



# TELEDYNE INSTRUMENTS

*Advanced Pollution Instrumentation*

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## Service Note

95-035 Rev B  
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### VERIFICATION OF UV LAMPS

**Scope:** How to determine if the UV lamp is good, bad or misadjusted. All UV lamps drift in a downward direction (loss of energy) throughout their life. Over a short term period, there may be some upscale drift. Most lamps have a major decrease in energy the first 90 days of operation. Up to 50% decay can be expected according to the UV manufacturer. As the lamp decays, the computer/ratio chip will correct the ppb value and hold the calibration. Even if the energy decays by 40% or 50%, the computer can still correct and keep the analyzers calibrated and giving the correct data. If the UV lamp does have very low energy, some of the failure modes are noise at zero and span. To determine if a lamp is bad and needs to be replaced, follow the guideline below for the particular model you have.

**Note:**

1. Every 10% drop in UV output gives a maximum of 1% change in reading in the analyzer output.
2. The UV lamps output is directly proportional to the line voltage and will change as the AC changes. But the CPU will compensate for AC line changes.
3. You should get 2+ years life out of a UV lamp.

**Tools:** Crosspoint screwdriver  
3.5 digit DMM

**For M100, M152**

To test for a low energy output lamp, use a 3 1/2 digit DMM:

Set the DMM to AC millivolts. Measure from TP1 of the mixer card (+ side of DMM) to TP13 of the mixer card (- side of DMM) ground.

1. Peak the lamp.  
Adjust UV lamp for maximum output.  
NOTE: This step is not normally done during a routine calibration. It is included here in case the UV lamp was knocked out of adjustment during shipment.
  - a. Connect a DVM to test Point 1 of mixer card. Select 2 VAC range on DVM.
  - b. Adjust the lamp for maximum output by pushing up on the lamp until you can grasp the glass at the top of the lamp. Slowly rotate lamp until largest signal is measured on DVM.

- c. Push the UV lamp down until the voltage at TP1 is close to zero volts. Slowly push lamp back up until the voltage at TP1 reaches maximum and starts to fall. Push lamp down again until voltage at TP1 reached maximum.
  - d. Wait 10 minutes and adjust R3 (CAUTION: if you adjust R3, you must perform the quick cal procedure) of mixer card until front panel display (press TEST button until front panel displays UV LAMP) reads 3500 mV  $\pm$ 50 mV.
  - e. Check to see that lamp ratio is 100%  $\pm$  2%. If not, press SETUP button. Press MISC button. Press LAMP button. Enter password. Enter 3500 and press ENTR button. Exit back to main menu.
2. If, after peaking the lamp, TP1 millivolt is less than 150 mVac, the lamp should be replaced.
  3. Prior to sending back to API, annotate the serial number of the analyzer and the TP1 millivoltage achieved.

For M100A:

The M100A doesn't have the mixer card. The voltage is amplified at the photodetector board and fed directly to the V/F card. Therefore, use the front panel "UV LAMP" test signal to test the lamp output. Please use the following procedure to peak and test the UV lamp.

1. Loosen the thumbscrew to allow the lamp to move freely. If the lamp still doesn't move freely, loosen two Philips screws.
2. Slowly rotate or move the lamp vertically while monitoring the UV lamp display to read as close as you can to 3500 mV. If you can not peak the lamp output above 600 mV, go to step 4.
3. Finger tighten the thumbscrew. If you had to loosen the Philips screws, tighten them up too.
4. If the UV LAMP display is lower than 600 mV, the "UV LAMP WARNING" will be displayed, and lamp replacement is necessary. Prior to sending back to API, annotate the serial number of the analyzer and "UV LAMP" millivolt achieved.

After the lamp adjustment is made, please recalibrate the UV lamp (SETUP-MORE-DIAG-NEXT.... until "LAMP CALIBRATION" , then hit ENTR). Recalibrate the unit with calibration gas.

**We will test all lamps returned to us and any found not to fail will not be credited and we will invoice accordingly.**