

## Model 205 Dual Beam Ozone Monitor™

EPA Federal Equivalent Method (FEM)

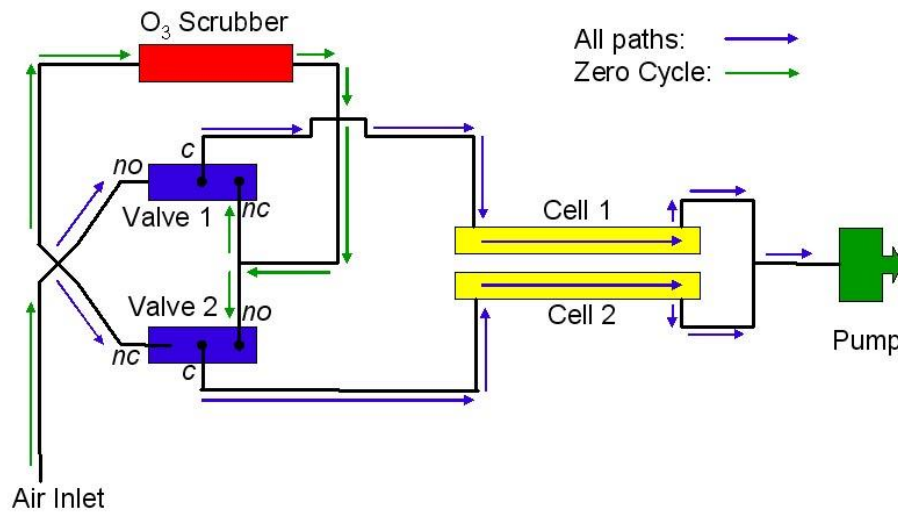


The Model 205 Dual Beam Ozone Monitor makes use of two detection cells to improve precision, baseline stability, and response time. In the Dual Beam instrument, UV light intensity measurements  $I_0$  (ozone-scrubbed air) and  $I$  (unscrubbed air) are made simultaneously. Combined with other improvements, this made it possible to reduce the time between ozone measurements to 2 seconds, making our instrument the fastest UV-based ozone monitor on the market, while still retaining the small size, weight, and power requirements of our popular Model 202 Ozone Monitor. Fast measurements are especially desirable for aircraft and balloon measurements where high spatial resolution is desired. Alternatively, one can choose to average more points internally to obtain even better precision.

The Model 205 has all of the features of the Model 202, including choice of measurement or averaging time (2 s, 10 s, 1 min, 5 min, 1 hr), analog output (0-2.5 V), real time serial output, internal data logger with 3 analog inputs for simultaneous logging of other measurements (e.g., T, P, and RH), and real-time clock. Flash memory (SD card) and quiet long-life internal pump are now standard features.

The Model 205 Dual Beam Ozone Monitor is an Environmental Protection Agency (EPA) Federal Equivalent Method (FEM).

## Schematic Diagram



## Features

- Quiet, long-life internal air sampling pump
- Low power consumption (~8 watt)
- Internal data logger (EEPROM), logs 16,383 lines of data
- Real-time clock
- Both serial and user-scalable analog voltage outputs (4-20 mA current output optional)
- Flash card memory (SD card) for virtually unlimited, portable data storage
- Three 0-2.5 VDC analog inputs for logging other measurements, such as external temperature, pressure, and humidity
- Convenient user interface to microprocessor, including calibration parameters (gain and zero)
- Selectable measurement time of 2 s or data averaging times of 10 s, 1 min, 5 min and 1 hr (custom averaging times available)
- DewLine™ for elimination of any water vapor interference, a unique feature of 2B Tech instruments
- Dual beam feature allows for heightened precision and improved baseline stability for applications where high spatial resolution is required

## Options

- GPS for continuous logging of latitude, longitude, and altitude
- Rechargeable lithium-ion battery provides ~11 hours of continuous operation
- External particle filter
- Serial-to-USB adapter
- 4-20 mA analog current output
- Bluetooth for wireless data transmission
- Cold-weather package for operation to -20°C (pump, lamp heater)
- High-altitude upgrade for operation to 25 km (pressure sensor)
- Extra-long-life, low-temperature internal air pump
- Low-power option for even lower power consumption
- Rack-mount enclosure

## Specifications

<b>Measurement Principle</b>	UV Absorption at 254 nm; Dual Beam
<b>Federal Equivalent Method (FEM)</b>	Yes, EQOA-0410-190
<b>Linear Dynamic Range</b>	0 to 250 ppm
<b>Resolution</b>	0.1 ppb
<b>Precision (1<math>\sigma</math>; rms noise)</b>	Greater of 1.0 ppb or 2% of reading for 10-s average
<b>Accuracy</b>	Greater of 1.0 ppb or 2% of reading
<b>Limit of Detection (2<math>\sigma</math>)</b>	2.0 ppb for 10-s average
<b>NIST-Traceable Calibration</b>	Yes
<b>Measurement Interval</b>	2 s (Data averaging options: 10 s, 1 min, 5 min, 1 hr)
<b>Flow Rate (nominal)</b>	~1.8 Liter/min
<b>Flow Rate Requirement</b>	>1.2 L/min
<b>Baseline Drift</b>	<1 ppb/day; <3 ppb/year
<b>Sensitivity Drift</b>	<1%/day; <3%/year
<b>Measurement Time, Frequency</b>	2 s, 0.5 Hz
<b>Response Time, 100% of Step Change</b>	4 s, 2 points
<b>Measurement and Averaging Times</b>	2 s, 10 s, 1 min, 5 min, 1 hr
<b>Ozone Units</b>	ppb, pphm, ppm, $\mu\text{g m}^{-3}$ , $\text{mg m}^{-3}$
<b>Pressure Units</b>	mbar, torr
<b>Temperature Units</b>	$^{\circ}\text{C}$ , K
<b>T and P Corrected</b>	Yes
<b>Operating Temperature Range</b>	0 to 50 $^{\circ}\text{C}$ standard; optional -20 to 50 $^{\circ}\text{C}$ with low temperature modifications (pump and lamp heater cold-weather package)
<b>Operating Altitude Range</b>	~0-13.5 km (150-1,013 mbar) standard; optional ~0-25 km (30-1,013 mbar) with upgraded pressure sensor

