

# Turbidity Sensor

## User manual

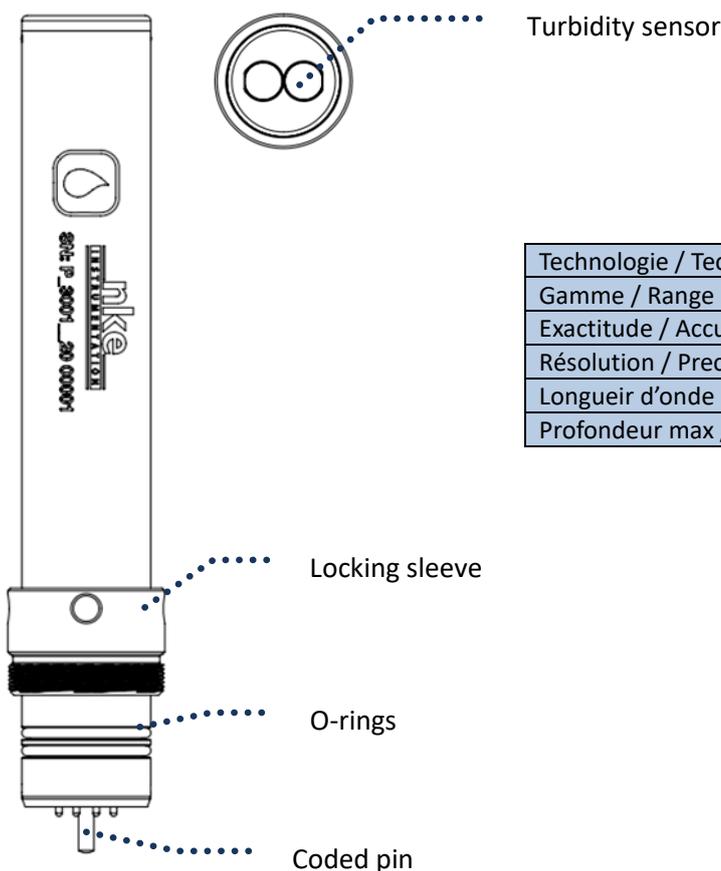
### 1 Description

The turbidity of an environment depends on lots of parameters including the type of particles, their size or their shape. Measurement methodologies measure only part of the information (absorption, diffusion) and results may differ greatly depending on the method used. The WiMo turbidimeter is based on the reflection of light induced by particles (nephelometry) that meets ISO 7027. It detects light scattered at 90° to the incident near infrared light beam.

The turbidity of an environment is a function of a plethora of parameters including the type of particles, their sizes or their shapes.

Calibration solutions are associated with instruments. Mostly the standard used is formazine, however it is possible to use other references (such as AMCO Clear). In this case differences in measurement may appear between the different turbidity sensors used.

The turbidity sensor is also compatible with Mosens Modbus



Technologie / Technology	Néphélogométrie 90°
Gamme / Range	0 – 4000 NTU
Exactitude / Accuracy	0,4 NTU ou 5% of reading
Résolution / Precision	0,01 NTU
Longueur d'onde	860 nm
Profondeur max / Max depth	300 m

**i** The turbidity sensor will be wiped if a cleaning system is plugged to the sonde.

## 2 Sensor response time

The response time of a sensor is the time required for the sensor to respond to a known variation of its measurement and reach a percentage of its final value. It is often mentioned a response time at 63% of the final value (T63) or 90% of the final value (T90). In order to compare response times between sensors it is essential to know the percentage of the final value that has been calculated.

<i>Response Time</i>	<i>Type</i>	<i>Value</i>
Turbidity	T63	< 2 sec

## 3 Calculated parameters

If a Turbidity sensor is detected by the WiMo probe, it shows an additional channel in the calculated parameters that you can activate.

Refer to the WiMo sensor manual to see how to activate this parameter.

### 3.1 Total Suspended Solids (TSS)

**Turbidity (expressed in NTU – Nephelometric Turbidity Units) and Total Suspended Solids (TSS) are two related but distinct parameters used to assess water quality.**

They do not measure exactly the same thing. There is no universal or fixed relationship between NTU and TSS, as this depends on several factors such as the nature, size, shape, color, and density of the suspended particles.

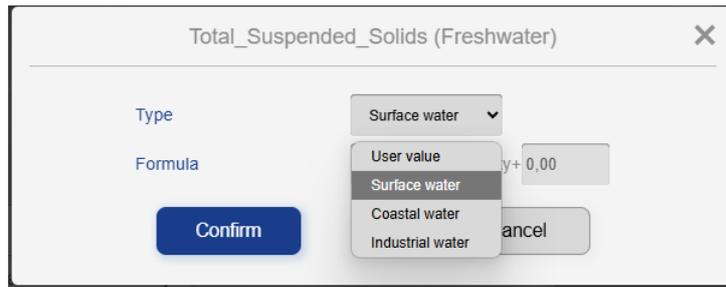
To accurately estimate TSS from turbidity, it is recommended to perform a local calibration based on representative water samples. The relationship between turbidity and TSS can be described using the following equation:

$$TSS = a \times Turbidity + b$$

- **TSS:** concentration of total suspended solids (mg/L)
- **Turbidity:** measured value in NTU
- **a** and **b:** coefficients determined through calibration, depending on the characteristics of the water

The WiMo probe offers three predefined correlation models tailored to different environments: *Surface water*, *Coastal water*, and *Industrial water*. However, these generic formulas may not provide accurate results in all contexts.

A fourth option, called *User value*, allows users to input their own coefficients based on site-specific calibration.



## 4 Adjustment

Sensor adjustment is a simple process requiring the use of adjustment standards.

nke Instrumentation will provide you with the procedure to perform this adjustment.

You will also need the "Metrology Interface" tool and the dedicated "WiMo\_Calibration-Tool" to perform this adjustment.

<https://nke-instrumentation.fr/produit/wimo-calibration-tool-2/>

We recommend to contact our sales department for more information.

**i** Nke instrumentation uses formazine solutions for adjusting WiSens turbidity probes. They make it possible to give an indication of the turbidity of the environment and to compare the probes.

The unit is NTU.

The measurement of suspended solids (MES) on sites, independently of the turbidity values, is essential in order to establish a correlation between the suspended solids and the turbidity value (NTU) given by the probes.

## 5 General recommendations

The sensor should always be kept clean, especially in the area around the optical windows.

Deposits on the optical windows can lead to measurement errors.

The use of this sensor in combination with our WIPER system is highly recommended.

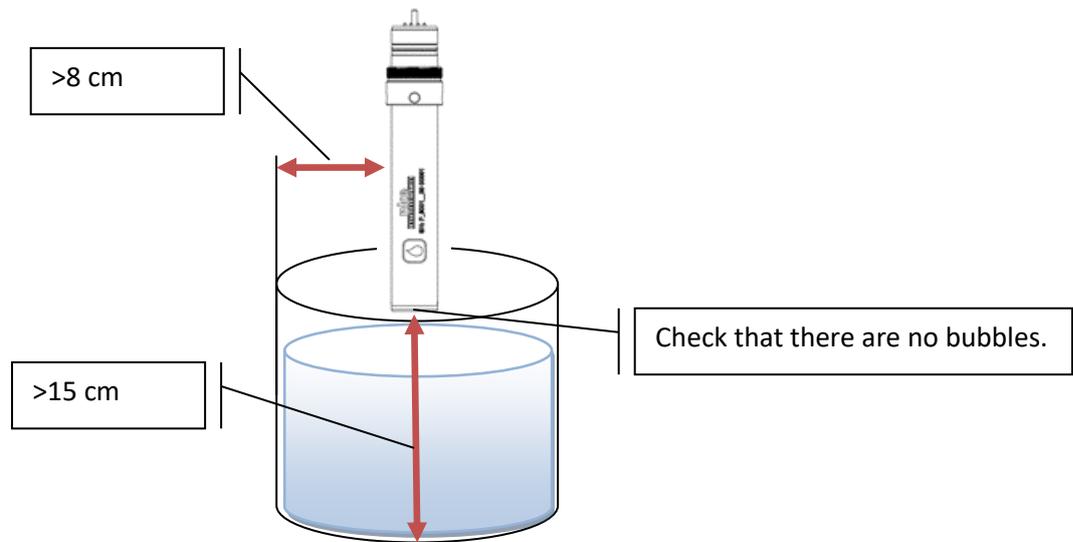
The pressure measurement is done at the top of the probe. There is therefore a position offset between the pressure measurement and the measurements made by the sensors. The offset for the turbidity sensor is 12.3 cm.

If the sensor is taken out of service, it must be rinsed and stored dry with its protective cap.

## 6 Recommendations for laboratory measurements

The following recommendations will improve the quality of your measurements, especially at low concentrations.

1. Use a non-reflective (dark or black) vessel. Avoid glass containers which can cause reflections and therefore biases on the measurement.
2. Make sure that the sensor is more than 15 cm from the bottom of the container.
3. Make sure that the sensor is in the center of the container and more than 8 cm from the edges of the container.



## 7 Maintenance

Regular maintenance of the equipment will ensure maximum longevity.

A thorough visual inspection should be performed regularly and any damaged parts should be replaced.

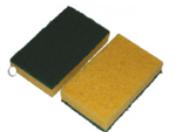
### 7.1 Routine maintenance

Deposits such as biofilm (or silt), silt and mud must be carefully removed.

Use a sponge with warm soapy water (such as dishwashing liquid) to clean the sensor body. Never use abrasive agents (e.g. a scouring sponge).

In case of heavy contamination with barnacles (or calcifying organisms), rinsing the sensor with water may not be sufficient. Depending on the degree of contamination, we recommend removing the heaviest contamination with a plastic scraper. Then use a soft sponge with a 5% acetic acid solution (white vinegar), preferably with warm water, and rinse the sensor with fresh water.

Wipe and dry the sensor with a soft cloth or optical wipes.



## 7.2 O-rings maintenance

The O-rings seal the probe. Any O-rings damaged can affect the reliability of the sonde. A visual inspection must be done each time a sensor is plugged or unplugged and also when battery compartment is opened. Check that no hair-type, particle-like elements are found on the O-rings. If the surface has impurities, gently clean them with a non-fluffy wipe and lightly grease the O-rings with molykote grease. Any damaged O-rings must be changed.

## 8 Return a product to the factory

For a consideration of your product by our after-sales service it is essential to follow the RMA procedure. Any material returned without an RMA number will not be taken into account.

- In case of shipment for repair or expertise, obtain an RMA number by using the procedure available on the website:  
<https://nke-instrumentation.com/product-return-form/>
- Pack the product in its original shipping box to prevent damage in transit.