ABB MEASUREMENT & ANALYTICS | DATA SHEET

LGR-ICOS 927S

Industrial trace gas analyzers

Sensitive, accurate and reliable gas analysis by patented OA-ICOS

Measurement made easy

LGR-ICOS 927S performance analyzer

Overview

The LGR-ICOS™ industrial trace gas analyzer was designed to perform to the most demanding of our customers' requirements with the highest sensitivity, accuracy, precision and response times:

- Leak detection for personnel safety
- Airborne contamination monitoring
- Front Opening Unified Pod (FOUP) and vapor deposition chamber monitoring
- Regulatory-compliant emissions and stack gas monitoring

Key features

- Available in single or multi-gas configurations of HF, HCI, NH_3
- All LGR-ICOS Model 927S analyzers also report accurate and precise H_2O measurements
- 0 to 5 V and analog 4 to 20 mA outputs standard and Modbus optional
- Optimized data processing for best performance in measuring sub-ppb concentrations
- Primary password protection for analyzer and data security
- Customizable Calibration & Performance Certification document packages available
- Touchscreen digital display for gas concentration and analyzer status
- Optimized zero-air performance for reliable confirmation of process events

Introduction

The LGR-ICOS trace gas analyzers provide sensitive measurements of hydrogen fluoride, hydrogen chloride, ammonia and water vapor (for other gases, please inquire) in ambient air or in industrial process flows with extremely high precision and sensitivity. With optimized performance for semiconductor applications in leak detection, airborne contamination monitoring, FOUP monitoring and stack gas emissions, this series of analyzers will report measurements over a wide range of concentrations with unsurpassed stability, accuracy and consistency in analyzer-to-analyzer performance.

The LGR-ICOS trace gas analyzers use our patented off-axis ICOS technology, a fourth-generation cavity enhanced absorption technique. Off-axis ICOS has many advantages over conventional cavity ring down spectroscopy techniques such as being far more robust and reliable, having a much shorter measurement time and field-serviceable cavity and mirrors.

All ABB instruments include an internal computer (Linux OS) that stores both the results of each analysis and the complete spectra of the gases measured on its internal hard drive for unattended long-term operation. Data can be exported continuously through analog, digital (RS232), and Modbus outputs. Furthermore, the instruments may be controlled remotely via the Internet. This capability enables the user to operate the analyzer using a web browser anywhere Internet access is available. Furthermore, remote access allows the opportunity to control, obtain data from, and diagnose the instrument without being on site.

These LGR-ICOS analyzers are simple to use, start up in minutes, require no field calibration and have minimal preventative maintenance requirements. Like all ABB analyzers, the LGR-ICOS industrial trace gas analyzers are supported by our expert service and technical support staff.

Specification

Item (gases)	H_2O	NH_3	HCl	HF	H_2O
Precision	<50 ppm (1 s) <20 ppm (10 s) <10 ppm (100 s)	<1 ppb (1 s) <0.3 ppb (10 s) <0.1 ppb (100 s)	<0.3 ppb (1 s) <0.1 ppb (10 s) <0.035 ppb (100 s)	<0.1 ppb (1 s) <0.05 ppb (10 s) <0.025 ppb (100 s)	<25 ppm (1 s) <20 ppm (10 s) <5 ppm (100 s)
Low Detection Limit (LDL)	50 ppm @ 100 s data acquisition	0.3 ppb @ 100 s data acquisition	0.1 ppb @ 100 s data acquisition	0.075 ppb @ 100 s data acquisition	25 ppm @ 100 s data acquisition
Accuracy (of reading) @ concentrations of:	>7,000 ppm = 1 % FSD*	>10 ppb: ±1 % <10 ppb: 10 % <2 ppb ±0.2 ppb Full scale = ±1 %	>10 ppb: ±1 % <10 ppb: 10 % <2 ppb ±0.2 ppb Full scale = ±1 %		>7,000 ppm = 1% FSD*
Analyzer-to-analyzer variability (of reading) @ concentrations of:	≤1000 ppm = ±10 %	>10 ppb: ±1 % <10 ppb: 10 % <2 ppb ±0.2 ppb Full scale = ±1 %	>10 ppb: ±1 % <10 ppb: 10 % <2 ppb ±0.2 ppb Full scale = ±1 %		≤1000 ppm = ±10 %
Measuring range	100 to 70,000 ppm	0.5 to 10,000 ppb	HCl: 0.3 to 2,000 ppb HF: 0.15 to 2,000 ppb		10 to 70,000 ppm
Sample flow rate (lpm)	1.4 to 2.4		1.1 to 1.9		
Calibration period	Calibration not required – validation period = 1 year				
Time required for calibration	Calibration not required – time to perform rigorous validation procedure (see below for details) = 6 hours				
Response time (T_{90}, T_{10})	<25 s (HF/HCl), <10 s (NH_3)				
Measuring principle	Off-axis ICOS / CEAS				
Data rate (user selectable)	1, 10, 20, 100 seconds				
Mean Time Between Failures (MTBF)	>3 years				
Ambient temperature	0 to 50 °C (32 to 122 °F)				
Ambient humidity	0 to 100 % non-condensing				
Sample inlet pressure	0 to 0.35 bar (0 to 5 psig) at analyzer inlet				
Power	170 W (steady state)				
Output signal	RS232C, analog, Ethernet, USB, Modbus TCP/IP				
Approvals & Certifications (with ISO)	CE Mark				
Country of manufacture	Canada				

* H_2O Accuracy testing range limited to 7,000 ppm and above due to Dew Point Generator output

Standard validation
Single-point verification of accuracy using a certified gas mixture. This is standard practice to validate the analyzer, in addition to the continuous self-monitoring checkpoints of the analyzer.

In-depth validation
Exhaustive validation including multipoint linearity, zero points, water vapor cross-interference and stability measurements. This is a detailed, rigorous and comprehensive set of measurements recreating some of the critical factory tests. This is optional and performed by a certified ABB service engineer.

Acknowledgements
Modbus™ is a trademark of Modicon, Inc.

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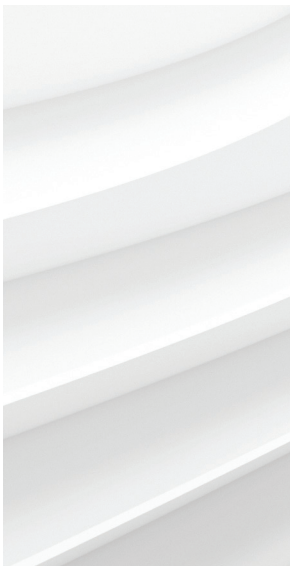

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