COLD-WATER METERS/ STATIC ULTRASONIC METERS

SIZES: 2” – 8”

GENERAL

All commercial and industrial cold-water meters (solid-state type 2” – 8”) furnished shall be produced from an ISO 9001 manufacturing facility and shall meet or exceed the latest revision of the AWWA C715 Electromagnetic and Ultrasonic for Revenue Applications.

APPROVALS

- AWWA C715 Electromagnetic and Ultrasonic for Revenue Applications (latest revision)
- Lead Free Legislation:

  The utility requires that all water meters submitted in this proposal be compliant with NSF/ANSI 61, which exceeds the requirements of NSF/ANSI 372 that became effective January 2014:

  - Materials in contact with potable water shall comply with the requirements of the Safe Drinking Water Act and other federal requirements.
  - Meters shall be made of “lead free” cast iron, epoxy coated.
- Complies with FCC part 15B.

MEASUREMENT TECHNOLOGY

The measurement technology must be based on transit time ultrasonic sensing featuring no moving parts. Only meters featuring solid-state ultrasonic metrology will be accepted because of enhanced low-flow accuracy performance and extended accuracy over the meter life.

SIZE, CAPACITY, LENGTH

The meter’s size, capacity, and length shall be as specified in AWWA Standard C715 (latest revision).

GENERAL SPECIFICATIONS

- Potable water temperature 33° - 122° F.
- Ambient operating temperature 14° - 131°.
- Ambient storage temperature 14° - 158°.
- Operating pressure 300 psi.
- Field replaceable battery.
- Meter installation must be in any position without reference to level in the horizontal, vertical, or plumb.
- No required calming sections before or after the meter.
- Strainers must not be required.

- Meter must meet accuracy requirements in the forward direction as well as the reverse direction.
- Temperature must be calculated from a temperature probe submersed in the water flow.
- The meter must report total forward flow, total reverse flow, and the totalized flow.
- The meter must take cross section measurements with four transducers, two opposed horizontally across the meter. The second pair must be diagonal from the front of the meter (inlet) to the rear of the meter (outlet). This positioning of the transducers allows for the longest period of signal in the water stream and provides the highest degree of accuracy.
- The meter must have a test mode to reduce testing time.
- The product code, serial number, date of manufacturer as well as the factory test results must be laser etched to register housing.
- The meter must have lab test results laser etched onto the register housing.
- The meter must have on-board memory of hourly and historic alarms. The on-board memory must have the ability to be downloaded to a phone or tablet via a Bluetooth Data extraction device.
- The meter must be field configurable.

ENVIRONMENTAL

The ultrasonic meter must feature fully potted electronics and battery as well as carry an IP68 rating for submersion in flooded meter pits.

MAIN CASE

The meter main case must be cast from NSF/ANSI 61 certified lead-free cast iron, epoxy coated. The serial number should be displayed in a permanent location on the register. Meter markings shall indicate size, model, direction of flow, and NSF 61 certification:

- All lead-free main cases shall be guaranteed free from manufacturing defects in workmanship and material for the life of the meter.
- All main case screws or bolts shall be of 300 series non-magnetic stainless steel to prevent corrosion.
- Main Case must be rated to 300 PSI.

ELECTRONIC DISPLAY REGISTER

The ultrasonic meter electronic enclosure shall be constructed of a durable engineered composite designed to last the life of the meter. The meter shall provide a fully potted wire connection (Nicor connector) for use with AMR/AMI devices. No radio can be embedded inside of the register/meter.

- The register box must have a lid. The lid shall be recessed and shall overlap the register box to protect the lens, and the lens shall be held securely in place.
- The electronic display register shall provide at least a 9-digit visual registration at the meter and capable of 10-digit High Resolution.
- The electronic display register shall provide a 9-digit meter reading for transmission through the RF AMR/AMI MIU.

- The electronic display register shall employ a visual LCD leak detection indicator as well as provide remote leak detection through an ASCII format to the RF AMR/AMI MIU.
- The electronic display register shall provide reverse flow detection.
- The electronic display register shall subtract reverse flow from the total registration. In addition, reverse flow totalization shall be downloadable as separate total.
- The electronic display register LCD, at a minimum, should display the following and toggle between fields:
    - Totalized read (shall be displayed with leading zeros so that all digits capable of displaying are readable)
    - Gallons Per Minute (GPM)
    - Temperature of the Water (obtained by probe in the measuring chamber)
    - High Resolution Read
    - Error Messages (logged error messages)
        - Electronic error, the meter must be replaced
        - Water temperature too low or too high
        - Ultrasonic hardware error
        - Ultrasonic transducers disconnected or cut off
        - Communication not possible
        - Air in supply system
    - Alarm Message (current)
        - Reverse flow
        - No usage (over a certain period, configurable)
        - Failure of ultrasonic or temperature measuring
        - Leak (configurable to user profile)
        - Low water temperature 37.4°F (< 3 °C)
        - Air in pipe system
        - Low Battery
    - Firmware version
- The display “loop” contents and order shall be field configurable.
- The Electronic Display Register face must contain the following:
    - Meter Manufacturer, Type and Model
    - Size of meter
    - Serial number
    - Date of manufacturer
    - Flow direction
- The register shall provide and display low battery detection on the LCD and communicated as ASCII format data to the RF AMR/AMI endpoint.

MEMORY

- The meter should accumulate and register consumption without connecting to a receptacle or RF AMR/AMI Endpoint. The display should show flow rate information (toggled within the display loop with the current meter reading).
- The meter must store a minimum of 40 days of hourly data.
- The meter must provide a data log of at least 120 errors and alarms.

ENCODER OUTPUT

Standard Encoder Protocol

- Meter volume
- Serial number

The meter must be available in a version that provides an extended encoder protocol output to AMR/AMI devices that will accept the extended encoder protocol.

Extended Encoder Protocol:

- Meter volume
- Serial number
- Alarm flags
- Battery lifetime
- Water temperature
- Ambient temperature
- Backwards volume
- Max. flowrate
- Min. flowrate

LOCAL COMMUNICATION

- Local communication of the meter is to enable download of data when an AMR/AMI endpoint is not present or in case of AMR/AMI endpoint failure.
- Local communication should be performed wirelessly to local collection device such as laptop, tablet, or handheld.
- Local communication via non-AMR/AMI endpoint or frequency.
- Software to download the meter data must be available at no cost.

PERFORMANCE

Meter manufacturer's solid-state meters shall meet or exceed the latest revision of the Electromagnetic and Ultrasonic for Revenue Applications, **AWWA C715** and warrant their published accuracy levels for the life of their meters. Each meter shipment must be accompanied by factory test data showing the accuracy of the meter as tested at their factory. The test results must be permanently affixed to the register housing via laser etching.

WARRANTY

The warranty must be a nationally published warranty, available to all utilities. Minimum length of the warranty must be ten years with total meter replacement in case of failure.