Product Owner's Manual

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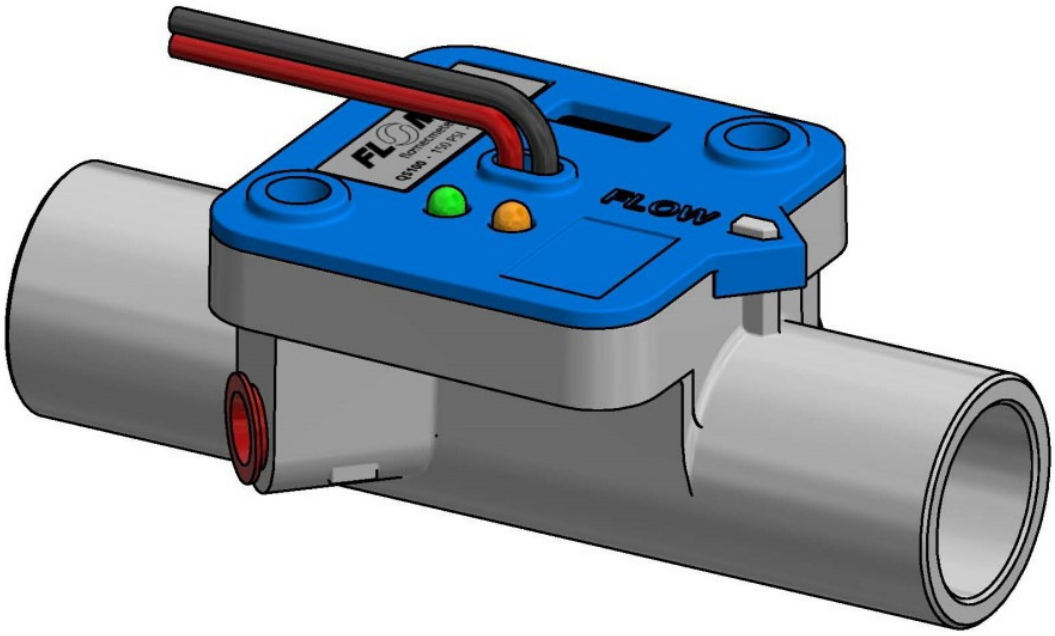

QS100-10
In-line Irrigation Ultrasonic Flowmeter

3/2021

920901-03 Rev C

Please save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described.

Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage.

Please refer to back cover for information regarding this product's warranty and other important information.

SAVE FOR YOUR RECORDS

Model #: _____

Serial #: _____

Purchase Date: _____

TABLE OF CONTENTS

BEFORE YOU BEGIN

Usage Requirements

This meter is for use with water only.

This meter is not legal for trade applications.

This meter has a permanent factory setting for measuring water only.

Power Source Requirements

This meter requires DC power from a customer-provided controller in order to provide flow information back to the controller.

Tools and Materials Needed

Wire strippers, wire cutters, tape measure

PVC pipe fittings (as needed), PVC pipe primer, PVC pipe cement, Direct burial wire splices, valve box

#18 AWG wire cable (Direct Burial). Controller manufacturer may recommend thicker gauge wire for longer distances.

UNPACKING

Contents:

- QS100-10 In-line Irrigation Ultrasonic Flowmeter
- Owner's Manual

Inspect

After unpacking the unit, inspect carefully for any damage that may have occurred during transit. Check for loose, missing or damaged parts. Shipping damage claims must be filed with carrier.

See General Safety Instructions, and all Cautions, Warnings, and Dangers as shown.

GENERAL SAFETY INSTRUCTIONS

IMPORTANT: It is your responsibility to:

Ensure that all equipment operators have access to adequate instructions concerning safe operating and maintenance procedures.

⚠ CAUTION — ***This product is not approved for use with petroleum products (diesel fuel, unleaded gasoline, jet fuel, kerosene, etc.), aromatic hydrocarbons or other incompatible chemicals.***

⚠ CAUTION — ***This product is not approved for use in hazardous locations.***

⚠ WARNING — ***When applying power, adhere to specifications listed in appropriate electronics manual.***

⚠ CAUTION — ***Disconnect external power before attaching or detaching input or output wires.***

⚠ WARNING — ***Compatibility of this product's material and the process fluid and/or environment should be considered prior to putting into service.***

⚠ WARNING — ***Product should never be operated outside its published specifications for temperature or pressure. See specifications for your model.***

⚠ WARNING — ***Make sure flow and pressure have been eliminated from process pipe prior to installing or removing product.***

⚠ CAUTION — ***Installation near high electromagnetic fields and high current fields is not recommended and may result in inaccurate readings.***

⚠ CAUTION — ***Do not allow water to*** **freeze** ***in*** **meter.** ***Ice expansion may burst the plastic housing.***

Do not allow this meter to be used with **steam.**

⚠ CAUTION — ***Take precautions to remove sand and debris from flow stream.*** **Prolonged exposure to meter will affect meter performance and cause irreversible damage.**

⚠ CAUTION — ***Entrapped air pockets and air bubbles will adversely affect meter performance.***

FLOMEC®

SPECIFICATIONS

QS100-10

MECHANICAL		
Housing Material	SCH 80 PVC (Polyvinyl chloride)	
Wetted Materials	PVC (Polyvinyl chloride)	
Coverplate Material	PC/ABS (Polycarbonate/Acrylonitrile Butadiene Styrene)	
Type	Ultrasonic Flowmeter	
Unit of Measure	Controller Dependent	
Flow Rate	0.22-33 GPM 0.83-124.92 L/min 0.1-15 ft/sec	
Accuracy	+/- 2% of Reading	
Uncertainty	0.04 GPM 0.018 ft/sec	
Maximum Working Pressure	150 PSI @ 70°F (10.3 bar @ 21.1°C)	
Process Fluid Temp Range	+32°F to +140°F (0°C to +60°C)	
Storage Temperature	-40°F to +140°F (-40°C to +60°C)	
Field Calibration	No	
Inlet / Outlet Connections	1 in. Male Spigot	
Weight	0.42 lbs. (0.19kg)	
ELECTRICAL		
Powered by	DC power provided by customer controller 7.5V (dc) min to 36V (dc) max	
	OFF State Current	200µA (typical)
	OFF State V-High	Supply Voltage - (OFF State Current * Supply impedance)
Transducer Excitation	ON State Current	(Supply Voltage / (Supply impedance + 50Ω))
	ON State V-Low	ON State Current * 50Ω
Output Frequency	0 to 100 Hz	
Output Pulse Width	4mSec (Approx.)	

SPECIFICATIONS (CONTINUED)

Dimensions

Length "A"	Height "B"	Width (at widest point) "C"
5.32 in. (13.5 cm)	1.96 in. (5.0 cm)	2.58 in. (6.6 cm)

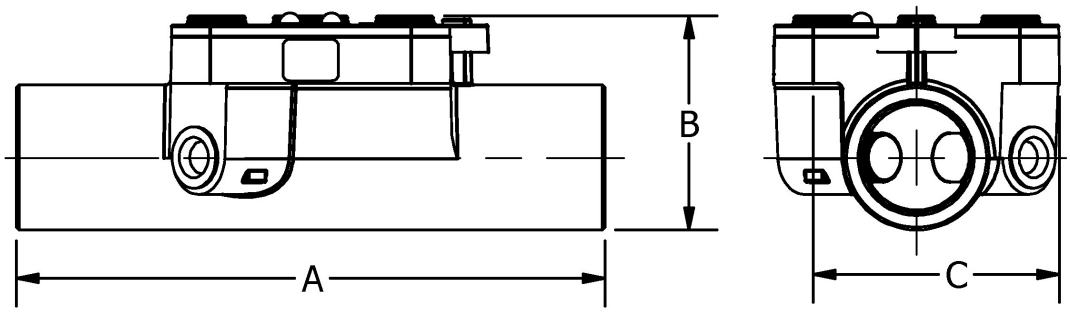

Figure 1

K-Factor Information

FLOMEC ultrasonic meters use K-factor values for greater accuracy during calibration. These values are derived by calibrating the meters using NIST traceable instrumentation. The K-factor value for this meter is listed below.

IMPORTANT: The K-factor provided is for reference. Accuracy can be affected by plumbing configuration, fluid condition, adjoining pipe schedule, and entrapped air. Customers should always validate accuracy and adjust K-factor as needed using the K-factor adjustment menu of your controller.

Pipe Schedule	① Typical K-Factor (Controller)	② Hydrawise® K-Factor (Litre/Pulse)	Rain Master® K-Factor	Offset	Reference	
					Pulses/ Gal	Pulses/ Litre
Sch 40	0.4211 *	0.0266	115	0	142.5	37.6
Sch 80	0.3963 **	0.0250	108	0	151.4	40.0

* Based on 142.5 pulses per gallon.
** Based on 151.4 pulses per gallon.

① ***Use this K-Factor for these Controller Brands:***

BaselineTM, Calsense, Hunter®, HydroPoint® (WeatherTrak®), ©TUCOR, Rain Bird®, Toro®, and Weathermatic®.

② ***Use this K-Factor for these Controller Brands:***

Hydrawise® HCC models only.

INSTALLATION

Meter Components and Features

Below is a QS100-10 meter with labeled components. Familiarize yourself with the meter before installation.

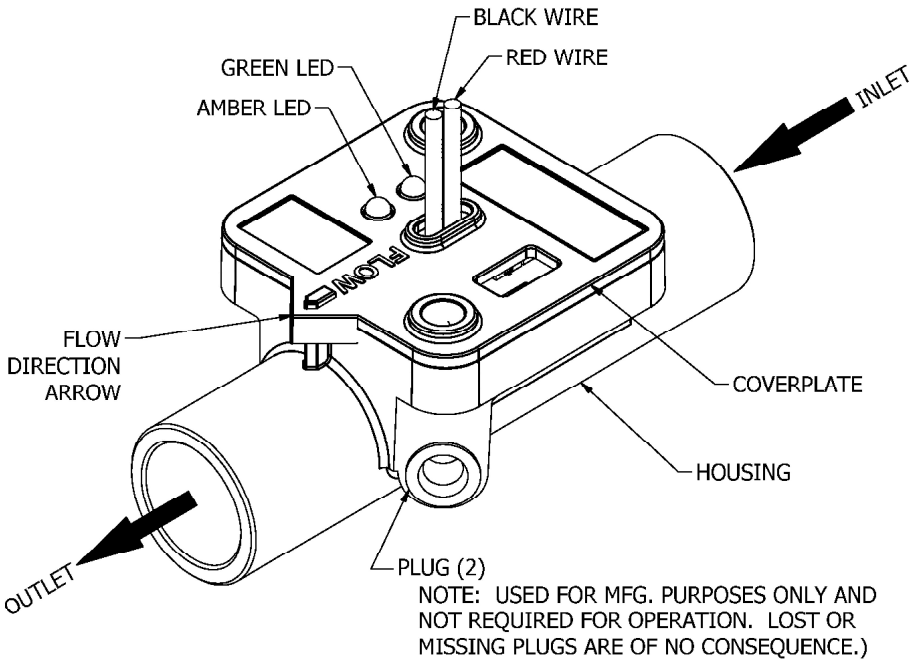

Figure 2

Preferred Installation Layout

Provide a straight pipe run of at least 10 times the pipe's diameter (Ø) upstream (inlet end) of the meter, and at least 5 times the pipe's diameter (Ø) downstream (outlet end) of the meter. The word “FLOW” and the arrow embossed on the coverplate denotes the flow direction.

Couplers or unions can be used to install the meter in the piping system; however, for ease of future maintenance or repair of the piping system, it is recommended that unions be used. Unions are shown in all graphics.
For best results, coverplate and wires should be facing up.

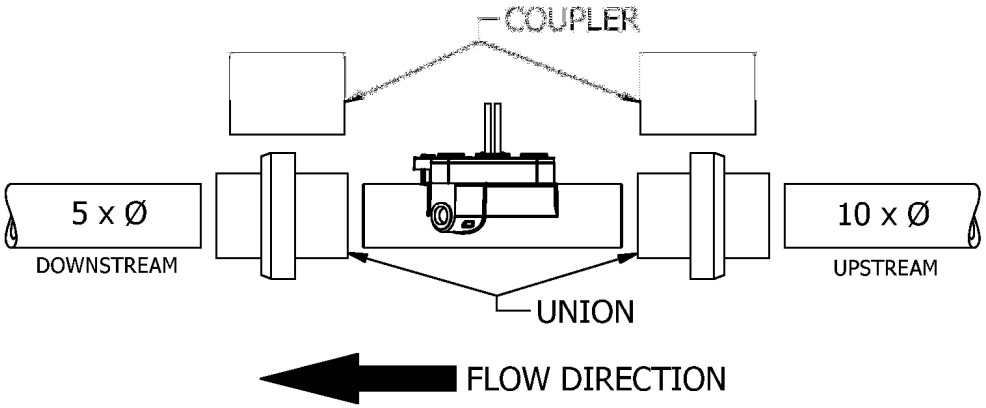

Figure 3

INSTALLATION (CONTINUED)

Connecting Components

NOTE: Keep the meter bore clean and free of dirt and debris during installation.

1. Remove all I.D and O.D edge burrs on the pipe ends. (see Figure 4)
2. Clean and apply primer to the pipe ends, fittings and meter. (see Figure 5)

Note: The joint cementing sequence in 5 and 6 below is for general reference. Use the sequence best suited for your piping and overall layout.

3. Following the PVC cement manufacturer's instructions, apply PVC cement to a meter end and fitting and quickly assemble while the cement is fluid. Hold the cemented parts together for at least 30 seconds.
   Repeat for other end of meter. (See Figure 6)
4. Attach meter with attached fittings to pipe ends using the same "cement and hold" process used above. (see Figure 6)

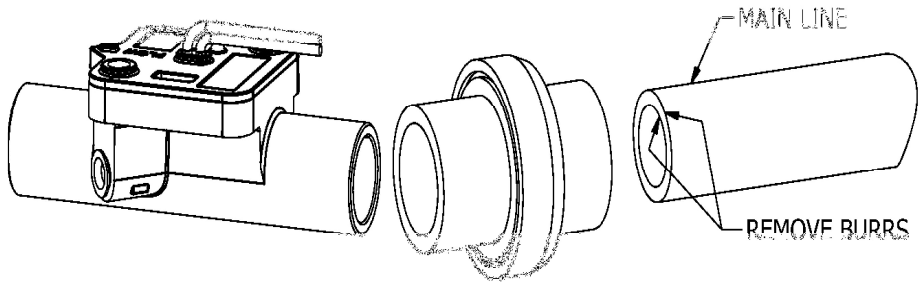

Figure 4

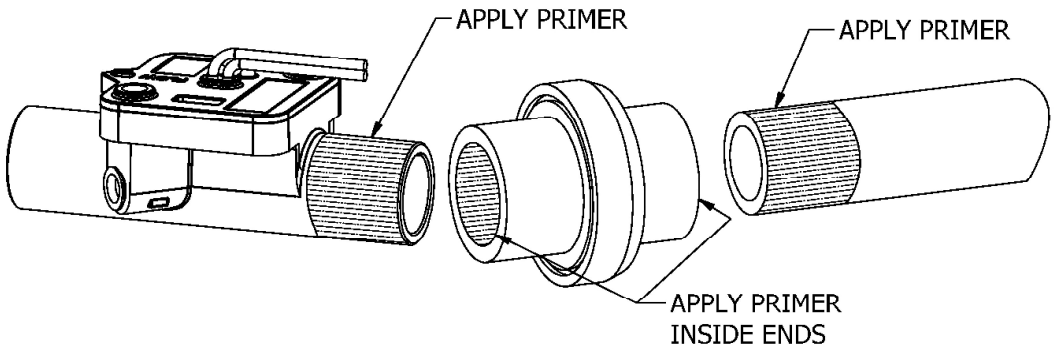

Figure 5

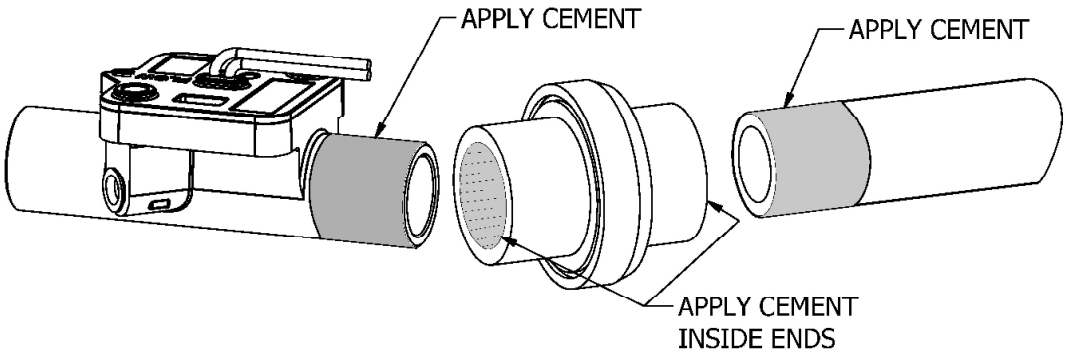

Figure 6

INSTALLATION (CONTINUED)

For Below Ground Installation

Install a valve box around the meter. Valve box extensions may be needed depending on depth. (See Figure 7)

Note: A minimum of 10 in. thick layer of gravel should be installed immediately below the meter and valve box.

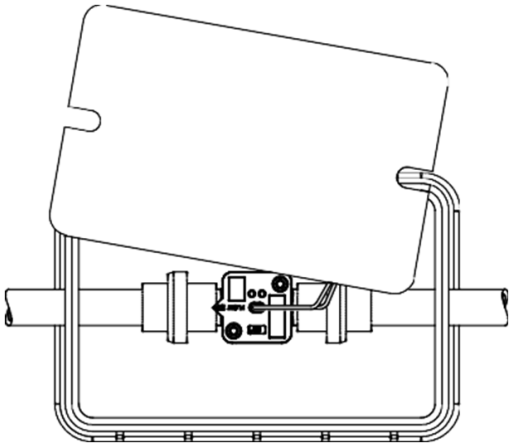

Figure 7

Wiring Connections

Below ground wiring connections require a waterproof splicing method to wire the meter wires to the wire cable from the controller. The following splice sequence (Figure 8) shows a **3M DBR/Y-6** splice kit used with 18 AWG wire cable from the controller. See next page for splice instructions and wiring diagram.

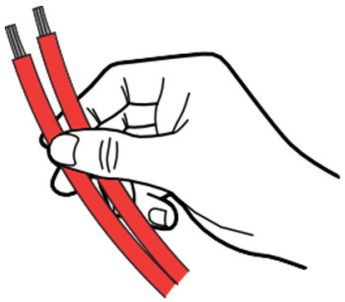

Figure 8a

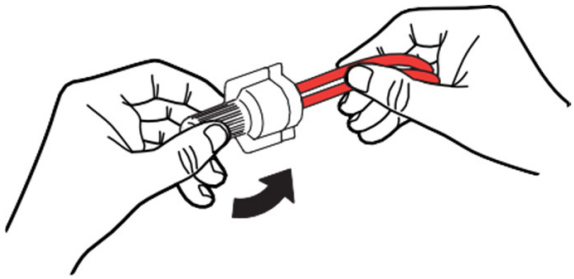

Figure 8b

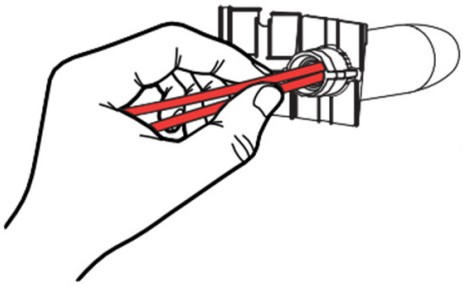

Figure 8c

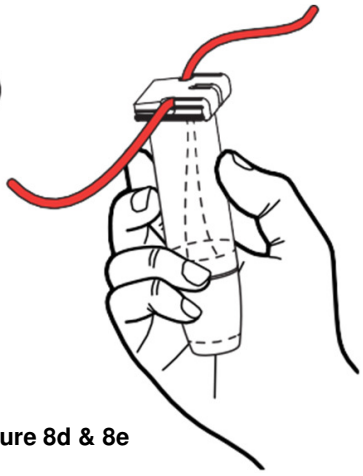

Figure 8d & 8e

INSTALLATION (CONTINUED)

Reference Figures 8a thru 8e on previous page

8a. Strip insulation 3/4 in. (19 mm).

8b. With wire ends even, insert wires into the connector and tighten until secure.

8c. Insert the connector all the way into the grease filled tube until the connector rests on the bottom of the tube.

NOTE: If having difficulty getting the twist-on connector down into the tube when using small gauge wires, use a thin, non-conductive object to push the connector to the bottom of the tube. Upon removal of the object, ensure that no voids or water paths remain in the grease.

8d. Fold the wires into the channels. 8e. Close the cap.

Wiring Diagram

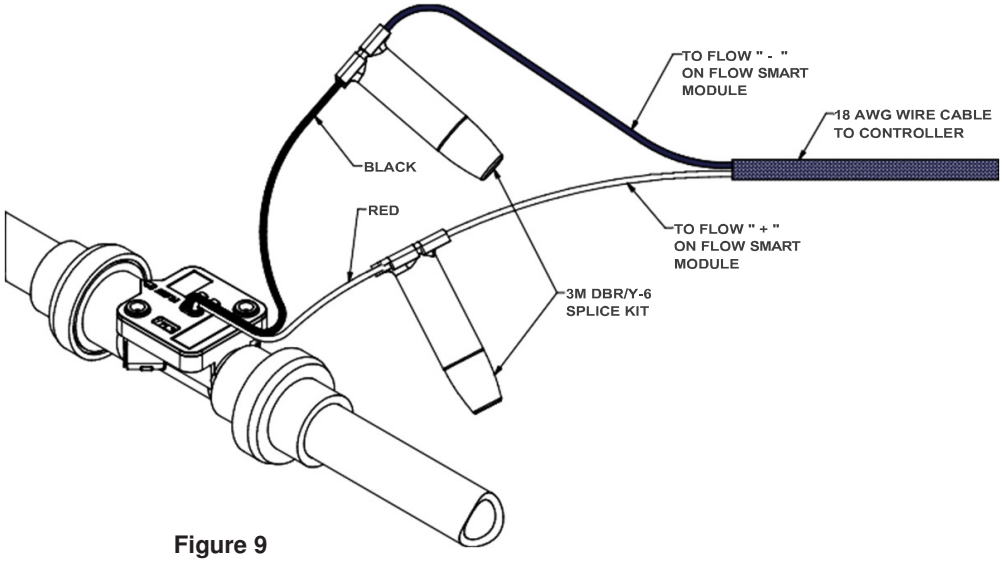

Figure 9

Optional Above Ground Installation

The meter can be installed above ground as long as proper plumbing and wiring outlined in previous pages are followed, and the meter is positioned with upward flow into the meter to keep it filled for proper operation. (See Figure 10)

Avoid downward flow that can lead to partially filled pipes and inaccurate operation.

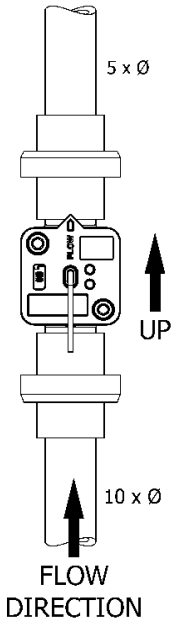

Figure 10

OPERATION

Each QS100-10 meter is shipped with the K-factor and other information permanently marked in a rectangular recess on the coverplate.

LEDs Functionality

There are two LEDs on the QS100-10 meter. The GREEN LED is used to indicate basic power and functionality of the meter. The AMBER LED is used to indicate that there is a flow of water through the QS100-10 meter. The LEDs will behave in the following manner to indicate different modes of operation:

MODE	LED BEHAVIOR
Power Disconnected or Meter Failure:	Both GREEN and AMBER LEDs are OFF.
No Flow Low Power Mode:	GREEN LED flashes ON/OFF at a rate of approximately 2 blinks per second.
No Flow or Reverse Flow Active Mode:	GREEN LED flashes ON/OFF at a rate of approximately 8 blinks per second.
Low Flow Active Mode:	GREEN LED flashes ON/OFF at a rate of approximately 8 blinks per second and the AMBER LED flashes ON/OFF at a rate that is proportional to the rate of water flow thru the meter.
**High Flow Active Mode:	GREEN LED flashes ON/OFF at a rate of approximately 8 blinks per second and the AMBER LED will appear to be constantly ON, but will be dim.

****NOTE:** To save power it is normal for the LEDs to be dim when flashing at higher flow rates. At very high flow rates, the AMBER LED will appear to be constantly ON but dim.

TROUBLESHOOTING

1. The LEDs are the primary indicators of meter performance. Refer to the Operations Section for LED indicating functionality.
2. Entrained air is air bubbles suspended in the water flow. Entrained air creates errors in accuracy of ultrasonic technology meters. Recommend a maximum of 10% entrained air in the water flow.
3. The faces of the transducers need to be clean and free of oily substances for accurate operation. Do not touch transducers with fingers, oily rags, etc.

DO NOT use wire brushes or abrasives to clean the faces of the transducers (see Figure 11).

4. Ensure the flow direction arrow is pointing in the direction of flow for correct LED functionality.

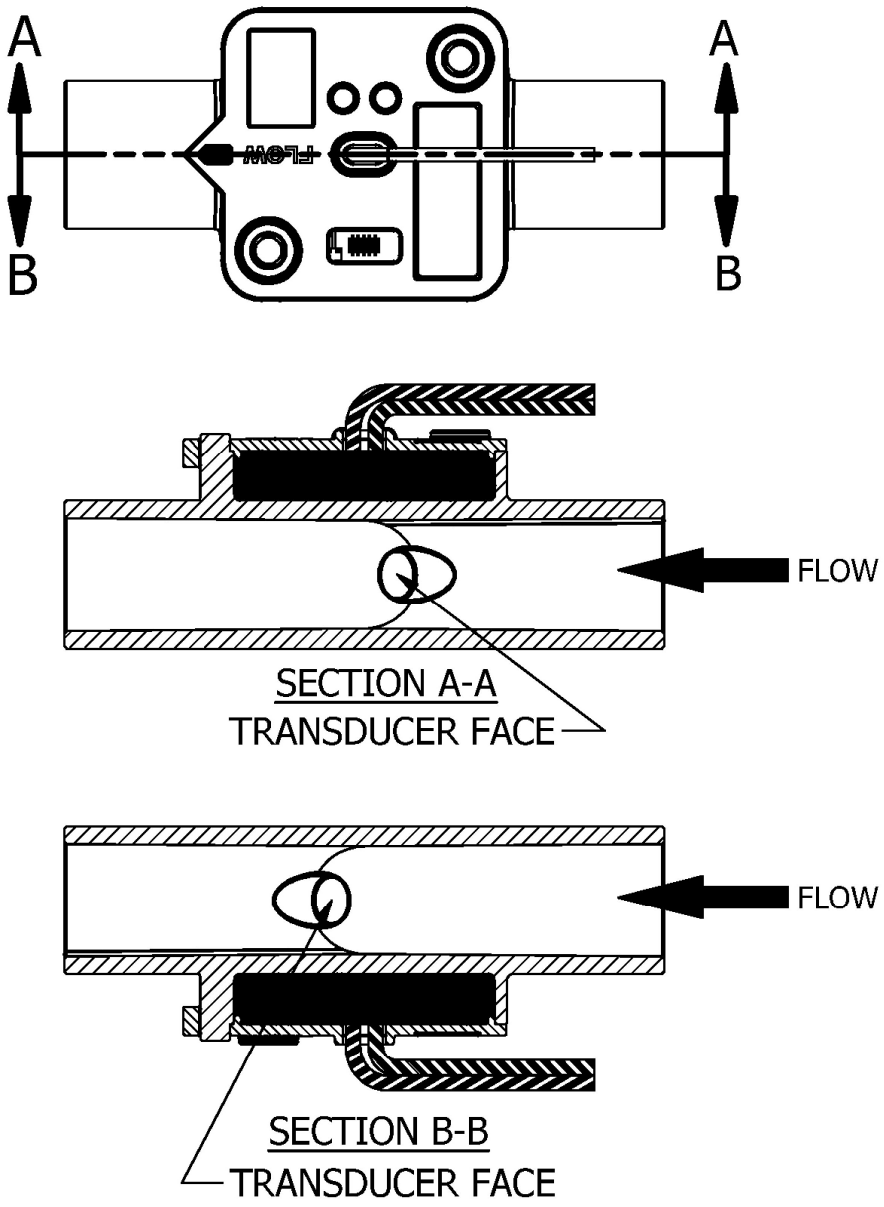

Figure 11

NOTES: