Dynasonics®
Ultrasonic Flow Meters

U500w Ultrasonic Meter

Cold Water Engineered Polymer Meter, 5/8, 5/8 x 3/4, 3/4 and 1 inch NSF/ANSI Standard 61 Certified, Annex G

DESCRIPTION

The U500w Ultrasonic meter uses solid-state technology in a compact, totally encapsulated, weatherproof, and UV-resistant housing, suitable for building and property management submetering 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 U500w 5/8, 5/8 × 3/4, 3/4, and 1 inch meters feature:

- 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.

- Battery powered—eliminates wiring.

- Compatible with AquaCUE® Flow Measurement Manager.

The U500w meter is available with an in-line connector for easy connection and installation to AquaCUE connectors.

APPLICATIONS

Use the U500w meter for measuring potable cold water in building/property management and industrial applications. The meter is also ideal for non-potable, reclaimed irrigation water applications or less than optimum water conditions where small particles exist.

The U500w 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.

OPERATION AND 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…85° F (7…29° C), the U500w "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

The U500w meters feature an engineered polymer, 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 polymer 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 pipe is partially full.

Badger Meter

Product Data Sheet

SPECIFICATIONS

| U500w Ultrasonic Meter Size	5/8 in. (15 mm)	5/8 in. x 3/4 in. (15 mm)	3/4 in. (20 mm)	1 in. (25 mm)
Operating Range	0.1…25 gpm (0.4…95 lpm)	0.1…25 gpm (0.4…95 lpm)	0.1…32 gpm (0.4…121 lpm)	0.4…55 gpm (1.5…208 lpm)
Extended Low-Flow Rate	0.05 gpm (0.2 lpm)	0.05 gpm (0.2 lpm)	0.05 gpm (0.2 lpm)	0.25 gpm (95 lpm)
Maximum Continuous Operation	25 gpm (95 lpm)	25 gpm (95 lpm)	32 gpm (121 lpm)	55 gpm (208 lpm)
Pressure Loss	4.3 psi at 15 gpm (0.3 bar @ 57 lpm)	2.3 psi at 15 gpm (1.6 bar @ 57 lpm)	2.0 psi at 15 gpm (0.14 bar @ 57 lpm)	1.8 psi at 25 gpm (0.12 bar @ 95 lpm)
Reverse Flow - Maximum Rate	4.0 gpm (15 lpm)	4.0 gpm (15 lpm)	4.0 gpm (15 lpm)	9.0 gpm (34 lpm)
Operating Performance	In the normal temperature range of 45…85° F (7…29° 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 (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			
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 (US gallons per minute or cubic meters per hour) • Alarms • 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	Engineered polymer
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

U500w Ultrasonic Meter Size	5/8 in. (15 mm)	5/8 × 3/4 in. (15 × 20 mm)	3/4 in. (20 mm)	1 in. (25 mm)
Size Designation X Lay Length	5/8 × 7-1/2 in. (15 × 190 mm)	5/8 × 3/4 × 7-1/2 in. (15 × 20 × 190 mm)	3/4 × 7-1/2 in. or 3/4 × 9 in. (20 × 190 or 20 × 229 mm)	1 × 10-3/4 in. (25 × 273 mm)
Weight (without AMR)	1.6 lb (0.73 kg)	1.58 lb (0.72 kg)	3/4 × 7-1/2 in.: 1.58 lb (20 × 190 mm: 0.72 kg) 3/4 × 9 in.: 1.64 lb (20 × 229 mm: 0.74 kg)	2.3 lb (1.04 kg)
See illustration below for Measurement Designations.				
Length (A)	7.5 in. (190 mm)	7.5 in. (190 mm)	7.5 in. (190 mm) or 8.85 in. (225 mm)	10.75 in. (273 mm)
Height (B)	2.46 in. (62 mm)	2.46 in. (62 mm)	2.46 in. (62 mm)	2.66 in. (68 mm)
Height (C)	3.27 in. (83 mm)	3.23 in. (82 mm)	3.23 in. (82 mm)	3.62 in. (92 mm)
Width (D)	3.90 in. (99 mm)	3.90 in. (99 mm)	3.90 in. (99 mm)	3.90 in. (99 mm)
Bore Size	5/8 in. (15 mm)	3/4 in. (20 mm)	3/4 in. (20 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.

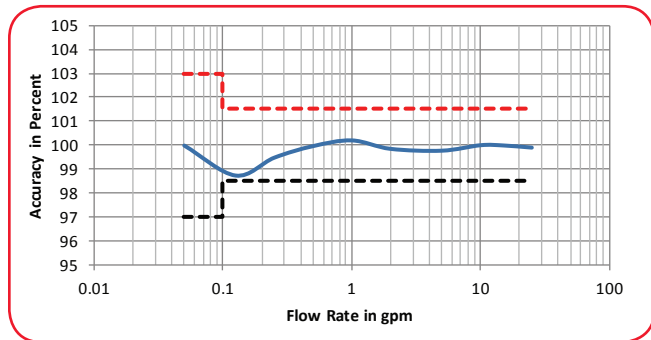### Measurement Designations
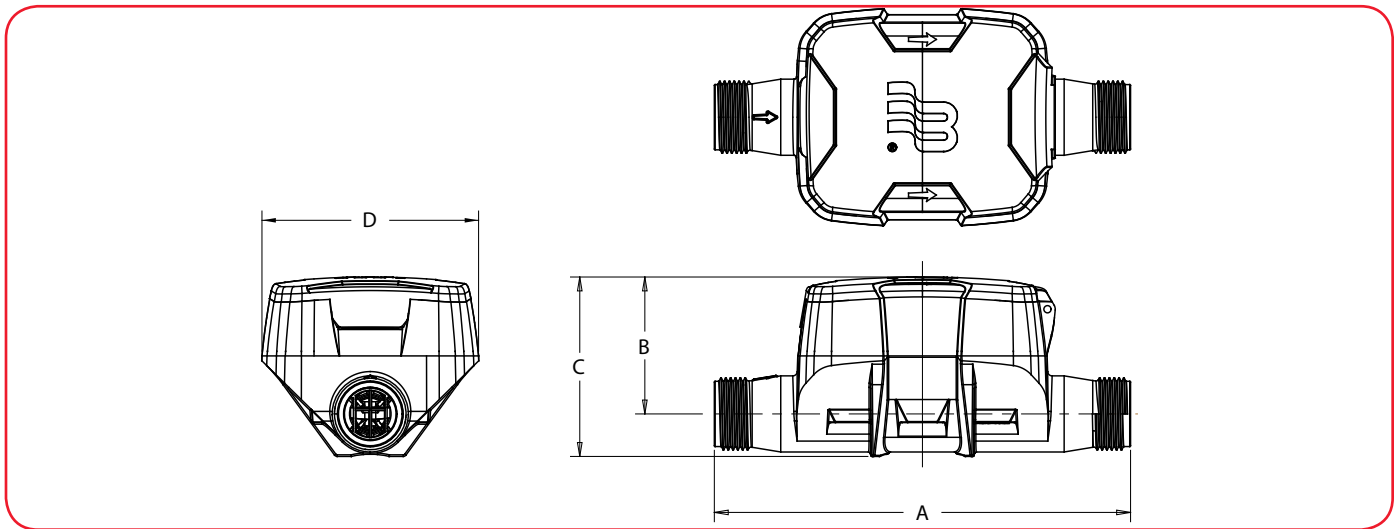
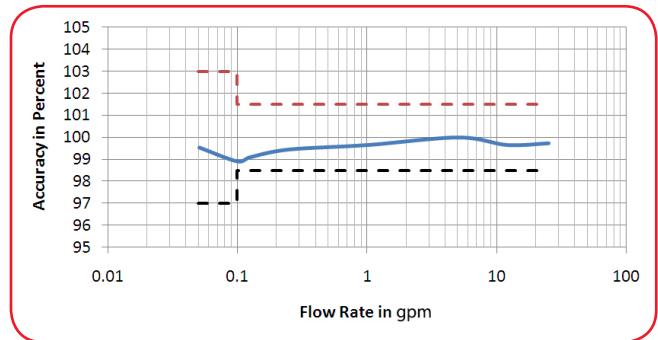## PRESSURE LOSS CHART
Rate of Flow in gallons per minute (gpm)
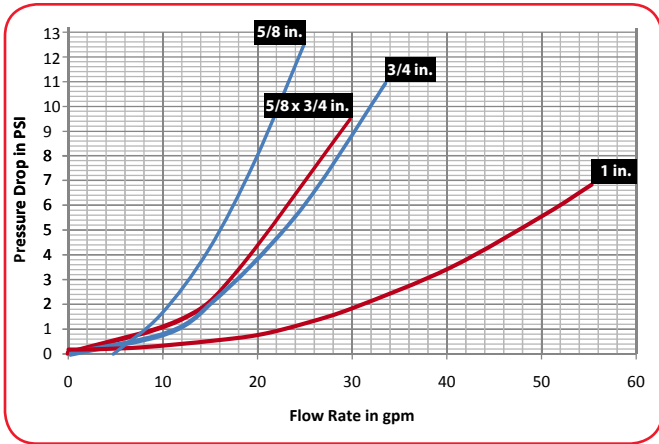
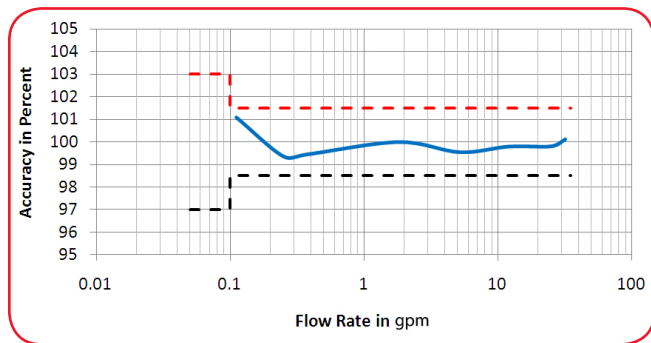## ACCURACY CHARTS

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
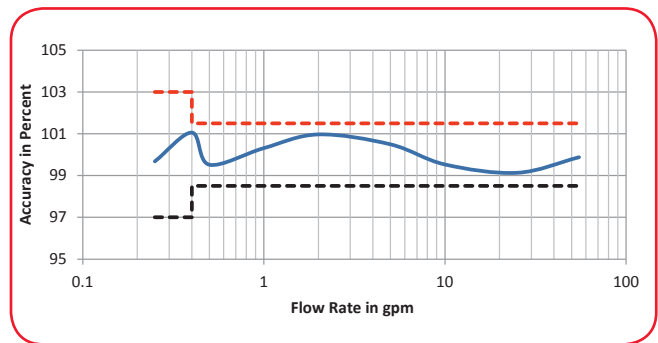
PART NUMBERS

Meter 5/8 inch

Dynasonics U500w Ultrasonic Meters

Part number string: UA - EAA - P X E5 CA - 1 - A1 Y2 XX TF - XX - B0A

Category	Description	Code
PRODUCT TYPE	Engineered Polymer Meter	UA
METER TYPE	5/8 in. (1/2 x 7-1/2 in.)	EAA
WATER APPLICATION	Potable Water	P
CONNECTIONS / GASKETS	Plastic Connections - Thick Washers (Engineered Polymer Meter Only)	PA
	None - Thick Washers	XT
ACCESSORIES	None	X
REGISTRATION	Encoder	E5
TECHNOLOGY	Meter with Cable (No Endpoint)	CA
REGISTRATION FACE	Standard	1
UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS	9 Dial - 0.01 Gallon, GPM, 1000	9AE
	9 Dial - 0.001 ft3, GPM, 100	9FD
	9 Dial - 0.0001 M3, GPM, 10	9MC
TESTING	BADGER STD (TS-419)	A1
SERIALIZATION	Year of Mfg | 9 Digit S/N | Barcoded | Primary and Lid Outside	Y2
APPLICATION (See Note)	None	XX
WIRING METHOD (See Note)	Twist Tight - 5 ft (MTR, ASSY)	TF
ENDPOINT SHIPMENT MODE	N/A	XX
RESERVED	Standard	B0A

Meter 5/8 x 3/4 inch

Dynasonics U500w Ultrasonic Meters

Part number string: UA - EAC - P X E5 - CA - 1 - A2 Y2 XX TF - XX - B0A

Category	Description	Code
PRODUCT TYPE	Engineered Polymer Meter	UA
METER TYPE	5/8 in. x 3/4 in. (3/4 x 7-1/2 in.)	EAC
WATER APPLICATION	Potable Water	P
CONNECTIONS / GASKETS	Plastic Connections - Thick Washers (Endpoint Polymer Meter Only)	PA
	None - Thick Washers	XT
ACCESSORIES	None	X
REGISTRATION	Encoder	E5
TECHNOLOGY	Meter with Cable (No Endpoint)	CA
REGISTRATION FACE	Standard	1
UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS	9 Dial - 0.01 Gallon, GPM, 1000	9AE
	9 Dial - 0.001 ft3, GPM, 100	9FD
	9 Dial - 0.0001 M3, GPM, 10	9MC
TESTING	BADGER STD (TS-420)	A2
SERIALIZATION	Year of Mfg | 9 Digit S/N | Barcoded | Primary and Lid Outside	Y2
APPLICATION (See Note)	None	XX
WIRING METHOD (See Note)	Twist Tight - 5 ft (MTR, ASSY)	TF
ENDPOINT SHIPMENT MODE	N/A	XX
RESERVED	Standard	B0A

NOTE: For connectivity to AquaCUE, contact your Sales Representative.

Meter 3/4 x 7 1/2 inch

Dynasonics
U500w Ultrasonic Meters

UA - EBA - P X - E5 - CA - 1 - A3 Y2 - XX TF - XX - B0A

PRODUCT TYPE	
Engineered Polymer Meter	UA

METER TYPE	
3/4 in. (3/4 x 7-1/2 in.)	EBA

WATER APPLICATION	
Potable Water	P

CONNECTIONS / GASKETS	
Plastic Connections - Thick Washers (Engineered Polymer Meter Only)	PA
None - Thick Washers	XT

ACCESSORIES	
None	X

REGISTRATION	
Encoder	E5

TECHNOLOGY	
Meter with Cable (No Endpoint)	CA

REGISTRATION FACE	
Standard	1

UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS	
9 Dial - 0.01 Gallon, GPM, 1000	9AE
9 Dial - 0.001 ft3, GPM, 100	9FD
9 Dial - 0.0001 M3, GPM, 10	9MC

TESTING	
BADGER STD (TS-421)	A3

SERIALIZATION	
Year of Mfg | 9 Digit S/N | Barcoded | Primary and Lid Outside	Y2

APPLICATION (See Note)	
None	XX

WIRING METHOD (See Note)	
Twist Tight - 5 ft (MTR, ASSY)	TF

ENDPOINT SHIPMENT MODE	
N/A	XX

RESERVED	
Standard	B0A

Meter 3/4 x 9 inch

Dynasonics
U500w Ultrasonic Meters

UA - EBB - P X - E5 - CA - 1 - A3 Y2 - XX TF - XX - B0A

PRODUCT TYPE	
Engineered Polymer Meter	UA

METER TYPE	
3/4 in. (3/4 x 9 in.)	EBB

WATER APPLICATION	
Potable Water	P

CONNECTIONS / GASKETS	
Plastic Connections - Thick Washers (Engineered Polymer Meter Only)	PA
None - Thick Washers	XT

ACCESSORIES	
None	X

REGISTRATION	
Encoder	E5

TECHNOLOGY	
Meter with Cable (No Endpoint)	CA

REGISTRATION FACE	
Standard	1

UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS	
9 Dial - 0.01 Gallon, GPM, 1000	9AE
9 Dial - 0.001 ft3, GPM, 100	9FD
9 Dial - 0.0001 M3, GPM, 10	9MC

TESTING	
BADGER STD (TS-421)	A3

SERIALIZATION	
Year of Mfg | 9 Digit S/N | Barcoded | Primary and Lid Outside	Y2

APPLICATION (See Note)	
None	XX

WIRING METHOD (See Note)	
Twist Tight - 5 ft (MTR, ASSY)	TF

ENDPOINT SHIPMENT MODE	
N/A	XX

RESERVED	
Standard	B0A

NOTE: For connectivity to AquaCUE, contact your Sales Representative.

Meter 1 inch

Dynasonics U500w Ultrasonic Meters	UA	ECA	P	X	E5	CA	1		A4	Y2	XX	TF	XX	B0A

PRODUCT TYPE
Engineered Polymer Meter — UA

METER TYPE
1 in. (1 x 10-3/4 in.) — ECA

WATER APPLICATION
Potable Water — P

CONNECTIONS / GASKETS
Plastic Connections - Thick Washers (Engineered Polymer Meter Only) — PA
None - Thick Washers — XT

ACCESSORIES
None — X

REGISTRATION
Encoder — E5

TECHNOLOGY
Meter with Cable (No Endpoint) — CA

REGISTRATION FACE
Standard — 1

UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS
9 Dial - 0.01 Gallon, GPM, 1000 — 9AE
9 Dial - 0.001 ft3, GPM, 100 — 9FD
9 Dial - 0.0001 M3, GPM, 10 — 9MC

TESTING
BADGER STD (TS-422) — A4

SERIALIZATION
Year of Mfg | 9 Digit S/N | Barcoded | Primary and Lid Outside — Y2

APPLICATION (See Note)
None — XX

WIRING METHOD (See Note)
Twist Tight - 5 ft (MTR, ASSY) — TF

ENDPOINT SHIPMENT MODE
N/A — XX

RESERVED
Standard — B0A

NOTE: For connectivity to AquaCUE, contact your Sales Representative.

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