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| Version | Date | Description of Revisions |
| 1 | November 1, 2011 | Standard Specification Release |
| 2 | April 17, 2015 | General formatting |
| 3 | June 13, 2022 | 1.4 Tagging requirement revised (BM) |
|  |  |  |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**For each project the Consultant is responsible for the correct application of the specifications and for updating and modifying all highlighted items, as well as updating and modifying those sections that are directly applicable to the project. All updates and modifications to this standard document are to be highlighted to the Region for review and acceptance on each project.**

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

# specifications

## General

### The specifications in this section define additional requirements to those set forth in Section 13105 – Process Control: General Instrumentation Requirements. Where a conflict exists, the more stringent requirement is to be provided.

### The contractor is to clearly identify on the shop drawings any deviation from the specification.

### Contractor required to provide the following O&M documentation: manufacturers’ printed O&M documentation; installation instructions; specifications; operation manuals, including electrical drawings, and plumbing diagrams; sales literature; materials; and training materials as applicable.

### Contractor is to furnish copies of the manufacturer’s warranties.

### Contractor is to provide, through the Instrumentation Supplier, pH and ORP analyzers, complete and operable, in accordance with the Contract Documents.

## Measurement and Payment

### The work outlined in this section shall be included in the lump sum price for Section 13185 – pH & ORP Analyzer as indicated in the Bid Form.

## Sensor

### Mounting: Submersion mounting or flow through mounting

### Maximum Pressure: 650 kPa at 50°C

### Electrical Connection: Submersible cable factory sealed to probe

### Self-Cleaning (flow through) Automatic In-line Water Blast Cleaning

### Self-Cleaning (submergence): Automatic Water or Air Blast, Ultrasonic, self-cleaning if crystalline precipitate possible

### Electrode Life: Minimum 1 year

### Preamplifier Integrated into probe assembly

### Housing: NEMA 4X corrosive resistant housing and mounting hardware

## Transmitter / Controller

### Provide analyzer to be software configurable as either pH or ORP

### Place the probe in process streams that have a flow rate within the manufacturer’s recommended range of flow

### Automatically recalibrate with buffer recognition and stabilization check.

### Provide pH glass diagnostics to alarm for maintenance, calibration or sensor replacement.

### Set-up and calibration from user programmable and/or predetermined choices accessible from menu prompts.

### Provide two (2) isolated 4-20mA @ 600Ω outputs with superimposed digital signal based on HART protocol on one output.

### Provide dual, high and low alarms; with adjustable set-points, isolated output SPDT contacts, 5 amp 120 VAC.

### Provide NEMA 4X corrosive resistant housing and mounting hardware.

### Provide equipment tag wired to transmitter and to sensor in accordance with Section 01080 – Process Equipment Location Tagging.

# INSTALLATION

## General

### The following installation requirements are in addition to or deviations from the requirements set forth for instrumentation in Section 13105 – Process Control: General Instrumentation Standard.

#### Locate the sample point to minimize unnecessary dead time in the ph / ORP analysis. Take care to ensure the sample is clean, thoroughly mixed, and representative of the process stream.

#### Provide all required process connections, valves, pressure / flow regulators, filters, and miscellaneous mounting hardware not provided with the analyzer. Select type and material for the application.

#### For flow-through applications mount the flow cell in a readily accessible location to permit preventive maintenance and inspection of the electrode assembly. Provide isolation valves, drain valve, and a bypass loop so the electrode sensor can be removed and inspected without shutting off the flow stream.

#### Provide a local junction box for wiring to allow withdrawal of the probe for maintenance.

#### Do not install the horizontal on the horizontal. The sensor must be installed at least 10º off the horizontal to ensure accuracy.

#### Do not install the sensor upside down.

#### Do not install sensor cable with power or control wiring.

#### Provide safety chain for sensors installed under pressure.

#### Install pressure reducing valve sample line to maintain constant flow and manufacturer pressure limits.

#### Ensure that the system is on-line 24 hours before start up and calibration for adequate warm up.

#### Provide a one (1) year supply of consumables and spare parts.

#### Mount the transmitter unit at grade, 1.8m off floor, in a readily accessible location to facilitate maintenance and calibration.

#### Transmitter/Electronics not mounted/installed indoors must be installed within fiberglass enclosure with viewing window, thermostat and heater. Panel heater to be powered from separate circuit than instrument.

# ACCEPTABLE MANUFACTURERS

### Acceptable manufacturers are listed in the following table in order of preference. The design has been completed around the first named supplier. The contractor is responsible for all costs associated with any changes required to the design to accommodate one of the other manufacturers

|  |  |  |
| --- | --- | --- |
| Preference | Manufacturer | Model |
| 1 | Hach | sc200 |
| 2 | Siemens | MFC Analyzer, Depolox 5 |
| 3 |  |  |

### The Contractor is to select the appropriate options to suit the application and the requirements of the specification.

### Where second and third named manufacturers are provided, they are to meet the performance specifications of the first named manufacturer.

## pH and ORP Analyzers

First Named Manufacturer:

|  |  |  |
| --- | --- | --- |
| **Service:** | pH & ORP Analyzer –  Insertion Mounting | pH & ORP Analyzer –  Insertion Mounting |
| **Process:** |  |  |
| Tag Name: | xxx-xxx | xxx-xxx |
| Installation DWG. | 13185A | 13185A |
| Liquid: | Raw Water | Raw Water |
| Temp min/max: | 0 to 25 °C | 0 to 25 °C |
| Press min/max: | 0 - 300 kPa | Ambient |
| Flow min/max | 0 - 1 L/min | ~ |
| pH min/max | 6.5 - 8.5 | 6.5 - 8.5 |
| **Sensor:** |  |  |
| Type: | pHD Analog Sensor | ORP Analog Sensor |
| Body Material: | Polyetheretheketone (PEEK) | Polyetheretheketone (PEEK) |
| Body Style: | Convertible | Convertible |
| Electrode Material: | Glass, General Purpose | Platinum |
| Max. Temp.: | 95°C (203°F) | 95°C (203°F) |
| Manufacturer: | HACH | HACH |
| Part Number: | PD1P1 | RD195 |
| **Accessories:** |  |  |
| Analog Interconnect Cable: | 1W1100 | 1W1100 |
| Analog Junction Box, Pipe Mount (1`), PVC | 60G2052 | 60G2052 |
| Protector for Convertible Sensor: | 1000F3374-002 |  |
| Salt Bridge (PEEK/Kynar): | SB-P1SV |  |
| pHD Analog Sensor Reagent, Standard Cell Solution | 25M1A1025-115 |  |
| pH Buffers, pH 7: | 2283549 |  |
| ORP Reference Solution, 200mV: |  | 25M2A1001-115 |
| Self-Contained Air Blast Cleaning System for pHD Sensor, 115VAC: | 1000A3335-005 |  |
| Mounting Hardware, Insertion, CPVC: | 5646400 |  |
|  | *Additional added as necessary* | *Additional added as necessary* |
| **Transmitter:** |  |  |
| Model: | sc200 Controller, 1 Channel, pH/DO | sc200 Controller, 1 Channel, pH/DO |
| Manufacturer: | HACH | HACH |
| Part Number: | LXV404.99.00102 | LXV404.99.00102 |
| **Accessories:** |  |  |
| Pipe Mounting Kit to 1.5" FEM NPT | 6131300 | 6131300 |
| sc200 Power Cord with Strain Relief, 125 Vac: | 9202900 | 9202900 |
| sc200 Weather and Sun Shield with UV Protection Screen | 9220600 | 9220600 |
| pH and DO Sensor and Communication Module: | 9012900 | 9012900 |
| 4-20 mA Output Module Sensor and Communication Module: | 8783600 | 8783600 |
|  | *Additional added as necessary* | *Additional added as necessary* |

Second Named Manufacturer:

|  |  |
| --- | --- |
| **Service:** | Fluoride Levels |
| **Process:** |  |
| Tag Name: | xxx-xxx |
| Installation DWG. | 13185A |
| Liquid: | Raw Water |
| Temp min/max: | 0 to 25 °C |
| Press min/max: | 0 - 300 kPa |
| Flow min/max | 0 - 1 L/min |
| pH min/max | 6.5 - 8.5 |
| **pH Sensor Device Data:** |  |
| Sensor Type: | Single Junction, Combination Electrode |
| Measuring Range: | pH 0 – 12 |
| Resolution: | 0.01 pH |
| Operating Temperature Range: | 0°C – 50°C |
| Manufacturer: | Siemens |
| Part Number: | pH Sensor |
| **ORP Sensor Device Data:** |  |
| Sensor Type: | Single Junction, Combination Electrode |
| Measuring Range: | 0 – 1000 mV |
| Resolution: | 1 mV |
| Operating Temperature Range: | 0°C – 50°C |
| Manufacturer: | Siemens |
| Part Number: | ORP Sensor |
| **Measurement Module Device Data:** |  |
| Type: | Potentiostatic Bare Electrode Technology |
| Cleaning: | Continuous Hydro-Mechanical Cleaning of Sensor |
| Manufacturer: | Siemens |
| Part Number: | Depolox 5 |
| **Transmitter Device Data:** |  |
| Measurement Inputs: | 1 x PT 1000 Temperature Input,  5 x Measured Value Isolated Inputs |
| Analog Outputs: | 4-20mA, Isolated, Plug-In |
| Relay Outputs: | 8 x 5A, 250VAC |
| Operating Conditions: | 0°C – 50°C, Non Condensing |
| Production Category: | NEMA 4X/IP66 Wall Mount |
| Power Supply: | 120 VAC, 50-60 Hz |
| Manufacturer: | Siemens |
| Part Number: | MFC |
| Accessories: | Pressure Regulating Valve |

**END OF SECTION**