

# FTIR, NDIR AND TUNABLE FILTER SPECTROMETERS

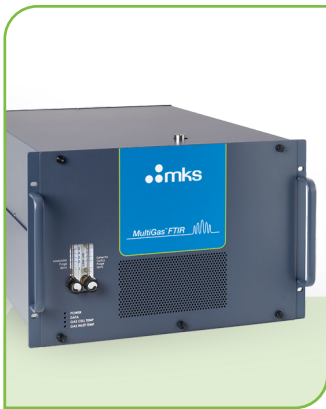
## CONTINUOUS PROCESS MONITORING



## FTIR, NDIR AND TUNABLE FILTER SPECTROMETERS PROCESS AND ENVIRONMENTAL ANALYSIS SOLUTIONS

MKS optical gas analysis solutions employ Fourier Transform Infrared (FTIR), Nondispersive Infrared (NDIR) and Tunable Filter Spectroscopy (TFS™) technologies for manufacturing applications such as combustion emissions, air purity, precursor concentration monitoring, etch process, endpoint detection, chamber clean, gas blending control, chemical process monitoring, and selective catalytic reduction (SCR). With high accuracy and selectivity, MKS analyzers provide continuous monitoring of various gases to deliver analytical data that significantly improves process performance in critical applications.

- Highly reliable, real-time gas analysis in a variety of industries including Semiconductor, Specialty Gases, Automotive and Defense
- Effective, high-performance detection that improves productivity and yield



### MULTIGAS™ FTIR Gas Analyzers

- Simultaneous analysis of more than 30 gases
- Permanent and transferable calibration spectra reduces the need for gas cylinders
- 10-100 ppb sensitivity for many toxic gases
- Linearized detector response assures all instruments maintain the same calibration
- User-friendly software reduces the need for highly-trained operators
- Multiple configurations available to meet a wide array of application requirements



### AIRGARD® CWA/HPM/TIC Ambient Air Analyzers

- Ultra-sensitive toxic gas detection
- Single-digit parts per billion (ppb) detection of a broad range of threats
- Rapid response - typically less than 20 seconds
- Compact and rugged design for reliable performance
- Ethernet connectivity for remote monitoring



### PROCESS SENSE™ NDIR Endpoint Detector

- Specifically designed for chamber clean endpoint detection for silicon-based CVD deposition chambers
- Sensitivity to SiF<sub>4</sub> down to 1 ppm
- Simple analog output for reported concentration signal
- Reduced chamber clean time increases wafer throughput
- Reduced NF<sub>3</sub> usage and power consumption



### PRECISE® 5 Gas Analyzers

- Real-time, continuous measurement of a wide range of gases across multiple process industries
- Controls critical process parameters
- No carrier gas or fuel gas requirements
- Compact, outdoor rated, low power
- Hazardous Area certified

## FTIR Gas Analyzers

FTIR spectroscopy gas analyzers from MKS are capable of ppb to ppm sensitivity for multiple gas species in a variety of gas analysis applications such as toxic gas detection, automotive emissions measurement, and monitoring stack emissions, processes, ambient air, purity, and selective catalytic reduction performance.

## NDIR Gas Analyzers

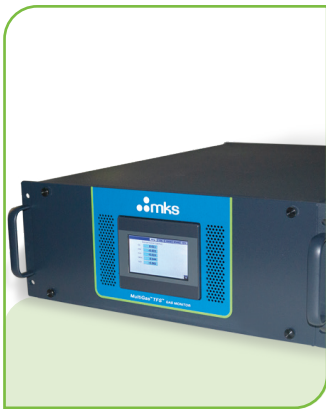
Our NDIR endpoint sensor is specifically designed for Remote Plasma Chamber Clean Endpoint detection for silicon-based CVD deposition chambers. Process Sense is based on infrared absorption, the only technique applicable to all plasma cleaning processes (in-situ and remote). Mounted to a bypass on the rough line ensures no effect on deposition hardware. The signal level reported by the

Process Sense, which is proportional to  $\text{SiF}_4$  concentration, can be used to determine the completion of the chamber clean process.

## Tunable Filter Spectrometers

MKS Instruments' platform of innovative optical analyzers based on Tunable Filter Spectroscopy provides real-time gas analysis, while delivering customers a substantially lower total cost of ownership. TFS can be utilized from UV (Ultra-Violet) through IR (Infra-Red) spectral regions. TFS sensor platforms have been on the market since 2008 with more than 2500 systems deployed.

**For detailed specifications on MKS Optical Gas Analyzers visit <https://www.mksinst.com/c/optical-gas-analyzers> or contact us at +1 978-645-5500.**



### MULTIGAS™ TFS™ Gas Monitor for Multi-Compound Gas Analysis

- Continuous measurement for rapid detection of changes in effluent composition
- High analytical performance, low detection limits, high stability, linearity over wide ranges
- Complete, integration-ready system reduces complexity and ensures fast install time
- Permanent calibration reduces the need for costly calibration gas cylinders
- Easy installation and maintenance

### T-SERIES Advanced IR Gas Analyzer for Process Monitoring

- Inline or in-process sampling with configurable manifold and sample ports design
- Versatility with ppm to percent level sensitivity for most IR active gases
- Improves gas measurement accuracy and selectivity over traditional NDIR analyzers
- Easy installation and maintenance

## WHY MKS?

### CRITICAL TECHNOLOGIES

World-class technology and development capabilities for leading-edge processes



### PROVEN PARTNER

Recognized leader delivering innovative, reliable solutions for our customers' most complex problems



### OPERATIONAL EXCELLENCE

Consistent execution across all aspects of our business



### COMPREHENSIVE PORTFOLIO

Extensive offering of products and services for the markets we serve



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**MKS INSTRUMENTS** enables technologies that transform our world. We deliver foundational technology solutions to leading edge semiconductor manufacturing, electronics and packaging, and specialty industrial applications.

We apply our broad science and engineering capabilities to create instruments, subsystems, systems, process control solutions and specialty chemicals technology that improve process performance, optimize productivity and enable unique innovations for many of the world's leading technology and industrial companies.

Our solutions are critical to addressing the challenges of miniaturization and complexity in advanced device manufacturing by enabling increased power, speed and feature enhancement for optimized connectivity. Our solutions are also critical to addressing ever-increasing performance requirements across a wide array of specialty industrial applications.

Additional information can be found at [www.MKS.com](http://www.MKS.com).

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