Turbidity / Suspended Solids

Turbidity

For people, turbidity of water is highly comprehensible. For most persons, turbid water is nasty or even repellent. Smell, taste and turbidity are the most important indicators for the quality of potable water. Turbidity is typically determined using 90 degree scattered light principle in compliance with EN ISO 7027.

Fields of application:

- Outlet of wastewater treatment plants
- Sludge concentration
- Monitoring/Controlling of sludge cycle
- Drinking water
- Surface water

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Suspended Solids (TS)

The concentration of suspended solids is a very important process parameter for today's sludge treatment. A continuous gravimetric analysis is not possible in wastewater treatment process – therefore on-line methods are used. Total suspended solids can be determined on-line using scattered light or light absorbance.

Under normal conditions there is a good correlation to gravimetric analysis. However, sludges can be totally different – concerning coloration, particle size and structure. Threrefore of course a "multi-point" user calibration is possible. This can also be done with the mandatory required gravimetric determination of total suspended solids.

ViSolid® 700 IQ with switched-off cleaning system is completely covered with a biological layer after 16 days.

Cleaning System

The fouling of the optical path requires an effective cleaning system realized by WTW using a unique Ultrasonic System. This ultrasonic module, integrated in the VisoTurb® 700 IQ and in the ViSolid® 700 IQ, causes a permanent oscillation on the optical windows avoiding biological fouling. Pictures (right) show the same sensor with ultrasonic cleaning system switched-off and switched-on in a typical wastewater application.

The sensor with a switched off ultrasonic cleaning (upper picture) ist totally covered with organic deposits after 16 days. The sensor with switched on ultrasonic cleaning (below) doesn't show any negative impact.

Likewise, the IQ spectral sensors provide the integrated ultrasonic cleaning.

ViSolid® 700 IQ with working ultrasonic cleaning system shows no adverse effect.

see also https://www.xylemanalytics.com/en/parameters/turbidity-and-tss

Turbidity Sensor VisoTurb®

The VisoTurb® is ideal to monitor turbidity, for example in the outlet of a wastewater treatment plant. The unique integrated ultrasonic cleaning system ensures low-maintenance and continuously reliable measuring. By this, whether spare nor wear parts are needed.

With the nephelometric measuring principle, the scattered light is measured at a 90° angle. The measuring setup is suitable for low and medium turbidity values up to 4000 FNU. The sensor works according to EN ISO 7027.

VisoTurb® 700 IQ

- Ultrasonic cleaning without wear or spare parts
- Extremly low maintenance
- Highly accurate factory calibration
- High operational safety (SensorCheck function)

IP 68 · 2 Year Warranty · TD D2.05

Digital

To be connected to the digital, modular, and expandable IQ Sensor Net as well as to the single parameter controller 281.

VisoTurb® 700 IQ

for the IQ Sensor Net

VisoTurb® 700 IQ SW

for use in corrosive media

Ordering Information

Model	Description	Order No.
VisoTurb® 700 IQ	Digital turbidity sensor with integrated ultrasonic cleaning	600010
VisoTurb® 700 IQ SW	Like VisoTurb®700 IQ, but as a sea water model	600011

For technical data please see datasheet D2.05

Alternatives and accessories see brochure "Product Details" and website

Information about IQ Sensor Net system see from page 48

Sensors for suspended solids measurement see from page 25

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Suspended Solids Sensor ViSolid®

The unique integrated ultrasonic cleaning system ensures low-maintenance and continuously reliable measuring. By this, whether spare nor wear parts are needed.

The sensor uses two methods, which are selected depending on the total suspended solids concentration. At low concentrations, scattered light is measured. At higher concentrations, the direct back scattering provides optimal results.

ViSolid® 700 IQ

- Ultrasonic cleaning without wear or spare parts
- Extremly low maintenance
- Highly accurate factory calibration
- High operational safety (SensorCheck function)

IP 68 · 2 Year Warranty · TD D2.06

Digital

To be connected to the digital, modular, and expandable IQ Sensor Net.

IQ SENSOR NET

ViSolid® 700 IQ

for the IQ Sensor Net

ViSolid® 700 IQ SW

for use in corrosive media

Ordering Information

Model	Description	Order No.
ViSolid®700 IQ	Digital suspended solids sensor with integrated ultrasonic cleaning	600012
ViSolid®700 IQ SW	Like ViSolid®700 IQ, but as a sea water model	600013

For technical data please see datasheet D2.06

Alternatives and accessories see brochure "Product Details" and website

Information about IQ Sensor Net system see from page 48

UV-VIS spectral sensors for TSS measurement see from page 26

UV-VIS Spectral Sensors

With spectral sensors (wavelengths 200-720 nm) TSS, Nitrate, Nitrite and Color as well as additional carbon parameters can be measured (COD, BOD, TOC, DOC, SAC).

The following WTW spectral sensors are optimized for municipal wastewater application:

NitraVis® 701 IQ TS	*for inlet and aeration*	*from page 32*
NitraVis® 705 IQ TS	*for effluent*	*from page 32*
NiCaVis® 705 IQ TS	*for effluent*	*from page 32*
CarboVis® 701 IQ TS	*for inlet and aeration*	*from page 38*
CarboVis® 705 IQ TS	*for effluent*	*from page 38*
CarboVis® 705 IQ TS Co	*for effluent*	*from page 45*
NiCaVis® 705 IQ TS Co	*for effluent*	*from page 45*
ColorVis 705 IQ	*for effluent*	*from page 45*

The following WTW spectral sensors are designed for monitoring of surface water:

NiCaVis® 705 IQ SF	*for e.g. rivers and lakes*	*from page 32*
NiCaVis® 705 IQ SF Co	*for e.g. rivers and lakes*	*from page 45*
NiCaVis® 705 IQ NI SF	*for e.g. rivers and lakes*	*from page 32*
ColorVis 705 IQ	*for e.g. rivers and lakes*	*from page 45*

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Analyzer for Turbidity

Turb PLUS 2000 Series

For Turbidity Monitoring in Drinking Water

For many drinking water treatment plants, turbidity is the most important parameter. With the Turb PLUS 2000, turbidity can be monitored according to DIN EN ISO 7027 or US EPA 180.1.

The devices with integrated ultrasonic cleaning can be used in sedimentation, filtration, disinfection and in the plant outlet.

- High accuracy of ±2% of reading or ±0.02 NTU below 40 NTU
- Ultrasonic Cleaning System
- ISO and EPA compliant
- Resolution down to 0.0001 NTU
- 20 mA Current and RS 485 (Modbus RTU)
- Can be integrated into existing IQ Sensor Net via MIQ/IC2

IP 66 · CE · UK CA · ETL · 1 Year Warranty · TD D7.06

Turb PLUS 2020

white light,
without ultrasonic cleaning

Turb PLUS 2120

infrared light,
without ultrasonic cleaning

Turb PLUS 2120 Set

infrared light, with ultrasonic cleaning and additional bubble trap

Turb 2120

Ordering Information

Model	Description	Order No.
Turb PLUS 2020	Turbidity analyzer with white light (US EPA 180.1)	600026
Turb PLUS 2120	Turbidity analyzer with infrared light (ISO EN DIN 7027)	600036
Turb PLUS 2120 Set	Turb PLUS 2120 including external bubble trap	600037
BC-Turb/DW	External bubble trap	600041
Kal Kit Turb/DW	Calibration standard set (0.02, 10, 1000 NTU, cleaning tissues, designation rings)	600052
Kal Kit Turb PLUS 2000	Calibration standard set (0.02, 10, 100 NTU, cleaning tissues, designation rings)	600054
Kal Kit Turb 2110/DW	Calibration standard set (0.02, 1, 10 NTU, cleaning tissues, designation rings)	600056

For technical data please see datasheet D7.06

Alternatives and accessories see brochure "Product Details" and website

Pre-mounted panels for turbidity measurement see from page 65

Analyzer for chlorine see from page 47