

# Process &

# Environmental

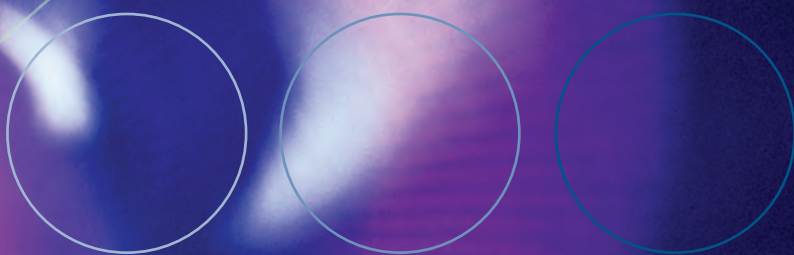
# Analysis Solutions

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# Enabling

## Enabling Continuous Process **Monitoring**

- EXHAUST EMISSIONS ANALYSIS
- CONTINUOUS EMISSIONS MONITORING
- CWA/HPM/TIC AMBIENT AIR ANALYSIS
- NATURAL GAS COMPOSITION AND CV MONITORING
- SPECIALTY GASES ANALYSIS AND CERTIFICATION
- IN-LINE PROCESS MONITORING



# Optical Gas Analyzers



## MultiGas™ Series FTIR Gas Analyzers —

MultiGas™ FTIR (Fourier Transform Infrared) Spectrometry instruments are capable of ppb to sub ppm sensitivity for multiple gas species in a variety of gas analysis applications, such as stack gas emissions, vehicle and engine certification testing, continuous emissions monitoring (CEM), catalyst performance testing, bulk gas purity analysis, protocol gas certification, and finally vehicle, diesel, marine, locomotive, non-road and other engine exhaust monitoring. The MultiGas Analyzer is available in the following models:

- MultiGas 2030 Analyzer for compliance testing
- MultiGas 1065 Analyzer for high speed 5 Hz engine emissions testing
- MultiGas 2032 Purity Analyzer for real-time trace impurity analysis
- MultiGas 2031 Analyzer for protocol gas certification
- MultiGas CEM Analyzer for continuous emissions monitoring

MultiGas FTIR Analyzers are Class 1 laser products containing a class 3R laser with continuous wave output at 633 nm.

## Continuous Emissions Monitoring Kit (CEMS Kit) —

The MGS300-KIT provides integrators with access to key components used in a Continuous Emissions Monitoring System (CEMS) which has achieved TÜV and MCERTS certification in accordance with requirements of the DIN EN 15267-3 standard. The MGS300-KIT allows integrators to build system performance and reliability into their own continuous emissions monitoring systems. It is designed to monitor emissions from stationary sources such as waste incinerators, power plants and cement kilns and is able to directly measure the composition of hot, wet and corrosive sample streams without the need for sample conditioning. Key to the design is the MultiGas™ 2030 CEM-Cert FTIR analyzer, which is able to monitor multiple gas constituents over a wide range of gas mixtures. Its high resolution ( $0.5 \text{ cm}^{-1}$ ) enables the monitoring of these components with minimal cross interference effects from water (up to 40%) or other potentially interfering elements. Also, the MultiGas' permanently stored, internal calibration spectra eliminates the need for costly calibration gas mixtures. The MGS300-KIT is comprised of the MultiGas 2030 CEM-Cert FTIR analyzer, and the critical sampling components MGS300-SP sample probe and MGS300-EP eductor pump module.



## MultiGas™ TFS™ Monitor —

The MKS MultiGas™ TFS™ monitor is based on the innovative all optical Tunable Filter Spectroscopy platform, and provides a high performance, low-cost, multi-components alternative to the single analyzer technologies for trace hydrocarbon, moisture, CO, CO<sub>2</sub> and N<sub>2</sub>O measurements. The MultiGas TFS is designed for 24/7 operation, low maintenance, and has very low detection limits (ppb to 10's of ppbs) along with high repeatability. It is well positioned between traditional NDIR (Non-Dispersive Infrared) and laboratory grade FTIR (Fourier Transform Infrared).



### Precisive® TFS™ —

The MKS Precisive® TFS™ is based on the innovative all optical Tunable Filter Spectroscopy platform and provides real-time gas analysis in the natural gas and hydrocarbon processing industries, including refineries, hydrocarbon processing plants, gas-to-power machines, biogas processes and fuel gas transportation and metering. It delivers real-time unattended analytics with hydrocarbon speciation capability—equivalent to traditional Gas Chromatography (GC) instruments but with a greater ease of use and a much lower cost of ownership.



### AIRGARD® Ambient Air Analyzer —

The AIRGARD® CWA/HPM/TIC Ambient Air Analyzer for Continuous Chemical Warfare Agent (CWA), Hazardous Protection Materials (HPM), and Toxic Industrial Chemical (TIC) monitoring is a self-contained, ultra-sensitive, Fourier Transform Infrared Spectroscopy (FTIR) based gas analyzer that rapidly detects toxic gases. The AIRGARD analyzer has been tested against all Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM) threat listed gases, mixtures of threat agents and common interfering materials with no false positive alarms and greater than 97% detection. The AIRGARD analyzer has been thoroughly tested by the United States Department of Defense for sensitivity, specificity, response time, and immunity to false positive readings and prevents unnecessary alarms, evacuations or interruptions of business. The AIRGARD Plus is also available with ancillary electrochemical sensors that detect halogens (chlorine & fluorine) and hydrogen sulfide—materials that have a weak or no infrared signal. AIRGARD Ambient Air Analyzers are Class 1 laser products containing a class 3R laser with continuous wave output at 850 nm.

### Process Sense™ Chamber Clean Endpoint Sensor —

The Process Sense™ NDIR endpoint sensor is a small, low cost partial-pressure analyzer specifically designed to determine the completion of plasma chamber cleaning for both semiconductor and flat panel deposition chambers. Process Sense is based on infrared absorption, the only technique applicable to all (in-situ and remote) plasma cleaning processes. The Process Sense installs into the rough line, ensuring no effect on deposition hardware. The signal levels reported by the Process Sense can be used to determine the completion level of any clean with respect to time, and communicate back to the process tool to signal endpoint.



