

KAPTA™ 5000 – Biogas

Online multi-parameter biogas measurement/regulation ATEX probe
CH₄, CO₂, Pressure, Temperature

Applications: Biogas measurement/ Management

- Organic waste energy conversion sites: real-time in situ CH₄ & CO₂ concentration and biogas temperature and pressure
- System management optimisation by providing a 4-20 mA output directly proportional to the methane concentration (CH₄)

Advantages

- In situ measurement through 1-inch 1/8 attachment
- 4-20 mA output proportional to the CH₄ concentration
- Fully integrated sensor
- Simple and quick maintenance

Main characteristics

- Pre-calibrated probe in a defined Biogas environment
- 1-inch 1/8 diameter direct attachment to the pipes
- Simple maintenance requiring only the filters to be changed
- ATEX probe – Zone 0 – Ex II 1 G -
- 24VDC power supply – I_{max}= 100 mA
- Data transfer via Modbus RTU RS232

A NEW SOLUTION FOR BIOGAS QUALITY CONTROL



General description

Waste storage centres produce combustible biogas caused by the decomposition of organic matter using different processes (methanization, aerobic or anaerobic natural decomposition). These waste are as an example placed in buried racks called cells. A system of drains enables the biogas produced by its decomposition to be recovered. This may then be turned into energy via turbines and motors to produce electricity and heat. For optimum Biogas conversion, principally when motors are used, the concentration of methane (CH₄) must be measured precisely.

The KAPTA™ 5000-Biogas probe is an innovative measurement system for instrumentation in biogas management. It enables in situ measurement of biogas quality (CH₄, CO₂), its pressure and its temperature. The CH₄ concentration value enables a regulation valve to be set directly. In addition, this probe, which is attached to the pipes, removes the additional costs generated by a derivation/ dehydration of the gases needed when standard systems are used.

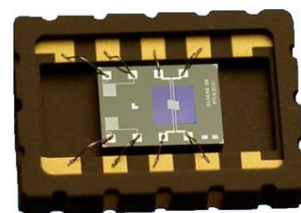
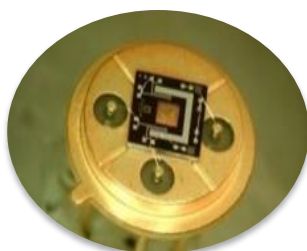
The KAPTA™ 5000-Biogas probe offers a fully integrated in situ ATEX - ZONE 0 measurement solution.

KAPTA™ next generation probes are the responses proposed by Neroxis for online biogas valorization

With its full range of multiparameters probes, the KAPTA™ offers unique environmental detection solutions to manage drinking water and biogas.

Biogas sensor specifications

General specifications	<ul style="list-style-type: none"> • Methane CH₄ [%] and carbon dioxide CO₂ measurement [%] • Pbiogaz biogas pressure measurement [mbar] • Tbiogaz biogas temperature measurement [°C] • Power supply battery voltage check [Volt] • Output [4.20mA] proportional to the methane concentration (in option)
Biogas usage range	<ol style="list-style-type: none"> 1. Biogas - CH₄: [0; 100%]; CO₂: [0; 50%] 2. Temperature - [-10°C; 70°C] 3. Relative humidity - [70%; 100%] 4. Biogas absolute pressure - [500; 1'100 mbar]
Measurement accuracy	<p>Depending on the involved process, biogas composition and its characteristics are quite different. Consequently, the calibration procedures of the probes takes into account these specifications in order to get the best CH₄ precision.</p> <ol style="list-style-type: none"> 1. Biogas - CH₄: ± 2% in the whole range ; ± 1% in the range of interest 2. Biogas - CO₂: ± 3% across the whole range 3. Temperature - ± 0.8°C within the range [-10°C; 70°C] 4. Biogas pressure - ± 1.5mbar at 25°C within the range [750; 1'100 mbar]; ± 2.5mbar within the ranges [-20°C; 85°C]; [300; 1'100 mbar]
Data transmission	Continuous data transmission by Modbus RTU RS232 protocol. Maximum recording frequency of 1 mes/second.
Analog output 4-20 mA	Analog output proportional to the CH ₄ concentration.
Calculation constant modification	The constants used for the 4-20 mA calculation according to the CH ₄ concentration may be modified by the user via Modbus RTU RS232.
Maintenance	Filter replacement with sensor powered down - Frequency to be defined depending on the dirt build-up.
Usage time	> 1 year
Electrical power supply	24 VDC. I _{max} : 100 mA.
Standard	ATEX – Zone 0 – Ex II 1 G – IP68 (upper part of the sensor on the atmosphere side)
Sensor materials	Sensor body and upper part in POM-C EC (Electrically Conductive)
Cable/Connector	3 m cable (outside Explosive Atmosphere zone) with IP68 6-contact male plug
Filters	316 L metal sintered filter + PTFE membrane
Sensor attachment	On 1-inch 1/8 pipe
Sensor dimensions	Max overall: L= 27.5 cm; Ø upper part = 50 mm; Ø max sensor body = 42 mm
Sensor weight	~ 650 g including the 3m cable and the connector



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