

Model 906 CO₂ Analyzer



Model 906 pictured with optional two mode pump switch, 0-20% range, battery.

✓ **Features**

- Continuous measurement of CO₂ in all types of applications
- Ranges of 0 to 2000ppm up to 0-100% (see note below)
- AC or (optional) battery operation
- (Optional) Internal sampling pump
- Economically priced
- Two-year warranty
- (Optional) 0-1, 0-5, 0-10 Vdc analog outputs
- (Optional) Companion data logging available complete with graphing software
- (Optional) 4-20mA output also available

✓ **Available native sensor ranges ***

- 0-100%
- 0-20%
- 0-2.5%
- 0-2000ppm

✓ **Applications**

- Bioreactors
- Gas Blending Systems
- Fruit Storage Areas
- Fermentation
- Welding Gases
- Controlled Atmosphere Rooms
- Algae Experiments
- Carbon Capture And Storage
- Incubation Experiments
- Cell Culture Analysis
- Greenhouse CO₂ Research
- Biofuel Experiments
- CO₂ Mitigation Research

** - any sensor range can be modified if requested. For example, 0-100% sensor can be set up for 0-50% range.*

Overview

The Model 906 Carbon Dioxide Analyzer is designed for continuous or spot check monitoring of CO₂ levels in all types of processes, gas blending, biotech and other systems. The Model 906 is available for measurement of any range from 0-1% up to 0-100%.

Options include battery operation, Swagelok inlet / outlet (see page 5), analog outputs, internal sample pump, cycling pump operation, complete data logging package, and contact closure for control of pump using PLC system.

Sensor Design

The Model 906 uses an NDIR infrared sensor which has no moving parts, a compact optical cell, and microprocessor-based calibration factors using a 6th order polynomial equation to linearize the full range measurement up to 100%. Infrared CO₂ measurements are inherently non-linear, especially over a high range of concentrations. The math algorithm used in the 906 yields more accurate results over a much wider range of concentrations than other methods.

The Model 906 sensor combines cutting edge 32-bit digital signal processing with the solid reliability, compact size and state of the art microprocessor technology that makes this full-featured CO₂ measurement system less complex and more robust than other instrumentation.

The advanced design allows an output requiring less frequent calibration. It provides a stable, drift-free linearized voltage or current output that is much less susceptible to external electro-magnetic interference than conventional analog electronics.

The sensor assembly is cable connected to the control circuit board. It can be used with diffusion or pumped sample draw systems. The measurement accuracy is not affected by sample flow rate, provided t between 10 and 1000cc/min.

The sensor design is compact, has a low internal volume and requires only a small amount of sample to achieve a reading. For 0-20% and 0-100% units, the minimum sample requirement is 10cc. For 0-2.5% and below, the minimum sample requirement is 50cc.

The sample should be clean and dry (non-condensing), and less than 50°C temperature. Moisture or dirt deposits on the internal surfaces of the sensor can cause errors in the reading. A disposable type particulate filter can be inserted in the sample line outside

The Model 906 is also equipped with an internal 4 layer PTFE filter, designed to trap moisture and particulates before they reach the sensor. A spare filter is included and the filter is user-replaceable.

Sampling Versatility

Sample flows into the sensor through the front panel fitting and vents out through a port fitting on the back panel. The sensor operates at atmospheric pressure, and the accuracy of the measurement is not dependent on the flow rate of the sample gas. There are no restrictions in the sample cell, and samples introduced at slightly higher pressure will quickly equilibrate to atmospheric pressure. For those systems where a source of sample flow is not available,

the Model 906 can be equipped with an optional internal miniature diaphragm pump with an on-off switch on the front panel, a continuously operating pump, or a cycling pump which is user adjustable.

Also available is an optional internal relay, designed to trigger an external contact closure or alarm. This is beneficial for systems where action needs to be taken above or below a particular CO₂ level, such as purging with additional CO₂ or activating a fresh air intake.

For applications where multiple vessels or containers need to be monitored in an automated fashion, the Model 906 can be paired with a manual multi-point manifold, allowing the operator to choose from six gas sample streams.

Battery Operation

With its low power requirement, the Model 906 can be operated with an optional battery for those applications where AC power is not readily available, or for convenience if spot checking samples at different locations. A totally sealed, long-life internal 12 Vdc NiMH battery accepts a full or partial charging cycle and will operate the unit for up to 12 hours. The charger module plugs into a standard 110-240 Vac outlet for charging or continuous operation. Alternatively, the unit can be powered from an external 12-24 Vdc source.

For updated information on the options available for this analyzer, please contact us directly.

Principle of Operation

Sample is introduced to the analyzer through a front panel fitting and into the NDIR sensor for carbon dioxide measurement. Microprocessor controlled light pulses at a specific wavelength in the infrared are absorbed by any carbon dioxide present in the sensor cell, which causes a reduction in the light energy impinging on the detector. The amount of energy absorbed is processed by another microprocessor which mathematically calculates the concentration value using a 6th order algorithm and converts it into a linear electronic output. This output signal is then sent to the analog output converter for the 4-20 mA or Vdc output, and also to the LCD screen for concentration display.

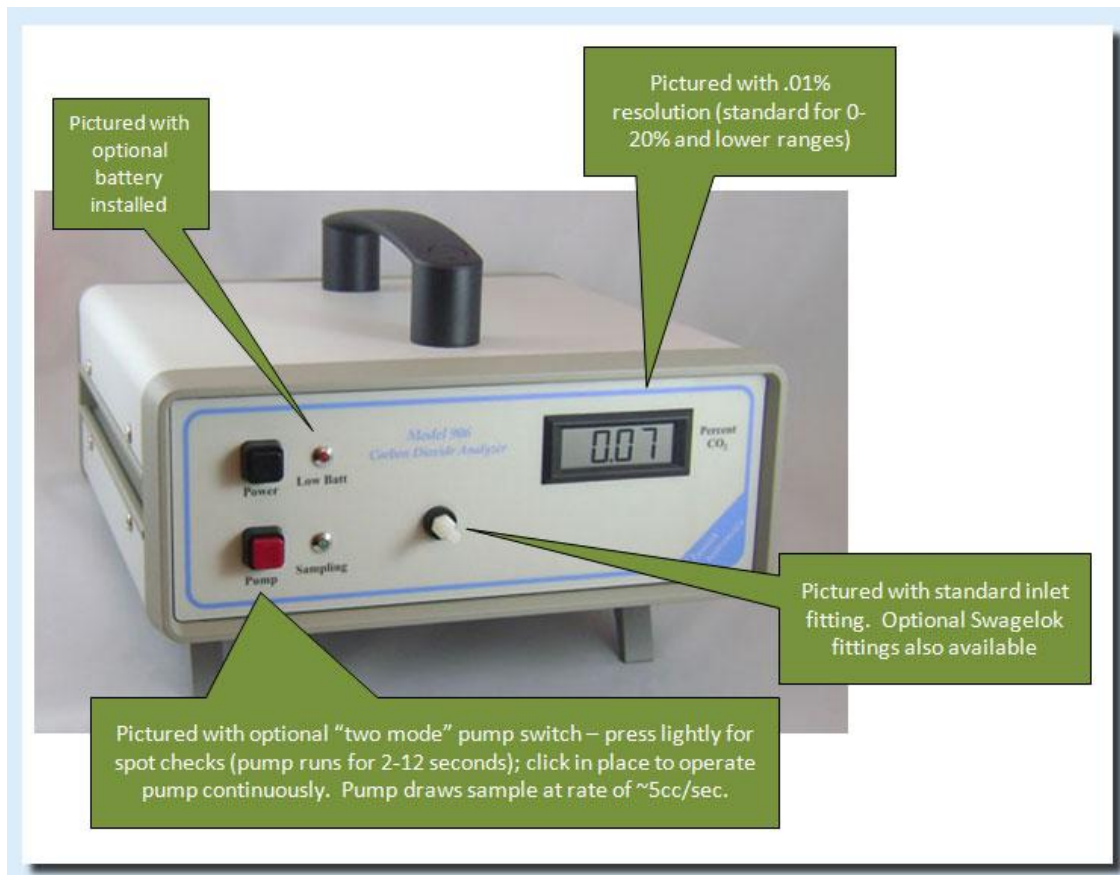
Technical Specifications

Sample Requirements	Flow Rate	10-1000cc/min for units with no pump; 1L to 3L per minute for units with no pump is also okay (prior notification is required)
	Sample Temperature	1-50°C
	Humidity	< 95% RH (non-condensing)
	Free of...	particulates
	Free of...	corrosive gases such as SO ₂ and NO ₂ in greater than ppm levels
Range	0.0 to 100% Carbon Dioxide <i>Other Ranges: 0 to 1%, 0 to 2.5%, 0 to 10%, 0 to 20%, 0-30%, 0-50%) (0-2000 ppm or 0-5000 ppm)</i>	

Resolution	0.1% CO ₂	for 0 to 30% and 0 to 100% ranges
	0.01% CO ₂	for 0 to 2.5%, 0 to 10%, or 0 to 20% ranges
	0.001% CO ₂ 1 ppm	for 0 to 1% for 0-2000 ppm range
Output	Optional, 0 to 1/5 Vdc, or 4-20mA, linear, proportional to CO ₂ concentration (*analog output set at factory, please inquire)	
Accuracy	0-100%	± 1% of reading, or ± 0.1% CO ₂ concentration below 5%
	0-20%	± 1% of reading, or ± 0.05% CO ₂ concentration below 5%
	For 0-2.5% or 0-1%	± 3% of reading
	For 0-2000ppm:	± 50 ppm or +/-4%, whichever is greater
Drift	less than 1% per month	
Sensor	NDIR Infrared; non-depleting with no moving parts	
Sensor Body	Anodized aluminum	
Calibration	With standard calibration gas; SPAN adjustment on rear panel ZERO set with auto-zero button located on rear panel.	
Calibration Frequency	Minimum once per year	
Power Supply	Internationally compatible charger or power supply, 100/240V (50/60Hz) to 12V	
Sample Pump	Optional; internal, with on-off switch on front panel.	
Battery Operation	Optional, with internal rechargeable 12 Vdc sealed gel battery	
Size	10 in. x 4 in. x 10.5 in. (25.4 cm x 10.6 cm x 26.67 cm)	
Weight	7 lbs. (3.18 kg)	
Warranty	2 years, parts and labor	
Standards	 	
Consumables	Internal moisture trap filter	
Origin of Goods	Our products are manufactured in the U.S.A.	



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Inlet Fitting Choices

Standard Inlet



Accepts $\frac{1}{8}$ in to $\frac{3}{16}$ in ID tubing

Luer Inlet



Swagelok Inlet



Available in:
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 $\frac{1}{8}$ stainless, $\frac{1}{4}$ in stainless