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| Version | Date | Description of Revisions |
| 1 | November 1, 2011 | Standard Specification Release |
| 2 | April 21, 2015 | General Formatting |
| 3 | June 13, 2022 | 1.3 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.

### The Ultrasonic flow meters are to deploy the sensor measuring variable of Flow Velocity (converted to volume flow) utilizing the path differential transit-time method and be of clamp-on type (non-intrusive).

### 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, ultrasonic flow meters, 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 13240 – Ultrasonic Flow Meters as indicated in the Bid Form.

## Transmitter

### Digital input to SCADA to be provided for all bi-directional flow meters.

### 4-20 mA @ 600 Ω output with superimposed digital signal based on HART protocol.

### Signal Cable: Manufacturer's recommended sensor signal cable connection direct from sensor to instrument without joints or splices via flexible weatherproof conduit.

### Tagging: 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.

#### Install meters upstream from control valves

#### Never install a meter within ten pipe diameters of a double change in planes (e.g., a tee and an elbow).

#### Never install a meter where gas can collect or a line can self-drain when flow stops.

#### Install meters where the pipe remains full at all times.

#### Install meters in vertical pipes where flow is upward where possible.

#### Install separate conduits for signal and power wiring to the meter and between the transmitter and control panel.

#### Install the transmitter remotely from the primary element

#### Ground the meter in accordance with manufacturer's instructions.

#### Transmitter unit is to be mounted at 1.8m off the floor in a readily accessible location for ease of reading and 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 lighting panel 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 | Endress + Hauser | 93W |
| 2 | Siemens | Sitrans FUS1010 |
| 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.

## Ultrasonic Flow Meters

First Named Manufacturer:

|  |  |
| --- | --- |
| **Service:** | General |
| **Process:** |  |
| Tag name: | xx-xx |
| Installation DWG: | 13240x |
| Fluid: | Raw Water |
| Velocity min/max: | 0 - 1.7 m/sec |
| Temp min/max: | 0 to 25°C |
| Press min/max: | 0 - 300 kPa |
| Flow min/max: | 0 - 14 L/s |
| Up/Down Stream: | 5/2 Min. |
| Bi-directional Flow: | Yes |
| **Device Data:** |  |
| Mounting Type/Number of Channels: | Clamp On/Dual Channels |
| Flow Sensor Type: | NEMA 4X Sensor, 2” to 12” Pipe Size, Clamp On, -4°F to 175°F |
| Sensor Holder: | Fixed Retaining Nut, Clamp On Version |
| Installation Set: | 8” to 24” Pipe Size Clamp Set |
| Sensor Cable: | 30 ft Sensor Cable, PVC, 4°F to 174°F |
| Sensor Cable Conduit Adapters: | ½” NPT cable Conduit Adapters |
| Calibration: | Dry Calibrated |
| Approvals: | FM Approved Non-incendive, Class 1, Division 2, Groups A-D |
| Protection Type/Version: | NEMA 4X/ Remote, Wall Mounting Housing |
| Cable Glands: | ½” NPT Thread for Cable Gland |
| Display/Power Supply/Operation: | 85 to 260 VAC, With Display, Touch-control Operation |
| Software: | Standard Software |
| Outputs/Inputs: | Fixed I/O Modules: Current HART Frequency |
| Manufacturer: | E+H |
| Part Number: | 93W-A2BA2B20RCBAAA |
| **Accessories:** |  |
| Dry Coupling Kit: | 7ME3960-OUC40 |
|  | *Additional added as necessary* |

Second Named Manufacturer:

|  |  |
| --- | --- |
| **Service:** | General |
| **Process:** |  |
| Tag name: | xx-xx |
| Installation DWG: | 13240x |
| Fluid: | Raw Water |
| Velocity min/max: | 0 - 1.7 m/sec |
| Temp min/max: | 0 to 25 °C |
| Press min/max: | 0 - 300 kPa |
| Flow min/max: | 0 - 14 L/s |
| Up/Down Stream: | 5/2 Min. |
| Bi-directional Flow: | Yes |
| **Device Data:** |  |
| SITRANS FUS1010 Standard Clamp-On: | IP65 (NEMA 4X) |
| Number of Channels/Ultrasonic Beams: | Dual Channel/Dual Beam |
| Flowmeter Functions and I/O Configurations: | Type 1 Standard |
| Meter Power Options: | 90…240VAC |
| Communication Options: | 120 Vac 60 Hz 4 wire |
| Communication: | MODBUS |
| RTD Temperature Sensor: | No RTDs |
| Transducer for Channel 1: | C3 Universal to 13”/Mounting Frame |
| Transducer for Channel 2: | C3 Universal to 13”/Mounting Frame |
| Approvals: | FM/CSA |
| **Further Designs:** |  |
| Cable Assembly for Transducers: | K03 |
|  | *Additional added as necessary* |
| Manufacturer: | Siemens |
| Part Number: | 7ME3530-2AA10-0DD1-Z K03 + K03 |
| **Accessories:** |  |
| Dry Coupling Kit: | 7ME3960-OUC40 |

**END OF SECTION**