MODCON

MOD 550

MOD 550

CH_4, O_2, CO_2 , H_2S
BIOGAS ANALYZER

USERS ADVANTAGES

ACCURATE QUANTIFICATION IN BIOGAS OF:

⇒ Methane

⇒ Oxygen

⇒ Carbon Dioxide

⇒ Hydrogen Sulfide

MAJOR ADVANTAGES OF THE MOD 550

⇒ Enables full control of processing conditions.

⇒ Monitors anaerobic conditions for optimized process conditions.

⇒ Small footprint, easy to install and easy to operate.

⇒ User-friendly display.

APPLICATION

Fossil fuel is still the major source of energy. However, especially ecological awareness is a driving force in the utilization of biomass as a source to produce methane gas for energy production and generation.

Biogas obtained by the biological conversion of organic materials into methane gas an carbon dioxide, in an oxygen free anaerobic environment. Aside from that, biogas contains in general also water and hydrogen sulfide. Other contaminants which may be present in biogas include traces of ammonia, hydrogen, nitrogen and remainders of organic acid fats and alcohols.

The composition and quality van de biogas is directly associated with the origin and constituents of the biomass, and whether the source is manure, crops, organic material, household and food waste or domestic wasted. A four stage microbial process converts these materials through immediate compounds , like sugars, hydrogen and acetic acid, and finally into methane biogas. The target of each biogas plant is to produce the highest achievable yield of production capacity of the valuable methane gas.

The conversion efficiency is the direct result of rigorous control of process parameters, such as temperatures, the hydrogen content, the dwell time and rearrangement of the substrate, and the quantity and the frequency of the feeding of substrate into the reaction mixture. When the partial pressure of hydrogen gas raises the reaction becomes thermodynamically unstable, which leads to an increased concentration of fatty acids in the liquid. Hydrogen is removed from the system by microbial oxidation with methanogens. Another type of methanogens is responsible for the cleavage of acetic acid into methane, which counts for about 2/3 of the produced quantity of methane.

Hydrogen sulfide removal is a part of the biogas production. The importance of that action is not only to prevent corrosion which is not only caused by increased hydrogen sulfide concentrations, but also by the combustion of hydrogen sulfide into corrosive SO_2, especially upon contact with humidity.

It is superfluous to mention, that the absence of oxygen is not only crucial to maintain an anaerobic environment, but also to reduce any danger to attain conditions that lead to fire or explosions hazardous conditions.

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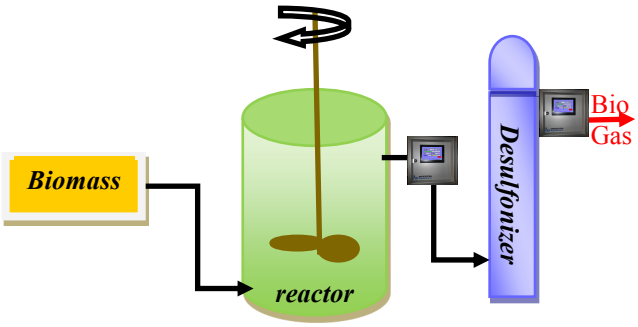
MEASURING BIOGAS

Compositions of biogas vary according to their production method, digesters or landfills. Successful operation of a biogas plant is only achieved by stringent monitoring of the biogas composition. According to the biogas analyses, process conditions can be optimized to provide the highest feasible production yield.

Modcon Systems its MOD 550 is an "all in one solution". It allows to measure the methane, oxygen, carbon dioxide and the hydrogen sulfide content at different locations in the plant, such as after the digester, before and after the desulfurization of the power plant.



The sample gas stream to be analyzed is dehumidified and the dried biogas enters the analyzer to measure the concentrations of CH_4, O_2, CO_2 and H_2S.

THE SYSTEM

Different sensor technologies are incorporated in the analyzer. Oxygen is measured by paramagnetic technology which provides the highest accuracy at low concentrations, to prevent any damage to the anaerobic system.

CO_2 and CH_4, are measured by utilizing NDIR technology. Hydrogen sulfide is tested by means of diffusion/absorption and MOS technology.

The analyzers is a modular systems, which allows to add and remove measurements according to the requirement of the customer

TECHNICAL DATA

Analyzer Performance

CH4	Principle: NDIR Range: 0 - 100 vol % Pressure and temperature compensated Accuracy ± 2 % of range of measurement
CO2	Principle NDIR Range: 0 - 100 vol % Pressure and temperature compensated Accuracy ± 2% of range of measurement
O2	Principle: Paramagnetic Range: 0 - 25 vol %
H2S	Principle : Diffusion/Absorption iOS technology Range: 0-100 ppm Accuracy: ± 10% of measurement or 2ppm (what is greater)

Technical Details

Temperature sensor	50°C ± 5°C
Gas flow	25 - 35 l/h (0.8 – 1.2 Scfh)
Response time (T90 time) with gas flow 150 ml/min.	< 3 s
Warm up time	15 minutes at 20°C
Heating temperature	55°C
Power supply	240 VAC, 50 Hz
Power consumption	max 240VA
Communication Interfaces	RS 232 (optional) 4 - 20 mA Status relay
Tube connections	1/4" OD
Condensed water removal	Peristaltic (hose) pump
Measuring points	1 x process gas channels (8 max) 2 x calibration gas inputs (optional)
Gas sample system	Gas cooler Flame arrestor (ATEX) rated
Ambient temperature	10 – 45 °C
Storage temperature	0 – 45 °C
Operating temperature	5 - 45°C
Relative humidity	90% without condensation
Dimensions (H x W x D)	1000 x 600 x 400mm

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