

INCA gas analyzer with measuring point switchover monitors biogas plant acting as CO₂ supplier for a PtG plant



COMPETENCE
IN GAS
MONITORING



COMPETENCE IN GAS MONITORING

Over the years, biogas plants have undergone a considerable level of development with regard to technical features, size and use. In addition to simple and local plants at farms, for example, where the biogas is used directly in local combined heating and power stations, biogas plants are increasingly used as generators and suppliers of both biomethane for provision to natural gas networks and of CO₂ for supplying power-to-gas plants. In these plants, a reaction of CO₂ with hydrogen - generated via electrolysis - is producing an attractive energy source: methane. This enables excess electrical energy from, in particular, wind power plants to be both stored temporarily in the natural gas network and utilized for e.g. the operation of natural gas driven cars.

A waste fermentation and PtG plant network

A joint project has been recently being conducted in Werlte (Emsland, Germany), where a PtG plant managed by AUDI and operating as a CO₂ consumer and a waste fermentation plant managed by the Fraunhofer Institute and serving as a CO₂ supplier are located directly next to one another. The fermentation plant receives a wide variety of different waste materials, such as greases, food waste, whey and other liquid waste for processing. It is also supplied with pork and beef slurry from local farmers. To be able to obtain the level of CO₂ quality required by the PtG plant, the biogas plant was expanded to include a gas processing section for "amine washing." A heavily fluctuating raw material load, together with the quality requirements of networked plant operation place high demands on the functional and operational safety of both the plant and the analysis technology used with it.

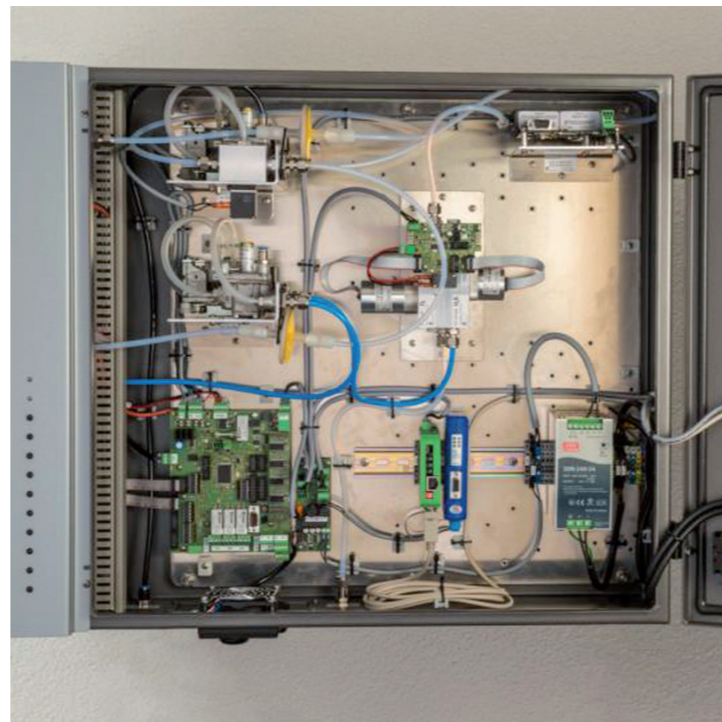


Best proven
in biogas plants

Long term stability
of H₂S analysis

Especially high intake power
for sample gas

Extremely economical
solution



8x measuring point
switchover

Compact design

Ethernet interface
for remote maintenance

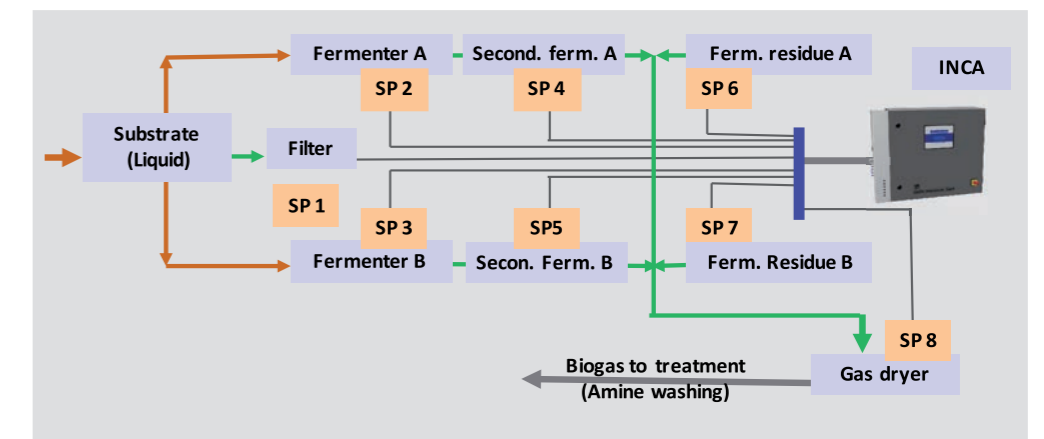
Integrated gas cooler

Gas analysis as a main plant component

Gas analysis plays a central role in the measuring and control technology of a biogas plant. It determines the composition of the process gas at various locations of the plant (see graphic) and thus monitors the orderly progression of the process all the way to the final products: biomethane and CO₂. The measurement values also serve as safety indicators with regard to poisoning and/or explosion hazards and contribute to compliance with legal emission limit values. In addition to methane (CH₄) and carbon dioxide (CO₂), biogas always contains hydrogen sulfide (H₂S) and small quantities of hydrogen (H₂) and oxygen (O₂) as well.

Just one single gas analyzer for eight sampling points

The plant being considered here is comprised of two redundantly designed production lines, A and B, and is equipped with just one single gas analyzer (INCA type from UNION Instruments) despite the eight measuring/sampling points required. This extraordinarily cost-effective solution is made possible thanks to the automatic sampling point switching of the INCA and the up to 100 m-long intake lines for the wet sample gas. The INCA sensors use tried-and-tested detection technologies such as NDIR to determine the CO₂ and CH₄ concentration levels and electrochemical cells with an especially long service life to determine O₂, H₂ and H₂S levels. The determined concentration values are transferred in digital form to the control system of the plant over a Profibus network and from there via Ethernet to the central server of the entire project. The data is then sent to the network partners via a VPN tunnel.





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.

