



Source and Treatment Specifications and Standards

March 2012

This document contains specifications and standards for items that are not listed in the CAW Engineering Construction Specification Document. Items will be listed in the three separate forms. If an item is listed as **ONLY**, that is the only brand name that is acceptable. If an item is listed with a generic description, then any brand name is acceptable as long as it meets the applied description. If an item is listed with a manufacture number and the words **OR EQUAL**, then any brand name is acceptable as long as it meets the applied description; in the case CAW supplies a manufacturer's number as a point of reference only.

Low Range Online Turbidity Unit Specifications & Standards

1. General

- 1.1 These specifications are intended to set a standard for the online Turbidity unit purchased or installed for **Central Arkansas Water**. Specifications for material not included in these specifications shall be included in other specifications or plans and will be furnished on request. These general and detail specifications are subject to revision from one project to another. The **CONTRACTOR** shall make himself familiar with the current revision.
- 1.2 **Central Arkansas Water** must approve all material prior to installation.
- 1.3 Any reference to specifications published by other agencies shall refer to the latest edition or revision of such specifications as of the date of advertising for bids.

2. Definitions

- 2.1 The term "as specified" shall mean as specified by the **Central Arkansas Water** in plans, proposals, other specifications, and written or oral instructions.
- 2.2 The term "or equal" shall mean that the proposed material or item shall perform adequately the duties imposed by the general design and is of the same or equal design, substance, and function to that specified by using the name of a product manufacturer, or vendor. **Central Arkansas Water** shall make final approval of such items or materials.

3. Online Turbidity Unit Specifications

- 3.1 **Online Turbidity Unit shall be Hach 1720E or latest version of that model.**
- 3.2 The turbidimeter shall be a microprocessor-based, continuous reading, on-line nephelometric instrument.

The turbidity unit shall MEET include the following MINIMUM protection functions:

- Range
 - 0.001-100 Nephelometric Turbidity Unit (NTU)
- Accuracy
 - (Defined according to ISO 15839.) $\pm 2\%$ of reading or ± 0.015 NTU (whichever is greater) from 0 to 40 NTU; $\pm 5\%$ of reading from 40 to 100 NTU
- Displayed Resolution
 - 0.0001 NTU up to 9.999 NTU; 0.001 NTU from 10.000 to 99.999 NTU

- Repeatability
 - (Defined according to ISO 15839.) Better than $\pm 1.0\%$ of reading or ± 0.002 NTU, whichever greater
- Response Time
 - Initial response in 1 minute, 15 seconds for a full-scale step change
- Signal Average Time
 - User selectable from 6, 30, 60, 90 seconds; default 30 seconds
- Sample Temperature
 - 0 to 50°C (32 to 122°F)
- Sample Flow Required
 - 200 to 750 mL/minute (3.1 to 11.9 gal/hour)
- Operating Temperature
 - Single sensor system:
 - 0 to 50°C (32 to 122°F)
 - Two sensor system:
 - 0 to 40°C (32 to 104°F)
- Operating Humidity
 - 5 to 95% non- condensing
- Storage Temperature
 - -20 to 60°C (-4 to 140°F)
- Power Requirements
 - 100 – 230 Vac, 50/60 Hz, auto selecting; 40 VA
- Sample Inlet Fitting
 - ¼" NPT female" compression fitting (provided)
- Drain Fitting
 - ½ " NPT female, ½ " hose barb (provided)
- Recorder Outputs
 - Two selectable for 0-20 mA or 4-20mA; output span programmable over any portion of the 0-100 NTU range; built into the sc 200 controller.
- Alarms
 - Three set-point alarms, each equipped with an SPDT relay with unpowered contacts rated 5A resistive load at 230 Vac; built into the sc200 controller
- Enclosure
 - NEMA-4X (indoor)/IP66 Controller
- Compliance
 - Standard Methods 2130B, USEPA 180.1, Hach Method 8195
- Certifications
 - Safety:
 - Listed by ETL to UL 61010A-1: Certified by ETL to CSA C22.2 No. 1010.1: CE certified by Hach Company to En 61010-1
- Immunity:
 - CE certified by Hach Company to EN61326 (Industrial levels)
- Emissions
 - Class A: EN 61326, CISPR 11, FCC Part 15, Canadian Interference-Causing Equipment Regulation ICES-003
- Mounting
 - Turbidimeter body and head assembly:
 - wall and floor stand.

- Turbidimeter body and cap:
 - 25.4 X 30.5X 40.6 cm (10X12X16 in.)

Surface Scatter Turbidity Unit Specifications & Standards

4. General

- 4.1** These specifications are intended to set a standard for the Surface Scatter Turbidimeter purchased or installed for **Central Arkansas Water**. Specifications for material not included in these specifications shall be included in other specifications or plans and will be furnished on request. These general and detail specifications are subject to revision from one project to another. The **CONTRACTOR** shall make himself familiar with the current revision.
- 4.2** **Central Arkansas Water** must approve all material prior to installation.
- 4.3** Any reference to specifications published by other agencies shall refer to the latest edition or revision of such specifications as of the date of advertising for bids.

5. Definitions

- 5.1** The term "as specified" shall mean as specified by the **Central Arkansas Water** in plans, proposals, other specifications, and written or oral instructions.
- 5.2** The term "or equal" shall mean that the proposed material or item shall perform adequately the duties imposed by the general design and is of the same or equal design, substance, and function to that specified by using the name of a product manufacturer, or vendor. **Central Arkansas Water** shall make final approval of such items or materials.

6. Surface Scatter Turbidimeter Specifications

- 6.1** Surface Scatter Turbidimeter shall be **Hach Surface Scatter 7 SC or latest version of that model**.
- 6.2** The turbidimeter shall be a microprocessor-based, continuous reading, on-line nephelometric instrument.

The turbidity unit shall MEET include the following MINIMUM protection functions:

- Range
 - 0-999 Nephelometric Turbidity Unit (NTU)
- Accuracy
 - $\pm 5\%$ of reading or ± 0.1 NTU (whichever is greater) from 0 to 2000 NTU; $\pm 10\%$ of reading from 2000 to 9999 NTU
- Resolution
 - 0.01 NTU below 100 NTU; 0.1 NTU from 100 to 9999.9 NTU

- Repeatability
 - $\pm 1.0\%$ of reading or ± 0.04 NTU, whichever greater
- Response Time
 - Initial response in 45 seconds
- Signal Average Time
 - User selectable from 6, 30, 60, 90 seconds; default 30 seconds
- Sample Temperature
 - SS7 0 to 50°C (32 to 122°F)
- Sample Flow Required
 - 1.0 to 2.0 L/minute (15 to 30 gal/hour)
- Ambient Temperature
 - 0 to 50°C (32 to 122°F)
- Operating Humidity
 - 5 to 95% non- condensing
- Power Requirements
 - 100 – 230 Vac, 50/60 Hz, auto selecting; 40 VA
- Installation Category
 - Category II
- Sample Inlet Fitting
 - $\frac{3}{4}$ " NPT female
- Drain Fitting
 - 1" NPT female
- Body Drain Fitting
 - $\frac{3}{4}$ " NPT female
- Recorder Outputs
 - Two selectable for 0-20 mA or 4-20mA; output span programmable over any portion of the 0-100 NTU range; built into the sc 200 controller.
- Air Purge Fitting
 - $\frac{3}{4}$ " compression fitting; 0-50 SCFH airflow clean instrument air.
- Enclosure
 - NEMA-12 plastic instrument enclosure
- Mounting
 - Wall mount.
- Turbidimeter body and cap:
 - 64.2 X 67.5X 19.0 cm (25.3 X 26.6 X 7.5 in.)

Universal Controller Specifications & Standards

7. General

- 7.1** These specifications are intended to set a standard for the Universal Controller purchased or installed for **Central Arkansas Water**. Specifications for material not included in these specifications shall be included in

other specifications or plans and will be furnished on request. These general and detail specifications are subject to revision from one project to another. The **CONTRACTOR** shall make himself familiar with the current revision.

7.2 Central Arkansas Water must approve all material prior to installation.

7.3 Any reference to specifications published by other agencies shall refer to the latest edition or revision of such specifications as of the date of advertising for bids.

8. Definitions

8.1 The term "as specified" shall mean as specified by the **Central Arkansas Water** in plans, proposals, other specifications, and written or oral instructions.

8.2 The term "or equal" shall mean that the proposed material or item shall perform adequately the duties imposed by the general design and is of the same or equal design, substance, and function to that specified by using the name of a product manufacturer, or vendor. **Central Arkansas Water** shall make final approval of such items or materials.

9. Universal Controller Specifications

9.1 Universal Controller shall be Hach SC200 Digital Controller or latest revision of that model.

The Universal Controller shall MEET include the following MINIMUM protection functions:

- The controller provides connections for up to 29 Hach digital and analog sensor families for 15 different parameters.
- The controller is available with the following power requirements:
 - AC powered: 100 to 240 Vac $\pm 10\%$, 50/60 Hz; 15 W with 7 W sensor/network card load, 37 W with 25 W sensor/network card load.
 - 24 Vdc powered: 24 Vdc, -15%, +20%; 16 W with 7 W sensor/network card load, 34 W with 25 W sensor/network card load (optional Modbus RS232/RS485 or Profibus DPV1 network connection).
- The controller uses a menu-driven operation system.
- The controller display is graphic dot matrix LCD with LED backlighting.
- The controller is equipped with a real-time clock.
- The controller is equipped with two security levels.
- The controller is equipped with a data logger with RS-232 capability.
- The controller is equipped with an SD card reader for data download and controller software upload.
- Four electromechanical, UL rated, SPDT relays (Form C) are provided for user-configurable contacts rated 100 to 230 Vac, 5 Amp at 30 Vdc resistive maximum.
 - The following can be programmed:
 - Alarm
 - Warning
 - Timer/scheduled cleaning
 - Feeder control
 - Event control
 - Pulse width modulation
 - Frequency modulation

- The following can be assigned:
 - Primary value measurement I
 - Secondary value measurement I
 - 3rd value measurement I
 - 4th value measurement I
 - Primary value Measurement II
 - Secondary value measurement II
 - 3rd value measurement II
 - 4th value measurement II
 - Real time clock
 - Calculated values
- Two analog 0/4-20 mA outputs are provided with a maximum impedance of 500 ohms.
 - 1) The following can be programmed:
 - 2) Alarms:
 - Low alarm point
 - Low alarm point deadband
 - High alarm point
 - High alarm point deadband
 - Off delay
 - On delay
 - 3) Controls:
 - Linear
 - Bi-linear
 - Logarithmic
 - PID
- The following can be assigned:
 - Primary value measurement I
 - Secondary value measurement I
 - 3rd value measurement I
 - 4th value measurement I
 - Primary value measurement II
 - Secondary value measurement II
 - 3rd value measurement II
 - 4th value measurement II
 - Calculated values
- The controller can be equipped with four additional 4-20 mA outputs with a maximum impedance of 500 ohms.
- The controller can be equipped with the following forms of communication:
 - MODBUS RS-232
 - MODBUS RS-485
 - Profibus DP
- All user settings of the controller are retained for 10 years in flash memory.
- The controller is equipped with a system check for:
 - Power up test (monitoring and shutdown)
 - Total power draw
 - Memory devices
 - Temperature mother board
- Equipment
 - Materials
 - Housing: polycarbonate, aluminum (powder coated), and stainless steel

- Rating: NEMA 4X enclosure, rated IP66
- Conduit openings: 0.5 in. NPT
- Components
 - Standard equipment
 - Controller
 - Mounting hardware for wall, pipe, and panel mounting
 - Dimensions: 1/2 DIN (144 x 144 x 180 mm (5.7 x 5.7 x 7.1 in.))
 - Weight: 1.6 kg (3.5 lbs.)
- Accessories
 - Weather protection shield
 - Sun screen
 - RS-232 / RS-485 MODBUS output card
 - PROFIBUS DP output card
 - Additional mA output card