

LM3 Troubleshooting guide 05/2025

This guide addresses issues specific to LM3 chambers such as EC11A-LM3 etc. with –LM3 in the model name. For heat/cool issues please see EC1x heating/cooling troubleshooting guide.

LM3 operation:

The LM3 chambers differ from the standard EC1x chambers in that the circuit breaker module (CKTBK03_30A) mounted on the back of chamber can be tripped by either the motherboard or the small TLIM board mounted just under the cover plate and just above the main motherboard, while the standard EC1x chambers are tripped by either the electronic Limit Module mounted on the back of chamber or the adjustable bi-metal thermostat accessible from back of chamber.

When the motherboard receives a UTL/LTL command remotely or locally, such as UTL=200, the small TLIM board receives this same UTL/LTL. If the chamber probe temperature exceeds the UTL or LTL, the motherboard will trip the circuit breaker mounted on the back of the chamber after approximately 20 seconds removing all power from the chamber. If the motherboard fails to trip the chamber, then after approximately 1 minute, if the TLIM probe temperature has also exceeded it's UTL/LTL, the TLIM board will trip this same breaker. Therefore the purpose of the TLIM board is to act as a redundant failsafe in case the motherboard fails to trip the chamber's circuit breaker.

LM3 chambers will have either firmware version 11.xx or version [12.xx](#) (displayed when chamber is first powered on). Version [11.xx](#) is used with the older parallel front panels that used the 26 wire ribbon cable while version [12.xx](#) is used with the newer serial front panel that uses the thinner 14 wire ribbon cable.

Issues specific to the LM3 chambers

Chamber is displaying “NO LIMIT MOD”.

Every 30 seconds the motherboard will check for the presence of the small TLIM board mounted under the motherboard's cover plate. Make sure that this motherboard which will have version [11.xx](#) or 12.xx is installed, is in an “LM3” chamber. The serial tag on the back of the chamber should have LM3 appended to model type, such as EC11ALM3. In addition, these chambers have a custom circuit breaker trip module mounted on the back as well as a small 4” x 1.5” TLIM board mounted under the motherboard cover plate. It also uses an I/O board that has a 14 position connector with ribbon cable that connects to the TLIM board and a red/white twisted pair-wire soldered to pads on the I/O board labeled “TRIG”. This red/white wire connects to the red/white wire attached to the breaker trip module mounted on the back of the chamber. An LM3 motherboard will not work properly if installed in a standard EC1x chamber as it will constantly display NO LIMIT MOD as there is no TLIM board installed in a standard EC1x chamber.

If the chamber is an LM3 chamber, then make sure that the gray 14 wire ribbon cable is connected from the I/O board to the small TLIM board mounted under the motherboard cover plate.

It's possible to also get this message if the set point is too close to UTL/LTL. Try raising the UTL/LTL remotely or via the front panel. Unplug chamber and power back on to see if the message clears after approximately one minute.

If the problem persists, then there could be an issue with either TLIM board or motherboard. Contact Sun for an RMA number and send in the control section that includes the motherboard and TLIM board attached to the cover plate.

The part number for the TLIM board is TLIMH232 and part number for the motherboard is 980062G3FPG. Please provide the serial number listed on the back of the chamber so that the correct firmware version for LM3 will be installed and proper hardware configuration performed.

Chamber trips immediately after being plugged into outlet

If the chamber trips immediately after being plugged in, then the issue could either be a dead short or a faulty breaker trip module.

A short will usually occur when a ceramic insulator cracks and breaks off such that the heater terminal screw is shorting to chassis. Remove backplate, set aside insulation, and inspect backplate area for any signs of a short such as charring near fuse holder or on backplate. Verify motor wires have not melted, or fused together or insulation from wire is missing and making contact with backplate causing a short. Use an ohmmeter to measure resistance from each heater terminal screw to ground to see if any terminals are making direct contact to chassis via a missing or cracked ceramic insulator. You should get a very high resistance reading in megaohms or an OL "Out of Limit" reading between each heater terminal and chassis ground. If no short exists, then it's possible the breaker trip module is faulty.

Contact Sun for any replacement parts needed or if you would like an RMA to send chamber or module in for evaluation/repair. Please provide the serial number listed on the back of the chamber.

Part number for the breaker trip module is: CKTBK03_30A. Part number for the 600W heater element is: 980201 and part number for the 800W element is: 980205.

Chamber trips several seconds after being plugged in

If the chamber trips several seconds after being plugged into the outlet, detach the right side control section and verify that the red/white wire soldered to the I/O board has 15-25VDC between the red and white wire with the chamber plugged in. Make sure that the red wire from the I/O board connects to red wire going back to the breaker trip module and that the white wire from I/O connects to white wire from the breaker trip module. The breaker trip module will trip if

either no voltage is present on red/white wire from the I/O board or if not connected properly to red/white wire from the trip module (wires reversed).

Verify that chamber probe reading is not exceeding UTL/LTL as this will cause the breaker to trip. Raise the UTL or lower the LTL as needed to make sure chamber probe reading does not exceed either UTL or LTL. If probe reading on the chamber is faulty, verify that probe leads and probe connector are securely attached to the 4 position connector on the motherboard. If the chamber has K thermocouples installed, the red wire connects to terminal 2 above the yellow wire which is connected to terminal 3. Verify that the thermocouple probes are ok by measuring the resistance of probes. You should measure less than 20 ohms. Much higher values indicate an 'open' probe condition and should be replaced. If the probe is ok and the chamber is continuing to display a faulty reading, it's possible the motherboard is faulty. Contact Sun for an RMA to send board in for evaluation repair. Please provide the serial number etched into the motherboard.

The breaker trip module will also trip if a ground fault occurs. A current imbalance between the 2 poles of the breaker greater than 2A will trigger this condition. This can happen, for example, if one or more of the heater elements has sprung open and is making contact with ground (chamber chassis). Remove the 'L' shaped inner baffle to inspect heater elements. Alternatively, you can also measure each heater terminal resistance to ground. The heater terminals are accessible by removing the backplate, setting aside the insulation and measuring resistance from each terminal to ground. The resistance for heater terminals to ground should measure a very high resistance (typically megaohms or OL (out of limit)). Disconnect the wires to each terminal and measure the resistance of each heater element. 600W heater elements measure approximately 20 ohms, while the 800W elements will measure approximately 16 ohms.

If heater elements and wiring to elements are ok, then it's possible the breaker trip module could be faulty. Contact Sun for a replacement part or an RMA if you would like to send in for evaluation/repair. Part number for breaker trip module is #: CKTBK03_30A.

Chamber trips after approximately one minute.

If the temperature reading of the small TLIM board attached to the bottom side of the cover plate exceeds it's UTL/LTL (which are the same as the motherboard), then the TLIM board will trip the breaker.

Make sure UTL/LTL are set high/low enough to prevent the TLIM from tripping the breaker. The TLIM will have the same UTL/LTL as the motherboard and is set by issuing the command UTL=200 (for example) via front panel or remotely. Check that the TLIM's probe is firmly seated into the probe connector on the TLIM board and that both thermocouple leads are properly attached to the four position connector. The red thermocouple lead connects to terminal 2 above the yellow lead connected to terminal 3. Measure the resistance of the thermocouple probe to verify that resistance is less than 20 ohms. If a much higher resistance is measured, replace the K thermocouple probe. If the probe is ok, then it's possible that the TLIM board is faulty. Contact

Sun for a replacement probe, TLIM or for an RMA if you would like to send the TLIM board in for an evaluation/repair. TLIM part number is TLIM-H232.