

Continuous Emissions Monitoring System for the measurement of Total Reduced Sulfur (TRS) using field-proven, pulsed fluorescence technology.

Thermo Scientific Continuous Emissions Monitoring System for Total Reduced Sulfur



Key Features

- Designed to meet U.S. EPA 40 CFR Part 60 requirements
- Dry-basis measurement
- Reliable pulsed-fluorescence technology
- Corrective oxygen measurement
- Designed specifically for the pulp and paper industry

The Thermo Scientific Continuous Emissions Monitoring System (CEMS) for the measurement of Total Reduced Sulfur (TRS) is designed to meet the needs of the pulp and paper industry in complying with the regulatory requirements of 40 CFR part 60 as set forth by the U.S. EPA.

In order to measure TRS in accordance with the federal regulations, the sample must be measured on a dry basis and be corrected to a fixed Oxygen (O_2) content. This is accomplished by extracting the sample from the process using the Thermo Scientific PRO902C Low-Flow Dilution Probe.

First, the sample is passed through a water removal device to provide a dry sample. The oxygen content is measured

and the sample is diluted to an appropriate level, depending on the site conditions.

The diluted sample is sent through a sample line to the instrument cabinet and passes through a selective scrubber where Sulfur Dioxide (SO_2) is removed and TRS is allowed to pass. Next, the sample is routed to a thermal oxidizer where the TRS compounds react with O_2 under high temperature, and is then sent on to the Model 43i Pulsed Fluorescent SO_2 analyzer.

The result of this process is that TRS compounds are converted to SO_2 in a 1:1 ratio. This means the SO_2 reading from the analyzer is a true representation of the amount of TRS in the sample.

Product Specifications

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific air quality products.

Thermo Scientific Total Reduced Sulfur Continuous Emissions Monitoring System

Thermo Scientific Model 43i SO₂ Analyzer

Preset Ranges	0-0.05, 0.1, 0.2, 0.5, 1, 2, 5, and 10 ppm
Extended Ranges	0-0.05, 1, 2, 5, 10, 20, 50 and 100 ppm
Custom Ranges	0-0.05 to 100 ppm,
Zero Noise	0.25 ppb RMS (300 second average)
Lower Detectable Limit	0.5 ppb (300 second average)
Zero Drift (24 hour)	Less than 1 ppb
Span Drift (24 hour)	+/-0.5%
Response Time	320 seconds (300 second average)
Precision	1% of reading or 1 ppb
Linearity	+/-1% full scale
Sample Flow Rate	0.5 liters/min.
Temperature Range (Operating)	15°C - 35°C range
Outputs	Selectable voltage, RS232/RS485, TCP/IP, 10 status relays, and power fail Indication (standard). 0-20 or 4-20 mA isolated current output (optional)
Inputs	16 digital inputs (standard), 8 0-10Vdc analog inputs (optional)

Thermo Scientific Thermal Oxidizer

Maximum Flow Rate	1000 cc/min
Maximum Operating Temperature	2000°F
Maximum Pressure	5 PSIG at maximum temp.
Dimensions	3.5"Hx17"Wx13"D
Oxidation Media	Quartz
Heater	Ceramic Fiber, 220 Watt
Sensing Element	Type K Thermocouple
Temperature Controller	Microprocessor Based, Programmable PID with Auto-Tuning
Alarm Output	Electromechanical, Form A, 0.5A @120/240VAC
Temperature Stability	+/- 0.2°F per °F rise in ambient

Thermo Scientific PRO902C

Heated Filter	0.1-micron glass fiber element, temperature controlled at 300°F
Sample Orifice	Quartz glass, temperature controlled at 300°F (149°C)
Dilution Eductor	Sample flow rate of 100 cc/min. dilution air-flow rate of 5 liters/minute, heated eductor temperature 300°F +/- 2°F, eductor vacuum greater than 15" Hg
Calibration Line	0.64 cm (1/4") OD Teflon
Probe Assembly Weight	73lbs. (33kg)
Diluted Sample Dew Point	-20° to 20°F (-28° to -6°C)
Dilution Ratios	Between 20:1 and 200:1
Instrument Air Requirement	Clean, dry air at -40°F (-40°C) dew point, 70 PSI minimum
Operating Ambient Temp Range	-4° to 122°F (-20° to 50°C)
Maximum Process Temperature	662°F (350°C)
Modular Heat Exchanger	Thermo electrically cooled 35° to 45°F (2° to 7°C)
Modular TE O₂ Analysis System Enclosure	Electrochemical oxygen sensor Fiberglass, NEMA 4 X (17" (H) x 19" (W) x 10.5" (D))
Pressure Transducer	Loop powered 0-15 PSIA w/316 SS diaphragm and housing

Thermo Scientific SO₂ Scrubber

Air Requirements	5 liters/minute, 30-45 psi, oil free, SO ₂ -free, -20°F dewpoint
Water Requirements	Distilled, sulfur-free
Ambient Temperature Range	40-90°F
Allowable Sample Flow Rate	400-800 cc/minute
Assembly size	20" (50.8cm) H X 5" (12.2cm) W X 6" (15.2cm) D

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This product is manufactured in a plant whose quality management system is ISO 9001 certified.

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