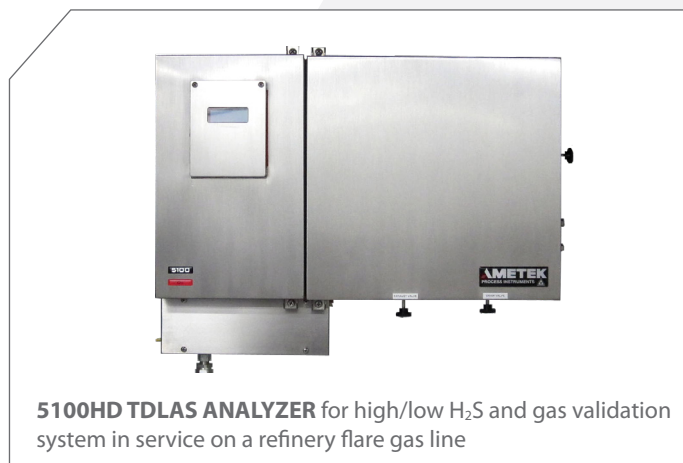


MEASURING HYDROGEN SULFIDE IN REFINERY FUEL GAS

EPA regulation 40 CFR Part 60, sub part J, section 60.105 allows the measurement of pre-combustion hydrogen sulfide (H₂S) in refinery fuel gas as a surrogate measurement of the sulfur dioxide (SO₂) released to atmosphere in the combustion process. The AMETEK 5100HD tunable diode laser absorption spectroscopy (TDLAS) analyzer directly measures the H₂S concentration over the typical full-scale range of 0 to 300 parts per million (ppm).



PROBLEM

Process gas chromatographs (PGCs) and lead acetate tape-based analyzers can be used to measure H₂S in refinery fuel gas. However, for most PGCs there is a requirement for a temperature-controlled shelter, carrier and detector fuel

gases, and take several minutes to separate the analyte of interest. Disposing of the hazardous lead acetate tape cartridges can be burdensome and expensive.

SOLUTION

TDLAS technology has been applied to a number of applications and is widely accepted in hydrocarbon operations for the measurement of moisture, carbon dioxide and hydrogen sulfide from percent levels down to single digit ppm concentrations. The key attributes of TDLAS analyzers are no lag time, no consumables, and a high reliability due to the long life of the solid-state lasers.

TDLAS analyzers have features well suited to refinery process analyzer applications and variable process conditions. For refinery fuel gas applications, the operational and capital savings of a TDLAS analyzer over a process GC are very significant. As compared to paper tape, TDLAS is more precise and has no consumables.

WHY AMETEK?

The AMETEK 5100HD uses a direct measurement technique. Unlike laser analyzers from other manufacturers, the 5100HD does not require a background measurement where the sample is scrubbed of H₂S using a consumable copper salt absorbent material. The 5100HD also continuously verifies

optical system performance, using a sealed reference cell. If required, the laser module can be changed in the field in less than one hour. Products from other TDLAS manufacturers must be returned to the factory for this type of repair.

5100HD FEATURES

- Field-proven in both refinery fuel and flare gas applications
- Online verification (H₂S reference cell) assures the optical system is performing accurately
- Direct measurement of H₂S - no scrubber, no consumables
- A true process TDLAS analyzer with liquid separator and horizontal cell built into 0 to 150°C oven
- Low maintenance: No carrier or detector fuel gases, no columns, no column valves, no dilution
- IP65 design - walk-in shelter not required
- Suitable for an ambient temperature range of -20 to 50°C (-4 to 122°F)

PERFORMANCE SPECIFICATIONS

Typical ranges and performance	Range: 0 to 300 ppm (min), 0 to 100% (max) Accuracy: ±5 ppmv (min), ±2% of reading (max) Repeatability: ±3 ppmv (min), ±1% of reading (max)
Ambient temperature	-20 to 50°C (-4 to 122°F)
Relative humidity	0 to 90%, non-condensing
Sample flow rate	1 to 2 SLPM recommended (2.1-4.2 SCFH)
Sample cell pressure	109 kPa to 156 kPa absolute (1-8 psia)
Speed of response	<2 second photometric response Total system response is dependent on sample flowrate
Electrical requirements	120 VAC (108-132V); 47-63 Hz, or 240 VAC (216-264V), 47-63 Hz, or 24 VDC (Consult AMETEK)
Power requirements	5100HD: 450W; 105W without heater
Outputs	Keypad with display Fast ethernet (IEEE802.3); supports Modbus over TCP/IP RS485 serial port, isolated (supports Modicon Modbus RTU) (1) single isolated 4-20 mA instrument or loop-powered analog output, per analyte (4) dry relay contacts. Contact rating 30 VAC, 60 VDC, 100 VA resistive
Physical dimensions (W x H x D)	5100HD 830 x 674 x 305 mm (32.7 x 26.5 x 12.0 in.)
Weight	5100HD CEC/NEC Class I Division 2: 60 Kg (132 lb)
Enclosure	IP65 and Type 4X
Approvals and certifications	Certified to meet multiple ATEX, IECEx, CSA, NEC and Inmetro standards for hazardous areas Consult AMETEK for more details

SALES, SERVICE & MANUFACTURING

USA - Pennsylvania

150 Freeport Road
Pittsburgh PA 15238
Tel: +1 412 828 9040
Fax: +1 412 826 0399

USA - Delaware

455 Corporate Blvd.
Newark DE 19702
Tel: +1 302 456 4400
Fax: +1 302 456 4444

Canada - Alberta

2876 Sunridge Way NE
Calgary AB T1Y 7H9
Tel: +1 403 235 8400
Fax: +1 403 248 3550

WORLDWIDE SALES AND SERVICE LOCATIONS

USA

Tel: +1 713 466 4900
Fax: +1 713 849 1924

Brazil

Tel: +55 19 2107 4100

France

Tel: +33 1 30 68 89 20
Fax: +33 1 30 68 89 99

Germany

Tel: +49 2159 9136 0
Fax: +49 2159 9136 39

India

Tel: +91 80 6782 3200
Fax: +91 80 6780 3232

Singapore

Tel: +65 6484 2388
Fax: +65 6481 6588

China

Beijing
Tel: +86 10 8526 2111
Fax: +86 10 8526 2141
Chengdu
Tel: +86 28 8675 8111
Fax: +86 28 8675 8141
Shanghai
Tel: +86 21 5868 5111
Fax: +86 21 5866 0969



© 2019, by AMETEK, Inc. All rights reserved. Printed in the U.S.A. A-0437 Rev 7 (0119)
One of a family of innovative process analyzer solutions from AMETEK Process Instruments.
Specifications subject to change without notice.



To find out more or request a quote visit our website

ametekpi.com