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| Version | Date | Description of Revisions |
| 1 | November 1, 2011 | Standard Specification Release |
| 2 | April 20, 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.**

# GENERAL

## 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, fluoride 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 13210 – Fluoride Analyzer as indicated in the Bid Form.

## Sensor

### Principal: Direct millivolts reading on a Fluoride Ion Selective Electrode (ISE method)

### Range: 0.1 to 10 mg/L

### Minimum Detection Limit: 0.1 mg/L

### Mounting: Panel or Wall Mount

### Calibration: Two point log/linear using 0.5 mg/L and 5.0 mg/L fluoride standards

## Transmitter

### Local backlit LCD display of Fluoride with additional indicators for alarms and status conditions. Minimum 12 mm high characters. Front of enclosure display, discernible from 10 feet

### Front panel keypad for parameter selection and calibration data entry.

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

### One 4-20mA @ 600 Ω analog output.

### Two alarms with adjustable set-points, isolated output SPDT contacts, 5 amp 120 VAC.

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

### Equipment tag wired to transmitter 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 Fluoride analysis. Take care to ensure the sample is representative of the process stream.

#### Provide a floor drain next to the analyzer.

#### Provide all required process connections, valves, pressure / flow regulators, reagents, bottles, inlet/drain hoses, pump tubing set, electrode tips, venting and miscellaneous mounting hardware not provided with analyzer. Select type and material for the application.

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

#### Install a sample withdrawal valve next to the analyzer so samples can be taken for calibration checks.

#### 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 spare parts.

#### Mount the transmitter unit 1.8 m 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 | Siemens | MFC Analyzer, Depolox 5 |
| 2 | Hach | CA610 |
| 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.

## Fluoride Analyzer

First Named Manufacturer:

|  |  |
| --- | --- |
| **Service:** | Fluoride Levels |
| **Process:** |  |
| Tag Name: | xxx-xxx |
| Installation DWG: | 13210x |
| Fluid: | Final Water |
| Temp min/max: | 5 to 40 °C |
| Fluoride: | 0 to 10 mg/L |
| **Sensor Device Data:** |  |
| Sensor Type: | Single Junction, Combination Electrode |
| Measuring Range: | 0.02 mg/L – 2 mg/L  0.02 mg/L – 20 mg/L |
| Resolution: | 0.01 mg/L |
| Operating TemperatureRange: | 0°C – 50°C |
| Manufacturer: | Siemens |
| Part Number: | Fluoride 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 |

Second Named Manufacturer:

|  |  |
| --- | --- |
| **Service:** | Fluoride Levels |
| **Process:** |  |
| Tag Name: | xxx-xxx |
| Installation DWG: | 13210x |
| Fluid: | Final Water |
| Temp min/max: | 5 to 40 °C |
| Fluoride: | 0 to 10 mg/L |
| **Device Data:** |  |
| Sensor Type: | Electrode |
| Sensor Principal: | Fluoride Ion Selective Electrode (ISE) |
| Material: | Fluoride Lanthanum Crystal |
| Self Cleaning: | No |
| Process/Sample Inlet: | 6 mm (1/4”) OD Quick Disconnect |
| Drain Fitting: | 12 mm (1/2") ID flex hose |
| Mounting: | Wall |
| Calibration Type: | TISAB Reagent and 2 Fluoride Standards |
| Analog Output: | 4 - 20 mA DC isolated (600 W) |
| Alarm Relays: | Two SPDT Programmable |
| Power Supply: | 120 VAC, 60 Hz |
| Enclosure: | NEMA 4, IP62 ABS wall mount |
| Indication: | Local |
| Operating Range: | 0.1 to 10 mg/L |
| Accuracy: | ±10% or ±0.10ppm, whichever greater |
| Precision: | ±7% or ±0.07ppm, whichever greater |
| Manufacturer: | HACH |
| Part Number: | 5740001 |
| **Accessories:** |  |
| Power Cord, 115V, 10A, 1.83m, North American Plug: | 5448800 |
| Oil Tight Seal: | 4221000 |
| Maintenance Kit: | 5742100 |
| Reagent Set: | 2816900 |
| Electrode Kit: | 5744800 |
| Electrode Tip, Fluoride Lanthanum Crystal: | 5745100 |

**END OF SECTION**