



BLUE DRAGON
TECHNOLOGY

Online Total Sulfur Analyzer

Model 800TS

Continuous online sulfur measurement for liquid and gas process streams



● Up to 6 streams

Single-channel operation or optional rapid multi-stream switching.

● Superior precision

Reliable real-time data support for process adjustment and product compliance.

● Minimal installation

Designed to maximize online operation time and simplify site integration.

Wide Range of Applications

liquid and gas streams

The Model 800TS Online Total Sulfur Analyzer provides high-precision measurement of sulfur in liquid and gas samples, offering critical data for fuel quality control, environmental compliance and process optimization.

WHY SULFUR MONITORING MATTERS

Sulfur is one of the primary sources of environmental pollution. Sulfur dioxide (SO₂) generated from fuel combustion is a major cause of acid rain, while sulfur compounds in vehicle exhaust emissions can create significant health risks.

As environmental awareness and fuel specifications become stricter, petrochemical producers require lower detection limits and dependable online measurement techniques.

Complex refining processes require comprehensive online monitoring to control sulfur content throughout production, not only in final product quality control.

MAIN APPLICATIONS

Gasoline

Automotive gasoline

Naphtha

Diesel

Gas oil

Kerosene

Natural gas

LPG



Continuous sulfur control for refining, petrochemical and gas processing workflows

Design Concept - Simple & Reliable

UV fluorescence technology

The Model 800TS uses ultraviolet fluorescence (UVF) technology for sulfur content measurement. The method is rapid, accurate and aligned with recognized methods including ASTM D6667, ASTM D5453, ISO 20846, GB/T 34100 and SH/T 0689.

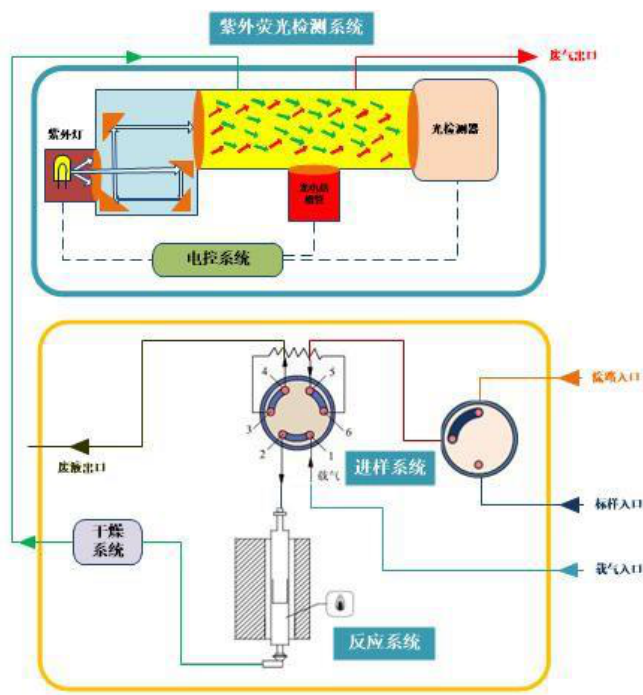
UV FLUORESCENCE MEASUREMENT PRINCIPLE

Sulfur compounds in the sample are converted to gaseous SO₂ in a high-temperature combustion furnace. SO₂ is exposed to ultraviolet light (hv₁), exciting it to SO₂*. As SO₂ returns to its ground state, it emits fluorescent radiation (hv₂). The sulfur concentration is proportional to the measured fluorescence intensity.



CATALYTIC COMBUSTION

The automatic sample injection valve precisely controls sample introduction into the high-temperature combustion tube, supporting complete conversion of sulfur compounds to SO₂ without carbon residue formation.



UV fluorescence detection system

Electronic control system

Sample introduction system

Drying system

Reaction system

Carrier gas / calibration gas inlets

Rapid and accurate measurement system

Exceptional Analytical Performance

features and long-term stability

FEATURES & BENEFITS

- Ultraviolet fluorescence detection for fast sulfur measurement.
- Patented catalytic combustion technology to support complete conversion of sulfur compounds to SO₂.
- Maximum 6-stream automatic switching capacity with rapid stream-to-stream measurement.
- Ultra-low detection limit: 100 ppb.
- Excellent repeatability and linearity for dependable process control.
- Single-point and multi-point calibration functions.

100 ppb

ultra-low detection
limit

6

stream auto
switching capacity

~3 min

carryover
elimination after
large concentration
shift

+/- 1%

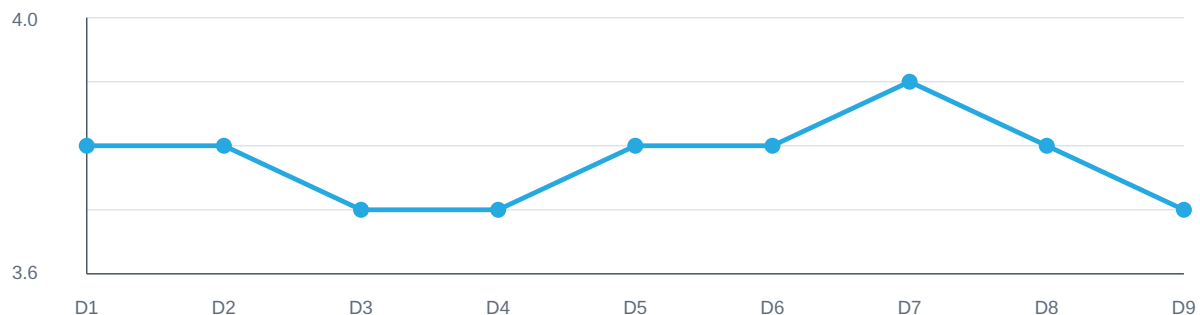
repeatability of full
scale

LONG-TERM STABILITY

The original 9-day stability dataset reports measured concentrations from 3.6 to 4.0 ppm, with daily averages between 3.7 and 3.9 ppm. This supports stable continuous operation for low-ppm sulfur applications.

Day	1	2	3	4	5	6	7	8	9
Average (ppm)	3.8	3.8	3.7	3.7	3.8	3.8	3.9	3.8	3.7

Daily average concentration (ppm)



Reliable Accuracy & Precision

range, precision and linearity

The Model 800TS provides accurate and precise sulfur measurements that reflect true variations in sample sulfur content. Users can adjust process conditions using real-time sulfur data and maintain compliance with final product specifications.

The measurement results are compared with the ASTM D5453 / GB/T 34100 laboratory method. After months of continuous testing, the analyzer results were found to be fully consistent with laboratory method results.

MEASUREMENT RANGE

0-100 ppm, customizable upon request for wider ranges.

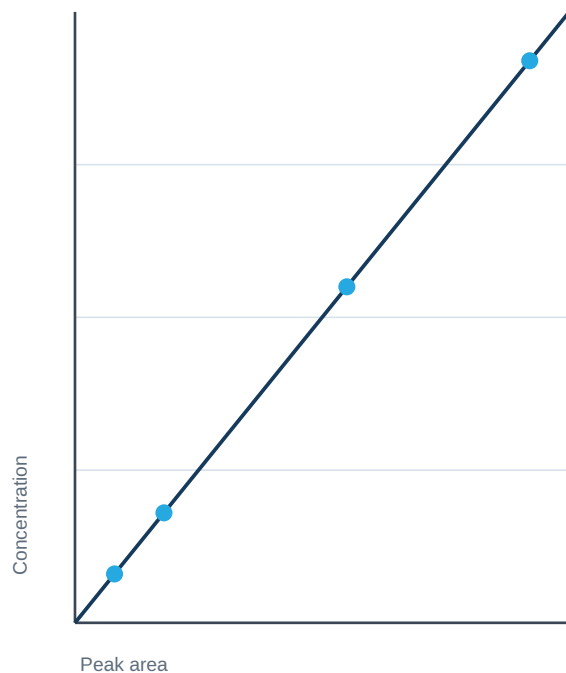
MEASUREMENT PRECISION

Multiple measurements below 5 ppm produced relative standard deviation (RSD) values under 3%.

LOW-PPM REPEATABILITY DATA

Gasoline (ppm)	Diesel (ppm)
4.2	3.8
4.3	3.7
4.2	3.8
4.1	3.8
4.3	3.9
4.4	3.7
4.3	3.7
4.2	3.6
4.4	3.7
4.1	3.7
RSD = 2.54%	RSD = 2.25%

Linearity: $r = 0.99969$



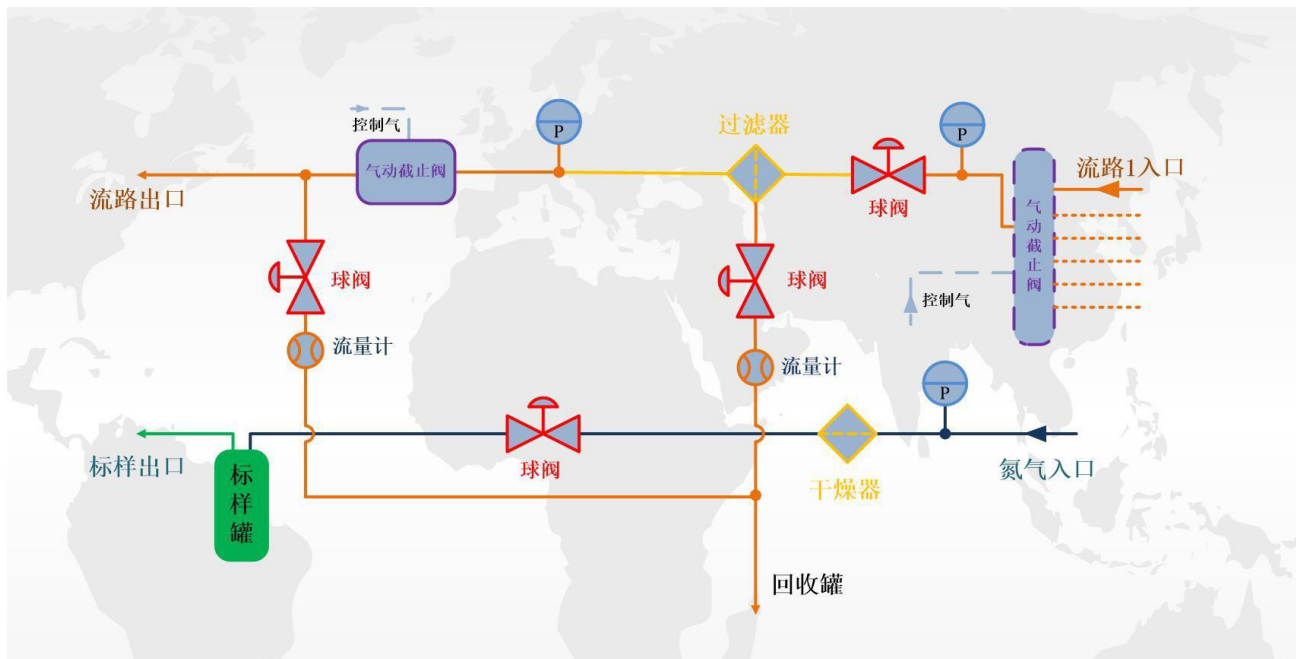
Precision expressed as RSD was less than 3%, meeting requirements for laboratory-grade data analysis in the tested gasoline and diesel samples.

Comprehensive Sample Pre-Treatment

reliable sample conditioning

Maintaining a uniform sample state before analysis is critical for accurate sulfur measurement. The sample pre-treatment system removes particulate matter, regulates sample pressure before entering the analyzer and controls flow rate to ensure consistent analysis conditions.

The system consists of a sample pre-treatment module and a calibration module. The pre-treatment section includes stream selection, filters, pressure gauges, shut-off valves, flow meters and a two-stage fast loop system.



PRIMARY PRE-TREATMENT COMPONENTS

Stream outlet

Stream 1 inlet

Calibration gas outlet

Calibration gas cylinder

Ball valve

Filter

Flow meter

Dryer

Nitrogen inlet

Waste tank

Pneumatic shut-off valve

Control gas

Communication & Diagnostics

control system integration

The Model 800TS is a multi-stream online sulfur analyzer with calibration functionality. It communicates with the control system through 4-20 mA signal output or RS-485, compliant with the RTU network communication protocol.

The software displays real-time concentration data and analyzer status information. In the event of a malfunction, the display interface issues an alarm and provides corresponding fault information. The analyzer can also shut off the sample stream automatically and control the furnace cooling process.



COMMUNICATION & DIAGNOSTICS

- RS-485 communication compliant with RTU network protocol
- 4-20 mA signal output per channel for data transmission
- Fault information displayed on the analyzer panel

OPERATIONAL SAFETY RESPONSE

During a fault condition, the system can issue an alarm, display fault information, shut off the sample stream and manage furnace cooling. This supports safer unattended online operation in process environments.

Technical Specifications

technical parameters

Technical parameter	Specification
Detector	Ultraviolet fluorescence detector
Compliance standards	ASTM D6667, ASTM D5453, ISO 20846, GB/T 34100, SH/T 0689
Measurement range	0-100 ppm, customizable upon request
Detection limit	100 ppb
Repeatability	+/- 1% of full scale
Linearity	+/- 2% of full scale
Calibration functionality	Single-point and multi-point calibration; per-stream 4-20 mA calibration
Digital communication	RS-485
Alarm output	Furnace temperature, system pressure, etc.
Ambient temperature	0-40 deg C
Power supply	220 VAC, 50/60 Hz, 3 KVA
Instrument air	0.6 MPa, 200 L/min, oil-free
Zero air	0.2 MPa, 1.5 L/min
Dimensions	705 x 386 x 1155 mm
Weight	Approx. 100 kg