

FT-3400 Master Specification

a. Products:

- i. Subject to compliance with requirements, for energy/BTU Meters in hydronic systems. American Made, Buy America Act FAR 52.225.1, ASHREA 62, field serviceable.
- ii. Basis of Design: **ONICON Model FT-3400** Series Insertion Electromagnetic Flowmeter. Manufacturers approved to bid, subject to compliance with requirements include:

a. Description: Provide an insertion electromagnetic flowmeter complete with NIST traceable, wet calibrated flow-measuring element, remote transmitter, installation valves, adjustable installation depth gauge, and calibration certificate. Flowmeter shall be wet-tappable, allowing insertion and removal from the flow stream without system shutdown.

b. Application Range: The contractor shall be responsible for selecting the flowmeter options submitted based on the application. Flowmeter shall be constructed, calibrated, and scaled for the intended application in terms of pipe size, pipe material, installation requirements, expected flow rate, ambient conditions, and fluid characteristics which include but are not limited to pressure, temperature, conductivity, and viscosity.

c. Sensing Technology: Electromagnetic velocity-measuring element.

d. Design: Electromagnetic sensing element shall utilize two sets of diametrically opposed electrodes to measure the average flow rate velocity.

e. Construction: Wetted components shall be constructed of 316L stainless steel with an attached tag indicating calibration information. Sensor technology shall have a NEMA4 enclosure.

- i. Maximum Pressure Rating: 400 psig.
- ii. Fluid Temperature Rating: 15F to 250F

- iii. Ambient Conditions Transmitter: -20F to 150F
 - iv. Pipe Size Range Available Options
 - v. Standard Configuration: 3 - 72" nominal diameter
 - vi. Small Pipe Configuration: 1 1/4 - 2 1/2" nominal diameter
 - vii. End Connections for NPS 1.25" and Larger: 1" Male NPT Hot Tap Adapter fitting. Installation through 1" full port isolation valve, minimum.
- f. Flow Range: Flow-measuring element and transmitter shall cover the operating range of equipment or system served.
- g. Accuracy: Flowmeter shall provide calibrated outputs directly from the integral transmitter, throughout the operating range with the accuracy stated as follows:
- i. Accuracy: $\pm 1.0\%$ of reading from 2 - 20 ft/s | ± 0.02 ft/s below 2 ft/s
 - ii. Flow Range: 0.1 ft/s to 20 ft/s (200:1 turndown)
 - iii. Minimum Conductivity: 25 $\mu\text{S/cm}$
- h. Calibration: Each flowmeter shall receive a wet calibration, within the expected operating range, against a primary volumetric standard that is traceable to NIST.
- i. Input Power: 20 - 28 VDC, 400 mA at 24 VDC or 20 - 28 VAC, 60 Hz, 10 VA
- j. Analog Outputs: (1) one active 4-20mA, and (1) one 2-10V, or 1-5V. Alarm condition at 2mA for 4-20mA, 1V for 2-10V, or 0.5V for 1-5V analog output.
- k. Digital Outputs: (3) Isolated solid-state dry contacts. (1) one for totalization, (1) one for optional directional contact, and (1) meter master alarm
- l. Frequency Output: (0-15V peak pulse, 0-500hz)
- m. Optional Local Display: Local display shall provide instantaneous flow rate information and totalized flow information and shall be factory configured for connection to a specific flowmeter.

- n. Operating and Installation Instructions: Installation and operating instructions shall be provided for each flowmeter.
- o. Warranty: Each flowmeter shall be covered by a one-year no-fault warranty and three-year manufacturing warranty.
- p. Approvals
- i. IEC 61000-6-2 Power-Frequency Magnetic Field, Radiated Immunity and Electrostatic Discharge.
 - ii. IEC 61000-6-4 Radiated Emissions
 - iii. EN 301 489-17 Radiated Emission, RF Immunity, and Electrostatic Discharge
 - iv. EN 301 328 Wideband transmission systems
 - v. UL ANSI/NSF 61 & 372 Drinking Water Safety
 - vi. UL 50: Standard for Enclosures for Electrical Equipment
 - vii. UL 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use
 - viii. FCC: Part 15, Subpart B
- q. Execution
- i. Installation: Meters shall be installed per the manufacturer's recommendations.
 - ii. Connections:
 1. Install meters and allow space for service and maintenance.
 2. This contractor shall be responsible for connecting all flow meter-system elements.
 3. This contractor shall be responsible for connecting the flow meter to any optional display.
 4. This contractor shall be responsible for connecting thermal-energy meter transmitters to flow meters.
- r. Commissioning:
- i. After installation, commission all meters according to the manufacturer's written instructions.
 - ii. Adjust faces of meters and transmitters/displays to proper angle for best visibility. Refer to manufacturers written instructions.



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