

## Technical Bulletin #17

**To:** Coulometrics Support Personnel  
**From:** Engineering Dept.  
**Date:** REV C. 2-04-04  
**Subject:** Evaluation of Low %T on a Carbon Coulometer models CM5011 & CM5012

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A low %T can be caused by the following:

- 1) The lamps brightness has deteriorated with age and 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) There is a loose connection on the CM110-020 Carbon front end Board.
- 6) There is an electronic problem with the circuits on the CM110-020 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 lamp is part number CM140-005.

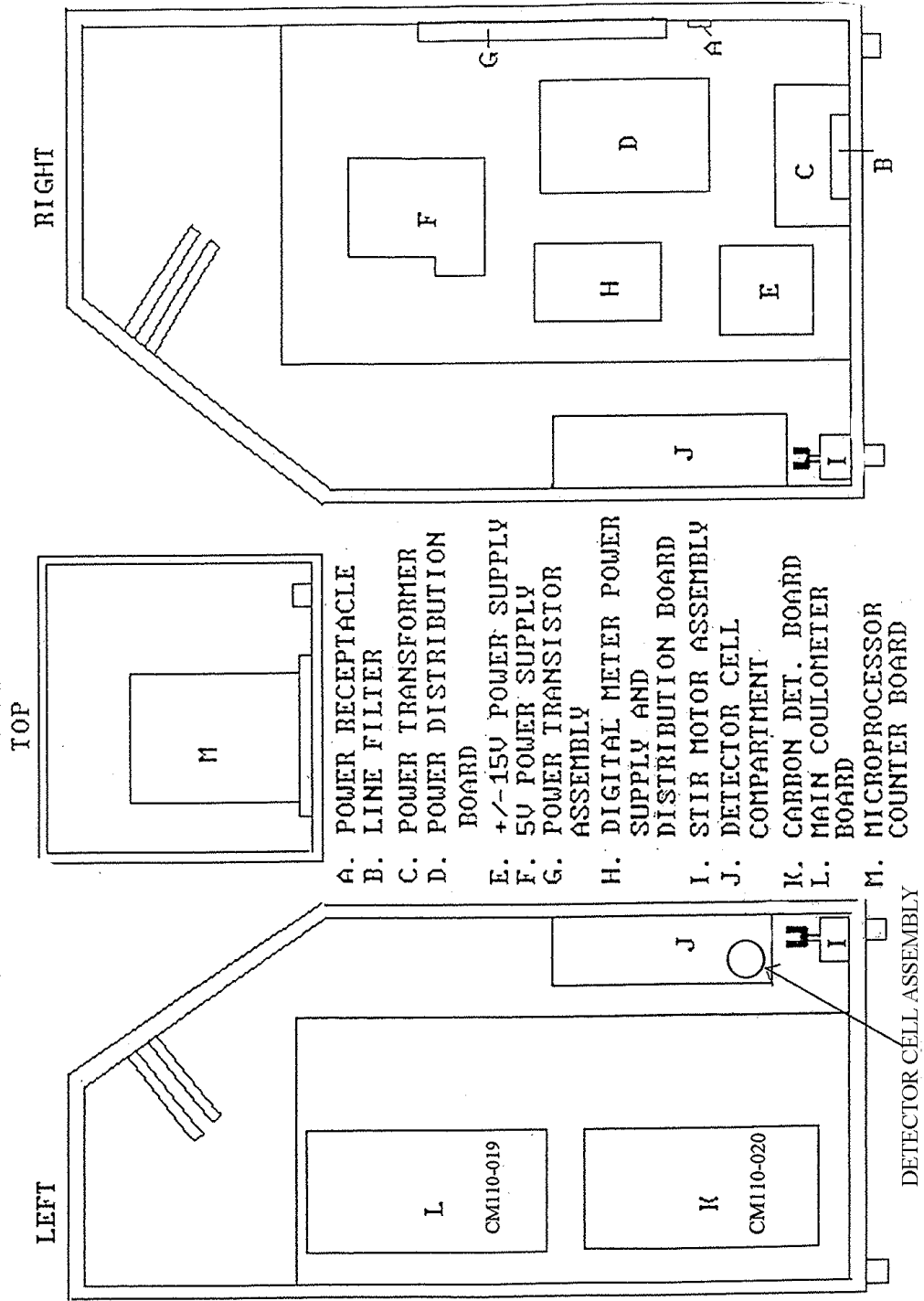
If you replace the lamp and you still exhibit problems, the next thing to try would be the lamp voltage check item number 3. The lamp voltage check is in page 27 of the users manual. I will repeat it here for your convenience along with a diagram that better shows how to measure it. The lamp voltage is measured by using a digital voltage meter on test points TP7 and TP8 of the CM110-020 PCB. The lamp voltage is typically 2.00 VDC to 2.300 VDC. It can not be greater then 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 CM110-020 Carbon front end board. See figure 9.1 item K. At this time it would be wise to also make sure all the connectors to the CM110-020 are plugged in ( item 5). The lamp power supply as well as the detector plug in here. Reset the connectors by pushing on them . Attach a volt meter to TP7 (red) and TP8 (black)of the CM110-020 board ( see CM110-020 pictorial attached). Turn the instrument on. Adjust the %T knob full clockwise. Measure the lamp voltage. If the lamp voltage is low adjust the potentiometer marked RV4 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. 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.

If these items do not seem to solve your problem, chances are there is an electronics problem on the CM110-020 board. In that case, a solution is to replace the CM110-020 carbon front end board. However, since the circuits are analog and a calibration is necessary, the CM110-020 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.** The only other alternatives would be the purchase a Calibrated set of boards from UIC (CM101-139.) or a complete calibration kit of the filter, lamp, detector sub assembly and a calibrated set of boards. The calibration kit is part number CM101-177.

FIGURE 9.1  
ELECTRICAL SUBASSEMBLIES



LEFT

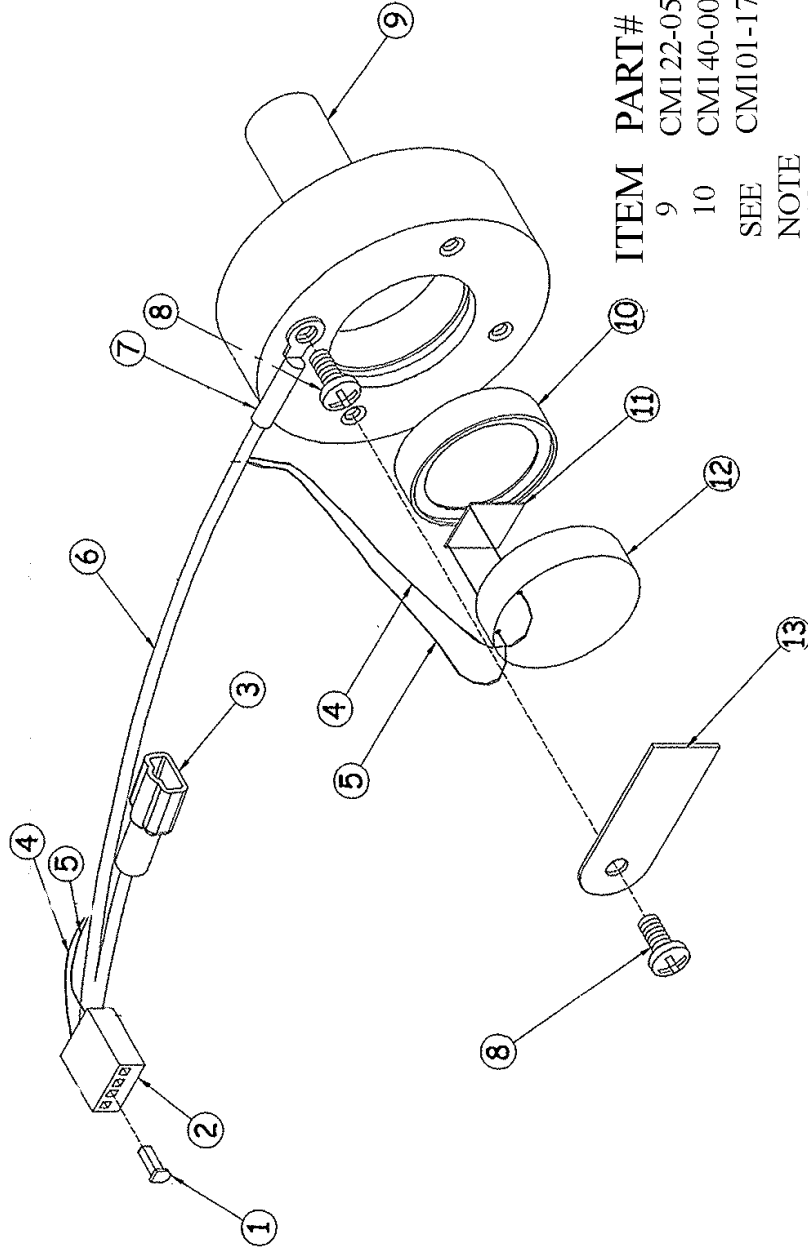
TOP

RIGHT

- A. POWER RECEPTACLE
- B. LINE FILTER
- C. POWER TRANSFORMER
- D. POWER DISTRIBUTION BOARD
- E. +/- 15V POWER SUPPLY
- F. 5V POWER SUPPLY
- G. POWER TRANSISTOR ASSEMBLY
- H. DIGITAL METER POWER SUPPLY AND DISTRIBUTION BOARD
- I. STIR MOTOR ASSEMBLY COMPARTMENT
- J. DETECTOR CELL
- K. CARBON DET. BOARD
- L. MAIN COULOMETER BOARD
- M. MICROPROCESSOR COUNTER BOARD

DETECTOR CELL ASSEMBLY

# CM101-202 DETECTOR CELL ASSEMBLY CM5011/CM5012



ITEM	PART#	DESC.
9	CM122-057	CELL BODY
10	CM140-001	FILTER
SEE	CM101-178	PHOTO DIODE
NOTE		SUB ASSEMBLY
13	CM122-047	TAB

NOTE: PHOTODIODE SUB ASSEMBLY  
INCLUDES 1-7+ 11 & 12 PRE  
ASSEMBLED & READY TO INSTALL

# CM110-020 CARBON FRONT END PCB

