



Badger Meter

E-Series® Ultrasonic Meter

Lead-Free Bronze Alloy, 3 and 4 inch

DESCRIPTION

The E-Series® Ultrasonic meter uses solid-state technology in a compact, tamper protected, weatherproof, and UV-resistant housing, suitable for 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.

Ultrasonic 3 and 4 inch Meter Features

- Open flow tube design preventing obstruction of flow to reduce pressure loss
- Greater turn-down ratio for extended flow ranges and increased revenue
- Approved connectivity with Badger Meter ORION® endpoints
 - Easy-to-read, 9-digit LCD display, which presents consumption, rate of flow, unit of measure, as well as reverse flow, empty pipe, exceeding max flow, suspected leak, temperature, pressure and battery alarms
 - Pressure and temperature monitoring reported through ORION Cellular and BEACON® AMA
- Field programmable registration and reporting features
- Meter designed for replaceable electronics
- Single and dual outputs include high resolution industry standard ASCII encoder protocol, scaled/unscaled and 4-20 mA

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

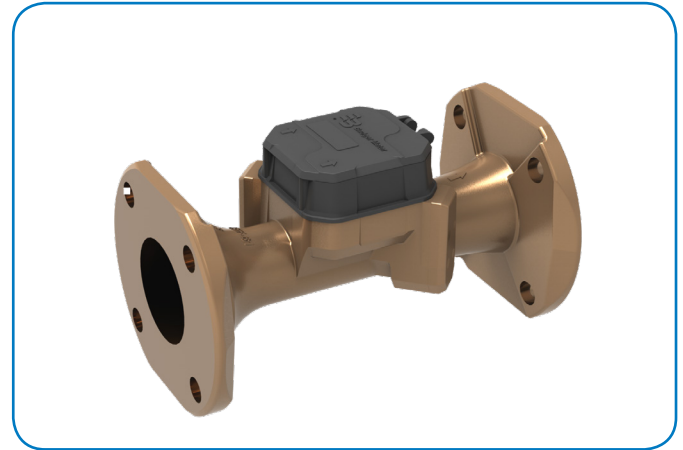
APPLICATIONS

Use the Ultrasonic meter for measuring potable cold water in 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 or exceed the upcoming AWWA C715 and the most recent revision of AWWA C750 Standards. The lead-free bronze alloy meters comply with the lead-free provisions of the Safe Drinking Water Act. NSF/ANSI Standards 61 and 372 certification pending.

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, unit of measure, rate of flow and alarm conditions (reverse-flow, empty pipe, exceeding max flow, leak, temperature and battery alarms). Temperature and pressure data alarms are available on meters with connectivity to ORION endpoints.

In the normal temperature range of 45...105° F (7...41° C), the Ultrasonic “new meter” consumption measurement is accurate to:

- $\pm 1.5\%$ over the normal flow range
- $\pm 3.0\%$ from the extended low flow range to the minimum flow value

CONSTRUCTION

The E-Series Ultrasonic meter features lead-free bronze alloy meter housing, ultrasonic transducers, a meter-control circuit board with associated wiring, LCD, and battery. Wetted elements are limited to the pressure vessel and transducers. The electronic components are housed and fully potted within a molded, engineered polymer enclosure, which is attached to the meter housing. The transducers extend through the housing and are sealed by O-rings, enabling turbulence-free water flow through the tube. The open flow tube design prevents obstruction of flow to reduce pressure loss and provide long-term accuracy.

METER INSTALLATION

For long-term performance the meter is weatherproof, UV-resistant, fully submersible, and can be installed using horizontal or vertical piping. The registration electronics and battery are encapsulated to withstand harsh environments and protect the electronics in flooded or submerged pit applications. 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.

SPECIFICATIONS

E-Series Ultrasonic Meter Size	3 in.	4 in.
Operating Range	0.75...560 gpm	1.5...1100 gpm
Extended Low-Flow Rate	0.37 gpm	0.75 gpm
Maximum Continuous Operation	560 gpm	1100 gpm
Pressure Loss	2.6 @ 350 gpm	2.9 @ 630 gpm
Operating Performance	In the normal temperature range of 45...105° F (7...41° C), new meter consumption measurement is accurate to: <ul style="list-style-type: none"> • ±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	
Environmental	Exceeds IP68	
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	<ul style="list-style-type: none"> • Consumption • Rate of flow • Alarms: empty pipe, exceeding max flow, reverse flow, battery, suspected leak, temperature • Pressure data • Temperature data • Firmware version • Unit of measure factory programmed for gallons, cubic feet and cubic meters 	
Register Capacity	<ul style="list-style-type: none"> • 100,000,000 gallons • 10,000,000 cubic feet • 1,000,000 cubic meters 	
Totalization Display Resolution	<ul style="list-style-type: none"> • Gallons: 0.X • Cubic feet: 0.XX • Cubic meters: 0.XXX 	
Battery	3.6-volt lithium thionyl chloride; battery is fully encapsulated within the register housing; 10-year battery life	

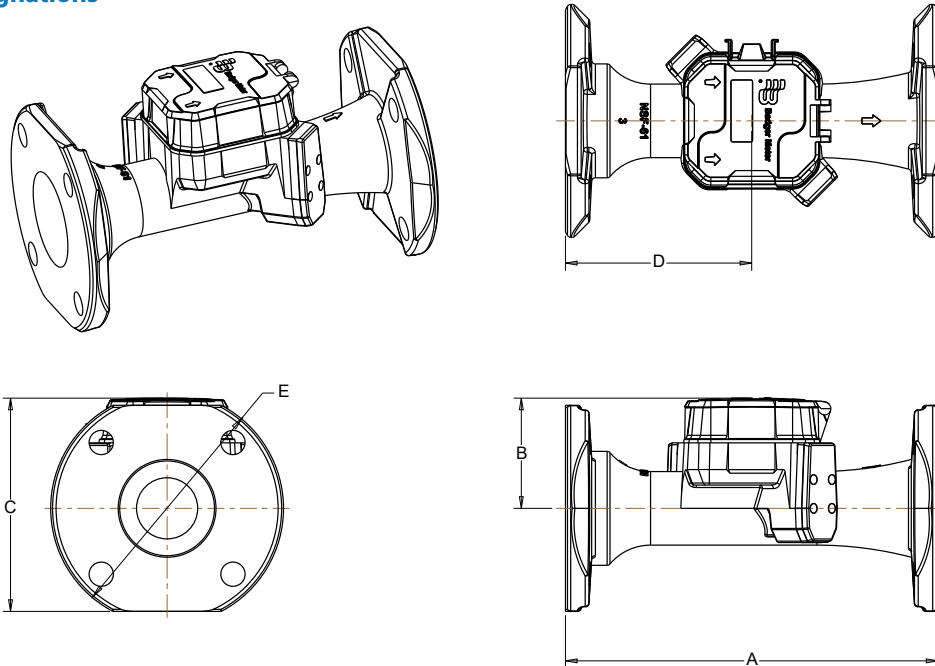
MATERIALS

Meter Housing	Lead-free bronze alloy
Measuring Section	Ultrasonic sensors located in the flow tube
Register Housing & Lid	Engineered polymer

PHYSICAL DIMENSIONS

E-Series Ultrasonic Meter Size	3 in.	3 in.	4 in.	4 in.
Housing	Round	Round	Round	Round
Size Designation X Lay Length	3 x 12 in. (76 x 305 mm)	3 x 17 in. (76 x 432 mm)	4 x 14 in. (102 x 356 mm)	4 x 20 in. (102 x 508 mm)
Weight (without AMR)	26 lb (11.8 kg)	28.5 lb (12.9 kg)	38 lb (17.2 kg)	42 lb (19.1 kg)
See illustration below for Measurement Designations				
Length (A)	12 in. (305 mm)	17 in. (432 mm)	14 in. (356 mm)	20 in. (508 mm)
Height (B)	3.55 in. (90 mm)	3.55 in. (90 mm)	3.69 in. (94 mm)	3.69 in. (94 mm)
Height (C)	6.87 in. (175 mm)	6.87 in. (175 mm)	8.5 in. (216 mm)	8.5 in. (216 mm)
Length (D)	6 in (152 mm)	8.5 in. (216 mm)	7 in. (178 mm)	10 in. (254 mm)
Width (E)	4.42 in. (112 mm)	4.42 in. (112 mm)	4.42 in. (112 mm)	4.42 in. (112 mm)
Number of Bolts	4	4	8	8
Companion Flange	3 in. (76 mm)	3 in. (76 mm)	4 in. (102 mm)	4 in. (102 mm)

Measurement Designations



Making Water Visible®

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www.badgermeter.com

The Americas | Badger Meter | 4545 West Brown Deer Rd | PO Box 245036 | Milwaukee, WI 53224-9536 | 800-876-3837 | 414-355-0400
México | Badger Meter de las Americas, S.A. de C.V. | Pedro Luis Ogazón N°32 | Esq. Angelina N°24 | Colonia Guadalupe Inn | CP 01050 | México, DF | México | +52-55-5662-0882
Europe, Eastern Europe Branch Office (for Poland, Latvia, Lithuania, Estonia, Ukraine, Belarus) | Badger Meter Europe | ul. Korfantego 6 | 44-193 Knurów | Poland | +48-32-236-8787
Europe, Middle East and Africa | Badger Meter Europa GmbH | Nurtinger Str 76 | 72639 Neuffen | Germany | +49-7025-9208-0
Europe, Middle East Branch Office | Badger Meter Europe | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
Slovakia | Badger Meter Slovakia s.r.o. | Racianska 109/B | 831 02 Bratislava, Slovakia | +421-2-44 63 83 01
Asia Pacific | Badger Meter | 80 Marine Parade Rd | 21-06 Parkway Parade | Singapore 449269 | +65-63464836
China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412
Switzerland | Badger Meter Swiss AG | Mittelholzerstrasse 8 | 3006 Bern | Switzerland | +41-31-932 01 11