Process Insights™
Premium Insights Into Process

REAL-TIME LAB ELEMENTAL ANALYZER

PRODUCT BROCHURE

XT Series™

Laboratory Analyzer for Total Sulfur and Total Nitrogen

For Gases and Liquids
Complies with ASTM D5453, D6667 and D4629

Precise

Flexible

Reliable Analysis

- High Sensitivity Total Sulfur and Nitrogen Analysis (<1 ppm)
- Patented Excimer Technology Improves Performance
- Outstanding Analytical Performance
- Rapid Analysis and Response Time
- Compact Instrument Footprint
- Capable of Running on Air
- Low Utility Consumption
- High Dynamic Range

Revolutionizing Total Sulfur and Total Nitrogen Measurement

We offer the most innovative laboratory analyzers on the market for Total Sulfur and Total Nitrogen measurements. All XT Series™ Analyzers are designed and built for precise, accurate and reliable analysis with flexibility that allows the measurement of a wide range of samples with a single instrument. Analyzer versatility enables operation with either air or Oxygen-Argon mixtures for combustion. XT analyzers offer rapid analysis combined with the highest dynamic range on the market, which allows measurement of a broad range of samples with a single method using a single calibration. The efficient and compact design reduces required benchtop space to a minimum, while maintaining complete accessibility to analyzer components.

- Exceptional Analytical Performance
- Highest Dynamic Range Available
- Stable and Precise Trace Measurement
- High Reliability
- Small Footprint and Overall Size
- Safer Operations When Running Air
- High-Speed Analysis
- Versatile Analyzer for Liquids and Gases

Excimer UV Fluorescence (EUVF) Provides High Sensitivity with High Dynamic Range and Unequaled Stability

The XT Series utilizes patented EUVF technology which achieves high detection sensitivity with minimal nitrogen interference. Coupled with proprietary signal processing technology enables the XT analyzers to achieve the highest dynamic range of any analyzer available on the market. These technologies enable extremely high precision and stable results across all measurement ranges.

Advanced Nitrogen Detection Technology Provides High Sensitivity with High Dynamic Range and Stability

The XT Series utilizes the same proprietary signal processing technology for nitrogen measurement. This technology, along with enhanced chemiluminescent detector design, provides extremely low background noise for trace nitrogen measurement of samples with diverse concentration using one single calibration.

XT Series Analyzer (XTS-1000) with Autosampler (LAS-1000) and External Injection Module (EIM-100).

Principle of Operation

Measurements start with combustion of injected samples at high temperature (1050°C). For hydrocarbon species:

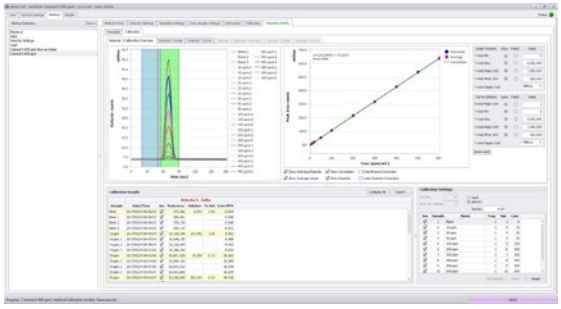
$$R\text{-}SH + R\text{-}NH + O_2 \rightarrow SO_2 + NO + CO_2 + H_2O$$

After removal of water (H_2O), sulfur dioxide (SO_2) is excited by the Excimer UV light emission, generating a secondary emission known as fluorescence which is proportional to total sulfur in the sample:

$$SO_2 + h\nu \rightarrow SO_2^* \rightarrow SO_2 + h\nu'$$

Nitrous Oxide (NO) produced during combustion is reacted with Ozone (O_3) to generate a chemiluminescence emission which is proportional to total nitrogen in the sample:

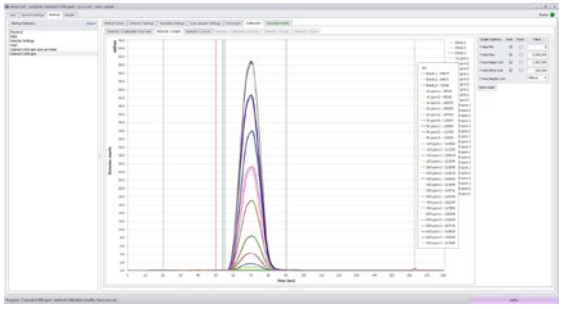
$$NO + O_3 \rightarrow NO_2^* + O_2 \rightarrow NO_2 + O_2 + h\nu$$

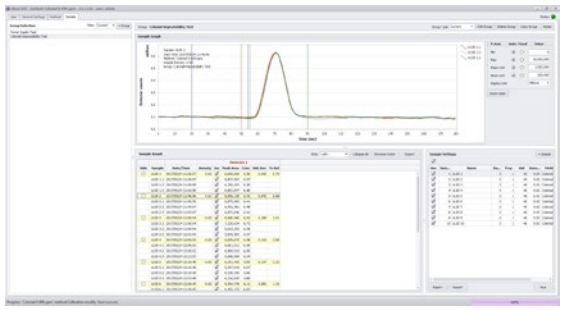


- User Friendly & Intuitive
- Easy Calibration and Method Setup
- Real-Time Monitoring of Analysis
- Calibration and Sample Recalculation Feature
- Multi-Level User Login
- Idle Mode Operation
- Full Operation of External Injection Module and Autosampler

Optional Modules Extend Analytical Capability

The Liquid Autosampler (LAS-1000) and External Injection Module (EIM-1000) allow measurement of an extended range of liquids, gases and LPG products. The autosampler injects liquids and utilizes XYZ vectorized movement for sampling and injection for quick analysis. It is fully user-programmable to allow utilization of specified settings for intended samples. The direct screw drive Z-axis ensures highest reliability throughout autosampler life.The EIM is designed for injection of gaseous and LPG samples using a micro-electric actuator, eliminating the need for supplemental carrier for sample valve operation. Injected samples are carried from the EIM to the analyzer using specialized tubing, enabling optimal analytical performance. The EIM is generally installed adjacent to the XT analyzer and configured directly through the computerized user interface.





Software

All XT Series analyzers come complete with a standard desktop computer and intuitive software that is both user-friendly and highly configurable. The various settings allow flexibility of method configuration and sample combinations that provide maximum range of analysis. Calibration menus provides an array of charts and tables that reflect analysis results that include statistical computations that analyze the quality of calibrations. Calibrations can be updated without the need to re-run standards and with automatic reprocessing of analytical results. Export and print features allow easy access to data for storage, archiving and processing. Sample menus allow users to group samples where each sample may be run using a different method and calibration. This can facilitate analysis of sample groups by plant area or sample type and eliminate the need to set up groups for each calibration. The software comes with a preloaded "Idle" method that automatically engages according to user-defined parameters thereby minimizing utility consumption when the analyzer is not in use.

Sample	CONCENTRATION (PPM), SD (PPM) AND RSD (%)						
	Sulfur	SD	RSD	Nitrogen	SD	RSD	Module
RFG 1*	10.44	0.011	1.10	–	–	–	LAS
RFG 2	31.45	0.128	0.41	8.07	0.068	0.84	LAS
RFG 3	5.01	0.053	1.06	4.52	0.060	1.33	LAS
ULSD 1	0.94	0.020	2.16	–	–	–	LAS
ULSD 2*	8.11	0.072	0.89	–	–	–	LAS
ULSD 3	5.91	0.038	0.64	10.50	0.097	0.92	LAS
Toluene (Technical Grade)	2.06	0.034	1.67	0.41	0.007	1.74	LAS
Butane 1*	9.97	0.096	0.97	–	–	–	EIM
Butane 2*	7.99	0.085	1.06	–	–	–	EIM

Outstanding Analytical Performance

The XT Series analyzers provide unmatched analytical performance. The table above showcases results obtained with various samples using an XT-2000 with autosampler (LAS) or External Injection Module (EIM). Samples include various grades of gasoline, diesel, LPG and aromatics matrices. Each sample was run 10 times using air or argon/oxygen mixture. Results reflect impressive analytical performance averaging a relative standard deviation around 1%.
(*Denotes analysis using air for combustion)

SPECIFICATIONS

Analytical Performance

Measurement Method:	Total Sulfur – Excimer UV Fluorescence (EUVF) Total Nitrogen – Chemiluminescence
ASTM Methods:	Total Sulfur – D5453, D6667, D7551 Total Nitrogen – D4629
Measurement Range:	Total Sulfur – 0-10%* Total Nitrogen – 0-1%*
Repeatability:	Total Sulfur – 30 ppb or 2% whichever is greater. Total Nitrogen – 30 ppb or 2% whichever is greater.
Analysis Time:	3 minutes (typical)
Typical Sample Size:	Autosampler Liquid 5-20 µL, EIM LPG 10 µL, EIM Gas 2.5 mL

Utility Requirements

Power:	90-240 VAC, 50/60 Hz. Analyzer peak power consumption: 1400 Watts
Gases (Sulfur >5 ppm):	Zero Grade Air – 450 SCCM, 3 bar (40 psig)
Gases (Nitrogen and Sulfur <5 ppm):	Ultra High Purity Oxygen – 350 SCCM, 3 bar (40 psig) Ultra High Purity Argon – 150 SCCM, 3 bar (40 psig)

Physical Parameters

Dimensions:	457 mm (18.0 in) Wide x 508 mm (20.0 in) Deep x 414 mm (16.3 in) High
Weight:	35 kg (77 lbs)

ProcessInsights™
Premium Insights Into Process

GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

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.

CENTERS OF EXCELLENCE | PROVIDING PROVEN SOLUTIONS

Process Insights – The Americas
14400 Hollister Street, Suite 800B, Houston, TX 77066, USA +1 713 947 9591

Process Insights – EMEA
ATRICOM, Lyoner Strasse 15, 60528 Frankfurt, Germany +49 69 20436910

Process Insights – APAC
Wujiang Economic and Technology, Development Zone, No. 258 Yi He Road, 215200 Suzhou, Jiangsu Province, China +86 400 086 0106

For a complete range of products, applications, systems, and service options, please contact us at:
info@process-insights.com

For a complete list of sales & manufacturing sites, please visit:
https://www.process-insights.com/about-us/locations/