



APPLICATION REPORT

Power Generation

Measuring biogas from waste disposal and digestion

- Methanation of waste for combined heat and power (CHP)
- Ultrasonic flow measurement of various biogases
- Installation validated by a verifying body



1. Background

The "Syndicat Mixte de Traitement et Valorisation des Déchets" [Joint association for waste treatment and recycling] chose the company Valor'Caux to set up and operate the facility E'Caux Pôle as a public-service concession. Valor'Caux is a subsidiary of the Veolia waste recycling and recovery branch. The company is located in the French commune Brametot, in the department of Seine Maritime.

The methanation and composting unit is a completely new facility at E'Caux Pôle. It is used to transform, or recycle, organic waste into biogas and agricultural fertilizer. Captured at the waste disposal facility and in the methanation unit, the biogas is used for combined heat and power (CHP) to simultaneously produce:

- electricity, which is then resold to the EDF network
- heat used in the process:
 - to treat liquid waste by supplying an evaporator
 - to reheat the percolate reinjected into the methanation tunnels, in order to optimise the degradation process.

2. Measurement requirements

At this facility, it is necessary to measure biogas production from the waste disposal facility and biogas plants and to measure the quantity of biogas that is utilised by the 400 and 200 kW generators. These measurements must indicate the percentage of biogas valorised, because if valorisation is greater than 75%, the customer can claim a noticeable reduction on the General Tax on Polluting Activities (TGAP). The measurement of the consumption of the generators used for CHP to produce electricity and hot water is also important when it comes to receiving a CHP bonus. It must be a commercial transactionor, alternatively, a calculation note indicating the overall uncertainty must be provided. A third party control body is mandated by EDF to verify this. It is important for the customer that the flowmeters are delivered with a calibration certificate and that annual follow-ups are set up.

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3. KROHNE solution

4 OPTISONIC 7300 C ultrasonic flowmeters have been installed at the output of the 4 digesters. Pressure and temperature sensors are connected to the flowmeters for integrated calculation of standard volume of the overall production of biogas. When it leaves the digester, the biogas is raw, laden with moisture, H₂S and particles.

1 OPTISONIC 7300 measures the production of biogas coming from the waste disposal facility. 1 OPTISONIC 7300 has been installed after gas purification that eliminates the particles, humidity and H₂S. For standard volume calculation, pressure and temperature sensors are again connected to the flowmeters.

The customer was provided with uncertainty calculations which were then validated by the third-party verifying body. An annual verification contract guaranteed by KROHNE customer service was signed by the customer.

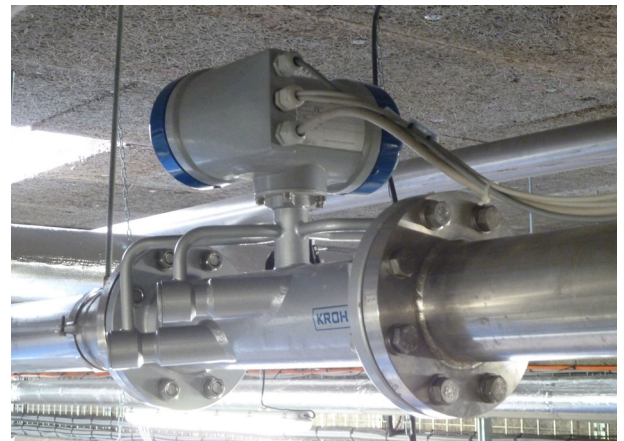


Biogas measurement with the OPTISONIC 7300 C ultrasonic flowmeter

4. Customer benefits

Thanks to KROHNE's extensive experience with ultrasonic technology applied to gas measurement, the OPTISONIC 7300 is able to measure gas such as biogas even when saturated with humidity and charged with H₂S and particles after methanation.

The overall measurement uncertainty corrected for pressure and temperature is far below EDF requirements. KROHNE customer service guarantees annual verification of these measuring devices in line with regulatory requirements.



OPTISONIC 7300 installed in the biogas supply line to the CHP generator

5. Product used

OPTISONIC 7300 C

- Ultrasonic flowmeter for inline measurement of gases
- Measurement of dry and humid biogas with changing composition
- Integrated calculation of standard volume and methane content using pressure and temperature measurement
- DN50...600 / 2...24" (higher on request)
- Full bore, unobstructed sensor tube: no moving parts, no pressure loss
- Available as compact or remote version
- ATEX, NEPSI, FM, CSA, IECEx
- HART®, FOUNDATION™ fieldbus, Modbus



Contact

Would you like further information about these or other applications?

Do you require technical advice for your application?

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