

## GENERAL DESCRIPTION

The Environics® Brand Series 2000 Computerized Multi-Component Gas Mixer automatically blends and dilutes gases to generate precise gas calibration standards, create gaseous atmospheres or produce gas mixes for analytical research or production purposes. The Series 2000 dynamically produces complex mixes containing up to, eight (8) individual component gases in a balance gas. Each component concentration may be independently varied in response to user commands. The Series 2000 can produce gas concentrations from percent levels to ppb for single or multi-point calibration of gas chromatographs, process gas analyzers, mass spectrometers, FTIR's and other gas analytic devices.

The Series 2000 consists of a single chassis supporting up to nine (9) mass flow controllers, a serpentine pre-mix zone and a zero dead-space final mixing zone. All gas wetted surfaces are electropolished stainless steel. Seals are gas compatible elastomers.

The Series 2000 employs mass flow controllers calibrated to a NIST (National Institute of Standards and Technology) traceable primary standard.

Commands are entered from the front panel and displayed on a backlit twenty-five line by eighty character liquid crystal display. Calibration sequences are stored in the internal microprocessor for recall by the keypad, optional RS-232 communications or optional status interface.

The Series 2000 is available in either a bench top configuration or an optional standard 19" rack mount.

## PRODUCT FEATURES AND BENEFITS

Simultaneous 8 component dynamic mixing with automatic computation of component and balance gas mass flow

Multi-component capability permits the user to generate a wide range of complex standards with a minimum inventory of expensive, long lead-time, multicomponent gas cylinders.

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

Internally-stored mass flow controller calibration data improves accuracy.

High capacity memory permits storage and recall of up to 200 multi-component "recipes", saving time and reducing errors.

Twenty-five line by eighty character display permits viewing of data in worksheet form.

Modular design allows user to add additional gas circuits later, reducing initial investment and protecting against obsolescence.

Optional RS-232 Serial Data Interface permits remote operation and complete integration with a data station.

## SOFTWARE

The Series 2000 has six primary routines accessible through "soft" keys, located immediately below their on-screen labels.

- **Concentration Mode:** User enters target output gas concentration for the span gas. The actual concentration is displayed during mixing.
  - **Flow Mode:** User enters target flow rate (cc's per minute) for each component gas. Actual flow rates are displayed after mixing is initiated.
  - **Maintain Ports:** User enters the name of the component gas in the source cylinder, its concentration and the port to which it is connected.
  - **Automatic Sequencer:** Permits unattended automatic operation of the instrument on a programmable seven-day schedule.
  - **Purge Mode:** Purge component gas circuits and mixing zone.
  - **Status (Optional):** Allows user to remotely activate different modes of the system and also activate external devices
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## SPECIFICATIONS

### Performance (as a percent of setpoint)\*

Accuracy	From 10 to 100% of <u>Full Scale Flow</u>
Concentration:	± 1.0%
Flow:	± 1.0%
Repeatability	±0.05%

\*Mass flow controllers are calibrated using a NIST traceable Primary Flow Standard, using a Reference Temperature of 0° C (32°F) and a Reference Pressure of 760mm Hg (29.92 in. Hg)

Warm up time: 30 minutes

### Mechanical

#### Inlets

Balance:	One external ¼" Swagelok™*
Purge:	One external ¼" Swagelok™*
Analyte:	One external ¼" Swagelok™*

#### Outlet

One external ¼" Swagelok™\*

#### Operating Pressures at inlets

Minimum:	10 psig (0.67 Bar)
Recommended:	<b>25 psig</b> (1.68 Bar)
Maximum:	75 psig (5.04 Bar)

#### Wetted Surfaces

Tubing: Electropolished 316 Stainless Steel  
MFC's: Stainless Steel  
Seals: Viton  
(Optional - Kalrez, Buna-N,  
Neoprene, Metal)

#### Operating temperatures

32° - 122° F (0° - 50° C)

#### Performance temperatures

59° - 95° F (15° - 35° C)

#### Weight

Minimum:	35 lbs. (16 Kg)
Maximum:	70 lbs. (32 Kg)

\*(or compatible fitting)

### Dimensions (w x h x d)

Portable:	17" x 7" x 23.5" (43.18cm x 17.78 cm x 59.69 cm)
Rack:	19" x 7" x 23.5" (48.26 cm x 17.78 cm x 59.69 cm)

### Electrical

Standard:	115 VAC (100 to 130 VAC), 50/60 Hz
Optional:	220 VAC (200 to 260 VAC), 50/60 Hz
Current:	3 Amps (maximum)

### Electronics

Inmos T 400 series, 32 Bit processor  
12 Bit A/D and D/A Conversion

### Operating Modes

Front panel membrane keypad  
Internal timer control  
Optional RS-232 serial data interface  
Optional Status board interface

### Data Output

Parallel printer port (Centronics™ compatible)  
Optional RS-232 serial data interface

### OPTIONS

- RS-232 Serial Data Interface
- Status Board
- Solenoid Valve on Output
- Ozone Generator (0-1.0ppm)
- Permeation Oven
- Pressurization Package
- Humidification Package

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