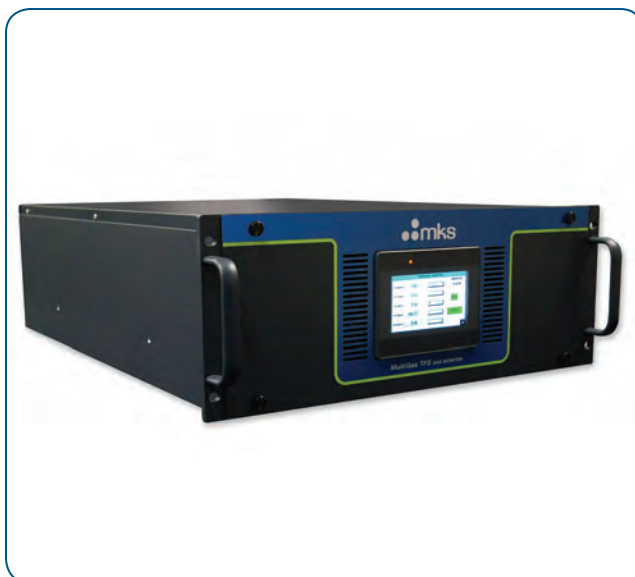


**Process &**

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# MultiGas™ TFS™ Monitor

## MULTI-COMPONENT ONLINE GAS ANALYZER

MKS MultiGas™ TFS™ Monitor is an online, multi-compound, trace gas monitoring system in a stand-alone 19-inch rack enclosure. It uses an innovative tunable filter spectroscopy technology enabling high selectivity and stability measurement. Low detection limit (sub-ppm levels for most gases) is achieved through the use of high throughput optics coupled with a long-path gas cell and a high sensitivity detector.

The all-optical MultiGas TFS Monitor provides an alternative to the traditional analyzer technologies for trace hydrocarbon, moisture, CO, CO<sub>2</sub> and N<sub>2</sub>O measurements, enabling low cost yet high performance analysis.

The analyzer is permanently calibrated, reducing the need for costly reference gas mixtures. The calibration stability is guaranteed through the use of "feature based" measurement and an advanced spectral processing algorithm that compensates for baseline variations.

### Features & Benefits

- A single analyzer measuring multiple compounds
- 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
- Low cost of ownership, easy to install and maintain
- Continuous measurement for rapid detection of changes in effluent composition
- Replaces multi-analyzer solutions, reducing costs and infrastructure requirements



## Industries

- Air Separation
- Bulk & Specialty Gas
- Hydrocarbon Processing
- Semiconductor
- Stack Emissions/CEM

## Applications

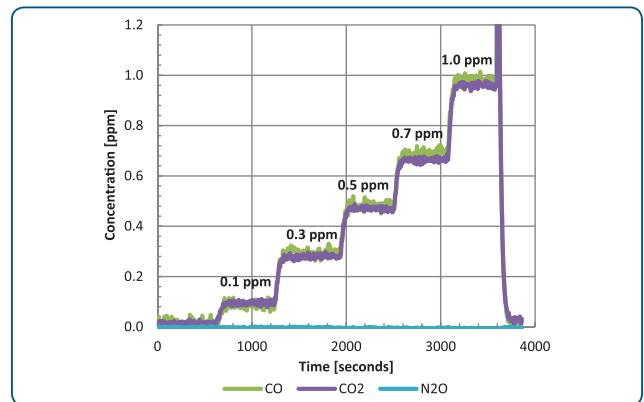
- Impurity Monitoring
- Process Safety Monitoring
- Product Quality Analysis
- Process Monitoring/Control
- Emissions Monitoring/Control

## Detection Limits of Sample Compounds

Table 1 shows some of the possible measured compounds and the estimated detection limits. Estimated detection limits are calculated as three times the standard deviation with an averaging time of 30 seconds.

- Detection limits shown in pure background gas
- May differ based on application
- Shaded gases are currently available

TABLE 1	
Component	Detection Limit (ppmV)
CH <sub>4</sub>	0.05
CO	0.05
CO <sub>2</sub>	0.05
H <sub>2</sub> O	0.25
N <sub>2</sub> O	0.02
C <sub>2</sub> H <sub>6</sub>	0.05
C <sub>2</sub> H <sub>2</sub>	0.05
C <sub>2</sub> H <sub>4</sub>	0.05
C2+	0.05
HCl	0.03
NH <sub>3</sub>	0.2
NO	0.3
NO <sub>2</sub>	0.05
SO <sub>2</sub>	0.06



### Example Configuration —

Monitoring of CO<sub>2</sub>, N<sub>2</sub>O, and CO in Nitrogen background gas



# Specifications

## Analyzer

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Measurement Technique	IR absorption using Tunable Filter Spectrometry
Measurable Gases	All IR active gases (see Table 1 for example gases)
Gas Cell Path Length	10 meter, with proprietary high throughput folded path design
Update Rate	1 - 120 seconds (software configurable)
Calibration	Factory calibrated; no recalibration required
Zero Drift	<15 ppb per day (typical)
Optics Purge Flow	0.2 L/min of dry nitrogen or CO <sub>2</sub> - free clean, dry air with dewpoint below -70°C
Pressure Transducer	MKS Baratron® capacitance manometer to compensate for sample pressure variations
Purge Connection	1/8" Swagelok®
Dimensions	19" W x 7" H x 25" D (48.3 cm W x 17.8 cm H x 64.5 cm D)
Installation	19" rack mount chassis
Power	120 VAC, 60 Hz, 3.3A / 230 VAC, 50 Hz, 1.7A
Weight	35 lbs. (16kg)

## Sampling Parameters

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Sample Temperature	10 - 50°C (nominal)
Sample Flow	0.5 L/min (nominal)
Sample Pressure	1 atm ±0.1 (nominal)

## Gas Cell

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Construction	Nickel coated Al
Fittings	4 VCR® Swagelok
Tubing	1/4" stainless steel
Mirrors	Nickel plated aluminum substrate, with rugged gold coating
Windows	ZnSe
O-rings	Viton®

## Communication Options

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Communication Protocol	Modbus TCP/IP or Modbus RS-485 Four, 4 – 20 mA analog output
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## Ordering Information

Please contact your local MKS office for price and availability information.



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