E-Series® Ultrasonic Meter

Cold Water Stainless Steel Meter

DN15, DN20, DN25, DN32, DN40, DN50

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.

E-Series 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 presenting consumption, rate of flow, indicators and alarms.
- High resolution industry standard ASCII encoder protocol.

The meter is available with an in-line connector for full connectivity to AMR/AMI devices.

APPLICATIONS

Use the E-Series 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.

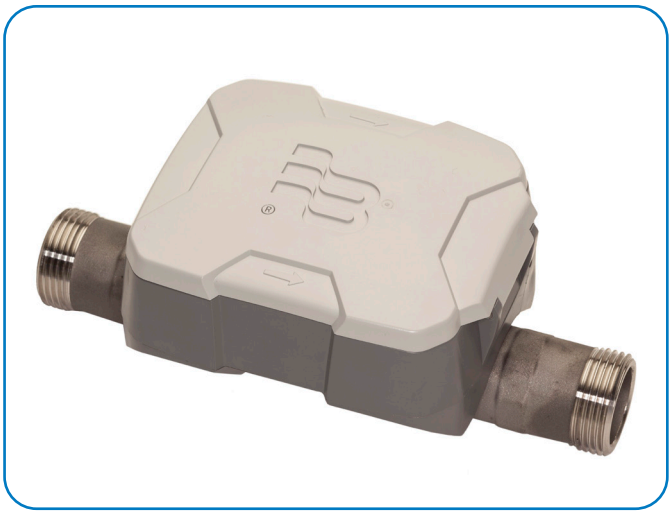
E-Series Ultrasonic meters meet and exceed ANSI/AWWA Standard C715 and OIML R49-1. The meters also comply with the lead-free provisions of the Safe Water Drinking Act and NSF/ANSI Standards 61 and 372.

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 7…50° C (45…122° F), the Ultrasonic "new meter" consumption measurement is accurate to:

- ± 2% from Q_2 to Q_4
- ± 5% from Q_1 to Q_2



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 when the flow sensors are not fully submerged.

Badger Meter

ESM-DS-00240-EN-05 (June 2022)

Product Data Sheet

SPECIFICATIONS

E-Series Ultrasonic Meter	DN15		DN20		DN25		DN32	DN40	DN50
Size	15 mm (5/8 in.)	15 mm (5/8 in.)	20 mm (3/4 in.)	20 mm (3/4 in.)	25 mm (1 in.)	25 mm (1 in.)	32 mm (1-1/4 in.)	40 mm (1-1/2 in.)	50 mm (2 in.)
Nominal Flow Rate Q_3	2.5 m^3/hr (11.0 gpm)	2.5 m^3/hr (11.007 gpm)	4.0 m^3/hr (17.6 gpm)	4.0 m^3/hr (17.6 gpm)	6.3 m^3/hr (28 gpm)	10.0 m^3/hr (44 gpm)	10.0 m^3/hr (44 gpm)	16.0 m^3/hr (70 gpm)	25.0 m^3/hr (110 gpm)
Overload Flow Rate Q_4	3.1 m^3/hr (13.7 gpm)	3.125 m^3/hr (13.759 gpm)	5.0 m^3/hr (22.0 gpm)	5.0 m^3/hr (22.0 gpm)	7.9 m^3/hr (34.78 gpm)	12.5 m^3/hr (55 gpm)	12.5 m^3/hr (55 gpm)	20.0 m^3/hr (88 gpm)	31.25 m^3/hr (138 gpm)
Transitional Flow Rate Q_2	0.016 m^3/hr (0.07 gpm)	0.01 m^3/hr (0.044 gpm)	0.026 m^3/hr (0.115 gpm)	0.016 m^3/hr (0.07 gpm)	0.063 m^3/hr (0.28 gpm)	0.064 m^3/hr (0.28 gpm)	0.064 m^3/hr (0.28 gpm)	0.102 m^3/hr (0.45 gpm)	0.16 m^3/hr (0.70 gpm)
Minimum Flow Rate Q_1	0.010 m^3/hr (0.04 gpm)	0.006 m^3/hr (0.027 gpm)	0.016 m^3/hr (0.07 gpm)	0.01 m^3/hr (0.04 gpm)	0.039 m^3/hr (0.17 gpm)	0.04 m^3/hr (0.18 gpm)	0.04 m^3/hr (0.18 gpm)	0.064 m^3/hr (0.28 gpm)	0.1 m^3/hr (0.44 gpm)
Pressure Loss at Q_3	0.045 bar (6.0 psi)	0.045 bar (6.0 psi)	0.40 bar (6.0 psi)	0.40 bar (6.0 psi)	0.60 bar (8.7 psi)	0.60 bar (8.7 psi)	0.60 bar (8.7 psi)	0.40 bar (5.8 psi)	0.2 bar (2.90 psi)
Reverse Flow Maximum Rate	0.55 m^3/hr (2.4 gpm)	0.55 m^3/hr (2.4 gpm)	0.91 m^3/hr (4.0 gpm)	0.91 m^3/hr (4.0 gpm)	1.71 m^3/hr (7.5 gpm)	1.71 m^3/hr (7.5 gpm)	1.71 m^3/hr (7.5 gpm)	3.2 m^3/hr (14.0 gpm)	4.5 m^3/hr (20 gpm)
R Value	250	400	250	400	250	250	250	250	250
Operating Performance	In the normal temperature range of 7…50° C (45…122° F), new meter consumption measurement is accurate to: • ± 2% from Q_2 to Q_4 • ± 5% from Q_1 to Q_2								
Storage Temperature	– 40…60° C (– 40…140° F)								
Maximum Ambient Storage (Storage for One Hour)	66° C (150° F)								
Measured-Fluid Temperature Range	1…60° C (34…140° F)								
Humidity	0…100% condensing; meter is capable of operating in fully submerged environments; IP68 rating								
Maximum Allowable Pressure	16 bar (232 psi)								
Register Type	Straight reading, permanently sealed electronic LCD; digits are 7 mm (0.28 in.) high								
Register Display	Consumption (up to nine digits) • Rate of flow • Alarms • Unit of measure factory programmed for gallons, cubic feet or 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								

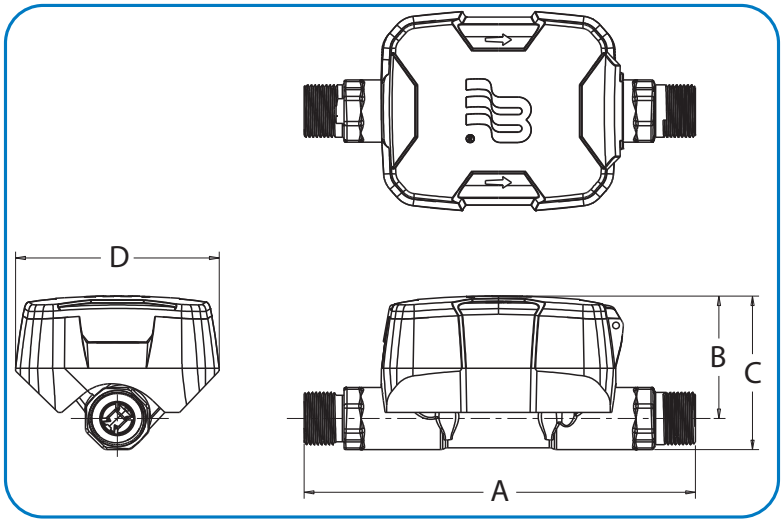
MATERIALS

Meter Housing	316 stainless steel
Register Housing & Lid	Engineered polymer
Metering Insert	Engineered polymer & stainless steel
Measuring Element	Pair of ultrasonic sensors located in the flow tube
Transducers	Piezo-ceramic device with wetted surface of stainless CrNiMo

PHYSICAL DIMENSIONS

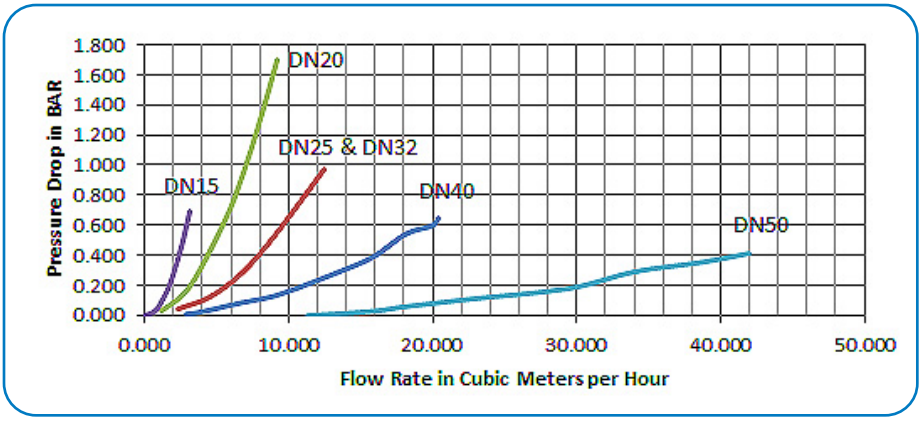
E-Series Ultrasonic Meter	DN15	DN20	DN25	DN25	DN32	DN40	DN50
Size	15 mm (5/8 in.)	20 mm (3/4 in.)	25 mm (1 in.)	25 mm (1 in.)	32 mm (1-1/4 in.)	40 mm (1-1/2 in.)	50 mm (2 in.)
Weight (without radio)	1.0 kg (2.2 lb)	0.95 kg (2.1 lb)	1.4 kg (3.1 lb)	1.4 kg (3.1 lb)	1.4 kg (3.1 lb)	2.7 kg (5.9 lb)	3.1 kg (6.8 lb)
See illustration below for Measurement Designations.							
Length (A)	165 mm (6.5 in.)	190 mm (7.5 in.)	200 mm (7.87 in.)	260 mm (10.25 in.)	260 mm (10.25 in.)	300 mm (11.8 in.)	270 mm (10.63 in.)
Height (B)	59.4 mm (2.3 in.)	61 mm (2.4 in.)	64 mm (2.5 in.)	64 mm (2.5 in.)	64 mm (2.5 in.)	71 mm (2.8 in.)	76.5 mm (3.0 in.)
Height (C)	75.9 mm (3.0 in.)	79 mm (3.1 in.)	85 mm (3.4 in.)	85 mm (3.4 in.)	85 mm (3.4 in.)	101 mm (4.0 in.)	114 mm (4.9 in.)
Width (D)	99 mm (3.9 in.)	99 mm (3.9 in.)	99 mm (3.9 in.)	99 mm (3.9 in.)	99 mm (3.9 in.)	99 mm (3.9 in.)	99 mm (3.9 in.)
Bore Size	20 mm (0.75 in.)	20 mm (0.75 in.)	25 mm (1.0 in.)	25 mm (1.0 in.)	25 mm (1.0 in.)	40 mm (1.5 in.)	50 mm (2 in.)
Coupling Nut & Spud Thread	G3/4B	G1B	G1-1/4B	G1-1/4B	G1-1/2B	G2B	G2-1/2B
Tailpiece Pipe Thread (BSP)	1/2 in.	3/4 in.	1 in.	1 in.	1-1/4 in.	1-1/2 in.	2 in.
Service Pipe Thread (BSP)	1/2 in.	3/4 in.	1 in.	1 in.	1-1/4 in.	1-1/2 in.	2 in.

MEASUREMENT DESIGNATIONS



PRESSURE LOSS CHART

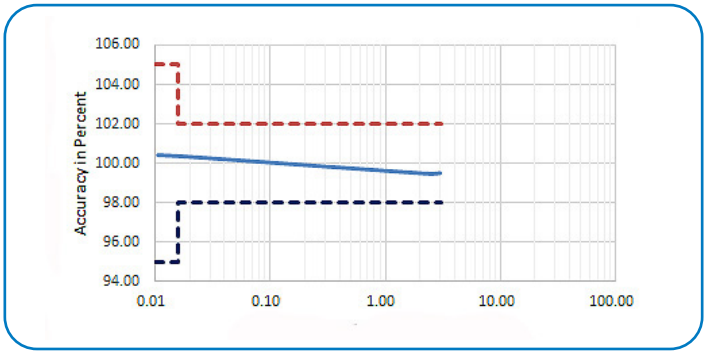
Rate of flow in cubic meters per hour (m^3/hr).



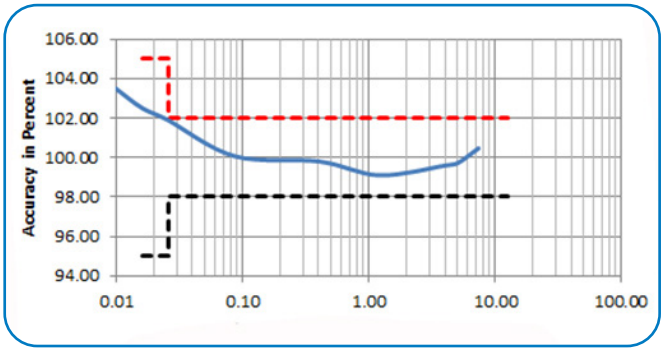
ACCURACY CHARTS

Rate of flow in cubic meters per hour (m^3/hr).

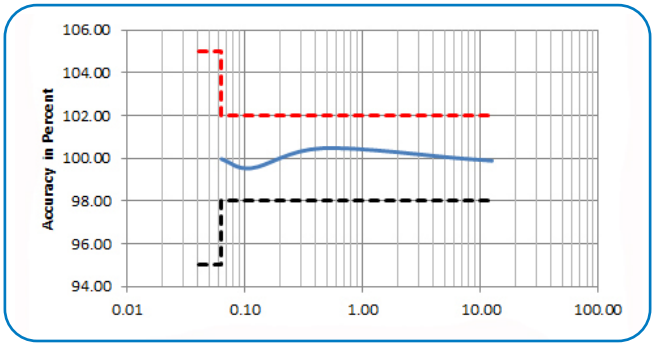
DN15 METER



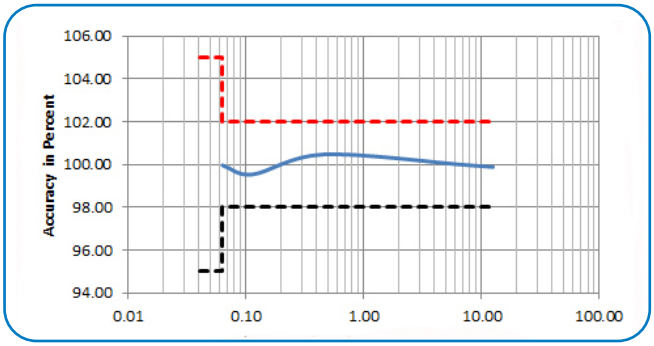
DN20 METER



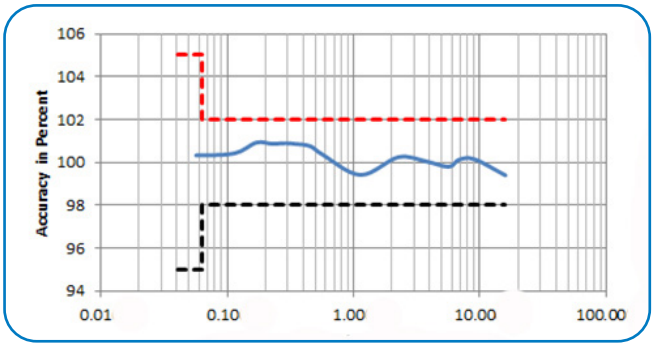
DN25 METER



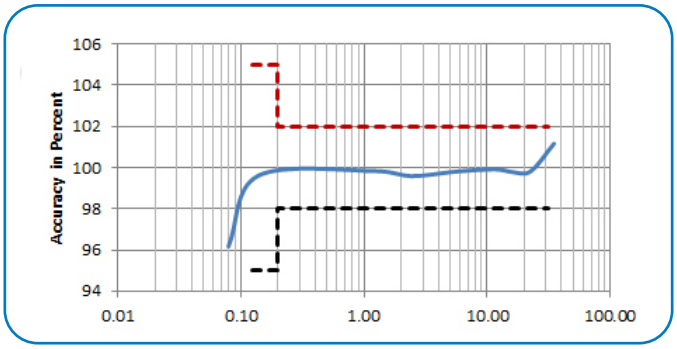
DN32 METER



DN40 METER



DN50 METER



SMART WATER IS *BADGER METER*

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