

APPLIEDTM

ANALYTICS



OMA-300 H₂S ANALYZER

Features:

- nova-II diode array spectrometer
- rugged solid state construction
- optional expansion to monitor SO₂, COS, and R-SH
- long-lifespan xenon light source
- liquid + gas phase measurement

Optimized for use in:

- sulfur recovery
- syngas
- flare
- flue gas
- propane
- LNG processing
- natural gas
- cooling water
- biogas & landfill
- quality assurance
- and more

Background correction is the central consideration in engineering accurate H₂S measurement. Using powerful diode array detection, the OMA-300 H₂S exploits the full spectrum to isolate each cross-interfering stream chemical from the composite absorbance.

Many applications call for simultaneous monitoring of other sulfur compounds (SO₂, COS, and R-SH) alongside H₂S as peripheral components. Highly accurate multi-species monitoring begins with the nova-II spectrometer, where the diode array produces UV absorbance spectra in real time. AAI's proprietary over-determined regression algorithm takes the high-res spectral data and continuously outputs precise concentrations for each compound—all with unrivaled accuracy.

Hydrogen sulfide is notorious for being toxic to humans at 10 ppm, entirely lethal at 800 ppm, and highly corrosive to metal pipelines and equipment. Complicating matters further, H_2S is flammable when in excess of 4.3% by volume in air and—with an odor threshold of less than 1 ppb—intolerable to workers and civilians alike. It's no surprise that, in modern industry, H_2S monitoring is often synonymous with safety, pollution control, and process optimization.

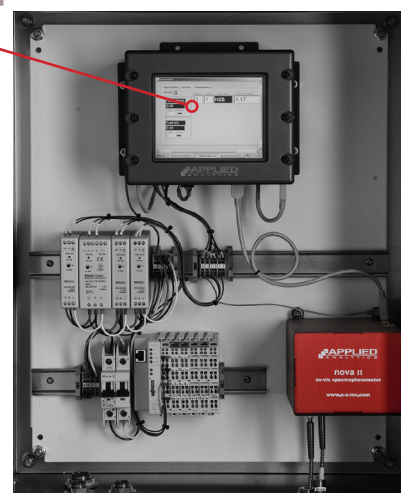
The OMA-300 H_2S continuously monitors UV absorbance in the process stream. Using constants harvested from calibration spectra, the analyzer recognizes the distinct structures of each species' absorbance and regressively isolates the individual concentrations of each measured sulfur compound (i.e. H_2S , SO_2 , COS, and/or R-SH). Fiber optic connectivity between the analyzer and the sample keeps both user and electronics safe from corrosive process gas. Various explosion-proof options, enclosures, and purges are available for seamless integration with your environment.

The nova-II Spectrometer

Collecting light intensity data from 1,024 photodiodes simultaneously, the nova-II produces full, high-res absorbance spectra. From xenon lamp to diode array, the measurement is instantaneous and involves no moving parts, resulting in extremely fast response.

- diode array **1,024 photodiodes**
- broad spectral response **190-800nm range**
- maximal light throughput **high-grade optics, powerful Xe light source**
- exceptional in low UV **minimal stray light**
- CMOS analog circuitry **low noise, low power consumption**

Output no	ACH no	Output comp	Output Concentration
1	1	H2S	1.17



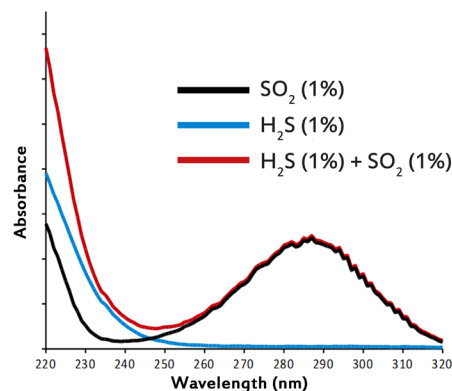
Multi-Component Analysis

The hallmark of the OMA series is interference-free analysis of multiple stream components within a single instrument. The measurement technique treats sample absorbance like a composite image; each species contributes an unknown amount of its own distinctive absorbance structure. Solving for these unknowns is a matter of systemic over-determined regression, the classical set-of-equations taken to its logical limits. The nova-II provides light intensity data from hundreds of wavelengths simultaneously, each diode contributing another equation to the matrix.

The averaging effect contained in this algorithm achieves an accuracy that is unmatched in online H_2S monitoring. The elegance of the OMA-300 H_2S lies in the reality that this is all transparent to the end user; while the analyzer continuously processes spectra, the Eclipse software broadcasts real-time concentration values via streamlined display and/or 4-20mA outputs.

To learn more about multi-species analysis, visit www.a-a-inc.com/concepts.php.

Composite UV Absorbance of H_2S and SO_2



H_2S and SO_2 show interfering absorbance throughout this UV range. The OMA-300 H_2S is able to break the process absorbance spectrum down into its individual components.

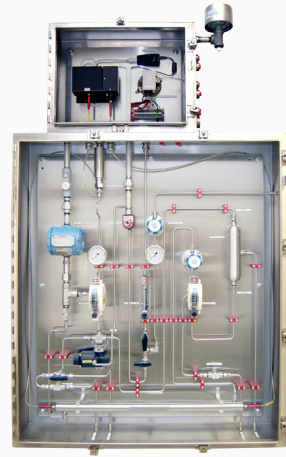
Integration

AAI builds custom sample conditioning systems for H_2S monitoring applications. Depending on your process conditions and operational preferences, the system could range in complexity from a simple flow cell to advanced conditioning. Common options include filtration, separation, heating, pressure/temperature compensation, and feedback loops for a higher caliber of process control.

Sulfur compounds have been AAI's highest volume application throughout our history. That means that our approach to each application is informed by two decades of monitoring H_2S worldwide.



The HEADSPACE sampling system is used for opaque liquid streams. A heated stripping column continuously brings H_2S in the sample to the gas phase for absorbance measurement.

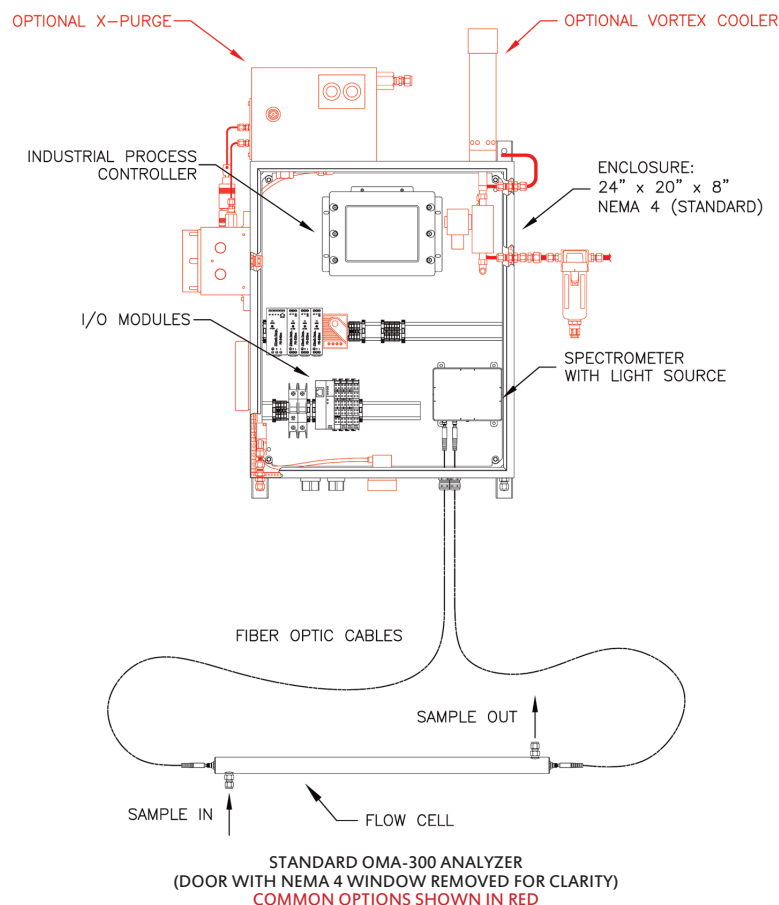


The OFFSHORE sampling system is used with the high-pressure process streams frequently found on deep sea oil platforms. Wetted materials are super duplex stainless steel, made to withstand long-term oceanic stress.

The OMA Advantage

The solid state OMA-300 H_2S was engineered for uninterrupted, automated performance. That commitment inherently excludes filter-based instruments (malfunctioning moving parts) as well as the widespread lead acetate tape-based methods, which are well-known for chronic consumable replacement, dilution error, labor-heavy maintenance, and toxic tape disposal.

Above all, the OMA-300 H_2S delivers insurance. The sensitivity and always-on reliability of OMA are the elements that safeguard your people and your process.



Specifications

General Performance

Measur. Technology	UV-VIS diode array spectrometer (nova-II)
Light Source	Pulsed xenon lamp (~5 year lifespan)
Sample Introduction	Flow-through cell; standard or custom-design sampling system (optional)
Accuracy (by Range)	H₂S (liquid-phase) 0-10 mg/L: ±0.1 mg/L 0-100 mg/L: ±1% full scale or 0.1 mg/L* H₂S / SO₂ (gas-phase) 0-10 ppm: ±1 ppm 0-100 ppm: ±1% full scale or 1 ppm* 0-10,000 ppm: ±1% full scale 0-100%: ±1% full scale Mercaptans/Thiols 0-10 ppm: ±1 ppm 0-100 ppm: ±1% full scale or 1 ppm* 0-10,000 ppm: ±1% full scale 0-100%: ±1% full scale COS/CS₂ 0-200 ppm: ±2% full scale or 4 ppm* (*whichever larger)
Calibration	For most applications, factory calibrated with certified calibration gases/liquids
Verification	Easy verification/validation with gas/liquid samples or neutral density filters

Operating Conditions

Ambient Temp.	Standard: 0 to 55 °C (32 to 131 °F) Optional: -20 to 55 °C (-4 to 131 °F)
Sample Temp.	In situ probe: -20 to 200 °C (-4 to 392 °F) Flow-through cell: -20 to 150 °C (-4 to 302 °F)
Sample Pressure	Flow-through cell: 206 bar (3000 psi)
Environment	Indoor/outdoor (no shelter required)

Hardware

Size	Analyzer: 24" H x 20" W x 8" D (610mm H x 508mm W x 203mm D) Optional sampling system: 24" H x 30" W x 8" D (610mm H x 760mm W x 200mm D)
Weight	32 lbs. (15 kg)
Wetted Materials	Analyzer: Teflon, K7 glass, Kalrez, Hastelloy C-276 (optional sampling system: Teflon, quartz, Kalrez, Hastelloy C-276)
Outputs	One galvanically isolated 4-20mA output per component; modbus TCP/IP (optional); RS232 (optional); Fieldbus, Profibus, and HART (all optional); two digital outputs for fault and sampling system control (user programmable)
Electrical Requirements	85 to 264 VAC 47 to 63 Hz
Power Consumption	45 watts
Area Classification	General Purpose (standard) / Class I, Div. 2 (optional) Class I, Div. 1 (optional) / ATEX Exp II 2(2) GD (optional)

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