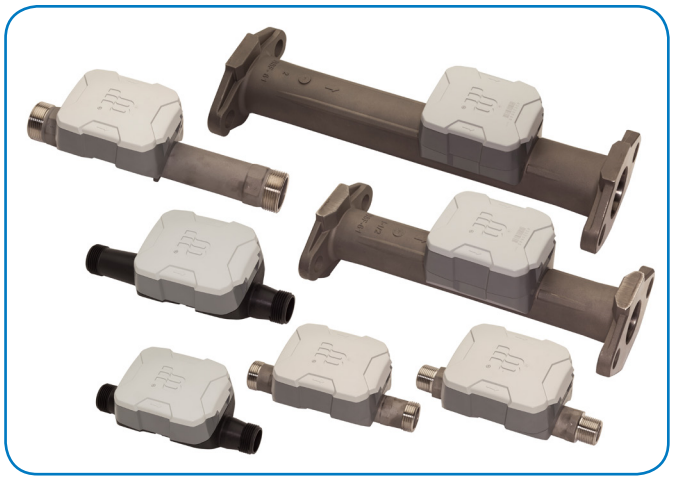
Badger Meter | E-Series® Ultrasonic Meter

ULTRASONIC METER PRE-INSTALLATION

- Inspect the piping around the meter setting for suitable conditions. The service line, valves, connections and meter must be watertight. Repair the piping system if corroded or damaged.
- Set the meter in a horizontal or vertical position with flow in the up direction. Registration should be upright and protected from damage, freezing, and tampering.
- Position the meter so it is accessible for installation, removal and reading.
- Verify that a suitable, electrical grounding wire is properly attached to the upstream and downstream pipe connections of the meter. The grounding wire provides an alternative path for any electrical current that may exist across the opening in the line.
- Close the curb (shutoff) valve to relieve water pressure in the line before starting the cutting operation. Provide a high-quality upstream shutoff valve with a low pressure drop.
- When cutting into a new section of service pipe, flush the pipe to clear chips, pipe dope or other plumbing residue.
- For **5/8" to 1" meters**, the line opening in which the meter is to be set should match the laying length of the meter, allowing slight additional space for coupling gaskets. The inlet and outlet sides of the meter should be set axially aligned to the pipe.
- For **1-1/2" and 2" meters**, the line opening in which the meter is to be set should match the laying length of the meter. For optimal performance and accuracy, it is also recommended that five to ten diameters of straight pipe be installed upstream of the meter.
- The installed meter must not be an obstacle or a hazard to the customer or interfere with public safety.
- During meter installation, you may choose to replace the old gaskets with the provided 9/64" thick rubber gaskets.



Storage Mode

All E-Series Ultrasonic meters are delivered in a storage mode so that a meter alarm is not triggered. During storage mode, the empty pipe shows up on the LCD display as an error message, but it will not trigger a meter alarm. The meter needs to sense a full pipe for 24 hours for the meter to go from storage mode to normal operation. If installed when the meter is still in storage mode, the meter will function as expected with the addition of also displaying "err" on the flow rate screen. The meter will display consumption and, if connected to AMR/AMI, will send a reading to the endpoint. When the meter is in normal operation, the meter alarm displays immediately upon detecting the empty pipe condition. The alarm clears immediately after the condition is corrected and the pipe is full. Systems that support the additional alarm conditions will be notified that an empty pipe condition has occurred.

Status Indicators

Other indicators and alarms appear in the display as symbols that illuminate when the condition is active and dim when the alarm condition is eliminated. For additional status indicator information, refer to the Installation and Operation manuals, available online at *www.badgermeter.com*.

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Quick Start Guide

ULTRASONIC METER INSTALLATION

To prepare for meter installation, follow these steps:

1. Close the meter's inlet-side valve.
2. Open a faucet and wait until water flow stops, to depressurize the system. Do not remove the meter until the flow stops.
3. Check valves and make necessary repairs to the curb (shut-off) valve or inlet side valve if necessary.
4. Close the meter's outlet-side valve. Protect the floor below the meter against potential spills or leaks that could occur. Protect the coupling area from debris, so that the new meter will not be damaged or contaminated.
5. To replace an existing meter continue with Step 6. To install a new meter skip to Step 8.
6. Depending on meter size, loosen meter couplings/flange connection bolts and remove the meter and the old gaskets.
7. Clean the coupling nuts/flanged ends removing any pipe dope or dirt from the meter ends.
8. Check the existing setting for proper alignment and spacing. Correct any misalignment and spacing in the setting.
9. Place the new connection gaskets inside the connection.
10. Set the meter in the pipeline so that the flow arrow on the meter housing points in the direction of flow.
11. With the meter and gaskets in place, tighten the coupling nuts/flange connection bolts. Verify that the nuts are properly aligned to avoid damage to the meter ends.

GUIDELINES FOR TESTING E-SERIES ULTRASONIC RESIDENTIAL METERS

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.

- Reference meters should be installed downstream of the Ultrasonic meter.
- For the 1-1/2" and 2" meters, provide 5 to 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. 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. For more information on the high resolution test mode, refer to the Application Brief, available online at *www.badgermeter.com*.

For more detailed information on the Ultrasonic meter, refer to the Installation and Operation manuals, available online at *www.badgermeter.com*.

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