



Solid State Absolute Encoder Registers

It is the preference of the Utility to obtain an advanced encoder-based remote metering system capable of providing electronically encoded meter information as described in the enclosed specifications. Specifications for the required cold water meters can be found in the enclosed documentation. Bids should be submitted with detailed information on the features and benefits to the Utility to adequately evaluate the proposed system. Proposals without adequate information may not be considered.

DESCRIPTION - GENERAL

These specifications cover a self-contained solid state absolute encoder register metering system designed to obtain remote simultaneous water meter registration that is guaranteed to exactly match the registration on the register odometer. The metering information shall be obtained through a remotely located receptacle or meter interface unit (MIU) using a compatible data capture system. The above system shall be configured as follows:

- > Solid state absolute encoder meter register—direct-mounting, electromagnetically-encoded measuring element into an electronic solid state odometer. Encoder shall provide value-added flow data including leak, tamper, and reverse flow detection when connected to a compatible RF AMR/AMI MIU. Batteries and digital counters using volatile memory are not allowed. Encoder register shall display flow rate information at register.
- > Remotely-mounted receptacle or MIU providing a communication link for the transmission of information from the register.
- > Data acquisition equipment with which the above components can be interrogated. Such equipment shall be configured in two types:
 - A device that captures information and displays it visually to confirm correct system installation and wiring.
 - A device that is pre-programmed with route information and is capable of storing collected data in solid state memory. This device shall also electronically transfer the data for use by the utility billing computer.

ENCODER REGISTER UNIT

- > Registration
 - The register shall provide at least a nine-digit visual registration at the meter.
 - The unit shall provide an eight-digit meter reading for transmission through the radio MIU.
 - The dial shall have a high-resolution, nine-digit LCD display for meter testing.
 - The 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 register shall provide reverse flow detection, communicated as ASCII format data to the RF AMR/AMI MIU.
 - Reverse flow detection shall be calculated based on 15-minute interval consumption.



- The register shall provide an indication of days of zero consumption, communicated as ASCII format data to the RF AMR/AMI MIU.
- The manufacturer will guarantee that the reading obtained electronically matches the LCD odometer reading on the register.
- The register should accumulate and register consumption without connecting to a receptacle or MIU.
- The register shall display flow rate information.

> Mechanical Construction

The registers should be manufactured in two different versions, one for inside set application and one for pit set.

> Inside Set Version

- The unit must be constructed of high-strength polycarbonate and possess a hermetic sonic-weld seal. Registers for inside set applications should be oil-free designs.
- The register shall be attached to the meter case by a bayonet attachment. Fastening screws or nuts shall not be required. A tamperproof seal pin shall be used to secure the register to the maincase.
- The register shall be removable from the meter without disassembling the meter body and shall permit field installation and/or removal without taking the meter out of service.
- Provision shall be made in the register for the use of seal wires to further secure the register.
- Terminal screws must be accessible on the register for transmission wire connection to the remote receptacle or a future AMR/AMI system. A permanently-potted wire connection shall be available for pit set meter applications.

> Pit Set Version

- The unit must be constructed in a roll-sealed copper shell and glass lens assembly.
- The register shall be attached to the meter case by a bayonet attachment. Fastening screws or nuts shall not be required. A tamperproof seal pin shall be used to secure the register to the maincase.
- The register shall be removable from the meter without disassembling the meter body and shall permit field installation and/or removal without taking the meter out of service.
- Provision shall be made in the register for the use of seal wires to further secure the register.
- Terminal connections must be permanently-potted so that the terminal cover cannot be removed.

> Electrical Construction

- The solid state absolute encoder register shall incorporate an Application Specific Integrated Circuit (ASIC) and firmware designed to verify accurate measurement, information transmission, and data integrity.
- Connection shall be made to the register by three screw-type terminals sonically inserted into the register top. Access to the terminals shall be available to all register models with the exception of a permanently-potted version. A port cover shall be provided to cover the terminals after they have been wired.

> Meter Reading Information

- The solid state absolute encoder register shall provide to the reading equipment an eight-digit meter reading. An identification number of up to ten (10) digits shall be provided with each reading when read using a probed reading device.
- The solid state absolute encoder register shall provide additional value-added information remotely when connected to a radio MIU (e.g., detailed leak detection data, days of leak state, days of no consumption, and backflow indication). This information shall be communicated through the encoder protocol and RF MIU to the route management software to allow the seamless integration of data into a CIS package.

REMOTE RECEPTACLE

> Mechanical Construction

- Where indicated, a remote receptacle must be provided for attachment to a pit meter lid with another unit also designed for attachment by wall mounting.
- The materials employed shall be corrosion-resistant, resistant to ultraviolet degradation, unaffected by rain or condensation, and compatible with rugged service and long life.
- The pit receptacle shall be mounted in a single 1¾" hole in the pit lid while not extending more than 4½" into the pit.
- The pit-mounted receptacle shall be provided with a minimum length of six feet of wire connected and sealed at the receptacle without terminal exposure.
- The remote receptacle shall not contain a battery unless it is a radio MIU.



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