

6200 SERIES

Sulfur & Nitrogen process analyzers



Meet future sulfur regulations today...



- Total sulfur and/or total bound nitrogen
- Wide detection range: ppb to % levels
- Advanced communications, remote control
- Dual range, dual stream analysis
- Excellent reliability; low maintenance
- Sulfur complies with ASTM D 5453 & D 6667
- Nitrogen complies with ASTM D 4629
- LPG, gas & liquids analysis

6200 SERIES

The leadership continues...

Building upon years of innovation, analytical leadership, and customer satisfaction, ANTEK sets the standard against which other nitrogen/sulfur analysis instruments are measured.

The ANTEK Advantage

■ **Experienced**

We are experts at sulfur and nitrogen analysis technology with over 30 years experience in analytical instrumentation.

■ **Recognized**

We comply with the most widely accepted methods for sulfur and nitrogen determination—methods of choice by regulatory agencies and method writing institutions worldwide.

- ASTM D 5453, D 6667 total sulfur: gasoline, diesel, oil, gas
- ASTM D 2622, D 4294 equivalency
- ASTM D 4629 total nitrogen: gasoline, diesel, oils
- Approved and recognized by CARB and US EPA

■ **Responsive**

Our experienced staff of engineers and chemists will help you solve your analytical challenge and fit the 6200 Series to your unique application.

■ **Cost-effective**

Our fast, reliable technologies further benefit your process with low cost of ownership. We eliminate need for expensive chemicals, column switching, reagents, and tape.

Process Sulfur & Nitrogen Analyses

Pyro-fluorescent™ sulfur and Pyro-chemiluminescent™ nitrogen technology

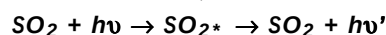
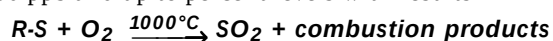
- Fast, precise measurement of liquid, LPG, and gas samples
- Total sulfur, total bound nitrogen, or both
- Sensitivity from 250 ppb to % levels
- Excellent reproducibility and linearity
- Fast cycle time: 2½ to 15 minutes per stream, programmable
- Dual range and multi-stream capabilities built-in
- No environmentally hazardous catalysts, reagents, tapes or other wastes; no radioactive license required
- No matrix effects; no CO₂ interference
- No columns
- Easy to operate and maintain

RELIABLE, PROVEN Technology



Total Sulfur Analysis: Model 6200 S

Our Pyro-fluorescent™ sulfur analysis technology is a fast and accurate quantitation method, providing determinations down to 250 ppb and up to percent levels with results in minutes.

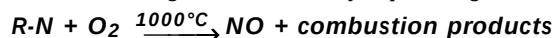


A fixed amount of sample is combusted at a high temperature to convert sulfur atoms into Sulfur Dioxide (SO₂) molecules. The SO₂ molecules are then exposed to ultraviolet light, causing them to fluoresce. The light produced by this reaction is converted by a photomultiplier tube into signal that is proportional to the amount of sulfur present.

This clean instrumental method is more stable than lead acetate tape methods without the consumables or lead waste disposal problems. It eliminates matrix interference problems of x-ray, providing accurate results to much lower levels of sulfur. It does not require column switching or back flushing; and because our detector eliminates problems of quenching from CO₂ or water, you'll achieve more reliable results with excellent linearity.

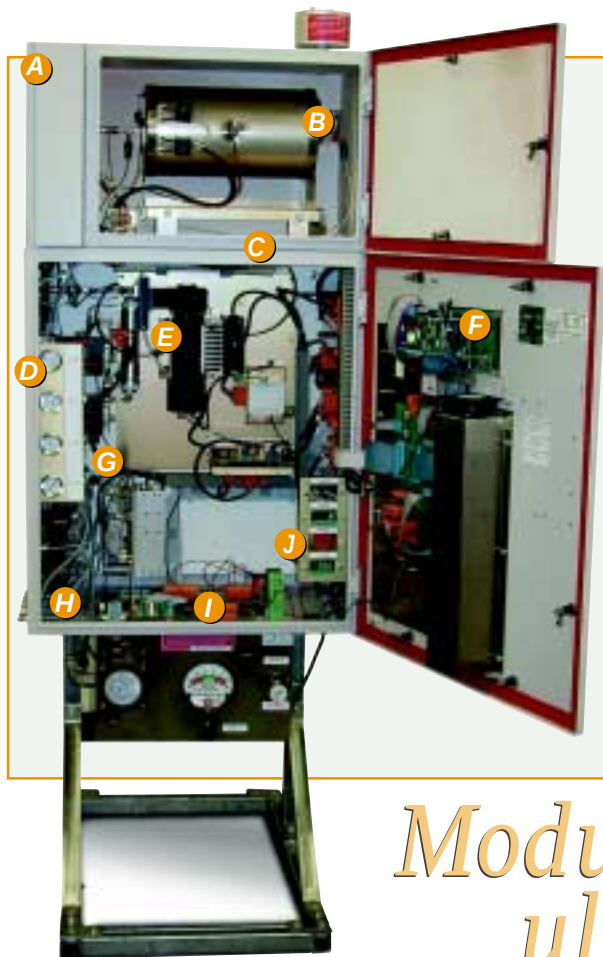
Total Nitrogen Analysis: Model 6200 N

Utilizing accuracy and precision of our Pyro-chemiluminescent™ technology, the 6200 N delivers total nitrogen determinations from 250 ppb to percent levels, providing results in minutes. Chemiluminescence is the clean, rapid method for determining total bound nitrogen in almost any liquid or gas.



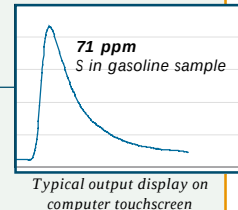
A fixed amount of sample is combusted at a high temperature to convert bound nitrogen atoms into Nitric Oxide (NO) molecules. The NO molecules are then mixed with ozone, causing them to chemiluminesce. The light produced by this reaction is converted by a photomultiplier tube into a signal that is proportional to the amount of nitrogen present.

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Designed for Dependability & Ease of Use

- A** Highly reliable 6-port rotary injection valve is isolated from electronic components, yet easily accessible for routine maintenance
- B** Furnace slides forward for easy access, enabling quick pyrotube changes
- C** Membrane dryer thoroughly removes moisture before sample enters detector
- D** Built-in pressure regulators ensure dependable flow of utility gases
- E** Thermo-electric cooling of detector ensures stable readings
- F** **Real-time on-screen view of analysis progress**; touch-screen access to method, calibration, validation, alarm settings, & troubleshooting ; local storage of historical data; and advanced data export and communication functions; digital output control
- G** Computer-controlled electronic mass flow controllers ensure stable readings
- H** 24V solenoids enable analysis of two sample streams
- I** Customer interface board provides easy connections for communication to plant DCS and/or remote workstation
- J** Digital displays provide quick viewing of furnace and detector temperatures



*Modular design,
ultimate reliability!*

Small footprint: only 26" wide

Advanced Plant DCS Communication

6200 Series' digital inputs/outputs enable remote instrument control and status monitoring. Concentration data transmits via scaled 4-20 mA outputs. Includes RS-232, RS-422, or RS-485 for Modbus RTU; Modbus TCP/IP & Ethernet available upon request.

Technology Link to Your Lab

The 6200 Series utilizes the same proven technology of ANTEK's widely accepted laboratory analyzers. Many customers value using common methodology between their process and lab since it simplifies data correlation between the two locations.

Custom Sample Conditioning Systems

A sample conditioning system (SCS) is critical for reliable sulfur and nitrogen measurement. The SCS will remove contaminants and H₂O, regulate sample pressure, and control sample flow to ensure sample introduction under constant conditions. ANTEK supplies these optional systems and can custom design an SCS to optimize your analysis.

Additional Features & Benefits

- Advanced communications with remote diagnostics and remote operation capabilities
- Fast recovery time when changing between high and low concentrations: 1000 ppm to 50 ppm in 10-15 minutes (2 to 3 injections) compared to several hours
- UVF's inherent linearity eliminates any need to add a sulfur-containing compound to make the system linear
- Touch screen control (man/machine interface)
- Small footprint; ideal as direct XRF & GC system replacement
- Easy to maintain; only 1 moving part
- ASTM and CARB approval in writing
- Each application reviewed by experienced, knowledgeable technical staff
- Worldwide representative/distributive network
- Comprehensive in-house or on-site training available
- Routine maintenance agreements available

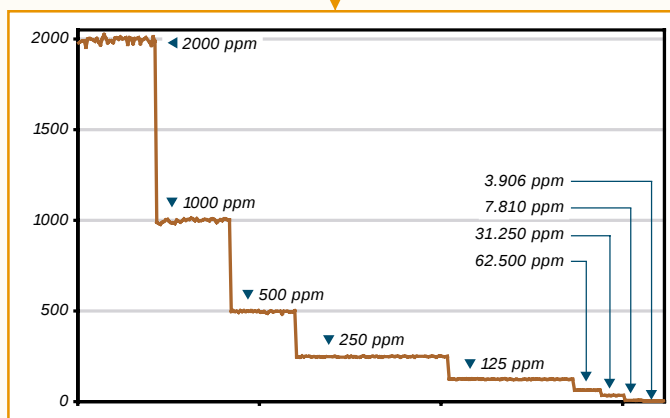
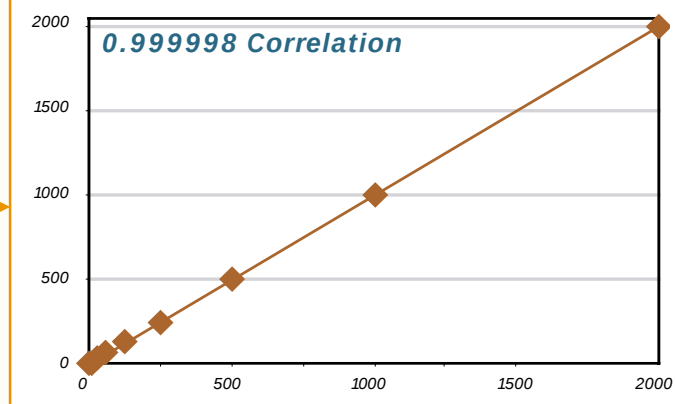
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Sample data

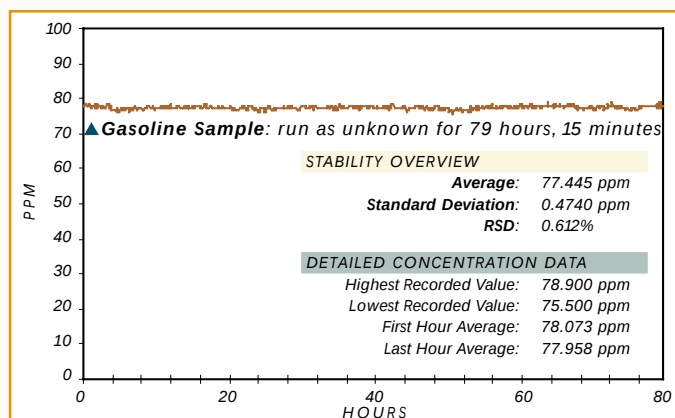
LINEARITY

A 1926 ppm dibutyl sulfide in toluene standard, run as an unknown, was used to calibrate the analyzer at 2000 ppm. Half dilutions were made of the standard, and eight of those dilutions were also run as unknowns:

EXPECTED	AVERAGE	SD	%RSD
2000.000	1993.568000	14.812230	0.743001
1000.000	998.666200	8.411135	0.842237
500.000	496.918400	4.013894	0.807757
250.000	248.195700	1.855034	0.747408
125.000	123.754500	1.432549	1.157573
62.500	63.031250	0.416760	0.661195
31.250	34.014420	0.685202	2.014444
7.810	7.046875	0.249239	3.536877
3.906	3.723958	0.393221	10.559210



STABILITY STUDY: 79-HOUR



REPEATABILITY

HOURS	INJECTIONS	AVERAGE	SD	%RSD	%SD FULL SCALE*
14:45	177	70.11	1.27	1.81	0.422668300
2:25	29	28.33	0.59	2.07	0.195045230
3:30	42	154.59	1.61	1.04	0.536623309
1:40	20	28.56	0.34	1.18	0.112339629
16:15	195	71.19	1.39	1.96	0.464927697
3:20	40	155.60	1.70	1.09	0.566114927
5:10	62	28.84	0.66	2.30	0.220751210
COMBINED RUNS		AVERAGE	SD	%RSD	%SD FULL SCALE*
MID RANGE :		70.65	0.76	1.08	0.254350579
LOWER RANGE :		28.58	0.25	0.89	0.843178860
UPPER RANGE :		155.10	0.72	0.46	0.239209735

* Full scale: 300 ppm

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Typical product specifications

Detection Method

6200 S Sulfur: Pyro-Fluorescence™

6200 N Nitrogen: Pyro-Chemiluminescence™

Method Compliance

6200 S Sulfur: **ASTM D 5453, D 6667**

6200 N Nitrogen: **ASTM D 4629, DIN#38409, TEIL 27**

Certifications

CSA/NRTL; CENELEC-ATEX & CE available Summer 2003

Performance

- Analytical Range: 250 ppb (lower detection limit) to % levels
- Precision: within <1% of full scale, for most applications
- Linearity: <1% of full scale at >1ppm concentrations
- Analysis: 2 minutes; analyses over 1000 ppm may take longer
- Cycle Time: 2½ to 15 minutes, programmable

Communication Outputs

- 4–20 mA isolated at 750 Ω (standard)
- Discreet digital inputs and outputs for remote control and status indication
- RS-232, RS-422, RS-485 for Modbus RTU (standard); optional Modbus TCP/IP and Ethernet

Sampling

Injection valve, 5 µl sample volume;

Sampling system available as recommended option

Gas Requirements

- Carrier (argon or nitrogen*): 99.975%, 50 psig, 5–15 cc/min
 - Oxygen O₂ (combustion): 99.75%, 50 psig, 400 cc/min
 - Plant Air (purge): clean, dry, particle-free; 80–100 psig
 - Instrument Air: 80–100 psig, for injection valve operation and for pneumatic output to sample conditioning panel
- * Nitrogen cannot be used as carrier on a 6200 N Nitrogen system.

Electrical

- 110VAC, 50/60Hz, 1500W, 20A *or* 220VAC, 50/60Hz, 1500W, 10A

Classifications:

- Class 1, Division 1 Groups C–D (B optional) X purge
- Class 1, Division 2 Groups C–D (B optional) Z purge
- CENELEC-ATEX Eex p IIC T4 (available Summer 2003)

Ambient Temperature

0 to 40°C (32 to 104°F); operation at the extremes of this temperature range may affect performance; please contact your Antek representative for details

Dimensions & Weight

- WxDxH: 660 x 483 x 1816 mm (26 x 19 x 71½ inches)
- 152 Kg (335 pounds)

Continuing research and development may result in specification or appearance changes at any time.

Ordering information

Model 6200 N Nitrogen Analyzer designed for rapid analysis of liquid or gas samples for total chemically bound nitrogen. Basic system comprised of detector/electronics enclosure, furnace enclosure, and operation/service manual. Complies with **ASTM D4629**.

Model 6200 S Sulfur Analyzer designed for rapid analysis of liquid or gas samples for total sulfur. Basic system comprised of detector/electronics enclosure, furnace enclosure, and operation/service manual. Complies with **ASTM D5453 and D6667**.

Model 6200 NS Nitrogen/Sulfur Analyzer designed for rapid analysis of liquid or gas samples for simultaneous detection of total chemically bound nitrogen and total sulfur. Basic system comprised of detector/electronics enclosure, furnace enclosure, and operation/service manual. Complies with **ASTM D4629, D5453, and D6667**.

The technology used in ANTEK's process instrumentation is also available for laboratory applications.

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