E-Series® Ultrasonic Meter

Cold Water Stainless Steel Meter, 5/8, 5/8 x 3/4, 3/4 and 1 inch

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.

Offered in four sizes and lay lengths, the Ultrasonic meter features:

- 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 (empty pipe, temperature, exceeding max flow, sensor error, reverse flow, suspected leak, 30 day no usage, end of life).
- High resolution industry standard ASCII encoder protocol sends alarms and data to ORION® Cellular endpoints and BEACON® SaaS* suite to establish a smart water solution.

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.

* Software as a Service

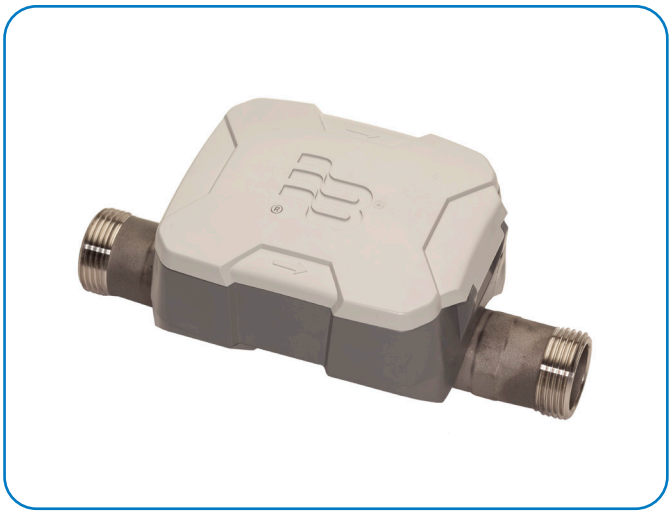
APPLICATIONS

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

E-Series Ultrasonic meters meet and exceed ANSI/AWWA C715 standards. The meters comply with the lead-free provisions of the Safe Drinking Water Act, are certified to NSF/ANSI/CAN Standards 61 and 372 and carry the NSF-61 mark on the housing.

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…122° F (7…50° 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 a stainless steel, 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 stainless steel 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 that occurs when the flow sensors are not fully submerged.

Badger Meter

ESM-DS-00675-EN-12 (December 2023)

Product Data Sheet

SPECIFICATIONS

E-Series Ultrasonic Meter Size	5/8 in. (16 mm)	5/8 x 3/4 in. (16 x 19 mm)	3/4 in. (19 mm)	1 in. (25 mm)
Normal Test Flow Limits	0.1…25 gpm (0.02…5.7 m^3/hr)	0.1…25 gpm (0.02…5.7 m^3/hr)	0.1…32 gpm (0.02…7.3 m^3/hr)	0.4…55 gpm (0.09…12.5 m^3/hr)
Minimum Test Flow Limits	0.05 gpm (0.01 m^3/hr)	0.05 gpm (0.01 m^3/hr)	0.05 gpm (0.01 m^3/hr)	0.25 gpm (0.06 m^3/hr)
Safe Maximum Operating Condition (SMOC)	25 gpm (5.7 m^3/hr)	25 gpm (5.7 m^3/hr)	32 gpm (7.3 m^3/hr)	55 gpm (12.5 m^3/hr)
Typical Pressure Loss	4.3 psi @ 15 gpm (0.3 bar @ 3.4 m^3/hr)	2.3 psi @ 15 gpm (0.16 bar @ 3.4 m^3/hr)	2.0 psi @ 15 gpm (0.14 bar @ 3.4 m^3/hr)	1.8 psi @ 25 gpm (0.12 bar @ 5.7 m^3/hr)
Reverse Flow - Maximum Rate	4 gpm (0.9 m^3/hr)	4 gpm (0.9 m^3/hr)	4 gpm (0.9 m^3/hr)	7.5 gpm (1.7 m^3/hr)
Operating Performance	In the normal temperature range of 45…122° F (7…50° 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 (66° 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 (empty pipe, temperature, exceeding max flow, sensor error, reverse flow, suspected leak, 30 day no usage, end of life) • 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			

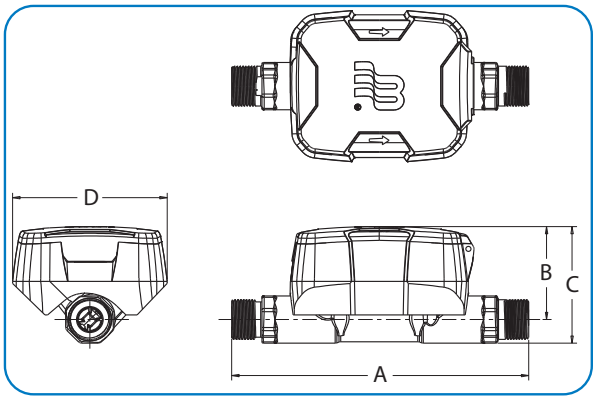
MATERIALS

Meter Housing	316 stainless steel
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

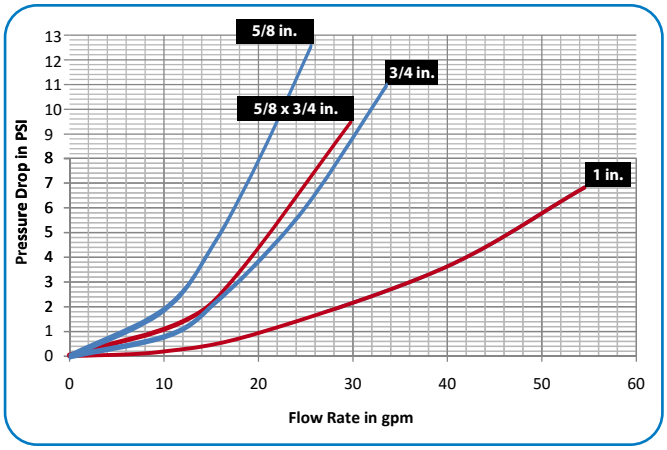
E-Series Ultrasonic Meter Size	5/8 in. (16 mm)	5/8 × 3/4 in. (16 × 19 mm)	3/4 in. (19 mm)	1 in. (25 mm)
Size Designation × Lay Length	5/8 × 7-1/2 in. (16 × 191 mm)	5/8 × 3/4 × 7-1/2 in. (16 × 19 × 191 mm)	3/4 × 7-1/2 in. or 3/4 × 9 in. (19 × 191 mm or 19 × 229 mm)	1 × 10-3/4 in. (25 × 273 mm)
Weight (without AMR)	2.2 lb (1 kg)	2.1 lb (.95 kg)	3/4 × 7-1/2 in.: 2.1 lb or 3/4 × 9 in.: 2.4 lb (20 × 190 mm: 0.95 kg or 20 × 229 mm: 1.08 kg)	3.1 lb (1.4 kg)
See illustration below for Measurement Designations.				
Length (A)	7.5 in. (191 mm)	7.5 in. (191 mm)	7.5 in. or 8.98 in. (191 mm or 228 mm)	10.745 in (273 mm)
Height (B)	2.404 in. (61 mm)	2.404 in. (61 mm)	2.404 in. (61 mm)	2.529 in. (64 mm)
Height (C)	3.014 in. (77 mm)	3.014 in. (77 mm)	3.094 in. (79 mm)	3.359 in. (85 mm)
Width (D)	3.898 in. (99 mm)	3.898 in. (99 mm)	3.898 in. (99 mm)	3.898 in. (99 mm)
Bore Size	5/8 in. (16 mm)	3/4 in. (19 mm)	3/4 in. (19 mm)	1 in. (25 mm)
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

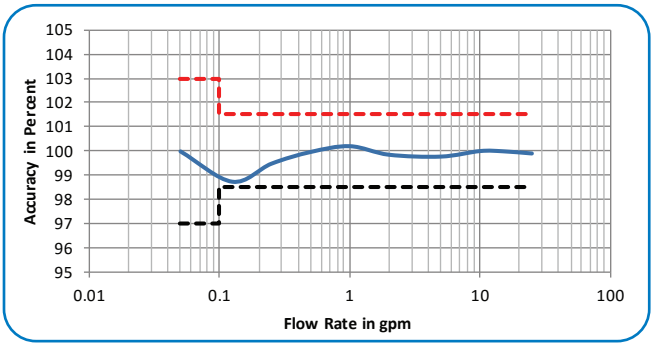
Rate of Flow in gallons per minute (gpm)



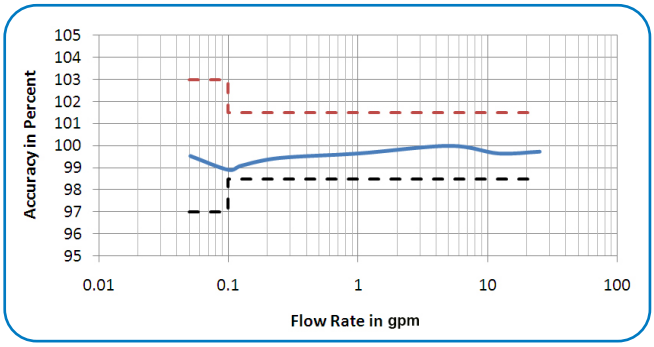
ACCURACY CHARTS

Rate of Flow in gallons per minute (gpm)

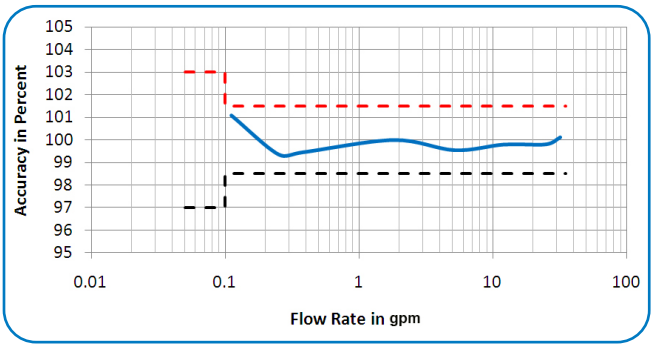
5/8 in. Meter



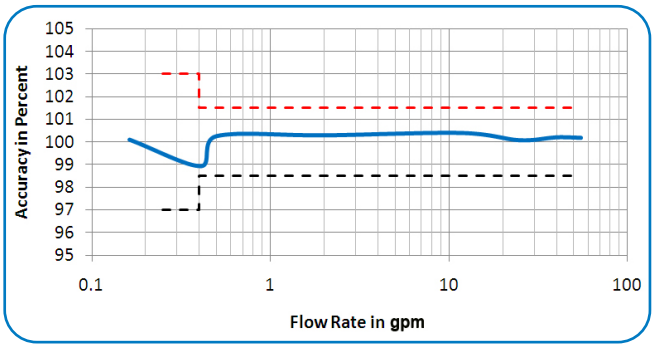
5/8 × 3/4 in. Meter



3/4 in. Meter



1 in. Meter



SMART WATER IS *BADGER METER*

www.badgermeter.com

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