

Application Report

Turbidity in Raw Water

The water available at the inlet of a Water Treatment Plant originates from different sources: ground water, rivers, lakes, wells. Accordingly, this water can be contaminated in different ways. Solid matter, dissolved organic carbons, humic acids, bacteria or micro pollutants can occur in any combination.



Picture 1: Buenos Aires at the Rio Plata, satellite view

In surface water, a large variation of solids (turbidity) ranging from a few FNU to several hundred FNU can be present depending on the season and/or the weather conditions. The picture shows the Rio Plata in Buenos Aires in which even more than 400 FNU has been measured in the rainy season.

Benefits

Some water suppliers only wish to know the turbidity at the water catchment. Others measure turbidity in order to decide if the water has to be rejected or which kind of treatment steps might be necessary. The value of turbidity can be used to decide on the dosage of flocculants to be added.

Typical Application

Water is conducted into the water treatment plant in a canal or a pipe. A sample of this feed water is then pumped or gravity fed to the measuring instrument. The resultant turbidity level of this water sample will be dependant upon the origin of the water, the season and other local conditions. Since high turbidity often occurs in raw water, an AquaScat with free-fall non-contact measurement is used. Hardly any fouling can occur, since there are no windows to foul, therefore the instrument provides reliable measuring values irrespective of how high the turbidity really is.



Picture 2: AquaScat WTM / HT

Level control

In some cases the raw water originates from a natural or artificial lake. This often involves seasonal variations of the water level, which result in changing pressures in the entire intake system.

To ensure that there is a constant supply to the AquaScat, a level control (picture 3, encircled in green) can be offered. The flow of water has to be adjusted in such a manner that a small water overflow exists at the lowest level of the raw water source (→).



Picture 3: AquaScat with level control and vent pipe

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Air bubbles in water

In some cases pressurized raw water undergoes degassing and in other cases, water is pumped from lakes and rivers to the measuring station. Both are processes with a high potential for air bubbles forming. Such air bubbles, however, are undesirable for the measurement of turbidity since they falsify the results. Air bubbles may be small enough so that they cannot be seen by the naked eye. A strong torch light directed at the jet of water makes many bubbles visible.

In order to remove air, the deaeration pipe (picture 3 & 4, encircled in orange) can be offered. If such a deaeration pipe is not sufficient, a second or even third one can be mounted in series.



Picture 4: AquaScat with deaeration pipe

Cost-benefit analysis

This measurement supplies the water treatment company with cost-advantageous online monitoring of the raw water. If an alarm is set off, the water can either be treated or rejected depending on the intensity of the soiling (turbidity value).

The in-line measurement results in process reliability.

Products

SIGRIST products and configuration:

- AquaScat 2 HT
(alternatively: all other models)
- Checking unit for AquaScat 2 HT/WTM
- Optionally: products for level control and deaeration

Parameter settings

- Check installation in accordance with the guidelines and recommendation from SIGRIST
- Adjust water flow
- Determine threshold value for preliminary alarm and alarm

Advantages of the SIGRIST

AquaScat HT/WTM

» Benefits

- Free-fall concept, the water does not contact optics
 - » No falsifying of the measured values and no drift because of window soiling
 - » very long maintenance interval
 - » metals such as manganese, iron, etc. will not soil optics
- Adjustment with secondary turbidity standard
 - » Allows recalibration without Formazin
 - » Buying, storing and managing Formazin is no longer necessary
- The design of the instrument and the materials used allow lowest basic stray light
 - » A low zero drift guarantees long-term stability
- Touch screen with colour display
 - » The display of measured values, graphics or information can be selected
 - » Data storage of the last 32 days