



TELEDYNE INSTRUMENTS

Advanced Pollution Instrumentation

A Teledyne Technologies Company
9480 Carroll Park Drive, San Diego, CA 92121-5201
Phone (858) 657-9800 Fax: (858) 657-9818 Toll Free 1800 324-5190
E-mail: api-customerservice@teledyne.com <http://www.teledyne-api.com>

Service Note

99-043 REV B
2 May, 2007

M100A UV LAMP INFORMATION

I. SCOPE:

To provide information about the API UV lamp circuits.

II. PARTS:

NONE

III. BACKGROUND

1. Something important to keep in mind regarding UV lamps, is that a new UV lamp can degrade as much as 30 – 50% in the first 3 – 6 months. This degradation is normal for UV lamps.
2. As most UV lamps are “off peaked” (that is to say that they are peaked to less than maximum intensity, as seen on the front panel), this is not a problem. Off peaking only applies to analyzers that do not have the adjustable pots on the UV lamp preamp card. The new UV lamp preamp cards have pots on them that allow us to peak the lamp to maximum intensity and the gain turned down on the preamp card. All that is necessary to get the UV energy higher is to move the lamp up or down in the holder to gain more intensity. Also the output of the UV detector has gain on it, and this allows the UV lamp to degrade and the UV lamp intensity on the front panel will remain at an acceptable level.
3. The UV lamp circuit of the M100A analyzer is comprised of three different items. They all work together to allow the CPU to make the concentration calculations relative to the amount of UV light in the Rcell. The three different items for the UV lamp circuit are the UV lamp, the UV filter and the UV detector.
4. The UV lamp is a simple lamp that is powered by a step up transformer that is supplied by the input AC line voltage.
5. The UV filter is a 214 NM band pass filter is the same filter in all the different variations of SO₂, H₂S and TRS analyzers that API makes.
6. The UV detector is the sensor that tells the computer how much light is in the cell. The amount of light that the UV detector “sees” is going to be relative to the input voltage to the lamp, how much SO₂ is in the cell (this does not have an affect on the ambient analyzers) and how much UV light the UV filter is letting into the cell.

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7. The most important factor to keep in mind when working on the UV circuit of the SO₂ analyzer is that the amount of light in the cell is relative. You can have a large UV lamp signal, and the analyzer will work correctly or you can have a small UV lamp signal, and the analyzer will work correctly. The important factor is that the CPU “knows” how much light is in the cell and that it has a realistic lamp ratio.
8. What this means is that if you have a lamp ratio that is very low or exceptionally high, the analyzer is probably going to have some error that is caused by this very small (or very large) lamp ratio.
9. This is simply adjusted by calibrating the lamp. This lamp calibration procedure is in your manual in section 9.1.6 step 2.
10. If the lamp intensity is so low that the firmware will not allow you to do the lamp calibration (less than 1000 mv), the lamp voltage on the front panel can be adjusted by peaking the lamp (older instrument with no pot on preamp card) or by turning up the pot on the preamp card. Then the lamp calibration can be done.
11. In order to increase the life of the lamps and simplify the adjustment of the lamps we have redesigned the UV detector pre-amp circuit with a new style of pre-amp. What we have done is to put an adjustable resistor on the pre-amp card that allows you to turn up on the gain of the detector. This new pre-amp assy can be retrofitted into all of our M100A analyzers. This is advantageous to the user, because to adjust the UV lamp energy all you have to do is to turn up on the resistor and then do the lamp calibration in the diagnostic menu.
12. If you would like to have more information about the adjustable pre-amps please contact the service department and ask for service note 99-006.

If you have questions regarding this procedure or any API equipment, please contact an API Customer

Service representative at:

Phone: (858) 657-9800

Fax: (858) 657-9816

Email: customerservice@advpol.com

WWW: <http://www.advpol.com>

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