Badger Meter Europa

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E-Series®

Submersible cold water stainless steel ultrasonic meter
Sizes DN15, DN20, DN25, DN32, DN40 & DN 50

Description

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

The E-Series® Meter is available with a wired lead, 308 in-line connector or fully prewired to ORION® and GALAXY® AMR/AMI endpoints. It is also offered with the Itron® in-line connector, in-line connector with pit endpoint, or prewired to an Itron remote endpoint.

The E-Series® 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.

Applications

The E-Series® meter can be used for measuring potable, cold water in residential, commercial and industrial services. It is ideal for non-potable, reclaimed, irrigation water applications or less than optimum water conditions where small particles exist.

Features

- Completely submersible IP68+
- 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.
- ANSI/NSF standard 61 certified, Annex G
- ANSI/AWWA standard C700
- Lead-free
- The ultrasonic meter is available with an in-line connector for full connectivity to AMR/AMI devices.

Measuring principle

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.

Construction

E-Series® meters feature a stainless steel, lead-free meter housing, an engineered plastic and stainless steel metering insert, a meter-control circuit board with associated wiring, LCD and battery. Wetted elements are limited to the pressure vessel, plastic/stainless steel metering insert and the transducers. The electronic components are housed and fully potted within a molded, engineered plastic 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.

Technical data

	DN15	DN20	DN25	DN25	DN32	DN40	DN50
Size	15 mm	20 mm	25 mm	25 mm	32 mm	40 mm	50 mm
Nominal flow rate Q3	2,5 m^3/h	4.0 m^3/h	6,3 m^3/h	10.0 m^3/h	10.0 m^3/h	16.0 m^3/h	25.0 m^3/h
Overload flow rate Q4	3,1 m^3/h	5.0 m^3/h	12,5 m^3/h	12.5 m^3/h	12.5 m^3/h	20.0 m^3/h	31.25 m^3/h
Transitional flow rate Q2	0,016 m^3/h	0.026 m^3/h	0,064 m^3/h	0.064 m^3/h	0.064 m^3/h	0.102 m^3/h	0.16 m^3/h
Minimum flow rate Q1	0,010 m^3/h	0.016 m^3/h	0,025 m^3/h	0.04 m^3/h	0.04 m^3/h	0.064 m^3/h	0.1 m^3/h
Pressure loss at Q3	0,40 bar	0.40 bar	0,60 bar	0.60 bar	0.60 bar	0.40 bar	0.2 bar
Reverse flow maximum rate	0,80 m^3/h	0.91 m^3/h	1,71 m^3/h	1.71 m^3/h	1.71 m^3/h	3.2 m^3/h	4.5 m^3/h
R value	250	250	250	250	250	250	250
Operating performance	In the normal temperature range of 7...29° C, new meter consumption measurement is accurate to: ± 2% from Q2 to Q4 ± 5% from Q1 to Q2						
Storage temperature	– 40...60° C						
Maximum ambient storage (for one hour)	72° C						
Measured fluid temperature range	1...60° C						
Humidity	0...100% condensing; meter is capable of operating in fully submerged environments						
Maximum operating pressure of meter housing	16 bar						
Test pressure	24 bar						
Register type	Straight reading, permanently sealed electronic LCD; digits are 7 mm 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. Up to 20 years lifetime.						
Interfaces	Optical, radio 868 MHz, cellular endpoint (M-Bus and 434 MHz radio, Q1/2016)						
Approvals	OIML R49, EN 14154, 4064-1, NSF						

Materials

Meter housing	316 stainless steel
Measuring element	Pair of ultrasonic sensors located in the flow tube
Register housing and lid	Engineered thermoplastic
Metering insert	Engineered thermoplastic and stainless steel
Transducers	Piezo-ceramic device with wetted surface of stainless CrNiMo

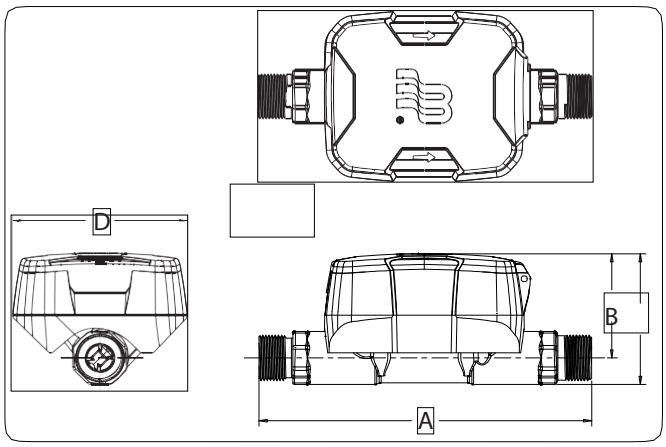
Dimensions

E-Series Ultrasonic Meter	DN15	DN20	DN25	DN25	DN32	DN40	DN50
Size	15 mm (1/2")	20 mm (3/4")	25 mm (1")	25 mm (1")	32 mm (1 ¼")	40 mm (1 ½")	50 mm (2")
Weight (without radio)	0,95 kg	0.95 kg	1,4 kg	1.4 kg	1.4 kg	2.7 kg	3.1 kg
See illustration below for measurement designations							
Length (A)	165 mm	190 mm	260 mm	260 mm	260 mm	300 mm	270 mm
Height (B)	61 mm	61 mm	64 mm	64 mm	64 mm	71 mm	76.5 mm
Height (C)	79 mm	79 mm	85 mm	85 mm	85 mm	101 mm	114 mm
Width (D)	99 mm	99 mm	99 mm	99 mm	99 mm	99 mm	99 mm
Bore size	15 mm	20 mm	25 mm	25 mm	25 mm	40 mm	50 mm
Coupling nut & spud thread	G 3/4"	G1B	G 1-1/4"B	G1-1/4B	G1-1/2B	G2B	G2-1/2B
Tailpiece pipe thread (BSP)	1/2"	3/4"	1"	1"	1-1/4"	1-1/2"	2"
Service pipe thread (BSP)	1/2"	3/4"	1"	1"	1-1/4"	1-1/2"	2"

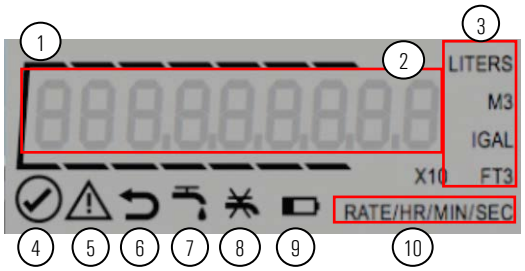
Meter installation

The meter is comptetely submersible and can be installed using horizontal or vertical piping, with water 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.

Measurement designations



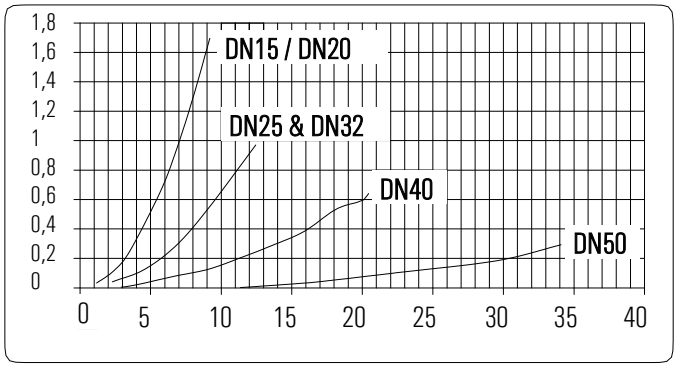
E-series display



1. Billing units indicator
2. Nine-digit display with decimal
3. Consumption units of measure
4. Meter operating normally
5. Meter alarm or error
6. Reverse flow
7. Suspected leak
8. No flow over 30 days
9. Low-battery alert
10. Rate of flow units of measure

Pressure loss chart

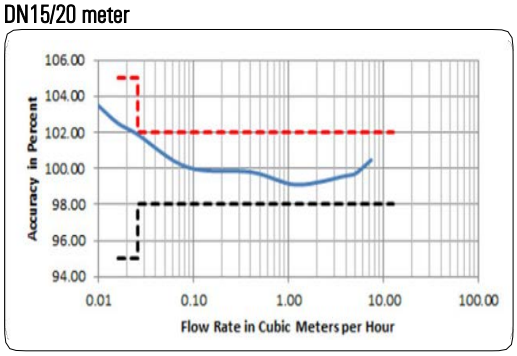
Rate of flow in cubic meters per hour (m3/h)



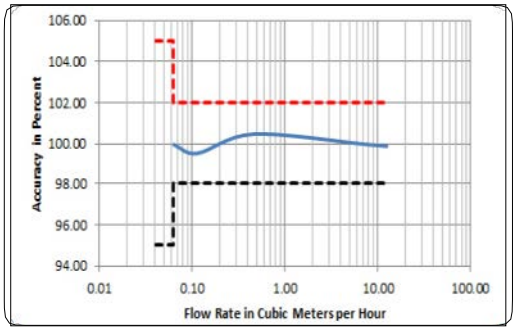
Accuracy charts

Rate of flow in gallons per minute

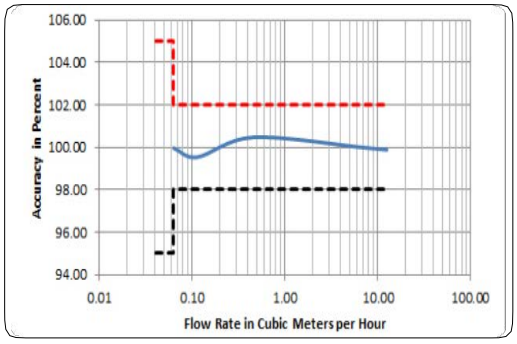
DN15/20 meter



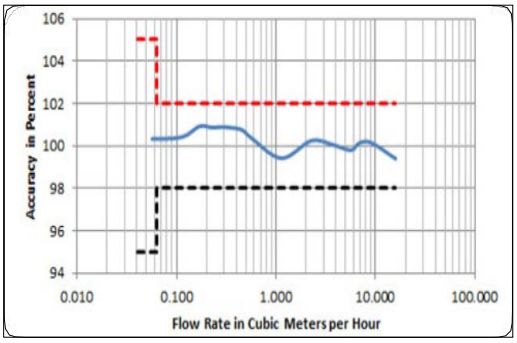
DN25 meter



DN32 meter



DN40 meter



DN50 meter