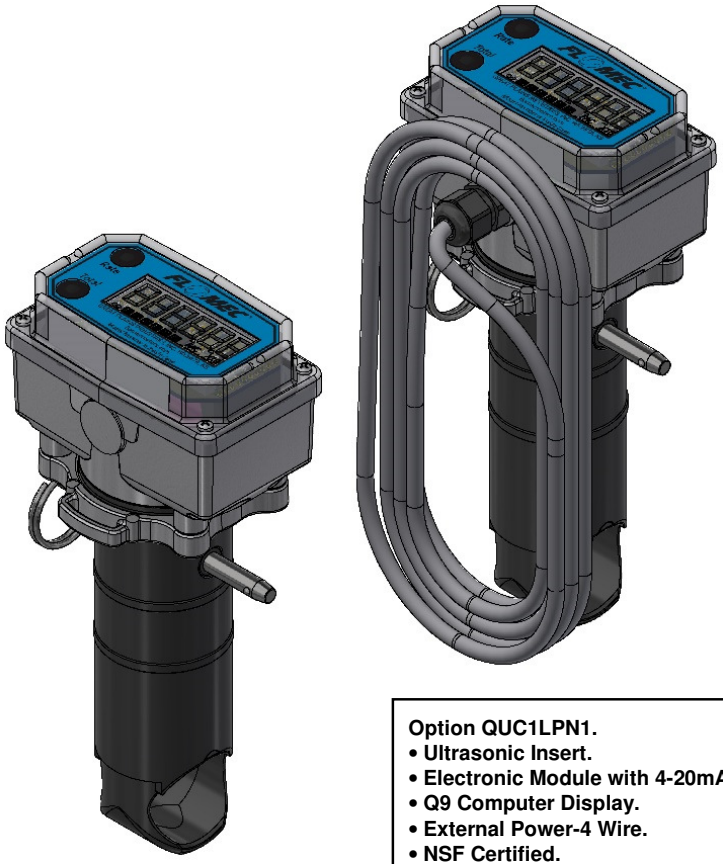
Product Owner's Manual

EN

FLOMEC®



Option QUC1LPN1.
- Ultrasonic Insert.
- Electronic Module with 4-20mA & Pulse Output.
- Q9 Computer Display.
- External Power-4 Wire.
- NSF Certified.

Option QUDSBAN1.
- Ultrasonic Insert.
- Electronic Module.
- Q9 Computer Display.
- Battery Powered.
- NSF Certified.

UM Ultrasonic Electronics

NSF Versions

For All FLOMEC® UM Ultrasonic Tee & Saddle Meters

06/2024

920901-05 Rev E

1.800.561.8187 www.itm.com information@itm.com

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#: _____

Purch. Date: _____

FLOMEC

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BEFORE YOU BEGIN

Usage Requirements

- These ultrasonic electronics assemblies are for use with UM Tee Ultrasonic Flowmeters and UM Saddle Meters only.
- **When QUDSBAN1C or QUC1LPN1 ultrasonic electronics options are used in a UM Tee Ultrasonic Flowmeter assembly, the flowmeter assembly is NSF Certified.**
- These ultrasonic electronics assemblies have permanent factory settings for measuring water only, and are for use with water only.
- These ultrasonic electronics assemblies are not legal for trade applications.
- Flow must go uphill through the insert, never downhill, to avoid air bubbles or air pockets captured in the Tee or Saddle meter in which the ultrasonic electronics assemblies are installed.

Power Source Requirements

- All ultrasonic electronics assemblies are DC powered either by battery or external power. Power requirements are dependent on the version of the ultrasonic electronics assembly in your meter.
- Specific versions are powered by a 3.6V lithium battery.
- Other versions require DC power from a customer-provided power supply.
- See the Specifications section for information specific to your version of electronics.

Tools and Materials Needed

- Wire strippers, wire cutters for external powered versions.
- 7/64 (.109) hex L-key, wrench

UNPACKING

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.***

⚠ WARNING ***This product is NOT INTENDED for use with flammable liquids.***

⚠ 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 or around installed insert. Ice expansion may burst the plastic housing.***

⚠ CAUTION ***Do not allow this ultrasonic electronics assembly to be used with steam.***

⚠ WARNING ***The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.***

⚠ WARNING ***When handling hazardous liquids, always follow the liquid manufacturer's safety precautions.***

- *When working in hazardous environments, always exercise appropriate safety precautions.*
- *Be sure O-rings and seals are kept in good repair.*

INTRODUCTION

There are various different versions of FLOMEC® Ultrasonic Electronics assemblies. Each version consists of an insert, an electronic module (a housing with internal electronics of varied capabilities) mounted on top of the insert, and a Q9 computer display mounted on top of the electronic module.

All versions are DC powered. Some versions are powered by an internal battery, while other versions require a customer provided external DC power source, via a multiconductor cable.

In operation, fluid flow through sensors embedded in the submerged end of the ultrasonic insert generate a voltage (or pulses). The pulses are processed by the electronic module to generate usable flow information for the Q9 computer display and other electronic features that are included in that version.

Externally powered versions use the multiconductor cable to send flow information back to customer equipment, such as a pulse counter, secondary flow computer/display, or Programmable Logic Controller (PLC).

Each version has a unique option code assigned for ease of identification (see below).

Option Code	Description
QUDSBAN1	Ultrasonic insert, module housing with electronics and battery, and Q9 computer display. NSF Certified. (Battery power.)
QUC1LPN1	Ultrasonic insert, module housing with 4-20mA & pulse output electronics, and Q9 computer display. 4-conductor cable (10 ft.). NSF Certified. (Loop power.)

FLOMEC® Ultrasonic Electronics assemblies can be used with UM Tees, UM Saddles, or can be ordered as a complete separate replacement ultrasonic electronics assembly.

Using This Manual

This manual has separate sections covering the three major components of the ultrasonic electronics assembly.

Section A: Ultrasonic insert.
Section B: Ultrasonic electronic module.
Section C: Q9 computer display.

A typical model number is shown below for a replacement display for a UM100 meter.

*UM100XXXXXXXXXX-**QUDSBAXX**-GMB*

The (8) characters between the dashes denote the electronic option (replacement display).

For clarity of manual references:

- *Q9 refers to the computer display.*
- *QUDSBAN1 & QUC1LPN1 refers to the "NSF Certified" electronic options.*

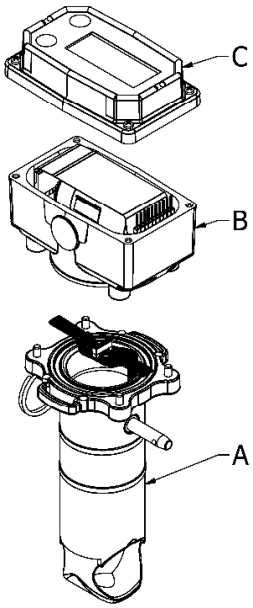


Figure A
Option QUDSBAN1 Shown

Using This Manual (cont.)

The table below describes some of the special features and their descriptions that can be viewed and configured on the Q9 display.

Special Feature	Description
Built in flow meter diagnostics	Diagnostic features that allow the user to troubleshoot application issues
Selectable volume and time-base units	User configurable accumulated volume units and flow rate time-base
Custom saddle pipe inner dimension	User configurable pipe inner diameter to allow proper velocity calculations when used in saddle configurations
Adjustable scaled pulse output K-factor	User configurable pulse output K-factor (pulses/volume) value can be adjusted for interoperability with various customer equipment
Adjustable 4-20mA output	User configurable zero and span settings to adjust product for specific application flow rates *
Field calibration	User calibration of the flow meter using one of three available methods (Dispense/Display, Percentage Adjustment, or K-factor Entry)

** "Zero" refers to the flow rate at which the product will output 4mA. "Span" refers to the flow rate at which the product will output 20mA.*

For details on using and viewing these features, scan the QR code on page 27 to view firmware version specific operation instructions.

COMMON SPECIFICATIONS – Overall Electronics

Mechanical					
Operating Temp. Process Fluid	**+32°F to +140°F (0°C to +60°C)**				
Operating Temp. Ambient Air	**+0°F to +130°F (-18°C to +55°C)**				
Storage Temp. Ambient Air	**-40°F to +158°F (-40°C to +70°C)**				
Electrical					
Accuracy	**+/- 2% of Reading**				
Uncertainty	**1" Meter 0.04 GPM 0.018 ft/sec**	**1-1/2" Meter 0.10 GPM 0.018 ft/sec**	**2" Meter 0.17 GPM 0.018 ft/sec**	**3" Meter 0.37 GPM 0.018 ft/sec**	**4" Meter 0.65 GPM 0.018 ft/sec**

SECTION A - Ultrasonic Insert

GENERAL

Two types of ultrasonic inserts are available. One type has circuits designed for use with battery power (Electronic option QUDSBAN1); the other type has circuits designed for use with external power (Electronic option QUC1LPN1).

Both types (including NSF certified versions) are visually identical. For identification, each insert has two labels below the inside rim; one has a part number barcode, the other has a serial number barcode. The barcodes are human readable (see Figure AA).

NOTE: The insert receives power to operate through a 10-pin ribbon cable from the electronic module. Therefore, the ultrasonic inserts are not interchangeable between power types (i.e., battery power type insert will not operate using an external power electronic module and vice versa).

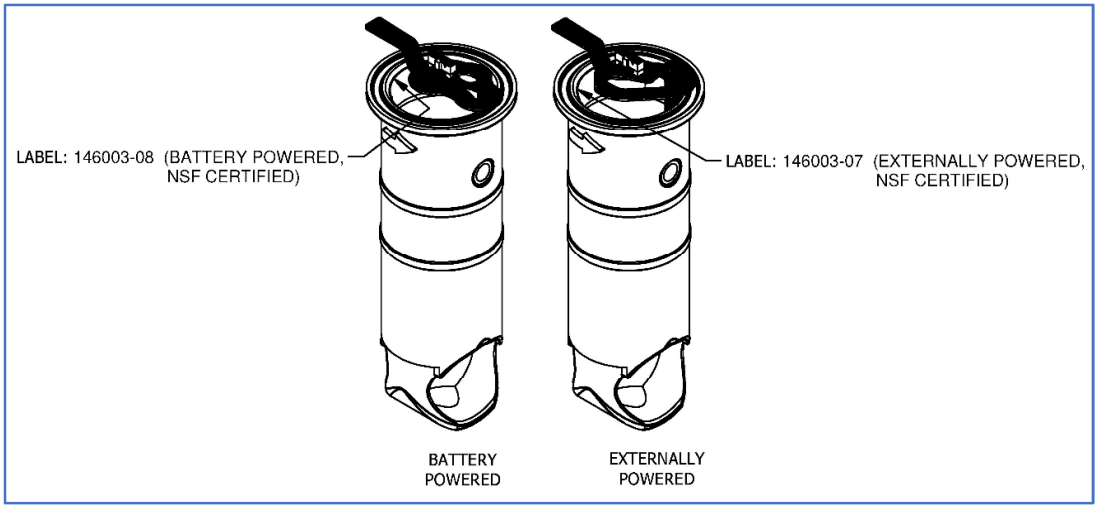


Figure AA

SPECIFICATIONS - Insert

Mechanical	
Insert Housing Material	PPS (Polyphenylene sulfide) / ULTEM® (Polyetherimide)
Type	Ultrasonic Insert

SPECIFICATIONS (cont.)

Dimensions

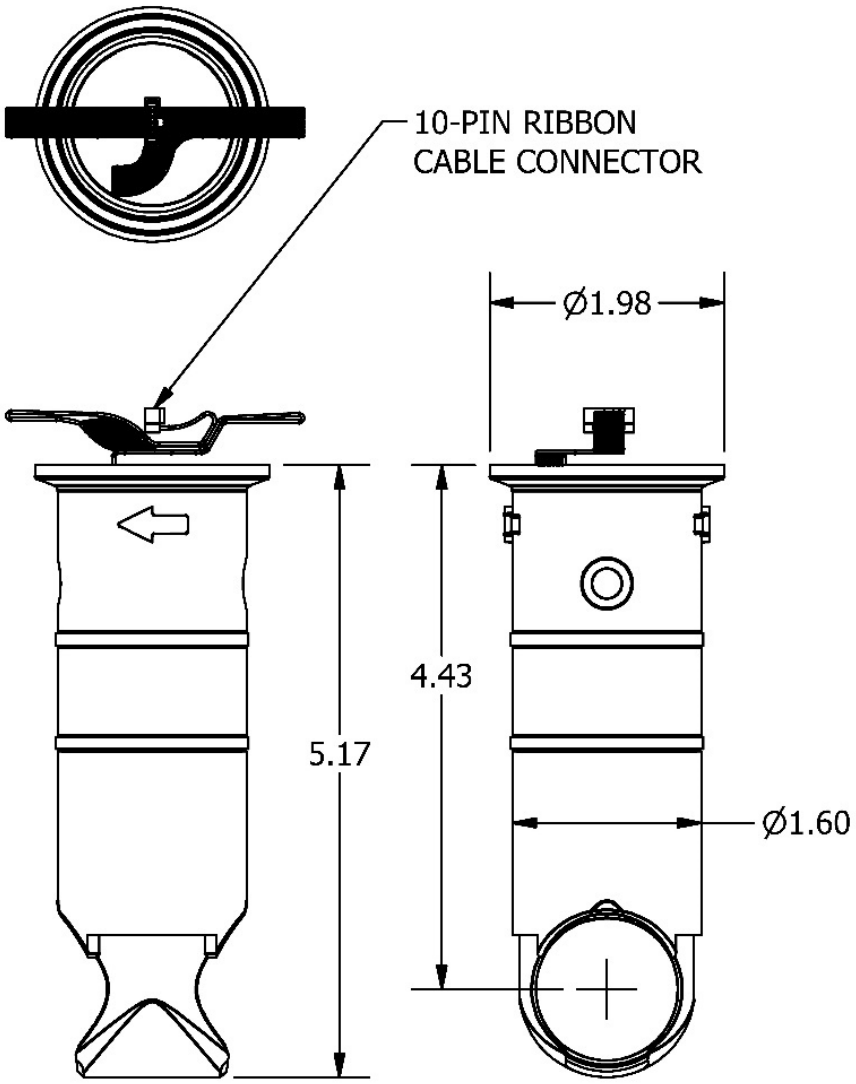


Figure A1

SECTION A - Ultrasonic Insert

INSTALLATION

Below is a typical UM ultrasonic insert. Adjacent components are labeled for reference.

NOTE: *Do not install Meter within 20 pipe diameters downstream of pressure regulation equipment. These devices cause any entrained air in the line to expand, and could cause your FLOMEC Ultrasonic Meter to become inaccurate*

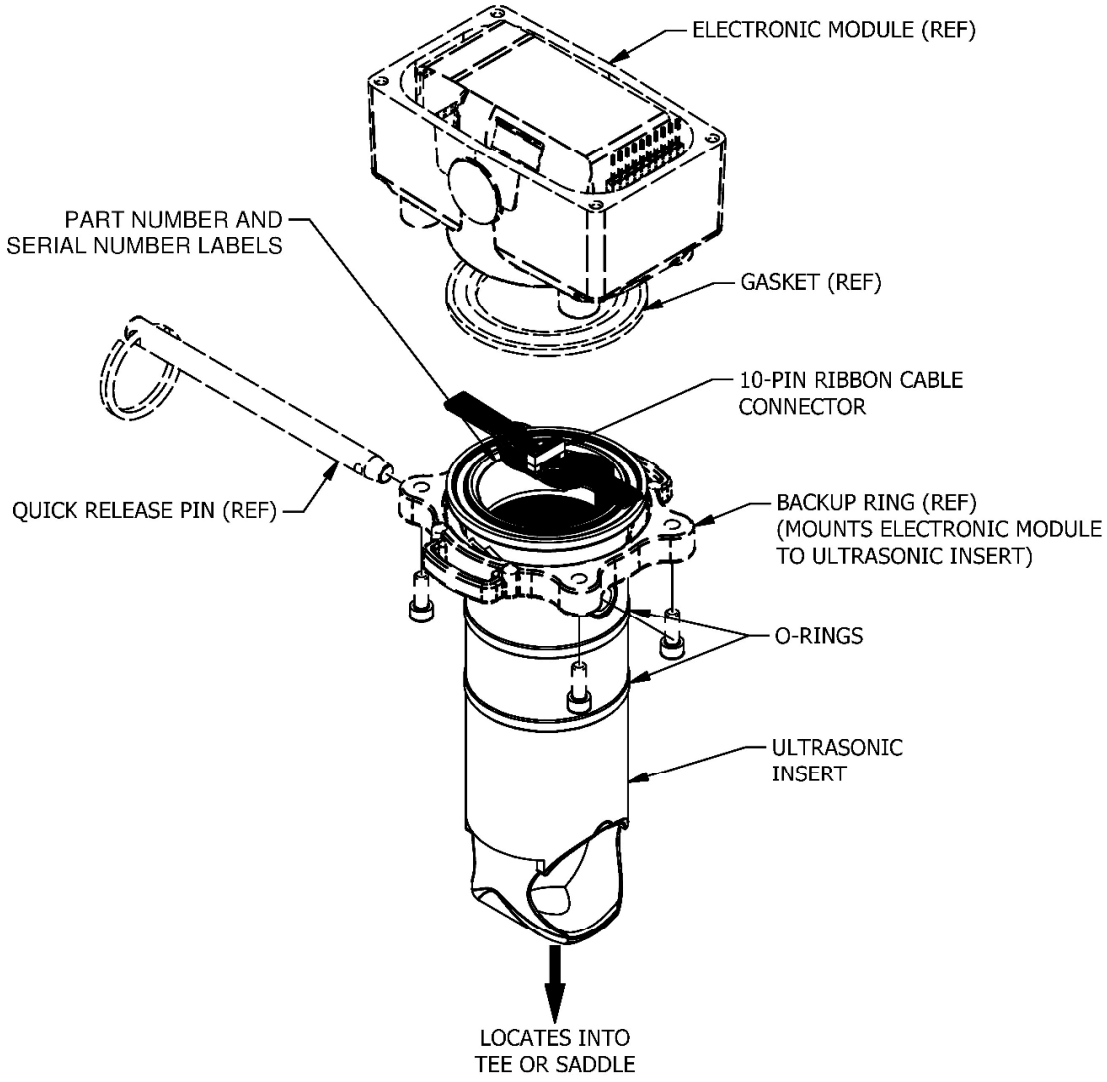


Figure A2

SECTION A - Ultrasonic Insert

OPERATION

The ultrasonic insert is prewired at the factory to the electronic module, so there are no user wiring connections, adjustments, or actions that need to be made to the ultrasonic insert.

TROUBLE SHOOTING

1. 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.
2. Flow must go uphill through the insert, never downhill through the insert to avoid air bubbles or air pockets captured in the Tee or Saddle where the insert is installed.
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 A3).
4. Ensure the flow direction arrow is pointing in the direction of flow for correct functionality.
5. Ensure the quick release pin is inserted through the ultrasonic insert when installed in the Tee or Saddle, to maintain pressure and alignment of the ultrasonic insert.

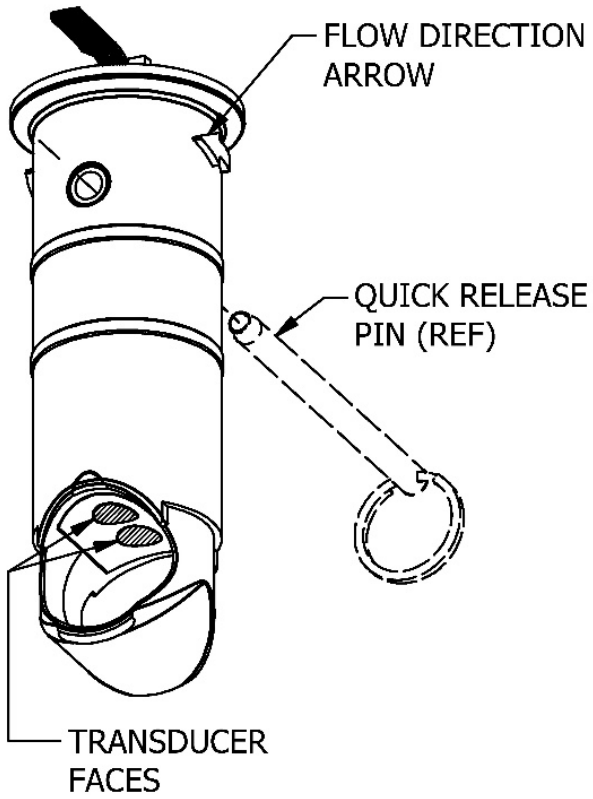


Figure A3

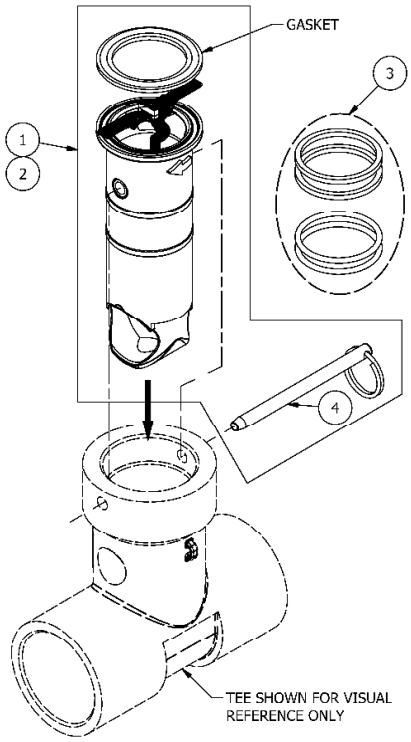
SECTION A - Ultrasonic Insert

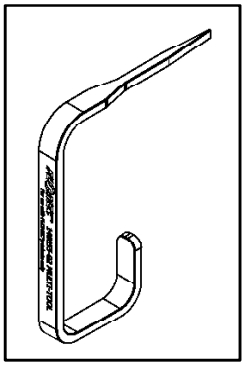
REPAIR

The only user repairs that can be made to the ultrasonic insert is replacement of the O-ring seals, the quick release pin, and gasket . Grips have been designed on each side of the backup ring to assist with lifting the insert out of the Tee or Saddle (see Figure A2).

When removing the insert from the Tee or Saddle, lift straight up until it clears.

REPAIR PARTS ILLUSTRATION – Ultrasonic Insert Only





Multi-Tool

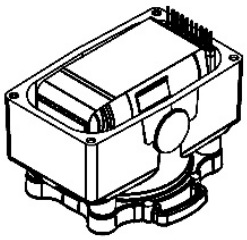
REPAIR PARTS LIST

Ref. No.	Description	Part Number
1	Ultrasonic Insert Kit-(**NSF** Battery powered version) – Includes complete insert assembly, gasket, quick release pin.	146504-06
2	Ultrasonic Insert Kit-(**NSF** External powered version) – Includes complete insert assembly, gasket, quick release pin.	146504-07
3	O-Ring Seal Kit - Includes (2) square profile O-rings &(2) round profile O-rings	146500-01
4	Hardware Kit - Includes (1) quick release pin	146500-02
-	Multi-Tool, Spare (For prying, leveraging, pin hole aligning)	146055-501

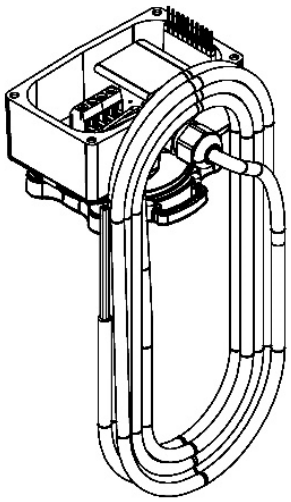
NOTE: *Parts, service and warranty information is at the end of this manual.*

SECTION B – Electronic Modules

GENERAL



Option QUDSBAN1
- **Electronic Module**
- **Battery Power**



Option QUC1LPN1
- **Electronic Module with 4-20mA & Pulse Output**
- **External Power-4 Wire**

The electronic modules shown above are covered in this section. Electronic modules are either battery powered from an internal battery, or are externally powered by a customer provided power supply. One function of the electronic modules is to distribute the power to the insert and the Q9 computer display, and as a protective housing for other electronic options.

SPECIFICATIONS – ELECTRONIC MODULES

Mechanical		
	Option QUDSBAN1	Option QUC1LPN1
Type	Electronic Module	
Housing Material	Aluminum Alloy 380	
Port Strain Relief	N/A	Hubble PG7
Strain Relief Grip Range	N/A	0.11”-0.26” (2.79 - 6.6mm)
Backup Ring Material	Aluminum Alloy 380	
Recommended Cable	N/A	Alpha Wire 1294C

SPECIFICATIONS - Option QUDSBAN1 Electronic Module

Housing w/Battery. (Battery Power)

This electronic module housing contains a 3.6VDC lithium battery mounted to PC board electronics. The electronic module is the distribution center for pulses generated by the insert, and also regulates the battery power supplied to all electronics.

Electrical

Power Requirement	**3.6VDC lithium battery Mounted to PC board inside module housing**

Dimensions

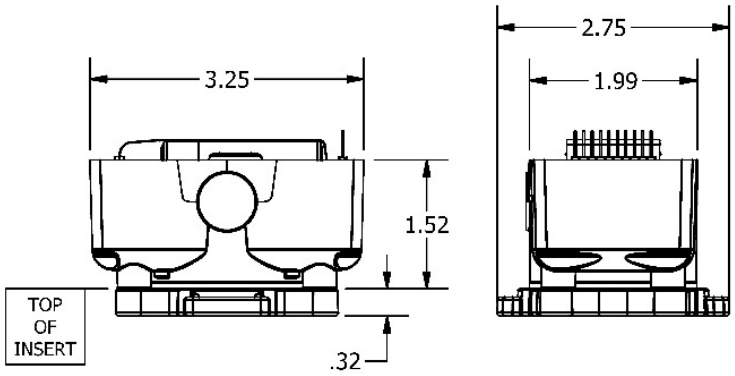


Figure B1

Illustration

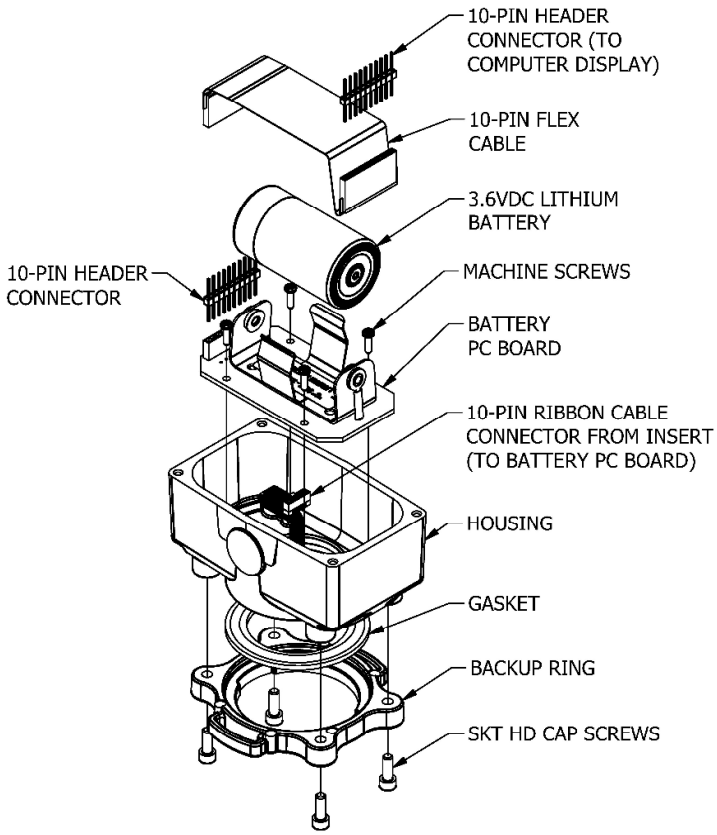


Figure B2

SPECIFICATIONS - Option QUDSBAN1 Electronic Module (cont.)

Wiring

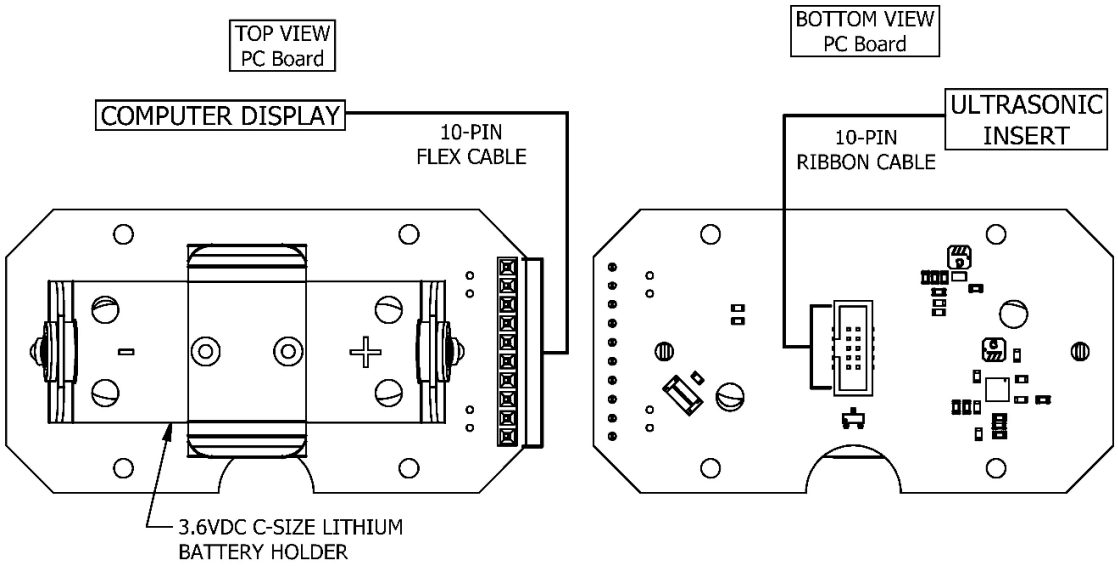


Figure B3

SPECIFICATIONS – Option QUC1LPN1 Electronic Module

Electrical

Housing w/4-20mA & Pulse Output Electronics. (4-conductor cable (10 ft.). (External power)

This electronic module housing contains 4-20mA & pulse out electronics. Power is supplied to the module by a customer provided external power supply using the 4-conductor cable.

The electronic module is the distribution center for pulses generated by the insert, and also regulates the power supplied to all electronics.

This 4-20mA transmitter complies with ANSI_ISA-50.00.01-1975 (R2012) and is rated as an output isolated Type 2 Class U device.

SPECIFICATIONS – Option QUC1LPN1 Electronic Module (cont.)

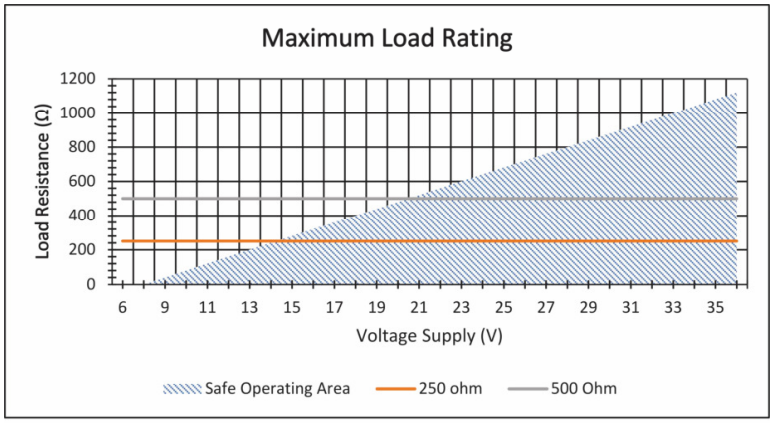
Electrical (cont)

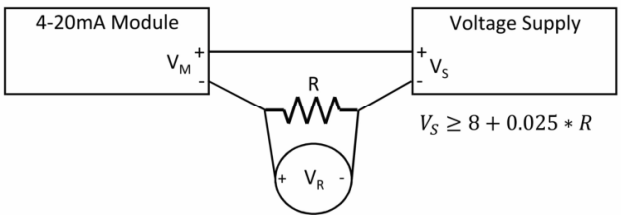
4-20mA Loop (Red & Black)				
Condition	**Min**	**Typical**	**Max**	**Unit**
Input Voltage	8	24	36	VDC
Loop Output	4	-	20	mA
Storage Temperature	-20	-	160	°F
Operating Temperature	0	-	140	°F

Pulse Output (White & Green)				
Condition	**Min**	**Typical**	**Max**	**Unit**
Pull-up Voltage	3.3	24	36	VDC
Storage Temperature	-20	-	160	°F
Operating Temperature	0	-	140	°F

Application Example

The following chart, drawing, & equation are intended for special use cases and for additional information. The "Maximum Load Rating" chart is a pictorial representation of the voltage supply equation below





Examples:

1. To generate a 1-5V signal, use a 250Ω resistor and supply a minimum of 15V.
   Where 1V is equivalent to the flow rate set as "Zero" on the Q9 display. (4mA setpoint)
   Where 5V is equivalent to the flow rate set as "Span" on the Q9 display. (20mA setpoint)
   See Section C - Q9 Computer Display - Electronic Module Options.

2. To generate a 2-10V signal, use a 500Ω resistor and supply a minimum of 21V.
   Where 2V is equivalent to the flow rate set as "Zero" on the Q9 display. (4mA setpoint)
   Where 10V is equivalent to the flow rate set as "Span" on the Q9 display. (20mA setpoint)
   See Section C - Q9 Computer Display - Electronic Module Options.

SPECIFICATIONS – Option QUC1LPN1 Electronic Module (cont.)

Dimensions

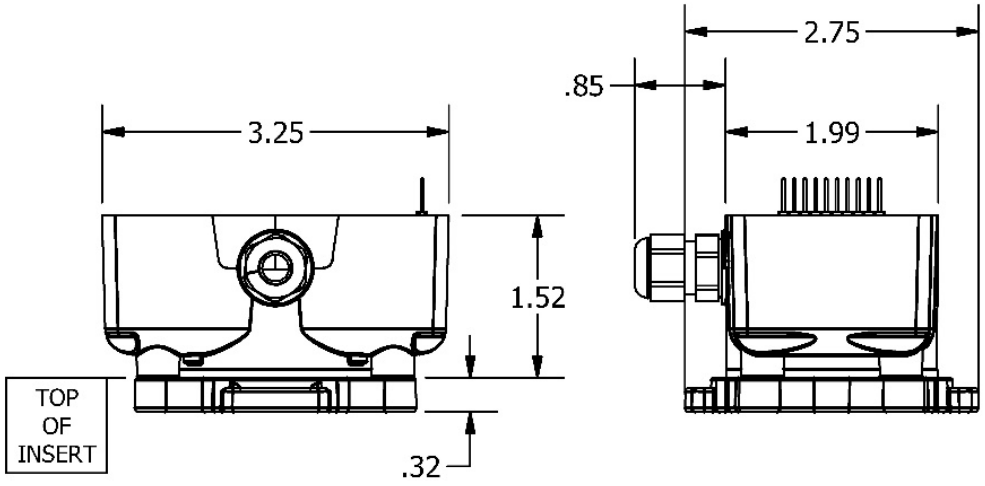


Figure B4

Illustration

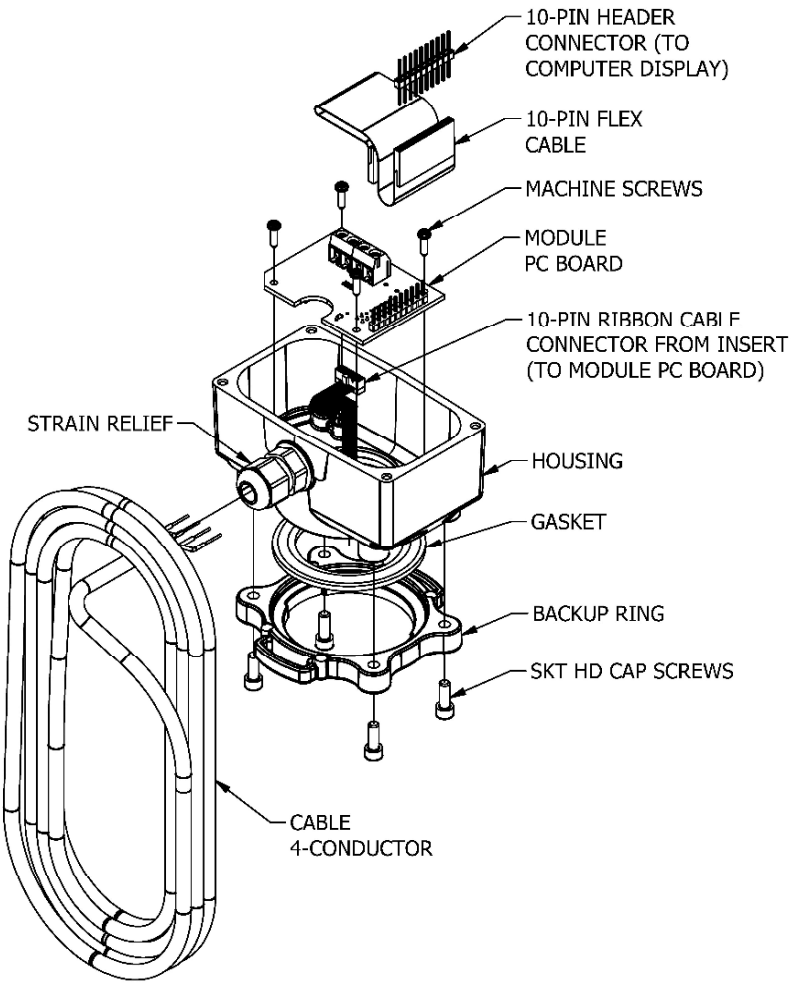


Figure B5

SPECIFICATIONS – Option QUC1LPN1 Electronic Module (cont.)

Wiring

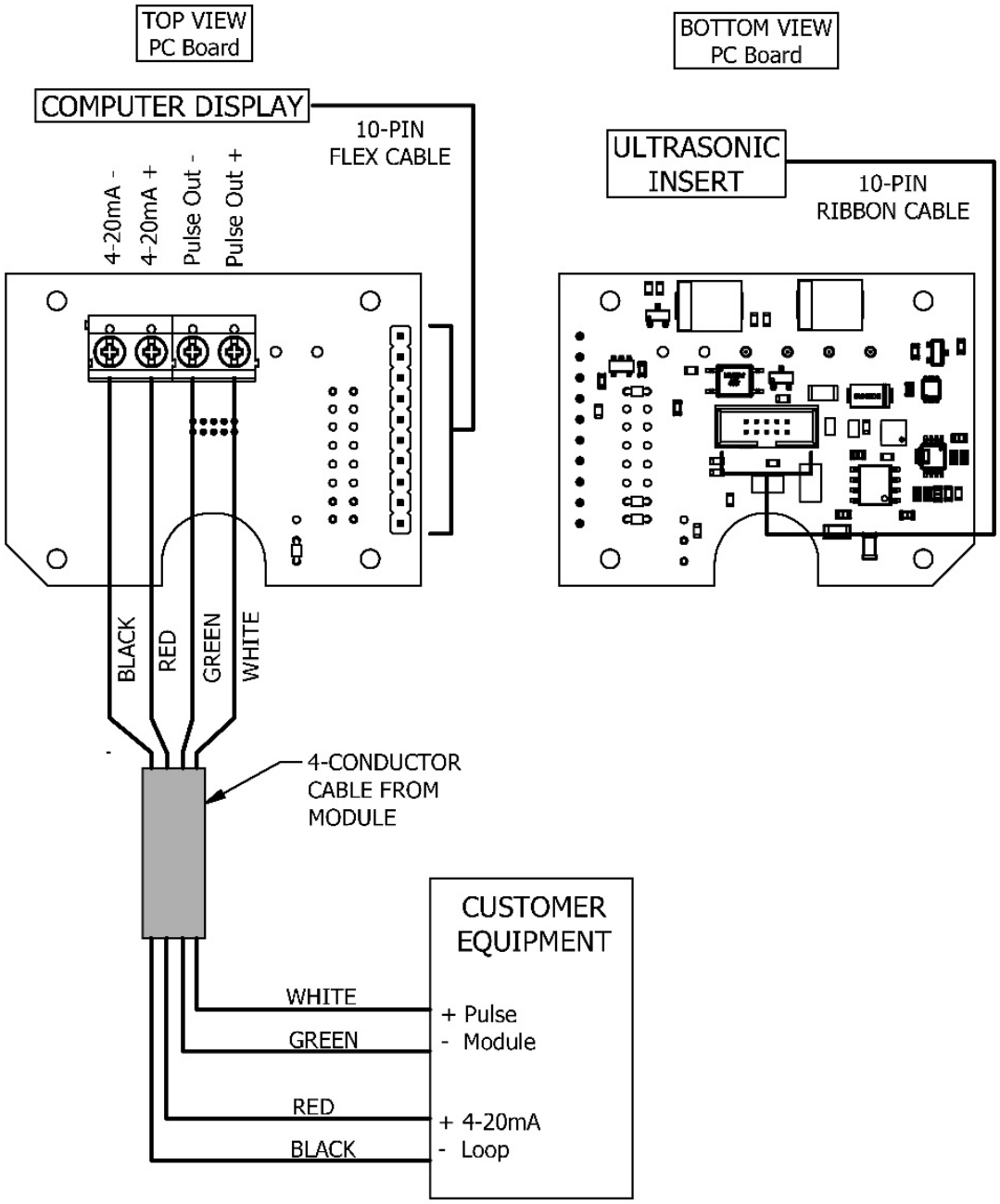


Figure B6

NOTE: *Alternate wiring diagrams on next page.*

SPECIFICATIONS – Option QUC1LPN1 Electronic Module (cont.)

Wiring – Alternate Wiring Diagrams

Application Example #1 — **4-20mA with Open Collector Pulse**

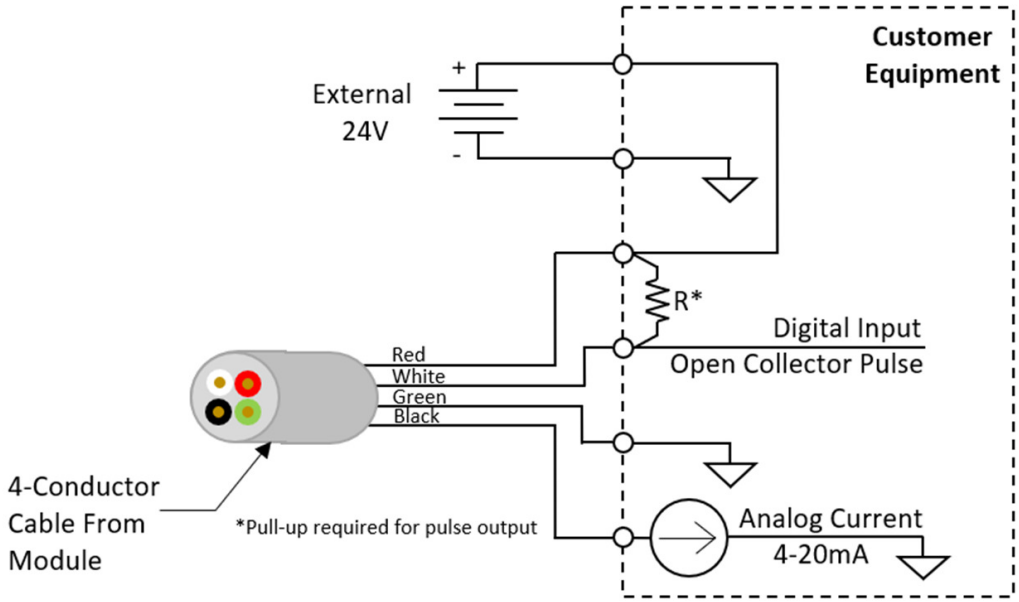


Figure B6-1

Application Example #2 — **2-10V with PNP Pulse**

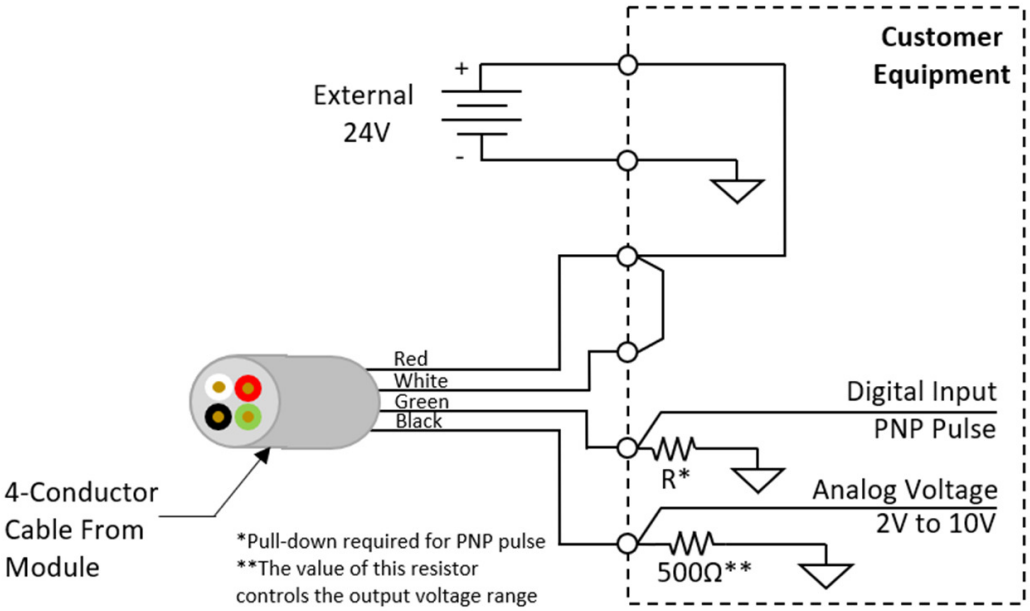
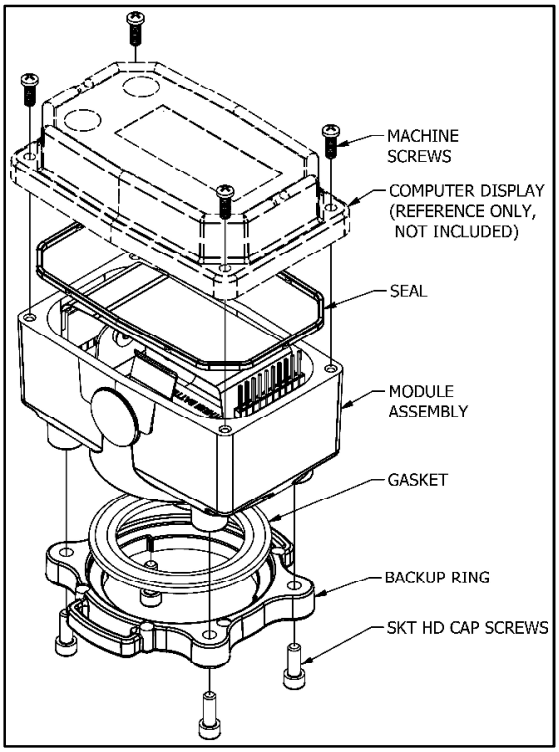


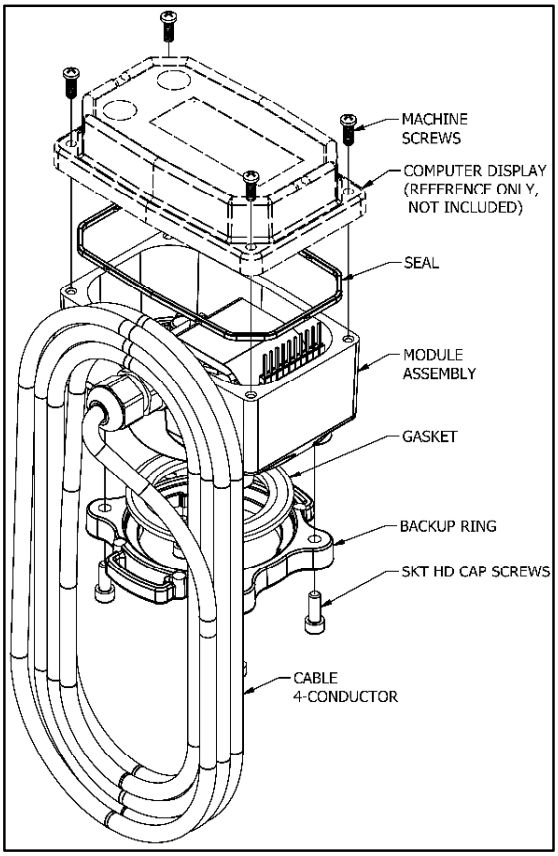
Figure B6-2

SECTION B – Electronic Modules

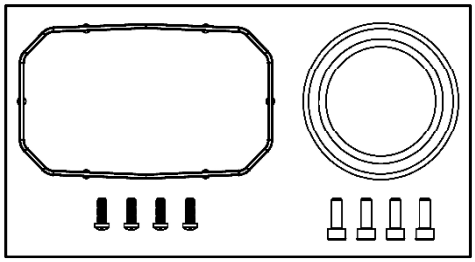
REPAIR PARTS ILLUSTRATION – Ultrasonic Modules Only



Ref. No. 1



Ref. No. 2



Ref. No. 3

REPAIR PARTS LIST

Ref. No.	Description	Part Number
1	Ultrasonic Module, Electronic Option QUDSBAN1 (Replacement) - Includes complete module assembly (battery not incl.), backup ring, gasket, (4) SHCS, (4) machine screws.	146504-04
2	Ultrasonic Module, Electronic Option QUC1LPN1 (Replacement) - Includes complete module assembly w/cable, backup ring, gasket, (4) SHCS, (4) machine screws.	146504-05
3	Seal & Hardware Kit - Includes computer display seal, gasket, (4) SHCS, (4) machine screws.	146504-03

NOTE: *Parts, service and warranty information is at the end of this manual.*

1.800.561.8187 www.itm.com information@itm.com

SECTION C – Q9 Computer Display

GENERAL

The CMOS, microprocessor-based electronics have extremely low power requirements and data retention capabilities in both RAM and ROM. Information is clearly displayed on a large 6-digit LCD readout with three-point floating decimal for totals from .001 to 999,999 (x1), 9,999,990 (x10), or 99,999,900 (x100). All operations are easily accessed with the two buttons on the front panel.

The model number and serial number of your computer is displayed on the outside wall of the computer housing and also inside the computer housing on the PC board.

SPECIFICATIONS – COMPUTER DISPLAY

MECHANICAL	
Housing Material	Transparent Amorphous Nylon
ELECTRICAL	
Power Requirement	DC power provided by 10-pin flex cable from module
K-Factor	Minimum: 0.001 pulses/unit Maximum: >999,999 pulses/unit
Field Calibration Correction	Minimum: -99.999% Maximum: +99.999%
Readout Totals	Minimum Display: 0.001 Maximum Display: 999,999 (x100)
Field Calibration	Yes

STANDARD FEATURES INCLUDE

- (2) Totalizing Registers
- (1) Factory Calibration Curve
- (1) Field Calibration Curve
- Rate of Flow Feature
- Flowrate Time Period in Day, Hour, minutes, or Seconds

SECTION C – Q9 Computer Display

SPECIFICATIONS (continued)

COMPUTER DISPLAY TERMINAL CONNECTIONS

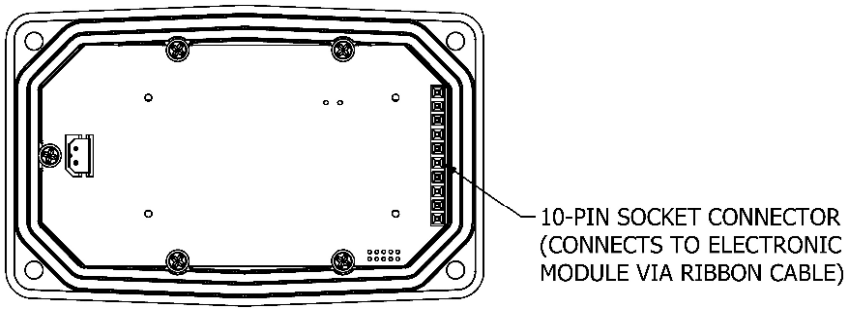


Figure C1

DIMENSIONS

Length "A"	Height "B"	Height (Mounted) "C"	Width (Widest Point) "D"
3.40 in. (8.6 cm)	0.85 in. (2.1 cm)	0.72 in. (1.8 cm)	2.14 in. (5.4 cm)

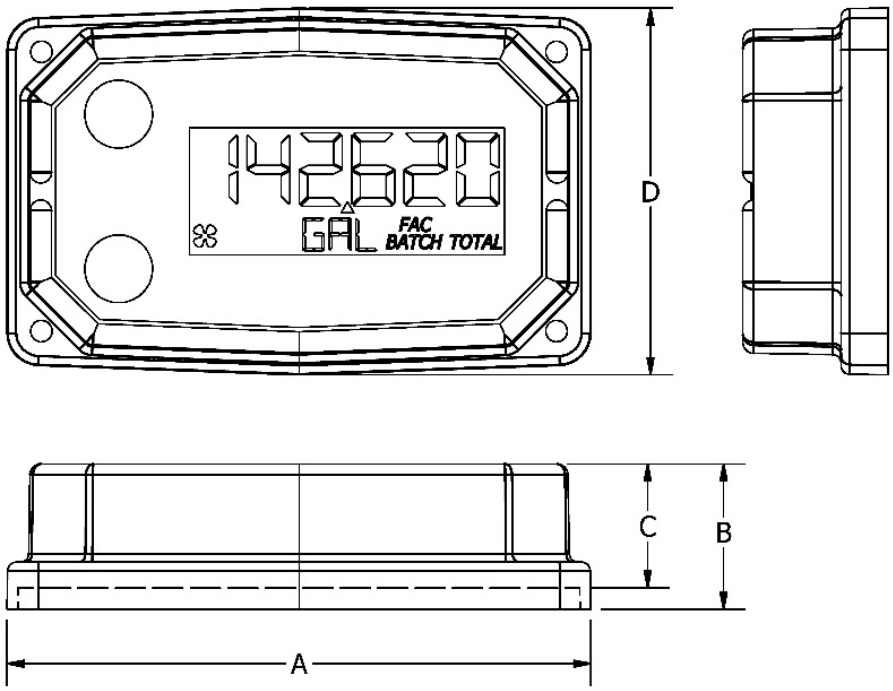


Figure C2

SECTION C – Q9 Computer Display

SPECIFICATIONS (continued)

COMPUTER DISPLAY FEATURES

Familiarize yourself with the computer features before installation and use.

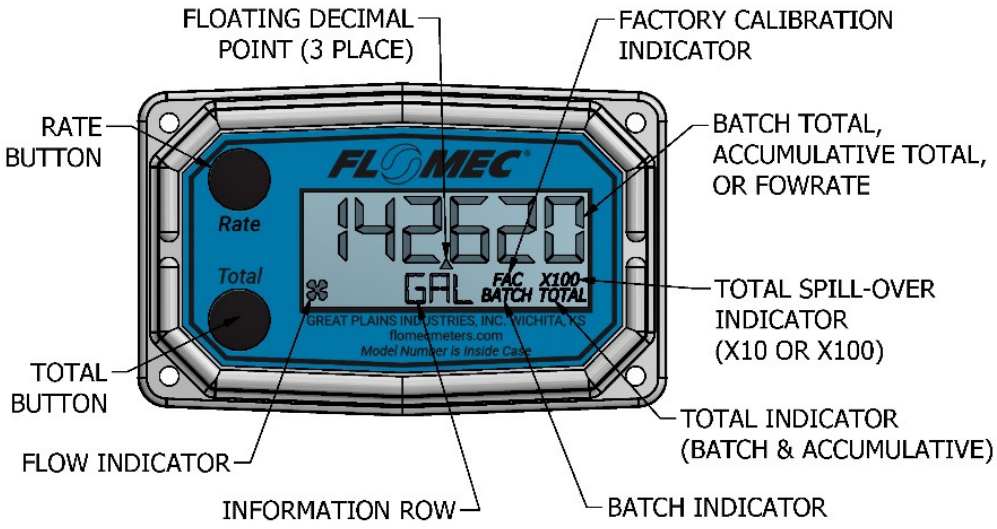


Figure C3

INSTALLATION

INSTALLATION

There are (3) major electronic components comprising the FLOMEC® ultrasonic meter: The ultrasonic insert, the electronic module, and the computer display. All items are assembled and wired at the factory.

The computer display is installed on top of the electronics module. It receives its power through a 10-pin flex cable from the electronic module. The electronic module also supplies the computer display with flow data from the ultrasonic insert via the same 10-pin flex cable.

Since all displays are mounted to the electronic module, please review and thoroughly understand the role of the electronic module in your installation.

All FLOMEC ultrasonic inserts are designed to measure flow in only one direction. The direction is indicated by the arrow on the insert. If the computer display is not oriented as desired for your installation, it can be rotated **by rotating the electronic module.** (See Figure C4)

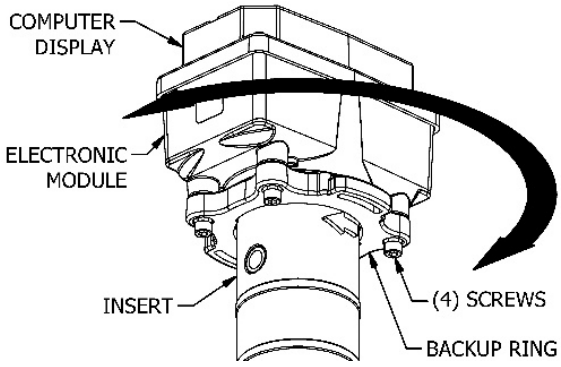


Figure C4

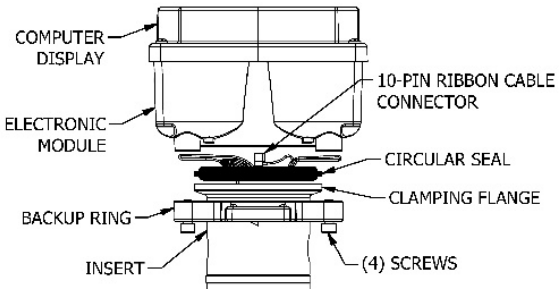


Figure C4A

NOTE: To rotate the computer display, loosen the (4) screws retaining the backup ring against the clamping flange of the insert. (See Figures C4 & C4A)

Gently rotate electronic module with attached computer display as a unit, until the computer display is oriented as desired.

Tightening the (4) screws will tighten the backup ring against the clamping flange and the electronic module against the gasket. (See figure C4A)

NOTE: *Before tightening the (4) screws, ensure the gasket is seated properly. (See Figure C4A)*

The 10-pin ribbon cable connecting the insert to the electronic module will adjust to ensure its connector remains seated to the electronic module during rotation.

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SECTION C – Q9 Computer Display

OPERATION

COMPUTER DISPLAY

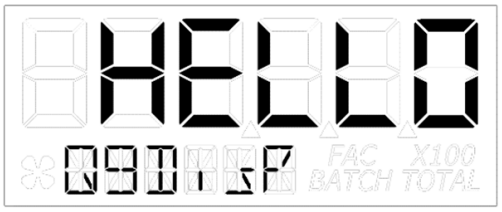
All operations are revealed on the LCD using the large 6-characters in the top row and smaller characters and symbols in the second row. These characters and symbols indicate information regarding totals, flow, calibration, units of measure and operational messages.

Push button operation varies dependent upon the various modes of operation, i.e. Normal Operation mode, Field Calibration mode, and User Configuration mode. Their operation will be described in their respective sections.

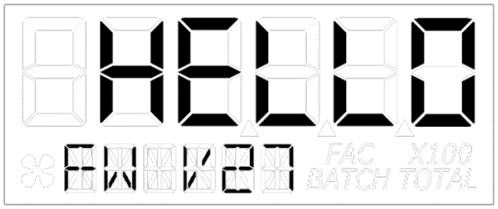
ACTIVATE THE COMPUTER

When batteries are installed, the computer is on continuously and always ready to perform.

The computer is powered by field replaceable commercially available batteries. Reference the Maintenance Section for battery replacement details.



When batteries are initially installed or replaced, the initialization routine will start the LCD display blank, and then display “HELLO” on the top row and “Q9Disp” on the information row for one second.



The LCD will then display “HELLO” on the top row and “FW Vxx” on the information row for one second. The Vxx will be the version of the firmware installed on the display. Example: “FW V27” indicates firmware version 27 installed on the display.

General

The computer maintains two totals; Batch total and accumulative total. The batch total can be reset to measure flow during a single use. The accumulative total provides continuous measurement and cannot be reset.

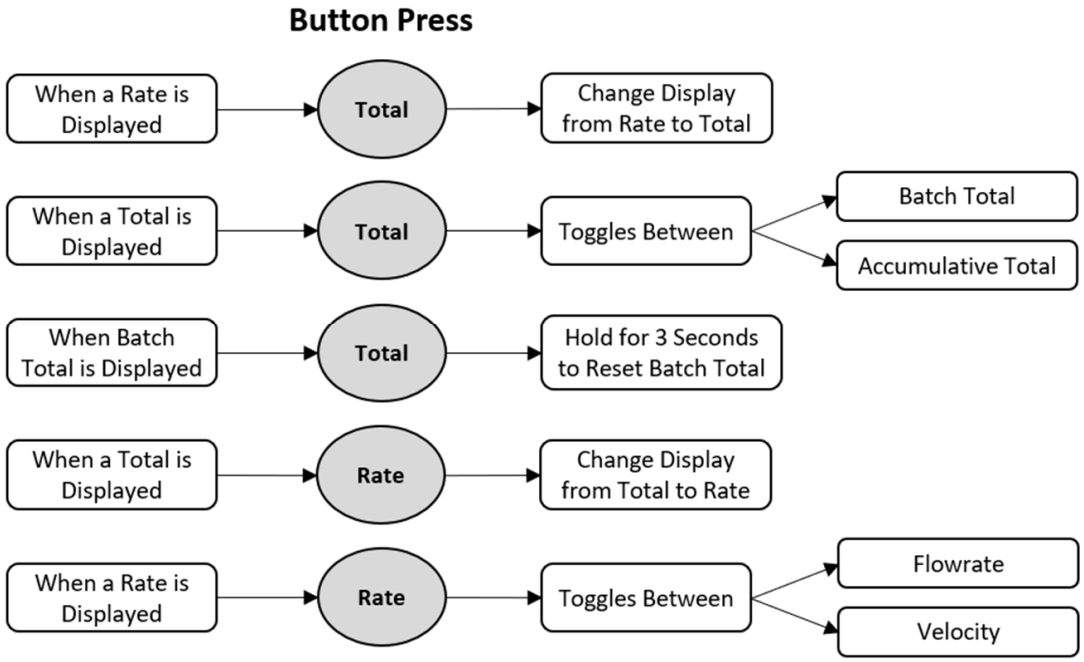
The normal operation map on the next page is useful for understanding what menus will display with various button presses. Following the map are instructions for checking the firmware version and instructions for viewing firmware version specific detailed operations.

SECTION C – Q9 Computer Display

OPERATION

NORMAL OPERATION

Normal Operation Map



Checking the Firmware Version

The firmware version will be displayed every time on initial power up. For more details on this view “Activate the Computer” on the previous page.

The firmware version can also be checked by navigating through several screens located inside of Diagnostics Mode shown below.

Diagnostics Mode

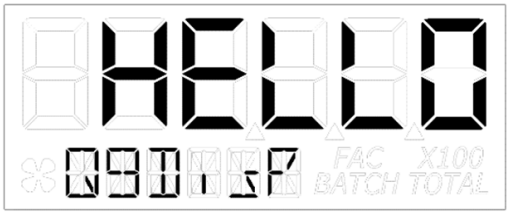
While either Rate of Flow or Velocity is displayed, Press and Hold the **Rate** button for 3 seconds. Diagnostics Mode can be exited at any time by Pressing and Releasing the **Rate** button. Diagnostics Mode will automatically exit after 90 seconds of inactivity.

Several screens will need to be progressed through by pressing and releasing the **Total** button to reach the firmware version screen.

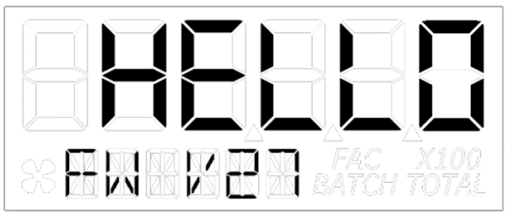
OPERATION

NORMAL OPERATION

Firmware Version



After pressing the **Total** button several times in diagnostics mode, the display will show “HELLO” on the top row and “Q9Disp” on the information row.



The next screen will then display “HELLO” on the top row and “FW Vxx” on the information row. Vxx will be the version of the firmware installed on the display. Example: “FW V27” indicates firmware version 27 installed on the display.

To return to the firmware version screen after it has been displayed while still in diagnostics mode, pressing the **Total** button several times will return the display to the firmware version screen.

Detailed Operations

For more in depth instructions on operating the Q9 display, scan the following QR code to view firmware version specific operation details.

SECTION C – Q9 Computer Display

TROUBLESHOOTING

Symptom	Probable Cause	Corrective Action
A. INACCURATE TOTALS / FLOWRATE.	1. Field Calibration not performed properly.	Field calibrate again or select Factory Calibration.
	2. Factory Calibration not suitable for liquid being measured.	Perform a Field Calibration according to Field Calibration Section.
	3. Meter operated below minimum flowrate.	Increase flowrate.
	4. Entrained air suspended in water flow.	Maximum 10% entrained air allowable.
	5. Faces of transducers dirty.	Remove insert. Gently clean faces of transducers. Do not touch faces with fingers, oily rags, etc.
	6. Meter installed too close to fittings.	Install correctly.
	7. Meter installed to close to motors or electrically “noisy” environment.	Install correctly.
B. BUTTON NOT WORKING.	1. Button plunger not fully pressed.	Ensure finger covers entire button.
	2. Button only operates upon release.	Release button to see display change.
	3. Assembly issue.	Contact the factory.
	4. Configuration issue.	Contact the factory.
C. “BA0.000” IS DISPLAYED.	1. Configuration issue.	a. Reset Batch and Accumulative Totals. b. Performing a Field Calibration may allow desired performance. c. Contact the factory.
D. WEIRD CHARACTERS ON SCREEN.	1. Assembly issue.	Contact the factory.
	2. Bad LCD.	Contact the factory.
E. DISPLAY IS FADED OR BLANK.	1. If battery powered, battery weak, dead, or not connected.	Remove display. Check and replace battery in electronic module.
	2. If external powered, loose or disconnected cables.	Remove display. Check flex cable connections.
	3. Ambient temperature is too cold.	Place bare hand or warmer on display for temporary readability.
	4. Computer defective.	Contact the factory.

SECTION C – Q9 Computer Display

TROUBLESHOOTING (continued)

Symptom	Probable Cause	Corrective Action
F. ENTIRE SCREEN "BLUISH".	1. Ambient / fluid temperature is reaching upper heat limits.	If readable, display is fine. If a nuisance, consider Remote Display kit options.
G. NO FLOW ON SCREEN WHEN FLUID IS MOVING IN PIPE.	1. Field Calibration not performed correctly. 2. Faces of transducers dirty. 3. Computer defective. 4. Low flow cutoff set too high.	Field calibrate again or select Factory Calibration. Remove insert. Gently clean faces of transducers. Do not touch faces with fingers, oily rags, etc. Contact the factory. Reduce value of "Hz Cut" within configuration menu. See USER CONFIGURATION MODE (Advanced Options)
H. EXCESSIVE FLOW ON SCREEN WHEN FLUID IS **NOT** MOVING IN PIPE.	1. Electro-Magnetic Interference (EMI) – Too close to motor or other electrically "noisy" equipment.	Move installation point of meter away from EMI sources.
I. PROBLEMS GETTING INTO FIELD CALIBRATION MODE.	1. Wrong button sequence.	Proceed with calibration using Field Calibration Section instructions that are included in this manual.
J. PROBLEMS NAVIGATING "DIAGNOSTIC MODE", "CONFIGURATION MODE", OR "NORMAL OPERATION MODE".	1. See this owner's manual Table of Contents for page number information for each specific "Mode" Section.	See specific "Mode" Section that is included in this owner's manual.
K. ELECTRONIC MODULE OUTPUT INACCURATE.	1. See specific Electronic Module section of this manual.	See specific Electronic Module section of this manual.

SECTION C – Q9 Computer Display

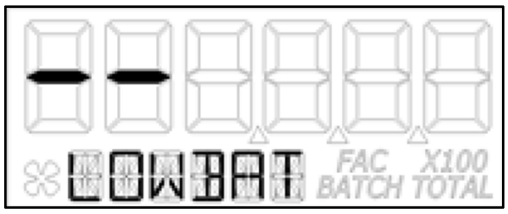
MAINTENANCE

Battery

UM Computer electronics are powered by (2) methods: external power supplied by a user provided power supply, or by a 3.6VDC lithium battery mounted in the electronic module.

Removing the battery before storing the meter will extend battery life since the computer is always on (either standby or active) when the battery is installed.

If the meter's readout should become dim, blank or the low battery message appears (see below), the battery should be replaced.



NOTE: If the battery life is sufficiently low, "LOWBAT" will be displayed in the message area on the bottom row of characters. This low battery message will be displayed automatically without running a diagnostic battery check.

Battery Replacement Information

When the UM computer display is a component of a UM meter that has an electronic module that is specifically battery powered, it is shipped with a C size lithium battery (3.6 volts) installed in the electronic module.

Battery replacements are readily available as an off-the-shelf item. To maintain the FLOMEC® warranty, the batteries listed below are approved for use.

Lithium (C size, 3.6-volts)
Tadiran TL-5920/S
Tadiran TL-4920/S
Battery Guy ER26500 NIYA
Micropower Battery Co. AriCell SCL-14

Do not use an alkaline battery.
Do not use a rechargeable alkaline or lithium-ion battery.

When the battery is disconnected or fails, the computer memory will retain the batch total, accumulative total, factory calibration curve, and field calibration curve indefinitely.

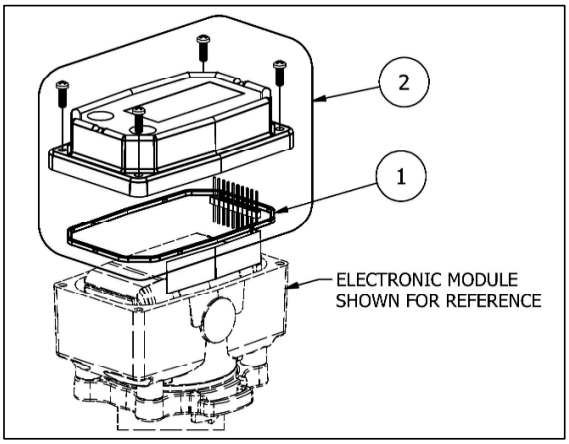
It is strongly recommended that battery checks and terminal cleaning be a part of a routine maintenance schedule. Battery terminals should be cleaned annually. The battery can be replaced without removing the meter from the piping system.

Replace Battery

1. Remove the (4) corner screws attaching the computer display to the electronic module and lift the computer display from the module without dislodging the flex cable connections.
2. Remove the battery.
3. Check the battery terminals and remove any corrosion.
4. Install the new battery and make sure the positive posts are positioned correctly. When the battery is installed correctly, the computer powers on automatically and the display will show information.
5. Make sure the seal is fully seated before placing the computer display back on the electronic module. Tighten the (4) screws previously removed.
6. Do not clean exterior of computer assembly with Isopropyl Alcohol.

SECTION C – Q9 Computer Display

REPAIR PARTS ILLUSTRATION – Q9 Computer Display Only



REPAIR PARTS LIST

Item No.	Part No.	Description	No. Reqd.
1	901002-52	Seal (Display)	1
2	Call Factory	Q9 Computer Display Replacement Kit – Includes Q9 computer display, seal, 10-pin header connector, (4) screws. ***Note:*** *Call factory to order. Each Q9 Computer Display is custom configured to match your Tee size and process line type (Tube, Pipe, P.I.P.)*	1