



## TELEDYNE INSTRUMENTS

*Advanced Pollution Instrumentation*

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## Service Note

95-039 Rev B  
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### PHOTOMETER AND OZONE GENERATOR CALIBRATION IN THE M700 CALIBRATOR

#### Background:

Ozone generation in the M700 Calibrator is accomplished through a UV lamp ozonator. Front panel and remote operation of the calibrator allow generation of ozone to requested ppb levels. In order to accomplish this, the ozone generator must be calibrated to a known ozone standard.

There are two versions of the M700 capable of generating ozone:

1. Units with the ozone generator and GPT mixing volume only.
2. Units with the ozone generator, GPT mixing volume and a photometer to measure and control ozone generation.

Both versions are capable of providing stable, repeatable ozone concentrations with excellent response characteristics. The photometer version has the added benefit of superior accuracy.

An accurate ozone generator calibration is critical to good performance of the calibrator:

1. In the case of the calibrator without photometer, the look-up table generated during initial calibration is used to develop the correct drive signal to the ozone generator in order to generate the requested concentration of ozone. If the ozone generator is not calibrated, requested ozone concentrations will never be reached and the actual results will be unpredictable.
2. In the case of the calibrator with photometer, the look-up table will be utilized during the initial drive to the requested concentration. After a delay to allow the ozone generator to drive to the requested concentration, the bench will take over control of the ozone generator. If the ozone generator is not calibrated, it could take as long as one hour to achieve good, stable generation at the requested concentration.

In both cases, the indications that an ozone generator calibration may be required are similar. They are:

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1. Upgrade to version C.4 of the software (See Service Note 95-036 for particulars). This upgrade changes the memory storage location of the ozone look-up table so an ozone generator calibration must be performed.
2. Replacement of any major component in the O<sub>3</sub> generator and it's control circuits (e.g. UV lamp, UV lamp power supply, UV detector, etc.) The procedure is outlined in Section 9.1.4.3 in the manual.)
3. After calibrating the photometer, if response time is slow or erratic (i.e., overshooting and undershooting the requested concentration) indicating a large change in the look-up table, calibration of the ozone generator would be indicated. The procedure is outlined in Section 9.1.4.3 in the manual.

Calibration of the photometer would be indicated when any major part in the photometer is replaced (e.g. UV lamp, UV power supply, UV detector, etc.) or when checked against a primary standard and is shown to be out of tolerance. Photometer calibration is detailed in Table 6.1 in the manual.