

Picarro Methane & Hydrogen Sulfide Analyzer

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The World's Highest Performing and Easiest to Use Analyzers

A fast Cavity Ring-Down Spectrometer for creating real-time visual plume maps of fugitive emissions of methane and hydrogen sulfide.

- Only product that delivers real-time Google Earth plume maps of landfills, pipelines, refineries, paper mills
- Beyond-the-fenceline mapping, identifies plume origin down to individual buildings or smokestacks
- Provides precise targeting for air bottle captures
- Extremely fast and accurate - continuous readings even at 65 mph with 30 readings per minute
- Shock and vibration resistant: deployable in cars, trucks and boats
- Sets up in minutes, no special tools required



Methane (CH₄)

Parameter	Specification	Comments
Precision at 2 ppmv (5.0 sec):	2 ppbv	1-sigma
Max Drift (over 8 hours):	< 4 ppbv	Peak-to-peak, 50-minute average
Operating Range:	0 to 20 ppmv	
Measurement Interval:	5.0 seconds	
Rise/Fall time:	< 5.0 seconds	10-90% / 90-10%

Hydrogen Sulfide (H₂S)

Parameter	Specification	Comments
Precision (5 sec)	10 ppbv	1-sigma
Max Drift (over 8 hours)	< 20ppbv	Peak-to-peak, 50-minute average
Operating Range:	0 to 500ppm	
Measurement Interval:	5.0 seconds	
Rise/Fall time:	< 5.0 seconds	10-90% / 90-10%

Advantage Note: This breakthrough mobile-ready system maps emissions plumes of methane and hydrogen sulfide back to point of origin at parts-per-billion concentrations even while driving at freeway speeds. For the first time ever, scientists and non-scientists alike can perform detailed beyond-the-fenceline emissions mapping to spot plumes of methane and hydrogen sulfide from landfills, pipelines, refineries, paper mills or industrial plants. For air quality and environmental experts, the Picarro plume mapping system can dramatically improve targeting for air bottle captures used to detect plumes of toxic volatile organic compounds such as benzene, xylene, and toluene (These VOCs are closely associated with methane).



Methane plumes from the Severstal Steel Plant in Detroit, Michigan

A powerful greenhouse gas, methane is also a compound of great interest to entities seeking to reduce their contribution to global warming. Toxic hydrogen sulfide is another compound of interest for air quality and environmental regulators. Natural emissions of both methane and hydrogen sulfide are also a key environmental consideration in geologically and volcanically active portions of the Earth. Grid patterned surveys with the system can yield detailed plume maps for cities, towns and wide-area regions such as very large landfills. The analyzer system can also operate in a small plane or boat for aerial or marine mapping operations. It is vibration and shock resistant and unaffected by wide temperature, pressure and humidity swings. This mobile, real-time plume mapping capability is unique to Picarro.

The plume mapping system uses Picarro's powerful and high-precision time-based Cavity Ring-Down Spectroscopy (CRDS) analyzer. Picarro's unique CRDS analyzer is a time-based measurement system that uses a near-infrared laser to quantify spectral features of molecules in a sample gas passed through an optical measurement cavity. An effective path length of up to 20 kilometers inside the cavity results in exceptional instrument precision and sensitivity. Picarro analyzers use a small 35 cc volume cavity, ensuring better temperature stability, faster gas exchange, lower noise and higher sensitivity. Precise cavity temperature controls (better than 0.002 °C) and pressure control (better than 0.003% of an atmosphere) designed into the system ensure accurate measurements over very long periods of time. As a result, Picarro systems maintain high linearity, precision, and accuracy with minimal calibration. Picarro CRDS systems all include a patented, high-precision wavelength monitor that makes certain the analyzer only monitors spectral features of interest. This

virtually eliminates spectral "noise" from interfering species, such as combustion byproducts like CO.

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The system includes a mobile weather station, a GPS system, an inverter, and appropriate cables for quick set up. (Customers will need to supply a monitor for real-time viewing). The system can be installed in minutes on a vehicle or as a stationary monitor. For mobile download of mapping data, a customer provided mobile broadband connection is required. The analyzer can be rack-mounted for stability in vehicles. Installation and configuration of the plume mapping system requires no tools. The system is controlled using intuitive GUI software tools included on the CPU of all Picarro analyzers.

Picarro's diagnostic software suite continuously measures and records 38 parameters for rigorous quality control and assurance of data integrity. If an analyzer is connected to the Internet, Picarro's service organization can access it remotely, practically anywhere to provide rapid support and problem resolution. Users can connect remotely and control the analyzer through a standard Remote Desktop connection or with similar remote login software. The analyzer can be configured to automatically send out measurement data at regular intervals via the Ethernet or optional modem and can output real-time data in digital format and via optional analog outputs. Only Picarro delivers this unparalleled combination of high-precision and accuracy, ease of use and installation and real-time mapping in a rugged, mobile-ready package. Map methane and hydrogen sulfide anywhere, anytime with Picarro.

Specifications	
Measurement Technique	WS-CRDS
Measurement Interval	<5 seconds
Sample Flow	< 0.4 L / min at 760 Torr
Sample Temperature	-10 to + 45oC
Sample Pressure	300 Torr to 1000 Torr
Sample Humidity	<99% R.H. non-condensing @40°C, no drying required
Temperature	10 to 35 °C (operating) -10 to 50 °C (storage)
Humidity (ambient)	<99% R.H. non-condensing
Accessories	Pump (internal), keyboard, mouse, LCD monitor (optional)
Outputs	RS-232, Ethernet, USB, analog (optional) 4-20mA / -10 – 10V
Fittings	¼" Swagelok®
Dimensions	17" x 9.75" x 23" (43 x 25 x 59 cm) including feet
Installation	Benchttop or 19" rack mount chassis
Weight	65 lbs
Power Requirements	90-120 VAC, 50/60 Hz, 220 VAC, 50 Hz, < 300 W