



APPLICATION NOTE

Water & Wastewater

Turbidity measurement for monitoring the quality of potable water in waterworks

- Continuous turbidity measurement in accordance with ISO 7027
- Easy to calibrate thanks to cuvette technology
- Minimal maintenance thanks to ultrasonic cleaning

1. Background

In accordance with the German Drinking Water Ordinance (2001), the 1 NTU turbidity limit at the outlet of the waterworks must be adhered to and any sudden or continuous increase must be immediately reported to the responsible authority. To guarantee this, online measurement technology which continuously measures turbidity and then transfers the values to a control system is used in most cases nowadays. The compulsory measuring technique in Europe, as per ISO 7027, is the 90° scattered light method using an NIR light source with a wavelength of 860 nm (+/-30nm).

Because mineral deposits and other contaminants can negatively affect the optical measuring system, the accuracy of the system must be regularly checked and corrected if necessary. Calibration is performed to so-called liquid secondary standards which are traceable to formazin. These calibration liquids are extremely expensive. With conventional systems, the liquids must be filled directly into the device and then disposed following calibration. Multiple use is not possible due to the possibility of cross-contamination. In addition, the contaminated optics must be regularly cleaned. Accordingly, the calibration and maintenance of the turbidity systems is extremely time-consuming and expensive. A reduction in the amount of maintenance as well as the possibility of multiple usage of the calibration standard is thus desirable.

2. Measurement requirements

In addition to measuring the turbidity at the outlet of the waterworks in order to monitor limits, additional turbidity measurement points are often located at the inlet and outlet of the sand filter to monitor the filter and initiate back-flush processes. It is important to ensure that these measuring points operate automatically and as continuously as possible with minimal maintenance.

3. KROHNE solution

The OPTISYS TUR 1050 turbidity measurement system is used to monitor turbidity values before and after the sand filter and during the process. The measurement is to be done as a bypass measurement with an open outlet. The system features automatic ultrasonic cleaning of the measuring cuvettes and is calibrated using reusable calibration cuvettes which contain a traceable secondary standard.

4. Customer benefits

Unlike comparable turbidity measuring systems, the measuring liquid in the OPTISYS TUR 1050 flows through a glass cuvette. The measurement is done through this cuvette and the optical measuring system does not come in contact with the sample. This almost completely eliminates any contamination of the sensitive optics. The measuring cuvette itself is independently cleaned via the built-in ultrasonic cleaning feature in the OPTISYS TUR 1050. Maintenance is thus minimal at approx. 4 services per year, each lasting 5 minutes (including calibration).

Short maintenance times can also be attributed to the innovative calibration of the device. To calibrate, the measuring cuvette is simply replaced by a calibration cuvette containing the liquid secondary standard and the calibration routine is started at the touch of a button. The included calibration kit contains three liquid standards (0.02 FNU, 10 FNU, 100 FNU) to calibrate the entire measuring range. Filled once, these cuvettes can be used to calibrate several systems (without the risk of cross-contamination). Calibrating the OPTISYS TUR 1050 is thus not only faster and easier, it is also significantly cheaper than for conventional systems.

5. Product used

OPTISYS TUR 1050 turbidity measuring system

- Turbidity measurement using a 90° scattered light technique (ISO 7027 / EPA 180.1)
- Measuring range 0...100 NTU/FNU
- Compact device with 1x 4..20 mA current output, RS485 interface and 2 alarm relays
- Cuvette technology makes it easy to calibrate and isolates the optical measuring system from the sample flow
- Integrated ultrasonic cleaning



Contact

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