

ETG 8500 BIO M

Complete Biomethane Monitoring System

Complies UNI/TR 11537



ETG's new 8500 M is a complete package for biomethane gas analysis ready to use. The system includes a pre-treatment sample system (needed for very wet gases like Raw Biogas), the gas analysers for measurement of CH₄, H₂S, CO₂, O₂, LHV, HHV, water dew point, relative density, Wobbe Index and ETG's software, a 5.7" touchscreen display with alarms-on-screen, Digital Inputs and Digital outputs. Mounted in a stand-alone cabinet, ETG 8500 is ready to use. The system uses NDIR technology for CH₄ and CO₂, Paramagnetic sensor for O₂, a special TDLAS analyzer for H₂S and a capacitive sensor for Dew Point

The 8500 M complies with the Italian UNI/TR 11537 Standard related to the transport networks of biomethane and the distribution of natural gas. The main features of this analysis system are: real time analysis, 30 minutes trend of analysis for each compound, automatic zero calibration for CH₄, CO₂ and O₂, remote access via LAN and WLAN, .csv log files of analysis. The whole unit has dimensions: 1600x800x600 mms weighs in at 105Kg and is manufactured of AISI 304 stainless steel. The communication protocol options are Modbus, Profibus and Ethernet.

WHAT IS BIOMETHANE?

Municipal solid waste landfills account for over one-quarter of the total methane emissions in the U.S. Landfill gas is a particularly attractive natural gas supply option because it is a low-cost feedstock source due to the minimal processing required to remove the impurities to produce biomethane.

Biogas is normally rich in methane (about 65%) and impurities of hydrogen sulfide (H₂S), CO₂ and water. Technology is commercially available to remove the H₂S, CO₂ and water contaminants in the biogas and landfill gas through processing. This produces high-purity natural gas (biomethane) suitable for vehicles.

Biomethane, also called renewable natural gas or RNG, is pipeline quality natural gas that can be used directly or added to existing supplies.

MAIN FEATURES ARE :

- Complete Analysis System ready to operate
- Continuous monitoring of CH₄, H₂S, CO₂, O₂, LHV, HHV, Dew Point, Relative Density, Wobbe Index
- Gas analyzers based on NDIR, OFCEAS (for sub ppm H₂S detection), Paramagnetic technique
- Pre-treatment sample conditioning included
- Complete Analysis System ready to operate

Over the last decade upgrading biogas to biomethane has become widespread in some countries where production of biogas from the collection systems in urban waste dumps, wastewater treatment plants and from digestion was already consolidated with anaerobic digestion of agricultural and agro-industrial biomasses.

Once organic material has been broken down in the anaerobic digestion process and has formed biogas, it is then put through a purification process whereby the Carbon Dioxide, Hydrogen Sulphide and Oxygen are made obsolete. After this process it must be analysed to confirm that the required purity has been obtained.

With the biogas now upgraded to biomethane it is now commercial comparable with natural gas and can be injected into the grid for general everyday use.

Gas Analyser Technical data

Measured Gas	Principle of Operation	Std Range	LOD	Linearity	Drift	Repeatability
H2S	OFCEas	0-10 ppm	0,05 ppm	< 1% fs	<2% fs/week	< 0,5 % fs
CH4	NDIR	90-100%	-	< 1% fs	<2% fs/week	< 0,5 % fs
CO2	NDIR	0-10%	-	< 1% fs	<2% fs/week	< 0,5 % fs
O2	Paramagnetic	0-5%	-	< 1% fs	<2% fs/week	< 0,5 % fs
Dew Point	Capacitive	-100+20 °C	-	+/- 1°C (from +20°C to -60°C DP, +/-2°C - 60°C to 100°C DP)	<2% fs/week	0,5 °C DP
Relative density	Calculated by SW	-	-	-	-	-
HHV	Calculated by SW	-	-	-	-	-
HLV	Calculated by SW	-	-	-	-	-
Wobbe Index	Calculated by SW	-	-	-	-	-

Others Technical data

Analysis cycle	Real time
Signal Output	4-20 mA for each measured gas
Access Data	Signals connected to registration form with inviolability of the data for report processing
Record data	Display of the last 30 minutes of acquired data (via graph)
Download data	Download data in csv format (for internal use only)
Communication	Ethernet , Modbus , Profibus (Optional)
Remote service	Remote Instrument control
Automatic Calibration	Automatic calibration on H2S CH4 CO2 O2
Standard Cabinet Dimension	1600x800x600
Standard Weight	105 Kg
Electrical Supply	110/230 Vac 50/60 Hz
Power line requirement	300 Va

The OFCEas Technology

OFCEAS is above all a spectrometry technique. It uses the same laws as all similar techniques (Beer-Lambert). It relies on the principle of absorption of light by gases, with each gas having an absorption (spectral response) that is particular to it. Two major differences regarding the OFCEAS technique result in it supplanting the techniques currently used.



THE RESONANT CAVITY

In conventional spectrometry, multi-path tanks with gold-coated mirrors are used. With OFCEAS, we use high reflectivity mirrors. This high reflectivity provides a large optical path (1 to 10 km compared to 10 m maximum with conventional technologies) which allows for very low detection thresholds. Another marked advantage for manufacturers comes from the small volume of the cavity. The renewal time of the gas inside is reduced, resulting in a very low response time from the analyzer: a considerable advantage regarding process control.

The advantages and benefits of the OFCEas are:

- NO INTERFERENCE MULTI-COMPONENTS ANALYZER
- NO RE-ZERO REQUIRED; NO DRIFT EXPERIENCED
- EASE-OF-USE
- ROBUST ANALYZER
- LOW MAINTENANCE; HIGH MTBF COMPONENTS.
- HIGH PERFORMANCE AND RELIABILITY IN THE TIME