

Model 932 Multi-Gas Analyzer

Benefits

- ▶ Measures up to five species simultaneously
- ▶ Optional detectors available (IR or thermal conductivity)
- ▶ Sample return to process (with HAG probe option)
- ▶ Minimal sample conditioning
- ▶ Dual-beam, dual-wavelength design
- ▶ Class I, Division 1 and ATEX II 2 G Hazardous Area Rating

The Need

The control of many petrochemical and chemical processes requires monitoring of multiple chemical species within your process's feed, reaction, or effluent gases. Unfortunately, multiple technologies are often required to monitor all of the required species. AMETEK Process Instruments has responded to industry's need for a rugged, multi-component, multi-technology gas analyzer in an explosion-proof package.

The Western Research® Model 932 is designed for a variety of gas monitoring and process control applications. Whether it's reliable H₂S and NH₃ analysis for feed-forward control of modern SRU plants, monitoring of H₂S and COS for the control of amine-based SRU tail gas treating plants, or any one of hundreds of other applications, the 932 analyzer is the best choice for reliable, field-proven, and rugged on-line analysis.

For those applications where sample condensation may occur, the Model 932 analyzer system is available with a heated cell option. The fully integrated AMETEK Process Instruments heated cell ensures reliable dew point control without running the risk of plugging, contaminating, or flooding the analyzer.

A flexible sampling system, which includes an optional integrated electrically heated acid gas sampling probe (HAG) for safe, reliable acid gas sampling, as well as optional on-board sample switching hardware and software, makes the Model 932 one of the most flexible, explosion-proof, multi-component analyzers available on the market.

Many process applications require the detection of species which do not absorb ultraviolet light. The Model 931/932 can incorporate two infrared measurements and a thermal conductivity sensor to allow for the measurement of additional species such as hydrogen, hydrocarbons, carbon dioxide and/or water vapor. These sensors are incorporated with the UV photometer and utilize the same proven flow and sample system. Typical applications include the measurement of hydrogen and H₂S (and optionally COS and CS₂) in amine-based tail gas treaters, SO₂ breakthrough from cobalt molybdate catalyst beds, as well as other sulfur recovery plant applications such as feed forward control by measuring hydrocarbons, H₂S and or carbon dioxide in acid plant inlet gas.

No matter what your needs are, this flexible, low-maintenance analyzer design will be the answer to many of your complex process control requirements.

The Measurement

The Western Research® Model 932 uses AMETEK's proprietary high-resolution UV technology in a dual-beam, dual-wavelength configuration with pulsed UV lamps to ensure optimal performance with low noise and minimal baseline and span drift.

Analysis linearity and measurement stability is maximized by using high-intensity, low-energy hollow cathode UV source lamps that provide a resolution

that is better than 0.02nm. This high resolution design enables unparalleled linearity over a wide dynamic range (less than 1% deviation over 3 to 4 orders of magnitude), which leads to simple, robust data analysis. Cathode construction of the UV lamp determines the wavelengths available for analysis, making it possible to configure the Model 932 to measure many components that absorb UV/VIS energy.

The Model 932 uses only AMETEK-engineered, purpose-built electronics to ensure reliable performance under the harsh environmental conditions common in chemical and petrochemical facilities. These electronics provide concentration calculations, data processing, temperature control, calibration and sophisticated self-diagnostics.

Applications

- ▶ Amine-based tail gas treating (H₂S/COS + optional H₂)
- ▶ SRU feed gas analysis
- ▶ Chemical process applications



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Performance Specifications

Methodology: Multiple wavelength, high resolution, non-dispersive UV/VIS

Full Scale Ranges: ppm and % vol are standard, other ranges are available

Accuracy:

±1.0% full-scale of standard ranges*

±2.0% full-scale of standard ranges for the H₂S+NH₃ application

Optional (TCD) H₂ sensor for TGTU applications: ±2% on a 0-10% Range

Optional (IR) sensor for THC, CO₂: application specific, consult factory

Repeatability: Better than ±0.5% of full scale range*

Linearity: Better than ±1% of full scale*

Zero Drift: Better than 2% of full scale range, with auto zero disabled, over 24 hour period

Speed of Response: Typically less than 30s to T90 (excluding sample system)

Number of Gases: up to five

Maximum Sample Cell Pressure: 6.9 barg (100 psig)

Maximum Sample Gas Temperature: 165°C (329°F)

Zero gas:

Gas: Nitrogen or instrument air

Liquid: Application specific

Typical Sample Flow:

Gas: 2.5 L/min (5 SCFH)

Liquid: Application specific

Sample Transport: Application dependant (options include Heated Acid Gas probe)

Outputs: Up to 4 isolated 4-to-20 mA, loop or self-powered; 4 non-isolated 1 to 5 VDC; 5 independent sets of SPDT, Form C, potential free alarm relay contacts, 2 A at 240 VAC

Digital Communication: RS485 Modbus port; RS232/RS485 service port

Utility Requirements: 120 VAC (104 to 132 VAC), 47 to 63 Hz, <3A; 240 VAC (207 to 264 VAC), 47 to 63 Hz, <2A

Power Consumption: 500 W maximum (with heated probe and cell), sample lines or additional heated sample components not included

Ambient Temperature: 0 to 50°C (32 to 122°F)

Physical Dimensions: 1185 x 780 x 254 mm (46.65 x 30.7 x 9.97 in.)

Weight: Approximately 145 kg (320 lbs)

Approvals and Certifications:

CEC Class I, Division 1, Groups C & D; Ex d IIB T3

NEC Class I, Division 1, Groups C & D; AEx d IIB T3

ATEX II 2 G Ex d IIB T3 Gb

Russian Ex Proof Certification; 1ExdIIBT3 X

Russian Gosstandart Pattern Approval

Complies with all relevant European directives

Options

- ▶ Fully integrated, heated acid gas probe comes with heated aspirator and integrated sample and vent valves (see AMETEK Heated Acid Gas probe brochure for details)
- ▶ Pressure compensation
- ▶ Heated cell for high water or acid dew point sampling
- ▶ Stream switching capability
- ▶ Optional thermal conductivity detector (TCD) for 0-5% or 0-10% H₂ for tail gas treating applications or 0 to 100% H₂ for hydrogen recycle applications
- ▶ Optional infrared sensor for the measurement of hydrocarbons, carbon dioxide and/or water vapor with typical ranges from 0 to 2% to 0 to 100% by volume.

* Typical for most applications



Optional: NEC Class I Div. 2 Groups B-D

Consult AMETEK Process Instruments for additional features and options available for the Model 932 Multi-Gas Analyzer.

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