

Thermo Scientific Omni FTIR Multi Gas CEMS

Continuous emissions monitoring system for the measurement of 10 or more gases

The Thermo Scientific™ Omni FTIR Multi Gas CEMS is designed to meet 40 CFR Part 60 standards by using the state-of-the-art Thermo Scientific™ Antaris™ IGS gas analyzer to simultaneously monitor more than ten gases with high precision, sensitivity, speed and reliability within a tough industrial environment.

- Meets 40 CFR Part 60/63 standards and HCl Performance Specifications
- Leading-edge Antaris IGS analyzer for monitoring multiple gases, including HCl
- Capable of serving as a Reference Method 321 for HCl
- Automated dynamic spiking triggered by plant's DAS or DCS
- Unique flowback mode through sampling system for continued clean operation



The Thermo Scientific Omni FTIR Multi Gas Continuous Emissions Monitoring System (CEMS) uses the field-proven Thermo Scientific Antaris Industrial Gas System (IGS) analyzer to deliver research-grade continuous monitoring of multiple gases in a robust package designed specifically to meet 40 CFR Part 60 standards and related performance specifications.

Designed to help users meet performance specifications for gases such as Hydrogen Chloride (HCl), the Omni FTIR CEMS can also be employed as a Reference Method 321 for HCl.

The system is capable of simultaneously monitoring 10 or more gases, using an advanced software platform to calibrate and analyze spectra with high sensitivity and precision. The system supports automated dynamic spiking that can be remotely triggered through the plant installed data acquisition system (DAS) or data control system (DCS). In addition, the system is easily integrated with the DAS or DCS through MODBUS or 4-20 ma analog outputs with digital I/O.

The Omni FTIR Multi Gas CEMS has the unique ability to switch to a Flowback mode that purges the sample stream all the way from the analyzer through the sample line to the tip of the probe. This feature enables clean and continuous operation of the system and eliminates the likelihood of sample line contamination.

The Omni FTIR CEMS uses a modular design for reliable trouble-free operation in demanding conditions, requiring minimal method maintenance. The Antaris IGS analyzer is a primary component of the system and uses a dynamically aligned interferometer, high precision mirrors, and a thermo-electrically cooled detector to offer superior minimum detection limit (MDL), selectivity, accuracy and speed. This combination of speed and performance is ideal for detailed analysis of rapidly changing complex gas mixtures in the stack.

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Thermo Scientific Omni FTIR Multi Gas CEMS

Linearity	<2% of minimum measuring range
Zero drift	<3% of minimum measuring range
Span drift	<2% of minimum measuring range
Influence of ambient temperature	<5% of minimum measuring range for zero and span with 20 °C as reference
Influence of sample gas pressure	None (pressure compensation)
Flow	~5 l/min
Response time T95	<3 minutes for all non-reactive gases; <5 minutes for NH ₃ , HCl and HF spiking; <10 minutes for NH ₃ , HCl and HF dry
Availability	>98%
Instrument Air	80-120 PSI, 5 SCFM
Ambient temperature	+60 to +95 °F/+15 to +35°C
Physical dimensions	22" (W) x 70" (H) x 36" (D); 31" (W) x 70" (H) x 36" (D) (built system)
Weight	~ 440 lbs (200kg)
Sample line length	Up to 120 feet
Power requirements	230 VAC, XX AMPS
Analog signals	4-20 mA for each measured concentration
Digital signals	FTIR data valid, temperature alarm for sample probe, heated lines, sample conditioning assembly, and FTIR cell; Status measurement/maintenance; Gas mode inputs and outputs: check span, check spike, check zero, background and flowback, blowback, and sample

Thermo Scientific™ Antaris™ IGS Analyzer

The Thermo Scientific Antaris IGS analyzer was specifically developed to meet the needs of demanding gas applications. Developed as an industrial FTIR system that can be deployed in either a rack-mount manufacturing environment of a table-top quality control area, the Antaris IGS analyzer provides the industry's highest possible performance in calibration and stability, method transferability and high speed data acquisition.



System Components

The main components of the system are the Antaris IGS analyzer, Sample Handling System, and an advanced software platform.

Sample Handling System

Consists of a direct extractive probe, heated sample line (not included with the system), pump assembly, hydrator, and purge gas generator. The probe assembly consists of a stainless steel/hastelloy probe barrel and a heated filter assembly. The entire sample stream, from the probe stinger to the analysis bench, is maintained at a temperature of 190°C to prevent sample loss or condensation.

Advanced Software Platform

The PC gathers information from the FTIR and temperature controller and reports readings over analog and digital I/O lines, Ethernet, and Serial.

Applications

The Omni FTIR CEMS uses the hot-wet extractive measurement technique and can be used in various applications including coal-fired power plants, cement kilns, waste incinerators, and to study industrial processes with multiple effluents.

Compound	Compound (ppm)	MDL 1σ 3 min. avg (ppm)
Carbon monoxide CO	0–750	0.15
Nitric oxide NO (gas turbine)	0-1200	0.40
Sulfur dioxide SO ₂	0– 350	0.40
Hydrogen chloride HCl	0–150	0.10
Ammonia NH ₃	0–100	0.10
Water H ₂ O	0–40.0 vol%	0.01 vol%
Nitrogen dioxide NO ₂	0–50.0	0.10
Nitrous oxide N ₂ O	0–50.0	0.10
Hydrogen fluoride HF	0–15.0	0.15
Carbon dioxide CO ₂	0–30.0 vol%	0.02 vol%
Sulfur hexafluoride SF ₆	0–10.0	0.003

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

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