

PART 1 GENERAL

- 1.1 Section includes:
 - A. Laboratory instrument for monitoring turbidity in water accordance/compliance with DIN EN ISO 7027 and USEPA method 10258.
- 1.2 Measurement Procedures
 - A. The TU5200 turbidimeter measures low range turbidity primarily in water purification applications and in seawater with high salt concentrations. This sensor collects scattered light at an angle of 90° in a 360° radius around the axis of the incident light beam.
- 1.3 Alternates
 - A. Other methods of turbidity measurements including those with incandescent light sources, LED light sources, or turbidimeters without a 360° x 90° detection system are not acceptable.
- 1.4 System Description
 - A. Performance Requirements
 1. TU5200 in accordance with DIN EN ISO7027
 - a. Measuring Range
 - 1) 0 to 1000 NTU / FNU / TE/F / FTU
 - 2) 0 to 250 EBC
 - 3) 0 to 100 mg/L
 - b. Accuracy
 - 1) ±2% of reading ±0.01 NTU from 0 to 40 NTU based on formazin primary standard at 25°C
 - 2) ±10% of reading from 40 to 1000 NTU based on formazin primary standard at 25°C
 - c. Repeatability
 - 1) 1% or ± 0.002 NTU, whichever is greater, from 0 to 40 NTU based on formazin primary standard at 25°C
 - 2) 3.5% at turbidity levels greater than 40 NTU, based on formazin primary standard at 25°C
 - d. Resolution
 - 1) 0.0001 NTU / FNU / TE/F / FTU / EBC / mg/L
 2. TU5200 in accordance with USEPA method 10258
 - a. Measuring Range
 - 1) 0 to 700 NTU / FNU / TE/F / FTU
 - 2) 0 to 175 EBC
 - 3) 0 to 100 mg/L
 - b. Accuracy
 - 1) ±2% of reading ±0.01 NTU from 0 to 40 NTU based on formazin primary standard at 25°C
 - 2) ±10% of reading from 40 to 700 NTU based on formazin primary standard at 25°C
 - c. Repeatability
 - 1) 1% or ± 0.002 NTU, whichever is greater, from 0 to 40 NTU based on formazin primary standard at 25°C
 - 2) 3.5% at turbidity levels greater than 40 NTU, based on formazin primary standard at 25°C
 - d. Resolution
 - 1) 0.0001 NTU / FNU / TE/F / FTU / EBC / mg/L

- 1.5 Certifications
 - A. CE Compliant
 - B. US FDA accession number: 1420493-000 EPA version, 1420492-000 ISO version. Complies with IEC/EN 60825-1 and to 21 CFR 1040.10 in accordance with Laser Notice No. 50
 - C. Australian RCM Marking
- 1.6 Environmental Requirements
 - A. Operational Criteria
 - 1. Storage Temperature: -30 to 60 °C (-22 to 140 °F)
 - 2. Operating Temperature: 10 to 40 °C (50 to 104 °F)
 - 3. Relative Humidity: 5 to 95 %, non-condensing
- 1.7 Warranty
 - A. Warranted from manufacturer defects for two years (Europe) or one year (all other geographies) from date of shipment.
- 1.8 Maintenance Service
 - A. Unscheduled Maintenance
 - 1. Clean the measurement vial (depends on cleanliness of sample)
 - 2. Clean the instrument (depends on cleanliness of instrument exterior)
 - 3. Clean the vial compartment

PART 2 PRODUCTS

- 2.1 Manufacturer
 - A. Hach-Lange GmbH, Berlin, Germany
 - 1. TU5200 Low Range Laser Turbidimeter
- 2.2 Manufactured Unit
 - A. The TU520 Low Range Laser Turbidimeter consists of a Class 1 650nm (EPA) or 850 nm (ISO) laser light source and 360° x 90° detection system.
- 2.3 Equipment
 - A. Turbidimeter
 - 1. The analyzer shall utilize a 360° x 90° optical system that allows for measurement of turbidity from multiple different angles.
 - 2. The analyzer's optical system should be identical to current market online turbidimeters to provide proper and direct comparison between online and laboratory measurements.
 - 3. The analyzer's optical system shall be class 1 laser 650nm (EPA) or 850 nm (ISO).
 - 4. The analyzer shall have a 7" TFT WVGA, colored touch screen with menu-guided, graphical user interface.
 - 5. The analyzer shall have the ability to be operated in at least 25 different languages.
 - 6. The analyzer shall not require the use of silicone oil or sample cell indexing.
 - 7. The analyzer shall have Link2sc capability to communicate measurements and provide calibration information between the analyzer and identical optical system online turbidimeters.
 - 8. The analyzer shall provide the user with built in help screens that include assistance with issues matching laboratory and online turbidity measurements.

9. The analyzer shall be capable of data storage of at least 2000 data points and shall have the capability to export these measurements through USB data stick download or via LAN connection.
10. The analyzer shall have the option of an integrated RFID module that allows for measurement tracking between online and laboratory instrumentation.

B. Calibration Standards

1. Calibration standards shall be able to be used at a frequency determined by recommendation of local regulator.
2. Manufacturer shall make available certified calibration standards that can be used in online and bench top instruments for highest calibration accuracy
3. Calibration standards shall be capable of being used to calibrate online turbidimeters with similar optics systems.
4. Calibration standards shall be capable of functioning with the instrument's optional RFID module.

2.4 Components

A. Standard Equipment

1. TU5200 Low Range Turbidimeter
2. Power adapter with multiple power plug options
3. Sample Cells
4. Sealed Vial StablCal® standards
5. Vial Stand
6. Instrument Dust Cover
7. User Manual

B. Dimensions: 409 x 278 x 195mm (16.1 x 10.9 x 7.7 in)

C. Weight: 2.4 kg (5.2 lb)

2.5 Complimentary Instruments

- A. TU5300sc Low Range Laser Turbidimeter
- B. TU5400sc Ultra-Low Range Laser Turbidimeter

2.6 Instrument Options, must added to instrument at time of order

- A. RFID Module

2.7 Instrument Accessories

- A. Glass calibration/verification rod
- B. StablCal® Sealed Vial Calibration Standards
- C. Peristaltic Pump automatic sampler

PART 3 EXECUTION

3.1 Preparation

1. Mounting
 - a. Laboratory Bench

2. Sample Temperature
 - a. 4 to 70 °C (39 to 158 °F)

3.2 Installation

- A. Contractor will install the analyzer in strict accordance with the manufacturer's instructions and recommendation.
- B. Manufacturer's representative will include a half-day of start-up service by a factory-trained technician, if requested.
 1. Contractor will schedule a date and time for start-up.
 2. Contractor will require the following people to be present during the start-up procedure.
 - a. General contractor
 - b. Electrical contractor
 - c. Hach Company factory trained representative
 - d. Owner's personnel
 - e. Controls Technician

3.3 Manufacturer's Service and Start-Up

- A. Contractor will include the manufacturer's services to perform start-up on instrument to include basic operational training and certification of performance of the instrument.
- B. Contractor will include a manufacturer's Service Agreement that covers all the manufacturer's recommended preventative maintenance, regularly scheduled calibration and any necessary repairs beginning from the time of equipment startup through to end user acceptance / plant turnover and the first 12 months of end-user operation post turnover.
- C. Items A and B are to be performed by manufacturer's factory-trained service personnel. Field service and factory repair by personnel not employed by the manufacturer is not allowed.
- D. Use of manufacturer's service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION