E-Series G2® Ultrasonic Meter

Cold Water Lead-Free Meters
DN15, DN20, DN25

DESCRIPTION

The next generation E-Series G2® 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 meter provides numerous integrated output options for data reporting.

Ultrasonic meter features:

- Minimum extended low-flow rate lower than typical 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, which presents consumption, rate of flow, unit of measure, alarm conditions, firmware version, all segments on, checksum and high resolution total display.

Output options:

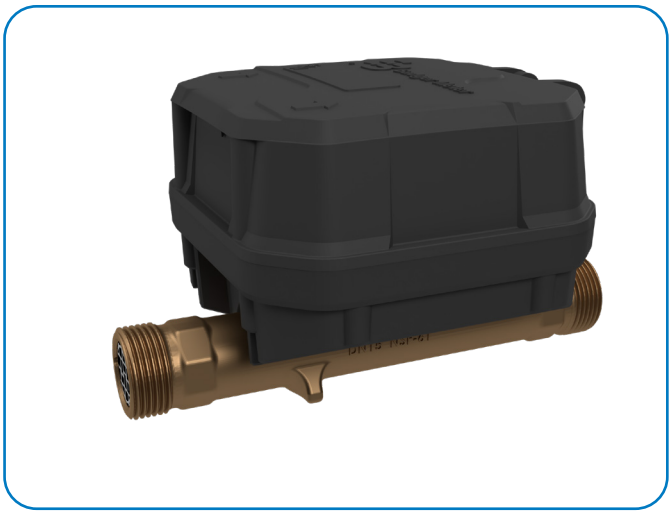
- Encoder: Industry Standard 3-wire ASCII protocol
- M-Bus: Integral wired M-Bus, 2400 baud (adjustable to 300 baud), configurable telegram
- Radio: Integral 434 or 868 MHz, Open Metering Standard compliant, configurable telegram
- Pulse Scaled/Unscaled

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.

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 and pipe diameter. The LCD shows total volume, unit of measure, alarm conditions (reverse-flow, no usage, empty pipe, exceeding max flow, suspected leak, temperature, end of life and measurement error), test mode, rate of flow, temperature, alarm & operating mode, firmware version, checksum, last program date, communication status (integrated radio only), all segments ON, display OFF and event counter.



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 lead-free brass alloy 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 housing and are sealed by O-rings.

The meter features a see-through design where a polymer insert conditions the flow and holds the ultrasonic reflective element for the signal reflection, 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.

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Badger Meter

ESM-DS-03253-EN-06 (March 2023)

Product Data Sheet

SPECIFICATIONS

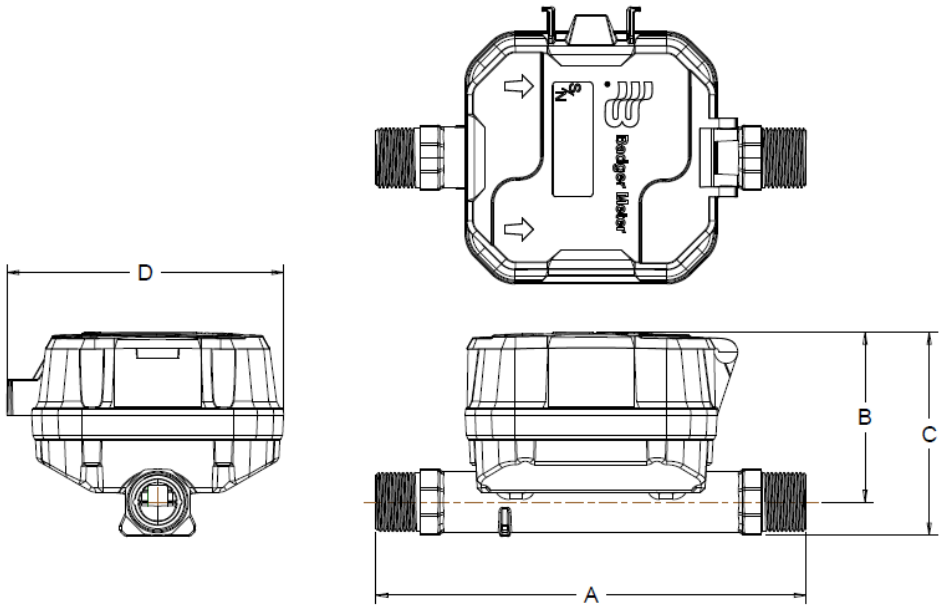
E-Series G2 Ultrasonic Meter	***DN15***			***DN20***			***DN25***		
Length	110, 114, 165 mm			190 mm			200, 260 mm		
R Value	250	400	800	250	400	800	250	400	800
Nominal Flow Rate Q3 m^3/hr (gpm)	2.5 (11.007)	2.5 (11.007)	2.5 (11.007)	4 (17.612)	4 (17.612)	4 (17.612)	10 (44.029)	10 (44.029)	10 (44.029)
Overload Flow Rate Q4 m^3/hr (gpm)	3.125 (13.759)	3.125 (13.759)	3.125 (13.759)	5 (22.014)	5 (22.014)	5 (22.014)	12.5 (55.036)	12.5 (55.036)	12.5 (55.036)
Transitional Flow Rate Q2 l/h (gpm)	16 (0.070)	10 (0.044)	5 (0.022)	25.6 (0.113)	16 (0.070)	8 (0.035)	64 (0.282)	40 (0.176)	20 (0.088)
Minimum Flow Rate Q1 l/h (gpm)	10 (0.044)	6.25 (0.028)	3.125 (0.014)	16 (0.070)	10 (0.044)	5 (0.022)	40 (0.176)	25 (0.11)	12.5 (0.055)
Pressure Loss at Q3 bar (psi)	0.25 (3.626)	0.25 (3.626)	0.25 (3.626)	0.25 (3.626)	0.25 (3.626)	0.25 (3.626)	0.6 (8.702)	0.6 (8.702)	0.6 (8.702)
Reverse Flow Maximum Rate m^3/hr (gpm)	3.125 (13.759)	3.125 (13.759)	3.125 (13.759)	5 (22.014)	5 (22.014)	5 (22.014)	12.5 (55.036)	12.5 (55.036)	12.5 (55.036)
Starting Flow Rate l/h (gpm)	5 (0.022)	3.125 (0.014)	1.5625 (0.007)	8 (0.035)	5 (0.022)	2.5 (0.011)	20 (0.088)	12.5 (0.055)	6.25 (0.028)

Operating Temperature	In the normal temperature range of 7…50° C (45…122° F), new meter consumption measurement is accurate to: • ± 2% from Q2 to Q4 • ± 5% from Q1 to Q2
Storage Temperature	– 40…70° C (– 40…158° 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 (1 m for 7 days)
Maximum Admissible Pressure (MAP)	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) • Unit of measure • Alarms • Test mode • Rate of flow • Temperature • Alarm & operating mode • Firmware version • Checksum • Last program date • Communication status (integrated radio only) • All segments ON • Display screen OFF • Event counter
OMS Parameters	• Actuality duration • Volume, Key date • Date, Key date • Remaining battery • Date & current time • Reverse volume • Flow rate • Water temperature • Ownership number • Operating hours • Error hours • Overload date/time • Overload hours • Ambient temperature • Meter status
Meter Status and Alarms	• Empty pipe • Temperature out of range • End of life • No consumption • Reverse flow • Leak • Measurement error • Communication error • Exceeding maximum flow
Register Capacity	100,000 cubic meters
Totalization Display Resolution	Cubic meters: 0.XXXX
Internal Data Logging Extraction	160 days of hourly data for encoder output. 320 days of hourly data for integrated radio variants. Data includes meter reading, serial number, alarms and status indicators, and temperature information.
Battery	3.6-volt lithium thionyl chloride; battery is fully encapsulated within the register housing and is not replaceable; 15-year battery life
Wired M-Bus Supply Voltage	21…42V DC, 1.3 mA
Approvals	Conforms to IEC 61010-1 safety requirements over the normal operating temperature range, an altitude of <2000 m (6560 ft) and a pollution degree of 3

PHYSICAL DIMENSIONS

E-Series G2 Ultrasonic Meter	*DN15*	*DN20*	*DN25*
Size	15 mm (0.59 in.)	20 mm (0.79 in.)	25 mm (0.98 in.)
See illustration below for Measurement Designations.			
Length (A)	110, 114 or 165 mm (6.50 in.)	190 mm (7.48 in.)	200 or 260 mm (10.24 in.)
Height (B)	73 mm (2.87 in.)	75 mm (2.95 in.)	78 mm (3.07 in.)
Height (C)	85 mm (3.35 in.)	90 mm (3.54 in.)	95 mm (3.74 in.)
Width (D)	123 mm (4.84 in.)	123 mm (4.84 in.)	123 mm (4.84 in.))
Bore Size	15 mm (0.59 in.)	20 mm (0.79 in.)	25 mm (0.98 in.)
Coupling Nut & Spud Thread	G3/4B	G1B	G1-1/4B

Measurement Designations



MATERIALS

Meter Housing	Lead-free brass alloy
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 engineered polymer

SMART WATER IS *BADGER METER*

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