WESTERN RESEARCH®

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 H_2O and CO_2
- Direct, simultaneous measurement of NO and NO_2
- Multi-range SO_2 with accuracy better than 0.25 ppm
- Optional O_2 measurement
- Web Interface / Ethernet connectivity

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.

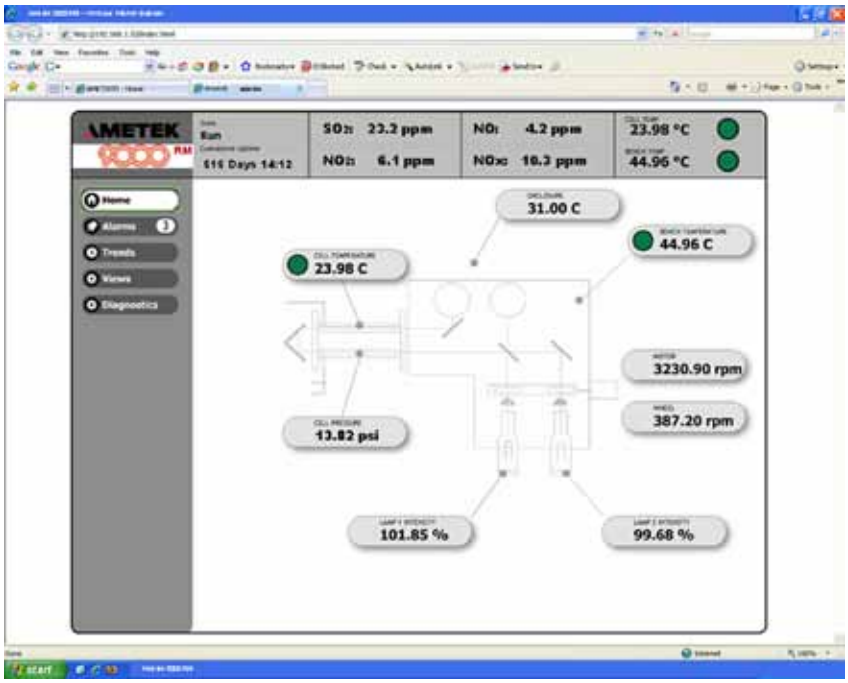
The Model 9000^{RM} can be configured to measure most gas species that absorb in the UV. Species typically measured directly by the Model 9000^{RM} include: SO_2, NO, NO_2, H_2S, COS, CS_2, NH_3, and BTX. Up to five components can be measured simultaneously making the system very economical for multi-component 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 outputs are available and serial communications via Modbus protocol. An optional paramagnetic oxygen sensor can be included to provide O_2 corrected concentrations.

When your requirement is for a rugged, single or multi-gas analyzer, free of interferences from water and CO_2, the Model 9000^{RM} is your answer.

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



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

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, H_2S, and SO_2. 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 NO_2 can be measured separately and simultaneously without the need for complex sample conditioning and free of quenching effects.

The Model 9000RM can also be configured to measure SO_2 on two different ranges, enabling accuracy better than 1% of reading within the range 100 ppm to 2%.

Performance Specifications

Species Measured	Single Species Minimum Full Scale	Multi-Species Minimum Full Scale
SO_2	10 ppm	50 ppm
H_2S	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 O_2: Integral paramagnetic sensor

Accuracy:
Better than 1.0% of standard full scale range

O_2: ±0.1%

Repeatability:
±0.5% full-scale of standard ranges
O_2: ±0.2% (reading varies by 0.05% due to A/D resolution)

Linearity:
SO_2: < ±1.0% full-scale
NO, NO_2, NOx, H_2S: < ±1.5% full-scale

O_2: ±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 O_2 sensor, 0 to 50˚C (32 to 122˚F) with Paramagnetic O_2 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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REGISTERED ISO 9001 MANAGEMENT SYSTEM

F-0117 Rev. 4 (0211)

One of a family of innovative process analyzer solutions from AMETEK Process Instruments.
Specifications subject to change without notice.

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