



EMS-10 Continuous Emissions Monitoring System (CEMS)

Technical specifications for compliance with US EPA PS-19

The Thermo Scientific™ EMS-10™ is a fully automated, four-channel stack emissions monitoring system designed and optimized to continuously measure ethylene oxide (EtO) and other pollutants.

The system complies with the performance specifications outlined in the United States Environmental Protection Agency's (US EPA) NESHAP* for EtO commercial sterilizers.

Meeting EPA PS-19 using EMS-10 CEMS

Performance specification	Criteria	Thermo Scientific EMS-10 CEMS system performance	Why choose the EMS-10
Section 11.1: Interference	Section 13.5: Sum of interference responses ≤ 30 ppbv	Sum of interference responses 0.4 ppbv	Thermo Scientific™ Starboost™ OE-FTIR technology, in conjunction with novel spectral-zeroing techniques, eliminates concentration biases due to cross-interferences and exceeds the PS-19 specification.
Section 11.2: Level of detection (LOD)	Section 13.1: LOD $< 20\%$ of the regulatory limit, typically 20 ppbv	LOD < 1 ppbv	Starboost OE-FTIR sensitivity exceeds PS-19 requirements.
Section 11.3: Response time (RT)	Not specified	15 to 30 sec (typical) Depends on sample line length and flow rate	The EMS-10 uses a 10 L/min diaphragm pump for rapid turnover of the sample train and gas cell, even with 200 ft of heated lines.
Section 11.4: Measurement error (ME)	Section 13.3: $\leq 5.0\%$ of span	Demonstrated $\leq 2\%$ of span in the field	Starboost OE-FTIR guarantees accurate results over a wide concentration range.
Section 11.5: 7-day calibration drift	Section 13.2: $\leq 5.0\%$ of span	Demonstrated $\leq 2\%$ of span in the field	Starboost OE-FTIR has constant calibration and very stable response over time.
Section 11.0 (g): Sample time (ST)	Section 11.0 (g): $\geq 3 \times$ response time	45 to 90 sec (typical) Depends on response time, which is typically 15 to 30 seconds	The Starboost OE-FTIR is capable of scanning as fast as 1 sec (3600 datapoints per hour); however, this is not necessary to comply with PS-19. PS-19 requires at least one data point per 15 minutes, so fast scanning times are not required.
Section 11.0 (g): Cycle time (CT) and measurement points allowed**	Section 11.0 (g): Maximum # of measurement points must be < 15 -minutes / longest cycle time	Can sample at least 4 sources that are time-sharing	The EMS-10 is available in a 1-channel or 4-channel configuration to accommodate multiple sources. Both systems meet time requirements outlined in PS-19.

* National Emission Standards for Hazardous Air Pollutants

** Relevant for time-sharing CEMS only

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