AMETEK®
PROCESS INSTRUMENTS

MEASURES: H_2S (optional COS and CH_3SH)

PRODUCT DATA SHEET

933 Hydrogen Sulfide Analyzer

The 933 is a unique UV-based photometric analyzer system for hydrogen sulfide in natural gas

The 933 uses AMETEK's proprietary frontal elution chromatography sampling technique, combined with the exceptionally high-resolution, multi-wavelength 900 Series ultraviolet (UV) optical bench. These combine to provide an accurate, interference-free measurement of hydrogen sulfide (H_2S). The result is a unique low-level H_2S analyzer that is designed for unattended operation for an extended time period.

- Fast response, fast recovery
- Ranges from 0-3 to 0-100 parts per million (ppm)
- Optional measurement of carbonyl sulfide (COS) and methyl mercaptan (CH_3SH)
- Direct measure of H_2S, no scrubbing

Self-recovery

Two self-regenerating columns are employed in the 933. While one column is conditioning the gas sample, the other is automatically regenerated.

Interference free measurements

The 933 utilizes unique, proprietary frontal elution chromatography to separate H_2S, COS and CH_3SH from interfering components in natural gas.

Accurate performance

Non-dispersive, dual-beam hollow cathode UV photometric detection of H_2S (optional COS and CH_3SH) provides accuracy better than ±0.25 ppm.

KEY BENEFITS

- Extended, unattended operation
- Fully integrated analyzer and sample system
- Self-recovery after high concentration H_2S events
- Fast response time to increasing or decreasing H_2S concentrations
- Concentration measurements of COS and CH_3SH optionally available
- No consumables, reagents, or disposables other than zero gas

APPLICATIONS

- Natural gas sweetening
- Amine contactor overhead
- Natural gas custody transfer stations
- Natural gas pipelines
- Synthetic natural gas (SNG)
- Natural gas blending stations
- Carbon dioxide (CO_2) purity
- Biogas

KEY MARKETS

- Natural gas
- Refining
- Chemical and petrochemical
- Industrial gas

PERFORMANCE SPECIFICATIONS

Methodology	Proprietary auto-carrier frontal elution sampling; non-dispersive ultraviolet analysis for H_2S, COS and CH_3SH
Full scale ranges	ppm ranges are standard; mg/nm^3 and other ranges are available
Standard range	H_2S: 0 to 25 ppm, up to 100 ppm; secondary higher ranges available COS option: 0 to 100 ppm min. to 0 to 500 ppm max. CH_3SH option: 0 to 50 ppm min. to 0 to 250 ppm max. CO_2 option: 0 to 5% Higher ranges are available upon request
Low range	H_2S: 0 to 3 ppm, up to 50 ppm; secondary higher ranges available COS option: 0 to 15 ppm, up to 250 ppm CH_3SH option: 0 to 9 ppm, up to 100 ppm CO_2 option: 0 to 1%, higher ranges are available for H_2S, COS, or CH_3SH
Accuracy	Standard range: ±2% of full scale Low range: ±5% of full scale
Repeatability	Standard range: ±2% of full scale
Zero drift	Standard range: Less than ±2% of full scale in 24 hours Low range and extra low range: Less than ±5% of full scale in 24 hours
Response time, excluding sampling system	H_2S: Less than 30 seconds to 90% response COS: Less than 60 seconds to 90% response CH_3SH: Less than 180 seconds to 90% response
Process pressure requirement	830 kPag to 13790 kPag (120 psig to 2000 psig)
Typical flow	2.5 L/min. (5 SCFH)
Outputs	Up to four isolated 4-20 mA, loop or self-powered Four non-isolated 1 to 5 VDC Five independent sets of SPDT, Form C, potential free alarm relay contacts, 2 A at 240 VAC
Digital communication	RS485 Modbus port; RS232/RS485 service port
Power	104 to 132 VAC, 47 to 63 Hz, <3A 207 to 264 VAC, 47 to 63 Hz, <2A
Ambient temperature	0 to 50°C (32 to 122°F)
Dimensions (W x H x D)	780 x 1185 x 254 mm (30.7 x 46.65 x 9.97 in.)
Weight	Approximately 100 kg (220.5 lb)
Approvals and certifications	CEC Class I, Division 1, Groups B, C, D; Ex d IIB+H_2 T3 NEC Class I, Division 1, Groups B, C, D/Class 1, Zone 1, AEx d IIB+H_2 T3 Optional Class I, Division 2, Groups A, B, C, D purged system available ATEX II 2 G Ex db IIB + H_2 T3 Gb EMC Russian Ex Proof Certification; 1ExdIIBT3 X Russian Gosstandart Pattern Approval Complies with all relevant European Directives

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One of a family of innovative process analyzer solutions from AMETEK Process Instruments. Specifications subject to change without notice.