Honeywell | Connected Industrial

Integrated Systems for Biomethane Grid Injection

Solution Note

Honeywell's Elster® Precision Solutions enable biomethane producers to safely and reliably inject upgraded biogas into the local natural gas grid while complying with all relevant regulations.

The global shift in the use of energy from conventional resources to unconventional or renewable resources is the main factor driving the growth of the biogas market. Various government and environmental regulations are supporting and influencing this worldwide trend.

Biogas plants with upgrading and injection facilities place new demands on gas measurement, particularly on gas quality analysis. In the case of injection systems, gas quality specifications must be complied with and monitored using metrological technology – all this while adhering to official fiscal gas measurement requirements.

Gas distributors must measure both the quantity and quality of gas before allowing it to enter the grid, or reject the gas if it does not meet quality standards. They also require solutions to control pressure and add an odorant to the gas, which is stipulated for safety reasons in case of leakages.

Honeywell has the broad and deep experience and technology to address this need with our comprehensive Elster Precision Solutions. We supply complete packages for all measurement and control tasks necessary for biomethane grid injection.

FEATURES & BENEFITS

- Industry-leading gas measurement and control technology
- Recognized industry domain expertise
- Extensive resources for system design, engineering, configuration and support
- Proven track record in Europe, North America and Asia/Pacific
- Complete metering and control systems for biomethane injection into the natural gas grid
- Fully compliant with national grid regulations and specifications
- Thorough understanding of gas network operations
- Extensive, end-to-end solutions portfolio for gas/liquid metering and control
- Safe and reliable connection of biogas to the gas grid
- Global technical assistance center with expert local service and support

Proven and Reliable Solution

Biomethane producers around the world seek proven and reliable technology for injecting upgraded biogas into their local natural gas grid, while complying with all relevant regulations. They need a grid injection system offering a combination of high availability for the supplier and maximum security for the grid operator.

With one of the most comprehensive portfolios in the natural gas industry, Honeywell can build turnkey systems that handle fiscal measurement tasks, odorization, and compression and blending with liquefied petroleum gas (LPG) to Condition the biomethane to the required quality.

Honeywell's tailored solutions are offered to both biogas suppliers and grid operators. They include compact and cost-effective systems to inject biomethane into low-, medium- and high-pressure gas grids. These systems are supported by best-in-class gas measurement and control technology and proven industry domain expertise.

Applications

Honeywell's Elster Precision Solutions include gas-to-grid injection systems configured to meet a wide range of application requirements. These flexible systems are easily customized to comply with the user's individual specifications – from simple to complex. Subject to local requirements, they can comprise any of the following components:

- Integrated control system
- Gas pressure control equipment
- Compressors
- Odorizing station
- Analyzers
- Remotely operated valves
- Electric ball valves
- Particle filters
- Propane injection and mixers
- Flow meters
- Pressure and temperature sensors
- Gas chromatographs
- Network telemetry equipment

In the UK, Honeywell's Elster gas experts partnered with the biogas industry to provide the first commercially built Grid Entry Unit (GEU). Our grid injection system is fully compliant with GS(M)R and OFGEM regulations. It is available as either a three- or five-compartment solution.

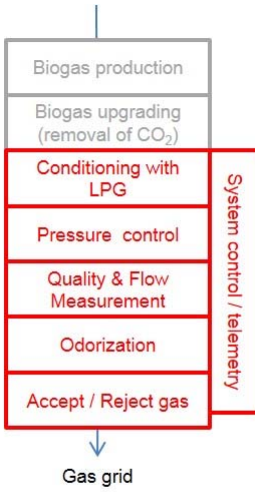
For the French market, Honeywell developed a compact system to inject biomethane into low- or medium-pressure gas grids. This solution includes:

- Fiscal metering, pressure control and analyzer system
- Odorization
- PLC-based control system with telemetry

Gas quality control

The feed of biomethane into the pipeline network in some cases requires conditioning of the gas to fit the calorific value of the pipeline gas. This conditioning of biomethane can be accomplished by blending the gas with LPG.

Honeywell scope (red):



* Optionally completed with gas compression in case of injection in high pressure grid

Honeywell Grid Injection System:

Three-compartment solution:

1. PLC-based control system with telemetry

2. Analyzers and odorization

3. Metering system and LPG blending

Five-compartment solution:

1. PLC-based control system

2. Metering system and LPG blending

3. Analyzers and odorization

4. Remotely operated valve

5. Network telemetry room

Figure 1. Honeywell's gas-to-grid injection systems can be configured to meet a wide range of application requirements.

The quality control as well as the conditioning of the biomethane requires continuous and accurate measurement of the gas composition.

Honeywell answers this challenge with the EnCal 3000 gas chromatograph, which has been adapted to measure all main components of biomethane including H_2, O_2, and H_2S. This application is approved by the PTB, LNE and OFGEM for use in metrologically approved metering systems.

EnCal 3000 Biogas: Metrological approved heating value measurement of biogas

Uncertainty: *<0.20 % for all calculated properties (based on a single point calibration)*

Repeatability: *<0.03 % for all calculated properties*

The EnCal 3000 biogas version uses different analytical columns specifically selected for the application. The oxygen present in the sample must be separated from the nitrogen, which is best handled with a molesieve column. Molesieve columns are particularly sensitive to water and CO2, which are removed using special filter cartridges inside the gas chromatograph's housing. For the optional measurement of hydrogen, the EnCal 3000 is capable of using Argon as a second carrier gas.

Special Applications

Honeywell also offers a virtual pipeline solution enabling multiple remote biogas producers to obtain access to the grid and eliminating the need for long pipelines to connect to grid.

In addition, a virtual pipeline solution eliminates the need to add costly LPG to meet grid quality requirements (blend in effect in high-volume networks).

Why Honeywell?

With Elster Precision Solutions, Honeywell offers an extensive, end-to-end solutions portfolio for gas and liquid metering, and control applications in the oil and gas industry.

Honeywell has proven experience meeting the needs of local gas distributors and grid operators across the globe. We provide seamlessly integrated solution packages – delivered by a single, trusted supplier – for all measurement and control tasks in biomethane grid injection systems:

- Full, turnkey biogas-to grid-systems
- Comprehensive engineering, procurement and construction (EPC) service
- Design and build to meet any site requirement
- Full compatibility with local/regional/national operator specifications
- Ongoing maintenance and service support for grid injection equipment along with associated utility gases, odorants and upgrades into the future

For More Information

To learn more about how Honeywell's Elster Precision Solutions can improve your gas measurement and control performance, visit www.honeywellprocess.com or contact your Honeywell account manager, authorized distributor or system integrator.

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SO-16-27-ENG
Aug 2016