

# Gas analyzer INCA – Palm Oil mill monitoring

Multigas-Analyzer INCA1050 monitors and controls  
a Palm Oil Mill Effluent (POME) digester plant  
to generate biogas and electricity



COMPETENCE  
IN GAS  
MONITORING



## COMPETENCE IN GAS MONITORING

### Monitoring and controlling biogas generation from Palm Oil Mill Effluent (POME) using the Multigas-Analyzer INCA1050

#### From palm oil mill waste to valuable fuel gas

Palm oil mills, while being a key and further growing economic factor in many countries world-wide, contribute considerably to the green house effect by emitting large amounts of methane gas from the liquid waste that emerges from the palm oil production process. Methane has a 21 times higher Global Warming Potential (GWP) compared to CO<sub>2</sub> in a 100 year time horizon. This unwanted effect can be stopped however and turned into the positive by collecting and converting the methane-rich waste gas to valuable fuel gas which then can be used for electricity generation.

UNION Instruments serves the Biogas market since years successfully with its INCA Multigas-Analyzer gas and extensive application know how from many hundreds of INCA installations.

#### INCA1050 as key component in a palm oil mill control system

INCA1050 is an innovative, compact Multigas-Analyzer which has been developed to perform best in biogas applications by monitoring methane gas (CH<sub>4</sub>) and other biogas typical gas components including H<sub>2</sub>S very reliably and precisely. A demanding application is the analysis of palm oil mill effluent as shown in the graphic:

- One INCA1050 analyzer is installed upstream of the flare (MP 1) to verify the residual amount of methane in the flare gas before it is released to the atmosphere. The heated stainless steel analyzer cabinet allows gas analysis measurements on a wet sample gas basis.
- A second INCA1050 analyzer is installed for process control by monitoring the content of various gas components at distinct locations of the plant. This includes measurement of H<sub>2</sub>S to monitor and control the gas desulfurization plant efficiency. This analyzer is equipped with an automatic sample stream switching system to serve three sampling locations (MP2 to MP4) with just one analyzer very cost friendly.



Air conditioning

Sample gas switching

Heated sample gas lines

Sampling point	Measured components	Application	Analyzer
MP 1 Outlet of lagoon A	CH <sub>4</sub> , CO <sub>2</sub> , H <sub>2</sub> , H <sub>2</sub> S, O <sub>2</sub>	Biogas plant process control	INCA1050 with sample gas switching
MP 2 Outlet of lagoon B		Desulfurization plant efficiency monitoring	
MP 3 Downstream gas cleaning plant			
MP 4 Base of the flare	CH <sub>4</sub>	Flare emission control	INCA1050

### INCA complies with the demanding CDM requirements

The conversion of methane from palm oil mill digester plants into renewable energy has been recognized as a “Clean Development Mechanism” (CDM) under article 12 of the Kyoto protocol. The number of certificates issued depended on how accurate and reliably the methane disposing process is engineered and operated including gas analysis and volume flow monitoring. Any cognizable risks or uncertainties in the measuring process would have reduced the amount of payment. INCA1050 complied with the options allowed by CDM by measuring the gas in its original wet condition without it cooling down. The advantage is that it does not require a separate moisture sensing equipment which saves cost and avoids additional measurement uncertainties.

### Some of INCAs highlights

All INCA versions generally feature a unique dual-wavelength NDIR measuring technology which permits efficient compensation of cross sensitivities and also reveals possible other sensor failures. Cross sensitivity, caused by overlapping spectral areas, is a deciding issue in assessing accuracy and confidence level of gas analysis results. Furthermore, INCA uses pre-calibrated sensors for easy exchange on site at the end of life time.

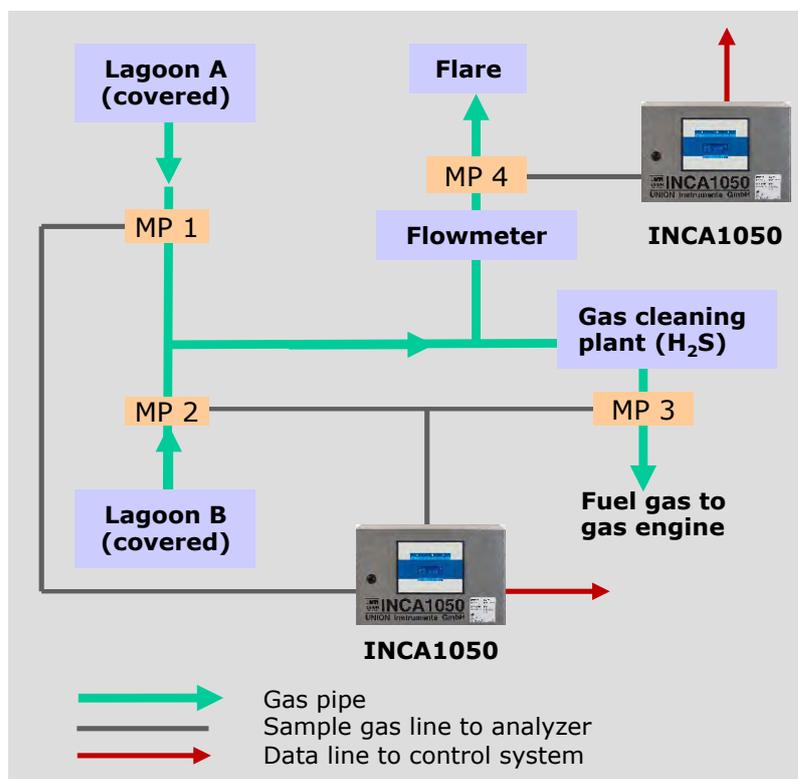
Especially in Biogas applications, analyzing the highly toxic and corrosive H<sub>2</sub>S gas in high and alternating concentration ranges is an extremely important issue: the electrochemical sensor cells are – from physical reasons - quite sensitive to the above mentioned conditions which often leads to incorrect measurement results and short sensor life times. INCA however uses a patented combined dilution and analysis technology to overcome these restrictions and to deliver reliable results over a wide concentration range with just one sensor.

Heated analyzer cabinet



INCA1050  
Gas Analyzer  
CH<sub>4</sub>, CO<sub>2</sub>, H<sub>2</sub>,  
H<sub>2</sub>S, O<sub>2</sub>

Automatic calibration





## UNION Instruments. Competence in gas monitoring

UNION Instruments GmbH is a Germany based manufacturer of devices and systems in gas measurement technology with a global approach. The company specialises in determining the energy content (calorimetry) and composition (analysis) of gases for industrial purposes covering a broad range of applications. The modular design of the devices makes them especially suited for custom solutions.

UNION Instruments offers our customers flexibly configurable standalone devices as well as complete solutions (systems) designed for individual needs including planning and engineering.

The characteristic feature of such a complete solution is the combination of different measuring methods to form a complete system. This tailor-made offer includes all measures from counselling, planning, engineering and installation to commissioning on site. This includes as well the correct documentation according to ISO and/or CSA/UL.

### Our service performance



#### Support

The UNION-hotline helps to solve all inquiries and urgent issues fast and easy. Device specific concerns can be solved worldwide within minutes by direct communication via TEAMVIEWER.



#### Training

UNION offers individual in-house training or on-site seminars for installation, use and maintenance of our devices even at the customer's premises. Training is individually adapted to the client's requirements.



#### Repair service

A global service for inspection, maintenance and repair of our devices and systems is provided directly by UNION and via its distributors.



#### Original spare parts

Original spare parts for the majority of UNION's products are on stock directly at site and ready for dispatch within a few hours.



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