Product Data
Series 2000
Computerized Multi-Component Gas Mixer

DESCRIPTION

The Environics® 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 chromagraphs, 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. Gas wetted surfaces are electro- polished 316 stainless steel. Seals are gas-compatible elastomer. User interface includes a backlit 80 character by 25 line liquid-crystal display and membrane keypad.

The instrument's mass flow controllers are factory calibrated using a primary flow standard traceable to the United States National Institute of Standards and Technology (NIST). The calibration data consists of an eleven-point comparison of commanded versus actual flow with linear interpolation between the points.

The Series 2000 is available in either a standard rack mount or bench top configuration. The optional RS-232 serial data interface permits remote or computer operation of the instrument.

PRODUCT FEATURES AND BENEFITS

- Simultaneous 8 component dynamic mixing, with automatic computation of component and balance gas flows, allows the user to formulate complex gas standards and vary the concentration of each individual component at will.
- Multi-component capability permits the user to generate a wide range of complex standards with a minimum inventory of expensive, long lead-time, multi-component gas cylinders. Save on gas costs, cylinder rental and handling labor.
- 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.
- 25 line by 80 character display permits viewing of data in worksheet form.
- Modular design allows adding additional gas circuits later, reducing initial investment and protecting against obsolescence.
- RS-232 Serial Data Interface permits remote operation and complete integration with a computer-controlled system.

SOFTWARE:

The Series 2000 has six primary routines accessible through on screen "soft" keys.

- **Concentration Mode**: User enters Target Output Gas Concentration (ppm or %) for each component. 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 (ppm or %) 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** (Optional): Purge component gas circuits and mixing zone.
- **Status** (Optional): Allows user to remotely activate different modes of the system and also activate external devices.

SPECIFICATIONS

Performance (as a percent of set point)

Accuracy

Concentration:	± 1.0%
Flow:	± 1.0%
Repeatability:	0.05%

* Performance specifications are valid when all Mass Flow Controllers are operating between 10% and 100% of full scale flow. 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 760 mm Hg (29.92 in. Hg)

Warm up time: 30 minutes

Mechanical

Gas connections

1/4" Swagelok (or compatible fitting)

Operating Pressures

Minimum:	10 psig (0.67 Bar)
Recommended:	25 psig (1.68 Bar)
Maximum:	150 psig (9.87 Bar)
	75 psig (5.04 Bar) with Purge option

Wetted Surfaces

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

Operating temperature:	32° - 122° F (0° - 50° C)
Performance temperature:	59° - 95° F (15° - 35° C)

Weight

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

Dimensions (w x h x d)

Portable:	17" x 7" x 23.5"
	(43.18 cm 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
RS-232 terminal mode / Remote computer control (optional)
Status board interface (optional)
Other communications options available

Data Outputs

Optional RS-232 serial port / Parallel printer port interface

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OPTIONS

- Serial/Parallel Port Interface
- Status Board
- Extra Component Gas Port
- Purge System
- Permeation Oven
- Solenoid Valve on Output
- Ozone Generator (0.0 to 1.0 ppm)
- Heated Flow Path
- Humidification
- Pressurization

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