

Technical Bulletin #56

To: Coulometrics Support Personnel
From: Engineering Dept.
Date: REV A. 3-01-04
Subject: Evaluation of Low response value during cell setup on a CM5014 Carbon Coulometer

A low response value can be caused by the following:

- 1) The lamps brightness has deteriorated with age. The lamp needs to be replaced.
- 2) The path to the detector is blocked.
- 3) The lamp voltage is incorrect.
- 4) The detector and/or the filter have become clouded or the detector is defective.
- 5) The gain adjustment RP3 needs adjustment
- 6) There is a loose connection on the CM110-054 Coulometer Interface Board.
- 7) There is an electronic problem with the circuits on the CM110-054 Circuit Board.

The most common problem is 1 assuming you have checked to make sure there is no obstruction in the path of the cell (item 2). The lamp in your instrument, if it is the original, may have lost the ability to produce sufficient light after years of use. It is easily replaced. The housing holding the lamp unscrews and the lamp unplugs from the socket. This is accessed inside the cell compartment. The lamp is part number CM140-005.

If you replace the lamp and you still exhibit problems, the next thing to try would be the lamp voltage check item number 3. The lamp voltage is set to 2.25 VDC. It can not be greater than 2.50 VDC. The bulb will burn out!

To check and or adjust the lamp voltage, make sure there is no cell in the cell compartment. Turn the power off to the instrument and remove the left side panel. Locate the CM110-054 Interface board. See figure 1 item O. At this time it would be wise to also make sure all the connectors to the CM110-054 are plugged in (Figure 3). Especially JP3, the photodiode plug and JP2, the lamp plug. Reset the connectors by pushing on them . Attach a volt meter to TP1 (red) and TP2 (black)of the CM110-054 board (see CM110-054 figure 3 attached). Turn the instrument on. Measure the lamp voltage. If the lamp voltage is low adjust the potentiometer marked RP1 to increase the voltage. **Do not adjust the voltage above 2.5 VDC.**

If the %T is still low the next common source of this problem is the filter in the detector cell assembly has become clouded or the photo diode detector is defective See figure 1 item N for location of Detector assembly. This sometimes happens when the unit has been in service for some time. The filter, Item CM140-001 can be replaced by itself. The photo diode is CM140-002. Replacing however the complete photo diode sub-assembly(CM101-178) is better because it eliminates the need for field assembly and soldering. See figure 2 for exploded view of assembly.

If the response value is still low check the gain of the circuit. With a cell in the cell compartment filled with clear cathode solution. Attach a meter on JP4 1 (red) and TP4 (black) of the CM110-054 PCB. With the instrument on, read the voltage on a DMM. Rotate the cell slowly back and forth until the max. Reading is achieved without anything blocking the light path. The reading should be 9.6 VDC . If not adjust RP3 on the CM110-054 PCB to increase the voltage to 9.6. Make sure the maximum voltage is 9.6 and not higher. Run the “ RUN CELL SETUP” procedure from the operation manual, The response value should fall between 3600-3950 as indicated in the CM5014 manual.

If these items do not seem to solve your problem, chances are there is an electronics problem on the CM110-054 board. In that case, a solution is to replace the CM110-054 Interface. However, since the circuits are analog and a calibration is necessary, the CM110-054 can not be replaced by itself without an electronic calibration. **For this reason it would be best to return the unit to UIC for this service.**

Figure 1
CM5014 SUBASSEMBLIES

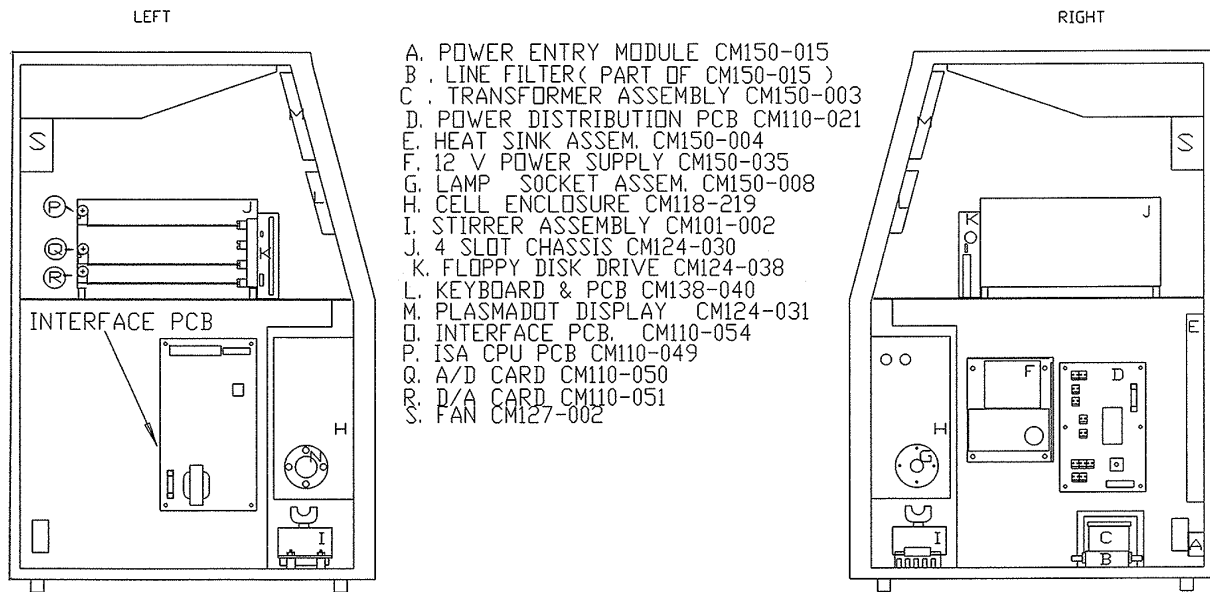


FIGURE 2
CM101-004 DETECTOR CELL ASSEMBLY
CM5014

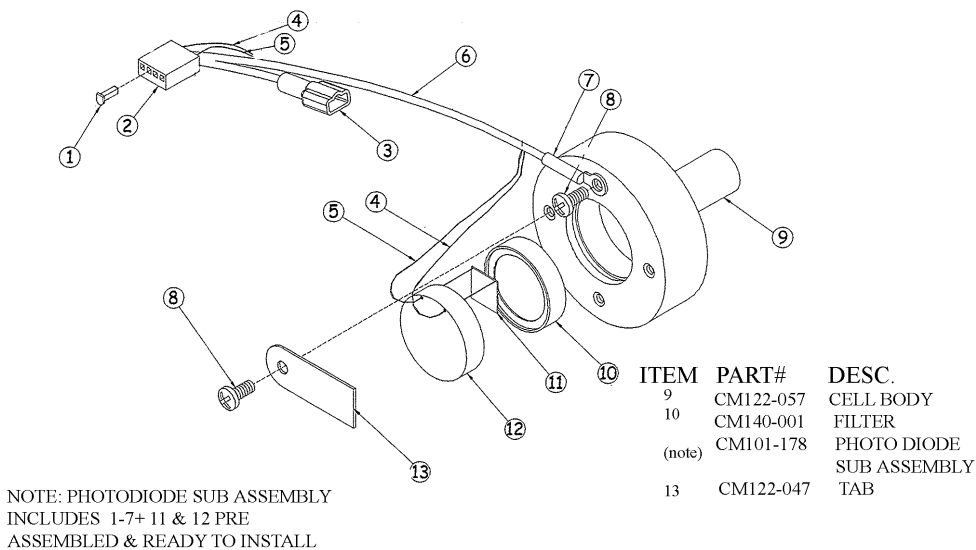


FIGURE 3

