

## 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<sub>2</sub>S). The result is a unique low-level H<sub>2</sub>S 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<sub>3</sub>SH)
- Direct measure of H<sub>2</sub>S, 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<sub>2</sub>S, COS and CH<sub>3</sub>SH from interfering components in natural gas.

### Accurate performance

Non-dispersive, dual-beam hollow cathode UV photometric detection of H<sub>2</sub>S (optional COS and CH<sub>3</sub>SH) provides accuracy better than ±0.25 ppm.



## KEY BENEFITS

- Extended, unattended operation
- Fully integrated analyzer and sample system
- Self-recovery after high concentration H<sub>2</sub>S events
- Fast response time to increasing or decreasing H<sub>2</sub>S concentrations
- Concentration measurements of COS and CH<sub>3</sub>SH 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<sub>2</sub>) purity
- Biogas

## KEY MARKETS

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

## PERFORMANCE SPECIFICATIONS

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

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