TL23 SERIES BENCHTOP TURBIDIMETER

Applications

- Food and beverage
- Pharmaceutical
- Chemical
- Power
- Metal and Mining
- Agriculture
- Wastewater

Trusted measurement for high range turbidity applications; simplified.

The new TL23 Series laboratory turbidimeters blend trusted technology and improved features to simplify testing in the most demanding industrial and wastewater applications.

Improved and intuitive design

The TL23 Series' large full colour touch screen display and intuitive user interface accelerate setup, calibration and measurement. An easy interface and guided procedures give you confidence in your results.

A smart device for more reliable measurements

The TL23 Series ensures stable readings and accurate analysis by capturing turbidity readings once the device detects sample stability. This quality step removes subjectivity and the need for repeated measurements.

Easy to use. Easy to Be Right

The TL23 Series provides everything you need at your fingertips. With a USB port for easy data export, sample identification for traceability, and self-diagnostics for quality assurance, Hach® makes it easy to Be Right.

HACH®
Be Right™

Technical Data*

Model	TL2300 EPA	TL2310 ISO	TL2350 EPA	TL2360 ISO
Measurement method	Nephelometric			
Regulatory	Meets EPA Method 180.1	Meets ISO 7027, DIN EN 27027, DIN 38404 and NFT 9033	Meets EPA Method 180.1	Meets ISO 7027, DIN EN 27027, DIN 38404 and NFT 9033
Display	17.8 mm colour touch screen			
Light source	Tungsten filament lamp	Light-emitting diode (LED) at 860 ± 30 nm	Tungsten filament lamp	Light-emitting diode (LED) at 860 ± 30 nm
Units	NTU and EBC	FNU and NTU	NTU, EBC, Abs (absorbance), %T (% transmittance) and mg/L	FNU, FAU, NTU, EBC, Abs (absorbance), %T (% transmittance) and mg/L
Measuring range	NTU (Ratio on): 0 - 4000 NTU (Ratio off): 0 - 40 EBC (Ratio on): 0 - 980 EBC (Ratio off): 0 - 9.8	NTU/FNU: 0 - 1000	NTU (Ratio on): 0 - 10000 auto decimal NTU (Ratio off): 0 - 40 EBC (Ratio on): 0 - 2450 auto decimal EBC (Ratio off): 0 - 9.8 Absorbance (auto range): 0 - 1.0 Transmittance (%): 1.0 - 100 Degree (mg/L): 1 - 100	FNU (Ratio on): 0 - 1000 FNU (Ratio off): 0 - 40 FAU (auto range): 20 - 10000 NTU (Ratio on): 0 - 10000 auto decimal NTU (Ratio off): 0 - 40 EBC (Ratio on): 0 - 2450 auto decimal EBC (Ratio off): 0 - 9.8 Absorbance (auto range): 0 - 2.00 Transmittance (%): 1.0 - 100 Degree (mg/L): 0 - 100
Accuracy	Ratio on: ±2% of reading plus 0.01 NTU from 0 - 1000 NTU, ±5% of reading from 1000 - 4000 NTU based on formazin primary standard Ratio off: ±2% of reading plus 0.01 NTU from 0 - 40 NTU	±2% of reading plus 0.01 FNU/NTU from 0 - 1000 FNU/NTU	Ratio on: ±2% of reading plus 0.01 NTU from 0 - 1000 NTU, ±5% of reading from 1000 - 4000 NTU ±10 % of reading from 4000 - 10000 NTU Ratio off: ±2% of reading plus 0.01 NTU from 0 - 40 NTU	FNU: ±2% of reading plus 0.01 FNU from 0 - 1000 FNU FAU: ±10% of reading from 20 - 10000 NTU NTU: ±2% of reading plus 0.01 NTU from 0 - 1000 NTU, ±5% of reading from 1000 - 4000 NTU, ±10% of reading from 4000 - 10000 NTU
Absorbance			Absorbance: ±0.01 Abs from 0 - 0.5 Abs at 455 nm, ±2% Abs from 0.5 - 1 Abs at 455 nm Transmittance: 2% T from 10 - 100% T at 455 nm	Absorbance: ±0.005 Abs from 0 - 1 Abs at 860 nm Transmittance: 0.12% T from 10 - 100% T at 860 nm
Resolution	Turbidity: 0.001 NTU/EBC (on lowest range)		Turbidity: 0.001 NTU/EBC Absorbance: 0.001 Abs Transmittance: 0.1% T	
Repeatability	±1% of reading or 0.01 NTU, whichever is greater (under reference conditions)			
Response time	Signal averaging off: 6.8 seconds / Signal averaging on: 14 seconds (when 10 measurements are used to calculate the average)			

Model	TL2300 EPA	TL2310 ISO	TL2350 EPA	TL2360 ISO
Stabilisation time	Ratio on: 30 minutes after start-up Ratio off: 60 minutes after start-up	Immediately	Ratio on: 30 minutes after start-up Ratio off: 60 minutes after start-up	Immediately
Reading modes	Single, continuous, Rapidly Settling Turbidity, signal averaging on or off, ratio on or off	Single, continuous, Rapidly Settling Turbidity, signal averaging on or off	Single, continuous, Rapidly Settling Turbidity, signal averaging on or off, ratio on or off	Manual or auto range, signal averaging on and adjustable or off, ratio on or off
Communication	USB			
Interface	2 USB-A ports for USB flash drive, external printer, keyboard and barcode scanner			
Data logging	2000 total logs, includes reading log, verification log and calibration log			
Air purge	Dry nitrogen or instrument grade air (ANSI MC 11.1, 1975) 0.05 L/s at 69 kPa (10 psig); 138 kPa (20 psig) max Hose barb connection for 1/8-inch tubing			
Sample cell compatibility	Round cells 95 x 25 mm (3.74 x 1 in.) borosilicate glass with rubber-lined screw caps Note: Smaller sample cells (less than 25 mm) can be used when a cell adapter is used.			
Sample requirements	25 mm sample cell: 20 mL minimum 0 to 70 °C (32 to 158 °F)			
Certifications	CE, KC, RCM			
Power requirements	100 - 240 V AC, 50/60 Hz, 3.4 A			

**Subject to change without notice.*

Principle of Operation

TL2300 and TL2350 Turbidimeters: The optical system is comprised of a tungsten-filament lamp, lenses and apertures to focus the light, a 90° detector, forward-scatter light detector, a backscatter detector (TL2350 only) and a transmitted-light detector. The instrument permits turbidity measurements at less than 40 NTU to be performed using only the 90° scattered-light detector or from 4000 NTU (TL2300) to 10000 NTU (TL2350) using the complete set of detectors (Ratio Measurement). With the Ratio Measurement on, the instrument's microprocessor uses a mathematical calculation to ratio signal s from each detector. The benefits of using Ratio on for measurements include excellent linearity, calibration stability and the ability to measure turbidity in the presence of colour.

TL2310 Turbidimeter: The optical system includes an 860 ±30 nm light emitting diode (LED) assembly and a 90° detector to monitor scattered light. The instrument measures turbidity up to 1000 FNU or NTU using the single 90° detector. The instrument does not utilise ratio measurements.

TL2360 Turbidimeter: The optical system includes an 860 ±30 nm light emitting diode (LED) assembly and a 90° detector to monitor scattered light, a forward-scatter light detector, a transmitted-light detector and a back-scatter light detector. The instrument measures turbidity up to 1000 units in FNU measurement mode using the ratio detectors. Attenuation measurements of up to 10000 FAU units can be made using a single transmitted detector. The instrument measures turbidity at less than 1000 NTU using only the 90° scattered-light detector or up to 10000 NTU using the complete set of detectors (ratio mode).

Order Information

Instruments

LPV444.99.00210	TL2300 Tungsten Lamp Turbidimeter, EPA, 0 - 4000 NTU
LPV444.99.00120	TL2310 LED Turbidimeter, ISO, 0 - 1000 NTU
LPV444.99.00310	TL2350 Tungsten Lamp Turbidimeter, EPA, 0 - 10000 NTU
LPV444.99.00320	TL2360 LED Turbidimeter, ISO, 0 - 10000 NTU

Replacement Parts

9647700	Cover, lamp access
9649100	Dust cover
9653500	Colour filter module for EPA compliance
4708900	Lamp replacement kit
4707600	Polishing cloth
126936	Silicone oil

Accessories

2662110	StablCal turbidity standards calibration kit, 100 mL bottles
2662100	StablCal turbidity standards calibration kit, 500 mL bottles
246142	Formazin turbidity standard, 4000 NTU, 100 mL
246149	Formazin turbidity standard, 4000 NTU, 500 mL
4397500	Test kit, sample degassing
4397510	Test kit, sample filtration & degassing
2723342	StablCal turbidity standard, 0.10 NTU, 100 mL
2697942	StablCal turbidity standard, 0.30 NTU, 100 mL
2698042	StablCal turbidity standard, 0.50 NTU, 100 mL

Service Packages

Start-up:

Commissioning, Instruction and Training of your operating personnel to ensure you get the best performance from your instrumentation from the first day you use it.

Instrument Qualification:

IQ/OQ to give you documented proof of your system operation functionality.

Service Agreement:

Hach offers a wide range of service agreements that can be tailored to you to help maximise your measurement reliability and instrument uptime.

Contact us to get a service offering designed for you.

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