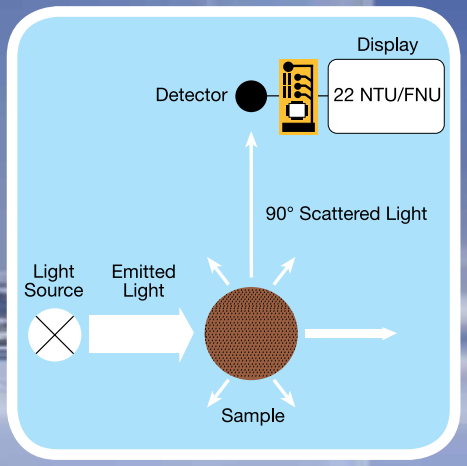
TURBIDITY

TurbiDirect

TurbiCheck

TurbiCheck WL

Principle



Turbidity measurement

The term "turbidity" is used to describe the cloudy or milky appearance of liquid or solid media such as water (drinking, mineral, bathing or waste water), beverages (beer, wine or soft drinks) or window glass (translucent glass).

In physical terms, turbidity is due to particles of varying sizes scattering or absorbing light, giving the medium in question a cloudy appearance.

This turbidity is caused by suspended particles such as sludge, limestone, yeast or microorganisms.

In former days, researchers attempted to use visual systems as a means of turbidity measurement. "Jackson Turbidity Units" (JTU), for example, were based on a defined volume of dissolved silicic acid from diatomaceous earth in water. Turbidity was measured using a candle turbidity meter, apparatus comprising a candle and a glass vessel that permitted visual comparison of the suspension with the silicic acid solution.

Today, it is still common practice to test water samples using a white "sight disc" made of cast bronze; the disc is lowered into the water until it can no longer be seen. The turbidity is then calculated on the basis of immersion depth.

Today, the phenomenon of turbidity is measured using optoelectronic meters. An artificial light source emits a known intensity of light through a sample. The suspended particles scatter or absorb the light. The scattered light is then recorded on a photodetector.

Nowadays, the scattered light is generally measured at an angle of 90°. This measurement principle is known as nephelometry. A nephelometer is therefore a turbidity meter that measures scattered light at an angle of 90°. The results are shown in NTU (Nephelometric Turbidity Unit).

To obtain defined, reproducible results, turbidity meters are calibrated and adjusted using formazine solutions (reference standard).

These meters display their results in FNUs (Formazine Nephelometric Units).

The result measured by a meter operating on the transmitted light principle is shown in FAUs (Formazine Attenuation Units).

There are two standards for turbidity measurement that are widely accepted at an international level.

EN ISO 7027, "Water quality, determination of turbidity" outlines all the possible methods for turbidity measurement.

All optoelectronic methods require an infrared light source. This also permits testing of coloured samples.

In its method 180.1, "Determination of turbidity by nephelometry", the EPA in the US describes solely the nephelometric (scatter light) method using a so-called white light source (tungsten halogen lamp).

The results measured by different units using the two aforementioned methods cannot be compared.

TurbiDirect with infra-red light source

Highlights

- Meets EN ISO 7027
- Automatic overall range adjustment with Standard-Set T-Cal
- Autoranging
- High accuracy
- Laboratory and mobile use
- RS 232 interface
- Storage for up to 1000 data-sets
- Real-time clock
- Waterproof sample chamber and housing

Turbidity is measured according to EN ISO 7027 by nephelometric means (90° scattered light). The infra-red light-source permits measurement of coloured and colour-free samples.

The automatic measurement range detection facility (Autorange) enables direct turbidity measurement from 0.01 to 1100 NTU with an accuracy of ± 2% up to 500 NTU and ± 3% thereafter.

A large graphic display, a choice of several different languages and user-friendly operating instructions make the device extremely easy to use.

Software updates (for example: languages) can be downloaded free of charge from our website www.lovibond.com.

Technical data

Principle	nephelometric (90° scattered light)
Light source	IR-LED (860 nm)
Keypad	acid and solvent resistant; membrane keypad
Auto – Off	automatic switch off
Display	Graphic-Display
Update	Software update via Internet
Clock	real time clock
Memory	1000 data sets
Sample vol.	approx. 12 ml
Range	0.01 – 1100 NTU (Auto range)
Resolution (NTU)	0.01 from 0.01 - 9.99 0.1 NTU from 10.0 - 99.9 1 NTU from 100 - 1100
Accuracy (NTU)	± 2 % of reading or 0.01 (0 - 500) ± 5 % of reading (500 - 1100)
Ambient conditions	temperature: 5-40°C at 30-90% relative humidity (non condensing)
Interface	RS232 for printer and PC-connection
Power supply	7 NiCd rechargeable batteries (Type AA) ; mains adapter (Input: 100-230V ; and lithium battery for data storage
Weight (instrument)	approx. 1000 g including batteries and power pack
Dimensions	265 x 195 x 70 mm (L x W x H)

CE-Conformity

Accessories

Set of 12 sample vials with black lid, height 55 mm, ø 24 mm	19 76 55
Cleaning cloth for vials	19 76 35
Rubber seal cap, black for interface and power plug-in	19 80 17 16
Sample chamber lid, black	19 80 11 19
Mains charger, 100-240 V, 50-60 Hz, with international adapters	19 30 10
Universal adapter for socket, international	19 20 65
Connection cable connection to PC, serial 9-pins	19 81 98
Akku AA Mignon, 1100 mAh (7 pc.)	19 50 02 0
Lithium battery	19 50 01 7
Formazin Stock Solution (4000 NTU), 100 ml	19 41 41
Formazin Stock Solution (4000 NTU), 250 ml	19 41 42
Set Turbidity Standards T-CAL (<0.1, 20, 200, 800 NTU)	19 41 50
Paper printer DPN 2335	19 80 75
Roll of paper for printer DPN 2335	19 80 62
Pack of accus for printer DPN 2335	19 80 66
Ribbon cartridge for printer DPN 2335	19 80 67

Delivery Content

- Instrument in carrying case
- 1 set of turbidity standards T-CAL
- 7 rechargeable batteries (AAA)
- Mains charger, 100-240 V
- PC connection cable
- 4 vials (ø 24 mm) with lids
- Guarantee sheet
- Certificate of Compliance
- Instruction Manual

Order code: 19 40 00

TurbiCheck with infra-red light source (EN ISO 7027)

The compact Lovibond® infrared turbidity meter TurbiCheck is designed to allow fast, precise on-site testing. The unit measures the scattered light at an angle of 90°, as stipulated in EN ISO 7027.

The wide measuring range from 0.01-1100 TE/F = NTU = FNU makes the instrument suitable for various applications, ranging from drinking water to waste water.

As infrared light is used for measurement purposes, the unit can be used to test both coloured and colourless liquids.

The standards required for calibration of the unit are also supplied. A second adjustment mode allows alternative adjustment with user-defined turbidity standards.

Accessories

Article	Code
Turbidity standard set T-CAL (< 0.1, 20, 200, 800 NTU)	19 41 50
Set empty vials, 24 mm ø (12 pc.)	19 76 55
Cleaning cloth for vials	19 76 35
Sample chamber lid	19 80 11 00
Battery, 9 V	19 50 012
Formazin Stock Solution (4000 NTU), 100 ml	19 41 41
Formazin Stock Solution (4000 NTU), 250 ml	19 41 42

Technical data

Measurement cycle	approx. 8 seconds
Display	backlit LCD (on keypress)
Optics	temperature-compensated LED (λ = 860 nm) and photosensor amplifier in water proof sample chamber, infrared light
Keypad	polycarbonate membrane, splash proof
Power supply	9 V power pack battery
Auto - OFF	automatic switch-off
Storage	internal ring memory for 16 data sets
Additional feature	real time clock and date
Range (Auto-range)	0,01 - 1100 NTU
Resolution	0.01 - 9.99 NTU = 0.01 NTU 10.0 - 99.9 NTU = 0.1 NTU 100 - 1100 NTU = 1 NTU
Accuracy	± 2,5 % of reading or ± 0.01 NTU (0 - 500 NTU) ± 5 % (500 - 1100 NTU)
Housing	ABS
Dimensions (L x W x H)	190 x 110 x 55 mm
Weight (base unit)	approx. 0.4 kg
Ambient conditions	Temperature: 5 – 40 °C rel. humidity: 30 – 90%
CE-Conformity	

Highlights

- Range 0.01 - 1100 NTU
- Measurement with infrared light at an angle of 90°
- Measurement of coloured liquids
- Easy handling
- 600 tests without battery change

Delivery Content

- Instrument in carrying case
- 4 turbidity standards (< 0,1, 20, 200 and 800 NTU)
- 9 V battery
- 3 vials (ø 24 mm) with lids
- Guarantee sheet
- Certificate of Compliance
- Instruction Manual

Order code: 26 60 20

TurbiCheck WL with white light source

Technical data

Display	large LCD display
Keypad	5 key polycarbonate membrane, splash proof
Power supply	4 AA Alkaline batteries for approx. 20 h continuous operation or 3500 tests
Range	0.01 to 1100 NTU
Accuracy	± 2% of value or 0.01 NTU (0-500 NTU) ± 3% of value (500-1100 NTU)
Resolution	0.01 NTU to 99.99 NTU 0.1 NTU from 100.0 to 999.9 NTU 1.0 NTU from 1000 to 1100 NTU
Housing	ABS
Dimensions	210 x 95 x 45 mm
Weight	approx. 0.45 kg (base unit)
Ambient conditions	Temperature: 0 – 50 °C rel. humidity: 0 – 90%
CE-Conformity	

Accessories

Set of secondary standards
0.02, 10, 1000 NTU
Order code: 19 42 80

Set of 3 vials
with black lids
Order code: 19 42 90

The TurbiCheck WL allows easy turbidity measurement in either the field or in the laboratory. Using a „white light" source and 90° detection, the TurbiCheck WL meets the specifications for EPA turbidity measurement (EPA Standard 180.1).A power efficient micro-circuit design
allows the instrument to yield 5000 tests on 4-AA alkaline batteries with an estimated 7-10 year bulb life. Integrated diagnostics confirm proper operation and accuracy. The instrument features an Auto-Ranging feature that automatically
selects the correct turbidity range for your sample. Calibration is simple with the included calibration standards. The instrument comes with all required items for testing including the TurbiCheck WL Turbidimeter, sample cuvettes, batteries, calibration set, operators manual and carrying case.

Highlights

- Ideal for regulatory monitoring, process control or field use
- Simple operation
- Easy calibration
- Auto-Ranging
- Meets USEPA

Delivery content

- Instrument in a sturdy handy case
- 2 sample vials
- 3 turbidity standards
- 4 batteries
- Instruction manual
- Guarantee sheet

Order code: 19 42 00