



07-017A

8/22/07

UV LAMP ADJUSTMENT AND REPLACEMENT IN M452 ANALYZERS

I. PURPOSE:

The UV Lamp has a limited life of use in the M452 analyzer. If the light deteriorates to a point where the Measure and Reference voltages go below the minimum point of 3500mV, the lamp and or detector amplifiers will need to be adjusted to above 3500mV but not over 4600mV. If the minimum voltage cannot be attained after adjusting each detector amplifier potentiometer and then by physically adjusting (“peaking”) the lamp, then the lamp will need to be replaced. This procedure guides you through this adjustment and replacement of the UV lamp.

II. TOOLS:

⁵/₆₄” Allen Wrench

⁷/₆₄” Allen Wrench

DVM Preferably with 3 digits below decimal point ability (Fluke 87)

Small Screwdriver

III. PARTS:

M452 UV Lamp Assembly

III. PROCEDURE:



The electronics used in T-API analyzers are sensitive to Electrostatic Discharge (ESD). When working on any T-API device, please ensure that you are properly grounded prior to handling or touching any electronic circuitry in the analyzers! For more information on how to protect sensitive components from ESD during handling, please contact T-API customer service and ask for the ESD Service note number 03-022A.

NOTE: Use only Distilled or De-Ionized Water with clean lint-free towels and swabs in cleaning any components in TAPI equipment unless otherwise instructed.

Measurement and Adjustment of the UV Lamp Reference and Measurement Voltages.

1. Flush the analyzer with zero gas to exhaust any possible residual high concentration of O3.
2. Remove the analyzer from the equipment (if necessary) to access the cover screws and the internal components of the analyzer.
3. Remove Three Screws shown in Figure 1.
4. Carefully slide cover up and off of instrument.
5. Apply +15VDC Power to J10 (+15 VDC Power Jack) or through DB-15 connector (Figure 3).

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6. Allow the analyzer to warm up for at least 15 minutes (the lamp output changes during warm up).
7. Measure and record the Reference voltage.
 - a. Measure the DC Voltage from GND J9 pin 1 to TP REF (Figure 3).
 - b. Adjust R43 as high as possible within range of 3500-4600mv.
8. Measure and record the Measure voltage.
 - a. Measure the DC Voltage from GND J9 pin 1 to TP MEAS (Figure 3).
 - b. Adjust R36 as high as possible within range of 3500-4600mv.
9. If the minimum voltage of 3500mV cannot be attained for the REF or MEAS, the lamp must be adjusted or replaced.
10. If the voltages are correct, reinstall and perform a zero calibration on the analyzer.

Adjustment of the Lamp

The object of the following adjustment is to get the voltage to the maximum by "peaking" the lamp (rotating until the voltage is maximum).

At peak, a new lamp may put out so much power that the detectors may become saturated even with the detector amplifier gain potentiometers turned all of the way down. If the lamp generates more than 4600mV on the REF and MEAS test points at "peak" (with the potentiometers turned all of the way down), then the lamp will have to be "de-tuned" to "off peak" by rotating it so it outputs a maximum of 4600mV on the REF and MEAS test points. So if installing a new lamp, peaking it, adjusting the potentiometers, and you are not able to get the voltages under 4600mV, then the lamp will need to be de-tuned by rotating it off of the peak.

Equally, if an older lamp is only putting out 3500mV or below with the lamp peaked (for instance a lamp that is near the end of its life), make sure the lamp is peaked and that both REF and MEAS potentiometers are adjusted all of the way up to get the voltages above 3500mV. If 3500mV is not attainable at peak (with the potentiometers turned all of the way up), the lamp must be replaced.

Ideally, the important thing is to get the voltage somewhere above 3500mV and below 4600mV. A new lamp should easily be able to get up to 4600mV. Over time, the lamp may need positional adjustments and adjustments to the potentiometers to get maximum usage from a lamp.

1. Monitor the DC Voltage from GND J9 pin 1 to TP 5 (Figure 3). This voltage must read between -0.8 and -1.8 Vdc. If the voltage does not read correctly, loosen the two UV lamp retaining screws (Figure 2) and rotate the UV lamp (avoid touching the transformer on the UV lamp power supply) until this voltage (-0.8 to -1.8 Vdc) is reached and then tighten the screws back down again. If unable to get the voltage below -0.8 Vdc (-0.8 V to -1.8 V), the lamp must be replaced. If a positional adjustment lowers TP5 voltage to below -0.8 V, adjust the Reference and Measure voltages as follows.
2. Measure and record the Reference voltage.
 - a. Measure the DC Voltage from GND J9 pin 1 to TP REF (Figure 3).
 - b. Adjust R43 as high as possible within range of 3500-4600mv.
3. Measure and record the Measure voltage.
 - c. Measure the DC Voltage from GND J9 pin 1 to TP MEAS (Figure 3).
 - d. Adjust R36 as high as possible within range of 3500-4600mv.
4. If the Reference and Measure readings are above 3500mV and below 4600mV, no further adjustment is necessary. Proceed to reinstall the analyzer and perform a zero calibration.
5. If the minimum voltage of 3500mV cannot be attained, the lamp must be replaced.

Replacement of the Lamp

1. Remove +15VDC Power to J10 (+15 VDC Power Jack) or DB-15 connector (Figure 3).
2. Loosen two UV Lamp Retaining screws (Figure 2) approximately one turn counter-clockwise.
3. Press in on the Connector Release (Figure 2) and pull up on connector to disconnect lamp.
4. Slide the UV lamp up and out of UV Lamp Block.

NOTE: Be careful to keep the lamp free from contaminants such as fingerprints. If the lamp becomes contaminated, clean the lamp optical surface with alcohol first, then with distilled or de-ionized water. Do NOT allow any alcohol to get / spill inside of the analyzer.

5. Install the new UV lamp, make sure that the UV lamp is all the way down in the UV lamp block and the index mark or inverted "V" notch is aligned as shown in Figure 2.
6. Tighten the UV Lamp retaining screws very carefully. They only need to be torqued to about 6 in/lbs (8 in/lbs Maximum).
7. Apply +15VDC Power to J10 (+15 VDC Power Jack) or through DB-15 connector (Figure 3).
8. Allow the new lamp and analyzer to warm up for at least 15 minutes.
9. Check the DC Voltage from GND J9 pin 1 to TP 5 (Figure 3). This voltage must read between -0.8 and -1.8 Vdc. If the voltage does not read correctly then loosen the two UV lamp retaining screws and rotate the UV lamp until this voltage is reached and then tighten the screws back down again. If this voltage can not be reached then contact API for further assistance.
10. Measure and record the Reference UV voltage.
 - e. Measure the DC Voltage from GND J9 pin 1 to TP REF (Figure 3).
11. Measure and record the Measure UV voltage.
 - f. Measure the DC Voltage from GND J9 pin 1 to TP MEAS (Figure 3).
12. Adjust R43 for REF and R36 for MEA to get the voltages as high as possible within the 3500-4600mv range. If the voltages can't go below 4600mV with the potentiometers turned all the way down, loosen the two UV lamp retaining screws and rotate the UV lamp (de-tune) until the voltages goes below 4600mV and then tighten the screws back down again.
13. Ensure both REF and MEAS voltages are 3500mV to 4600mV.
14. If proper voltages cannot be attained or the voltages are not stable, contact TAPI Customer Service Department for assistance or to arrange for return and repair of the analyzer.
15. Remove +15VDC Power to J10 (+15 VDC Power Jack) or from DB-15 connector (Figure 3).
16. Carefully slide the cover onto Instrument as shown in Figure 1. Be extremely careful that you do not catch any of the cables with the cover Tuck the cables "UP" first and then slide the cover down over them. If you feel any of the cables catch on the cover, remove the cover and ensure that all the cables are seated correctly.
17. Replace the three screws, reinstall the analyzer and perform a zero calibration.

Zero Calibration

1. Apply +15VDC Power to J10 (+15 VDC Power Jack) or through DB-15 connector (Figure 3).
2. Wait 15 minutes.
3. Perform a zero calibration. Check that the concentration is stable and no fault LEDs are lit.

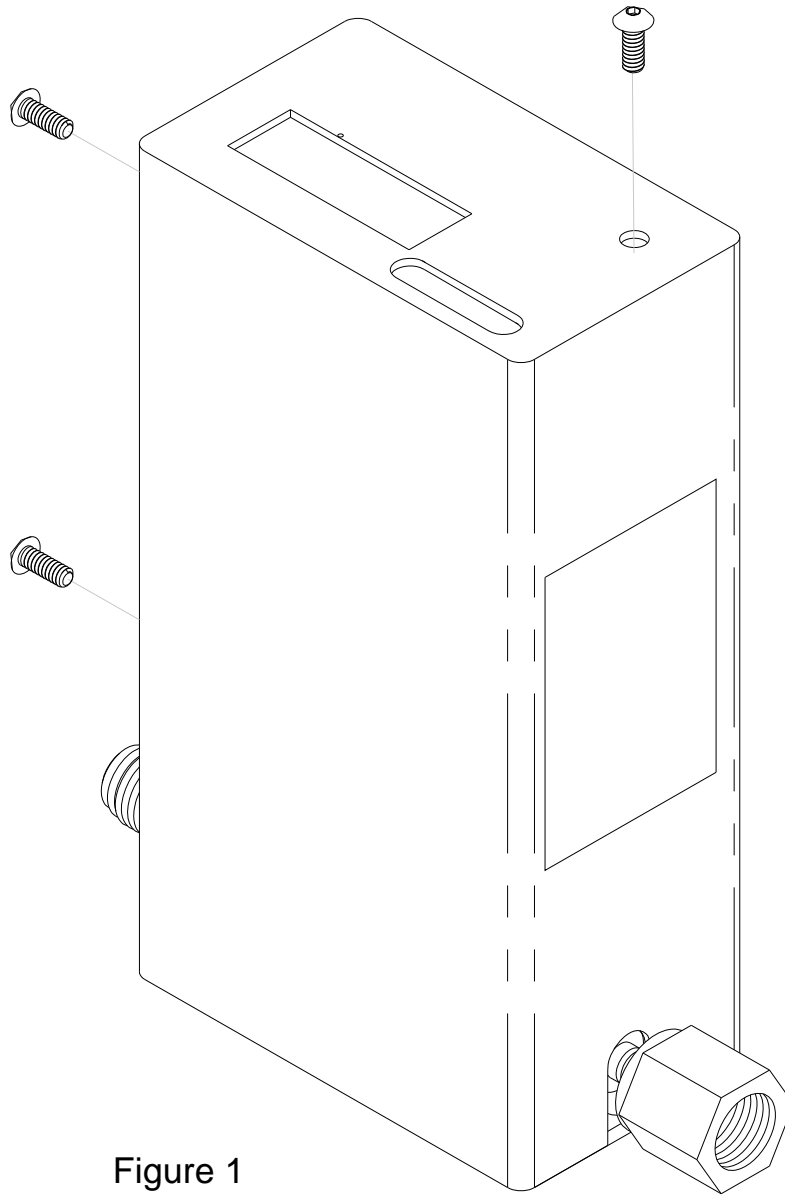


Figure 1

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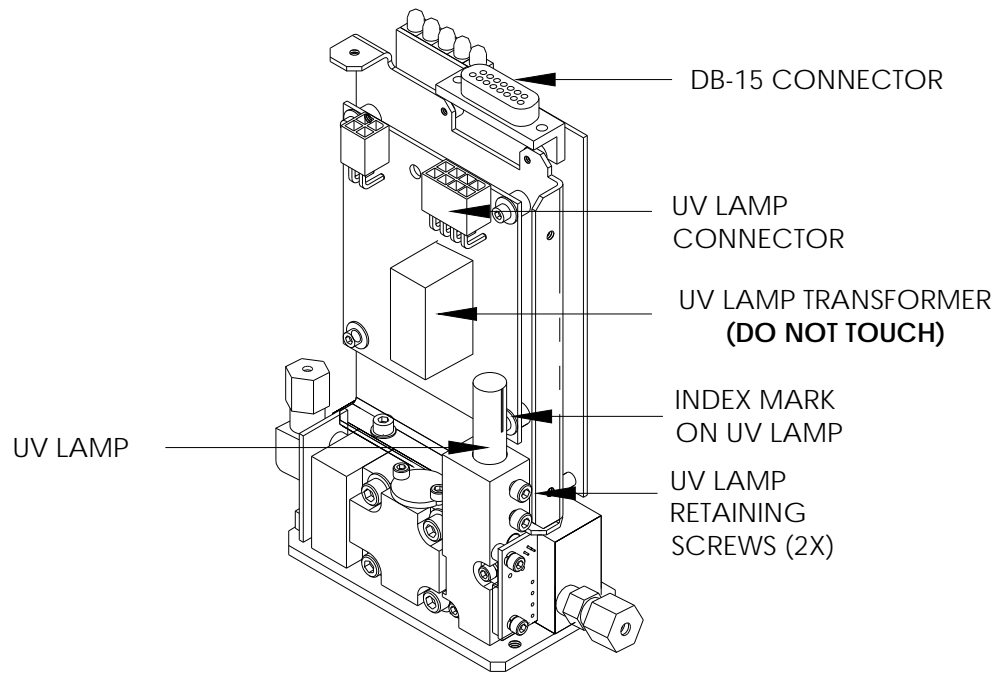


Figure 2

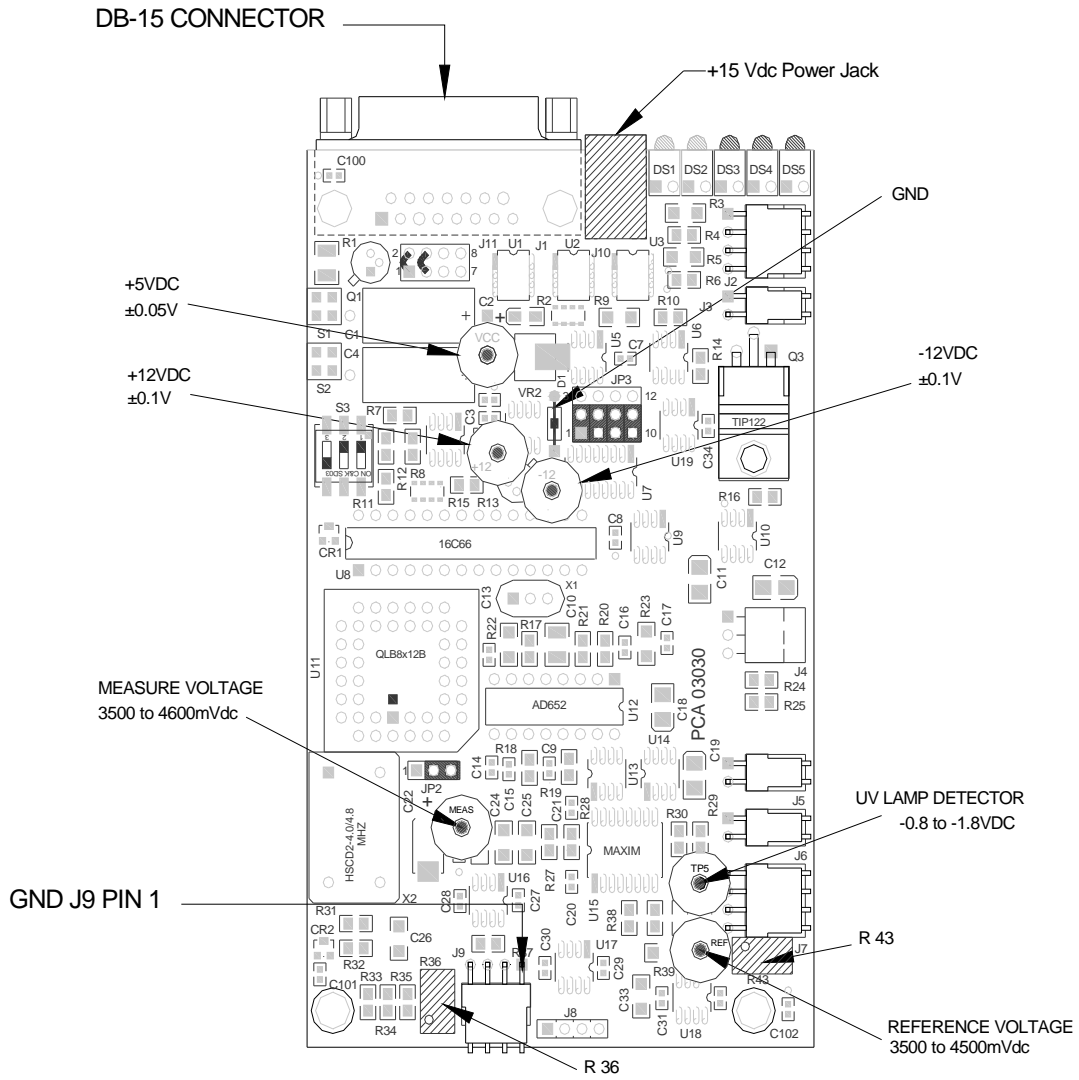


Figure 3