

ECOTECH EC9800 B SERIES GAS ANALYZERS

The EC9800 ambient air analyzers are intelligent analyzers with state-of-the-art features, outstanding gas measurement sensitivity and reliability, and a low cost of ownership. The analyzers in this family provide measurements of ozone, carbon monoxide, sulfur dioxide, and nitrogen oxides and are all USEPA Equivalent Method certified.

The EC9800 B Series analyzers require external pumps giving the system integrator the possibility of using more than one pump per analyzer. By unbundling many of the supporting hardware items and simplifying the operation of these analyzers the EC9800 B series provides outstanding performance in low cost but high performance OEM type analyzers.

Similarly, the choice of calibration techniques (e.g. external zero/span valves, internal zero/span check) can be optimized for the system allowing more flexibility for the system integrator.

FEATURES INCLUDED ON ALL B SERIES ANALYZERS :

- Selectable ppm, ppb, mg/m³ or ug/m³ corrected for temperature and pressure variations.
- Gas pressure, temperature measurement and compensation for accurate concentration measurements under all conditions.
- Sample flow rates are established by built-in critical orifice and controlled by an external sample pump.
- Software algorithms handle all internal adjustments, perform diagnostics, indicate errors, display status, linearize and make calculations of concentration. The only operator functions are routine maintenance of pneumatics and periodic calibration of the unit.
- Kalman adaptive filter for continuously optimized noise and response time.
- Menu driven large alphanumeric display provides a complete display of gas measurements, instrument status, setup parameters and data trending display.
- Event log for automatic recording of significant maintenance, calibration, and diagnostic events.
- All analyzer temperatures displayed on a single menu screen.
- EC9800 analyzers feature internal Flash ROM data storage for in excess of 135 days of 5 minute averages. Data can be downloaded using the analyzers RS232 port or remotely using a modem. Full remote control of each analyzer over multidrop RS232 serial port with a PC. Firmware easily updated utilizing USB or RS232 port.
- Internal lithium battery back-up of configuration parameters ensures that normal operation is restored even after a power interruption.
- Fold down front panel provides easy access to expendable items such as particulate filters and charcoal scrubbers, and power control switches.
- Common chassis, electronics, and software. Slide off chassis cover provides easy access to all internal construction.
- Optional manual operator controlled or automatic internal zero/span check.
- Optional external zero span valves.
- Low carbon footprint and utilizes 12 VDC internal electronics.
- US EPA Equivalent reference method certification.



Special versions of these analyzers are available for measuring carbon dioxide, background trace precursor levels of carbon monoxide, nitrogen oxides and sulfur dioxide, NO_y and ammonia, high concentration nitrogen oxides, sulfur dioxides and carbon monoxide .

OZONE ANALYZER EC9810B

The EC9810B Ozone Analyzer combines microprocessor control with ultraviolet (UV) photometry to measure O₃ in the range of 0-50 ppb or 0-20 ppm with a detection limit of 0.5 ppb.

The EC9810B uses the principle that certain wavelengths of UV light are absorbed by ozone (Beer-Lambert Relationship). A mercury vapor lamp is used to project a beam of 215 nm light through a glass sample cell that alternately contains the measurement sample and then a reference sample that is selectively scrubbed of ozone. The difference in UV light attenuation between the sample and the reference gas streams provides an accurate and reliable measurement of the ozone concentration.

FEATURES :

- Ozone measurement with photometric dual-channel technique provides reliable, nearly drift free measurement.
- The use of a small glass measurement cell boosts data quality and performance.
- With only one cell, low flow and no mirrors, cleaning frequency is less than that needed for other systems, while expendables life-time is extended.
- Photometer allows for manual operator controlled calibration zero/span sequence or a timed 24-hour cycle at an operator specified time or remotely controlled calibration by external contact closure. Full five point calibration.

CARBON MONOXIDE ANALYZER EC9830B

The EC9830B Carbon Monoxide Analyzer utilizes NDIR Gas Filter Correlation photometry and microprocessor control to measure CO in the range of 0-200 ppm with a detection limit of 50 ppb.

The EC9830 rotating gas filter correlation wheel has two gas filled 'cells'. One contains CO which removes all IR energy in the CO absorption wavelengths thereby creating a reference beam. The other cell contains nitrogen which allows the CO absorption spectral bands to be measured with the sample gas. The difference in IR energy sensed by the solid state detector during measurement and reference cycle is proportional to the CO present in the measurement cell. This ratiometric technique eliminates most sources of drift (i.e. interference from CO₂ and H₂O) typical of other less sophisticated infrared analyzers.

The EC9830B is typically used with external calibration gases for automatic zero/span checks. High pressure span valves are available when using moderately pressurized gas sources.

FEATURES :

- Long life infrared (IR) source and advanced gas filter wheel allows for trouble free operation and minimum maintenance.
- Built-in zero air scrubber ensures zero stability with no need for an external scrubber.
- Temperature stabilized filter and gas filter wheel ensure minimum span drift.
- Custom designed nafion dryer virtually eliminates inference of water vapor or carbon dioxide during measurement.

NITROGEN OXIDES ANALYZER EC9841B

The EC9841B Nitrogen Oxides Analyzer utilizes microprocessor control and chemiluminescence detection to measure NO, NO₂ and NO_x in the ranges of 0-50 ppb and 0-20 ppm with a detection limit of 0.4 ppb.

The EC9841B principle of measurement is based upon the reaction of the NO molecule with an internal source of ozone in an evacuated reaction cell that results in the emission of light. The EC9841B is a single channel instrument that measures the NO in a sample gas that is alternately passed through or around a catalytic converter to convert the NO₂ to NO. The measurement of the untreated sample provides a NO value and the measurement of the converted sample provides the NO_x measurement with NO₂ calculated as the difference between the two measurements.

FEATURES :

- Fast response and low noise achieved through a unique low pressure reaction cell design.
- Auto-zero routine allows the analyzer to periodically check and correct for background illumination, virtually eliminating zero drift.
- Low sample flow rate extends molybdenum converter life, 320 ml/min.
- The use of electro-polished stainless steel reaction cell results in decreased maintenance and greatly improved longevity.

SULPHUR DIOXIDES ANALYZER EC9850B

The EC9850B Sulphur Dioxide Analyzer combines microprocessor control with fluorescence detection to measure SO₂ in the ranges of 0-50 ppb and 0-20 ppm with a detection limit of 0.5 ppb.

The EC9850 depends on the fluorescent radiation produced by SO₂ molecules when excited by UV radiation. The excitation U.V. radiation is measured by a reference detector and the fluorescence radiation (SO₂) is measured by a photomultiplier tube (PMT). The two measurements are ratioed in a classical dual-channel technique to minimize the effects of variation in lamp intensity, optical contamination and common PMT drift characteristics. A hydrocarbon scrubbing system, containing no consumable materials, also removes interfering hydrocarbons prior to the ambient sample being measured.

FEATURES :

- A custom designed zinc UV source produces a single spectral line at 214 nm allowing the analyzer to be free from water vapor interference, even in very high humidity conditions.
- Optional internal zero/span check device which utilizes a constant temperature permeation tube to generate a known SO₂ span gas concentration.

Specifications	EC9810B	EC9830B	EC9841B	EC9850B
U.S. EPA Approval	EQQA-0193-091	RFCA-0992-088	RFNA-1292-090	EQSA-0193-092
Ranges: Display and serial output autorange: <i>from zero to max full scale</i>	0-20 ppm resolution 0.1 ppb	0-200 ppm resolution 0.01 ppm	0-20 ppm resolution 0.1 ppb	0-20 ppm resolution 0.1 ppb
U.S. EPA Designated Range	Any full scale range between 0.05 to 1.0 ppm	Any full scale range between 5.0 to 100 ppm	Any full scale range between 0.05 to 1.0 ppm	Any full scale range between 0.05 to 1.0 ppm
Noise (w/Kalman filter active)	<0.2 ppb RMS (at Zero)	<25 ppb RMS	<0.25 ppb RMS	<0.25 ppb RMS
Lower Detectable Limit (w/Kalman filter active)	<0.4 ppb or 0.2% of reading	<0.05 ppb or 0.2% of reading	<0.5 ppb or 0.2% of reading	<0.5 ppb or 0.2% of reading
Linearity (from best straight-line fit)	1.0 ppb or <1% of full scale	<1% of full scale (0-50 ppm) <2% of full scale (0-200 ppm)	<1% of full scale	<1% of full scale
Precision	1.0 ppb or 0.5% of reading	0.1 ppb or 1% of reading	0.5 ppb or 1% of reading	0.5 ppb or 0.5% of reading
Zero Drift <i>time dependent</i> (fixed temp)	24 Hours: <1.0 ppb 30 Days: <1.0 ppb	24 Hours: <100 ppb 30 Days: <100 ppb	24 Hours: <0.4 ppb 30 Days: <1.0 ppb	24 Hours: <0.4 ppb 30 Days: <1.0 ppb
Span Drift <i>time dependent</i>	24 Hours: <0.5% of reading 30 Days: <0.5% of reading	24 Hours: <0.5% of reading 30 Days: <0.5% of reading	24 Hours: <1% of reading 30 Days: <1% of reading	24 Hours: <1.0% of reading 30 Days: <1.0% of reading
Temperature/Pressure Compensation	With selectable reference temperature of 0°C, 20°C, 25°C at 101.3 kPa.			
Rise/Fall Time (95% final value w/Kalman filter active)	<60 sec (0.5 slpm flow)	<40 sec (1 slpm flow)	<30 sec (0.64 slpm flow)	<120 sec (0.6 slpm flow)
Sample Flow Rate	0.5 slpm	1.0 slpm (nominal)	0.64 slpm	0.6 slpm
Sample Pressure Dependence	A 5% change in pressure produces <1% change in reading			
Temperature Range	5° to 40°C (US EPA approval 15°C - 35°C)			
Relative Humidity	10% to 80% non-condensing			
Digital Output	Local user DB50 I/O interface with 32 digital open collector outputs and 3 digital inputs user controls. The digital outputs are 24 status output commands, 8 status alarm conditions and 2 analogue inputs 0-5 V.			
Communication Port	Rear panel multi-drop RS232 port shared between analyzers for data plus USB interface			
Data Logging	Supports internal data logging capability with storage in excess of 135 days of 5 minute average data stored in flash ROM.			
Data Storage Selection	Instantaneous data selectable period from : 1, 3, 5, 10, 30 or 60 minute intervals. Average data selectable period from 1, 3, 5, 10, 15, 30 minutes 1, 4, 8, 12, or 24 hours.			
Power	99-132 VAC. 198-264 VAC. 47-63 Hz. 100 Watts			
Dimensions	43.2 x 17.8 x 64.8 cm (w x h x d)			
Warranty	All EC9800B Analyzers have a one year warranty			
Optional :				
Analog Output	Menu selectable current output: 0-20 mA, 2-20 mA, and 4-20 mA, standard Requires 50-pin I/O PCA provides voltage output of 100mV, 1V, 5V, and 10V with zero offset of 0, 5% or 10%			
Communication Port	Ethernet connection to TCP/IP network via an RJ45 connector			
Additional	Rack mount kit assembly External zero/span valve assembly (EVS) Sample particulate filter assembly (internal or external) External sample pump (115V 60 Hz or 220V 50/60 Hz) Internal zero module for zero and span point calibration checks			

Contact US:

The above is just a sampling of the instruments and services that American Ecotech can provide. For more information including product updates and upcoming events please visit our website at www.AmericanEcotech.com. Please also contact us with any questions via email at info@americanecotech.com or phone at (401) 247-0100.