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# FT-3500 Master Specification

#### a. Products:

- 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. <u>Basis of Design:</u> **ONICON Model FT-3500** Series Insertion Electromagnetic Flowmeter. Manufacturers approved to bid, subject to compliance with requirements include:
- a. <u>Description</u>: 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.
- <u>b.</u> <u>Schedule:</u> 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
- <u>c.</u> <u>Sensing Technology:</u> Electromagnetic velocity-measuring element.
- <u>d.</u> <u>Design:</u> 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. <u>Maximum Pressure Rating</u>: 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. <u>Standard Configuration</u>: 3 72" nominal diameter
- vi. Small Pipe Configuration: 1 1/4 2 1/2" nominal diameter
- vii. <u>End Connections for NPS 1.25" and Larger:</u> 1" Male NPT Hot Tap Adapter fitting. Installation through 1" full port isolation valve, minimum.
- <u>f.</u> <u>Flow Range:</u> Flow-measuring element and transmitter shall cover the operating range of equipment or system served.
- <u>g.</u> <u>Accuracy:</u> 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 |  $\pm 0.02$  ft/s below 2 ft/s
  - ii. Flow Range: 0.1 ft/s to 20 ft/s (200:1 turndown)
  - iii. <u>Minimum Conductivity</u>: 25 μS/cm
- h. <u>Calibration</u>: Each flowmeter shall receive a wet calibration, within the expected operating range, against a primary volumetric standard that is traceable to NIST.
- <u>i.</u> <u>Local Display:</u> 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. <u>Input Power</u>: 22-26VDC with maximum power draw at 25 Watts. 20-28VAC with maximum power draw at 30VA, 60 Hz.
  - ii. <u>I/O Signals</u>: 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. <u>Display Size</u>: 4.3-inch touch screen display with a resolution of 480 x 272 pixels



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x. <u>Programming Available Options</u>: Password-protected menudriven user interface via touchscreen.

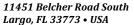
#### <u>i. Electrical Connections:</u>

- i. <u>Input Power</u>: Removable orange terminal blocks for use with 12-20 AWG
- ii. <u>I/O Signals</u>: Removable green terminal blocks for use with 14-30 AWG
- iii. <u>Coil & Electrodes</u>: 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
- <u>I.</u> 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
- 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. <u>Installation:</u> Meters shall be installed per the manufacturer's recommendations.

### ii. <u>Connections:</u>

- 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 thermalenergy 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.