SECTION XXXXX

 ELECTROMAGNETIC FLOWMETER

PART 1 GENERAL

* 1. SUMMARY
1. Section Includes:
2. Electromagnetic Flowmeter
	1. REFERENCES
3. National Institute of Standards and Technology (NIST)
4. ANSI/IEC 60529 – Degrees of Protection by Enclosures (IP Code)
	1. QUALITY ASSURANCE
5. Manufacturer: the company shall have a minimum of 50 years of experience in the design, manufacture, assembly, and field performance flow metering instrumentation. The manufacturer shall have NIST traceable calibration facilities to deliver a Certificate of Calibration for each flowmeter supplied.
6. Equipment shall be of top quality construction and design, and shall be guaranteed to perform the service required.
7. Equipment and materials shall be new, and if of the same type as other performing parts of the same system, shall be products of the same manufacturer.
	1. SUBMITTALS
8. Submittals shall include
9. Product Datasheets:
10. Furnish manufacturer’s name, catalog numbers, and product specification for each component.
11. Wiring diagrams and/or control schematics for each field I/O point shall identify the module and terminal wiring designation.
12. Information for the Record:
13. Operation and Maintenance Manuals
14. Certificate of Calibration

PART 2 PRODUCTS

* 1. GENERAL
1. The flow meter shall consist of two components: an electromagnetic sensor and a converter. The 1” (25mm) electromagnetic sensor shall installed in an upstream port of a Singer Valve from diameters from 4 in. (100mm) to 36 in. (900mm) in clean water applications.
2. The flow meter shall determine the volumetric flow rate by means of the Continuity Equation where flow rate “Q” equals mean velocity “V” times cross sectional area “A” (Q = V x A). The velocity measurement must be taken at a known location, then, through empirically established equations, the sensed velocity will be converted to a mean velocity.
3. The electromagnetic flowmeter shall have no moving parts or sensors that are prone to damage and inaccuracy due to particulate matter and/or vibration.
4. The electromagnetic flowmeter shall be capable of being powered by from 90 to 265V, 45-66 Hz AC voltage source. It shall have a power draw of 25VA*. (or 10-35V DC voltage source. It shall have a power draw of 21W)*
5. The electromagnetic flowmeter shall have an accuracy of 2% of reading. Accuracy based on full scale is not allowed.
6. Each flowmeter shall be calibrated at the manufacturer’s factory with calibrated test equipment traceable to standards such as NIST. Calibration certificates shall be submitted to the Engineer or Engineer Representatives prior to delivery of equipment.
7. The electromagnetic flowmeter shall have operating and storage temperature rating from -4° to 140°F (-20°C to +60°C).
8. The flowmeter shall be guaranteed for satisfactory performance and against manufacturing defects for a period of one year.
9. The meter shall be equivalent to the SPI-MV Single Point Insertion Electromagnetic Flow Meter as manufactured by McCrometer, Inc., in Hemet, California, and supplied for use, specifically, with Singer Valve Inc. Main Valves.
	1. CONVERTER
10. The flow meter converter shall be microprocessor based with a keypad for instrument set up and LCD displays for totalized flow, flow rate engineering units and velocity.
11. The converter shall power the flow-sensing element and provide a galvanically isolated Dual 4-20mA output. It shall be possible, in the test mode; to easily set the converter outputs to any desired value within the range.
12. The 4-20mA scaling, time constants, pipe size, flow proportional output, engineering units and test mode values shall be easily set via the keypad and display.
13. Four separate fully programmable alarm outputs shall be provided to indicate empty pipe, forward/reverse, polarity (normally open/close), analog over-range, fault conditions, high/low flow rates, % of range, and pulse cut-off.
14. The converter shall periodically perform self-diagnostics and display any resulting error messages.
15. All set up data and totalizer values may be protected by a password.
16. The converter shall have an IP67 rating for protection against temporary immersion in water and ingress of dust (dust tight)
	1. SENSOR
17. The flow-sensing element shall be of an electromagnetic single point type design and factory calibrated to traceable standards, such as NIST.
18. The sensor shall be made of polyurethane with pure carbon electrodes exposed to flow.
19. To eliminate erroneous readings due to pipe wall effects, the sensor must have its electrodes located at 1/8th pipe diameter from the pipe wall and be designed with a curved tip shape, so as not to collect debris while in the operating position. Flat tipped or Doppler sensors shall not be acceptable.
20. The sensor shall have an IP68 rating for protection against the effects of continuous immersion in water.
	1. COMPONENTS
21. The sensor cable is 20 feet of multi-conductor, abrasive resistant, PVC jacketed submersible cable flexible to -40°F. The sensor cable shall be permanently bonded to the sensor. Additional sensor cable, up to 200 feet, shall be available as an option.
22. The stainless steel insertion tube shall be rated for 250 PSI @ 160°F (71°C). Hardware must allow sensor to be secured by bolts when sensor is being inserted and retracted. A stainless steel compression seal assembly shall also be supplied.