



**01-005C  
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**TROUBLESHOOTING MOLY TEMPERATURE IN ANALYZERS WITH STATUS/TEMP CARDS.**

**I. PURPOSE:**

This service note describes a method of troubleshooting Moly and Hicon Temp problems in analyzers using the Status/Temp card, (currently M100A, M101A, M102A, M200A, M200AH, M200AU, M201A).

**II. TOOLS:**

Phillips Head Screwdriver  
Multi-Meter  
Small Flat-blade Screwdriver

**III. PARTS:**

None

**IV. PROCEDURE:**

1. If the temperature displayed on the front panel is low, (below 310 for Molys and below 695 for hicons), go to step 2. If the displayed temperature is too high then the problem is likely to be in the Power Supply Module (PSM). Follow the instructions below:
  - A. Set the meter to DCmV. Measure the thermocouple temperature at J1 on the Status/Temp card by connecting the leads across the two metal tabs at the top of J1. The moly should be running at  $315 \pm 3^{\circ}\text{C}$ . The hicon should be running at  $700 \pm 5^{\circ}\text{C}$ . The target voltage is listed below based upon type of converter and type of thermocouple:  
For Molys with type J thermocouple this voltage should be  $15.7 \pm .2\text{mV}$ .  
For Molys with type K thermocouple this voltage should be  $11.6 \pm .2\text{mV}$ .  
For mini-hicons (all have type K) this voltage should be  $28.0 \pm .2\text{mV}$ .  
A higher voltage at the thermocouple indicates that the heater and status/temp cards are working. Go to step B.  
A lower voltage (or a reading very close to 0mV) indicates a failure in the status/temp card and it should be replaced.
  - B. Look at the LED marked "converter" on top of the PSM. It should be off. If it is off, go to step C. If it is on, then place the meter on DCV and place the black lead onto a white test point on the V/F card. Measure the voltage at U33-12 on the V/F card. This voltage should be less than .5V. If not, replace the V/F card and see if the problem is fixed. If U33-12 is less than .5V, replace the PSM or the relay inside the PSM or contact a Teledyne API customer service rep.
  - C. If the LED marked "converter" on top of the PSM is off, then set the meter to ACV. Locate the heater connector on the converter. Push the meter leads into the connector at the black and clear wires to measure the voltage going to the heater. This voltage should read zero. If not, replace the PSM or the relay inside the PSM or contact a Teledyne API customer service rep.

2. Set the meter to DCmV. Measure the thermocouple temperature at J1 on the Status/Temp card by connecting the leads across the two metal tabs at the top of J1. The moly should be running at  $315 \pm 3^{\circ}\text{C}$ . The hicon should be running at  $700 \pm 5^{\circ}\text{C}$ . The voltage should be as listed below based upon type of converter and type of thermocouple:
  - D. For Molys with type J thermocouple this voltage should be  $15.7 \pm .2\text{mV}$ .
  - E. For Molys with type K thermocouple this voltage should be  $11.6 \pm .2\text{mV}$ .
  - F. For mini-hicons (all have type K) this voltage should be  $28.0 \pm .2\text{mV}$ .If this voltage is wrong, go to step 4.
3. If the voltage at J1 is correct, then set the multimeter to DCV. Place the black lead on TP2 and the red lead on TP1 of the Status/Temp card. The voltage should be as follows based upon the type of converter and type of thermocouple:
  - A. For Molys with type J thermocouple this voltage should be  $3.15 \pm .05\text{V}$ .
  - B. For Molys with type K thermocouple this voltage should be  $2.00 \pm .05\text{V}$ .
  - C. For mini-hicons (all have type K) this voltage should be  $4.00 \pm .1\text{V}$ .If the voltage at TP1 of the Status/Temp card is wrong, then replace the Status/Temp card.
4. Locate the power connector on the Hicon (2 wires coming down to a 2 pin molex connector). Disconnect the connector from its mating connector. Place your meter in  $\Omega$  and measure the heater resistance by pushing the meter leads into the 2 pin molex connector (be sure you are doing this on the side with the wires going into the hicon) until they touch the metal. This should read between 120 and 150 $\Omega$ . If not, replace the Hicon heater.
5. Connect the Hicon heater connector to its mating connector. With power applied to the analyzer and the Converter LED on the PSM lit, place your meter in VAC and measure the voltage across the heater (place the meter leads in the same place as step 4 above). This voltage should be  $108 \pm 10\%$ . If not, replace the relay or the PSM.
6. If you have not found the problem so far, the problem is either a bad V/F card, or a connection problem between the Status/Temp card and the V/F card. Remove both the V/F and Status/Temp cards and check the connectors on the bottom for bent/missing pins. If all pins are present and straight, replace the V/F card.