Model 306 Ozone Calibration Source™

The 2B Technologies Model 306 Ozone Calibration Source™ is a portable source of ozone that allows you to calibrate any ozone monitor - not just those manufactured by 2B Tech. The instrument scrubs ozone from ambient air and produces any mixing ratio of ozone in the range 30 to 1,000 ppbv. The desired ozone concentration is chosen from the easy-to-use menu using a rotary select switch. The total output flow rate is in the range 3.0−3.2 L/min volumetric, and the ozone mixing ratio is controlled so as to be independent of ambient temperature, pressure, and humidity. You can attach the Ozone Calibration Source (OCS™) output directly to the inlet of any ozone monitor; the excess flow is vented through an ozone scrubber internal to the OCS. Although the instrument comes calibrated against a NIST-traceable ozone standard, the menu allows the user to change the calibration parameters of the ozone output if desired. For example, if you maintain an ozone reference instrument in the lab, you can use the OCS as a transfer standard for calibrating ozone instruments in the field relative to your lab standard. A scheduler feature allows you to schedule an autocalibration once daily.

The Ozone Cal Source™ is housed in the same small, rugged instrument case as the 2B Technologies Model 202 and Model 205 Ozone Monitors™.

Some applications of the Model 306 Ozone Calibration Source™ include:

- Calibration of ozone monitors in the field. This highly portable transfer standard is especially useful for maintaining the calibrations of networks of ozone monitors.
- Testing of materials such as rubber, plastics, and paint for effects of ozone exposure.
- Studies of the effect of ozone on plants where a calibrated source of ozone is required.

Example Data

Data were obtained for the calibration of a Model 202 Ozone Monitor, which had previously been calibrated against our NIST-traceable standard instrument. New target ozone concentrations were entered into the Ozone Cal Source every 5 minutes. As can be seen from the data, the new ozone concentrations are reached within 3 data points (30 s). Concentrations were stepped up and down twice to produce 4 calibration plots. Target ozone mixing ratios were 0, 50, 100, 200, 400, 600, 800 and 1,000 ppbv. There is an extra measurement at 150 ppbv in the rise side of the first set of "stairsteps."

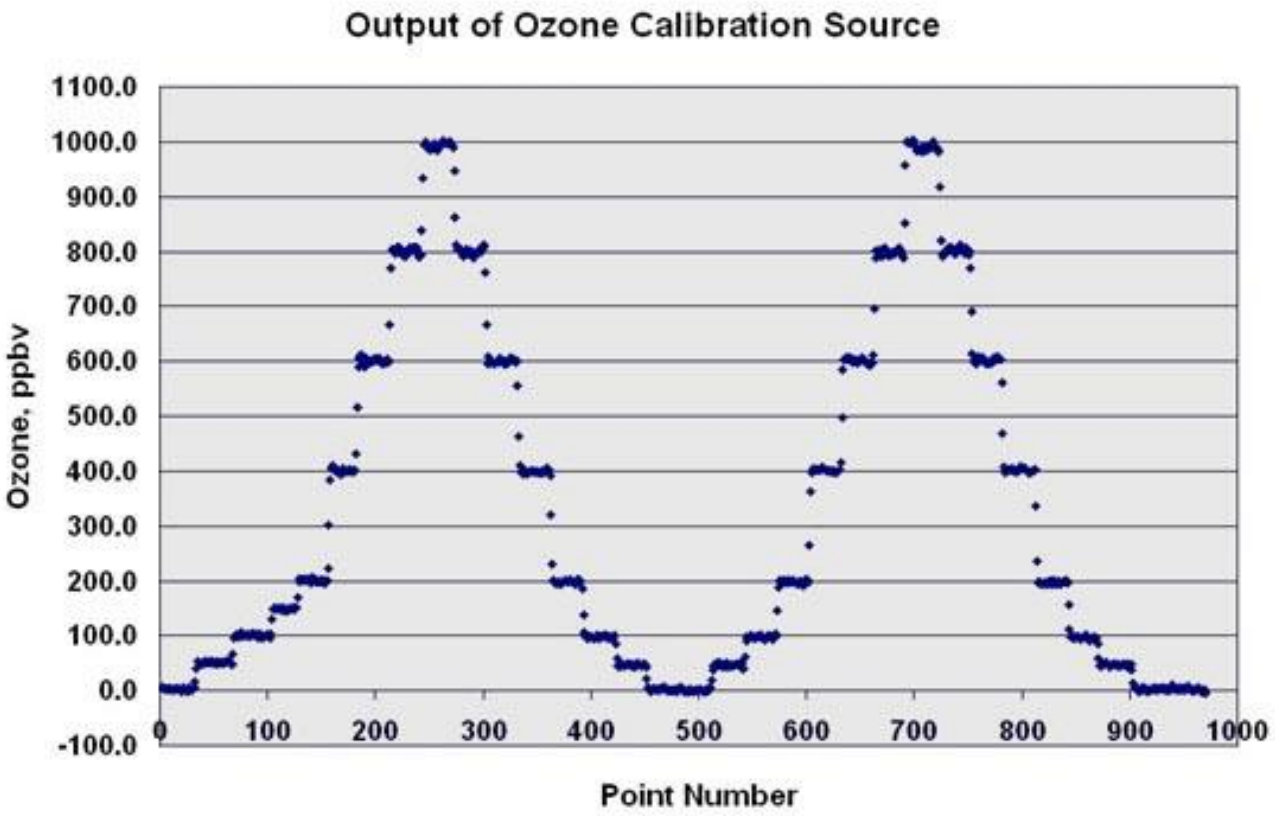

Fig.1. Measured ozone concentrations for "stair step" changes in Ozone Calibration Source Output.

The following figure shows the four calibration curves produced from the four sets of increasing and decreasing ozone concentrations. The data points and lines for the 4 least squares fits, which are plotted in different colors, overlap so well that it is difficult to distinguish them. The equations for the linear regressions show that the slopes of the four individual calibration curves agree to better than ±1% and the intercepts agree to ±2 ppbv. Correlation coefficients (R^2) are all 0.9999 or 1.0000.

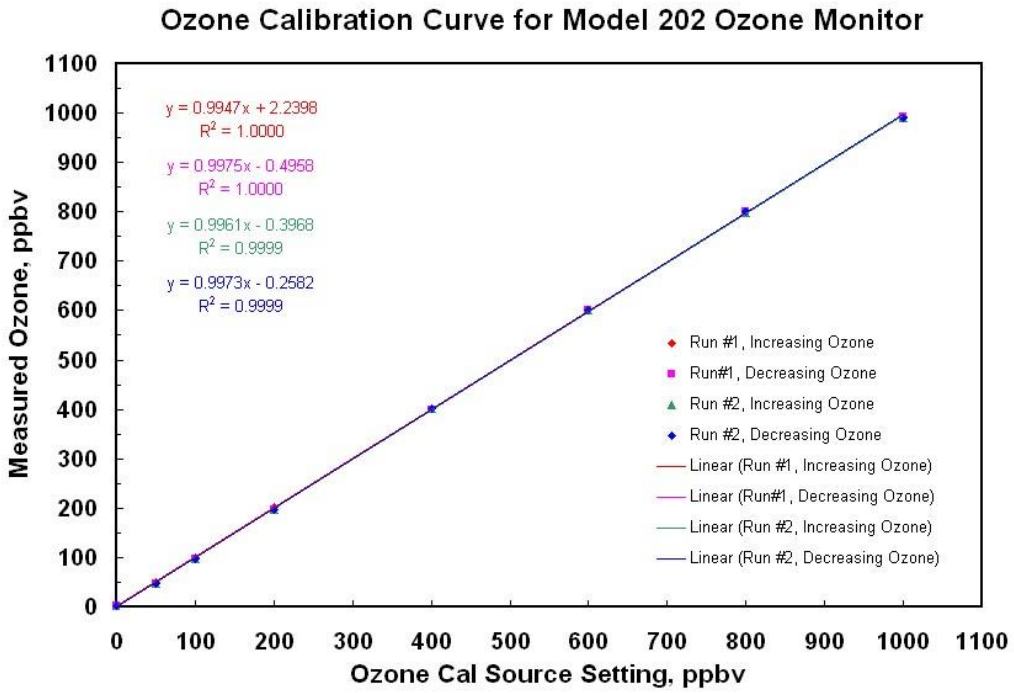

Fig. 2. Calibration curves established from data of Fig. 2. Click here for an enlarged image.

Specifications

Method of Ozone Production	UV Photolysis of O_2 at 185 nm
Ozone Concentration Range	0 ppbv and 30 ppbv to 1,000 ppbv
Precision and Accuracy of Output	Greater of 2 ppbv or 2% of ozone concentration
Response Time for Change in Ozone Output Concentration	30 s to reach 95% of concentration change
Flow Rate Range	3.0–3.2 Liter/min volumetric
Power Requirements	12 V dc or 120/240 V ac, 18 watt
Size	3.5 × 8.5 × 11 inches (9 × 21 × 29 cm)
Weight	5.6 lb (2.6 kg)
Autocalibration Scheduler	Yes; once-daily autocalibration function