

## A Comprehensive Solution for EtO Indoor Air Quality and Stack Emissions Monitoring

### Background

Ethylene Oxide (EtO), a widely utilized sterilizing agent for medical equipment and devices, has been increasingly scrutinized due to its potential negative health effects, such as carcinogenicity and mutagenicity. As a result, federal, state, and local agencies have implemented stricter regulations surrounding EtO emissions, including the Proposed Interim Decision (PID) intended to reduce the risk to workers regarding the use of ethylene oxide and the proposed National Emission Standards for Hazardous Air Pollutants (NESHAP). Companies operating in this space must stay informed about these regulatory changes and adapt their practices accordingly to ensure compliance and minimize risks.



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### Maximizing Compliance and Efficiency

Montrose Environmental Group and Thermo Fisher Scientific have collaborated to provide an all-encompassing solution for organizations facing challenges in EtO emissions monitoring, testing, and regulatory compliance. By integrating Montrose's extensive project services expertise with the purpose-built Thermo Scientific™ MAX-iAQ™ Air Ambient Monitoring System and EMS-10™ Continuous Emissions Monitoring (CEMS) systems, clients gain access to a powerful combination that streamlines their efforts to meet stringent regulations and maintain safe operations.

### The Power of Collaboration: SensibleEDP

Montrose's SensibleEDP offers a broad range of services for EtO sterilization facilities and chemical manufacturing plants using EtO. Their expertise includes ambient air monitoring, real time software, source testing, laboratory analysis, LDAR, and CEMS installation, as well as regulatory compliance assistance. Montrose's team of specialists possesses decades of experience, ensuring clients receive top-notch guidance and support in utilizing advanced technologies such as the MAX-iR™ FTIR Gas Analyzer.

The MAX-iAQ and EMS-10 systems are based on the Thermo Scientific™ MAX-iR™ FTIR Gas Analyzer, a state-of-the-art measurement technology specifically designed for continuous monitoring of EtO with a limit of detection of 1 ppb. Its high sensitivity and accuracy enable organizations to detect and measure EtO emissions in real-time, ensuring adherence to the most stringent regulatory requirements.



MAX-iR FTIR gas analyzer.

# Addressing Evolving EtO Emission Regulations

Thermo Scientific™ MAX-iR™ FTIR Gas Analyzer combines with Thermo Scientific™ StarBoost™ Optically-Enhanced FTIR (OE-FTIR) technology to allow users to achieve detection limits of 1 ppb while maintaining all the benefits of real-time FTIR analysis. This technology breakthrough, available only with the MAX-iR analyzers, utilizes FTIR spectroscopy, a trusted technique in environmental applications for over 30 years due to its reliability, ease-of-use, and low maintenance.

## Better Together

The combination of Thermo Fisher's advanced technology and Montrose Environmental Group's expertise in ambient air monitoring creates a comprehensive solution for organizations to tackle the challenges of EtO emissions monitoring, regulatory compliance, and maintaining safe operations. This robust partnership ensures that clients can rely on cutting-edge technology and industry-leading services to meet the ever-evolving demands of EtO emission regulations.

## Integrated Solutions for iAQ and Stack Emissions

Test	Measurement	Result
Limit of detection	3σ	0.6 ppb
Accuracy	Avg. error (% of span)	-1.08%
Linearity	R <sup>2</sup>	0.9998
Response time	Rise time	12 seconds
	Fall time	11 seconds
Spike recovery	Avg. % recovery	92.37%
US EPA	Relative bias	7.63%
Method 301	Precision (RSD)	2.82%

EMS-10 OE-FTIR System Field Study Results

The impressive results displayed in the table above are from a field study at a commercial sterilization facility where the EMS-10 System was continuously measuring EtO emissions from a common stack, following US EPA ALT-142. While various factors can affect the performance of the EMS-10 System, this field study showcases its potential for providing precise and reliable EtO emissions measurements.

### Next Steps

Discover how our combined expertise and technology can provide the comprehensive solution you need to navigate the evolving regulatory landscape of EtO emissions and ensure the highest level of safety and operational efficiency. Contact us: [demo@sensible-edp.com](mailto:demo@sensible-edp.com)



MAX-iAQ™ Ambient Air Monitoring System



EMS-10™ Continuous Emissions Monitoring System

- **Installation:** Seamless integration and optimization of MAX-iAQ™ and EMS-10™ CEMS Systems.
- **Operation & Maintenance:** Expert handling of equipment and processes for accurate EtO monitoring.
- **Quality Assurance:** Regular audits to ensure accuracy and compliance.
- **Alert Response:** Immediate action when pollutant levels exceed predetermined thresholds
- **Compliance Advisory:** Expert guidance navigating evolving regulatory requirements.