

Model 9000^{RM} Gas Analyzer

Features and Benefits

- || Economical, rugged single or multi-gas analysis (up to five species)
- || Excellent baseline stability, minimal span drift
- || Linearity better than 1% over 4 orders of magnitude
- || No interference from H₂O and CO₂
- || Direct, simultaneous measurement of NO and NO₂
- || Multi-range SO₂ with accuracy better than 0.25 ppm
- || Optional O₂ measurement
- || Web Interface / Ethernet connectivity



The Measurement

The Western Research® Model 9000^{RM} uses AMETEK's proprietary high resolution UV technology in a dual beam, multiple wavelength configuration. Resolution is better than 0.02nm, while high intensity, fixed-wavelength, line source lamps emit low total power to reduce the potential for sample photolysis. The high resolution enables unparalleled

outputs are available and serial communications via Modbus protocol. An optional paramagnetic oxygen sensor can be included to provide O₂ corrected concentrations.

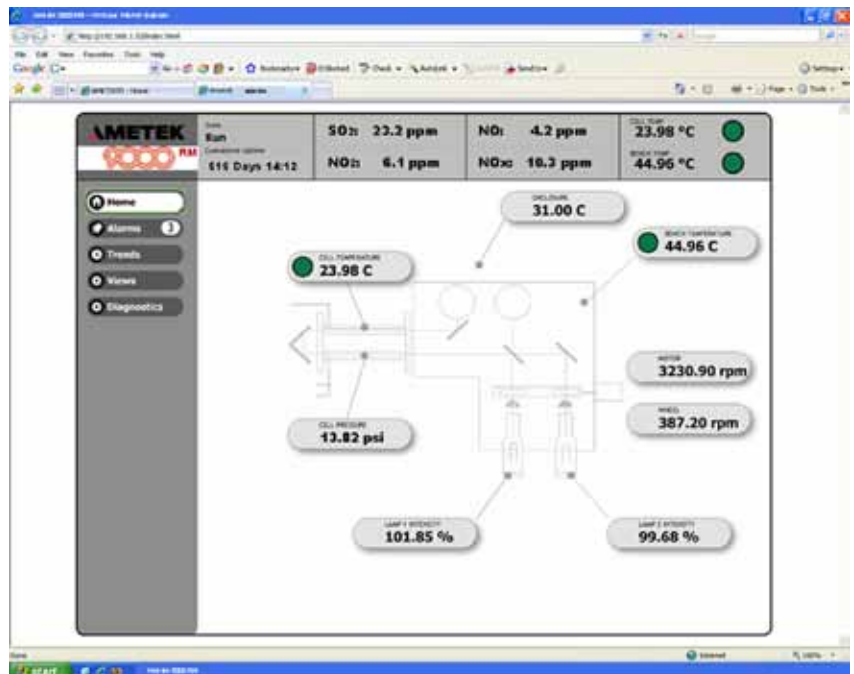
When your requirement is for a rugged, single or multi-gas analyzer, free of interferences from water and CO₂, the Model 9000^{RM} is your answer.

The Need

The new Model 9000^{RM} is a single or multi-component gas analyzer that can be used alone or as an integrated part of a CEM (continuous emissions monitoring) system. The analyzer is 19" rack-mountable and supports Modbus/RS485 and Web Interface/ Ethernet connectivity.

The Model 9000^{RM} can be configured to measure most gas species that absorb in the UV. Species typically measured directly by the Model 9000^{RM} include: SO₂, NO, NO₂, H₂S, COS, CS₂, NH₃, and BTX. Up to five components can be measured simultaneously making the system very economical for multi-component analysis needs.

The simple and robust design of the Model 9000^{RM} is complemented by powerful data processing capabilities. The user-friendly keyboard enables programming of such variables as timing and frequency of local zero and span checks. Both analog and digital



Model 9000^{RM} top level system display web software

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linearity over a wide dynamic range (less than 1% deviation over four to five orders of magnitude) which, in turn, leads to simple, robust data analysis. Furthermore, the analyzer can be configured to measure nearly any gas species that absorbs energy in the UV range, including NOx, H₂S, and SO₂. Onboard processing includes extensive diagnostics, data logging, graphing and trending, plus

programming of timing, frequency of local zero and span checks, and more.

A six-position filter wheel enables one reference and five measure wavelengths. The dual beam configuration, combined with the reference measurement, ensures low noise performance with minimal baseline and span drift. The five measure wavelengths enable the direct measurement of up to five

species. Therefore, NO and NO₂ can be measured separately and simultaneously without the need for complex sample conditioning and free of quenching effects.

The Model 9000^{RM} can also be configured to measure SO₂ on two different ranges, enabling accuracy better than 1% of reading within the range 100 ppm to 2%.

Performance Specifications

Species Measured	Single Species	Multi-Species
	Minimum Full Scale	Minimum Full Scale
SO ₂	10 ppm	50 ppm
H ₂ S	50 ppm	100 ppm
NO	50 ppm	200 ppm*
NO ₂	100 ppm	200 ppm*
NOx	n/a	200 ppm*

* Lower ranges available upon request

Maximum full scale on all systems: 100%

Methodology: Multiple wavelength, high resolution, non-dispersive ultraviolet

Optional O₂: Integral paramagnetic sensor

Accuracy:

Better than 1.0% of standard full scale range

O₂: ±0.1%

Repeatability:

±0.5% full-scale of standard ranges

O₂: ±0.2% (reading varies by 0.05% due to A/D resolution)

Linearity:

SO₂: < ±1.0% full-scale

NO, NO₂, NOx, H₂S: < ±1.5% full-scale

O₂: ±0.1%

Response Time:

90% in 30 seconds or less

Number of Gases:

1 (single species version)

Up to 5 (multi-species version)

Typical Sample Flow:

0.25 - 5 l/min (0.6 - 10.5 SCFH)

Sample Gas Requirements: Non-corrosive, non-condensing, free from oil and with less than three micron particulates (0-95%, non-condensing)

Sample System Limits: 5 psig max (without the dynamic pressure compensation option, the reported concentrations will be directly proportional to barometric pressure)

Pressure and Temperature Compensation: Optional

Ambient Conditions:

Storage: -40 to 70°C (-40 to 158°F)

Operating: -20 to 50°C (-4 to 122°F) without Paramagnetic O₂ sensor, 0 to 50°C (32 to 122°F) with Paramagnetic O₂ sensor

0.95 Relative Humidity

Zero Drift: Typically better than 2% full scale standard ranges in 24 hours

Utility Requirements

Electrical:

120 VAC (105 to 132 VAC), 47 to 63 Hz

240 VAC (209 to 264 VAC), 47 to 63 Hz

Power Consumption:

< 300 W maximum start-up (from a cold start) with average power dependant on ambient temperature

Outputs:

Two (expandable to six) isolated Analog Outputs, each configurable to 0-20 mA, 4-20 mA, 0-5V DC

Four (expandable to six) Relay Contacts, Contact Form A (SPST), normally open. Switching: maximum 240 V DC, 0.5 A DC, limited to 10 W. Carry: maximum 1.2 A DC

Four optional solenoid drivers 24 V DC 0.5A max.

Inputs:

Two optional isolated analog inputs, each configurable to 0-5 Volts or 0-20 mA.

Two (expandable to four) contact inputs, each pair isolated from analyzer. Voltage 5 V DC unregulated. Current approx. 7 mA.

Communications:

Modbus RTU RS485 and Modbus TCP Fast Ethernet - network connection or web-based server

Physical Dimensions (W x H x D):

48.2 cm x 17.7 cm x 60.256 cm (19 in. x 7 in. x 23.7 in.)

Weight: 18.2 kg (40 lb)

Approvals and Certifications (pending):

Standard General Purpose model: +Electrical safety for Pollution Degree 2 and Installation Category II

With Div 2/Zone 2 option:

Class I, Div 2, Groups A, B, C, D

Class I, Zone 2 AEx nA IIC T3

Ex nA IIC T3

II 3 G ATEX Ex nA IIC T3 IP20

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