Q09 Display

Owner's Manual
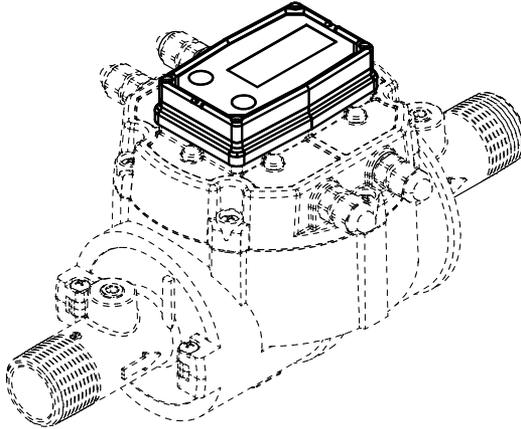
Q09 Display
(Shown on 1 inch NPT QSE Meter)

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INTRODUCTION

The Q09 display is specifically designed to operate with the electronics housed within the cover plate. The display is mounted on a specialized cover plate containing other electronics and together they make up the total Q09 electronics package. The electronics in the cover plate (QSB [not available as adapter kit]) or (QSI1, QSI2 or QSI3) when externally powered, provides correctly adjusted power to the display via a 10 pin bridge connector. Information on the operation, capabilities and wiring of the electronics within the cover plate that is mated to your Q09 display is contained in its own dedicated manual (QSB, QSI1, QSI2, QSI3).

The display microprocessor electronics have extremely low power requirements and high data retention capabilities in both RAM and ROM. Information is clearly displayed on a large 6-digit LCD readout with two-point floating decimal for totals from .01 to 999,999. All operations are easily accessed with the two buttons on the front panel.

The Q09 display is available mounted to the meter you ordered or as a kit that adapts the electronics to other GPI meters. The electronics inside the cover plate converts the voltage (or pulses) from the meter into usable information. This information, along with power, is supplied to the display that translates the information into calibrated flow units shown on the display's readout.

The display is a precision measuring instrument and should be handled as such. Refer to the Specifications Section to confirm required features.

IMPORTANT NOTICE

Q09 displays 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 Q09 Display is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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.

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

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

INSTALLATION

If you ordered your Q09 display with a meter, it is installed at the factory. If you ordered your Q09 display separately from a meter (i.e. repair part), follow the instructions below to install on a QSE meter. If you ordered your Q09 display with one of our several types of meter adapter kits, follow the separate instructions enclosed with the kit to install the unit. In every case, please review and thoroughly understand all manuals and installation instructions before proceeding.

- Make sure the seal is seated in its groove on the bottom of the display (see Figure 1).
- Insert the long pins of the 10 pin bridge connector about half-way into the 10 pin PC board connector.
- Then, align the 10 pin connector on the display with the short pins on the 10 pin bridge connector and engage pins using gentle force until the display is seated on the cover plate (see Figure 2).
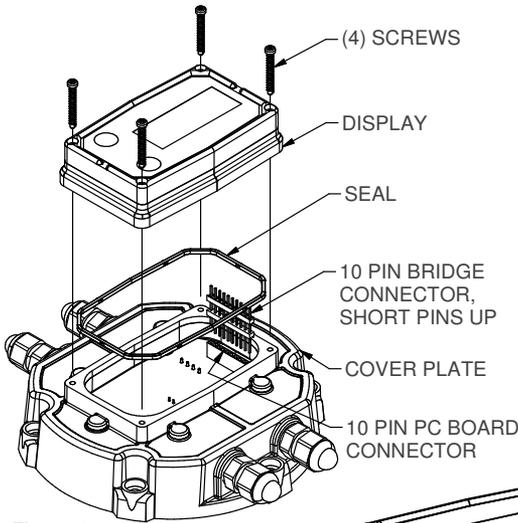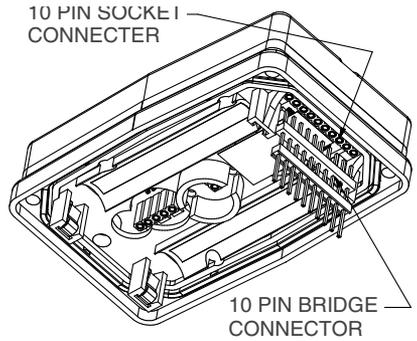
(4) SCREWS

DISPLAY

SEAL

10 PIN BRIDGE CONNECTOR, SHORT PINS UP

COVER PLATE

10 PIN PC BOARD CONNECTOR

Figure 1

10 PIN SOCKET CONNECTER

10 PIN BRIDGE CONNECTOR

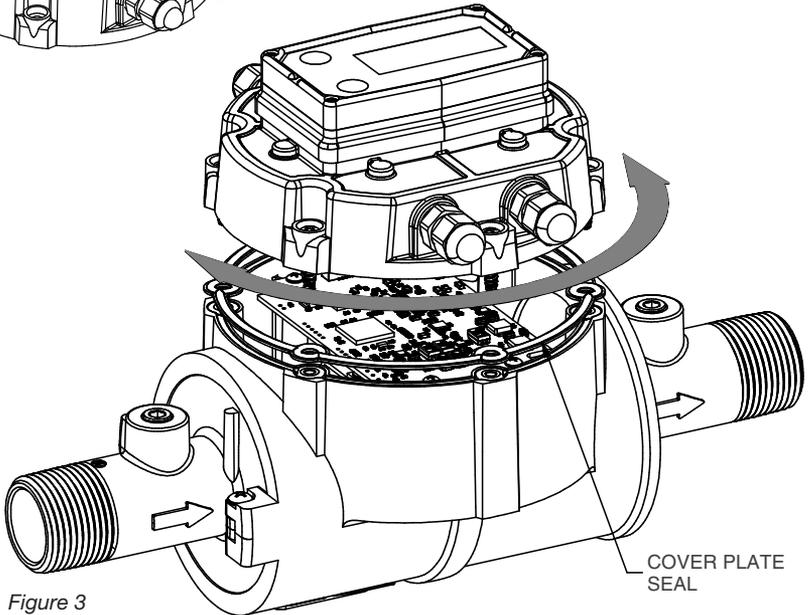*Figure 2*

COVER PLATE SEAL

Figure 3

- When the display is seated on the cover plate, the pins are fully engaged. Secure the display to the cover plate with the four screws at the corners of the faceplate. Make sure the seal is fully seated before tightening the screws.

QSE meters are designed to measure flow in only one direction. If the display is upside down in your installation, remove the six screws retaining the cover plate to the meter, turn the cover plate with display as required and reinstall the screws. A ribbon cable connects the electronics within the cover plate to electronics within the meter body and allows 180 degrees of movement in either direction. Make sure the cover plate seal is fully seated before tightening the screws (see Figure 3).

DISPLAY

All operations are reflected in the LCD readout. The large center digits indicate amounts, where smaller words or "icons" located above and below indicate specific information regarding totals, flow, calibration and units of measure.

Activate the Meter: When power is supplied to the meter, the display automatically becomes active, is on continuously and always ready to perform. It remains active until meter power is disconnected.

BATCH AND CUMULATIVE TOTALS

The display maintains two totals. The Cumulative Total provides continuous measurement and cannot be manually reset. The Batch Total can be reset to measure flow during a single use. The Cumulative Total is labeled TOTAL 1, Batch Total is labeled TOTAL 2 BATCH.

When the Cumulative Total reaches a display reading of 999,999 the display will highlight an X10 icon. This indicates to the operator that a zero must be added to the 6 digits shown. When the next rollover occurs, the display will highlight an X100 icon. This indicates to the operator that two zeros must be added to the 6 digits shown.

Press the DISPLAY button briefly to switch between the TOTAL 1, TOTAL 2 BATCH and FLOWRATE. When TOTAL 2 BATCH is displayed, you can hold the DISPLAY button for 3 seconds to reset the Batch Total to zero.

When fluid is flowing through the meter, a small propeller icon is highlighted.

Flowrate Feature: To use this feature, press and release DISPLAY button until FLOWRATE icon appears. The factory set time base will be highlighted to the right of FLOWRATE (M = minutes, H = hours, D = days). When FLOWRATE is invoked, the display will be indicating rate of flow.

CALIBRATION

FACTORY CALIBRATION

All Q09 Displays

All calibration units are visible to the user as icons on the top line of the display, above the numeric digits.

All units are configured with a "factory" calibration. Both gallons and litres are available ("GL" or "LT" will be displayed). While holding the CALIBRATE button, briefly press DISPLAY to toggle between gallons and litres. This factory calibration (indicated with FAC) is permanently programmed into the display and is not user adjustable.

NOTE: *Your display may have other units of measure programmed into it. If so, holding the CALIBRATE button and momentarily pressing the DISPLAY button will toggle through all factory set units. Other possible units are: IGL (imperial gallon), QT (quart), CF (cubic feet), CM (cubic meter), BL (42 gal. barrel), CC (cubic centimeter) or OZ (ounce).*

Switching between different units will not corrupt the Total's contents. For example, in GL mode, the display totalizes 10.00 gallons, if the user switches to LT mode, the display will

read 37.85 litres (the same volume, different unit). The "field" calibration may be set by the user, and can be changed or modified at any time using the calibration procedure described in the Field Calibration Section. Totals or flowrate derived from the field calibration are invoked when the FAC icon is no longer visible on the top line of the display.

FIELD CALIBRATION

If the meter is suspected of being incorrect, field calibration is a method of adjusting the meter K-factor to compensate for error causing factors. The method of field calibration is dependent on the electronics that is mated with your Q09 display.

NOTE: Q09 displays not mated to QSI electronics will use the manual entry Correction Factor Method outlined below.
The manual entry method of field calibration outlined below is disabled when the Q09 display is mated with QSI electronics. The QSI electronics becomes the controlling element that manages the manual calibration entries for the display. This field calibration method is available in the QSI Android Application noted in the QSI owner's manual.

Q09 Displays Not Mated to QSI Electronics

A manual entry method using the buttons on the Q09 display is used. This method adjusts the K-factor by percentages to match the display volume with actual volume.

Calibration Using Display (Correction Factor Method)
Field Calibration and Factory Calibration were outlined previously in the Calibration Section.

Factory calibration settings are programmed into each display during manufacturing, using water at 70° F (21° C). Readings using the Factory Calibration (FAC) may not be accurate in some situations. For example: Under extreme temperature conditions, non-standard plumbing configurations or with fluids other than water.

1. To field calibrate, press and hold the CALIBRATE and DISPLAY buttons for about 3 seconds until you see FLdCAL. Release both buttons and you will see CF - 00.0. You are now in the field calibration mode and values from -99.9% to +99.9% can be entered.

2. The +/– position appears either as an "underscore" character for positive, or as a "hyphen" character for negative. The DISPLAY button selects the position and the CALIBRATE button toggles this character.

3. The DISPLAY button can then be pushed to select the numeric positions. Press the CALIBRATE button to scroll from 0 to 9. Enter the percentage of change you want the display to correct. When satisfied with the value, press both CALIBRATE and DISPLAY buttons simultaneously. CALEnd will be displayed and unit will go back to normal operation, less the FAC (factory calibration) icon.

4. All enabled units-of-measure remain visible and selectable – the entered correction will be applied to all enabled units.

5. To return to factory calibration (FAC), press and hold both CALIBRATE and DISPLAY buttons for about 3 seconds until FAcCAL is displayed. Then release buttons. The unit should return to normal operation and FAC icon is visible.

The Q09 display has been programmed with many features, most of which can be enabled by the end user by way of a configuration process. By disabling "unnecessary" features, day-to-day flowmeter operation can be greatly simplified, making the unit easier to use. There are several features that are disabled by default when shipping standard meters. (For example, K-Factor Entry Field Calibration, described below.) For more advanced users, it may be desirable to enable ALL possible features. User configurable features include:

• Totalizers/Modes Enabled (Cumulative Total, Batch 2 Total, Flowrate Mode).

• Flowrate Timebase (Minute, Hour, Day).

• Factory Calibration Curve Units Enabled – Gallons, Litres, Imperial Gallons, Quarts, Ounces, Cubic Feet, Cubic Centimeters, Cubic Meters or Barrels (42 Gal).

• Dispense/Display or K-Factor Entry Calibration.

CHANGING CONFIGURATION SETTINGS

Q09 Displays Not Mated to QSI Electronics

NOTE: Q09 displays not mated to QSI electronics can use the manual entry method outlined below. The manual entry method of changing configuration settings outlined below is disabled when the Q09 display is mated with QSI electronics. The QSI electronics becomes the controlling element that manages the manual configuration entries. This configuration setting method is available in the QSI

Android Application noted in the QSI owner's manual.

Access to the configuration process is restricted for security until a "password" is entered. Contact your distributor or GPI to get the password and instructions to unlock and reset configuration settings. This information is also available at www.FLOMEC.net. Configurations are entered and stored as six-digit "codes" where each digit represents a setting for one of the configuration options. New configuration settings are stored in the display's long-term memory and will not be lost either in OFF mode or during electrical failure.

K-FACTOR ENTRY FIELD CALIBRATION

Presently all displays are programmed with three different field calibration methods, only one of which is active, the "correction factor" calibration procedure described above. It is possible to activate "K-Factor entry" or "dispense/display" field calibration by changing configuration settings. Contact your distributor or GPI to get the correct password, configuration code and instructions for this calibration method. This information is also available on the GPI Web site.

The display is virtually maintenance-free. However, it is important to keep the display clean and free of contaminants.

STANDARD FEATURES

- 2 Totalizing Registers
- 1 Factory Calibration Curve
- 1 Field Calibration Curve
- Rate of Flow Feature
- Flowrate Time Base in Minutes

INPUT PULSE RATE	
Minimum Pulse In:	DC
Minimum Coil Input:	10 Hz
Maximum Raw:	1,000 Hz

K-FACTOR	
Minimum:	.01 pulses/unit
Maximum:	999,999 pulses/unit

FIELD CALIBRATION CORRECTION	
Minimum:	-99.9%
Maximum:	+99.9%

READOUT TOTALS	
Min. Display:	0.01
Max. Display:	999,999 (x100)

TEMPERATURES	
Operational:	+0° to +140° F (-18° to +60° C)
Storage:	-40° to +158° F (-40° to +70° C)
Ambient Air Operation Temperature	0°F to +140°F (-18°C to +60°C)

INTERNAL POWER SUPPLY TO DISPLAY	
Voltage Requirement:	5 VDC provided by a 10 pin bridge connector from cover plate electronics. External power to meter is required to provide necessary internal power to display.

ELECTRICAL	
Pollution Degree	2
Installation Category	1
Altitude	2000m Max.
Indoor use only	

SERVICE

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

1-888-996-3837

To obtain prompt, efficient service, always be prepared with the following information:

1. The model number of your display electronics.

2. The serial number and manufacturing date code of the FLOMEC® meter the display is attached to.

3. Specific information about part numbers and descriptions.

For warranty work always be prepared with your original sales slip or other evidence of purchase date.

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.

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 1 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, contact the GPI Customer Service Department at

316-686-7361 or 888-996-3837. Or by mail at:
Great Plains Industries, Inc.
5252 E. 36th St. North
Wichita, KS, USA 67220-3205

The company shall, notify the customer to either send the product, transportation prepaid, to the company at its office in Wichita, Kansas, or to a duly authorized service center. The company shall perform all obligations imposed on it by the terms of this warranty within 60 days of receipt of the defective product.
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).

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