

QSI COVER PLATE TRANSMITTER

For FLOMEC® G2 Meters



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.

DO NOT RETURN THIS PRODUCT TO THE STORE!

Please contact Great Plains Industries, Inc.® before returning any product. If you are missing parts, or experience problems with your installation, contact our Customer Support Department. We will be happy to assist you.

Call: 888-996-3837 or 316-686-7361

Email: meters@gplains.com

SAVE FOR YOUR RECORDS

Model #: _____

Serial #: _____

Purch. Date: _____

TABLE OF CONTENTS

<i>Getting Started</i>	4
<i>Introduction</i>	4
<i>General Information</i>	4
<i>Important Notice</i>	4
<i>Safety</i>	4
<i>Installation</i>	5
<i>Wiring</i>	5
<i>Strain Reliefs</i>	5
<i>NPT Adapters</i>	5
<i>Terminal Connections Chart</i>	6
<i>QSI1 Wiring</i>	7
<i>QSI2 Wiring</i>	8
<i>QSI3 Wiring</i>	9
<i>FLOMEC App for Android</i>	11
<i>Temperature Probes</i>	11
<i>Installation & Wiring</i>	11
<i>Maintenance</i>	12
<i>Replacing Battery</i>	12
<i>Specifications</i>	14
<i>Approval Ratings</i>	15
<i>Service</i>	15
<i>Returning Parts</i>	15
<i>Warranty</i>	16

UNPACKING/INSPECTION



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.



INTRODUCTION

The QSI communications module is a multiple capability electronics package. For the G2 meter, the module is available with the plain cover plate only. The QSI module has three versions (QSI1, QSI2 or QSI3) available; each with its own mix of capabilities to better serve the customer (See Versions below).

- QSI1 is equipped with Bluetooth®, coil/digital pulse input, pulse output (flow or energy & scalable), RS485 (Modbus® RTU), temperature inputs, BTU calculator.
- QSI2 is equipped with Bluetooth, coil/digital pulse input, pulse output (flow or energy & scalable), temperature inputs, BTU calculator.
- QSI3 is equipped with Bluetooth, coil/digital pulse input, pulse output (flow scalable), 4-20mA output.

This manual contains information and meter wiring diagrams for the three different QSI electronics modules.

IMPORTANT NOTICE

QSI module electronics are very sensitive to electric noise if operated within 6 inches of some electric motors, relays, transformers or other sources of electronic noise.

If the QSI electronics are used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

GENERAL INFORMATION

QSI electronics are mounted into the cover plate of the meter you ordered. The QSI electronics converts the voltage (or pulses) from the meter into usable information.

The QSI module electronics is powered by customer supplied external power.

SAFETY

- This product is not approved for use in hazardous locations.
- Be sure O-rings and seals are kept in good repair.
- When applying power, adhere to specifications in this manual.
- Disconnect external power before attaching or detaching input or output wires.

INSTALLATION

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

NOTE: *There is no external visual difference between QSI1, QSI2, or QSI3 communications suites when they are installed.*

NOTE: *If you ordered a QSI communications suite with your meter, it was installed at the factory. Please review and thoroughly understand all manuals and installation instructions before proceeding.*

WIRING

All electronic options are associated with a flat style of meter cover plate. This cover plate has four threaded ports, compatible with PG7 threads, for gaining wiring access to the electronics inside the cover plate.

The meter is shipped with the ports environmentally sealed with a threaded plug and seal. Remove one or more of these plugs as required to install the supplied port fittings below.

Each meter is supplied with cable gland strain reliefs with O-rings and 1/2 NPT adapters with seals for use in the threaded ports of the meter cover plate.

Select the port fittings that fit your process and replace the threaded plugs in the cover plate with the fittings as required.

NOTE: *The threaded plugs installed at the factory may be left in any unused cover plate port indefinitely.*

It is recommended that a “removable” thread-locker (fluid, stick, tape, spray, etc.) be used when installing the strain reliefs or adapters into the cover plate ports.

STRAIN RELIEFS

The cable gland strain reliefs will accommodate a cable diameter of 0.11 - 0.26 inches (2.79 - 6.6mm) and provide an environmental seal around the cable when the dome-nut is tightened.

NPT ADAPTERS

The 1/2 NPT adapter fittings are used for attaching flex conduit to the meter, for those applications that require cable runs to be enclosed in conduit.

NOTE: *Cable to be provided by customer to accommodate job requirements. Cable is not included with meter.*

INSTALLATION – (continued)

TERMINAL CONNECTIONS CHART

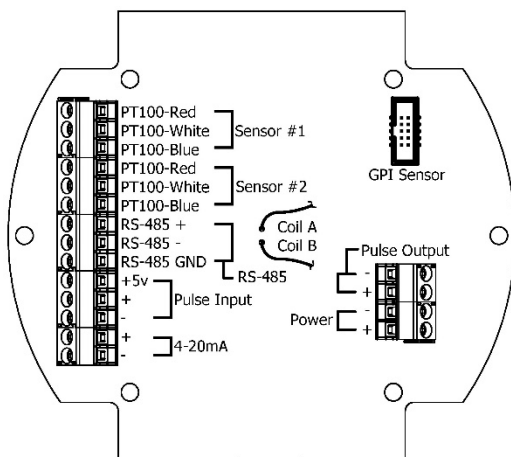


Figure 1

TEMP SENSOR	
PT100-Red	Sensor VCC Output
PT100-White	Input High Side
PT100-Blue	Input Return
RS-485 (Galvanically Isolated)	
RS485 (+)	Positive Signal
RS485 (-)	Negative Signal
RS485 GND	Circuit Ground*
PULSE INPUT	
+5V	5VDC output to power external sensor
(+)	Digital Pulse Frequency Input, up to 3kHz
(-)	Digital Pulse Return
4-20mA (Galvanically Isolated)	
(+)	4 to 20mA current loop-current in to transmitter
(-)	4 to 20mA current loop-current out of transmitter*

***NOTE:** It is not recommended to connect isolated ground connections together or to board common.

Coil A	Low level sine wave input
Coil B	Low level sine wave input
GPI SENSOR	
Ribbon cable connection to GPI custom sensor designs	
PULSE OUTPUT (Galvanically Isolated)	
(-)	Pulse Output return current*
(+)	Pulse Output frequency output. This is a "current sinking open collector" output ***
POWER INPUT	
-)	12-36VDC Input A**
(+)	12-36VDC Input B**

****NOTE:** Polarity of voltage for DC is not important. However, an earth ground isolated power supply is required to prevent earth ground loop currents and ground fault conditions.

*****NOTE:** This output may require an external pull up resistor if interfacing equipment does not include one.

QSI1 WIRING

QSI VERSION 1 – PC BOARD RS-485 BTU

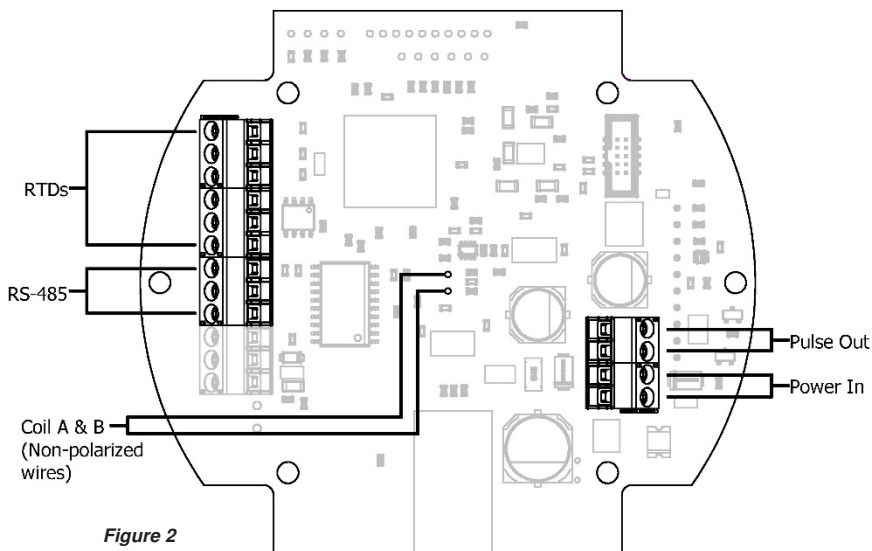


Figure 2

QSI VERSION 1 - WIRING DIAGRAM

Inputs: Temperature Sensors, Variable Reluctance, Pickup Coil

Outputs: RS-485, Pulse Output

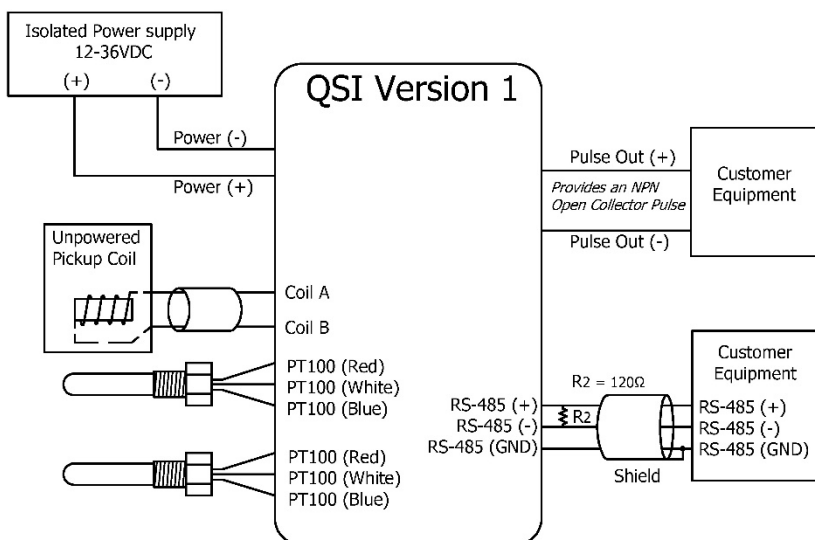
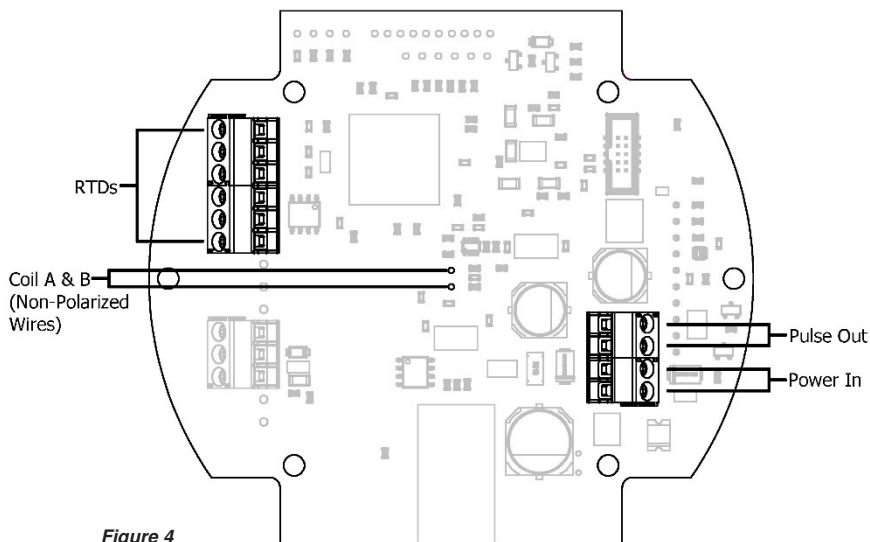


Figure 3

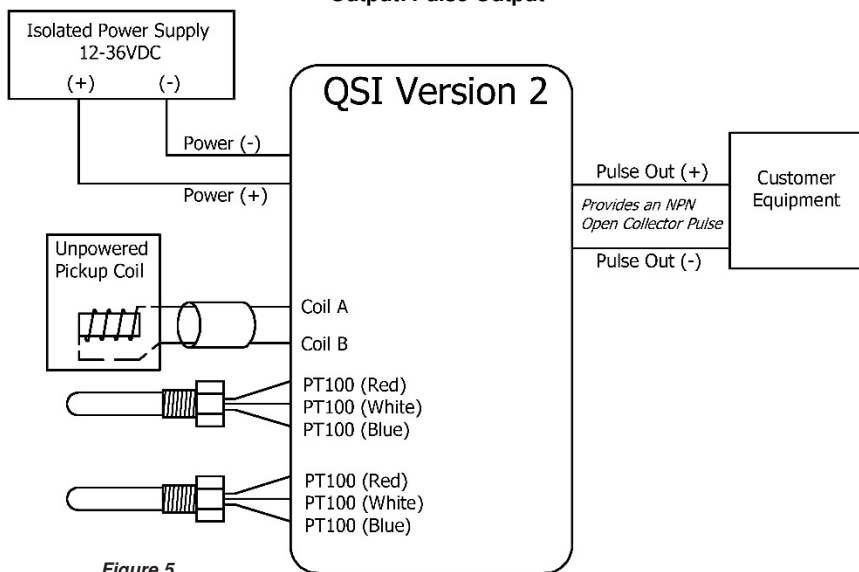
QSI2 WIRING

QSI VERSION 2 – PC BOARD
Pulse In
BTU



QSI VERSION 2 - WIRING DIAGRAM

Inputs: Temperature Sensors, Variable Reluctance, Pickup Coil
Output: Pulse Output



QSI3 WIRING

QSI VERSION 3 – PC BOARD
4-20mA

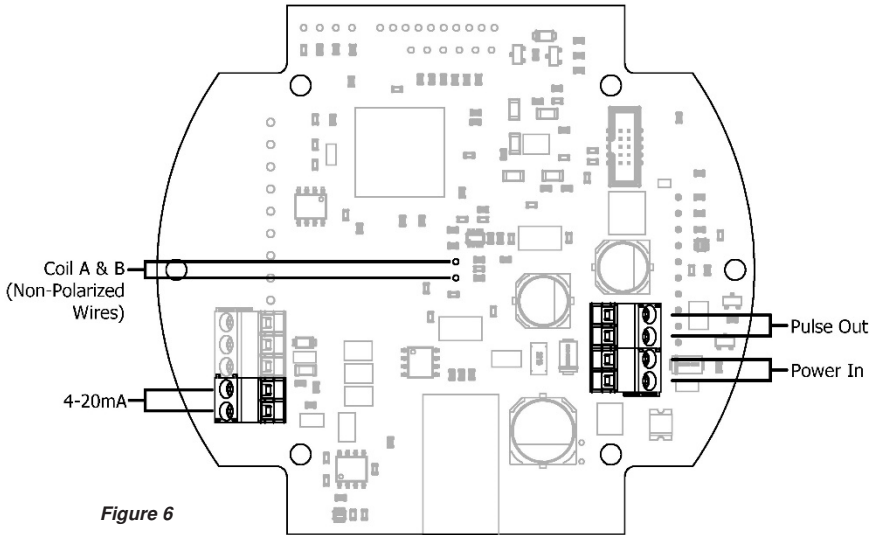


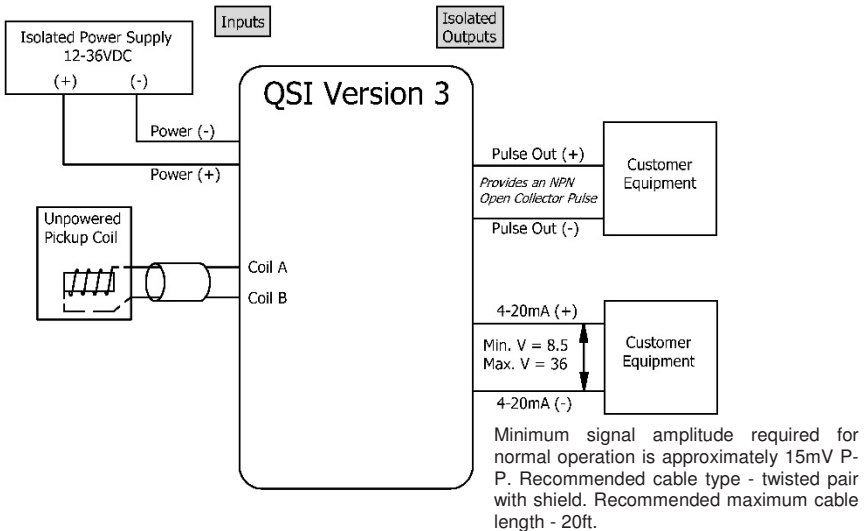
Figure 6

QSI VERSION 3 - WIRING DIAGRAM

Customer Equipment with Built-in Power Supply

Inputs: Standard Remote Sensor (Variable Reluctance Pickup Coil)

Outputs: Customer Equipment, 4-20mA Sensing, Built-in Loop Power Supply



CAUTION: When reassembling the cover plate, make sure the enclosure seal is not crimped or twisted. Do not over-tighten screws (hand-tighten only).

Figure 7

QSI3 WIRING - (continued)

QSI VERSION 3 - WIRING DIAGRAM

Customer Equipment without Built-in Power Supply

Inputs: Standard Remote Sensor (Variable Reluctance Pickup Coil)

Outputs: 4-20mA with Separate Power Supply

Note: Either of the wiring diagrams below (**Low Side Negative Wiring-Figure 8A**) or (**High Side Positive Wiring-Figure 8B**) are valid, as long as the current direction arrows and the (+) and (-) connections on all of the equipment in the loop are correct.

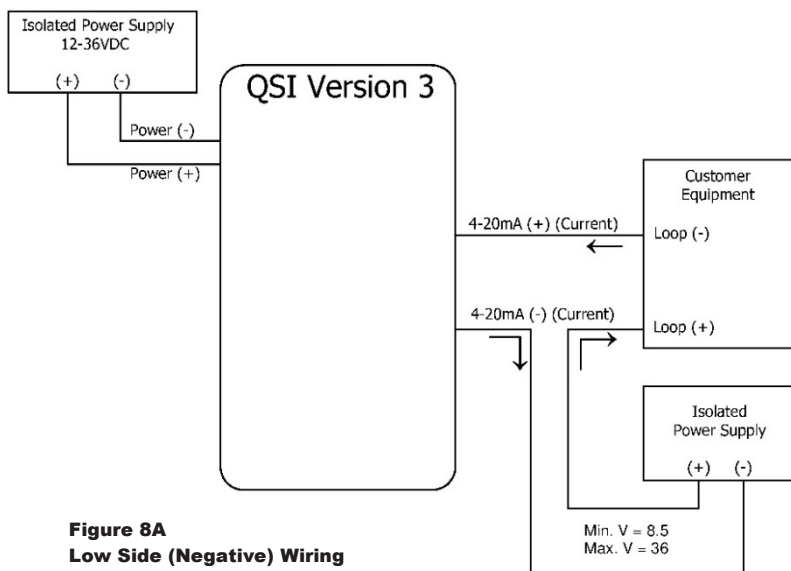


Figure 8A
Low Side (Negative) Wiring

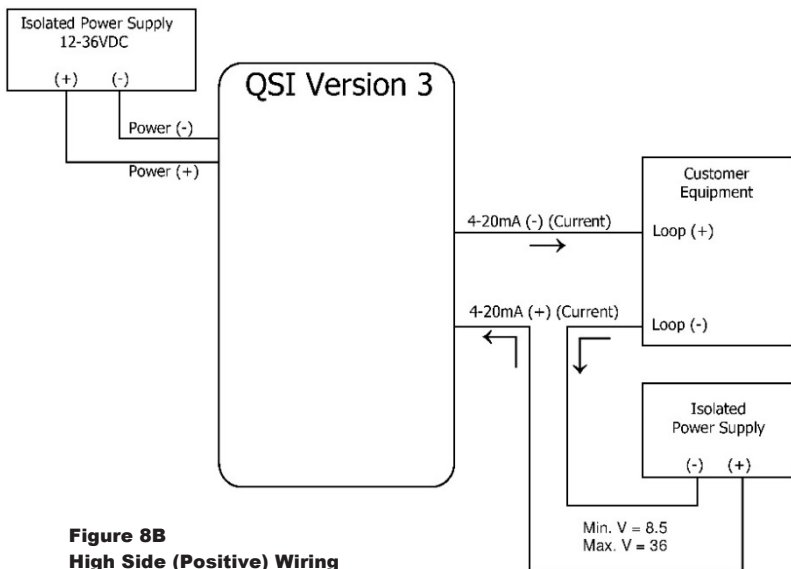


Figure 8B
High Side (Positive) Wiring

FLOMEC APP FOR ANDROID

To learn how to get started using the FLOMEC App, visit:

flomecmeters.com/downloads/flomec-app-quickstart.pdf



[FLOMEC APP QUICKSTART](#)

**TEMPERATURE PROBES**

If you ordered a QSI1 or QSI2 electronic module and intend to use the BTU calculator function in your process, you will need to provide temperature probes and cables suitable for your process. The cables are not connected to the QSI PC board.

If the cables used with your probes has a smaller diameter than the standard strain reliefs (black) provided with your meter, reduced fit strain reliefs (gray) are available as a kit from the factory.

NOTE: PN 145500-13, Kit, strain relief, temperature sensor. Includes: (2) PG7 thread strain reliefs (reduced fit), .08 - .20 cable diameter range.

INSTALLATION & WIRING

NOTE: The meter should be installed in the system return line for accurate BTU calculations.

Typically, a temperature probe is installed in the process piping, initially near each end of the meter to calculate the differential between the two probes (inlet vs outlet), if any. The differential is captured and shown in the Android application as "Temp 1" and "Temp 2" and is used in the BTU calculations to ensure an accurate calculation.

For clarity, one probe is considered PT100 #1 and is connected to the meter PC board in that location. It is shown as "Temp 1" in the Android application.

The other probe is then considered PT100 #2 and is connected to the meter PC board in that location. It is shown as "Temp 2" in the Android application.

To perform the differential check, the probe installed near the meter outlet end should be considered PT100 #1.

The probe installed near the meter inlet end should be considered PT100 #2.

After wiring the probes to the correct terminal of the PC board, perform the differential check.

TEMPERATURE PROBES

INSTALLATION & WIRING - (continued)

After performing the differential check, remove the PT100 #2 probe near the inlet end of the meter and install the removed probe in the system supply line.

During normal system operation, probe PT100 #1 is installed near the meter outlet end and probe PT100 #2 is installed in the system supply line. Accurate system BTU usage is calculated between the (2) probes.

Typically, the probe cables are the same length. Excess cable from the PT100 #1 probe (near the meter outlet) to the cover plate may be coiled and secured using plastic quick ties.

MAINTENANCE

Check cable-entry seals periodically. Tighten and/or apply sealant if needed. This is especially important in environments containing heavy concentrations of dust, oil mist, or other residue.

Check all wiring connections occasionally for oxidation or corrosion. Clean and re-seat if such conditions are noted.

If necessary, check and re-seat any connections that may have been subjected to strain (during rework or construction, for example).

REPLACING BATTERY

NOTE: *The QSI2 and QSI3 communications module has a 3V lithium coin cell battery installed on the PC board. In case of power failure, the battery functions as power backup to maintain the internal system time. Any QSI2 or QSI3 feature that uses a time reference as part of its functionality will be immediately accurate to the current time when power is restored.*

- **DISCONNECT POWER TO METER**
- Remove (6) screws retaining the cover plate to the base and lift the cover plate free of the meter body (see Figure 9).
- Flip the cover plate over and remove (4) screws retaining the PC board assembly (see Figure 10).
- Remove and replace the coin cell battery (CR2032) on the backside of PC board (see Figure 11).
- Reverse the procedure to reassemble the cover plate to the base. Make sure the cover plate seal is seated before tightening the (6) cover plate screws.

MAINTENANCE – (continued)

REPLACING BATTERY – (continued)

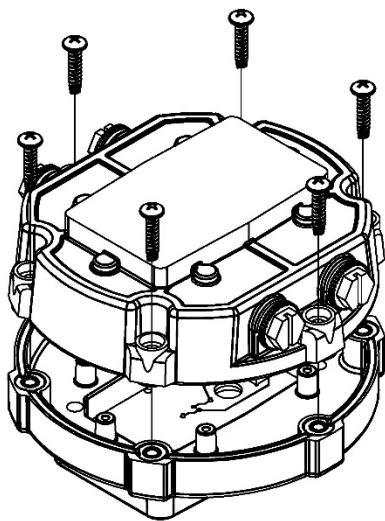


Figure 9

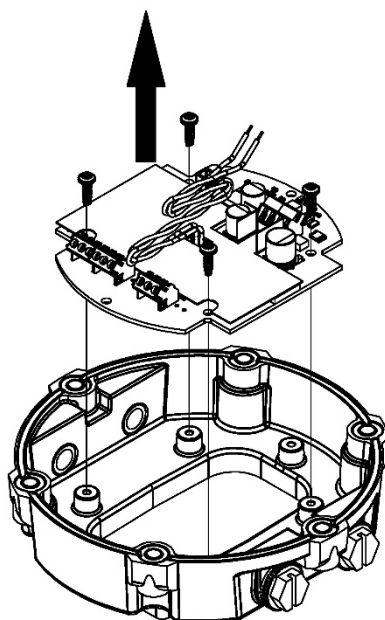
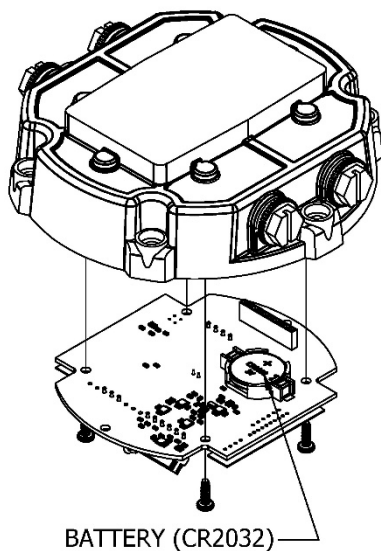


Figure 10



BATTERY (CR2032)

Figure 11

SPECIFICATIONS

MECHANICAL	
Cover Plate Port Threads	Female 1/2-20 UNF-2B (Compatible with PG7 thread)
Port Strain Relief	Hubble PG7
Grip Range	0.11"-0.26" (2.79 - 6.6mm)
Port Conduit Adapter	GPI PG7 x 1/2 in. NPT Male
Recommended Cable	Belden #9501 (2-Conductor w/Drain Wire, Shielded)
TEMPERATURES	
Operation Temperature	+32°F to +140°F (0°C to +60°C)
Ambient Air Operation Temp	0°F to +140°F (-18°C to +60°C)
POWER SUPPLY	
Voltage Requirement	Min. 12 VDC (voltages below 12V will result in meter accuracy issues)
	Max. 36 VDC (higher voltage may damage unit)
Battery Backup (QSI2, QSI3 Only)	Coin cell lithium, 3V (CR2032) UL APPROVED
MAX POWER CONSUMPTION	
G2 Meter with QSI	170mA 4 watts @ 24VDC 6 watts @ 36VDC

ELECTRICAL	
Pollution Degree	2
Installation Category	1
Altitude	2000m Max.
Indoor use only	
OUTPUTS & COMMUNICATION	
QSI Version 1:	
Bluetooth	
Coil/Digital Pulse Input	
Pulse Output	
RS485	
Temperature Inputs	
BTU Calculator	
QSI Version 2:	
Bluetooth	
Coil/Digital Pulse Input	
Pulse Output	
Temperature Inputs	
BTU Calculator	
QSI Version 3:	
Bluetooth	
Coil/Digital Pulse Input	
Pulse Output	
4-20mA output	

APPROVAL RATINGS



IP65



SERVICE

For warranty consideration, contact your local distributor. If you need further assistance, contact the GPI Customer Service Department at:

1-888-996-3837

You will need to:

- Provide information from the decal on your meter.
- Receive a Return Authorization number.
- Flush any fluid from the meter before shipping to the factory.

RETURNING PARTS

Please contact the factory before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call. GPI can also inform you of any special handling requirements you will need to follow covering the transportation and handling of equipment which has been used to transfer hazardous or flammable liquids.

CAUTION: Do not return equipment without specific authority from the GPI Customer Service Department. Due to strict regulations governing transportation, handling, and disposal of hazardous or flammable liquids, GPI will not accept equipment for rework unless it is completely free of liquid residue.



The Waste Electrical and Electronic Equipment (WEEE) directive (2002/96/EC) was approved by the European Parliament and the Council of the European Union in 2003. This symbol indicates that this product contains electrical and electronic equipment that may include batteries, printed circuit boards, liquid

crystal displays or other components that may be subject to local disposal regulations at your location. Please understand those regulations and dispose of this product in a responsible manner.

RoHS Compliant (2011/65/EU)

This product is in compliance with the RoHS Directive of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.



FLOMEC® TWO-YEAR LIMITED WARRANTY

Great Plains Industries, Inc. 5252 E. 36th Street North, Wichita, KS USA 67220-3205, hereby provides a limited warranty against defects in material and workmanship on all products manufactured by Great Plains Industries, Inc. This product includes a 2-year warranty. Manufacturer's sole obligation under the foregoing warranties will be limited to either, at Manufacturer's option, replacing or repairing defective Goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the Buyer, and Buyer's exclusive remedy for breach of any such warranties will be enforcement of such obligations of Manufacturer. The warranty shall extend to the purchaser of this product and to any person to whom such product is transferred during the warranty period.

The warranty period shall begin on the date of manufacture or on the date of purchase with an original sales receipt. This warranty shall not apply if:

- A. the product has been altered or modified outside the warrantor's duly appointed representative;
- B. the product has been subjected to neglect, misuse, abuse or damage or has been installed or operated other than in accordance with the manufacturer's operating instructions.

To make a claim against this warranty, or for technical assistance or repair, contact your FLOMEC distributor or contact FLOMEC at one of the locations below.

In North or South America contact

Great Plains Industries, Inc.
5252 East 36th St. North
Wichita, KS 67220-3205
USA

888-996-3837

www.flomecmeters.com
(North America)

Outside North or South America contact

GPI Australia
(Trimec Industries Pty. Ltd.)
12/7-11 Parraweena Road
Caringbah NSW 2229
Australia

+61 02 9540 4433

www.flomec.com.au

The company will step you through a product troubleshooting process to determine appropriate corrective actions.

GREAT PLAINS INDUSTRIES, INC., EXCLUDES LIABILITY UNDER THIS WARRANTY FOR DIRECT, INDIRECT, INCIDENTAL AND CONSEQUENTIAL DAMAGES INCURRED IN THE USE OR LOSS OF USE OF THE PRODUCT WARRANTED HEREUNDER.

The company herewith expressly disclaims any warranty of merchantability or fitness for any particular purpose other than for which it was designed.

This warranty gives you specific rights and you may also have other rights which vary from U.S. state to U.S. state.

NOTE: In compliance with MAGNUSON MOSS CONSUMER WARRANTY ACT – Part 702 (governs the resale availability of the warranty terms).

Wichita / Sydney

GREAT PLAINS INDUSTRIES



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