Badger Meter

E-Series® Ultrasonic Meter

Cold Water Meter Testing Considerations

OVERVIEW

The E-Series Ultrasonic meter is a highly accurate electronic meter that operates on an entirely different principle than a positive displacement meter due to the fact that it has no moving parts.

Since the meter testing outcome is based on accurate measurement of the velocity of water through the meter, any water turbulence and pressure fluctuations that occur during the short testing intervals can affect the results. Pipeline valves, fittings or impediments installed too close can cause flow disturbances and could affect the accuracy results.

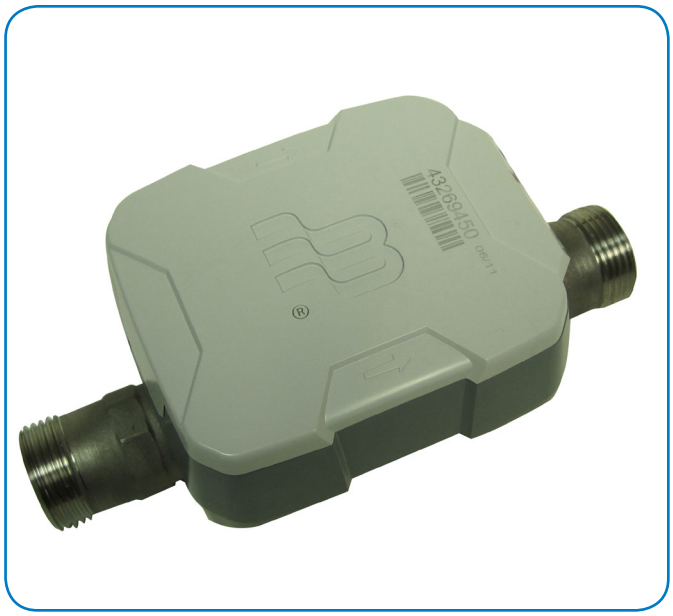
Guidelines For Testing E-Series Ultrasonic Residential Meters

- Reference meters should be installed downstream of the Ultrasonic meter.
- For the 1-1/2" and 2" meters, it is recommended that you have 10 diameters of straight pipe upstream of the meter to improve accuracy.
- System should be purged of air and the meter completely filled with water. To do this, run at least 100 gallons of water through the system at maximum flow.
- Start the meter test at the high flow first and then continue with the lower flows. This will help ensure all air is purged through the meter.
- For the **5/8" to 1" meters**, run at least a volume of 100 gallons at the high, mid and low flows.
- For the **5/8" to 1" meters**, run at least 10 gallons at the extended low flow rate.
- For the **1-1/2" and 2" meters**, run at least 40 gallons for the low and mid-flow tests. Run at least 500 gallons for the high flow tests.
- The greater the volume of water measured or the longer the test is run, the more accurate the meter test measurement will be.

Sampling Rate and E-Series Ultrasonic Test Mode

Ultrasonic signals are sent at a fixed time interval (also called sampling rate) to conserve battery life. Very high meter accuracies can be observed in the normal mode of operation, however at the expense of higher test volumes and longer test times.

Because of this flow sampling technique, special testing methodology in a meter shop can be performed by temporarily increasing the sampling rate to observe the high accuracy performance at ultra low flows in a reasonable test time.



E-SERIES ULTRASONIC METER TEST MODE

A high resolution meter test mode in the meter electronics is activated using an IR interface with a computer program. This test mode will increase the sampling rate of the meter for a 2-1/4 hour period to allow for more accurate testing. After the 2-1/4 hour period has expired, the meter will revert to its normal mode of operation. The Meter Test Mode is activated using the Badger Meter Handheld Programmer/Data Collector or the ORION® Utility program. Again, very high meter accuracies can also be observed in the normal mode of operation, however at the expense of higher test volumes and longer test times.

The increase in sampling rate for accuracy testing is not related to the ultrasonic technology used in the meter. This is the nature of any meter technology that uses a sample flow rate to calculate consumption and is common in most battery-operated flow meters.

The sampling flow rate technique is necessary to maintain a reasonable product battery life.

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Application Brief

INITIATING METER TEST MODE WITH THE HANDHELD

To initiate the E-Series Ultrasonic Meter Test Mode, use the Badger Meter handheld with an IR cable.

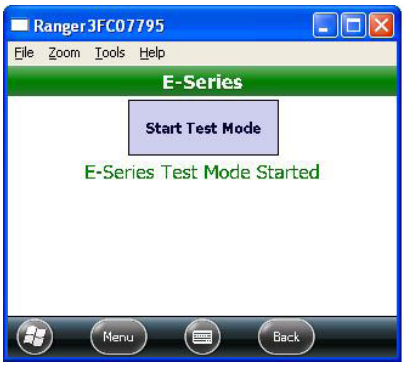
1. Access the **ORION Endpoint Utility** (Software Version 2.2.4 or higher) on the handheld and log in.

2. On the *Technology Selection* screen, select **E-Series**.

3. Position the IR cable head over the IR port on the left-center face of the meter display.

4. While holding the IR cable in place, select **Start Test Mode** on the handheld to initiate the meter test mode.

5. If the IR communication with the meter is successful, the display indicates that the meter test mode is activated. This is the end of the test.



6. If the IR communication with the meter fails, the display indicates that the software was unable to start the test mode. In this case, repeat steps 2 through 5.

7. After 2-1/4 hours, the meter test mode automatically deactivates and the sampling rate reverts to normal operation.

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