (**See Fuse Replacement Section XI A**). Check the TCO (**See Thermal Cutoff Switch (TCO) Troubleshooting Section XII C).**
2. **Heater Element Resistance Test**
    a. Remove power from the SCA.
    b. Remove the top cover (**See Removing the Top Cover Section III A).**
    c. Set the Multimeter to Ohms **Ω**. Check the resistance of the Heating Element (***See Figure 36***).
        i. On 120V AC (US) Systems, if the Multimeter reads ~11.0 Ω between HN → H-L1, the Heater Element is operating correctly. Continue to the next section (Section 3).
        ii. On 230V AC (US) Systems, if the Multimeter reads ~34.0 Ω between HN → H-L2, the Heater Element is operating correctly. Continue to the next section (Section 3).

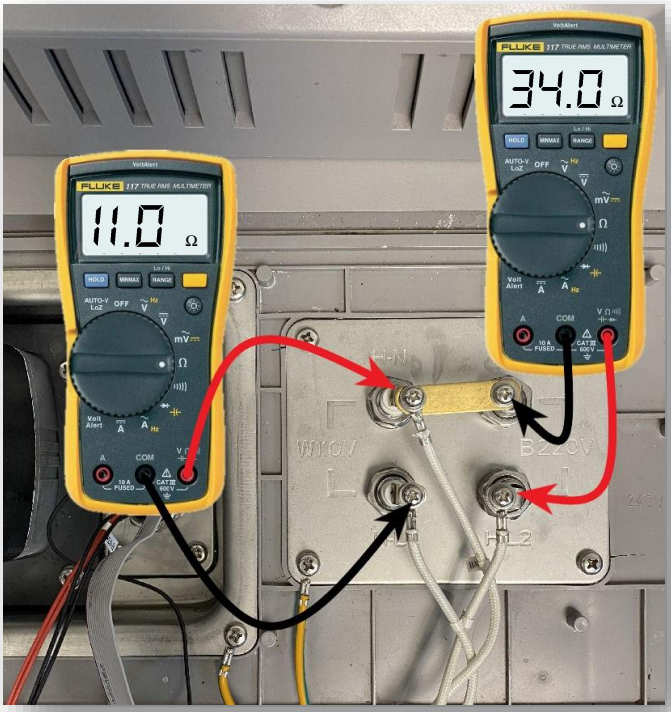


Figure 36 - Heating Element Resistance Check

d. If the Multimeter reads 0.0Ω or OL, replace the Heater Elements. Verify initial measurements.

3. **Heater Element Voltage Test**

SHOCK HAZARD!

ONLY QUALIFIED PERSONNEL SHOULD DO THIS TEST

a. Remove the top cover, (**See <u>Removing the Top Cover</u> Section III A**).

b. Set the Multimeter to AC voltage Ṽ. With power applied and the heat setting activated, press the Start Button ⏻ and check the voltage to the Heating Element (***See Figure 37).***

   i. On 120V AC (US) Systems, if the Multimeter reads ~ 115 VAC between HN → H-L1, the Control Panel and the PCB are operating correctly.

   ii. On 230V AC EU) Systems, if the Multimeter reads ~ 230 VAC between HN → H-L2, the Control Panel and the PCB are operating correctly.

c. If the Multimeter reads ~0 VAC, skip to the next section (Section 4).

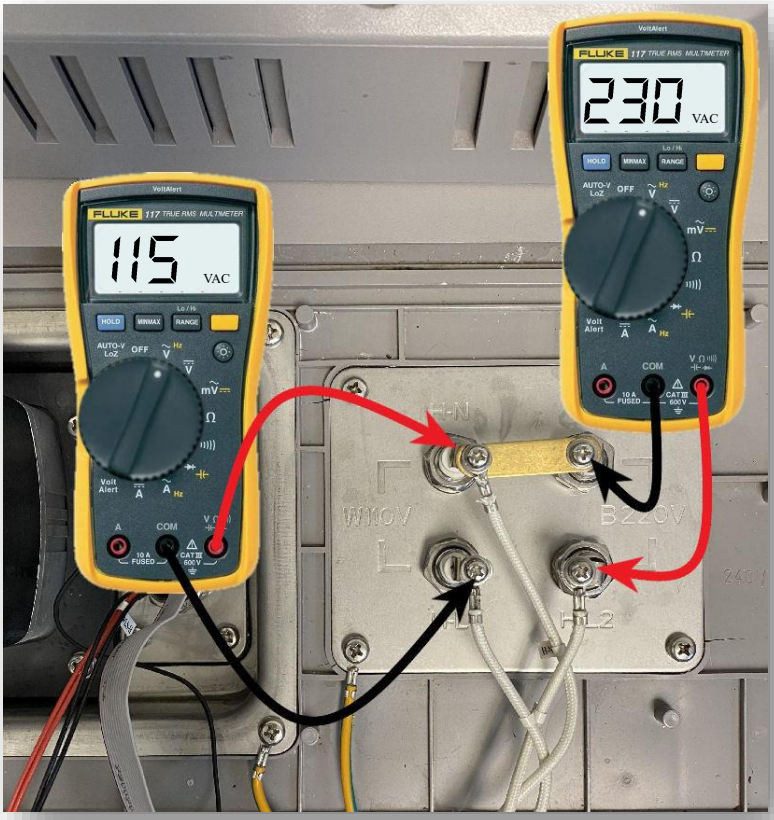


Figure 37 - Heating Element Input Voltage

NOTE:
There are 2 Heater Elements on the SCA 1200ht. One Heater Element is dedicated to 120V AC (US) only, the other is dedicated to 230V AC (EU). Only one Element is used and only one Element will have voltage depending on the input voltage. They are not interchangeable.

4. **Heater Element Control Signal Test**
    a. Select a heat setting and press the Start Button ⏻ on the Control Panel. Ensure the bath temperature is not at the set temperature. The Control Panel will not send a signal to the PCB when the bath temperature is equal to the set temperature.
    b. Set the Multimeter to DC voltage ⩛. Measure the voltage across pin 2 (GND) and pin 7 (Heating Tube control signal input) on the Connector Board J2 solder joints (***See Figure 38***). When the Start Button is pressed, the control signal transitions from a low (~0V DC) to a high (~12V DC). This energizes the Heater Relay.
        i. If the Multimeter reads ~12.0 VDC across pins 2 and 7 on the J2 solder joints when the Start Button is pressed and there is no voltage across the Heater Element, test the Thermal Cutoff Switch (See **Thermal Cutoff Switch Troubleshooting Section XII C)**.

ii. If the Multimeter reads ~0 VDC, continue to the next step (Step c).

c. Reseat connector J3 and check the voltage again.

i. If the Multimeter reads ~12.0 VDC, the Display Control Panel is operating correctly. Re-check the voltage on the heating Elements.

ii. If the Multimeter still reads ~0 VDC, continue to the next step (Step d).

d. If there is ~0V DC between pins 2 and 7 on the J2 solder joints when the Start Button is pressed, check the Temperature Sensor (**See Temperature Sensor Troubleshooting Section XII D**).

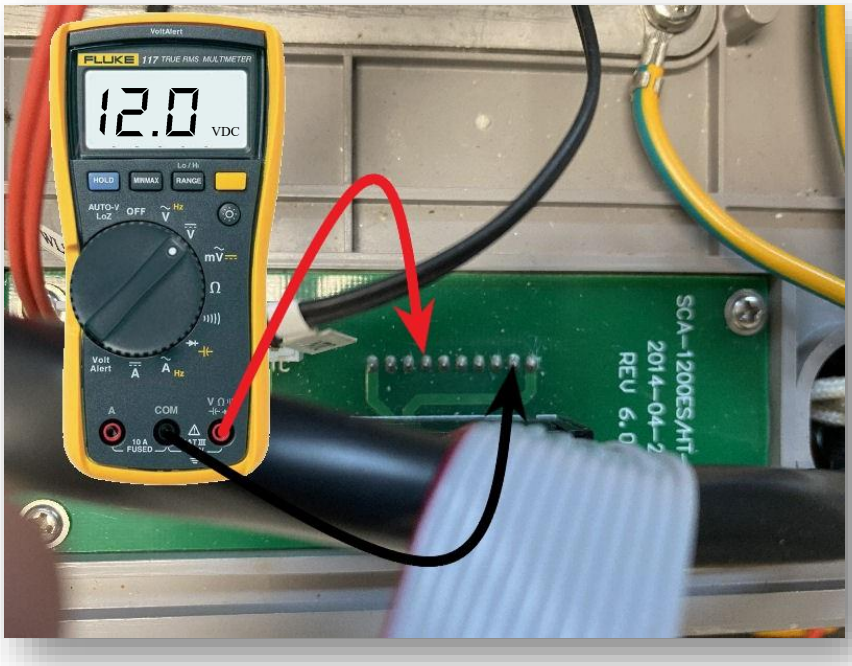


Figure 38 – Connector Board Heater Control Signal J2

C. Thermal Cutoff Switch (TCO) Troubleshooting

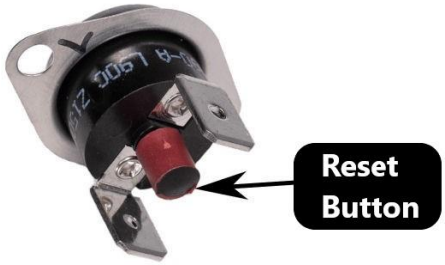
Tools Needed:

Multimeter

Phillips Screwdriver

Symptom: **Not Heating**

Theory: The Thermal Cutoff Switch found on the back wall of the tank by the Main Power Switch removes voltage from the Heater Relay if the temperature of the bath exceeds 90ºC. To reset the switch, allow the temperature of the bath to drop below 80ºC and press the red reset button between the wire terminals.

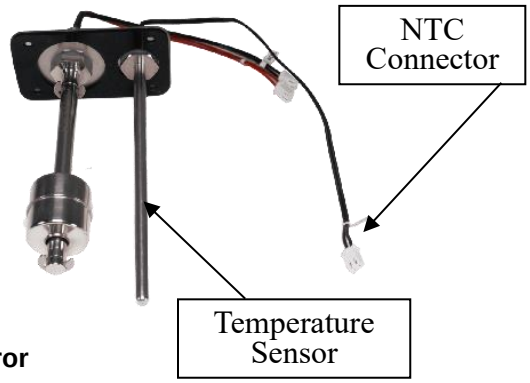


Steps:

1. **Check the continuity of the Thermal Cutoff Switch**
   a. With the power off, remove the connectors from the Thermal Cutoff Switch at the PCB, (***See Figure 39***). Set the Multimeter to the Diode Test Mode ⊣▶⊢ and connect the probes to the wire terminals.
   b. Check the continuity of the switch between the terminals.
      i. If the Multimeter displays continuous (0.00), the TCO operating correctly.
      ii. If the Multimeter displays open (OL), it is either tripped (open) or it is defective. Press the reset button on the TCO when the temperature of the bath is below 80ºC. If the TCO still reads open (OL), replace the TCO. Verify initial measurements.

Figure 39 – Thermal Cutoff Switch Check

D. Temperature Sensor Troubleshooting



Tools Needed:

Multimeter

Philips Screwdriver

Symptom: **Not heating at all, Over Heating, Under Heating, r1 Error**

Theory: The Temperature Sensor changes resistance according to the temperature of the bath. As the temperature increases, the resistance of the sensor decreases (See ***Figure 40***). The Temperature Sensor resistance is evaluated by the Control Panel to regulate when power is applied to the Heater Relay.

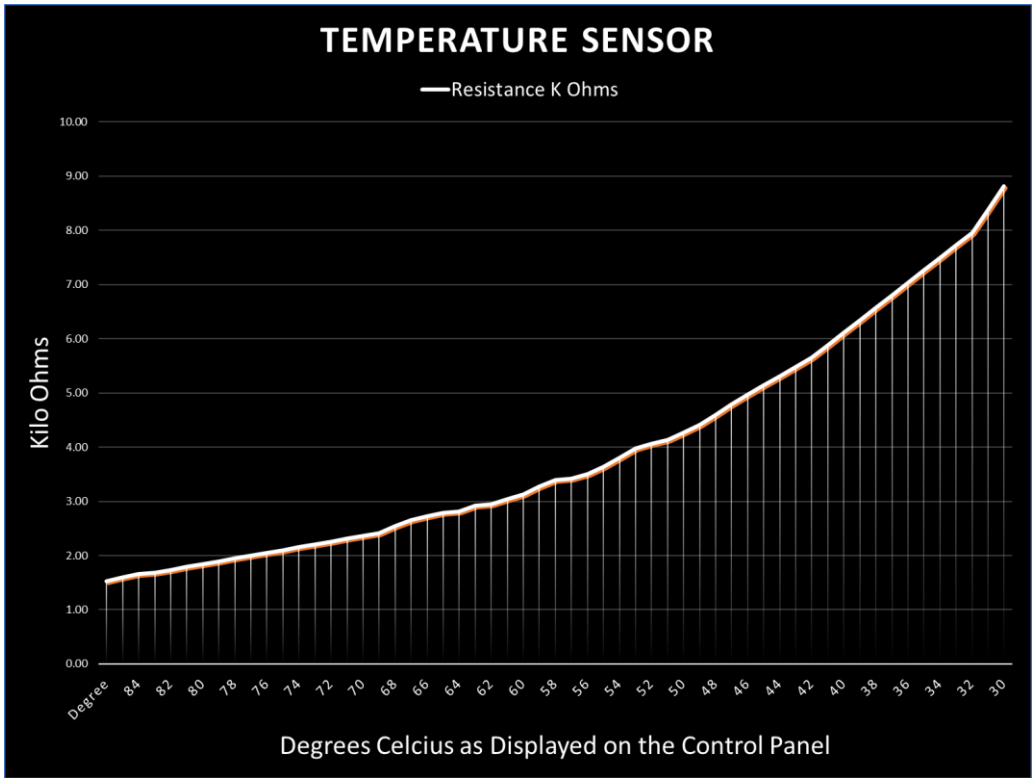


Figure 40 – Temperature/Resistance Correlation

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

- The bath may not reach the set temperature.
- The bath may overheat, possibly tripping the Thermal Cutoff switch (TCO).
- There will be an r1 error (infinite resistance or open).

Steps:

1. **Check the resistance of the Temperature Sensor**
   a. Remove the Top Cover (**See <u>Removing the Top Cover</u> Section III A**).
   b. Unplug the NTC connector (***See Figure 41***)

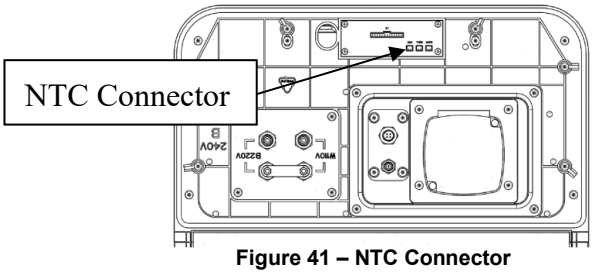


Figure 41 – NTC Connector

   c. Set the Multimeter to ohms **Ω** and check the resistance of the Temperature Sensor across both wires on the NTC connector using the .7mm probes (***See Figure 42***). Small staples can also be used by pushing them into the connector pins if the .7mm probes are unavailable. At room temperature (~19°C → 30°C). The resistance should read between12k and 8k (depending on what the actual room temperature is). Plug the NTC connector back in and power on the SCA.

Figure 42 – NTC Connector @ 50°C

2. Set the SCA to 50°C and press the Start Button ⏻. When the bath heats up and the Control Panel displays 50°C, remove power from the SCA, unplug the NTC connector and measure the resistance across both wires. The Multimeter should read ~4.41 kΩ. Try different heat settings and compare the resistance values to the table below (***See Table 1***). If the resistance measurements are not approximate to the values below, replace the Temperature Sensor. Verify initial measurements.

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	~ 8.38 kΩ

Table 1 – Temperature Resistance Values

E. Water Level Sensor Troubleshooting

Tools Needed:

Multimeter

Philips Screwdriver

Symptom: **SCA beeping, high or low water LED flashing on Control Panel, r2, r3 error**.

Theory: The Float 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.

Steps:

1. **Check the resistance of the Water Level Sensors**
   a. Remove the sensor from the mounting plate (**See <u>Sensor Assembly Replacement</u> Section V)**.
   b. Visually inspect the Float 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. Very rarely, the Float can be permeated with water. Ensure the integrity of the Float.
   c. Set the Multimeter to ohms **Ω** and check the resistance across both wires of the **WLS-H** connector (***See Figure 43***).
      i. Move the Float to the middle of the shaft.
         - Multimeter should read ~22.0 kΩ
      ii. Move the Float to the top of the shaft.
         - Multimeter should read 0.0 kΩ (continuous)
   d. Check the resistance across the **WLS-L** connector.
      i. With the Float in the middle of the shaft.
         - Multimeter should read ~22.0 kΩ
      ii. Move the Float to the bottom of the shaft.
         - Measure 0.0 kΩ (continuous)
   e. If the measured resistance values do not correspond to the values above, replace the Water Level Sensor.

Figure 43 – WLS-H Resistance

F. No Power to SCA Troubleshooting

Tools Needed:

Multimeter

Phillips Screwdriver

Symptom: **SCA Appears to have no power, there are no audible clicks when toggling the power switch, the LED on the PCB is not lit.**

Theory: The SCA requires 100-120VAC (US) or 220-230VAC (Europe). The SCA chooses the right configuration automatically according to the input power via an Evaluation Relay.

Steps:

1. **Measure the Input Power**
   a. With the AC voltage selected on the Multimeter, measure the voltage at the Power Outlet. It should read ~120VAC(US) / ~230VAC(EU) (***See Figure 44***).

Figure 44 – US Input Voltage

   i. If voltage is present, continue to the next step (Step b).
   ii. If no voltage is present, check your building's circuit breakers.

   b. With the Power Cord plugged into the outlet measure the voltage at the female end of the Power Cord (***See Figure 45***).

Figure 45 – US Input Voltage

i. If voltage is present, continue to the next step (Step c).

ii. If no voltage is present, check the continuity of the Power Cord and replace as needed.

c. With the Power Cord unplugged from the SCA, disconnect the AC-L and AC-N from the PCB. Attach the Multimeter leads between AC-L and AC-N wire connectors (***See Figure 46***). Plug in the Power Cord, switch the power on (I) and measure the voltage at the output of the Power Entry Module (PEM).

Figure 46 – US Input Voltage AC-L → AC-N

i. If voltage is present, skip to the next section (Section 2).

ii. If voltage is not present, continue to the next step (Step d).

d. With the power cord unplugged, remove the AC-L and AC-N wire terminals from the PCB (***See Figure 47***). Set the Multimeter to the Diode Test Mode ⊣◁⊢ . Connect one probe of the Multimeter to the AC-N (black wire) terminal of the PEM and the other probe to the N male post at the input.

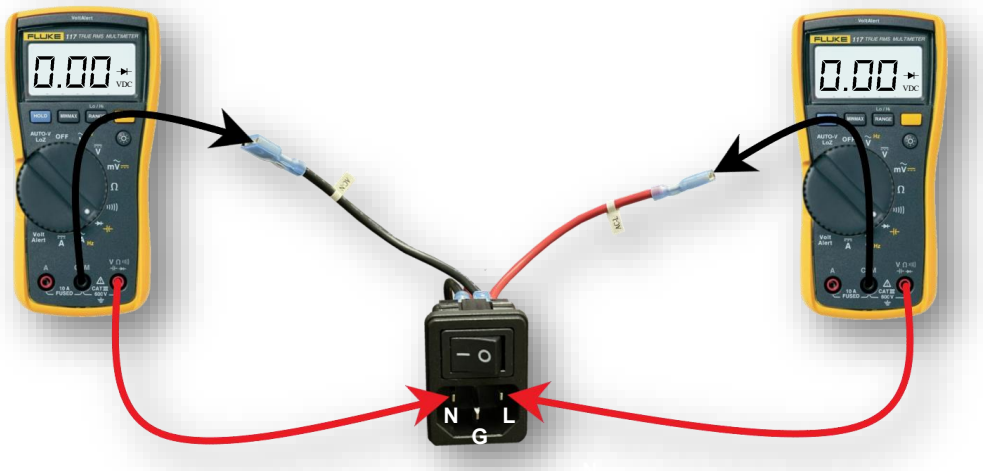


Figure 47 – PEM Continuity Test

i. With the switch “On” (I), the Multimeter should read continuous (0.00).

ii. With the switch “Off” (O), the Multimeter should read open (OL).

e. Connect one probe of the Multimeter to the AC-L (red wire) terminal of the PEM and the other probe to the L male post at the input.

i. With the switch “On” (I), the Multimeter should read continuous (0.00).

ii. With the switch “Off” (O), the Multimeter should read open (OL).

2. **Check the Continuity of F2**

a. Set the Multimeter to the Diode Test Mode ⊣◀ option. Remove power from the SCA and measure the continuity of fuse F2 (***See Figure 48***). Check the continuity of fuse F2 across both ends.

Figure 48 – F2 Fuse Continuity

i. If the Multimeter displays continuous (0.00), the fuse is operating correctly.

ii. If the fuse measures open (OL), the fuse is blown. Replace the fuse.

b. If the fuse blows again immediately upon powering up the SCA, remove power from the SCA and unplug the Pump and Transformer connectors from the PCB (***See Figure 49***). Replace the fuse.

Figure 49 – Transformer and Pump Connectors

i. Power up the SCA. If the fuse blows again with the Pump and Transformer unplugged, replace the PCB. NOTE: **Troubleshoot the Pump and Transformer to ensure they are not defective prior to replacing the PCB**. **A defective Pump Motor can damage the new PCB** (**See Pump and Transformer Troubleshooting Section XII A**).

G. No Power to Display Troubleshooting

Tools Needed:

Multimeter

Phillips Screwdriver

Symptom: **The SCA Control Panel appears to have no power and is not lit up when powering on the SCA. Upon plugging in to power and toggling the power switch, there *are* audible clicking sounds and the LED is lit on the PCB.**

Theory: The Control Panel requires ~12 VDC from the PCB to operate.

Steps:

1. **Reseat cable connectors J1, J2 and J3**
   a. Remove the Control Panel and Back Panel (**See <u>Removing Top Cover and Back Panel</u> Section III**).
   b. Reseat (unplug and plug back in) the J1, J2 and J3 cables from the Connector Board and from the PCB (***See Figure 50***). The J2 connector can be accessed by removing the 4 screws on the Connector Board and pulling the card up.

Figure 50 – Control Panel Connections

c. Power on the SCA. If the display powers up, there was probably a loose connection.

2. **Measure the Display Voltage**

a. Measure the voltage between pin 2 (GND) and pin 10 (12V DC) on the Connector Board J2 solder joints. There should be between 9V and 15V DC (usually around 12 or 13 V DC) (***See Figure 51***).

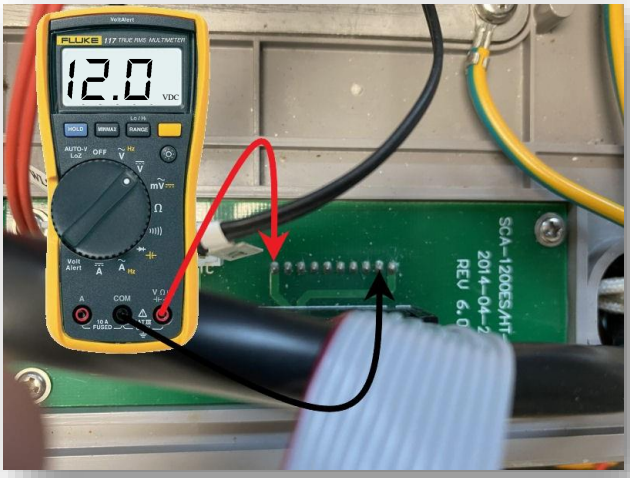


Figure 51 – Control Panel Connections

b. If there is no voltage between these points, and to ensure the ribbon cable is not defective, remove the J1 cable on the PCB and check the voltage between pins 1 and 9 on the PCB (***See Figure 52***). If no voltage is present at these pins, the PCB will need to be replaced. If there is voltage between these two pins, ohm out the ribbon cable wires to ensure continuity.

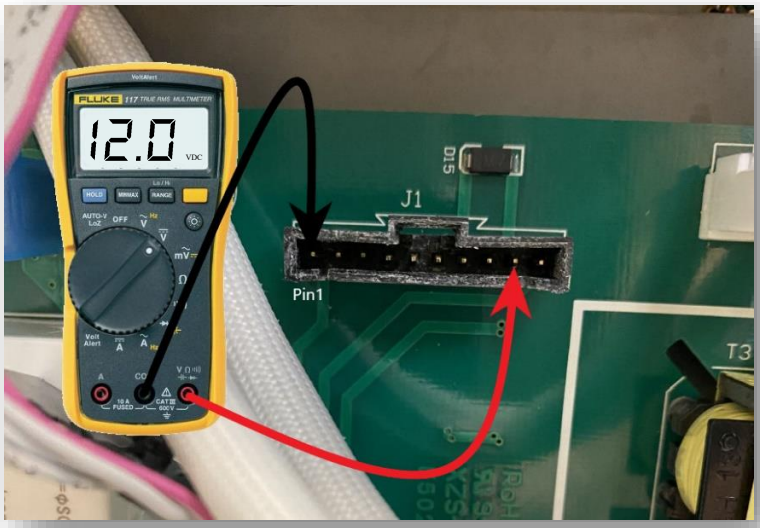


Figure 52 – J1 Connector Control Panel Voltage

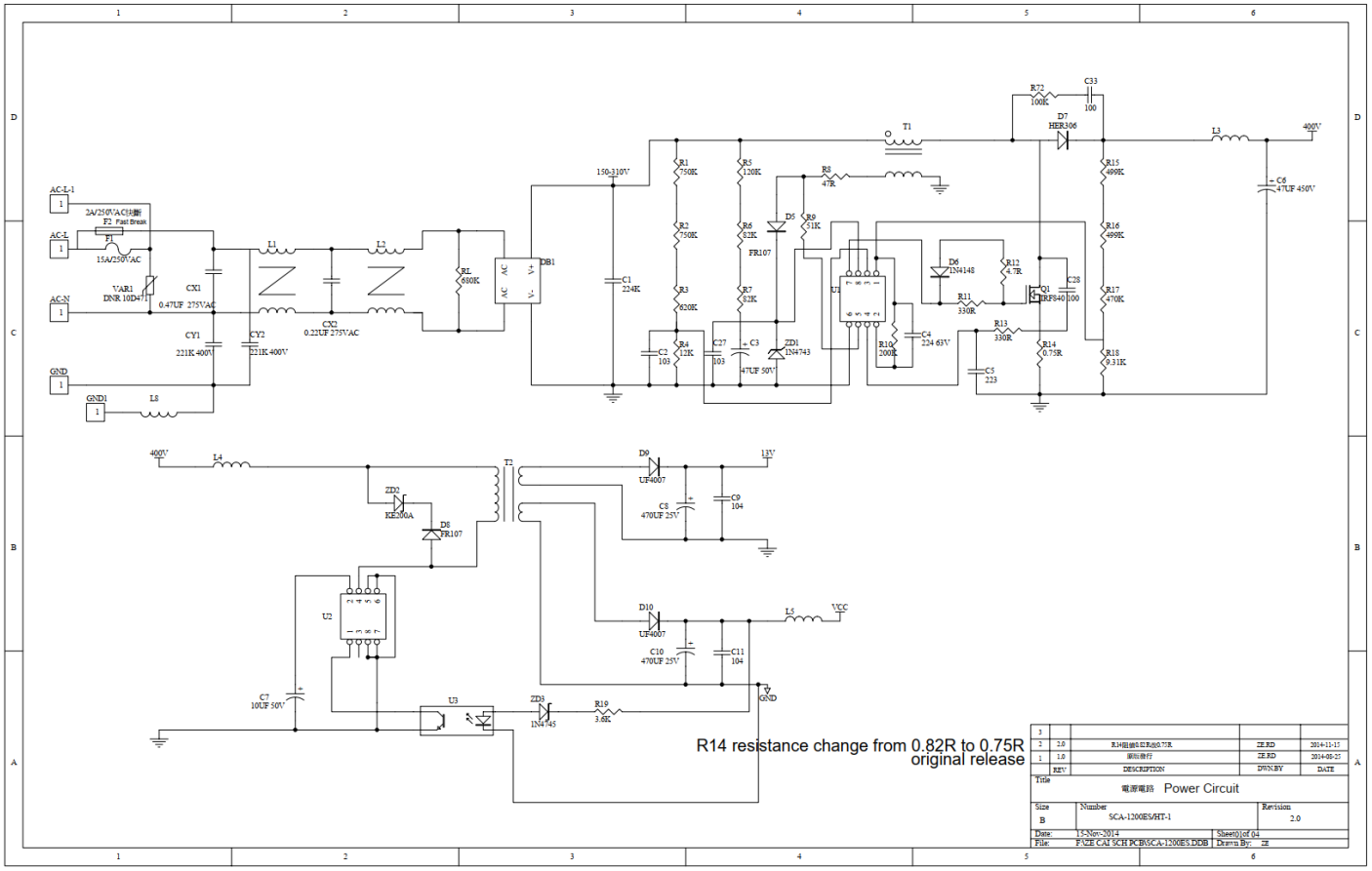
XIII. Documentation

A. Error Codes

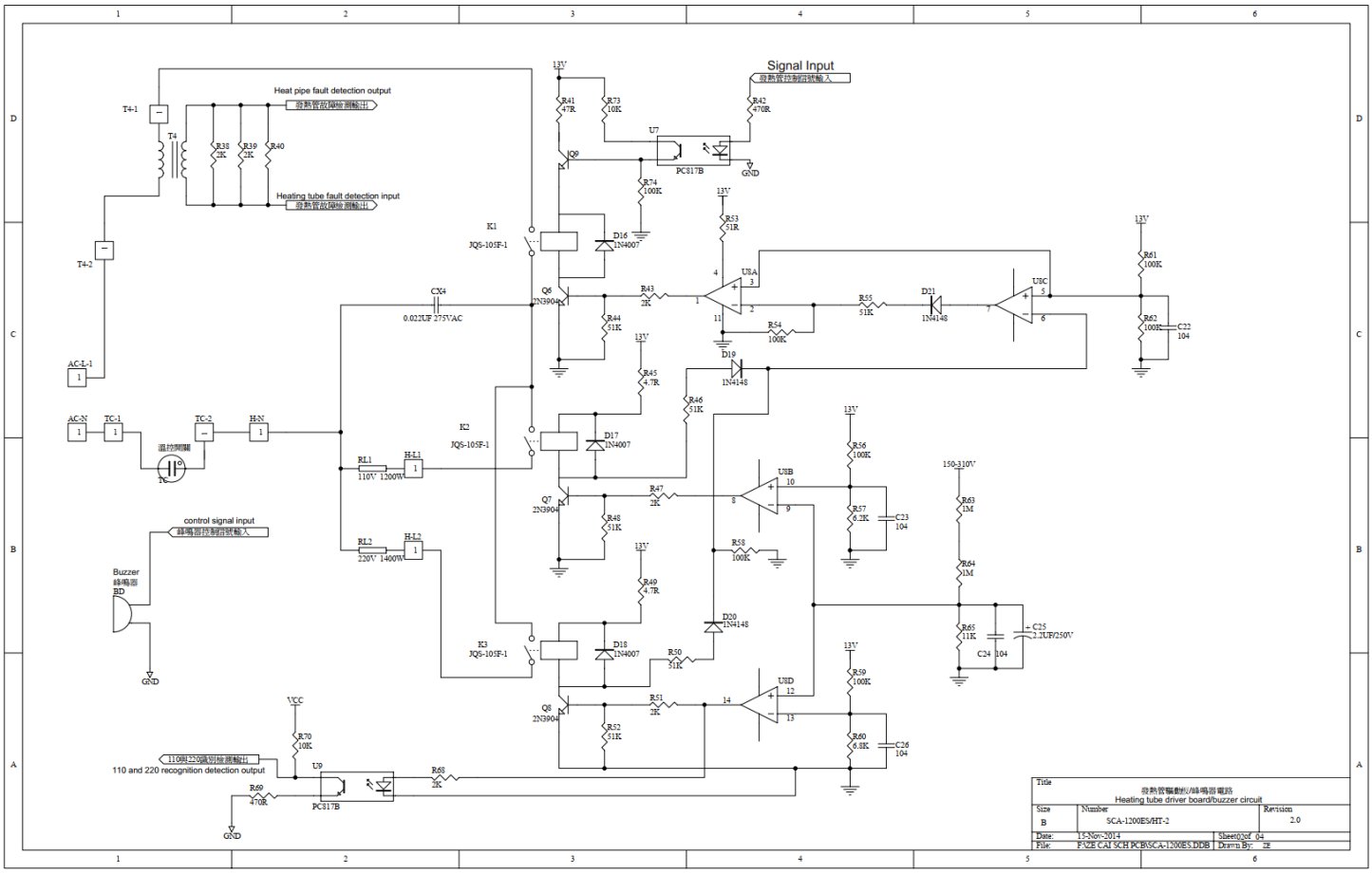
***EP**	Pump Motor malfunction/pump motor current fault.	(**See Pump and Transformer Troubleshooting Section XII A**).
***EH**	Heater current fault	(**See Heater Element Troubleshooting Section XII B**).
ES	12VDC out of range, power supply error for the display	(**See No Power to Display Troubleshooting Section XII G**).
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 Temperature Sensor Troubleshooting Section XII D**).
r1	Temperature Sensor failure	The Control Panel detects very high resistance on the sensor. (**See Temperature Sensor Troubleshooting Section XII D**).
r2	High Water Level Sensor failure	The Control Panel detects very high resistance on the sensor. (**See Water Level Sensor Troubleshooting Section XII E**).
r3	Low Water Level Sensor failure	The Control Panel detects very high resistance on the sensor. (**See Water Level Sensor Troubleshooting Section XII E**).

***Only displayed on the original display controller *without* the “No Heat” option

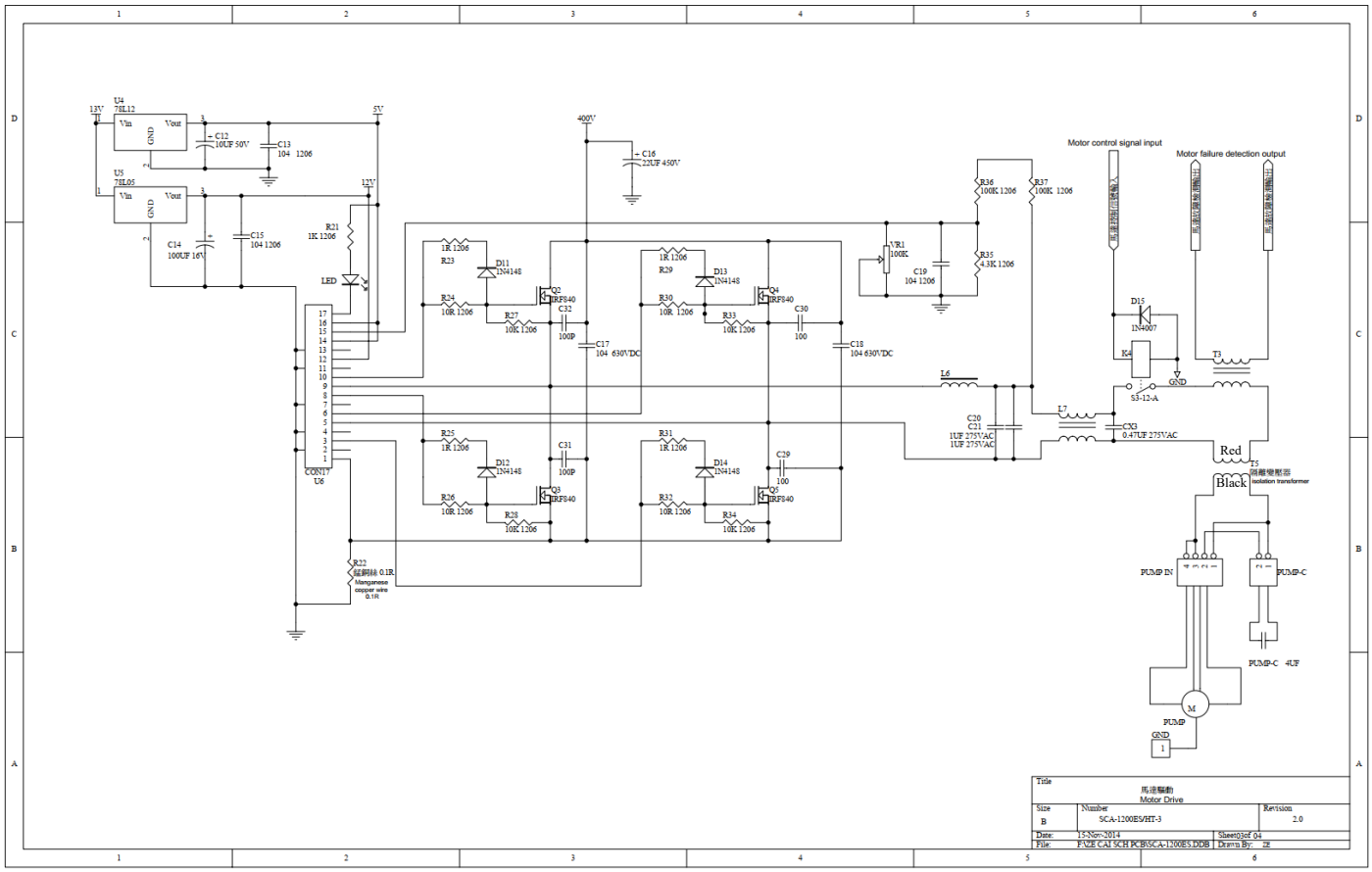
B. Schematics



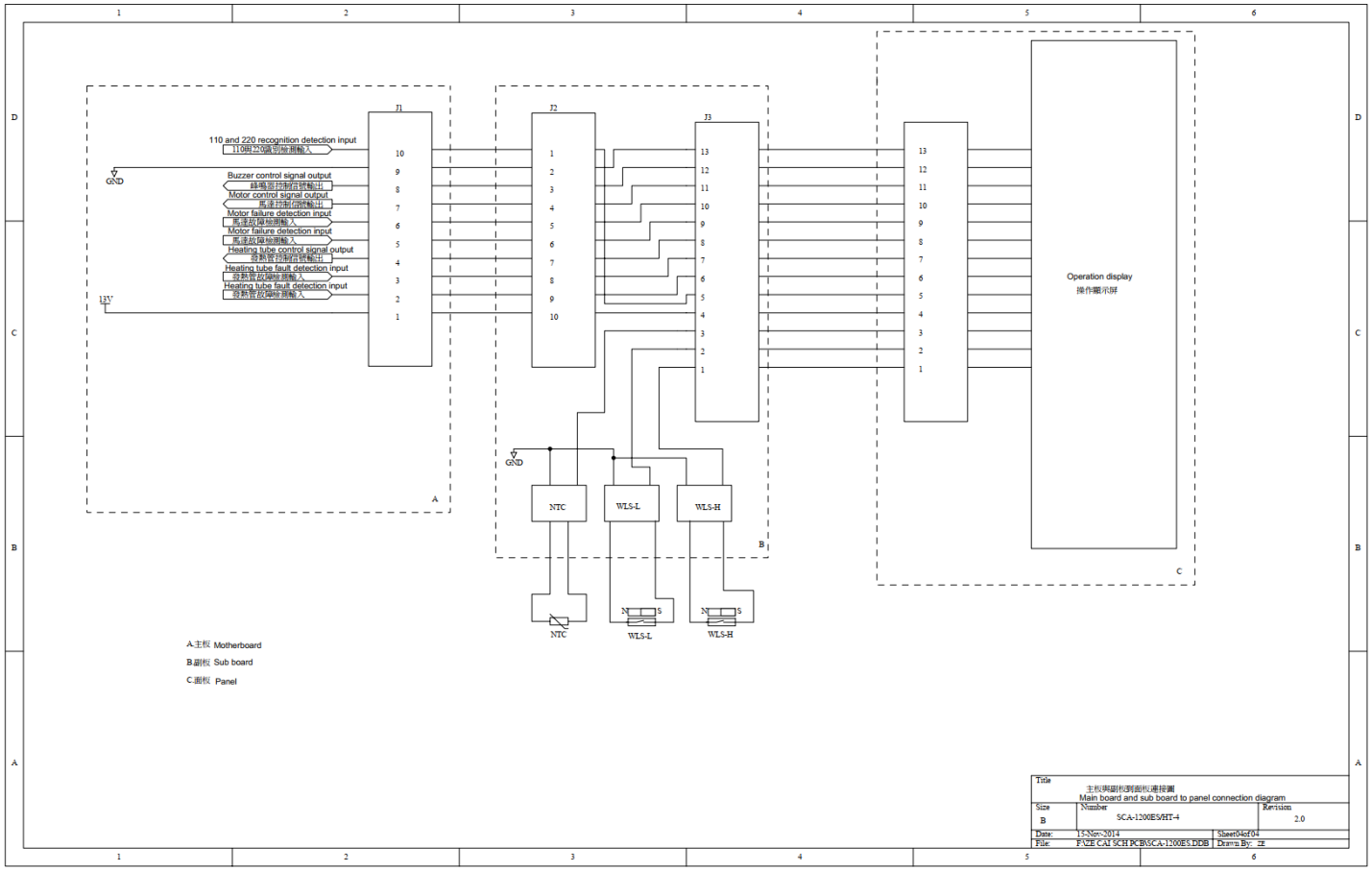
Power Circuit



Heating Elements Driver / Buzzer Circuit



Pump Motor Driver



Main board and Connector board to panel connection diagram

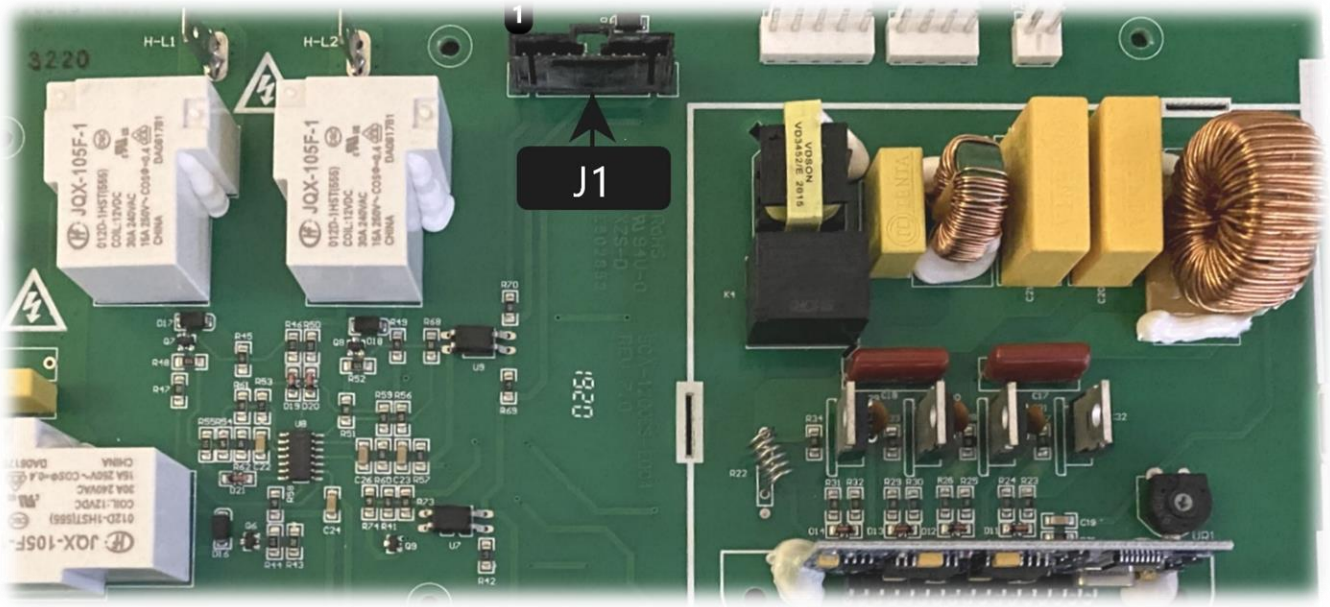
C. PCB Layout

PCB

D. Controller Cable Connectors

- Low → ~0V DC
- High → ~12V DC

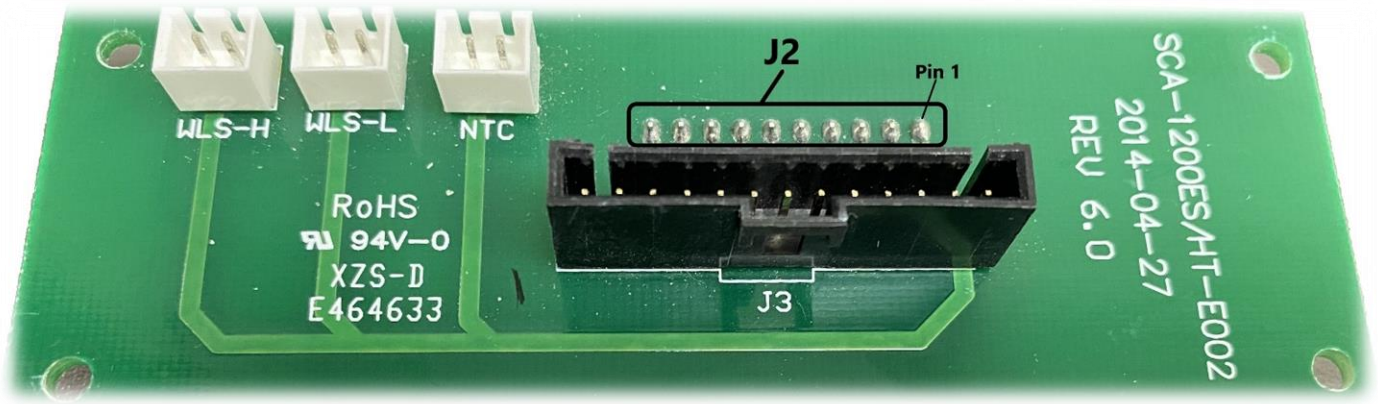
J1 Connector (PCB)			
Pin	**Description**	**Low**	**High**
1	12V DC	Power off	Power On
2	Heating tube fault detection input	No Fault	Fault
3	Heating tube fault detection input	No Fault	Fault
4	Heating tube control signal input	Heater Enable Off	Heater Enable On
5	Pump Motor failure detection input	No Fault	Fault
6	Pump Motor failure detection input	No Fault	Fault
7	Pump Motor control signal output	Pump Enable Off	Pump Enable On
8	Buzzer control signal output	Buzzer Off	Buzzer on
9	DC Ground	NA	NA
10	110V and 220V recognition detection input		110V AC Applied



J1 PCB

- Low → ~0V DC
- High → ~12V DC

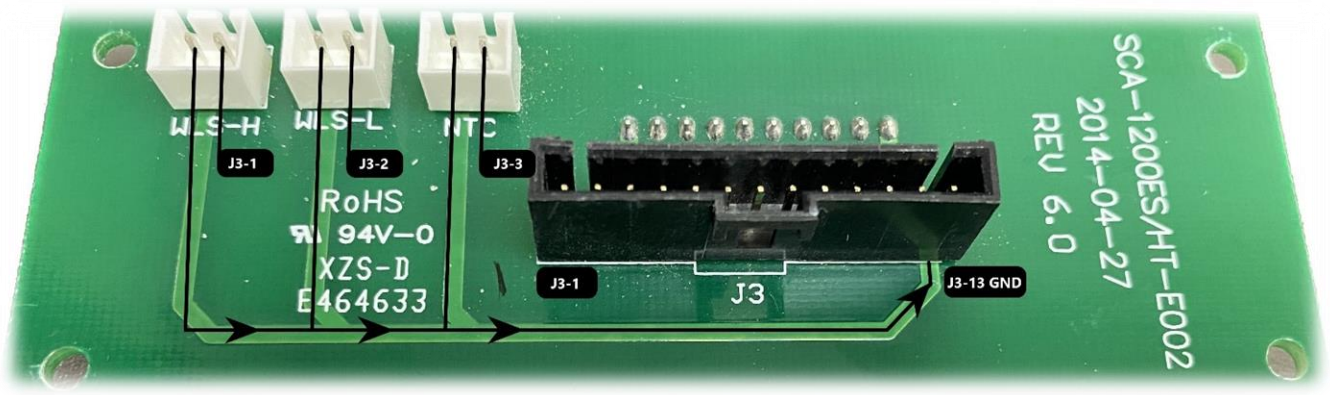
J2 Connector (Connector Board)			
Pin	**Description**	**Low**	**High**
1	110V and 220V recognition detection input		110V AC Applied
2	DC Ground	NA	NA
3	Buzzer control signal output	Buzzer Off	Buzzer On
4	Pump Motor control signal output	Pump Enable Off	Pump Enable On
5	Pump Motor failure detection input	No Fault	Fault
6	Pump Motor failure detection input	No Fault	Fault
7	Heating tube control signal input	Heater Enable Off	Heater Enable On
8	Heating tube fault detection input	No Fault	Fault
9	Heating tube fault detection input	No Fault	Fault
10	12V DC	Power Off	Power On



J2 Connector Board

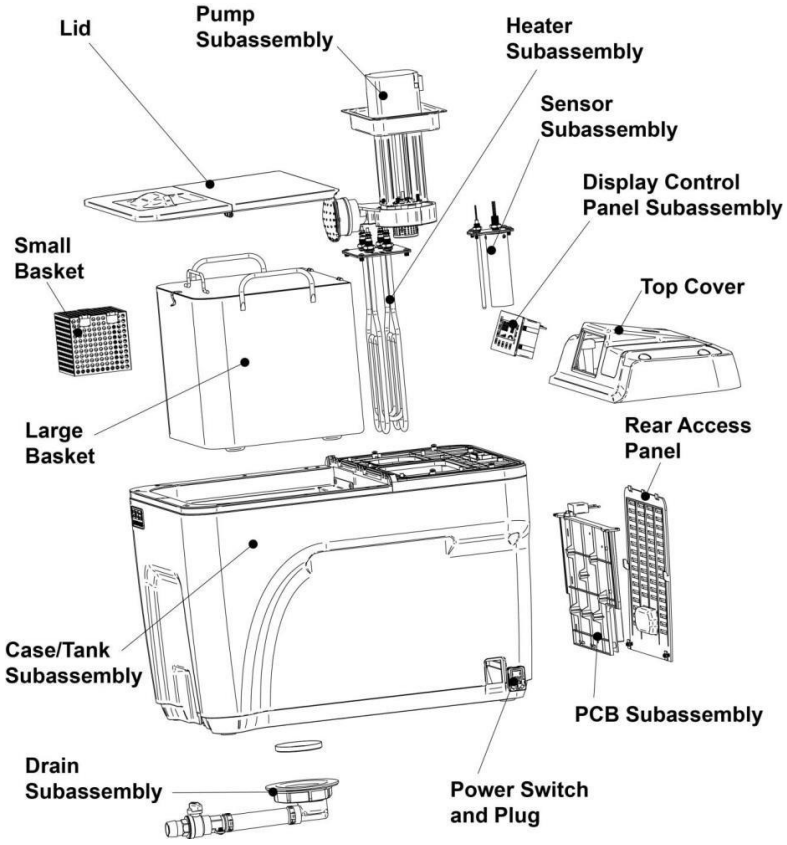
- Low → ~0V DC
- High → ~12V DC

J3 Connector (Connector Board)			
Pin	**Description**	**Low**	**High**
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	110V and 220V recognition detection input		110VAC
6	Heater Malfunction Sensing	No Fault	Fault
7	Heater Malfunction Sensing	No Fault	Fault
8	Heater Control	Heater Enable Off	Heater Enable On
9	Pump Motor Malfunction Sensing	No Fault	Fault
10	Pump Motor Malfunction Sensing	No Fault	Fault
11	Pump Motor Control	Pump Enable Off	Pump Enable On
12	Buzzer control signal output	Buzzer On	Buzzer Off
13	DC GND	NA	NA



J3 Connector Board

E. Commonly Used Parts



Part Description	Part Number
Large Basket	04812-01
Small Parts Basket	04098-01
Pump Assembly w/nozzle	04803-01
Heater Assembly	04805-01
Sensor Assembly	04810-01
Display Control Panel	100039
PCB Assembly	04807-01
Power Switch (PEM)w/wiring harness	04813-01
Spray Nozzle (Threaded)	04809-01 Rev A
Spray Nozzle (Bayonet)	04809-01 Rev B
Power Cord (North America)	04811-01
Power Cord (Europe)	04811-02

F. Specifications

Item	Specification	
Model Number	**SCA 1200ht**	
Power Cord	110 North American	220 International
Power Requirements	100-120V~ 50/60 Hz 12A	220-240V~ 50/60 Hz 9A
Main Supply Voltage Fluctuation	+/- 10%	
Electrical Protection	15A/250VAC Fuse	
Heater Power	1,200 Watts	1,700 Watts
Regulatory Compliance	CE / cTUVus/ RoHS / WEEE	
Tank Capacity	12.2 Gallons / 46.3 Liters	
Physical Dimensions	26L x 17.5W x 20.5H inches / 66 x 44.5 x 52 cm	
Shipping Package Dimensions	29.5 x 21.8 x 24.8 inches / 75.0 x 55.4 x 63.0 cm	
Weight, Shipping Max	NW: 64 lbs / 29 kg GW: 75 lbs / 34 kg	
Large Parts Basket Capacity	10 x 10 x 12 inches / 25 x 25 x 30 cm	
Small Parts Basket Capacity	4 x 4 x 4 inches / 10 x 10 x 10 cm	
Operating Environment Ranges	Temperature: 5ºC - 40ºC Humidity: 0% - 80% RH Altitude: 0 M – 2000 M	
Temperature Control Accuracy	± 2ºC	
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	

G. Customer Support

Technical support for this product is provided by **Oryx Additive, Inc**. Before contacting technical support, please try the Troubleshooting section of this Repair Manual. Please check for the newest version of the Repair Manual: **www.oryxadditive.com/products/sca1200ht**

If additional support is needed, contact Technical Support:

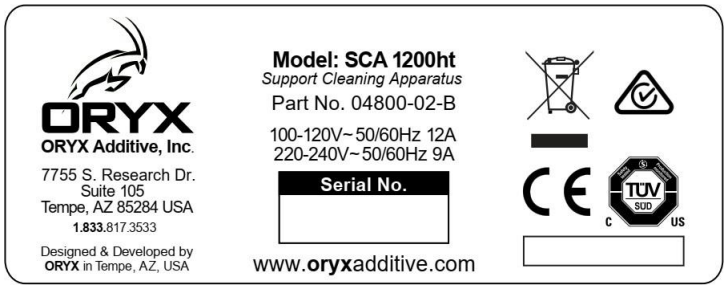
Email Technical Support: **support@oryxadditive.com**

Please include:

- full name
- company name
- phone number
- SCA serial number

Call Technical Support: **1.833.817.3533**

Note the SCA model number, part number, and serial number (found on the back of the unit):



Replacement and Accessory Parts

Send email to **support@oryxadditive.com** or call 1-833-817-3533 for information on obtaining replacement parts and accessories.

Regulatory Compliance Documents

Visit our website at **www.oryxadditive.com/support** for the latest regulatory compliance certificates.

H. Supplemental Information

SCA 1200ht Support Cleaning Apparatus Limited Warranty

Product	Limited Warranty Period
SCA 1200ht 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 over time 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 transferrable 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.