## Contents

The OMA Series

The flagship OMA-300 is the cornerstone of AAI technology. Uniting diode array detection and solid state durability, this analyzer delivers a higher caliber of process control.

The payload of the diode array lies in flexibility. The OMA-300 monitors stream absorbance across a broad range, from ultraviolet to NIR; each of the 1,024 photodiodes measures a distinct element in the spectrum to achieve extremely fine wavelength resolution across that wide range. Driven by evolved chemometric algorithms, this technology endows our process analyzers with enormous selectivity for species' absorbance ranges and robust background correction.

The OMA-300's field reputation for stability and automation has built AAI engineering into a premiere global brand.

OTHERS SCAN PEAKS.
OMA READS STRUCTURE.
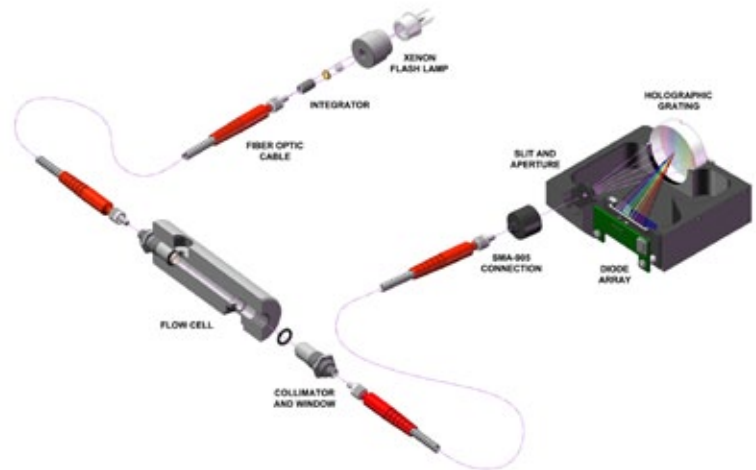
As expressed by the Beer-Lambert Law, the concentration of a given species is directly proportional to its absorbance (the quantity of light that it absorbs or scatters) at a specified light wavelength. In the OMA-300, fiber optic cables transmit white light from a pulsed xenon source to the flow cell. In the flow cell, a continuously drawn stream sample interacts with the light signal along the optical path. Each species has a unique spectral footprint, absorbing different amounts of light at different wavelengths.

After passing through the sample, the light signal exits the flow cell and returns to the nova-II spectrometer via fiber optic cable. A dispersive holographic grating prismatically separates the white light into its constituent wavelengths, focusing each differentiated wavelength onto a designated photodiode on the diode array.

From xenon lamp to diode array, the measurement cycle is instantaneous and involves no moving parts.

SPECTROMETER

- nova-II diode array detector
- broad response (190-1100nm)
- monitors multiple species
- long-lifespan xenon light source
- liquid & gas phase monitoring

SOFTWARE

The Eclipse software provides a streamlined user interface, but under the hood it houses the proprietary regression algorithms that govern highly accurate multi-component monitoring.

OMA-300 H$_2$S Analyzer
Monitored Compounds: H$_2$S, SO$_2$, COS, R-SH

Background correction is the central consideration in engineering accurate H$_2$S measurement. The OMA-300 H$_2$S exploits the full spectrum to isolate each cross-interfering stream chemical from the composite absorbance. The end user experiences a clean display of real-time concentration values for H$_2$S, SO$_2$, COS, and R-SH. This system delivers automated dynamic range in solid state form, so you can leave behind the toxic consumables and dilution regimens of lead acetate tape methods. (Note: explosion-proof enclosure depicted.)

OMA-300 Ammonia Slip Analyzer
Monitored Compounds: Ammonia, NO$_X$

Excessive ammonia slip downstream from NO$_X$ reduction indicates waste of materials, creates maintenance nightmares like ammonium bisulfate deposits, and contaminates commercial fly ash. The OMA-300 AS offers a complete, solid state solution; by keeping a vigilant watch on UV absorbance in the process stream, this system affords the process transparency needed for maximum efficiency and profitability. Where excess ammonia levels are a signal to reduce ammonia injection, the presence of NO and NO$_2$ indicates reduction inefficiency and catalyst bed failure. (Note: stainless steel enclosure and z-purge depicted.)

OMA-300 Chlorine Analyzer
Monitored Compounds: Cl$_2$, NCl$_3$, FeCl$_3$, TiCl$_4$, VOCl3, vanadium

Showcasing the power of full-spectrum analysis, the OMA-300 Chlorine smoothly monitors chlorine and derivative compounds' concentrations from trace ppm levels up to saturated percent levels with uncompromising accuracy. To achieve this dynamic range, the system seamlessly shifts spectral region in step with analyte concentration; optimized use of the spectrum in accordance with light levels is the key to retaining accuracy at any concentration. (Note: fiberglass enclosure depicted.)

OMA-300 Clean-in-Place Analyzer
Monitored Compounds: trace impurities

Clean-in-Place is a ubiquitous method for cleaning the interior surfaces of reaction chambers using solvents such as methanol or water. The OMA-300 CIP is a powerful tool for continuously validating the procedure. Engineered precisely to monitor the UV absorbance ranges of trace impurities (i.e., active ingredients from previous pharmaceutical recipes) in various backgrounds, this analyzer continuously tracks wash efficiency. The OMA-300 CIP optimizes production by signaling when a wash cycle has achieved stability of the specified concentration in the reaction chamber. (Note: carbon steel enclosure depicted.)

OMA-206P Portable Analyzer

Get classic OMA performance in ultra-portable form with our analyzer-in-a-suitcase offering.

OMA-406R Rack-Mounted Analyzer

Functionally and electronically identical to the OMA-300 , this rack-mounted system is designed for laboratory environments and field shelters.

Other OMA Series Analyzers include:

OMA-300 CEM
Integrated System for complete CEM analytics. Standard build monitors SO$_2$, NO$_X$, CO, and CO$_2$; optional expansion to H$_2$S, O$_2$, Cl$_2$, COS, and CS$_2$ monitoring.

OMA-300 Semiconductor Edition
Fab chemistry analyzer for real-time validation of wafer-contact solutions. Applications: CMP slurry health, SC-1 & SC-2, HF etching baths, metal ions, and more.

OMA-300 Color
Industrial color monitor for processes ranging from transparent to near-opaque. Configured for ASTM method D-1500, APHA, Saybolt, Rosin, nonstandard scales, or CIE tri-stimulus.

TLG-837 Tail Gas Analyzer
Monitored Compounds: H_2S, SO_2, CS_2, and COS

The TLG-837 is AAI's solid state, in situ solution for online tail gas analysis in sulfur recovery applications. This system monitors real-time concentrations of H_2S and SO_2 in the Claus process stream, computing the control parameter for a continuous air demand signal.

The critical point of innovation lies in the sampling design. The patent-pending, in situ demister probe condenses sulfur vapor out of the process gas in a controlled manner, elegantly resolving the major vulnerability of most tail gas analyzers. The lack of sample lines and heat tracing translates to extremely fast response and low-maintenance performance. The demister probe vastly outperforms the clumsier sampling methods used widely in sulfur recovery.

Altogether, the TLG-837 packages relentless accuracy, set-and-forget reliability, and true automation—that is, everything that modern sulfur recovery deserves.

OIW-100 Oil-in-Water Analyzer

CVA-100 Wobbe Index Analyzer

As global oil production grows each year, so does the amount of water being released into the environment from refining and other processes. Continuously monitoring variable oil concentrations in effluent water, the OIW-100 is a painless and economical option for complying with increasingly stringent wastewater regulations. This system uses an ultrasonic homogenizer to create even droplets from un-dissolved oil, thus creating a unifrom medium for spectroscopic analysis. Measuring aromatics' absorbance across the 250-320nm wavelength range, the OIW-100 accurately correlates total oil concentrations down to low ppm.

Whether for quality assurance in natural gas, optimization of a flare stack, or any other application, the CVA-100 is the ideal instrument for continuously monitoring the calorific value of a process sample. This fully automated analyzer performs controlled combustion of the continuously drawn sample with excess oxygen; the residual oxygen measurement (post-combustion) is linearly correlated to real-time Wobbe Index values. Driven by VCSEL laser technology, the CVA-100 delivers higher accuracy, faster response, greater reliability, and smaller form factor than traditional zirconium oxide methods (yet without the temperature sensitivity or high consumable rate of ZrO_2 methods).

TSA-100 Total Sulfur Analyzers

TSA-100L Total Sulfur Analyzer (Liquid Process)

The allowable sulfur content in diesel fuels is dropping steadily with pressure from myriad governments and interest groups. The TSA-100L makes compliance simpler, monitoring the total sulfur concentration from % down to parts per billion levels. This complete solution includes a diesel engine and a pyrolyzer working in tandem to combust all sulfur compounds in the stream sample to SO_2. The oxidized sample is then fed into the flow cell, where the UV flourescene of SO_2 is measured and correlated to exact total sulfur concentration. Designed in accordance with ASTM D5453-06, the TSA-100L has extremely fast response and field-proven stability.

TSA-100G Total Sulfur Analyzer (Gaseous Process)

Sulfur in natural gas is an oft-cited parameter for improving product quality, preserving pipelines, and controlling pollution. The solid state TSA-100G helps to simplify sulfur reduction by continuously monitoring total sulfur load in gaseous hydrocarbon streams. This system includes two mass flow controllers and a pyrolyzer working in tandem to combust all sulfur compounds in the sample to SO_2. The oxidized sample is then fed into the flow cell, where SO_2 is measured by UV absorbance and correlated to total sulfur concentration. Fully automated and seamlessly accurate, the TSA-100G harnessing the elegance of diode array technology for a true set-and-observe experience.

The MICROSPEC Series

The MICROSPEC Series is a line of analyzers designed both as standalone systems and as modular units within integrated systems. Employing measurement technologies such as VCSEL laser spectroscopy and non-dispersive IR detection, MICROSPEC analyzers pack excellent performance into a compact form factor.

TDL-506 Oxygen Analyzer

At the forefront of a mature market, the TDL-506 outperforms competitors by virtue of its evolved design. Harnessign the vast potential of surface-emitting laser technology, this affordable system is built to produce fast, reliable oxygen measurements in even the most volatile process streams. Solid state construction meets high-performing VCSEL spectroscopy in the TDL-506.

MCP-200 Non-Dispersive IR Analyzer

The MCP-200 is a direct in-stream monitor designed for dynamic concentrations of IR-absorbing components (e.g. CO_2 gas, water in various solvents). This truly compact analyzer uses infrared absorbance spectroscopy and a proprietary optical path design for proven accuracy and rugged performance. The intuitive graphical user interface includes a 'setup wizard' for painless start-up and calibration.

Sampling Systems & Integration

AAI builds custom sampling systems. Our design proceeds from the needs of the process to the drawing board, not vice versa. While we offer a baseline system for the OMA series, our engineering shines when it comes to demanding applications requiring highly specialized sample conditioning. Our areas of expertise include headspace systems for liquid process, extractive systems, close-coupled sytems, and in situ probes; we offer these systems in an array of wetted materials for your process needs.

Headspace system for H_2S in diesel

Double Headspace system for H_2S and NH_3 in water

H_2S sampling system for offshore platform environment (super duplex stainless steel enclosure for withstanding maritime punishment)

Teflon system for Cl_2 and NCl_3 (both steel-corroding)

Optics & Flow Cells

Fiber Optics

Our fiber optic cables are all manufactured in-house to ensure maximal light transmittance and durability. This allows us to personally verify the spectro-scopic-grade quality of each and every optical component that carries our signal. As an added benefit, we can easily tailor fiber length to best suit the conditions and safety concerns of your process.
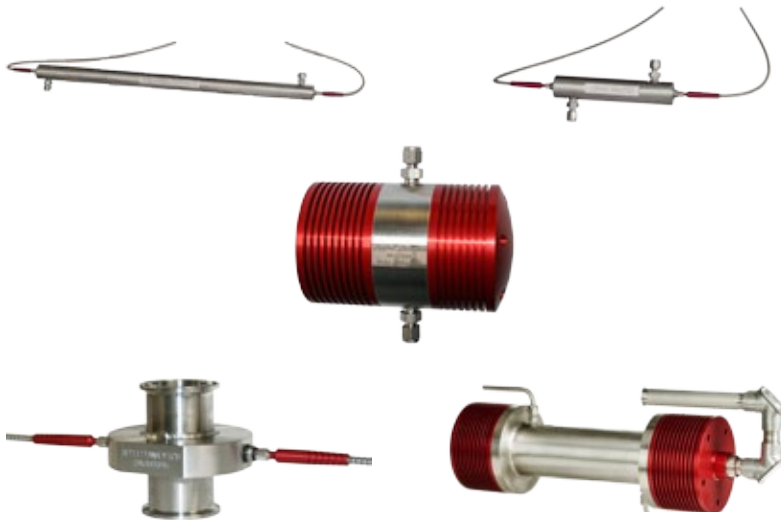
Flow Cells

We build our flow cells from an array of materials to meet the specifications of your process. Our typical stainless steel bodies can handle up to 3,000 lbs. of pressure and 150°C. Various path lengths are available for optimization of Beer-Lambert law within your application.

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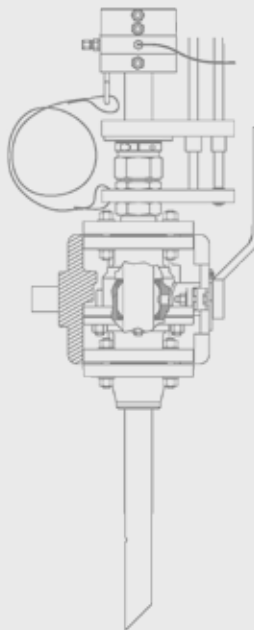Email: sales@a-a-inc.com

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