ONICON
Flow and Energy Measurement

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# FT-3500 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-3500** 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 gage and calibration certificate. Flowmeter shall be wet tappable, allowing insertion and removal from the flow stream without system shutdown.

b. Schedule: The following applications shall be provided with a btu meter where shown on the drawings:

   i. Chilled Water Systems
   ii. Heating Hot Water Systems
   iii. Domestic Hot Water Systems
   iv. Condenser Water, Cooling Tower Systems
   v. Condenser Water (Heat Loop) Systems

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 NEMA6 enclosure and NEMA4 local display.

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

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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: ±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 µS/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. Local Display: Local display shall provide instantaneous flow rate information and totalized flow information and shall be factory configured to a specific configuration given by the contractor.

i. Input Power: 22-26VDC with maximum power draw at 25 Watts. 20-28VAC with maximum power draw at 30VA, 60 Hz.
ii. I/O Signals: Transmitter should provide.
iii. Two (2) Analog Output: Active 4-20mA, 0-10V, or 0-5V.
iv. Two (2) Analog Inputs: Passive 4-20mA.
v. Two (2) 1000ohms RTD Inputs.
vi. Three (3) Digital Inputs/Output. (Field Selectable)
vii. One (1) Frequency Output (0-15V peak pulse, 0-1000hz)
viii. Mounting Option: Remote mount with kit, up to 200ft.
ix. Display Size: 4.3-inch touch screen display with a resolution of 480 x 272 pixels

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x. Programming Available Options: Password-protected menu-driven user interface via touchscreen.

j. Electrical Connections:
   i. Input Power: Removable orange terminal blocks for use with 12-20 AWG
   ii. I/O Signals: Removable green terminal blocks for use with 14-30 AWG
   iii. Coil & Electrodes: Removable green terminal blocks for use with 14-24 AWG
   iv. RS485: Removable green terminal blocks for use with 14-30 AWG
   v. IP: RJ45 connector

k. Communication Protocols: BACnet MS/TP, BACnet UDP/IP, Modbus RTU, Modbus TCP/IP

l. Operating and Installation Instructions: Installation and operating instructions shall be provided for each flowmeter.

m. Warranty: Each flowmeter shall be covered by a 1 year no-fault warranty and three-year manufacturing warranty.

n. 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

o. Execution

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i. Installation: Meters shall be installed per the manufacturer's recommendations.

ii. Connections:

1. Install meters and transmitters/displays adjacent to machines and equipment to allow service and maintenance.
2. This contractor shall be responsible for connecting all flow meter-system elements.
3. This contractor shall be responsible for connecting flow meter transmitters to the sensor.
4. This contractor shall be responsible for connecting thermal-energy meter transmitters to flow meters.

p. Commissioning:

i. After installation, commission all meters according to manufacturer's written instructions.

ii. Adjust faces of meters and transmitters/displays to proper angle for best visibility. Refer to manufacturers written instructions.