

SpectraSensors Series of Laser-based Gas Sensors

*The Best Solution for Accurate Measurement of
H₂O, H₂S and CO₂ in Natural Gas Pipelines*

H₂O

H₂S

CO₂



SpectraSensors®



SpectraSensors — *superior technology, best overall results*



Producing pipeline-quality natural gas requires exacting and dependable measurement of moisture and contaminants. In the past, producers had to make difficult trade off decisions when it came to gas analyzers: sacrifice speed for accuracy and live with high operational expenditures and hazardous waste.

Nothing better

SpectraSensors Tunable Diode Laser technology is setting new industry standards for analyzer stability. No competing system measures H₂O, H₂S and CO₂ in natural gas pipelines better or faster than the patented SpectraSensors series of gas analyzers.

Nothing more reliable

SpectraSensors analyzers provide consistency and accuracy – essential for resolving expensive shut-in events. No routine adjustments are necessary because the analyzers are drift free, even in streams that include high levels of gas phase contaminants.

Nothing faster

Depending on site requirements, measurements can be set to provide updates every second. Chilled mirror or electrochemical sensors cannot match the real-time precision of laser beams measuring at the speed of light. During process upsets, SpectraSensors analyzers recover and return to full operating capability in seconds rather than hours.

Natural Gas Analyzer Applications



SS500 – Mid Sensitivity
H₂O

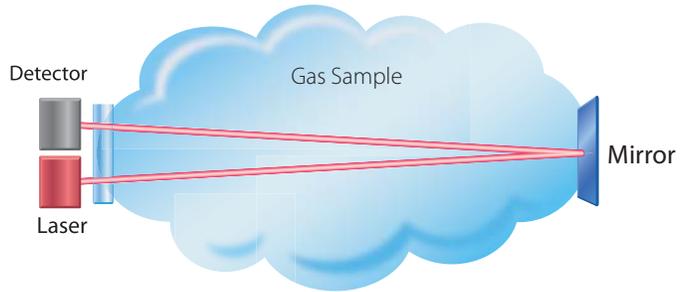


SS1000 – Portable
H₂O or CO₂

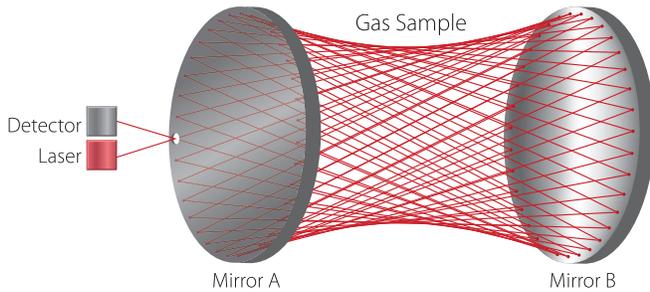
Virtually unaffected by contaminants

The sensing element in SpectraSensors analyzers has no contact with the gas or contaminants so are virtually immune to gas phase contamination. Measurements remain accurate without the need for frequent recalibration or sensor maintenance that can threaten the uninterrupted flow of tariff quality gas.

Single Pass Cell Technology



Herriott Cell Technology



Single Pass Cell or Herriott Cell Technology

In addition to our single pass sample cells, SpectraSensors analyzers incorporate a compact Herriott Cell comprised of a laser and two curved mirrors that allow for long optical paths within a small space. The extended interaction path guarantees the ideal combination of low detection limits (sub-ppm), high stability and practical size.

Increases pipeline safety

Meeting and exceeding industry specifications for the measurement of H_2O , H_2S and CO_2 in natural gas, SpectraSensors analyzers can help prevent dangerous leaks or potentially catastrophic ruptures by detecting the presence of corrosive contaminants.



SS2100 H₂S



SS2000 – Single Channel
H₂O, H₂S or CO₂

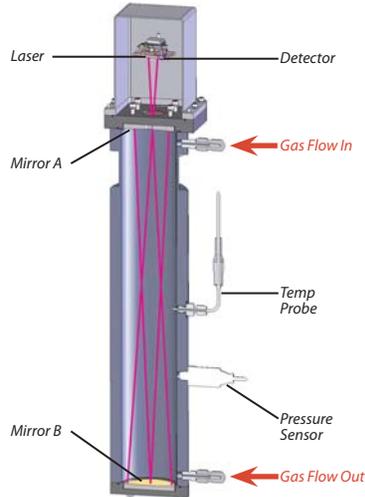


SS3000 – Dual Channel
H₂O, H₂S or CO₂

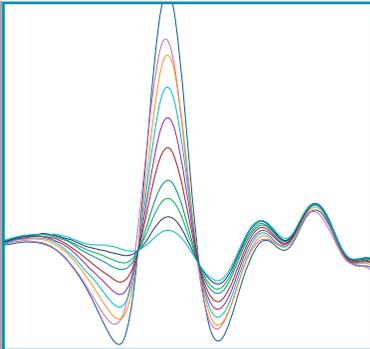
Typical tunable diode laser (TDL)



Schematic of laser sample cell



Absorption spectra



SpectraSensors Laser Technology

SpectraSensors—a commercial spin-off of JPL and NASA—perfected and applied proprietary TDL spectroscopy to petrochemical and environmental monitoring applications. Thanks to their widespread use in bar code scanning, compact disc players, and fiber optic telecommunications, diode lasers have made TDL spectroscopy commercially viable. TDL sensors are more stable and reliable because they are not exposed to the gas stream and do not require constant calibration. They do not drift over time, operate with very little maintenance and are unaffected by contamination. For these reasons, SpectraSensors TDL analyzers have become the preferred choice for a wide range of online gas analysis.

How the TDL analyzer works

SS Series analyzers use robust, tunable diode lasers that emit near-infrared light at wavelengths absorbed by the gas being measured. The IR light passes through the gas sample and is measured by a solid-state detector. As the laser wavelength is tuned across a specific wavelength, energy is absorbed, reducing the amount of light arriving at the detector. The fraction of light absorbed as the laser is tuned across the line is directly proportional to the concentration of the target gas. Because the laser is tuned across the line four times each second it can be used for fast, accurate measurements and control of process parameters independent of contamination or laser intensity.

Gas spectra at various concentrations

The graph at left shows several gas spectra in a hydrocarbon stream. The higher the concentration of the component of interest, the more absorption of light, and the stronger the corresponding absorption signal. Since the calculation is a direct, fundamental measurement, the amount of the target gas present can be measured quickly and accurately.

SpectraSensors®



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