OPERATING MANUAL

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VisoTurb® 900-P

DIGITAL TURBIDITY SENSOR

WTW

a xylem brand



The most current version of the present operating manual is available on the Internet under www.WTW.com.

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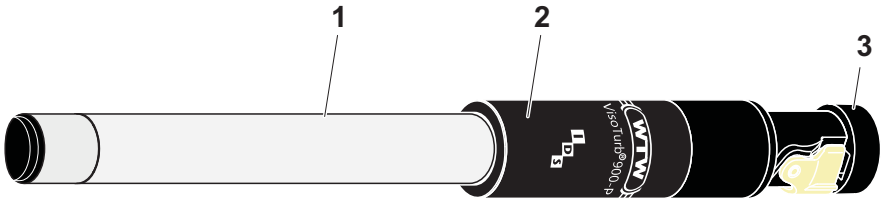
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1 Overview

1.1 Structure and function

Structure



1	Shaft
2	Connecting head with active electronics
3	IDS plug

Automatic sensor recognition

The sensor electronics with the stored sensor data is in the connecting head. The data include, among other things, the sensor type and series number. With each calibration, the calibration data are written in the sensor and the calibration history is recorded. The data are recalled by the meter when the sensor is connected and are used for measurement and for measured value documentation. Storing the calibration data in the sensor ensures that the correct calibration data are automatically used if the sensor is operated with several meters.

The digital transmission technique guarantees the failure-free communication with the meter even with long connection cables. The sensor firmware can be updated with the aid of the meter if the firmware is enhanced by WTW.

1.2 Recommended fields of application

- On site measurements in rivers, lakes and wastewater
- Ground water measurements
- Applications in water laboratories

2 Measurement / Operation

2.1 General information

The measured turbidity value is affected by:

- Gas bubbles (e.g. air bubbles) in the test sample.
- The measuring environment (reflective objects, incidence of light)

The following actions serve to avoid malfunctions:

Gas bubbles (e.g. air bubbles)

- When immersing the sensor in the test sample, hold the sensor at an angle.
- Prior to measurement, do not move or shake the test sample.

Reflection

- Keep 6 cm distance between the sensor and the bottom of the measuring vessel.
- Keep 2 cm distance between the sensor and the lateral walls of the measuring vessel.

Incidence of light

- Use a lightproof bottle for measuring.

Suitable vessels for measurement and calibration

Measure and calibrate in lightproof bottles with approx. 6 cm diameter and a filling level of at least 8 cm.

Suitable measurement and calibration bottles are listed in the price list of the WTW catalog "Lab and Field Instrumentation".

2.2 Commissioning

Scope of delivery

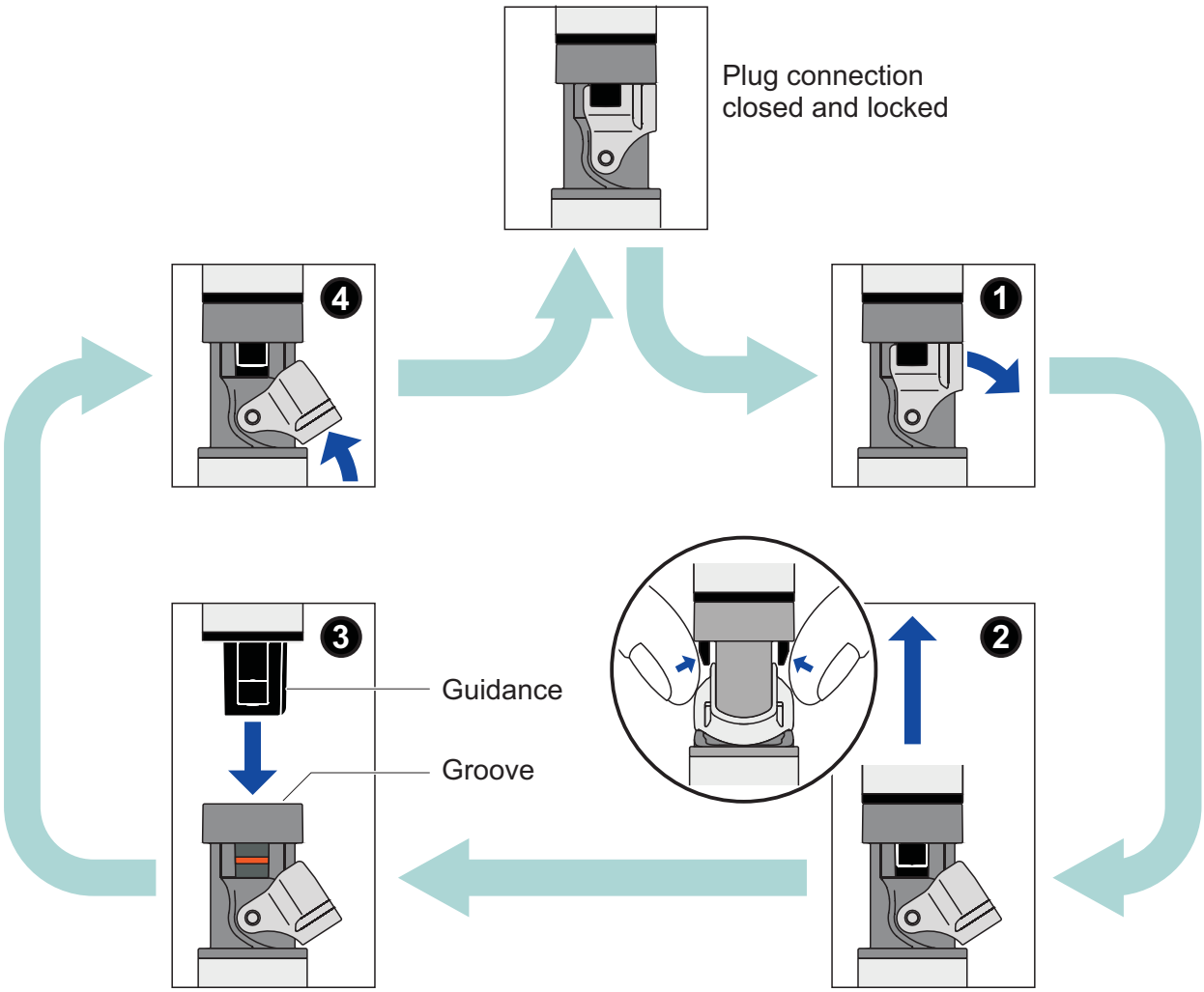
- Turbidity sensor VisoTurb® 900-P
- Operating manual

Getting the sensor ready for measuring

Connect the sensor with a free IDS connector of the meter. Please note the information on how to open and close the IDS plug connection given in section 2.3 OPENING AND CLOSING THE IDS PLUG CONNECTION.
The sensor is immediately ready to measure.

Connecting cables in various lengths to connect the sensor to the meter are listed in chapter 6 WEAR PARTS AND ACCESSORIES.

2.3 Opening and closing the IDS plug connection



Opening the plug connection

- If necessary, clean the plug connection
- Open the locking device (step 1)
- Press the clips of the coupling together with your thumb and forefinger and pull the coupling out of the plug (step 2).

Closing the plug connection

- Make sure that the plug connection is perfectly dry and clean.
- Align the guidance of the coupling to the groove in the plug and insert the coupling into the unlocked plug up to the stop (step 3)
- Close the locking device (step 4)

2.4 Measuring

Minimum distance

If the distance between the sensor and any reflecting surfaces (walls and bottom of the vessel) is too small, this will affect the measurement result. Keep the following minimum distance for optimum measurement results:

- Keep 2 cm distance between the sensor and the walls of the measuring vessel.
- Keep 6 cm distance between the sensor and the bottom of the measuring vessel.

2.5 Calibration

When is calibrating useful?

Calibrating can be useful in the following special cases:

- If the measured values seem to be implausible
- Routinely within the framework of the company quality assurance

2.6 Storing

Always store the sensor at a temperature in the range -20 ... +80 °C.

3 Cleaning



CAUTION
To clean the sensor, disconnect it from the instrument.

Exterior cleaning

We recommend cleaning the sensor thoroughly, especially before measuring low turbidity values.

Contamination	Cleaning procedure
Lime sediments	Immerse in acetic acid for 5 minutes (volume share = 10 %)
Fat/oil	Clean with warm water that contains washing-up liquid

After cleaning, thoroughly rinse with deionized water and recalibrate if necessary.

Aging of the turbidity sensor

Normally, the turbidity sensor does not age. Special measuring media (e.g. strong acids and bases, organic solvents) or temperatures that are too high may considerably reduce its lifetime or lead to damage. The warranty does not cover failure caused by measuring conditions and mechanical damage.

Disposal

We recommend to dispose of the measuring cell as electronic waste.

4 What to do if ...

Error symptom	Cause	Remedy
No turbidity display	– No connection between meter and turbidity sensor – Cable defective	– Establish connection between meter and turbidity sensor
Implausible turbidity values	– There are gas bubbles (e.g. air bubbles) in front of the measurement window	– Remove the gas bubbles, e.g. by immersing the sensor at an angle
	– Incorrect calibration,e.g.: – Unsuitable calibration standard solutions (e.g. too old) – Unsuitable calibration environment (e.g. due to gas bubbles, reflection, light)	– Check the calibration
Error message, OFL	– Measured value outside the measuring range	– Select a suitable measuring medium
Measured values too low	– Measurement window soiled	– Clean the measurement window
Measured values too high	– Reflection at the walls or bottom of the measuring vessel	– Keep the minimum distance of the sensor towards the walls and bottom of the measuring vessel (see section 2.4)
	– Incidence of light	– Use a light-proof measuring vessel

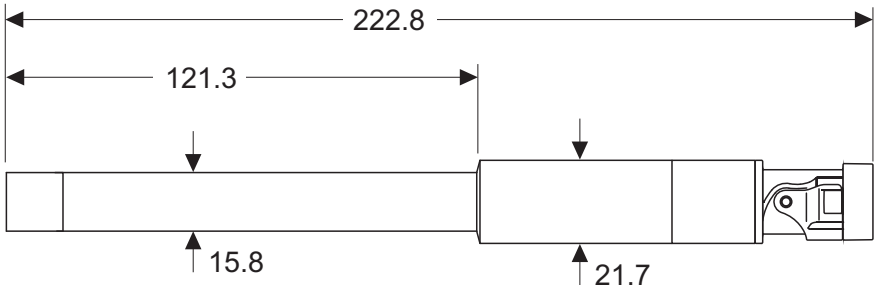
5 Technical data

5.1 General data

General features

Measuring principle	Nephelometric according to ISO 7027 / DIN EN 27027
Wavelength:	860 nm ± 15 nm
Light source	Infrared LED

Dimensions (in mm)



Weight

Approx. 83 g (without cable)

Materials

Shaft	Titanium
Connection head	POM

IDS plug

Connection type	4-pin, watertight plug connection with locking device, reverse polarity protected
Materials	– Plastic parts: Fiber-glass reinforced Noryl, TPU, TPC-ET, POM, PEEK, PBT – O-ring: FPM – Contacts gold-plated

Pressure resistance

Sensor with connection cable	IP 68 (10 x 10^5 Pa or 10 bar)
Cable plug	IP 67 (when plugged in)

The VisoTurb® 900-P meets the requirements according to article 3(3) of the directive, 97/23/EC ("pressure equipment directive").

Measurement conditions

Turbidity measuring range	0.0 ... 4000.0 FNU/NTU
Temperature range	-5 ... 50 °C (23 ... 158 °F)
Max. admissible overpressure	10 x 10^5 Pa (10 bar)
Minimum depth of immersion	2 cm

Storage conditions

Recommended storing method	In air
Storage temperature	-20 ... 80 °C

Characteristics when delivered

Responding behavior	t63 (63 % of the final value display after) < 2 s

5.2 Measuring ranges, resolution, accuracy

Measuring ranges, resolution

Measured parameter	Measuring range	Resolution (max.)
FNU/NTU	0.0 ... 4000.0	0.1

5.3 Accuracy of the IDS measuring technique

Measured parameter	Measuring range	Accuracy (± 1 digit)
FNU/NTU	0.0 ... 999.9	0.3 FNU or ± 2 % of the measured value (depending on the greater value)
	1000.0 ... 4000.0	± 5 % of measured value

6 Wear parts and accessories

Accessories for VisoTurb® 900-P

Description	Model	Order no.
IDS connecting cable, 1.5 m	AS/IDS-1.5	903 850
IDS connecting cable, 3 m	AS/IDS-3	903 851
IDS connecting cable, 6 m	AS/IDS-6	903 852
IDS connecting cable, 10 m	AS/IDS-10	903 853
IDS connecting cable, 15 m	AS/IDS-15	903 854
IDS connecting cable, 20 m	AS/IDS-20	903 855
IDS connecting cable, 25 m	AS/IDS-25	903 856
IDS connecting cable, 40 m	AS/IDS-40	903 857
IDS connecting cable, 60 m	AS/IDS-60	903 858
IDS connecting cable, 100 m	AS/IDS-100	903 859
Kit for turbidity calibration Turbidity standards 124.0 FNU/NTU and 1010.0 FNU/NTU)	Cal-Kit VT900	600 702
Calibration and measurement bottle, 0.5 l	SB VT 900	600 704
Protective armouring (/K variant) (The /S variant has an impact on the measured value.)	A 925-P/K	903 839



Further accessories are listed in the price list of the WTW catalog "Lab and Field Instrumentation".

What can Xylem do for you?

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to xyleminc.com.

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