

## DESCRIPTION

The Environics® Series 6100 Computerized Multi-Gas Calibration System is a computer controlled, state-of-the-art instrument for dynamic calibration of ambient air analyzers. The Series 6100 automatically performs zero, precision, span and multi-point calibrations using NO, NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, hydrocarbons and other gases of interest. The 6100 meets all U.S. Environmental Protection Agency requirements.

The Series 6100 consists of a single chassis supporting 2 thermal mass flow controllers, an ozone generation module, a mixing zone, a reaction chamber for gas phase titration, and control electronics.

Commands are entered from the front panel and displayed on a backlit 4 line by 20 character liquid crystal display. The instrument may also be remotely operated using contact closures or the RS-232 serial data interface, both are standard in the Series 6100.

The mass flow controllers are factory calibrated at 11 points to a NIST (National Institute of Standards and Technology) traceable primary standard. The calibration data consists of a comparison of desired versus actual flow over the full dynamic range of the instrument with linear interpolation between points. Calibration data is stored in non-volatile memory and may be updated by the user with a suitable standard.

The Series 6100 ozone generator is factory calibrated using a NIST traceable ozone standard. This temperature controlled, ultra-violet (UV) based ozone generator includes a precision photo-optical feedback circuit to compensate for lamp aging effects.

The Series 6100 is available in either a standard rack mount or portable configuration.

## PRODUCT FEATURES AND BENEFITS

User-friendly interactive software with plain language prompts is simple to use, reducing technician training time and virtually eliminating error.

Automatic calculation of dilution and span gas flows based on commanded concentration eliminates the need for manual computation and allows rapid transition from point to point.

Internally-stored mass flow controller calibration data improves accuracy by as much as a factor of ten and simplifies field recalibration. Mass flow controllers are factory calibrated at 11 points.

Internally-stored ozone generator calibration data insures linear, repeatable ozone generation without photometer control. Ozone generator performance meets U.S. EPA criteria for ozone transfer standards.

Ozone generator pressure compensation ensures repeatable ozone generation and stable pressure other than that at which it was originally calibrated

Full, two-way RS-232 Serial Data Interface (standard) permits remote operation of the instrument including data collection, gas selection, initiation of zero, span and multi-point calibrations.



## SOFTWARE

**Blend (Conc Mode):** In response to software prompting, user selects gas port, span (cylinder) gas concentration, output gas flow (total) and output gas concentration. Series 6100 automatically delivers concentrations at the total flow specified.

- **Generate Ozone:** Allows user to specify, and then generate a precise concentration of ozone.

- **Gas Phase Titration:** Utilizes blend and generate ozone routines to lead user through GPT using "excess NO" method.

**Manual (Flow Mode):** Allows user to manually command a desired rate of flow for each mass flow controller, separately or together, with or without ozone.

**Display:** Allows user to monitor flow rates for each mass flow controller separately. Also provides ozone oven block temperature during generate ozone and gas phase titration routines.

- **Maintain Ports:** User enters the name of the span gas in the source cylinder, its concentration (ppm) and the port to which the cylinder is connected.

## SPECIFICATIONS

### Mass Flow Controller (From 10-100% FSO)

Accuracy (as a % of setpoint)\*

Concentration:	±1.0%
Flow:	±1.0%

Flow Repeatability (% FSO) ±0.05%

\*Mass flow controllers are calibrated using a NIST traceable Primary Flow Standard, using a Reference Temperature of 25° C (77°F) and a Reference Pressure of 760mm Hg (29.92 in. Hg)

Warm up time: 30 minutes

### Ozone Generator

Concentration Range: 0.02 - .5 ppm at 5 – 10 slpm  
Optional Ranges: .05 - 1 ppm at 5 – 10 slpm

Accuracy: ±2% or ±.003ppm  
30 day repeatability: ±2% or ±.003ppm

### Mechanical

#### Inlets

Balance: External ¼" Swagelok™\*  
Span(s): External ¼" Swagelok™\*

#### Outlet

One external ¼" Swagelok™\*

\*(or compatible fitting)

### Operating Pressures at inlets

Minimum:	15 psig (1.03 Bar)
Nominal:	25 psig (1.72 Bar)
Maximum:	30 psig (2.07 Bar)

### Wetted Surfaces

Tubing:	Teflon™
Glass Chambers:	Pyrex™
MFC's:	Stainless Steel
Seals:	Viton™

Operating temperatures  
32° - 122° F (0° - 50° C)

Performance Temperature Range  
59° - 95° F (15° - 35° C)

### Weight

Standard:	20 lbs.
Including Options:	30 lbs.

### Dimensions (w x h x d)

Portable:	17" x 7" x 15"
Rack:	19" x 7" x 15"

### Electrical

Standard: 100 VAC to 250 VAC, (50/60 Hz)  
Current: 2 Amps (maximum)

### Operating Modes

Front panel keypad  
Internal timer control  
RS-232 serial data interface  
I/O control (8 inputs / 8 outputs) programmable through software

### Data I/O

RS-232 serial data interface  
I/O Control (8 inputs / 8 outputs)

### OPTIONS

- Rack Mount
- Extra Gas Inlets
- Solenoid Valve on Output
- Permeation Oven
- 3<sup>rd</sup> Mass Flow Controller

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