

## 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 x 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<sup>®</sup> 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...122 °F (7...50 °C), the U500w “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 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.

## SPECIFICATIONS

U500w Ultrasonic Meter Size	5/8 in. (15 mm)	5/8 in. x 3/4 in. (15 x 20 mm)	3/4 in. (20 mm)	1 in. (25 mm)
<b>Operating Range</b>	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)
<b>Extended Low-Flow Rate</b>	0.05 gpm (0.2 lpm)	0.05 gpm (0.2 lpm)	0.05 gpm (0.2 lpm)	0.25 gpm (95 lpm)
<b>Maximum Continuous Operation</b>	25 gpm (95 lpm)	25 gpm (95 lpm)	32 gpm (121 lpm)	55 gpm (208 lpm)
<b>Typical Pressure Loss</b>	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)
<b>Reverse Flow - Maximum Rate</b>	4.0 gpm (15 lpm)	4.0 gpm (15 lpm)	4.0 gpm (15 lpm)	9.0 gpm (34 lpm)
<b>Operating Performance</b>	In the normal temperature range of 45...122 °F (7...50 °C), new meter consumption measurement is accurate to: <ul style="list-style-type: none"> <li>• ± 1.5% over the normal flow range</li> <li>• ± 3.0% from the extended low flow range to the minimum flow value</li> </ul>			
<b>Storage Temperature</b>	- 40...140° F (- 40...60° C)			
<b>Maximum Ambient Storage (Storage for One Hour)</b>	150° F (66° C)			
<b>Measured-Fluid Temperature Range</b>	34...140° F (1°...60° C)			
<b>Humidity</b>	0...100% condensing; meter is capable of operating in fully submerged environments			
<b>Maximum Operating Pressure of Meter Housing</b>	175 psi (12 bar)			
<b>Register Type</b>	Straight reading, permanently sealed electronic LCD; digits are 0.28 in. (7 mm) high			
<b>Register Display</b>	<ul style="list-style-type: none"> <li>• Consumption (up to nine digits)</li> <li>• Rate of flow (US gallons per minute or cubic meters per hour)</li> <li>• Alarms</li> <li>• Unit of measure factory programmed for gallons, cubic feet and cubic meters</li> </ul>			
<b>Register Capacity</b>	<ul style="list-style-type: none"> <li>• 10,000,000 gallons</li> <li>• 1,000,000 cubic feet</li> <li>• 100,000 cubic meters</li> </ul>			
<b>Totalization Display Resolution</b>	<ul style="list-style-type: none"> <li>• Gallons: 0.XX</li> <li>• Cubic feet: 0.XXX</li> <li>• Cubic meters: 0.XXXX</li> </ul>			
<b>Battery</b>	3.6-volt lithium thionyl chloride; battery is fully encapsulated within the register housing and is not replaceable; 20-year battery life			

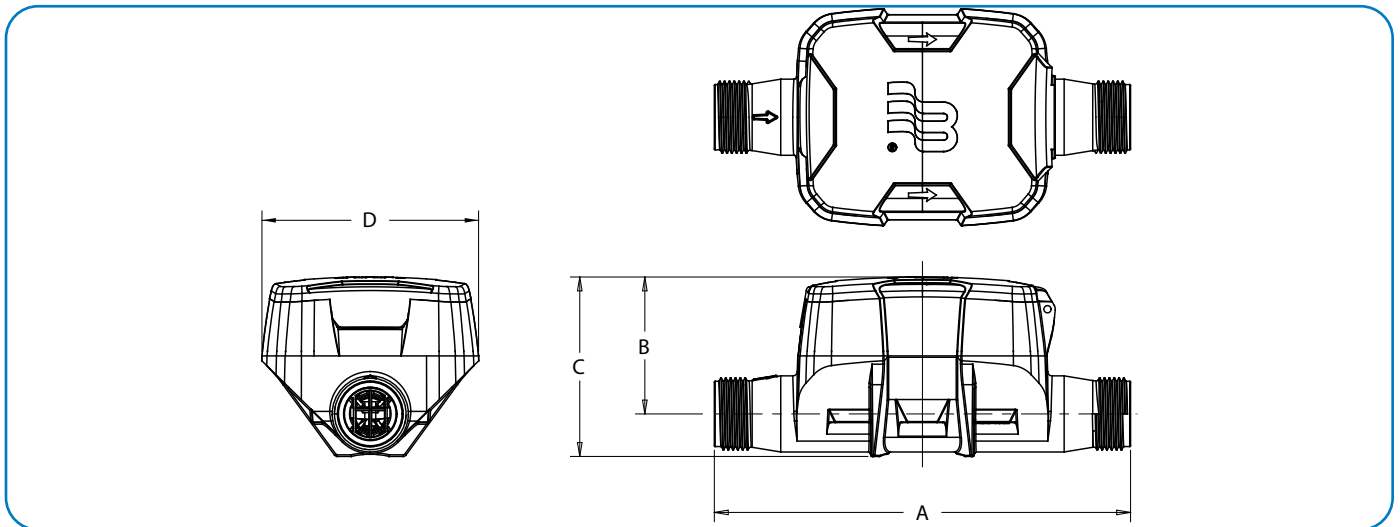
## MATERIALS

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

## PHYSICAL DIMENSIONS

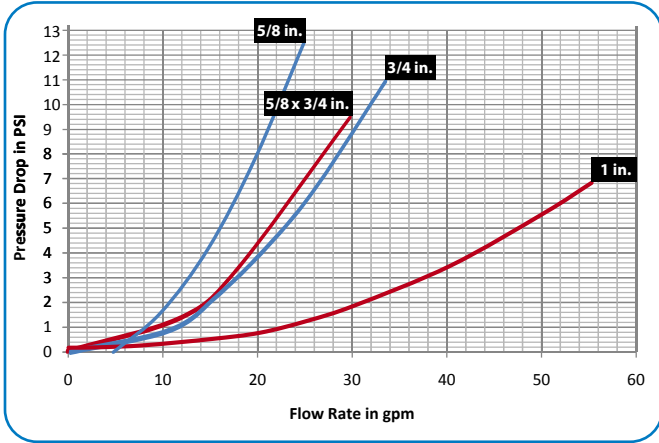
U500w Ultrasonic Meter Size	5/8 in. (15 mm)	5/8 x 3/4 in. (15 x 20 mm)	3/4 in. (20 mm)	1 in. (25 mm)
<b>Size Designation X Lay Length</b>	5/8 x 7-1/2 in. (15 x 190 mm)	5/8 x 3/4 x 7-1/2 in. (15 x 20 x 190 mm)	3/4 x 7-1/2 in. or 3/4 x 9 in. (20 x 190 mm or 20 x 229 mm)	1 x 10-3/4 in. (25 x 273 mm)
<b>Weight (without AMR)</b>	1.6 lb (0.73 kg)	1.58 lb (0.72 kg)	3/4 x 7-1/2 in.: 1.58 lb (20 x 190 mm: 0.72 kg) 3/4 x 9 in.: 1.64 lb (20 x 229 mm: 0.74 kg)	2.3 lb (1.04 kg)
See illustration below for Measurement Designations.				
<b>Length (A)</b>	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)
<b>Height (B)</b>	2.46 in. (62 mm)	2.46 in. (62 mm)	2.46 in. (62 mm)	2.66 in. (68 mm)
<b>Height (C)</b>	3.27 in. (83 mm)	3.23 in. (82 mm)	3.23 in. (82 mm)	3.62 in. (92 mm)
<b>Width (D)</b>	3.90 in. (99 mm)	3.90 in. (99 mm)	3.90 in. (99 mm)	3.90 in. (99 mm)
<b>Bore Size</b>	5/8 in. (15 mm)	3/4 in. (20 mm)	3/4 in. (20 mm)	1 in. (25 mm)
<b>Coupling Nut &amp; Spud Thread</b>	3/4 in. x 14 NPSM	1 in. x 11-1/2 NPSM	1 in. x 11-1/2 NPSM	1-1/4 in. x 11-1/2 NPSM
	(19 mm x 14 NPSM) (	(25 mm x 11-1/2 NPSM)	(25 mm x 11-1/2 NPSM)	(32 mm x 11-1/2 NPSM)
<b>Tailpiece Pipe Thread (NPT)</b>	1/2 in.	3/4 in.	3/4 in.	1 in.
<b>Service Pipe Thread (NPT)</b>	1/2 in.	3/4 in.	3/4 in.	1 in.

## Measurement Designations



## PRESSURE LOSS CHART

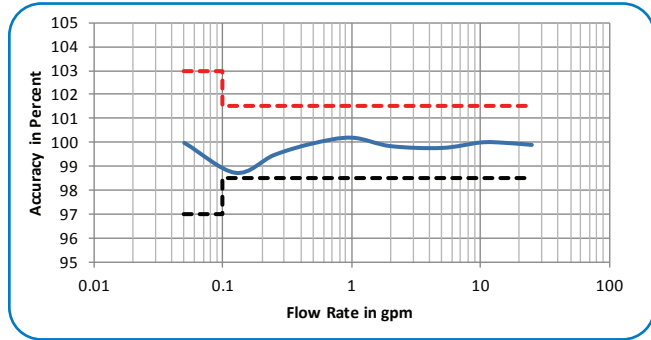
Rate of Flow in gallons per minute (gpm)



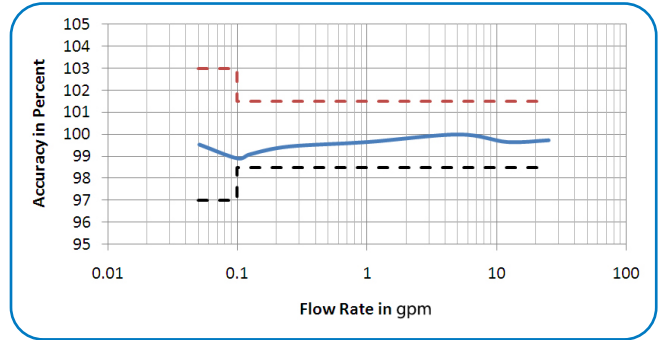
## ACCURACY CHARTS

Rate of Flow in gallons per minute (gpm)

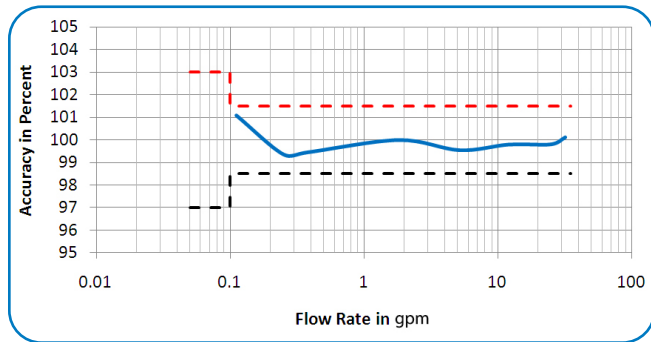
5/8 in. Meter



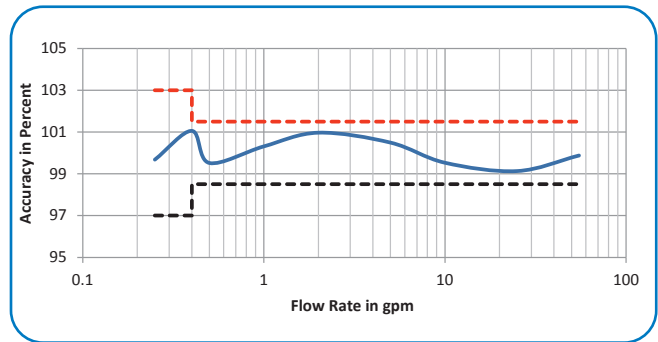
5/8 x 3/4 in. Meter



3/4 in. Meter



1 in. Meter



## PART NUMBERS

### Meter 5/8 inch

Dynasonics		UA	EAA	P	X	E5	CA	1	A1	Y2	XX	TF	XX	B0A
<b>U500w Ultrasonic Meters</b>														
<b>PRODUCT TYPE</b>		Engineered Polymer Meter	UA											
<b>METER TYPE</b>		5/8 in. (1/2 x 7-1/2 in.)	EAA											
<b>WATER APPLICATION</b>		Potable Water		P										
<b>CONNECTIONS / GASKETS</b>		Plastic NPSM Connections - Thick Washers (Engineered Polymer Meter Only)					PA							
		NPSM Threads - Thick Washers					XT							
<b>ACCESSORIES</b>		None			X									
<b>REGISTRATION</b>		Encoder				E5								
<b>TECHNOLOGY</b>		Meter with Cable (No Endpoint)					CA							
<b>REGISTRATION FACE</b>		Standard						1						
<b>UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS</b>		9 Dial - 0.01 Gallon, GPM, 1000												9AE
		9 Dial - 0.001 ft3, GPM, 100												9FD
		9 Dial - 0.0001 M3, GPM, 10												9MC
<b>TESTING</b>		BADGER STD (TS-419)												A1
<b>SERIALIZATION</b>		Year of Mfg   9 Digit S/N   Barcoded   Primary and Lid Outside												Y2
<b>APPLICATION (See Note)</b>		None												XX
<b>WIRING METHOD (See Note)</b>		Twist Tight - 5 ft (MTR, ASSY)												TF
<b>ENDPOINT SHIPMENT MODE</b>		N/A												XX
<b>RESERVED</b>		Standard												B0A

### Meter 5/8 x 3/4 inch

Dynasonics		UA	EAC	P	X	E5	CA	1	A2	Y2	XX	TF	XX	B0A
<b>U500w Ultrasonic Meters</b>														
<b>PRODUCT TYPE</b>		Engineered Polymer Meter	UA											
<b>METER TYPE</b>		5/8 in. x 3/4 in. (3/4 x 7-1/2 in.)	EAC											
<b>WATER APPLICATION</b>		Potable Water		P										
<b>CONNECTIONS / GASKETS</b>		Plastic NPSM Connections - Thick Washers (Engineered Polymer Meter Only)					PA							
		NPSM Threads - Thick Washers					XT							
<b>ACCESSORIES</b>		None			X									
<b>REGISTRATION</b>		Encoder				E5								
<b>TECHNOLOGY</b>		Meter with Cable (No Endpoint)					CA							
<b>REGISTRATION FACE</b>		Standard						1						
<b>UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS</b>		9 Dial - 0.01 Gallon, GPM, 1000												9AE
		9 Dial - 0.001 ft3, GPM, 100												9FD
		9 Dial - 0.0001 M3, GPM, 10												9MC
<b>TESTING</b>		BADGER STD (TS-420)												A2
<b>SERIALIZATION</b>		Year of Mfg   9 Digit S/N   Barcoded   Primary and Lid Outside												Y2
<b>APPLICATION (See Note)</b>		None												XX
<b>WIRING METHOD (See Note)</b>		Twist Tight - 5 ft (MTR, ASSY)												TF
<b>ENDPOINT SHIPMENT MODE</b>		N/A												XX
<b>RESERVED</b>		Standard												B0A

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

**Meter 3/4 x 7 1/2 inch**

Dynasonics		UA	EBA	P	X	E5	CA	1	A3	Y2	XX	TF	XX	BOA
<b>U500w Ultrasonic Meters</b>														
<b>PRODUCT TYPE</b>		Engineered Polymer Meter	UA											
<b>METER TYPE</b>		3/4 in. (3/4 x 7-1/2 in.)	EBA											
<b>WATER APPLICATION</b>		Potable Water		P										
<b>CONNECTIONS / GASKETS</b>		Plastic NPSM Connections - Thick Washers (Engineered Polymer Meter Only)					PA							
		NPSM Threads - Thick Washers					XT							
<b>ACCESSORIES</b>		None			X									
<b>REGISTRATION</b>		Encoder				E5								
<b>TECHNOLOGY</b>		Meter with Cable (No Endpoint)					CA							
<b>REGISTRATION FACE</b>		Standard						1						
<b>UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS</b>		9 Dial - 0.01 Gallon, GPM, 1000							9AE					
		9 Dial - 0.001 ft3, GPM, 100							9FD					
		9 Dial - 0.0001 M3, GPM, 10							9MC					
<b>TESTING</b>		BADGER STD (TS-421)							A3					
<b>SERIALIZATION</b>		Year of Mfg   9 Digit S/N   Barcoded   Primary and Lid Outside								Y2				
<b>APPLICATION (See Note)</b>		None									XX			
<b>WIRING METHOD (See Note)</b>		Twist Tight - 5 ft (MTR, ASSY)										TF		
<b>ENDPOINT SHIPMENT MODE</b>		N/A											XX	
<b>RESERVED</b>		Standard												BOA

**Meter 3/4 x 9 inch**

Dynasonics		UA	EBB	P	X	E5	CA	1	A3	Y2	XX	TF	XX	BOA
<b>U500w Ultrasonic Meters</b>														
<b>PRODUCT TYPE</b>		Engineered Polymer Meter	UA											
<b>METER TYPE</b>		3/4 in. (3/4 x 9 in.)	EBB											
<b>WATER APPLICATION</b>		Potable Water		P										
<b>CONNECTIONS / GASKETS</b>		Plastic NPSM Connections - Thick Washers (Engineered Polymer Meter Only)					PA							
		NPSM Threads - Thick Washers					XT							
<b>ACCESSORIES</b>		None			X									
<b>REGISTRATION</b>		Encoder				E5								
<b>TECHNOLOGY</b>		Meter with Cable (No Endpoint)					CA							
<b>REGISTRATION FACE</b>		Standard						1						
<b>UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS</b>		9 Dial - 0.01 Gallon, GPM, 1000							9AE					
		9 Dial - 0.001 ft3, GPM, 100							9FD					
		9 Dial - 0.0001 M3, GPM, 10							9MC					
<b>TESTING</b>		BADGER STD (TS-421)							A3					
<b>SERIALIZATION</b>		Year of Mfg   9 Digit S/N   Barcoded   Primary and Lid Outside								Y2				
<b>APPLICATION (See Note)</b>		None									XX			
<b>WIRING METHOD (See Note)</b>		Twist Tight - 5 ft (MTR, ASSY)										TF		
<b>ENDPOINT SHIPMENT MODE</b>		N/A											XX	
<b>RESERVED</b>		Standard												BOA

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**Meter 1 inch**

Dynasonics U500w Ultrasonic Meters		UA	ECA	P	X	E5	CA	1	A4	Y2	XX	TF	XX	B0A	
<b>PRODUCT TYPE</b>															
Engineered Polymer Meter	UA														
<b>METER TYPE</b>															
1 in. (1 x 10-3/4 in.)	ECA														
<b>WATER APPLICATION</b>															
Potable Water	P														
<b>CONNECTIONS / GASKETS</b>															
Plastic NPSM Connections - Thick Washers (Engineered Polymer Meter Only)	PA														
NPSM Threads - Thick Washers	XT														
<b>ACCESSORIES</b>															
None	X														
<b>REGISTRATION</b>															
Encoder	E5														
<b>TECHNOLOGY</b>															
Meter with Cable (No Endpoint)	CA														
<b>REGISTRATION FACE</b>															
Standard	1														
<b>UNIT OF MEASURE / DIAL RESOLUTION OUTPUT / VISUAL BILLING UNITS</b>															
9 Dial - 0.01 Gallon, GPM, 1000	9AE														
9 Dial - 0.001 ft3, GPM, 100	9FD														
9 Dial - 0.0001 M3, GPM, 10	9MC														
<b>TESTING</b>															
BADGER STD (TS-422)	A4														
<b>SERIALIZATION</b>															
Year of Mfg   9 Digit S/N   Barcoded   Primary and Lid Outside	Y2														
<b>APPLICATION (See Note)</b>															
None	XX														
<b>WIRING METHOD (See Note)</b>															
Twist Tight - 5 ft (MTR, ASSY)	TF														
<b>ENDPOINT SHIPMENT MODE</b>															
N/A	XX														
<b>RESERVED</b>															
Standard	B0A														

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

**Control. Manage. Optimize.**

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