Badger Meter

E-Series® Ultrasonic Meter

Cold Water Engineered Polymer Meter, 5/8, 5/8 x 3/4, 3/4, & 1 inch NSF/ANSI Standard 61 Certified, Annex G

DESCRIPTION

The E-Series® Ultrasonic meter uses solid-state technology in a compact, totally encapsulated, weatherproof, and UV-resistant housing, suitable for residential and commercial applications. Electronic metering provides information—such as rate of flow and reverse flow indication—and data not typically available through traditional, mechanical meters and registers. Electronic metering eliminates measurement errors due to sand, suspended particles and pressure fluctuations.

The Ultrasonic 5/8, 5/8 × 3/4, 3/4, and 1 inch meters feature:

- Minimum extended low-flow rate lower than typical positive displacement meters.
- Simplified one-piece electronic meter and register that are integral to the meter body and virtually maintenance free.
- Sealed, non-removable, tamper-protected meter and register.
- Easy-to-read, 9-digit LCD display presents consumption, rate of flow, reverse-flow indication, and alarms.
- High resolution industry standard ASCII encoder protocol.

The Ultrasonic meter is available with an in-line connector for easy connection and installation to AMR/AMI endpoints. It is also available with a flying lead for field splice connection.

APPLICATIONS

Use the Ultrasonic meter for measuring potable cold water in residential, commercial and industrial services. The meter is also ideal for non-potable, irrigation water applications or less than optimum water conditions where small particles exist.

The Ultrasonic meter complies with applicable portions of ANSI/AWWA Standard C700 and NSF/ANSI Standard 61, Annex G. There is currently no AWWA standard that specifically addresses ultrasonic meters for residential applications.

OPERATION & PERFORMANCE

As water flows into the measuring tube, ultrasonic signals are sent consecutively in forward and reverse directions of flow. Velocity is then determined by measuring the time difference between the measurement in the forward and reverse directions. Total volume is calculated from the measured flow velocity using water temperature and pipe diameter. The LCD display shows total volume and alarm conditions and can toggle to display rate of flow.

In the normal temperature range of 45…85° F (7…29° C), the Ultrasonic "new meter" consumption measurement is accurate to:

- ±1.5% over the normal flow range
- ±3.0% from the extended low flow range to the minimum flow value

CONSTRUCTION

E-Series Ultrasonic meters feature an engineered polymer, lead-free meter housing, an engineered polymer and stainless steel metering insert, a meter-control circuit board with associated wiring, LCD, and battery. Wetted elements are limited to the pressure vessel, polymer/stainless steel metering insert and the transducers. The electronic components are housed and fully potted within a molded, engineered polymer enclosure, which is permanently attached to the meter housing. The transducers extend through the polymer housing and are sealed by O-rings.

The metering insert holds the stainless steel ultrasonic reflectors in the center of the flow area, enabling turbulence-free water flow through the tube and around the ultrasonic signal reflectors. The metering insert's patented design virtually eliminates chemical buildup on the reflectors, ensuring long-term metering accuracy.

METER INSTALLATION

The meter is completely submersible and can be installed using horizontal or vertical piping, with flow in the up direction. The meter will not measure flow when an "empty pipe" condition is experienced. An empty pipe is defined as a condition when the flow sensors are not fully submerged.

SPECIFICATIONS

E-Series Ultrasonic Meter Size	5/8 in. (15 mm)	5/8 x 3/4 in. (15 mm)	3/4 in. (20 mm)	1 in. (25 mm)
Operating Range	0.1…25 gpm	0.1…25 gpm	0.1…32 gpm	0.4…55 gpm
Extended Low-Flow Rate	0.05 gpm	0.05 gpm	0.05 gpm	0.25 gpm
Maximum Continuous Operation	25 gpm	25 gpm	32 gpm	55 gpm
Pressure Loss	4.3 psi at 15 gpm	2.3 psi at 15 gpm	2.0 psi at 15 gpm	1.8 psi at 25 gpm
Reverse Flow - Maximum Rate	4.0 gpm	4.0 gpm	4.0 gpm	9.0 gpm
Operating Performance	In the normal temperature range of 45…85° F (7…29° C), new meter consumption measurement is accurate to: • ± 1.5% over the normal flow range • ± 3.0% from the extended low flow range to the minimum flow value			
Storage Temperature	– 40…140° F (– 40…60° C)			
Maximum Ambient Storage (Storage for One Hour)	150° F (72° C)			
Measured-Fluid Temperature Range	34…140° F (1°…60° C)			
Humidity	0…100% condensing; meter is capable of operating in fully submerged environments			
Maximum Operating Pressure of Meter Housing	175 psi (12 bar)			
Register Type	Straight reading, permanently sealed electronic LCD; digits are 0.28 in. (7 mm) high			
Register Display	• Consumption (up to nine digits) • Rate of flow • Alarms • Unit of measure factory programmed for gallons, cubic feet and cubic meters			
Register Capacity	• 10,000,000 gallons • 1,000,000 cubic feet • 100,000 cubic meters			
Totalization Display Resolution	• Gallons: 0.XX • Cubic feet: 0.XXX • Cubic meters: 0.XXXX			
Battery	3.6-volt lithium thionyl chloride; battery is fully encapsulated within the register housing and is not replaceable; 20-year battery life			

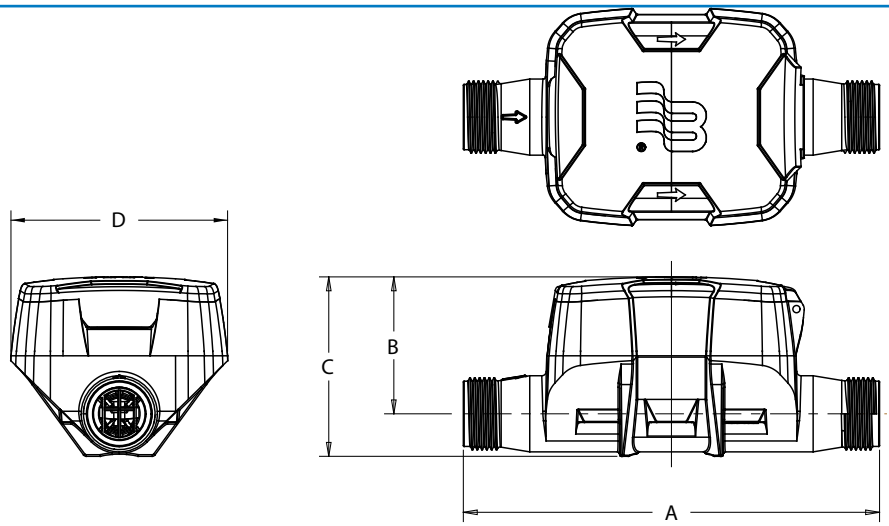
MATERIALS

Meter Housing	Engineered polymer
Measuring Element	Pair of ultrasonic sensors located in the flow tube
Register Housing & Lid	Engineered polymer
Metering Insert	Engineered polymer & stainless steel
Transducers	Piezo-ceramic device with wetted surface of stainless CrNiMo

PHYSICAL DIMENSIONS

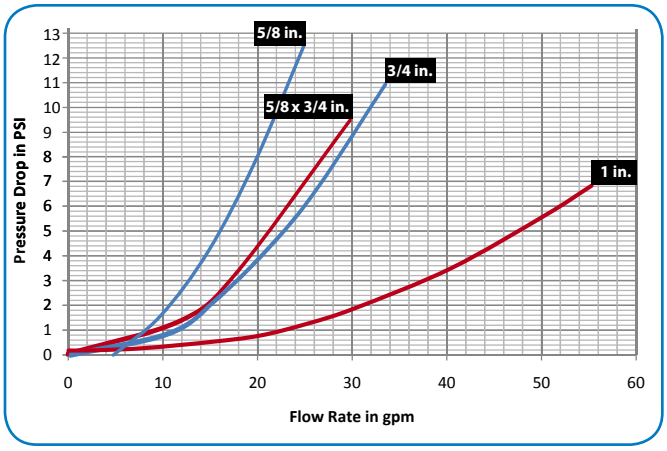
E-Series Ultrasonic Meter Size	5/8 in. (15 mm)	5/8 (15 mm) x 3/4 in. (20 mm)	3/4 in. (20 mm)	1 in. (25 mm)
Size Designation X Lay Length	5/8 × 7-1/2 in.	5/8 × 3/4 × 7-1/2 in.	3/4 × 7-1/2 in. or 3/4 × 9 in.	1 × 10-3/4 in.
Weight (without AMR)	1.60 lb	1.58 lb	3/4 × 7-1/2 in.: 1.58 lb 3/4 × 9 in.: 1.64 lb	2.3 lb
See illustration below for Measurement Designations.				
Length (A)	7.5 in.	7.5 in.	7.5 in. or 8.85 in.	10.75 in.
Height (B)	2.46 in.	2.46 in.	2.46 in.	2.66 in.
Height (C)	3.27 in.	3.23 in.	3.23 in.	3.62 in.
Width (D)	3.90 in.	3.90 in.	3.90 in.	3.90 in.
Bore Size	5/8 in.	3/4 in.	3/4 in.	1 in.
Coupling Nut & Spud Thread	3/4 in. × 14 NPSM	1 in. × 11-1/2 NPSM	1 in. × 11-1/2 NPSM	1-1/4 in. × 11-1/2 NPSM
Tailpiece Pipe Thread (NPT)	1/2 in.	3/4 in.	3/4 in.	1 in.
Service Pipe Thread (NPT)	1/2 in.	3/4 in.	3/4 in.	1 in.

MEASUREMENT DESIGNATIONS



PRESSURE LOSS CHART

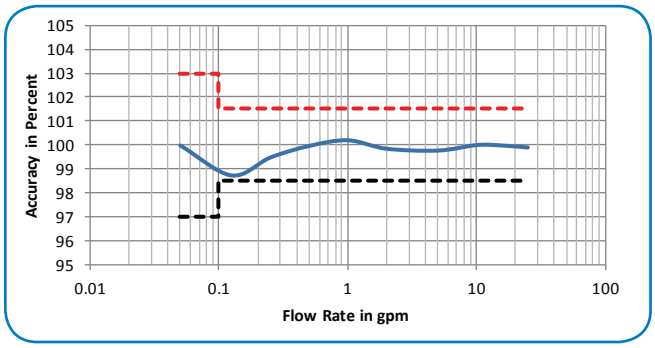
Rate of Flow in gallons per minute (gpm)



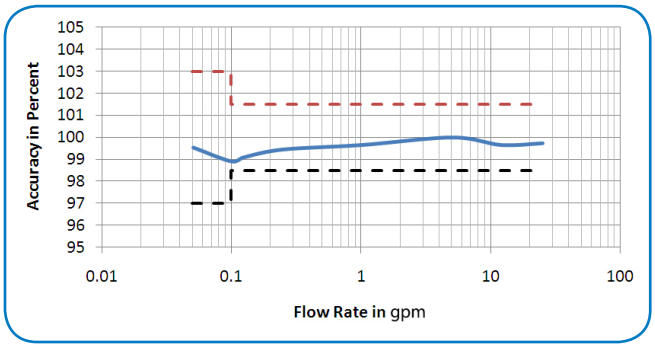
ACCURACY CHARTS

Rate of Flow in gallons per minute (gpm)

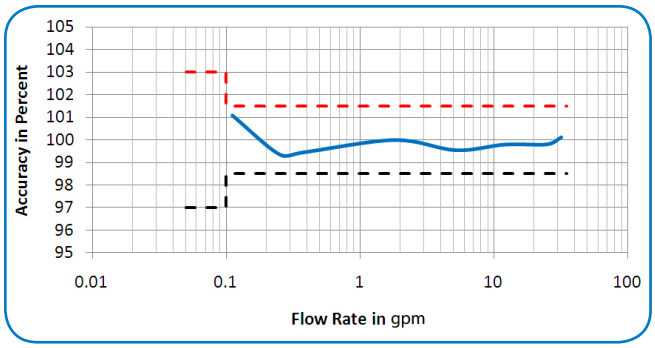
5/8 IN. METER



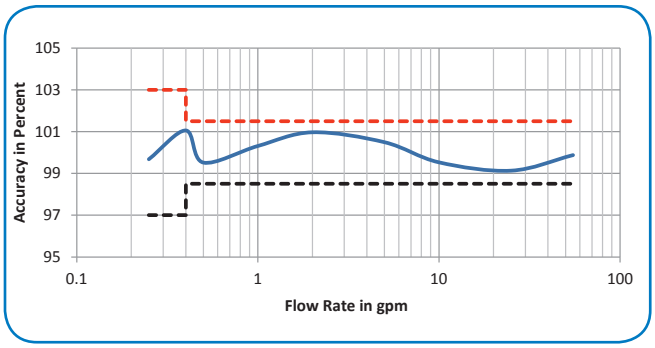
5/8 × 3/4 IN. METER



3/4 IN. METER



1 IN. METER



Making Water Visible®

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