

PRODUCT BROCHURE

ATOM SLA-1000

Fast and Versatile Innovative Measurement
Solution for Total Sulfur in Liquids



Accurate

Fast

**Reliable
Analysis**

KEY FEATURES

- Measurement of Total Sulfur as low as 1 ppm
- High Speed Analysis and Response Time User
- Defined Data Averaging
- Low Utility Consumption
- Convenient Compact Footprint
- Does not Require Installation in Shelter
- Utilizes Air for Combustion

ATOM Instrument offers the most versatile total sulfur analyzers available. The ATOM SLA-1000 has the fastest analysis time of any commercially available analyzer allowing user-defined, multiple cycle averaging to improve analyzer performance. The analyzer operating software is both intuitive and user-friendly. In addition, the SLA-1000 requires only bottled air (no other

gases needed for carrier or combustion) during normal operation and does not require installation in a shelter. The SLA-1000 is an online process analyzer utilizing patented Excimer UV Fluorescence (EUVF) technology to measure total sulfur in a variety of refinery process applications.

Typical Applications for the SLA-1000 includes Total Sulfur measurement in:

- Diesel (including ULSD)
- Gasoline (including Tier-III)
- Reforming and Isomerization
- Other Refinery Grade Fuels
- Blending Operations
- Catalyst Protection
- Natural Gasoline

Key Features

Excimer UV Fluorescence (EUVF) Provides Low Range Detection and Stability

The SLA-1000 is based on field proven EUVF technology that is exceptionally stable and utilizes an excitation wavelength that achieves high detection sensitivity. The SLA-1000 is an excellent fit for applications in the 0-10 ppm range even at concentrations lower than 1 ppm. In addition, the Excimer technology provides little to no nitrogen interference compared to other UVF technologies. The SLA-1000 is designed for outdoor installation and used in harsh environments like applications within the petroleum and petrochemical industries.

Simplified Design Improves Reliability

Calibration and validation routines are seamlessly incorporated into the ATOM operation software. The analyzer has a very fast response time to process changes (within 1 cycle), insuring proper process monitoring with fast moving processes. The sample injection system design is simplified resulting in greater reliability and lower maintenance, for example, the sample valve only actuates once per cycle increasing lifetime. Finally,

the analyzer results are insensitive to sample buildup or interference from oxygenates present in the sample stream.

Principle of Operation

The UV Fluorescence method is the most simple and practical low-level sulfur analytical technique. It has been widely used and proven over many years of use in industrial settings. This method involves injection of a sample into a high-temperature oxidation furnace, converting all hydrocarbons into water (H₂O) and carbon dioxide (CO₂). Total sulfur contained in molecular-bound hydrocarbon species is oxidized at temperatures in excess of 1000°C into sulfur dioxide (SO₂) by the reaction:



The furnace effluent containing these combustion byproducts is directed into a detection chamber where it is excited by high-energy, short-wavelength emission from the excimer source. The UV photons from the excitation source, transfer energy into the SO₂ molecule and raise its energy level to create an excited singlet state. These excited molecules rapidly decay back to their lower energy ground state releasing the absorbed energy as a secondary emission known as fluorescence.



Fluorescence emission is optically filtered to remove undesired wavelengths from excitation source and background scatter within the detector chamber. Detection of filtered fluorescence emission is accomplished using a Photomultiplier Tube and amplified by proprietary high sensitivity electronics.

Graphical User Interface (GUI)

The SLA software incorporates a user-friendly graphical user interface (GUI) designed to be both intuitive and easy to use. All aspects of analyzer operation are accessible from the Main toolbar utilizing drop down menu screens. The home screen displays 3 user selectable digital readout and analog bar graphs updated in real-time from the analysis. Run Cycle Status and current timed events are also refreshed in real-time. Major system control elements are also incorporated in this home screen. The calibrate menu allows complete control of calibration and validation processes, including manual, auto calibration and validation sequencing. Analytical results acquired during these events may be inspected at any time prior to subsequent calibrations.

All other menu screens such as Timed Events, Detector, Analog Output, Digital I/O and System Alarm Settings, allow the user to easily monitor or make changes to all aspects of analyzer control and operation. The GUI software also includes user setup and password security, as well as graphic plotting of real-time analysis data and display of historical settings.



Remote ATOM ACCESS®

The Analyzer Central Communication Ethernet Server Software (ACCESS) allows an authorized user to access any ATOM analyzer on the facility network from an internal office or work station. After a successful security login, the network will initiate communication to the selected instrument of choice. Once connected, the instrument can be operated and interfaced with, just as if the user was standing directly in front of the instrument. Instead of utilizing the analyzer touch screen, the remote connection keyboard and mouse are used for all interface requirements.

Speed of Analysis and Response Time

The SLA-1000 is specifically designed for high speed analysis and a fast response time. This feature enables more rapid, real-time measurements to be performed, allowing process events and changes to be monitored and quantified in a timely manner. Process variations and detail potentially obscured with slower responding analyzers, may be revealed or become more apparent. The cycle time is completely user selectable although a 1 OD-second cycle time is standard.

Low Concentration Total Sulfur Analysis

The SLA-1000 allows stable and accurate analysis at both high and low sulfur concentrations, even below 1 ppm, using the standard 100 second analysis cycle time. Any number of analysis up to 10 sequential results can be seamlessly averaged to provide a more consistent and reliable concentration measurement. In turn, this allows optimization of low range detection performance and analyzer response time for specific application requirements.

Compact Footprint

The following table allows direct comparison of size and occupied volume for the SLA-1000 vs current standard instrument packages. (Dimensions do not include size of the mounting framework or stand.)

	Package 1	Package 2	ATOM SLA
Height	45/56 inches (D1/D2)	45.00 inches	38.00 inches
Width	24.00 inches	26.00 inches	27/32 inches
Depth	18.00 inches	17.00 inches	12.75 inches
Volume	11.25/14 ft ³	11.50 ft ³	8.10 ft ³

SPECIFICATIONS

Analytical Performance

Measurement Method: Total Sulfur – Excimer UV Fluorescence (EUVF)

Measurement Range:	1 ppm – 10% (Application dependent)
Repeatability:	200 ppb SD or $\pm 2\%$ of measured value, whichever is greater. 100 ppb SD with 5-min. averaging or $\pm 2\%$ of measured value, whichever is greater.
Linearity:	$\pm 2\%$ of full scale (dynamic range dependent)
Response Time:	99% (+) in one cycle (180 secs typical)
Calibration:	Automatic or manual

Analog/Discrete Data Communications

Analog Outputs:	20 mA DC (optional)
Alarm Outputs:	One global dry contact triggered by one or more of the following: Power failure, loss op purge, low oxidizer pressure, low furnace temperature. Other alarm options available.
Digital Data Communications:	RS-485 or RS-422 Modbus (RS-232 or TCP/IP ethernet optional)
Local MMI (GUI):	12" Touchscreen computer with embedded Windows 7 allows complete operation and control of all analyzer functions
Remote Interface:	ATOM ACCESS allows complete control of SGA-1000, including monitoring of analysis parameters and digital data values

Utility Requirements

Ambient Temperature:	-20°C to +40°C (-4°F to +104°F)	Instrument Air:	70 psig (4.8 bar), 5 SCFM, Oil Free, -40°C (-40°F) dew point
Power:	120 VAC, 50/60 Hz at 2200 watts	Zero Grade Air:	70 psig (4.8 bar), 200 SCCM

Physical Parameters

Dimensions:	965.2 mm (38.0 in) high x 660.4 mm (26.0 in) wide x 304.8 mm (12.0 in) deep
Mounting:	Wall or Unistrut Stand
Certifications:	Built to NEC Class 1, Div 2, Group B,C,D. CSA (optional)

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