Laboratory & Field Instruments: Laboratory Turbidimeters

See Inside!

- **Trusted Hach laboratory and portable turbidimeters**

- ***NEW!*** **2100Q Portable Turbidimeter**

- **StablCal® Standards for quick and accurate calibration of your turbidimeters**

HACH®

Be Right™

2100 Series Laboratory Turbidimeters

Enhanced performance for the demanding user.

Color Measurement (2100AN only)

Interchangeable color filters allow APHA Platinum Cobalt color measurement.

Easy Calibration

Display prompts the analyst for each standard and automatically adjusts the curve as needed.

Ratio and Non-Ratio Measurement Modes

Ratio measurement (1) corrects for color interference, (2) enhances long term calibration stability, and (3) allows the measurement of turbidity at levels greater than 1,000 NTU. With ratio toggled off, turbidity is measured using only the single 90-degree detector.

IMPORTANT: for EPA reporting purposes, order 2100N or 2100AN models only. The IS versions are not EPA compliant.

EPA COMPLIANT

Prod. No.	Description
EPA-COMPLIANT	
4700000	2100N Laboratory Turbidimeter
4700100	2100AN Laboratory Turbidimeter
ISO-COMPLIANT	
4790000	2100N IS Laboratory Turbidimeter
4790100	2100AN IS Laboratory Turbidimeter

	2100AN Turbidimeter	*2100N Turbidimeter*
Applications	Monitoring and regulatory reporting of turbidity in drinking water, wastewater, and process water. Monitoring and quality control of chemicals and pharmaceuticals, highly colored samples and samples with high turbidity. Flow Cell accessories allow automatic or semiautomatic operation.	Monitoring and regulatory reporting of turbidity in drinking water, wastewater, and process water. Flow Cell accessories allow automatic or semiautomatic operation.
Principle of Operation	Nephelometric Ratio Selectable on or off	
Measurement Modes	Select NTU, EBC, Nephelo, ABS, %T, or CU	Select NTU, EBC or Nephelo
Ranges NTU Mode	RATIO ON: Manual 0-0.999, 0-9.99, 0-99.9, 0-10,000; Auto 0-10,000 auto decimal RATIO OFF: 0-40.0	RATIO ON: Manual 0-0.999, 0-9.99, 0-99.9, 0-4000; Auto 0-4000 auto decimal RATIO OFF: 0-40.0
Absorbance	Manual: 0 to 0.999 ABS, 0 to 2.00 ABS; Auto: 0 to 2.00 ABS	—
Transmittance	Range: 1.0 to 100 %T; Resolution: 0.1 %T	—
Color (at 455 nm)	Range: 0 to 500 CU; Resolution: 1 CU	—
Accuracy* Turbidity	± 2% of reading plus 0.01 NTU from 0 to 1000 NTU ± 5% of reading from 1000 to 4000 NTU ± 10% of reading from 4000 to 10,000 NTU	± 2% of reading plus 0.01 NTU from 0 to 1000 NTU ± 5% of reading from 1000 to 4000 NTU —
Color Measurements[†]	± 2 CU from 0-30 (calibrated at 15 CU) ± 5 CU from 0-500 (calibrated at 500 CU)	— —
ABS (Photometric Linearity)[†]	± 0.005 ABS from 0-1 ABS at 455 nm	—
%T (Photometric Linearity)[†]	± 0.12%T from 10 to 100 %T at 455 nm	—
Resolution	0.001 on lowest range	
Light Source	2100N and 2100AN: Tungsten lamp 2100N IS and 2100AN IS: Infrared light emitting diode (LED) 870 ±30nm	
Sample Cells	Six, 95-mm x 25-mm (3.74" x 1")	
Built-in Printer	Built-in 28 column thermal printer	—
Serial Input/Output	RS232 serial interface (bidirectional)	
Warranty	2 Years	

* Reference conditions: 23 ±2°C, 50% Relative Humidity ±10% Relative Humidity Noncondensing, 115/230 Vac ±17%, 50/60 Hz.
† Flow cell required to achieve cited specifications.

2100 SERIES LABORATORY TURBIDIMETERS

Each instrument is supplied with six sample cells, a complete set of StablCal® Primary Calibration Standards in sealed vials, silicone oil and oiling cloth, dust cover, instrument and operations manuals, and a power cord. Model 2100AN also includes a 455 nm filter for Pt-Co color measurement. Models 2100AN and AN IS also include printer paper.

IMPORTANT: for EPA reporting purposes, order 2100N or 2100AN models only. The IS versions are not EPA compliant.

Prod. No.	Description

EPA-COMPLIANT

4700000	**2100N Laboratory Turbidimeter** 110/220 Vac, with a North American power cord and a fuse.
4700002	**2100N Laboratory Turbidimeter** 110/220 Vac, with a continental European power cord and a fuse.
4700100	**2100AN Laboratory Turbidimeter** 110/220 Vac, with a North American power cord and a fuse.
4700102	**2100AN Laboratory Turbidimeter** 110/220 Vac, with continental European power cord and a fuse.

ISO-COMPLIANT

4790000	**2100N IS Laboratory Turbidimeter** with a North American power cord.
4790002	**2100N IS Laboratory Turbidimeter** with a continental European power cord and a fuse.
4790100	**2100AN IS Laboratory Turbidimeter** with a North American power cord.
4790102	**2100AN IS Laboratory Turbidimeter** with a continental European power cord and a fuse.

ACCESSORIES

4744900	Kit, Manual Flow Cell
4745000	Kit, Automated Flow Cell, 115 Vac
4745002	Kit, Automated Flow Cell, 230 Vac
4397500	Kit, Sample Degassing
4397510	Kit, Sample Filtration & Degassing
2489500	Branson Ultrasonic Bath for cleaning cells
3036300	Color Filter Module for 410 nm wavelength
1999800	Color Filter Module for 455 nm wavelength (included with 2100AN)
3031200	Color Filter Module for EPA compliance (included with 2100N and 2100AN)
3036700	Color Filter Module for 500 nm wavelength
3037100	Color Filter Module for 560 nm wavelength
3037300	Color Filter Module for 610 nm wavelength
3037600	Color Filter Module for 810 nm wavelength
1999900	Color Filter Module for 860 nm wavelength
3033400	Cell Adapter for 12 and 13 mm vials
2662105	StablCal Set for 2100N/N IS
2659505	StablCal Set for 2100AN/AN IS
2589000	Gelex Secondary Standard Set for 2100N/N IS
2589200	Gelex Secondary Standard Set for 2100AN/AN IS
2084900	Sample Cells, 1" round glass, 30 mL with cap, qty/6
4707600	Polishing Cloth
126936	Silicone Oil
4708900	Lamp Replacement Kit for 2100N and 2100AN

For calibration and verification standards, see page 84.
For sample cells, see page 90.

Hach Flow Cells eliminate the time-consuming task of matching sample cells. Additional Color Filter Modules for the 2100AN Turbidimeter provide a variety of color measurement methods for specialized applications. Sample preparation tools include a sample degassing kit and a sample filtration and degassing kit.

HACH SERVICEPLUS EXTENDED WARRANTY

Prod. No.	Description
BSPEW2100AN	2100AN Partnership Ex War Plus
BSPEW2100N	2100N Partnership Ex War Plus

Hach ServicePlus Extended Warranty programs extend the term of your standard warranty period and additionally provide your covered product with factory recommended depot preventative maintenance services, calibration services and NIST backed certificates. For additional Information about ServicePlus Programs please contact us at: (800) 227-4224, #6178.

CERTIFIED
HACH
SERVICEPLUS
PROGRAM

For more information, call to request Literature #2498, or visit www.hach.com

Laboratory Turbidimeters

NEW!

EPA COMPLIANT

Easiest calibration and verification with accurate results every time!

The 2100Q Portable Turbidimeter offers a unique combination of advanced features, such as easy calibration and simplified data transfer, and measurement innovation for rapidly settling samples, giving you confidence you're getting accurate results every time.

Easy On-Screen Assisted Calibration and Verification

Save time and get accurate results with an easy-to-follow interface that eliminates the need for complicated manuals to perform routine calibrations. Single-standard RapidCal™ calibration offers a simplified solution for low level measurements, while ensuring you meet reporting requirements.

Simple Data Transfer

Customizable power and connectivity modules enable smooth data transfer and flexibility. Optional USB + Power module allows data downloads to any computer via USB port.

Accuracy for Rapidly Settling Samples

The innovative Rapidly Settling Turbidity™ mode provides accurate measurements for difficult to measure, rapidly settling samples. An exclusive algorithm that calculates turbidity based on a series of automatic readings eliminates redundant measurements and estimating.

Convenient Data Logging

Up to 500 measurements are automatically stored for easy access and backup, including: date and time, operator ID, reading mode, sample ID, sample number, units, calibration time, calibration status, error messages and the result.

Features	Previous 2100P Turbidimeter	NEW! 2100Q Turbidimeter
On-screen, assisted operation		✔
Single Step Calibration Function		✔
RapidCal™ Single Standard Calibration		✔
RST Feature for improved accuracy and precision with rapidly settling samples		✔
Data log		✔
Data Transfer without special software		✔
Two-detector Optical System	✔	✔
Range: 0-1000 NTU	✔	✔
Resolution: 0.01 on lowest range	✔	✔

Customize Power and Connectivity with Flexible Modules

Power Only Module (LZV804)

• Allows the 2100Q and 2100Qis to operate on line power (includes universal power adapter).

USB+Power Module (LZV813)

• Allows linepower: 110-230 Vac, 50/60 Hz
• Charges NiMH batteries
• Transfers data to Citizen PD-24 printer
• Transfers data to computer without additional software (stored in module in XML format)
• Enables firmware updates
• Allows simple entry of Sample and User IDs with optional barcode scanner

For more information, call to request Literature #2655, or visit www.hach.com

For more information, visit: www.hach.com/2100Q

Specifications*

Measurement Method
Ratio turbidimetric determination using a primary nephelometric light scatter signal (90°) to the transmitted light scatter signal.

Regulatory
2100Q: Meets EPA Method 180.1
2100Q IS: Meets ISO 7027

Light Source
2100Q: Tungsten filament lamp
2100Q IS: Light-emitting diode (LED) @ 860 nm

Range
0 to 1000 NTU (FNU)

Accuracy
±2% of reading plus stray light from 0 to 1000 NTU (FNU)

Repeatability
±1% of reading, or 0.01 NTU (FNU), whichever is greater

Resolution
0.01 NTU on lowest range

Stray Light
<0.02 NTU (FNU)

Signal Averaging
Selectable on/off

Reading Modes (user selectable)
Normal (Push to Read)
Signal Averaging
Rapidly Settling Turbidity

Calibration Options
Single standard Rapid Cal™ for 0-40 NTU (FNU)
Full range calibration from 0-1000 NTU (FNU)
Calibration to degrees of turbidity

Calibration Logger
Records the last 25-successful calibrations

Verification Logger
Logs the last 250-successful verifications

Data Logger
500 records

Power Requirement
AC 100 – 240 V, 50/60 Hz
(with Power or USB+Power module)
4 AA alkaline batteries
Rechargeable NiMH
(for use with USB+Power module)

Interface
Optional USB

Instrument Enclosure Rating
IP67 (closed lid, battery and module compartments excluded)

Certification
CE certified

Sample Required
15 mL (0.5 oz.)

Dimensions
22.9 x 10.7 x 7.7 cm (9.0 x 4.2 x 3.0 in.)

Weight
530 g (1.17 lb) without batteries
620 g (1.37 lb) with four AA alkaline batteries

Subject to change without notice.

Closed cap control eliminates ambient light interference.

Flexible module options enable customization of power and connectivity and data storage in the module.

RST mode for precise measurement in rapidly settling samples.

User-friendly interface in 23 pre-programmed languages.

On-screen assisted verification ensures instrument is performing correctly.

Single standard calibration reduces calibration and handling time.

Hach portable turbidimeters are supplied with four AA alkaline batteries, a carrying case with insert, StablCal primary calibration standards in 1" sealed vials (20, 100, 800 NTU), 10 NTU primary verification standard, 6 sample cells with screw-tops, instrument manual (printed and on CD-ROM), quick start guide, silicone oil and oiling cloth.

Prod. No.	Description
2100Q01	2100Q Portable Turbidimeter (meets EPA method 180.1)
2100QIS01	2100Qis Portable Turbidimeter (meets ISO 7027)

HACH SERVICEPLUS EXTENDED WARRANTY

BSPEW2100Q 2100Q Partnership Ex War Plus

Hach ServicePlus Extended Warranty programs extend the term of your standard warranty period and additionally provide your covered product with factory recommended depot preventative maintenance services, calibration services and NIST backed certificates.
For additional Information about ServicePlus Programs please contact us at: (800) 227-4224, #6178.

OPTIONAL ACCESSORIES

LZV813 USB+Power Module
Includes module, universal power supply, and instruction sheet.

LZV804 Power Module
Includes module, universal power supply, standard USB cable for connection to PC, special USB cable adapter for connection to Citizen PD-24 printer, and instruction sheet.

Prod. No.	Description
2960100	Citizen PD-24 Printer Package includes printer, universal power supply, 115V North American power cord, RS-232 cable, gender adapter, USB cable, battery pack, and one roll of thermal paper.
LZV566	USB Barcode Scanner For fast entry of sample IDs.
2464105	Gelex Secondary Standard Set
2971304	NiMH Batteries, AA, pk/4 Rechargeable with USB+Power Module
4397500	Degassing Kit
4397510	Sample Filtration and Degassing Kit

REPLACEMENT PARTS

Prod. No.	Description
4653900	Replacement Lamp Assembly
2971205	Set of StablCal Sealed Vial Standards
2434706	Sample Cells, pk/6
1938004	Alkaline Batteries, AA, pk/4
126936	Silicone Oil
4707600	Polishing Cloth

StablCal® Stabilized Formazin Primary Standards

StablCal Stabilized Formazin Turbidity Standards are true Formazin dilutions developed for use in any turbidimeter. With proprietary manufacturing technology, Hach prepares StablCal Standards in precise concentrations for conventional turbidimeters. Monitor wastewater effluent, high-quality treated drinking water, or an industrial process stream with complete confidence in the results with Hach StablCal Stabilized Formazin Standards.

StablCal Stabilized Formazin Standards are equivalent in performance to Formazin primary standards, but require no special preparation. Accuracy is assured by reducing the margin for error while greatly reducing labor and precious time in the laboratory. Calibration of turbidimeters with StablCal can be done quickly and accurately.

- *No preparation of Formazin stock*
- *No dilutions*
- *Minimal handling*
- *No special glassware or difficult lab techniques*
- *StablCal can be used to calibrate a turbidimeter made by any manufacturer*

StablCal® Stabilized Formazin Turbidity Standards are available in 100 mL, 500 mL, 1L, 1 gallon bottles, or in convenient sealed vials. Sets are available that include the specific range of NTU values needed to calibrate any turbidimeter.

Individual Values for All Turbidimeters

NTU value	100 mL bottle Prod. No.	500 mL bottle Prod. No.	1000 mL bottle Prod. No.	1 gallon (3.78L) bottle Prod. No.
<0.1	2659742	2659749	2659753	
0.06	2805342			
0.1	2723342		2723353	2723356
0.3	2697942		2697953	
0.5	2698042		2698053	
1	2659842	2659849	2659853	
10	2659942	2659949		
20	2660142	2660149	2660153	
40			2746353	2746356
100	2660242	2660249		
200	2660442	2660449		
800	2660542	2660549		
1000	2660642	2660649		
4000	246142	246149		
7500	Available in sealed vial only. **Prod. No. 2584202**			

StablCal® Calibration Kits

Turbidimeter	NTU	Sealed vials Prod. No.	100 mL bottles Prod. No.	500 mL bottles Prod. No.
2100Q	20, 100, 800, 10 (for verification)	2971205	2971210	2971200
2100P	< 0.1, 20, 100, 800	2659405	2659410	2659400
2100N / N IS	< 0.1, 20, 200, 1000, 4000	2662105	2662110	2662100
2100AN / AN IS	< 0.1, 20, 200, 1000, 4000, 7500	2659505	2659510	2659500
2100A	1.0, 10, 100, 1000	2659105	2659110	2659100
ULR Verification Set*	0.1, 0.3, 0.5, 1.0		2714600	

For verification only. Not for calibration.

Gelex Secondary Standards

Turbidimeter	Sealed vials Prod. No.
2100 Portable Turbidimeters	2464105
2100N / N IS	2589000
2100AN / AN IS	2589200
Ratio™ 2000 and Ratio™/XR	2328700

For more information, visit the Hach Turbidity Product Guide: www.hach.com/turblc

HACH®
Be Right™

800-227-4224
Outside the United States, call 970-669-3050