



SIEMENS

Ingenuity for life

Waste to energy: Reliable flowmetering in harsh conditions

More efficient plant operation with the Sitrans F M Transmag 2

The customer

The Innsbrucker Kommunalbetriebe AG (IKB) plant is among the most sophisticated water treatment facilities throughout Europe. Day after day, up to 165,000 m³ of wastewater coming from the city of Innsbruck, Austria, and its 14 surrounding municipalities is treated in a multistage process to biologically and mechanically clean it before reentering the natural water cycle of the river Inn. The plant also handles 8,000 tons of organic waste each year to produce biogas.

In keeping with the goal of holistic energy use, the biogas produced by the fermentation process is supplied to the block heat and power unit on site to generate electricity. This yields

21 MWh of electricity each day, fulfilling the daily demand of 1,600 4-person households.

The challenge

Before the biological waste can be fed into the fermentation process, it requires extensive filtering to eliminate impurities such as plastics, rocks and metals. To obtain a purified medium, the waste is ground and blended into a chewy mass together with process water and the delivered fats. This liquid mixture is stored in bunkers before the remaining impurities are separated and eliminated at a hydrocyclone. Only now can the treated and cleaned organic waste be partnered with the sewage sludge from the water treatment facility and left to ferment in two digestion towers.

Within each of these process steps, as well as for higher-level processes and tasks within the Innsbruck plant such as the control of downstream pumps, measuring flow rates is imperative to secure smooth-running operation.

The solution

To ensure that the measuring signal is not momentarily interrupted by large quantities of fats or other foreign media, the Innsbruck plant relies on electromagnetic pulsed AC flowmeters, which prove their capability under even the harshest conditions.

Equipped with this ability, the SITRANS F M Transmag 2 from Siemens guarantees consistently high measuring accuracy, zero-point stability and signal strength regardless of impurities in the medium or fluctuations in the magnetic field. The Transmag 2 therefore combines the advantages of pulsed DC devices (high signal strength) with those of pulsed AC devices (stable zero point).



Reliable in even the harshest conditions: the Transmag 2 electromagnetic flowmeters in the IKB handle up to 40 m³ per hour.

The Transmag 2 also has an answer to the fluctuations in the magnetic field, voltage or temperature that generally take their toll on the measurement accuracy of DC devices: these influences are cut out thanks to the Pulsed Alternated Current Technology (PAC) and an additional reference coil.

Even in applications with media conductivity as low as 0.1 $\mu\text{s}/\text{cm}$, this setup allows for reliable measurements. With the push of a single button, application-related disturbances can be suppressed. This task is tackled by the slurry mode which – once individually parametrized – will use a tolerance band to increase the stability of the measurements.

Whenever measurements lie outside the set tolerance range, this reading will be compared to previous measurement readings within a defined blanking period and used to calculate an average value. By doing so, the device carries on working even if signal disturbances occur and retains the most recent measuring value.

In cases where the disrupted signal is permanent, the slurry mode will continue to calculate average values until the deviation from the tolerance band is no longer present. Once this status is achieved, the device returns to normal operation.

Liner materials specifically designed for abrasive media and a selection of electrode materials help to minimize wear and tear on the Transmag 2, ensuring quality measurements and a low cost of ownership due to longevity of operating life. The treatment plant's device is lined with Novolak, a highly robust material with a smooth, hard surface.

With this liner in place, the biomass can pass the measuring tube without considerable friction. This liner material also protects the measuring tube from abrasion and corrosion. Even at high pressures and temperatures or under vacuum conditions, Novolak endures.

The benefits

The extension of the IKB treatment plant to a district heating power station for surrounding businesses and the connection to Innsbruck's district heating system won the company the renowned EPCON award. The optimally efficient operation of the plant is no coincidence. Among other factors, it is rooted in high-functioning measuring technology. The Transmag 2 provides a reliable contribution and is well equipped for increased demand should the facilities require further growth. The presence of solids or other impurities in the medium do not interfere with its measuring performance.

For flow monitoring of biomass with high shares of substrate, fats or green cuttings, the Transmag 2 is the device of choice for consistently reliable and meaningful measurement values.

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