Ozone Monitor Models 202 & 205

The Model 202 Ozone Monitor™ is designed to enable accurate and precise (±1.5 ppb) measurements of ozone ranging from a few ppb to 100,000 ppb (0-100 ppm) based on the well established technique of UV absorbance at 254 nm. The Ozone Monitor™ is light weight (2.1 kg.) and has a power consumption of only 4 watts. The U.S. Environmental Protection Agency (EPA) has assigned the method number "901-O3 Model 202" for ozone data obtained by the Model 202 and included in the EPA AirNow database.

The Model 205 Dual Beam Ozone Monitor was designed for even higher precision and faster response time than our popular Model 202. Data may be output as frequently as every 2 s, making it ideal for vertical profiling using balloons and for aircraft measurements where high temporal resolution is required. For a given averaging time, the Model 205 has a higher precision (better than 1 ppb for 10 s averaging) and a more stable baseline than the Model 202.

Features:

- Small, light weight, low power
- DewLine™ for humidity control
- Data averaging options of (2 s), 10 s, 1 min, 5 min and 1 hr
- Internal data logger
- Real time clock
- RS-232 serial and 0-2.5 V analog outputs
- Optional Flash Card provides virtually unlimited data storage
- GPS option for continuous logging of location

Specifications:

Measurement Principle	UV Absorption at 254 nm
Analytical Range	Model 202: 1.5 ppb to 100,000 ppb (100 ppm) Model 205: 1.0 ppb to 100,000 ppb (100 ppm)
Precision and Accuracy	Model 202: Greater of 1.5 ppbv or 2% for 10-s avg Model 205: Greater of 1.0 ppbv or 2% for 10-s avg
Measurement Interval	Model 202: 10 s Model 205: 2 s
Nominal Flow Rate	1 L/min for Model 202; 1.8 L/min for Model 205
Data Storage	14,336 lines internal; optional flash memory card
Data Outputs	RS232, 0-2.5 V Analog, LCD Display
Power Requirements	12 VDC or 110/220 VAC Model 202, 4.0 watt; Model 205, 5.0 watt
Size	3.5 x 8.5 x 11 inches (9 x 21 x 29 cm)
Weight	Model 202: 4.7 lb (2.1 kg); 1.6 lb (0.7 kg) without case Model 205: 5.0 lb (2.3 kg); 1.9 lb (0.9 kg) without case

Ozone Monitor Model 106 Series

For industrial ozone applications, 2B Tech recently introduced the Models 106-L, 106-M and 106-H Ozone Monitors where L, M and H refer to Low (0-10 ppm), Medium (0-1000 ppm) and High (0-20 wt%) ozone concentrations, respectively. These instruments have different optical path lengths in order to accommodate this extremely wide range of ozone concentrations, spanning more than eight orders of magnitude. Additionally, the Model 106-H was designed with a flow through path that can be pressurized for in-line measurements with ozone generators. The Model 106 series was designed as an "ozone monitor on a board" in which nearly all of the components are mounted directly to the printed circuit board and may be purchased without the enclosure for OEM applications.

Specifications:

Model	Range	Resolution	Precision and Accuracy
106-L	0-10 ppm	0.001 ppm (1ppb)	Higher of 2 ppb or 2% or reading
106-M	0-1000 ppm	0.01 ppm	Higher of 0.01 ppm or 2% of reading
106-H	0-20 wt%	0.01 wt%	Higher of 0.01 wt% or 2% of reading

Measurement Principle	UV Absorbance
Measurement Interval	10 s
Nominal Flow Rate	1 L/min
Data Storage	14,336 lines (10 s avg. = 1.4 days; 5 min avg = 1.4 mo.)
Choice of Units	ppb, ppm, pphm, µg m^{-3}, mg m^{-3} (& mol %, wt % for 106H)
Data Outputs	USB, RS232, 0-2.5 V Analog, 4-20 mA, LCD Display
Power Requirements	12 VDC or 110/220 VAC, 3.5 watt
Size	3.75 x 7.5 x 8.5 inches (10 x 19 x 22 cm)
Weight	4.3 lb (2.0 kg)

Comparison of Ozone Monitors:

Model	202	205	106-L	106-M	106-H
Backup Air Pump	√	√			
0-2.5 V Output	√	√	√	√	√
4-20 mA Output			√	√	√
RS232 Serial Output	√	√	√	√	√
USB	Adapter	Adapter	√	√	√
2-Level Relay			√	√	√
Real Time Clock	√	√	√	√	√
Data Averaging Choices	√	√	√	√	√
DewLine	√	√	√	√	
Internal Data Logger	√	√	√	√	√
Analog Inputs (3)	√	√			
Flow Through					√
External Battery Option	√	√	√	√	√
Flash Memory Option	√	√			
GPS Option	√	√			

Ozone Calibration Source

The Model 306 Ozone Calibration Source is a portable source of ozone that allows one to calibrate any ozone monitor. The instrument scrubs ozone from ambient air and produces either zero air or air having a mixing ratio of ozone anywhere in the range 30-1,000 ppbv. The desired ozone concentration is chosen from the easy-to-use menu. The instrument can be programmed to output up to 10 individual ozone step concentrations over a chosen time interval. The total output volumetric flow rate is 3 L/min, and the ozone mixing ratio is controlled so as to be independent of ambient temperature, pressure and humidity.

Specifications:

Ozone Output Range	0 ppbv and 30-1,000 ppbv
Output Flow Rate	Regulated at 3.0 L/min volumetric
Precision and Accuracy	Greater of 2.0 ppbv or 1.5% of ozone
Rise Time (95%)	< 30 s to reach 95% of concentration
Data Outputs	RS232, LCD Display
Power Requirements	12 V dc or 120/240 V ac, 18 Watt
Size	3.5 x 8.5 x 11 inches (9 x 21 x 29 cm)
Weight	5.6 lb (2.6 kg)

Example Data:

The following are data obtained for the calibration of a Model 202 Ozone Monitor™. 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). Target ozone mixing ratios were 0, 50, 100, 200, 400, 600, 800 and 1,000 ppbv.