**FSM-3 Series Master Specification**

* + 1. Electromagnetic Flowmeters, Insertion Type:
       1. Basis of Design: **ONICON Model FSM-3** Series SuperMag Insertion Electromagnetic Flowmeter. Manufacturers approved to bid, subject to compliance with requirements include:
          1. Insert additional MFG’s pre-approved to bid.
       2. Description: Provide an insertion electromagnetic flowmeter complete with NIST traceable, wet calibrated flow-measuring sensor, transmitter, installation valves and calibration certificate. Flowmeter shall be hot tapable, allowing insertion and removal from the flow stream by hand, without system shutdown.
       3. 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.
       4. Sensing Technology: Electromagnetic velocity-measuring sensor.
       5. Design: Electromagnetic flow sensor shall utilize a single monolithic coil extending across the entire pipe diameter. Dedicated electrode sets shall be utilized to measure the average flow rate velocity.
       6. Construction:   
          For domestic water (DCW & DHW), chilled water (CHW) and condenser water (CW) applications, wetted components shall be constructed of:
          1. NSF approved materials when applicable
          2. Flow tube shall be constructed of Delrin
          3. Stem assembly shall be constructed of 316/316L SS
          4. Electrodes shall be contrasted of 316/316L SS
          5. Seal shall be EPDM
          6. Hot tap adapter shall be constructed of 316/316L SS

For heating hot water (HHW/HW) applications, wetted components shall be constructed of:

1. Flow tube shall be constructed of PSU
2. Stem assembly shall be constructed of 316/316L SS
3. Electrodes shall be contrasted of 316/316L SS
4. Seal shall be EPDM
5. Hot tap adapter shall be constructed of 316/316L SS
   * + 1. Maximum Operating Pressure Rating: 400 psig.
       2. Temperature Rating:
          1. Operating: 15 - 250 deg F
          2. Ambient: -20F – 150 deg F
       3. End Connections for NPS 6” to 12”: 1” Male NPT hot tap adapter fitting. Installation through a 1” full port isolation valve, minimum.
       4. Flow Range: Flow-measuring sensor and transmitter shall be calibrated and configured to cover the operating range of equipment or system served.
       5. Accuracy: Flowmeter shall provide calibrated outputs directly from the transmitter, throughout the operating range with the accuracy stated as follows:
          1. Plus or minus 0.5% of reading at calibrated velocity
          2. Plus or minus 1.0% of rate from 1.0 to 20.0 ft/sec velocity (20:1 turndown).
          3. Plus or minus 0.01 ft/sec below 1 ft / sec
       6. Calibration: Each flowmeter shall receive a wet calibration, within the expected operating range, against a primary volumetric standard that is traceable to NIST.
       7. Transmitter Enclosure: Transmitter enclosure shall be cast aluminum, NEMA 4 rated
       8. Display: Menu driven via four (4) programming keys, no configuration tools or software required. Display shall visually indicate total fluid volume and instantaneous flow rate.
       9. Operating and Installation Instructions: Installation and operating instructions shall be provided for each flowmeter.
       10. Warranty: Each flowmeter shall be covered by the manufacturer’s three-year warranty.