

PRODUCT BROCHURE

NEW

Trace-1000S/N™

Fast, Multi-Stream Trace Sulfur and Trace Nitrogen in Gas Analyzer



Precise

Consistent

**Reliable
Analysis**

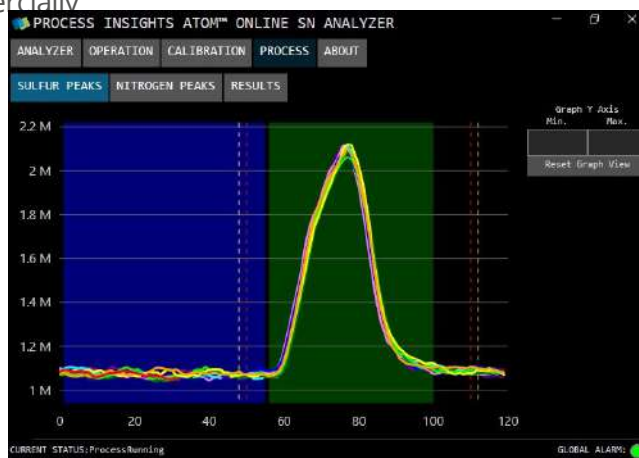
KEY FEATURES

- Trace Sensitivity Measurement of Total Sulfur and Nitrogen (<1 ppm)
- High Speed Analysis and Response Time
- User Defined Data Averaging
- Low Utility Consumption
- Convenient Compact Footprint
- Does not Require Installation in Shelter

We offer the most versatile Total Sulfur and Nitrogen analyzers available, which can be configured for total sulfur, total nitrogen, or the simultaneous measurement of both. The TraceS-1000™ online process analyzer incorporates patented Excimer UV Fluorescence (EUVF) technology for the detection of sulfur, and optimized chemiluminescence for nitrogen. These techniques are ideally suited for the measurement of total sulfur and nitrogen in a variety of hydrocarbon process streams.

The Trace-1000S/N™ additionally utilizes a proprietary signal processing technology for both sulfur and nitrogen measurement. This technology coupled with optimized detector designs, provides exceptional analytical performance of total sulfur and nitrogen measurement using a single calibration point. The TraceS-1000™ has the fastest analysis time of any commercially available analyzer providing a 99% response to process step changes in as little as 180 seconds.

Utility gas requirements include UHP oxygen and argon with a low gas consumption rate less than 200cc/min. each, enabling a pair of 300 ft³ bottles to last about 4-weeks. Instrument operation is simplified with intuitive and user-friendly software that incorporates user-defined cycle averaging that can be optionally applied to the high-speed analytical data for enhanced analytical precision.



Typical Applications for the Trace-1000S/N includes Total Sulfur and Nitrogen measurement in:

- LPG
- Natural Gas
- Reforming and Isomerization
- Catalyst Protection
- Blending Operations
- Flare and Stack Gas
- Refinery Grade Fuels

Key Features

Optimal Measurement Technologies Provides Low Range Detection and Stability

The Trace-1000S/N applies patented Excimer UV Fluorescence (EUVF) for total sulfur and optimized chemiluminescence for trace Nitrogen measurement. EUVF is a field proven technology using an excitation wavelength that achieves both high detection sensitivity and design that provides unparalleled stability. The Trace-1000S/N is an excellent fit for applications requiring a measurement range as low as 0-1ppm, or extending as high as 0-100 ppm. The TraceS-1000™ is designed for outdoor installation operation in harsh environments as may be required by the refining (LPG), Gas Processing (NGL) and Natural Gas industries.

Simplified Design Improves Certification and Process Monitoring

The Trace-1000S/N Trace Sulfur and Nitrogen measurement provides a complete analysis of all molecular-bound sulfur and nitrogen compounds present in process gas streams, rather than specifically selected sulfur and nitrogen compounds as with some GC or TDL applications. Calibration and validation are seamlessly incorporated with an optional calibration switching configuration and associated software for easy compliance or verification testing.

Principle of Operation

One of the most simple and practical low-level sulfur analytical techniques that has been widely used and proven over many years of industrial utilization is the UV Fluorescence method (UVF). The UV Fluorescence method involves injection of a sample into a high-temperature oxidation or combustion furnace, which converts all hydrocarbons into water (H₂O) and carbon dioxide (CO₂) byproducts. Total Sulfur content from any molecular-bound hydrocarbon species is similarly 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 a UV excitation source. The UV photons from the excitation source or lamp, transfers energy into the SO₂ molecule and raises 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.



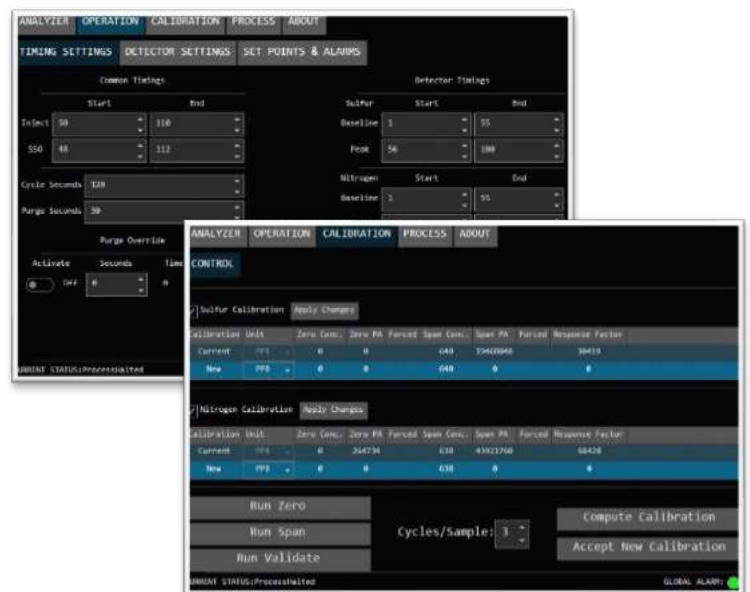
This low-level fluorescence emission is optically filtered to remove undesired wavelengths of the UV source and background scatter within the detector chamber. Detection of filtered fluorescence emission is accomplished using a Photomultiplier Tube (PMT) and amplified by proprietary high-sensitivity electronics. Nitric Oxide (NO) produced during combustion is reacted with Ozone (O₃) to generate a chemiluminescence emission which is proportional to total nitrogen in the sample:



The Trace-1000S/N 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 screen. 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 refreshed moment by moment. Major system control elements are also incorporated in this home screen.

The calibrate menu allows complete control of the calibration and validation processes, including manual or auto calibration and validation sequencing. Analytical results acquired during calibration events may be inspected at any time prior to any subsequent calibration.

All other menu screens allow the user to easily monitor or make changes to all aspects of analyzer control and operation.



Remote ACCESS®

The Analyzer Central Communication Ethernet Server Software allows an authorized user to access any analyzer on the facility network from an internal office or workstation. 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 Trace-1000S/N 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 more timely monitored and quantified. Process variations and detail often obscured with slower responding analyzers, may be revealed or become more apparent. Analyzer cycle time is user defined, although the standard minimum cycle time is 180 seconds. The Trace-1000S/N provides stable and accurate analysis of sulfur and nitrogen concentrations as low as 1 ppm.

Low Concentration Total Sulfur and Nitrogen Analysis

The Trace-1000S/N provides accurate and stable analysis at both high and low sulfur and nitrogen concentrations as low as 1 ppm. And since faster cycle times generate more results in less time, up to 10 sequential analysis results can be seamlessly averaged to provide improved precision to allow process optimization of detection performance and analyzer response time, depending on application requirements.

Compact Footprint

The following table allows direct comparison of size and occupied volume of the Trace-1000S/N vs current standard instrument packages' (dimensions do not include size of the mounting framework or stand).

	Package 1	Package 2	SGN
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: Trace Sulfur and Nitrogen – Sulfur by Excimer UV Fluorescence (EUVF)
Trace Nitrogen – by Chemiluminescence

Measurement Range: 1 ppm – 100ppm (As required for specific gas application)

Repeatability: 30 ppb SD or $\pm 2\%$ of measured value, whichever is greater. 20 ppb SD with 5-min. averaging, or $\pm 1.2\%$ 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: Two 4-20 mA DC

Alarm Outputs: One global dry contact triggered by one or more of the following:
Power failure, loss of purge, low oxidizer pressure, autocal fault, analyzer in calibration, analyzer not running

Digital Data Communications: RS-485 or RS-422 Modbus or TCP/IP ethernet optional

Local MMI (GUI): 12" Touchscreen computer with embedded Windows 11 allows complete operation and control of all analyzer functions.
15" Touchscreen with ATEX Certification.

Remote Interface: ACCESS allows complete control of TraceS-1000™, including monitoring of analysis parameters and digital data values

Utility Requirements

Ambient Temperature: -20°C to +40°C
(-4°F to +104°F)

Gases: UHP Oxygen/Argon,
3 bar (40 psig)

Total flow: 500cc/min max

Power: 120 VAC, 50/60 Hz
at 2200 watts (max.)

Instrument Air: 70 psig (4.8 bar), 5
SCFM, Oil Free, -40°C
(-40°F) dew point

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.
280lbs

Mounting: Wall or Unistrut Stand

Certifications: Built to NEC Class I Div 2 (US & Canada); Field Certification (optional)
ATEX (220VAC version only)



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Process Insights delivers premium analytical sensors, analyzers, instrumentation, software and solutions that are mission-critical to keep your operations, personnel, and the environment safe. Our commitment to customer satisfaction is evident through our diverse range of products, programs, and services, designed to accommodate various budgets and application needs.



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