

WASTE WATER TREATMENT DIGESTER GAS MONITORING



The combination of the Kurz 452 and Adam 155 Computer, or the use of the Kurz 454FTB, in conjunction with the custom 550E Flow Body provide extremely reliable digester gas readings with very low pressure drop, even in the presence of large amounts of water



complex technology
MADE SIMPLE

Waste Water Treatment: Digester Gas Monitoring



Benefits of the Kurz Solution

- *Custom 550E Flow Body designed specifically for Municipal Applications*
- *System Design that Ensures Accurate and Reliable Readings even in the Presence of Large Amounts of Water and Moisture*
- *Excellent Low Flow Sensitivity in Low Velocity High Turndown Situations*
- *High Repeatability*
- *Extremely Low Maintenance*
- *Long Product Life*

Digester Process Introduction

Waste Water Treatment removes impurities and contaminants from a community's sewage in order to return waste water back to the environment as clean as possible. The entire procedure utilizes a number of different processes and a variety of equipment to treat the waste water. One of the processes is the Digester Operation that uses a large holding tank where anaerobic bacteria exist in an oxygen-starved environment. Sludge from the primary sediment tanks are pumped to the digester, where the microorganisms that live in the tank water consume the bacterial portion of the waste products and result in the byproduct of carbon dioxide and methane gas. Anaerobic digesters require close monitoring since the rate of methane gas production indicates the performance of the digester process. The methane gas is measured and is then used to provide fuel to an engine and/or is burned through a flare stack.

The primary challenges facing Waste Water Treatment plants in the Digester Gas measurement process are the large amounts of water present in the system, short straight runs and temperature stratification that interferes with reliable gas monitoring and measurements. In addition, the presence of hydrogen sulfide in these applications poses further challenges for sensor integrity.

Customer Application and Performance Issues

A Southwest City Municipal Waste Water Treatment Plant has been using Kurz Single Point Insertion Elements with great success for over 15 years. The City monitors very low velocities (0 - 1000 SFPM) from sixteen digesters, as well as the flare gas. The customer wanted to update all their original analog signal conditioners and flowmeters.

The Kurz Solution

The customer plant was upgraded to the Kurz 452 Thermal Flow Meter and Model 155, Mass Flow Computer. Each flow element is connected via a two-wire cable to the 155, Mass Flow Computer, which totalizes the flow rate readings from each mass flow element and sends out a 4-20 mA output signal proportional to the flow rate. Kurz sensors are resistant to the buildup of the hydrogen sulfide impurities on the sensing elements without degradation of readings.

In addition, the installation of the custom 550E Flow Body, designed specifically for Municipal applications, provides superior low flow capability and unmatched reliability with no pressure drop.

Performance Results with the Kurz Solution

As a result of the Kurz 452 and Adam 155 computer, and the addition of the 550E Flow Body the plant was able to:

- Achieve high reliability and repeatability in low flow and low velocity situations
- Obtain fast response to changing conditions
- Eliminate up/down stream piping requirements



This photo shows the 550E Flow Body in a Digester Gas application. Notice the unique shape of the pipe that satisfies the need for flow measurement readings that are accurate, repeatable, and have a low pressure drop, even in the presence of short pipe runs and a large amount of water.

- Obtain an integral flowmeter and flow conditioner package
- Streamline sensor or electronics maintenance without pulling the entire meter
- Superior speed of response and sensitivity for Kurz meter sensors can be utilized in flare stack monitoring

Kurz 550E Flow Body

Water Treatment plants have the need for flow measurement devices that are accurate, repeatable, and have a low pressure drop, even in the presence of short pipe runs and a large amount of water. For these Municipal applications the custom designed 550C and 550E Flow Body offers a perfect solution when coupled with the Kurz flow meters and flow computers.

The Flow Body consists of an inlet section, a measurement section and a diffuser on the outlet. This special technology is designed to regain much of the pressure drop and ultimately yields a low permanent pressure loss with minimal up/down stream run that is virtually zero. And an elbow on the inlet or outlet will affect the accuracy less than 2%.

Units for digester gas applications utilize the unique design with the 452 or 454FTB mounted at the 4 o'clock position and the sensor pointing up. This prevents moisture from condensing and draining down onto the sensor and skewing gas readings. By utilizing this unique flow conditioning body with the complete Kurz monitoring system, the customer can expect high accuracy, repeatability, and shorter run requirements. Kurz also offers standard digester gas correlation calibrations for various concentrations of methane.

About Kurz Instruments

Kurz Instruments has maintained a reputation for designing and manufacturing Thermal Mass Flow Transmitters for industrial air and gas flow applications. Our engineers, product development specialists and management staff have developed products to operate in the harshest of environments. And for more than 30 years, our entire team has provided solutions to our customers most demanding and difficult applications.

Kurz headquarters is located in Monterey, California, and in addition, Kurz offers advanced services through Kurz Technical Services based in Tennessee.

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