



Gas Odorant Monitor

Natural Gas | Hydrogen | Biomethane



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Biospec Rhino Overview

BioSpec Rhino is an automated online monitor for measuring the level of odorant in the gas network. It has been developed specifically for gas distribution networks, leveraging on Kelvatek's expertise in optical spectroscopy measurement techniques.

BioSpec Rhino eliminates the need of having a trained Rhinologist performing checks on the gas network or sending samples to laboratories.

The Rhinologist results are only useful for the moment they are recorded and cannot identify issues occurring between such snapshots.

Continuous monitoring from BioSpec Rhino provides the utmost level of safety for gas networks and their customers, ensuring that the product delivered is consistently safe and complies with regulations.

"BioSpec Rhino provides continuous assurance that each component of the odorant is present at the required levels in the gas network"

Precision

- ✓ Highly sensitive measurement of all common odorants such as TBM, DMS, THT and others.
- ✓ Individual measurement of each component allows for detection of odorant fade and at the component level.

Financial

- ✓ Eliminates ongoing costs of Rhinologist manual sampling and laboratory testing.
- ✓ Enables odorant levels to be optimised and mitigates against cost of over odorisation.

Network integrity

- ✓ Online assurance that the correct level of odorant has been added to the gas.
- ✓ Monitoring for impurities that could impact the integrity of the network – e.g. H_2S and terpenes.

Net-zero future

- ✓ Instrument also measures odorant levels in hydrogen and biomethane, meaning the technology is future-proofed and aligned to network decarbonisation strategies.
- ✓ Online monitoring also for benzene and toluene that can be present in natural gas

Natural Gas and Transition to Net Zero

Component level odorant monitoring

As well as measuring total concentration of an odorant blend in the network, BioSpec Rhino also reports the concentration of the individual components in the blend, as well as contaminants such as benzene and terpenes

This provides assurance that each chemical in an odorant blend is at the appropriate concentration in the network, enabling the device to monitor for 'odorant fade' at the component level.

Future gas networks

Gas networks are decarbonising by including biomethane (renewable natural gas) and hydrogen on their networks, or even transitioning to 100% hydrogen. BioSpec Rhino is equally suitable for measurement of odorant in natural gas, biomethane and hydrogen.

However, biogas can contain impurities which must be removed before biomethane is injected onto the gas grid and hydrogen from industrial sources may also require cleaning before grid injection. These components can impact the grid integrity or result in non-compliant gas reaching customers. For example, terpenes (from biogas derived from food waste) can mask the smell of the odorant to the human nose.

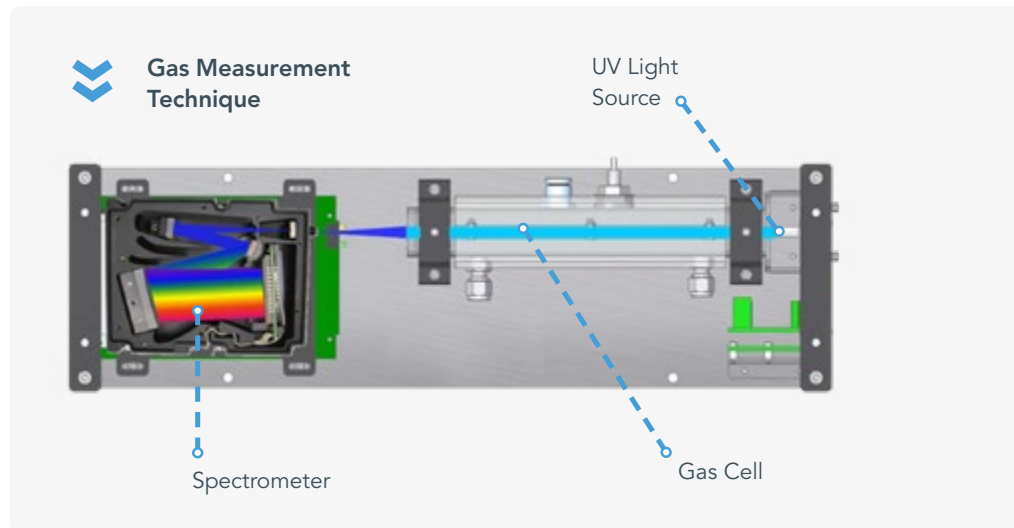
It is therefore important to also measure for these impurities as well as odorant levels. BioSpec Rhino also measures impurities such as hydrogen sulphide, ammonia, ketones and terpenes, enabling a single installation to monitor both odorant levels and potential impurities from sources of renewable gas.

Technology

Optical Absorption Spectroscopy

BioSpec Rhino uses an ultraviolet differential optical absorption spectroscopy (UV-DOAS) technique for online measurement of both odorant and impurities in the gas.

Ultraviolet (UV) light shines through a sample of gas and individual components will preferentially absorb certain wavelengths of the UV light. A spectrometer separates the transmitted light into individual wavelengths and the UV-spectrum of the gas mixture is obtained. This spectrum is analysed through sophisticated data analysis techniques and individual gas components and their concentrations are extracted and reported.



Measured Gases

BioSpec Rhino measures commonly used odorants around the world including TBM, DMS, and THT as well as others such as IPM and NPM.

Additionally, the instrument measures many impurities that could be present in the gas networks if, for example, there was a failure to properly clean the gas from a biomethane plant. Key additional gases include:

- Terpenes such as limonene, p-cymene, pinenes etc.
- Ketones such as 2-butanone and acetone
- Hydrogen sulfide
- Ammonia
- Other gases such as benzene, toluene, ethyl benzene and xylenes (BTEX)

Instrument Overview

- Report levels of individual odorant components
- Report levels of individual impurities
- Configurable alarms for odorant and impurity levels
- Simple installation and integration
- No carrier gas needed
- No instrument recalibration required
- Low total cost of ownership

Get in touch to
discuss online odorant
monitoring for current
and future gas networks



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