

# OMA-300 UV-VIS PROCESS ANALYZER

*A window into your process.*

## FEATURES

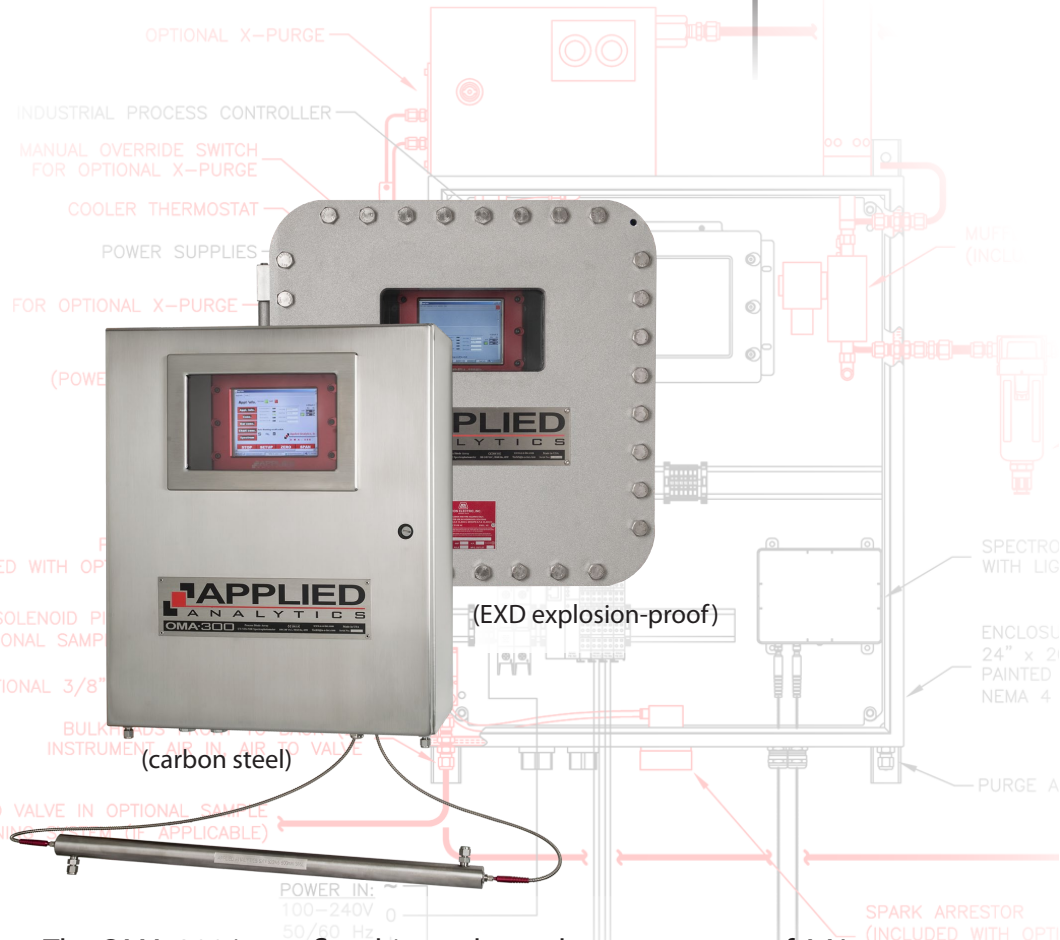
- nova-II diode array spectrometer
- rugged solid state construction
- multi-species monitoring
- long lifespan xenon light source
- liquid + gas phase

## INDUSTRIES

petrochemical • chemical • pharmaceutical • power generation • environmental • oil & gas • semiconductors • pulp & paper • sulfur recovery • mining • LNG • manufacturing • research

## COMPOUNDS

H<sub>2</sub>S • SO<sub>2</sub> • NO<sub>x</sub> • NH<sub>3</sub> • aromatics • BTX • benzene • Cl<sub>2</sub> • NCl<sub>3</sub> • FeCl<sub>3</sub> • TiCl<sub>4</sub> • vanadium • VOCl<sub>3</sub> • diesel • glycols • COS • CS<sub>2</sub> • mercaptans • Br<sub>2</sub> • MEG • acetonitrile • MEHQ • TBC • Co<sup>2+</sup> • Ni<sup>2+</sup> • Cu<sup>2+</sup> • Fe<sup>2+</sup> • phenol • and more:  
[www.a-a-inc.com](http://www.a-a-inc.com)



The OMA-300 is our flagship analyzer, the cornerstone of AAI technology.

This system is tailored to a variety of applications by virtue of its fundamental design. The nova-II spectrometer houses 1,024 photodiodes, each continuously measuring a distinct element in the UV-VIS spectrum. Ultra-fine wavelength resolution delivers flexibility; the OMA full-spectrum advantage is enormous selectivity for species absorbance range and robust background correction.

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

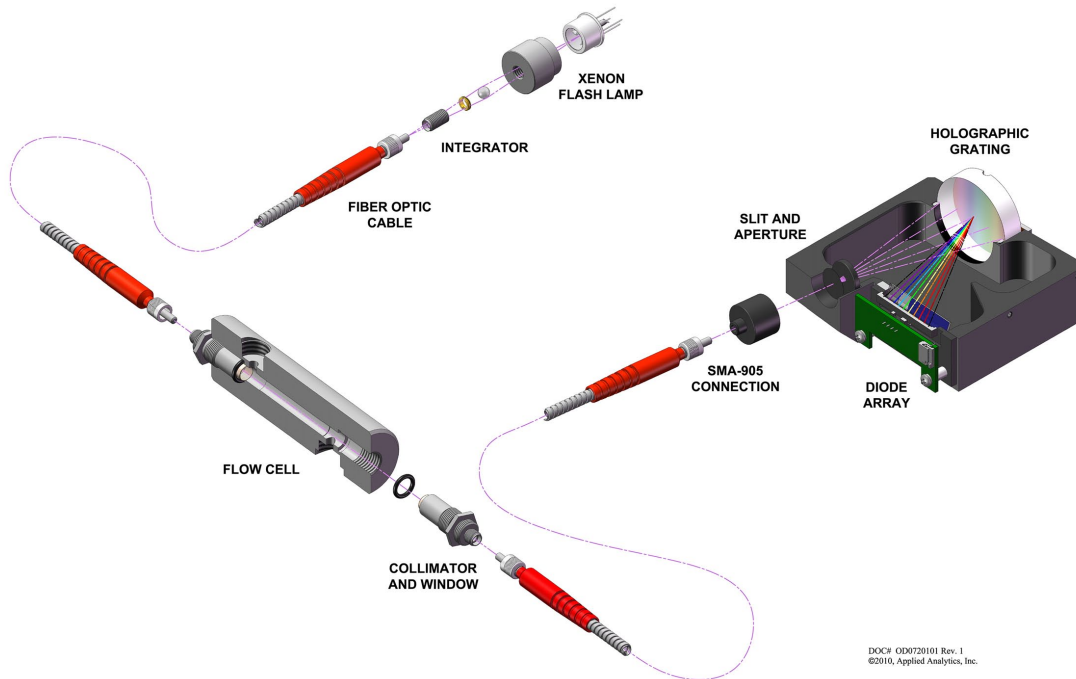


# OMA-300 UV-VIS PROCESS ANALYZER

## Principle of Operation: UV Absorbance

As demonstrated by the Beer-Lambert Law, the concentration of a given component 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 the pulsed xenon source to the flow cell. Inside the flow cell, gas sampled from the process stream interacts with the light signal along the path length. Each gaseous species has a unique spectral footprint, absorbing different quantities of light at different wavelengths. If the concentration of an analyte increases, so does its absorbance across the spectrum.



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

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

## The nova-II Spectrometer

In engineering a spectrophotometer, higher light transmittance means more robust data. Unlike conventional Czerny-Turner models, the nova-II uses holographic grating in place of focusing mirrors. Having fewer reflective elements reduces both stray light and incident light loss—manifesting as a very high signal-to-noise ratio.

- DIODE ARRAY 1,024 photodiodes for high-res spectra
- BROAD SPECTRAL RESPONSE 190-800nm range
- MAXIMAL LIGHT THROUGHPUT high-grade optics, Xe source
- EXCEPTIONAL IN LOW UV minimal stray light
- LOW DARK CURRENT
- CMOS ANALOG CIRCUITRY low noise, low power consumption





## SAMPLING SYSTEMS

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 systems, and in situ probes; we offer these systems in an array of wetted materials for your process needs.

The basic model sampling system provides an automated zero cycle, an integrated flow cell, a back pressure regulator, flowmeters for fast loop and sample loop flow control, and built-in filtration. The flow cell can handle up to 3,000 lbs of pressure and 150 °C, and its user-friendly design makes it extremely simple to maintain.

### Multi-Component Analysis

Often times, multiple components will show strong absorbance in the same spectral region. Consider continuous emissions monitoring, which requires analysis of  $\text{SO}_2$  and  $\text{NO}_x$  in a stack gas stream; both absorb within a tight UV range, so that most optical-based analyzers will struggle to determine how much each component is contributing to the total absorbance. Many systems attempt to compensate for this inability with blunt, intrusive methods like oxidizing the sample to a single component or physical separation. While unavoidable in some cases, these methods can usually be superseded with direct multi-component analysis, but that requires a capable instrument.

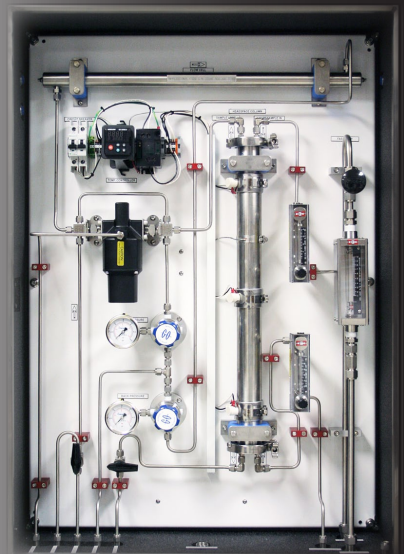
The OMA-300 overcomes cross-interference and background variability by obtaining a full, high-res spectrum. While the nova-II does its work, the analyzer processes the data with over-determined multi-wavelength regression, using constants harvested from standard absorbance spectra. Essentially, the system solves for the unknowns (species' concentrations) using the composite absorbance data from hundreds of individual wavelengths simultaneously for unrivaled accuracy. The Eclipse software provides a simple and clean user interface, but under the hood it houses the proprietary algorithms that govern robust, field-proven multi-component monitoring.

### The AAI Brand

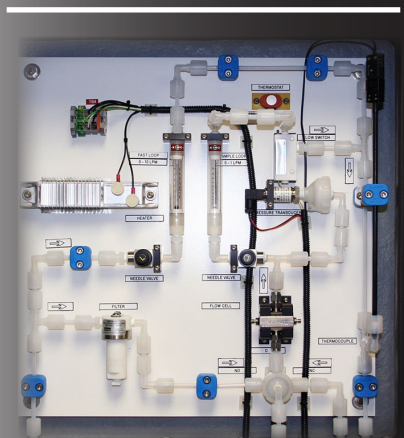
Applied Analytics, Inc. manufactures advanced process analyzers and sampling systems primarily for the chemical, petrochemical, power generation, and pharmaceutical industries, as well as various environmental applications. We have over two decades of experience in designing and installing monitoring solutions that are rugged in their stability and elegant in their automated performance. All of our products are made in the USA.



Double Headspace for  $\text{H}_2\text{S}$  and  $\text{NH}_3$  in water



Headspace for  $\text{H}_2\text{S}$  in diesel



Teflon system for  $\text{Cl}_2$  and  $\text{NCl}_3$   
(both steel-corroding)

# OMA-300 UV-VIS PROCESS ANALYZER

## SPECIFICATIONS

### general performance

<b>measurement technology</b>	nova-II UV-VIS diode array spectrometer
<b>light source</b>	pulsed xenon lamp (~5 year lifespan); deuterium and tungsten sources available
<b>sample introduction</b>	flow-through cell; standard or custom-design sampling system (optional)
<b>repeatability</b>	±0.5 % of scale
<b>photometric accuracy</b>	±0.004 AU
<b>calibration</b>	for many applications, factory calibrated with certified calibration gases/liquids; for safety reasons, some applications require on-site calibration

### operating conditions

<b>ambient temperature</b>	standard: 0 to 55 °C (32 to 131 °F) optional: -20 to 55 °C (-4 to 131 °F)
<b>sample conditions</b>	
<b>temperature</b>	immersion probe: -20 to 150 °C (-4 to 302 °F) flow-through cell: -20 to 150 °C (-4 to 302 °F)
<b>pressure</b>	immersion probe: 100 bar (1470 psig) flow-through cell: 206 bar (3000 psi)
<b>environment</b>	indoor/outdoor (no shelter required)

### hardware

<b>size</b>	analyzer: 24" H x 20" W x 8" D (610mm H x 508mm W x 203mm D) optional basic sampling system: 24" H x 30" W x 8" D (610mm H x 760mm W x 200mm D)
<b>weight</b>	32 lbs. (15 kg)
<b>wetted materials</b>	analyzer: stainless steel 316/316L; K7 glass; Viton optional basic sampling system: stainless steel 316/317; quartz; Viton
<b>outputs</b>	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)
<b>electrical requirements</b>	85 to 264 VAC 47 to 63 Hz
<b>power consumption</b>	45 watts
<b>area classification</b>	General Purpose (standard) / Class I, Div. 2 (optional) / Class I, Div. 1 (optional) / ATEX Exp II 2(2) GD (optional)

[www.a-a-inc.com](http://www.a-a-inc.com)



[sales@a-a-inc.com](mailto:sales@a-a-inc.com)

#### North America

**Headquarters**  
29 Domino Drive  
Concord, MA 01742  
Tel: (978) 287-4222 Fax: (978) 287-5222

**Houston**  
10685-B Hazelhurst Drive, #8677  
Houston, TX 77043  
Tel: (713) 589-9896 Fax: (713) 513-5210

**Baton Rouge**  
Tel: (225) 445-8326 Fax: (225) 612-7119

#### Southeast Asia

37th Floor, Singapore Land Tower  
50 Raffles Place  
SINGAPORE 048623  
REPUBLIC OF SINGAPORE  
Tel: +65 6829 7057 Fax: +65 6829 7070

#### Middle East

#097, Lane 6, Area P, SAIF Zone  
Sharjah, United Arab Emirates  
Tel: +971 6 557 8525 Fax: +971 6 557 8524

#### India

A/203-4 Mahan Terrace  
Surat, GUJARAT-395009, INDIA  
Tel: +91-261-279 0508 Fax: +91-261-278 5000

#### MADE IN USA

© 2010 Applied Analytics, Inc. Products or references stated may be trademarks or registered trademarks of their respective owners. All rights reserved. Information in this document subject to change.