



PRE-INSTALLATION GUIDELINES

- 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.
- 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.
- When cutting into a new section of service pipe, flush the pipe to clear chips, pipe dope or other plumbing residue.
- The installed meter must not be an obstacle or a hazard to the customer or interfere with public safety.

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.

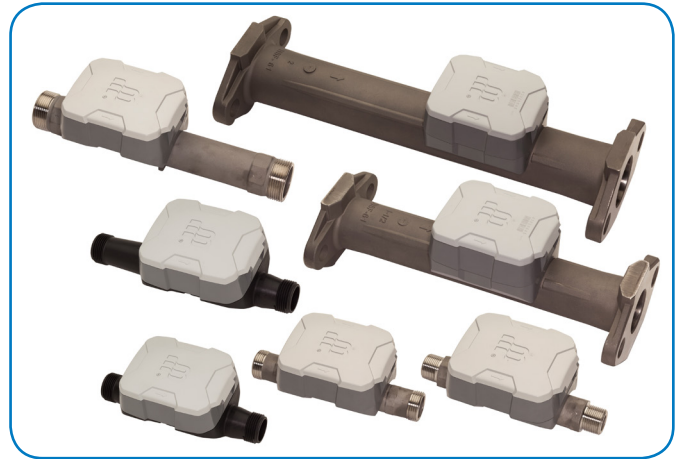
Status Indicators

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 more status indicator information, refer to the User Manuals, available online at www.badgermeter.com.

INSTALLATION & QUICK START

To install an E-Series Ultrasonic meter:

1. Close the meter's inlet-side valve.
2. Open a faucet to depressurize the system. Do not remove the meter until the flow stops.
3. Check valves and make necessary repairs to the curb (shutoff) valve or inlet side valve.
4. Before installing or removing a meter, close the outlet-side valve to relieve pressure. Protect the area around the meter against potential spills or leaks that could occur.



5. To replace an existing meter, continue with Step 6. To install a new meter, skip to Step 8.
6. Loosen the meter couplings or flange bolts and remove the meter and old gaskets in the coupling nuts. We recommend replacing the old gaskets with the provided thick rubber gaskets (**5/8 in.** PN:34819-037; **3/4 in.** PN:34819-038; **1 in.** PN:34819-039).
7. Clean the coupling nuts or flange bolts, removing any pipe dope or dirt from the threads or flange bolts.
8. Check the existing setting for proper alignment and spacing.
9. Place the connection gaskets inside the connection coupling nuts.
10. Set the meter between the coupling nuts or in the flange pipeline, positioned so that the flow arrow on the meter housing points in the direction of flow. Registration should be upright.
11. Start the coupling nuts or flange bolts at the meter ends. Verify that the connections are properly aligned to avoid cross-threading or damage to the meter ends.
12. After the meter is installed, open the inlet shutoff valve until the meter is full of water and ensure that there are no leaks. (The more flow you allow through the meter, appropriate for the meter size, the better.)
13. Open the outlet valve until air is out of the meter and service line.
14. Open a valve downstream of the meter and verify that no foreign debris in the water obstructs the operations of the system.

15. Make sure the meter is installed with the *flow arrow on the meter pointing in the direction of flow*. Check the read on the meter to make sure it is registering a positive number. If it is not, make sure the meter is installed in the correct direction.
 - a. The meter is sent in Storage mode so that customers do not experience alarms during shipment or installation. In general, a meter may take up to 2 minutes to begin measurement once the meter senses a full pipe.
 - b. The meter itself does not require a quantity of flow to begin measurement, the meter just requires that the pipe is cleared of air and filled with water. If the customer is attempting to purge the meter at low flow rates, it would likely be more difficult and take longer.
16. When the meter starts recording positive flow, note the meter read for your records.

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 **1-1/2 inch and 2 inch 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 **5/8 inch to 1 inch meters**, run at least 100 gallons at the high, mid and low flows. Run at least 10 gallons at the extended low flow rate.
- For **1-1/2 inch and 2 inch 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 *E-Series Ultrasonic Meter Application Brief*, available in the Resource Library at www.badgermeter.com.

For more detailed information on the Ultrasonic meter, refer to the User Manuals, available in the Resource Library at www.badgermeter.com.

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