

850e Cell Heater Troubleshooting and Fuse Replacement
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These steps can be followed to troubleshoot cell heater problems with an 850e Fuel Cell Test System.

First, verify that the “SP1” indicator on the Cell Temperature controller lights continuously when the cell temperature is set to a value more than 10 degrees above the current cell temperature. If “SP1” does not light but the green “SV” display goes to the value entered from the software (and the “PV” red value is at least 10 degrees below “SV”), then the temperature controller was accidentally reprogrammed or has failed. In this case, SAI can furnish programming instructions or a new controller, respectively.

If the “SP1” indicator is continuously lit, plug a known good 60W-200W incandescent or halogen (not fluorescent, CFL, or LED) lamp into the Cell Heater receptacle. Ensure the lamp power switch is on. If the lamp does not light, there is likely a blown heater fuse, but first determine why the fuses blew before replacing them. Check the resistance between the two flat blades of the cell heater plug for 120V units (the two outer contacts of the IEC heater plug for 230V models), not the 850e outlet, with an ohmmeter. The meter should read about 144 ohms for a 100W total 120V cell heater (about 576 ohms for a 230V 100W heater). If the reading is less than 60 ohms (less than 120 ohms for 230V units), then the heater wattage is too high for use with the 850e (240W at 120V) or the heater is damaged. The 850e manual explains how to connect an external relay in this case to control a large cell heater. This is not usually needed since a standard 100W cell heater (50W on each side) is sufficient for typical lab single cell fixtures. Next, check the resistance from one of the flat prongs to the round prong of the plug (outer to center pin of 230V heater plug). If the meter does not read open, the cell’s heater is damaged or shorted to the cell body and this needs to be fixed before replacing the fuses and using the cell.

Some cell designs use flat adhesive backed heaters attached directly to clamping plates that also serve as current collectors. We don’t recommend this cell type since the heater insulation can fail, damaging the 850e and creating a shock hazard.

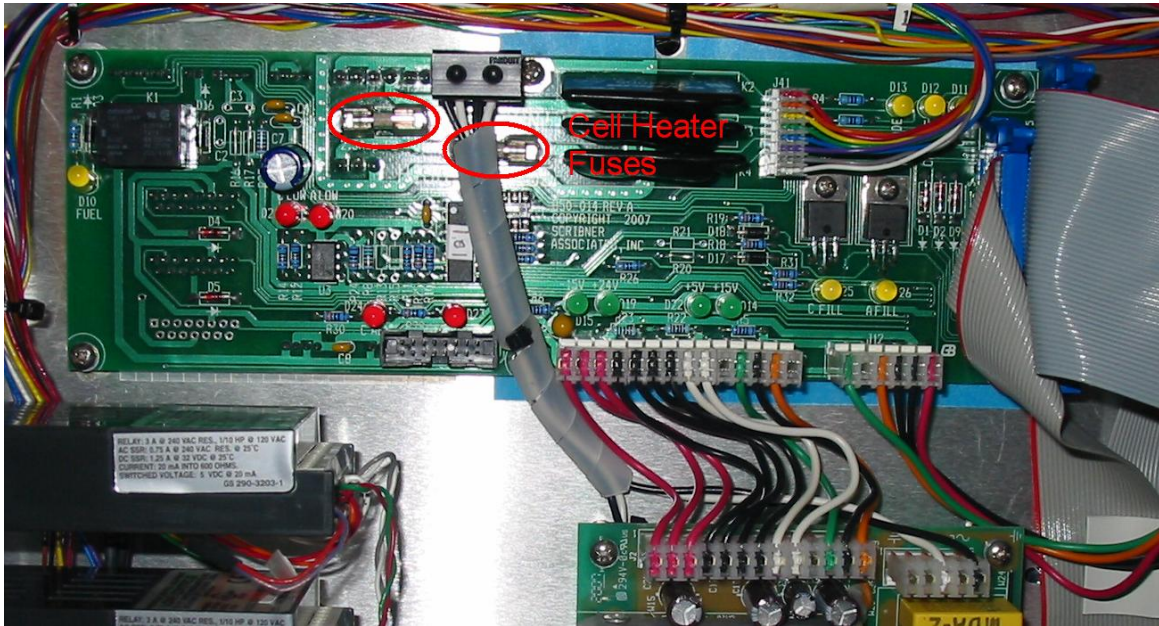


Figure 1 – Cell Heater Fuse Locations for 850e

If personnel familiar with servicing electronic equipment are available, the 850e's cell heater fuses can be checked, and if needed, replaced. To do this, disconnect the power cord and remove the 850 cover and locate the circuit board shown in Figure 1 on the metal divider. Locate the two small cartridge fuses on this circuit board as shown in Figure 1.

Remove each fuse (with a fuse puller or small screwdriver, being careful not to damage the circuit board) and check them with an ohmmeter. The fuses should read less than 1 ohm each. If either is blown (read open or high resistance), replace with Bussmann BK/C520-2.5-R or equivalent, available here:

<https://www.onlinecomponents.com/bussmann-eaton-bkc52025r.html?p=10801610>

Bend the fuse clips together slightly before inserting the fuse to ensure it is a tight fit. The specification for these fuses is 5x15mm size, 2.5A, 250V, fast acting.

If these fuses aren't blown, re-insert them in the fuse holder clips, bending the clips together first if needed for a tight fit. Check 3-pin connector J45 on the back of the circuit board for loose connections or bad solder joints on the front side of the board. Check the wires to see if any have come loose and push on the terminals with a small screwdriver if needed. If no loose connections are found, unplug J45 from the circuit board and measure with an ohmmeter from the three wires to the respective receptacle slots. Disassemble the receptacle and fix the connections if any of the three reads more than 1 ohm.

Make sure all cover screws are replaced and tightened when finished.