

STABILE & HIGH-FLOW MEASURING PROCEDURES

Turbidity measurement in compact design

Seli GmbH Automatisierungstechnik is taking a new approach with the STS product family in turbidity measurement for food and beverage technology processes. Whether in a product change or a phase separation, whether for wastewater control, separator or filter monitoring, the optical turbidity sensors are convincing by a stable and high-resolution measuring method.

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Turbidity Measurement – Why & How?

The turbidity measurement is used in the food processing and beverage filling industry for a variety of reasons. In various applications from Waste Water measurements as well as centrifuges monitoring it helps to improve and accelerate production processes and to avoid product losses to optimize cleaning phases and reduce wastewater pollution.

LED transmitting light ensures high reproducibility of measurements

In order to detect reproducible values with such sensors, temperature and component tolerances or fluctuations of the current source must be compensated, for example. At the same time, it is necessary to bundle the light beam onto the correct waveband by using filters and to mask possible transients by ambient light or the color of the carrier medium. This is not necessary with the turbidity measurement technology of the STS family since industrial LEDs are used as the light source.

Modular concept for low as well as high concentrations

The modularity and the ability to migrate the sensor family can be seen in the design and application areas. It is available in three optical path lengths and thus covers the measuring ranges 0 to 100 EBC / 400 FAU2, 0 to 250 EBC / 1,000 FAU and 0 to 500 EBC / 2,000 FAU. The STS02 version also offers an extended connection tube for the sensor element. The turbidity sensor STS03 and the extended STS04 are factory pre-calibrated measuring

instruments, which the user can add up to six additional individual measuring points. Their measuring range starts at approximately 10 EBC / 40 FAU and ends at 3,250 EBC / 13,000 FAU. With the STS turbidity sensors, both weak and extremely high concentrations can be measured and monitored.

Hygienic design - no chance for germs and bacteria

The sensor family STS is designed for use in humid and wet areas of food packaging and beverage filling plants. The selected materials - among others electro polished stainless steel 1.4404 (316L) with a surface quality of less than 0.37 µm roughness depth and a sapphire window as an optical interface - are characterized by the highest media resistance.

Low overall costs, high savings potential and fast ROI

The conception of the new STS sensor family is also very advantageous for the operator from an economical point of view. The housings of the sensors ensure high durability with regard to media resistance and tightness - at the same time low maintenance costs. No wonder that different users report a fast ROI and payback times of only a few months.

Examples of applications in breweries

Nowadays, about 1,000 systems have been used. In particular, a number of well-known breweries have opted for the STS turbidity sensors shortly after market launch. One of them - the Königs Brauerei

GmbH - uses STS01 sensors with different optical path lengths in different measuring locations. In all three measurement tasks, the STS sensors show a very good parallelism in comparison to the parallel installed and recorded EBC turbidity measurement. The STS01 are so precise and repeatable that their values can be used directly for process control. The Holsten Brewery Hamburg has not only improved the plant availability and product quality of its beers in several separator applications, but also saved around 500 euros of maintenance costs per separator as well as more than 1,000 euros of energy costs for previously required drying processes.

Phase separation in dairy - STS faster than conductivity measurement

In Germany's largest dairy, DMK Deutsches Milchkontor GmbH, the STS Sensor family has not replaced another turbidity measurement system, but an electrical conductivity measurement with which the phase separation of milk and water has previously been controlled. In comparative tests of both physical principles, it has been found that the optical measurement results in a much earlier and more stable switching signal than the conductivity measurement. The measurement via STS provides a reproducible changeover point without delay, whereas during the conductivity measurement the mean switching time depends on the entire switching range.

Further development at the end of the year

The versatile STS turbidity measurement technology offers new solutions for numerous applications. At the moment, the manufacturer Seli is working on a new development for this sensor series, which is to lead to another, breakthrough innovation at the end of 2017.

More Information

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Fig. Left: The turbidity sensor STS01 for the lower opacity range is available in three optical path lengths for different EBC or FAU measuring ranges. Fig. On the right: The STS01 is used in numerous breweries for turbidity measurement.