Process &
Environmental
Analysis Solutions

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MultiGas™ 2030 CEM

GAS ANALYZER FOR CONTINUOUS EMISSIONS MONITORING

The MultiGas™ 2030 CEM is an FTIR-based gas analyzer designed for integration with complete continuous emissions monitoring systems (CEMS) to measure emissions from stationary sources such as waste incinerators, power plants and cement kilns. This analyzer is the core technology used in the TÜV and MCERTS certified MGS300 system produced by MKS Instruments.

The MultiGas 2030 instrument is capable of directly analyzing hot, wet effluent gas streams without the need for sample pre-treatment. Owing to its high resolution FTIR technology (0.5 cm^{-1}) the MultiGas 2030 CEM is capable of monitoring multiple gas components over a wide range of compositions with minimal cross-interference effects from either water (up to 40%) or other potentially interfering species. Furthermore, by using permanently stored internal reference calibration spectra, the need for costly calibration gas mixtures is all but eliminated.

Features & Benefits

- Single FTIR analyzer measures main target emission species including: NO, NO_2, N_2O, SO_2, CO, CO_2, CH_4, HCl, HF, NH_3 and H_2O – no additional analyzers required for these components
- Direct analysis of effluent streams containing up to 40% water – no sample preparation required
- Permanent reference calibration spectra – all but eliminates the need for costly calibration gas cylinders
- Patented, linearized detector response – ensures all instruments maintain the same calibration and can use the same reference calibration spectra
- Frequency and resolution diagnostics ensure instrument response, and therefore calibration, is maintained for maximum accuracy
- Heated gas cell with automatic temperature and pressure compensation – maximizes accuracy performance and eliminates sample component condensation
- Continuous monitoring capability with rapid response to changes in the sample composition - complies with t90 performance requirements
- Software with several communication protocol options for interfacing the MultiGas 2030 with a CEMS control platform – flexible system integration
- Easy to integrate, install and maintain – low cost of ownership

Description

The MultiGas 2030 analyzer is made up of a Process FTIR spectrometer, a patented, high-optical-throughput gas cell and a long wavelength, thermoelectrically (TE) cooled detector. Also included is the MG2000 software platform which offers several communication protocol options for interfacing to CEMS control systems.

The MultiGas 2030 instrument is housed in a rugged 19-inch rack mount chassis for convenient integration with most CEMS enclosures. The analyzer is easy to maintain and has a low cost of ownership (COO).

Applications

The MultiGas 2030 CEM is designed for integration with complete continuous emissions monitoring systems to measure gaseous emissions from stationary sources such as:

- Waste incinerators
- Power plants
- Cement kilns
- Large combustion plants
- Turbine engines

Certification

The MultiGas 2030 CEM is the core technology used in the TÜV and MCERTS certified MGS300 system produced by MKS Instruments. MGS300 system certification was achieved in compliance with the DIN EN 15267-3 standard, which relates to automated measuring systems for the monitoring of emissions from stationary sources.

Performance

The TÜV and MCERTS “certification” and “supplementary” ranges achieved for the different gas components are shown in Table 1 below. Table 2 shows the same certification ranges, but this time in ppm, along with additional ranges and estimated detection limits calculated as three times the standard deviation in 25% water.

Gas Component	Certification Range	Supplementary Range 1	Supplementary Range 2
CH_4	0 - 15	0 - 50	0 - 500
CO	0 - 75	0 - 300	0 - 1500
HCl	0 - 15	0 - 90	0 - 200
HF	0 - 3	0 - 10	—
N_2O	0 - 50	0 - 100	0 - 500
NH_3	0 - 10	0 - 75	—
NO	0 - 200	0 - 400	0 - 1500
NO_2	0 - 50	0 - 100	0 - 1000
SO_2	0 - 75	0 - 300	0 - 2000

Table 1 — Gas Components and Ranges in mg/m^3

Addressed by the TÜV & MCERTS certified MGS300 system

Gas Comp.	Cert. Range	Supplementary Range 1	Supplementary Range 2	Additional Ranges	Detection Limit
CH_4	0 - 21	0 - 70	0 - 700	Upon request	0.3
CO	0 - 60	0 - 240	0 - 1200	0-4500	0.5
HCl	0 - 9	0 - 55	0 - 123	Upon request	0.20
HF	0 - 3.4	0 - 11	—	0-20	0.25
N_2O	0 - 26	0 - 51	0 - 255	Upon request	0.1
NH_3	0 - 13	0 - 99	—	0-300	0.35
NO	0 - 149	0 - 299	0 - 1119	0-3000	0.5
NO_2	0 - 24	0 - 49	0 - 488	0-2000	0.4
SO_2	0 - 26	0 - 105	0 - 699	0-2500, 0-5000	0.6

Table 2 — Gas Components and Ranges in ppm

Specifications

Analyzer

Measurement Technique	FTIR Spectrometry
Gases and Ranges	Refer to the Gas Components and Ranges Table
Spectral Resolution	0.5 cm^{-1}
Scan Time	60 seconds
Infrared Source	Silicon Carbide @ 1200°C
Reference	Helium Neon Laser (15798.2 cm^{-1})
Detector	Thermoelectrically (TE) cooled MCT (Hg Cd Te)
Certified Temperature Range	+5°C to +40°C
Purge Pressure	20 psig (1.5 bar) max.
Spectrometer Purge Flow	0.2 L/min of dry N_2 or CO_2 free clean, dry air with dewpoint below -70°C
Optics Purge Flow	0.2 L/min of dry N_2 or CO_2 free clean, dry air with dewpoint below -70°C
Purge Connection	¼" Swagelok® quick connect
Pressure Transducer	MKS Baratron® capacitance manometer
Dimensions	444.5 W x 317.5 H x 647.7 D mm (17.5"W x 12.5"H x 25.5"D)
Enclosure	19" Rack mount chassis
Power	230VAC/50Hz or 115VAC/60Hz, 3 amps
Weight	50 kg (110 lbs.)
Compliance	CE
Laser Safety	Class 1 laser product contains a Class 3R laser with continuous wave output at 633 nm

Sampling Parameters

Sample Temperature	191°C
Sample Flow	1 to 2 L/min
Sample Pressure	1 atm ±0.05

Gas Cell

Construction	Ni coated Al
Mirrors	Ni plated Al substrate with corrosion resistant MgF_2 coated gold surface
Path Length	5.11m
Fittings	¼" threaded Swagelok®
Tubing	Heated ¼" stainless steel
Windows	BaF_2
O-rings	Viton®

Computer Requirements and Communication Options

Computer Requirements	Desktop or notebook (1024 x 768 resolution) Intel Pentium® PC, Microsoft® Windows® XP or Windows® 7 OS
Minimum Specification	Intel Pentium III, 850 MHz, Microsoft Windows XP, 256MB
Computer/FTIR Communications	RJ-45 Crossover Ethernet
Communication Protocol Options	TOOLweb® (HTML based), OPC, Modbus TCP/IP

Ordering Information

Ordering Code

MultiGas 2030 CEM	Model No. 2030DD92FBKS13T

Spares and Accessories

Gas Cell Window Kit (BaF_2 /Viton®)	133525-G3
Filter Assembly	134838-G1
Replacement HeNe Laser	001-8446
Replacement IR Source Fan	001-8498

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