



## QUICK SERVICE GUIDE

The SEISCO circuit board depends on the temperature information it receives from each of the temperature sensors to detect water flow and maintain proper temperature. If any sensor or its connection to the circuit board is bad, the SEISCO may not turn on at all or if it does the temperature may fluctuate.



Whenever servicing a SEISCO, the proper operation of the sensors and the circuit board should **always** be verified regardless of the trouble code as these two items are critical to the continued reliable operation of the unit and often can lead to misleading trouble codes including false high temperature and element codes.

SEISCO recommends you follow the pre-service checklist every time you service the unit to verify proper operation and avoid callbacks.

### PRE-SERVICE CHECKLIST:

#### Verify Installation:

- Verify proper plumbing, cold on the right and hot on the left.
- Verify flow rate matches the specifications of the unit
- Verify the heater is mounted vertically on the wall with the fittings of the heater on the top, pointed up.

#### Tests with Power OFF

- Verify water flow through the heater. Check that shut off valves are in the open position.
- Check the plumbing and the heating chamber for any signs of leaks.
- Check for any loose wires to the circuit board and verify the power connections are tight. If stranded wire is used, check that all strands are inside the lug. Check high limit switch located at the top of the left heating chamber and reset as necessary.

#### Tests with Power ON

- Verify all circuit breakers are turned on and labeled correctly
- Verify power to all circuits connected to the heater. Check the voltage across the lugs labeled L1 & L2 for each circuit.
- Finally, check the circuit board LED board for any diagnostic codes. (Note: the circuit board will blink red and beep when breakers are turned on, then remain blinking green during normal operation)

### HEATER TESTING – Test With Power Off And Meter Set To Measure Resistance

COMPONENT	EXPECTED RESULTS
Temperature sensors	Readings should be taken after water has run through the heater with the power off so that the temperature in the chamber is uniform. All sensors should read within 5% of each other. Measurements vary with water temperature but are typically in the range of 5-20K ohms.
High Limit Switch	Should read zero ohms. If switch with manual reset shows open, press the reset button and retest
Heating Elements	Read across screws at the Red & Black wires. Typical readings are in the range of 5 to 14 ohms
Level Detects	Each contact should read zero ohms to ground when heater is filled with water.
Moisture Detect Switch	Should normally read open. If closed, check for water leaks or water on the switch pad (mounted on the bottom of the base pan). Correct the leak, dry the switch and retest.

### POWER ON TESTS

COMPONENT	TEST	EXPECTED RESULTS
Incoming Power Lugs	Voltage	L1 to L2: 208-240VAC; L1 to Ground 110-120VAC; L2 to Ground 110-120VAC
Heating Element	AMPS	Measure AMPS on wires leading to each element. Typical readings are 10-33 AMPS depending on element size. (Calculated as WATTS divided by 240)
Heating Element	AMPS	With power on and faucet open at 50% of rated flow, check amps at each element. Power should modulate and amp readings may fluctuate, but readings should be approximately the same across all elements.

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**READING DIAGNOSTIC CODES:** The LED status lamp located on the control board will flash a three part sequence of red flashes, each representing the individual digits of the 3 digit code. After each sequence, the LED will flash green and then repeat the diagnostic code. **THERE MAY BE MULTIPLE CODES SO VERIFY ALL SEQUENCES.** Press the small blue mode button on the circuit board for two seconds, and the speaker will audibly emit the code as it flashes.

## DIAGNOSTIC CODES

CODE	DESCRIPTION	ACTION
111	TH-IN Sensor	Turn off all the power to the heater. Cool down the heater by running the water for about 5 minutes. Check the resistance measurement for all temperature sensors. All sensors should read within 5% of each other.
112	TH 1	
113	TH 2	
114	TH 3	
115	TH 4	
117	Shorted Temp Sensor	Indicates sensor is shorted closed. Check wiring, replace as necessary
118	Open Temp sensor	Indicates sensor is open. Check wiring, replace as necessary
121	Disable Switch Open	Install jumper on SH model boards (also some RA service replacement boards)
122	High Limit Switches	Turn off all power to the heater. Reset the switch by pressing the red button on the switch itself. Check the switch and brown wires for continuity. <b>(Check temperature sensors and run matching procedure before replacing Limit Switch)</b>
123	Level Detects	Verify that heater is filled with water and that there is no air trapped inside. Check operation of back flow preventer (or check-valve). If the heater is filled and there are no leaks, connect both level detect spades on the board to ground. If code is accompanied with a clicking sound that is present when water is running, check the heating elements.
124	High Temperature Shutdown	The 124 code is triggered when the temperature of the water is more than 10 degrees higher than the set-point at TH-4 or THIN.
126	Moisture Detect	Immediately shut off all power to the heater. Check for water leaks. Completely dry circuit board before restoring power.
132	High Voltage	Voltages higher than 10% above the nominal rating should be corrected. Code will clear when voltage returns to nominal range.
133	Low Voltage	Low voltage may reduce heating capacity of the heater. Sustained voltages below 20% of the nominal rating may cause the heater to shut down. Code will clear when voltage returns to nominal range.
134	Element #1	Check elements. Check Temperature Sensors. Check Wiring and Breakers. Verify proper heater sizing, if necessary reduce unit temperature from maximum setting, and if necessary restrict flow rate with shut-off valve for testing.
135	Element #2	
136	Element #3	
137	Element #4	
142	Data Reading Error	The heater needs to be reset. Turn off all breakers to the heater for approx. 30 seconds. Turn on breakers, the LED should flash all green and heater should produce hot water. If the 142 code remains, reset the breakers again. If 142 code persists, test sensors and perform Matching Procedure. If the 142 code does not clear, replace circuit board.

## SENSOR MATCHING PROCEDURE

- Turn off power and run hot water for 5 minutes or until cold; With water running:
- Unplug the brown wire at the limit switch above the left hand corner of the circuit board.
- Restore power to the SEISCO it will beep four times, and then pause. You will then get one audible beep, a pause, two beeps, a pause, and two beeps.
- Press and hold the blue reset button for approximately 8-10 seconds, then release. You should hear a short, low tone buzz.
- Turn off power; Turn off the water; Reconnect the brown wire to the limit switch.
- Restore power to the SEISCO. You will hear 4 beeps then listen for the unit to "click"; turn on the hot water at a sink and test for temperature and operation.

