microCapStar CO$_2$ Analyzer

Fast response end-tidal CO2 monitor for mice & larger animals

STANDARD FEATURES AND APPLICATIONS

- End-tidal or continuous CO$_2$ monitoring
- Measures respiration rate (RR)
- Low sample flow requirements.
- Suitable for mice, rats, and larger animals
- Adjustable ETCO$_2$ and RR alarms
- Analog output signal and RS232 serial data output
- Use with ventilated or unassisted breathing animals
- Verifies proper ventilation

The microCapStar End-Tidal Carbon Dioxide Analyzer provides accurate end-tidal or continuous measurement of expired CO$_2$ in animals as small as mice. It features very low sample flow requirements, rapid response time, and long-term stability. Respiratory rate (RR) is computed using the excursions of the CO$_2$ waveform. The CO$_2$ and RR measurements, as well as a trend plot of the end-tidal values, are displayed on the graphics LCD screen.

The heart of the microCapStar is a new temperature-controlled, miniature infrared CO$_2$ sensor with digital output. Low sample flow and rapid response is achieved with a carrier gas system employing digitally-controlled active flow management. This technique precisely and automatically maintains the ratio of carrier flow to sample flow, which is essential for accurate measurements. The heated measurement cell prevents water condensation, even during long-term measurement sessions.

The front-panel display shows CO$_2$ concentration (either instantaneous or ETCO$_2$) in either percent or mmHg. Calibration is performed with a single calibration gas and room air. An adjustable ETCO$_2$ alarm provides a warning when end-tidal values fall out of a user-adjustable preset range. All adjustments are performed digitally using a single knob. Built-in diagnostics monitoring warn of plugged sample tubing or other fault conditions.

The advanced features, reliability, and ease of operation of the microCapStar make it the perfect companion to our SAR-830 series Small Animal Ventilators for monitoring respiratory status. An accessory pack containing spare low-volume sample tubing and a variety of connectors and fittings is included with the instrument. A range of accessories is available to ensure easy setup and convenient operation. Windows-based monitoring software is included, which allows display of the measurements, and saving the data to a disk file.

CO$_2$ monitoring is widely recognized as an important measure of the respiratory status of experimental animals. It is useful in setting ventilator parameters, and serves to gauge depth of anesthesia in unassisted, spontaneously breathing animals as well. The microCapStar extends this important technique to the realm of small experimental animals.

VENTILATE   ANESTHETIZE   ACQUIRE   MONITOR   MEASURE

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SPECIFICATIONS

Carbon dioxide measurement .... single beam, non-dispersive infrared

Measurement range .... 0-9.9% (0-76.0mmHg) CO$_2$

Accuracy 0.15% (1.1mmHg)

Resolution (internal and analog output) 0.01% (0.1mmHg)

Resolution (display) 0.1% (1.0mmHg)

Linearity 0.1% CO2

Repeatability..0.1% CO$_2$

Response time (T$_{10}$ - T$_{90}$) ....75mS at 70 ml/min through cell

Sample cell materials .... sapphire and stainless steel

Analog output scaling 0.5V/% (0-5V)

Response time (T$_{10}$ - T$_{90}$) .... 150mS at 50 ml/min sampling

Zero stability .... 0.2% (8 hours), 0.3% (24 hours)

Interference effects: 50% N$_2$O ....0.1% at 0% CO$_2$, 0.6% at 5% CO$_2$ (uncomp.)

Maximum sample cell pressure .... +5 psig

Interference effects: vaporized anesthetic agents.. negligible

Operating temperature range .... 5-40° C

Optical bench temperature ....48° C, controlled

Warm-up time .... 4 min to 0.2%, 10 min to 0.1%

ETCO2 trend display ....5 minute graphical scrolling display

Sample flow (sample inlet—carrier flow out) 10ml/min nominal, adjustable from 5.0-20ml/min

Sample tubing connections (carrier flow, sample inlet).....................................Luer female

Calibration controls...Zero, Span

ETCO2 alarm adjustment range....................................... 1.0-9.9% (8-75mmHg)

Respiratory rate measurement range ....5 – 200 breaths/min

Signal outputs (rear panel) ....BNC jacks

CO$_2$ output scaling .... 0.5V / %CO$_2$

Respiratory rate output scaling .... 0.025V / bpm

Alarm output ....5V if alarm condition, 0V if no alarm

Serial data output format .... 2400 baud, 8 data, no parity, 1 stop bit

Electrical requirements .... 120VAC/220VAC switchable, 35VA

Dimensions .... 19W x 5.25H x 16D in. (49W x 13H x 41D cm)

Weight ....10 lbs. (4.5kg)

ORDERING INFORMATION

Part No.:	Description:
15-10000	microCapStar CO2 analyzer, with tubing & accessory kit
15-00100	Sample tubing set, 1m long
15-00110	Sample tubing set, 2m long
11-01108	In-line miniature hydrophobic filter, 13mm dia, Luer fittings, pk of 5

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