

GEMINI Respiratory Monitor

Accurate O₂ and CO₂ measurement for small animals



Introduction

Respiratory gas measurement has long been known to be an excellent indicator of respiratory status, for both spontaneously breathing and artificially ventilated animals. The GEMINI Respiratory Monitor measures breath-by-breath oxygen and carbon dioxide concentration for accurate respiratory status assessment. The instrument uses the latest technology fast infrared (CO₂) and paramagnetic (O₂) measurement cells for unsurpassed accuracy and long-term stability. Respiratory rate is computed using the normal inspiration/expiration excursion of the CO₂ signal. Adjustable CO₂ and respiratory rate alarms are standard. Linear voltage outputs are provided for both gasses and respiratory rate, and a standard RS232 serial port provides data for external monitoring or collection on a computer.

The measurements and computed results are reported directly on the front-panel backlit LCD display. High/Low alarm settings are individually adjustable, and are stored in non-volatile memory. These settings are restored when the

unit is next used. Indicator lights and an audible signal provide status indicators for proper system operation. Measurements can be displayed as continuous (fast) or peak end-tidal readings.

Easy setup and operation

Typical operation requires only simple setup. The small diameter sample tubing is connected to the animal's endotracheal tube using the supplied fittings. All alarm settings are adjusted with a single knob. Alarm lights are always active, but an audible alarm can be switched on or off as desired.

The gas and rate outputs are standardized for easy external recording. The RS232 port provides simple ASCII formatted data that can be received using any communications software, and easily imported into a spreadsheet for calculation.

The only maintenance required is periodic inspection or replacement of the supplied moisture filters. Special input tubing includes a Nafion[®] membrane that automatically dries the sample gas for long, trouble-free monitoring. A miniature in-line hydrophobic filter prevents water from entering the analyzer.

Expandable

The GEMINI monitor includes an open slot for use with any SYSTEM 1000 instrumentation module. Available modules include a cardiometer (Model CT-1000), blood pressure amplifiers (Model PM-1000) and many other signal acquisition and processing functions.

Measures:

- Oxygen
- Carbon Dioxide
- Respiratory rate

Standard Features:

- Paramagnetic O₂ analyzer
- Infrared CO₂ analyzer
- Analog and RS232 outputs
- Expandable with additional function modules

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GEMINI Respiratory Monitor

Specifications

Oxygen analyzer type	paramagnetic
Linearity (0 - 100%)	$\pm 0.1\%$ O ₂
Repeatability	$< 0.01\%$ O ₂ /hour
Zero stability	$\pm 0.1\%$ O ₂ /day
Zero stability	$\pm 0.2\%$ O ₂ /month
Response time	< 200 mS
Operating temperature	0 - 65°C
Maximum pressure	15 psi
Maximum sample flow	250 ml/min
Instrument measurement range	0 - 100% O ₂
Carbon Dioxide analyzer type	single-beam infrared
Operating range	0 - 10% CO ₂
Linearity (full scale)	1% FS
Zero drift	0.1% (8 hours), 0.2% (24 hours)
Sensor cell temperature	controlled at 48°C
Warm-up time	< 5 min
Maximum sample flow	250 ml/min
Instrument measurement range	0 - 10.0% CO ₂
Respiratory Rate measurement range	10 - 600 breaths/min
Respiratory Rate alarm range	.9 - 599 breaths/min
CO ₂ alarm range	1.0 - 9.9%
Analog outputs	O ₂ , CO ₂ , Respiratory Rate
Analog signal outputs (rear panel)	.BNC jacks
Respiratory Rate output	10mV/br/min
O ₂ output	100mV/% O ₂
CO ₂ output	100mV/% CO ₂
Serial data output format	9600 baud, 8 data bits, no parity, 1 stop bit
Serial data interval	complete set of readings sent 1 per breath, or 1 per minute
Serial output connector (rear panel)	DB9 male
Dimensions, main unit	19W x 5.25H x 12D in.
Dimensions, expansion module	.2.75 x 5.0 inches (SYSTEM 1000 standard)
Power requirements	.120/240V (switchable), 100VA

Ordering Information

Part No.	Model	Description	Applications
14-10000	GEMINI	Respiratory monitor	Measure O ₂ , CO ₂ , and resp rate
10-06000	CT-1000	Cardiotachometer plug-in module	Direct connect ECG measurement
10-03000	PM-1000	Transducer amplifier plug-in module	Arterial BP measurement
10-04100	DTX-1	Medical-type blood pressure transducer	Economical arterial BP transducer
10-04210	TC-GRA	Required adapter cable for DTX-1	
11-01108	Filter	Miniature in-line hydrophobic sample filter	Prevents water from entering analyzer
11-01103	BCI-1128	Nafion sample line, 2'	Membrane tubing dries input sample

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