Bid Specifications
SS500 TDLAS H_2O Analyzer for Natural Gas

SpectraSensors TDLAS SS500 Analyzers with Sample Conditioning System

Analyzer performance specifications

1.1 The tunable diode laser (TDL) analyzer must quantitatively respond and measure H_2O in natural gas over a measurement and calibration range of 0-100 lbs/MMSCF (0-2110 ppm_v) for gas quality control measurements.

1.2 The TDLAS analyzer must have a measurement repeatability of ± 1 ppm or 1% of reading (whichever is greater) for gas quality measurements.

1.3 The H_2O analyzer readings must not vary by more than ±10ppm_v through the full range of ambient temperatures.

1.4 The analyzer must perform Tunable Diode Laser Absorption Spectroscopy (TDLAS) using a Near Infrared (NIR) laser and solid-state detector for selective, specific measurement of H_2O molar concentration in natural gas streams.

1.5 The TDLAS analyzer must provide measurement updates in 1-60 seconds depending on user-settable parameters.

Hardware design specifications

2.1 The TDLAS analyzer must be equipped with a sample cell capable of providing accurate H_2O measurements in natural gas.

2.2 Optical fibers should be avoided in the TDLAS analyzer due to their sensitive nature, and if employed must be shielded from physical contact during maintenance; also, shall be field-replaceable without requiring recalibration or realignment.

2.3 Fiber couplings should be avoided in the optical system of the TDLAS analyzer to avoid disturbances of the laser path. If fiber couplings are used, they must be secured as not to loosen or become misaligned during normal shipping and operational vibration; also, must be field-serviceable without requiring recalibration or realignment.

2.4 The sample cell must be constructed of 316L stainless steel per NACE MR0175 with electropolished internal surfaces to protect against corrosion and to support short response times.

2.5 The wetted components within the sample conditioning system and the sample cell must be constructed of 316 Stainless Steel per NACE MR0175, Glass, and Viton seals.

2.6 The mirror(s) in the sample cell must be easily cleaned and must be field-replaceable without requiring recalibration or realignment.

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2.8 The pressure sensor must be field-replaceable without requiring recalibration or realignment.

2.9 Electronic assemblies such as the CPU, laser and detector control, laser temperature controller, IO boards should be field replaceable.

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2.10 The TDLAS analyzer must have an IP rating of NEMA 3R for indoor installations and NEMA 4X for outdoor installations.

2.11 The sample system must have an available option for a pressure regulator and glass-tube flow meters that are function-checked and leak-tested during factory integration.

2.12 The analyzer electronics must be housed in a separate compartment from the enclosure with sample system components to avoid corrosion of electronic components.

2.13 The sample system components requiring regular service and inspection (such as filters) must be easily accessible for rapid field-maintenance.

Analyzer certification specifications

3.1 The TDLAS analyzer must be available in a configuration certified for use in a CSA Class 1, Division 2 location.

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Instrument firmware and software specifications

4.1 The TDLAS analyzer firmware must enable the user to program the analyzer to automatically perform a daily validation check to verify the analyzer is operating properly within its factory-certified calibration range.

Instrument calibration and validation specifications

5.1 The TDLAS analyzer must be factory calibrated using a test mixture blended to simulate the natural gas stream.

5.2 A calibration report documenting results of the factory calibration test must be provided in the shipment with the TDLAS analyzer.

5.3 The TDLAS analyzer supplier must provide the option of a Factory Acceptance Test to witness analyzer calibration.

Instrument communications specifications

6.1 The TDLAS analyzer must support analog communication with a choice of one or two isolated 4-20mA analog outputs.

6.2 The TDLAS analyzer must support serial communication via RS232C.

6.3 The TDLAS analyzer must support Modbus Gould RTU, Daniel RTU, or ASCII digital communications.

6.4 The TDLAS analyzer must offer 2 relays, one for a general fault and a user assignable alarm.

Optional equipment specifications

7.1 The TDLAS analyzer supplier must offer a sample extraction system with a heated probe and pressure regulator for adiabatic sampling of the gas stream to perform H_2O measurements.

7.2 The TDLAS analyzer supplier must offer insulated, weather resistant tubing assemblies to transport gas samples at a controlled, uniform temperature from a process sampling point to the inlet of the analyzer to perform H_2O measurements.