

GIR5000 series - Biogas & Landfill analysers

Multiparameter analysers for biogas applications

- CH₄, CO₂, H₂S and O₂
- ATEX Zone 2 certified
- Continuous monitoring
- Robust, weatherproof design
- Field-service friendly

Applications

- Landfill gas monitoring
- Digester gas analysis
- Flare-stack gas monitoring
- CDM verification
- Fuel gas analysis
- CHP engine protection and efficiency

The GIR5000 series analysers are ideal for biogas applications. These gases are usually a mixture of methane (CH₄) and carbon dioxide (CO₂) together with oxygen (O₂) and hydrogen sulphide (H₂S) which have implications for efficiency and safety. Two or three gas versions are available in a variety of configurations and all are ATEX certified.

Methane and carbon dioxide are both greenhouse gases (GHG). Methane is an important fuel gas for CHP engines, if not used as fuel then it is flared off to produce the less harmful carbon dioxide. Hitech use NDIR sensors to measure methane and carbon dioxide. These are sensors specially designed to withstand the damp, corrosive atmosphere often found in these applications.

Oxygen is an important process indicator in both landfill and digester gas. In landfill gas, a low reading might indicate the presence of an underground landfill fire, whilst a high reading may indicate over extraction from the site. In digester gas, a high reading may indicate a decrease in microbial activity due to poisoning. For this application Hitech use a special electrochemical cell designed for use in the presence of acidic gases, e.g. carbon dioxide.

Hydrogen sulphide is present in landfill and digester gas in varying amounts depending on the substrate composition. Hydrogen sulphide can be extremely corrosive to generator sets and continuous measurement can prevent costly damage. Hitech have developed a unique system which allows for continuous measurement of H₂S. At 5000ppm H₂S, good sensor lifetime can still be achieved.

Sample conditioning is important in the variable conditions encountered in this application. Hitech provide internal filters, an

internal pump and low-flow alarm as standard. An external coalescing filter is highly recommended and cooling options can also be offered to remove water. The enclosure itself contains a small heater to ensure that water vapour does not condense in the analyser. Hitech are ready to recommend complete systems on receipt of full gas stream specifications.

Attention to application specific detail is a feature of the GIR5000 from the robust, weatherproof case down to the correct internal filter elements. The instrument has a modular design so that if one sensor is requiring maintenance, the others will still work. All sensor modules are replaceable in the field for minimum downtime.

These are hazardous area applications by their very nature. All GIR5000 versions are ATEX certified for use in Zone 2 hazardous areas according to the industry Code of Practice ESA ICOP 2nd Edition, a decision endorsed by the Health & Safety Executive in the UK.



SPECIFICATION

Gas sensor options

Methane:

Range: 0 to 100%

Resolution: 0.1%

Carbon Dioxide:

Range: 0 to 100%

Resolution: 0.1%

Oxygen

Range: 0 to 25%

Resolution: 0.1%

Hydrogen Sulphide

Range: 0 to 5000ppm

Resolution: 1ppm

Consult Hitech for other gases and ranges, or installations at high altitude.

Stability

<2 % f.s.d./month

Accuracy

±2% of f.s.d.

Sample flow

100 to 250ml/min for optimum performance

Sample temperature range

-20°C to +55°C (non-condensing)

Sample pressure

Pump-off: Min. 20 mbarg
Max. 1 barg

Sample connections

Inlet and outlet: bulkhead compression fittings suitable for 0.25inch (or 6mm) o.d. tube

Analogue Outputs

4-20mA for each gas, 0-100% span

Maximum output load

Oxygen/hydrogen sulphide: 200 ohms
Methane/carbon dioxide: 400 ohms

Alarm Outputs

2 x Lo-alarms (for Methane only)
2 x Hi-alarms for gases other than Methane
1 x Fault alarm for low sample flow rate
1 x Fault alarm for each IR sensor
(Volt free contacts for all alarms)

Ambient operating temperature range

-5°C to +40°C,
RH 90% (non-condensing)

Power

110-120V or 220-240V AC, 50/60Hz
(user selectable), 110VA

Enclosure details

Wall mount, ventilated, GRP enclosure
Protection: IP54 (with door closed)
Net weight: 25 kg
Dimensions (mm): 536w x 300d x 747h

Accessories supplied

Mounting brackets, bushes and screws.
Inner and outer cabinet keys.

ORDERING INFORMATION

Part no.	Type	Gases measured	Description
GIR5000	811-9020	Methane, carbon dioxide and oxygen	GIR5000 biogas analyser, ATEX certified, complete with internal pump.
	811-9033	Methane, carbon dioxide and hydrogen sulphide	
	811-9035	Methane, oxygen and hydrogen sulphide	
	811-9037	Methane and oxygen	
	811-9039	Methane and carbon dioxide	
Spares	850-0035	Large, external coalescing filter	
	419-0089	Methane infrared sensor and pcb assembly	
	419-0090	Carbon dioxide infrared sensor and pcb assembly	
	235-0136	Replacement oxygen sensor	
	Consult	Pre-calibrated replacement hydrogen sulphide module	



Figure 1 - Typical gas display showing Alarm setting facilities, Span and Zero adjustments and a Fault indicator.

APPROVALS

Country (Authority)	Standards	Certificate number	Approved for
Europe (Hitech)	EN 60079-0:2009 EN 60079-15:2010	Hitech12ATEX160-2302X	Ex nA nC IIC T3 Gc