

APPLICATION BRIEF

Sage Metering Application Brief

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Digester Gas Flow at Wastewater Treatment Plants

Wastewater Digester

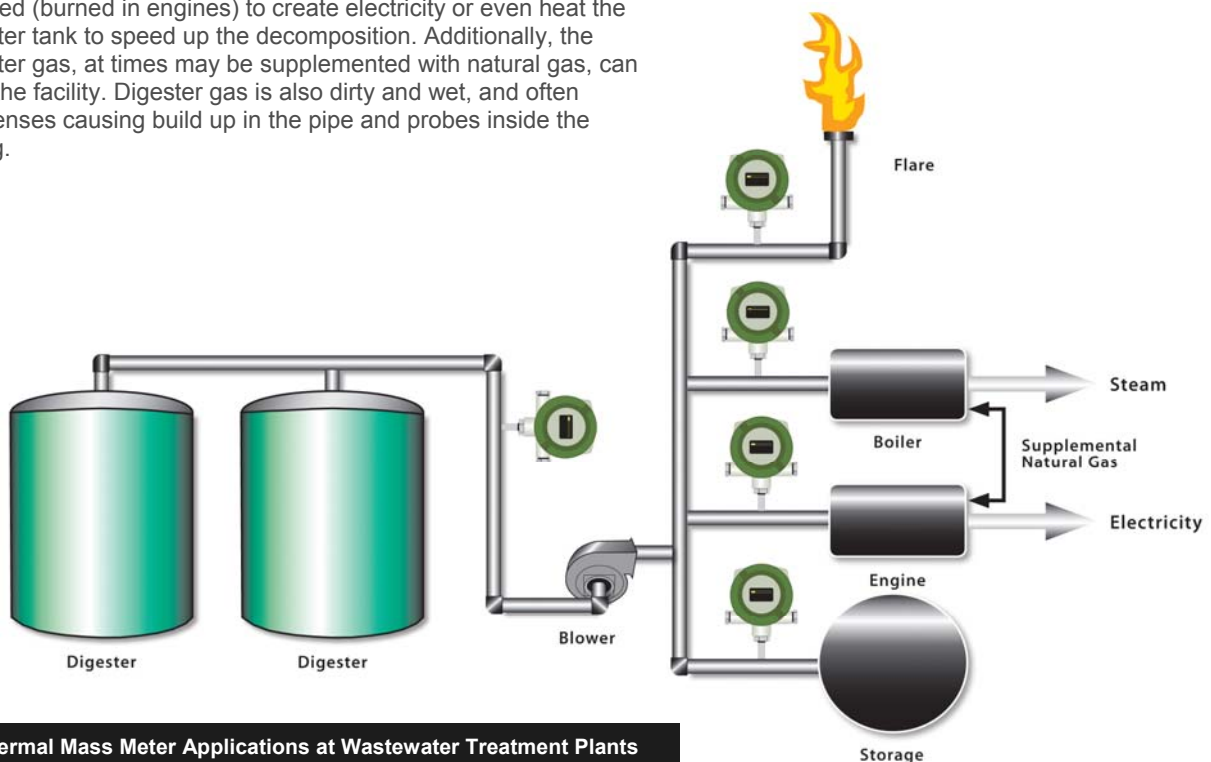
In large wastewater treatment plants, anaerobic digestion is often used to break down organic waste. The process produces digester gas from the decomposition of sewage sludge from primary or secondary clarifiers. Wastewater digester gas is a methane-rich byproduct that can be an energy source. A digester gas flow meter is often used to monitor digester gas applications.

Wastewater Digester Gas Composition

Digester gas is a form of biogas. The composition of wastewater digester gas varies, though the primary constituents are methane (CH_4) and carbon dioxide (CO_2). Trace amounts of nitrogen gas (N_2), oxygen gas (O_2), and hydrogen sulfide (H_2S) may also be present. While the gas composition will fluctuate depending on temperatures and the process itself, the methane-rich gas (~60-70% CH_4) becomes an attractive energy source. The biogas may be used (burned in engines) to create electricity or even heat the digester tank to speed up the decomposition. Additionally, the digester gas, at times may be supplemented with natural gas, can heat the facility. Digester gas is also dirty and wet, and often condenses causing build up in the pipe and probes inside the piping.

Digester Gas Flow Meters for Wastewater Treatment Plant

- Within a contemporary wastewater treatment process, there are many opportunities to use thermal mass flow meters to measure digester gas flow or flare gas flow.
- Monitor the digester process performance
- Process control for cogeneration systems that use digester gas as energy source
- Flaring to convert methane (GHG) to less harmful CO_2
- Collect data for GHG reduction and/or carbon credit programs
- Comply with environmental regulations to report greenhouse gas emissions





Considerations for Flow Meter Selection

- Easy in-situ calibration verification method to verify the accuracy, and operation of the sensor and transmitter
- Mass flow measurement without the need for temperature and pressure correction
- Gas from the digester is often low pressure and low flow rates so the meter requires excellent low flow sensitivity and negligible pressure drop
- Approved for use in Class I Div. 1 and Class I Div. 2 hazardous area
- No moving parts reduce maintenance; advantageous over commonly used positive displacement flow meters or turbine meters
- Calibrated for digester gas composition
- Probe retraction device for easy removal for cleaning
- Wide turndown for precision measurement at low or high flow
- Temperature compensation for accuracy and repeatability with changing process and ambient temperatures
- Due to condensed moisture in the gas, the flow meter should be installed downstream of the moisture knockout pots

The Sage thermal mass flow meters meet and exceed the selection considerations for measuring digester gas flow in wastewater treatment applications. Sage Metering is the only manufacturer offering an easy, in-the-pipe method to verify that the meter is accurate and that both the sensor and transmitter are clean and operational.

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Related Applications

Anaerobic digesters are commonly used in various industrial applications to produce biogas, including:

- Farms use digesters to exercise manure management for an energy source and co-generation
- Brewers use digesters in wastewater treatment for pollution prevention and create biogas for use in their boilers reducing natural gas consumption
- Distillers use digesters to convert their waste to energy and control pollution

Sage Prime pictured below



Recommended

- Sage Prime
(Prime with the SVA05 permits easy removal for cleaning)
- Sage Rio
(Rio when CI I Div. 1 or ATEX Zone 1 approval is required)