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PRODUCT SPECIFICATIONS

Continuous Emissions Monitoring System for Total Reduced Sulfur

Using field-proven, pulsed fluorescence technology emissions monitoring

The Thermo Scientific™ Continuous Emissions Monitoring System for Total Reduced Sulfur features:

Features

- Dry-basis measurement
- Reliable pulsed fluorescence technology
- Corrective oxygen measurement
- Designed specifically for the pulp and paper industry, and the USA EPA 40 CFR Part 60 Requirements

Introduction

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 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 Thermo Scientific™ 43iQ 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.

Thermo Scientific™ CEMS for Total Reduced Sulfur

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Thermo Scientific CEMS for Total Reduced Sulfur

Thermo Scientific 43iQ SO_2 Analyzer

Range	0-10 ppm, 0-25 mg/m^3
Extended ranges	0-100 ppm, 0-250 mg/m^3
Zero noise	1.0 ppb RMS (10 second averaging time) 0.5 ppb RMS (60 second averaging time) 0.25 ppb RMS (300 second averaging time)
Detection limit	2 ppb (10 second averaging time) 1 ppb (60 second averaging time) 0.25 ppb (300 second averaging time)
Zero drift	<0.5 ppb (24 hour)
Span drift	±0.5% full scale (24 hour)
Response time	60 seconds (10 second averaging time) 110 seconds (60 second averaging time) 320 seconds (300 second averaging time)
Linearity	±1% full scale
Flow rate	0.5 lpm (standard)
Interferences (EPA levels)	Less than lower detectable limit except for the following: NO < 3 ppb, M-Xylene < 1ppb, H2O < 3% of reading
Operating temperature	0°-45°C

Thermo Scientific Thermal Oxidizer

Thermo Scientific™ Thermal Oxidizer	
Maximum flow rate	1000 cc/min
Maximum operating temp.	2000°F
Maximum pressure	5 PSIG at maximum temp.
Dimensions	3.5" H ×17" W ×13" D
Oxidation media	Quartz
Heater	Ceramic fiber, 220 Watt
Sensing element	Type K Thermo couple
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 temperature

Thermo Scientific PRO902C

Heated filter	0.1-micron glass fiber element, temperature controlled at 300˚F
Sample orfice	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 O_2 analysis system	Electrochemical oxygen sensor
Enclosure	Fiberglass, NEMA 4X (17" (H) × 19" (W) × 10.5" (D))
Pressure transducer	Loop powered 0-15 PSIA w/316 SS diaphragm and housing

Thermo Scientific SO_2 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 × 5" (12.2cm) W × 6" (15.2cm) D

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 products.

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