Process & Environmental Analysis Solutions

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MultiGas™ 2030 CEM HiSens

GAS ANALYZER FOR LOW LEVEL CONTINUOUS EMISSIONS MONITORING

The MultiGas™ 2030 CEM HiSens is an FTIR-based gas analyzer designed for the continuous monitoring of very low emissions in effluent streams containing up to 40% of water and CO_2. With permanently stored calibration spectra, the need for costly reference gas mixtures is reduced. For certain applications such as HCl monitoring, an innovative software configuration also eliminates the need for daily nitrogen background, further increasing the instrument uptime. Furthermore, the robust, MultiGas 2030 is easy to operate and maintain and has a low cost of ownership (CoO).

Features & Benefits

- A single narrow band FTIR analyzer measures several target emissions at very low levels, including HCl, HF, formaldehyde, N_2O, CH_4, CO_2, H_2O
- High sensitivity detector with no liquid nitrogen cooling required
- Patented, linearized detector response ensures all instruments maintain the same calibration
- Continuous measurement for rapid detection of changes in effluent composition
- Direct analysis in effluent streams that contain up to 40% water, with no chillers or driers required
- Complete, integration-ready analyzer reduces complexity and ensures fast install time
- Permanent calibration spectra reduces the need for costly calibration gas cylinders
- Integrated gas cell heater maintains temperature of the gas sample, eliminating sample condensation and maximizing accuracy
- Frequency and resolution diagnostics maintain precise calibration for improved accuracy
- Integrated, automatic temperature and pressure compensation ensures accurate analysis
- User-friendly, intuitive software enables simple operation with relatively little training
- Low cost of ownership, easy to install and maintain

The MultiGas 2030 analyzer is comprised of a 2102 Process FTIR Spectrometer, an MKS-patented, high-optical-throughput sampling cell, applications-specific analysis software, and an instrument-independent, quantitative spectral library. The MultiGas also incorporates a high-sensitivity thermoelectrically (TE) cooled detector. This analyzer configuration, along with the software analysis package, allows for more accurate, extremely sensitive measurement of several gases, such as HCl, HF, formaldehyde and CO_2, in high moisture streams (up to 40%) by producing high resolution spectra which enable the detection and measurement of components without removal of the moisture.

Emissions Monitoring Applications

- Cement Kilns
- Waste Incinerators
- Electric Generating Utilities
- Large Combustion Plants
- Turbine Engines
- Coal Burning Facilities

Performance

Estimated detection limits are calculated as three times the standard deviation in 40% water and CO_2 for a typical scan time of 1 minute. Table 1 shows the components and the detection limit for components that are visible when running the MultiGas 2030 HiSens. Figure 1 shows two weeks worth of continuous HCl measurements when using the MultiGas 2030 HiSens at a cement plant, demonstrating the very high sensitivity and reproducibility of the instrument.

TABLE 1

Component	Detection Limit	Recommended Range
HCl	30 ppb	0-3 ppm
HF, formaldehyde, N_2O, CH_4, CO	10's of ppb	Depending on application

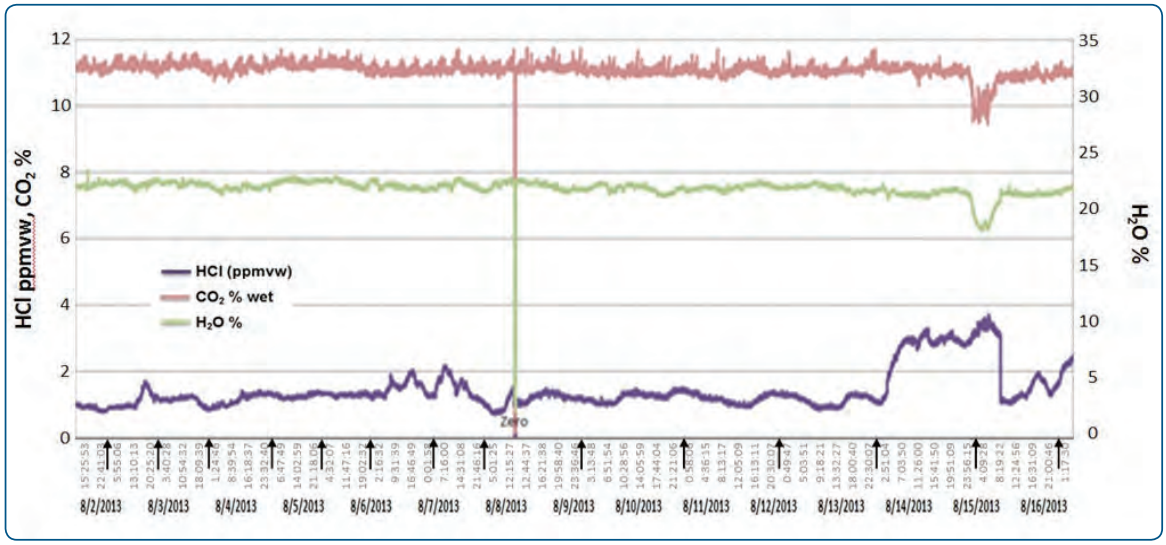

Figure 1 -
Cement plant data for HCl, H_2O and CO_2

Specifications

Analyzer

Measurement Technique	FTIR Spectrometry
Gases and Ranges	See Table 1
Spectral Resolution	Minimum of 0.58 cm^{-1}
Scan Time	60 seconds
Infrared Source	Silicon Carbide Laser Helium Neon
Detector	Thermoelectrically (TE) cooled MCT (HgCdTe)
Purge Pressure	20 psig (1.5 bar) max.
Spectrometer Purge Flow	0.2 L/min of dry nitrogen or CO_2, free clean, dry air with dewpoint below -70°C
Optics Purge Flow	0.2 L/min of dry nitrogen or CO_2, free clean, dry air with dewpoint below -70°C
Pressure Transducer	MKS Baratron® capacitance manometer
Purge Connection	¼" Swagelok® quick connect
Dimensions	17.5"W x 12.5"H x 25.5"D
Installation	19" Rack mount chassis
Power	120 or 240 VAC, 50/60 Hz, 3 amps
Weight	110 lbs. (50 kg)
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	0.5 - 5 L/min
Sample Pressure	1 atm ±0.05

Gas Cell

Construction	Nickel-coated Al
Fittings	¼" threaded Swagelok
Tubing	Heated ¼" stainless steel
Mirrors	Nickel plated aluminum substrate, with rugged MgF_2 - gold coating
Windows	CaF
O-rings	Kalrez®

Computer Requirements and Communication Options

Computer Requirements *(Desktop or Notebook)*	Intel Pentium® PC, Microsoft® Windows® XP or Windows® 7 operating systems, display (1024 x 768)
Recommended Minimum	Intel Pentium III, 850 MHz, Microsoft Windows XP, 256 MB
Computer/FTIR Communications	RJ-45 Crossover Ethernet
Communication Protocol	TOOLweb®, HTML based (included), OPC or Modbus TCP/IP (not included)

Ordering Information

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

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MG2030 CEM HiSens - 10/17
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