

# GPI Pulse Out with Display

## Owner's Manual

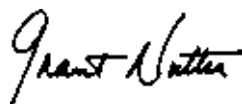


### To the owner...

Congratulations on receiving your GPI Standard Display. We are pleased to provide you with a product designed to give you maximum reliability and efficiency.

Our business is the design, manufacture, and marketing of liquid handling, agricultural, and recreational products. We succeed because we provide customers with innovative, reliable, safe, timely, and competitively-priced products. We pride ourselves in conducting our business with integrity and professionalism.

We are proud to provide you with a quality product and the support you need to obtain years of safe, dependable service.



President  
Great Plains Industries, Inc.

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## GENERAL INFORMATION

This manual will assist you in operating and maintaining the GPI electronics supplied with your GPI meter or as an accessory unit on both local and remote models. The GPI Electronics can be used in indoor or outdoor applications where occasional exposure to moisture is common.

- The Pulse Out with Display is available in two versions. One indicates flowrate in units/minute and one in units/hour. Both indicate flow totals in gallons and litres.
- The Pulse Out with Display can be used on all GPI models, including the Precision G series, the Industrial Grade G2 series, the Commercial Grade A1 series, and the positive displacement GM Series oval gear meters.
- The Pulse Out with Display can be battery powered or externally powered.

Product differences in this manual are identified by either, **Local** or **Remote** as necessary.

The Display may come calibrated from the factory for gallons "GAL" and litre "LTR" and be **locked out** "PRESET" to prevent unwanted calibrations. Field calibrations are available on "CAL B" and "CAL C."

If the unit was purchased as an accessory or remote, the calibration has not been entered and the end user will be required to calibrate the display. The gallon and litre calibration may then be **locked out** using the configuration procedure.

To determine if the Pulse Out with Display has been configured and calibrated at the factory to your specific meter, view the display. If "GAL" is followed by the word "PRESET," it has been configured and calibrated. If "GAL" **is not** followed by the word "PRESET," the display must be calibrated.

## SAFETY INSTRUCTIONS

- When measuring flammable liquids, observe precautions against fire or explosion.
- When working in hazardous environments, always exercise appropriate safety precautions.
- Be sure O-rings and seals are kept in good repair.
- When applying power, use DC power **only!**
- Disconnect external power before attaching or detaching input or output wires.

## INSTALLATION

### CAUTION

Installation should be performed only by qualified personnel, and in accordance with local governing regulations.

The following installation guidelines are separated by meter series and mounting type.

### Precision G Series:

- **Local** – The GG510 Pulse Out with Display mounts directly to the 1 inch MNPT conduit connector.
- **Remote** – The GG500 Pulse Out with Display connects via an output cable as shown in the Wiring Diagram.

### Industrial Grade G2 Series:

- **Local** – The GG510 Pulse Out with Display requires the GPI Conduit Connector Kit (Part #113437-01) for local mounting to the G2 series meter.
- **Remote** – The GG500 Pulse Out with Display connects via an output cable as shown in the Wiring Diagram.

### Commercial Grade A1 Series:

- **Local** – The GG510 Pulse Out with Display requires the GPI Conduit Connector Kit (Part #113437-01) for local mounting to the A1 series meter.
- **Remote** – The GG500 Pulse Out with Display connects via an output cable as shown in the Wiring Diagram.

### GM Oval Gear Series:

- **Local** – The Pulse Out with Display is mounted directly to the oval gear meter housing.
- **Remote** – The GG500 Pulse Out with Display connects via an output cable as shown in the Wiring Diagram.

## Connecting the Battery

G series and GM models are shipped with batteries. To save power, the display is shipped with the battery disconnected. To connect the battery:

1. Remove the two large and two small screws from the battery coverplate located on the lower portion of the meter face.
2. Insert the battery. When properly connected, numbers will appear in the readout.

NOTE: To protect the terminals from corrosion, coat with petroleum jelly.

3. Replace the gasket and battery cover, then tighten all four screws.

## Remote Installation

Choose a mounting location suitable for the Display. The ideal mounting location is where the:

- flowmeter is as close as possible.
- mounting surface has minimal vibration.
- ambient temperature is +14°F to 140°F (-10°C to 60°C).
- cable lengths are minimal.

Avoid mounting locations where the Display is:

- subject to constant exposure to water or other liquids (occasional low-pressure splashing will not harm unit).
- subject to > 5g shock loading.
- facing the sun directly for long periods of time.

Mount the GPI Display Remote using bolts, screws or standard U-bolts for pipes. Mounting options include:

- Wall
- Pipe
- Meter (1 inch FNPT conduit connection required)

Some products come with 20 feet of shielded cable. GPI offers an optional cable kit with 100 feet of cable (see spare parts list). When wiring longer lengths of cable, be sure to connect the shield to LOCAL-COM **only!** (Multiple shield connections may cause ground-loop problems. Some trial and error may be needed because of the wide variety of user conditions.

Try to keep cable lengths short. Individual installation sites vary widely, contact GPI Customer Service with questions regarding your specific needs.

## WIRING

This manual refers to various models of GPI flowmeters. Determine what type of input the electronics will receive and what type of output, if any, you require. If the unit is not already wired, use the diagrams found in the wiring diagrams section to correctly wire the system.

### Connecting the Equipment

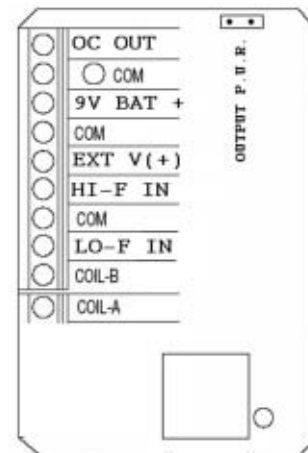
1. Remove the faceplate by removing the four corner screws.
2. Attach wiring from your equipment according to the following terminal connections and wiring instructions, depending on your circumstances. (See Terminal Connections below)

The display may be powered by battery, externally powered or both. When both are used (external power terminal as primary with the battery terminal as back up) the batteries should last up to 5 years. Connection and disconnection of either power input, while the other is active will not interrupt operation of the display.

### ⚠ CAUTION

Determine maximum power supply voltage after determining maximum allowable voltage of all electronic devices in the system.

## TERMINAL LOCATIONS



**9V\_BAT+** Battery, 6.5V to 20V

**EXT\_V(+)** External Power, 7V to 30V

**COIL\_B /  
COIL\_A**

Any magnetic (variable-reluctance) pickup coil can drive this input. Minimum signal amplitude is 10 mV P-P. Maximum recommended signal amplitude is 1V P-P. Shielded cable may be used to increase distance.

**HI-F\_IN**

Either open-collector or active-drive signals are accepted. If active-drive, signals of 5V to 12V P-P amplitude are acceptable. Maximum frequency is approximately 1000 Hz. *Note: Do not route a reed-switch signal directly to this input.*

**LO-F\_IN**

A reed switch may be connected directly between this terminal and any **COM** terminal. Maximum frequency is approximately 150 Hz.

**OC\_OUT**

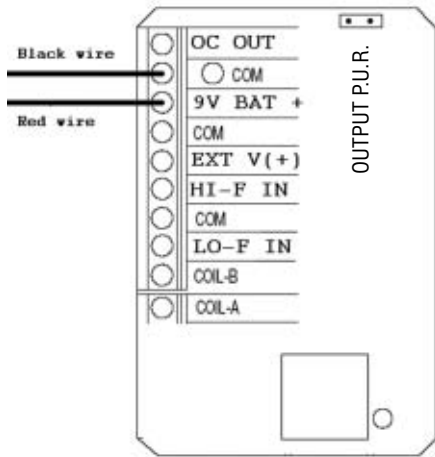
- This is an open-collector or current-sinking output when NO JUMPER is attached at OUTPUT P.U.R. location. It can sustain closed-circuit current of up to 200 mA and open-circuit voltage of up to 60V.
- This is an active-drive output when the JUMPER (supplied) is attached at location OUTPUT P.U.R. The JUMPER applies an internal 10K Ohm resistor as a "pull-up" to the regulated power supply of 5.5V.
- The output ground circuit may be connected to any **COM** terminal.
- Do not use JUMPER if operating from a battery; it will cause significantly increased system current consumption.
- **CAUTION:** Only use JUMPER when the receiving equipment has a active-drive input with 5V or less.

**COM**

All COM terminals are internally connected and may be used either as NEGATIVE power supply terminals or return terminals for any inputs or outputs.

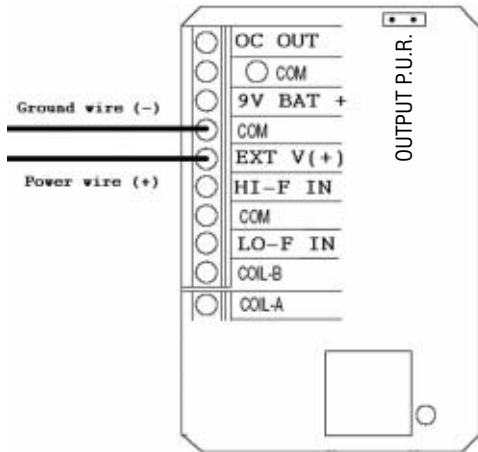
**POWER**

**9V Battery (included)**



Connect battery (included) red wire (+) to **9V\_BAT+** terminal.  
 Connect battery (included) black wire (-) to any **COM** terminal.

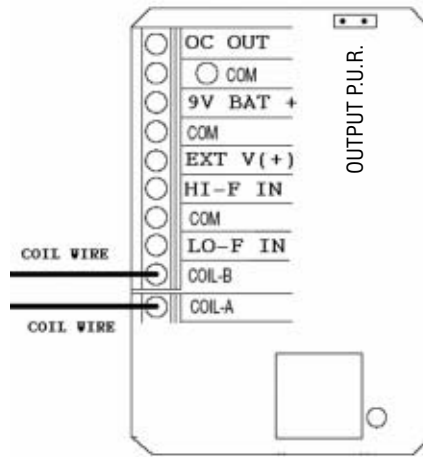
**External Power**



Connect power wire (7-30 VDC) to **EXT\_V(+)** terminal.  
 Connect ground wire to any **COM** terminal.

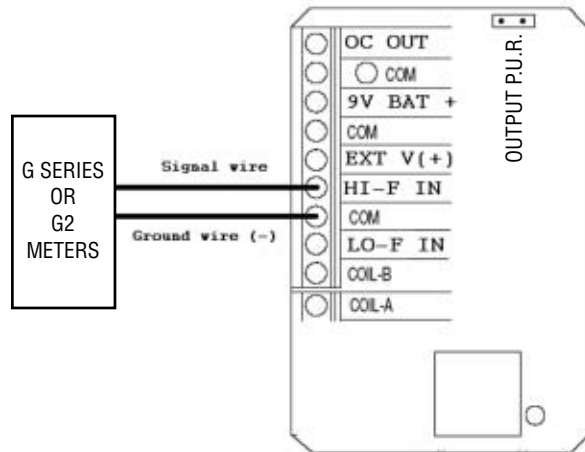
**SIGNAL INPUT**

**Sine Wave (coil)**



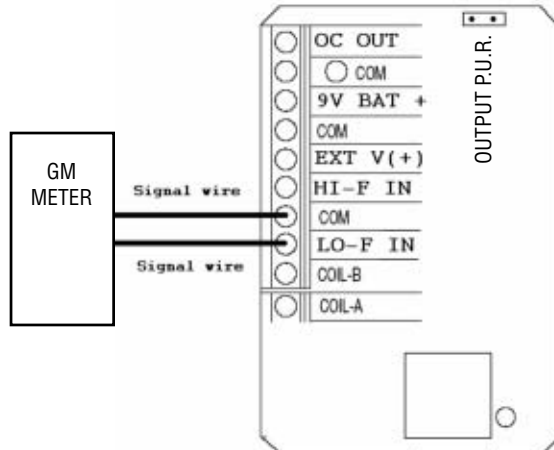
Connect either coil wire to **COIL\_A** terminal.  
 Connect other coil wire to **COIL\_B** terminal.  
 Connect shield cable, if any, to any **COM** terminal.  
 NOTE: Leave meter side of shield wire unconnected.

**Square Wave (active drive)**



Connect signal wire to **HI-F\_IN** terminal.  
 Connect ground wire to any **COM** terminal.

**Contact Closure (reed switch)**

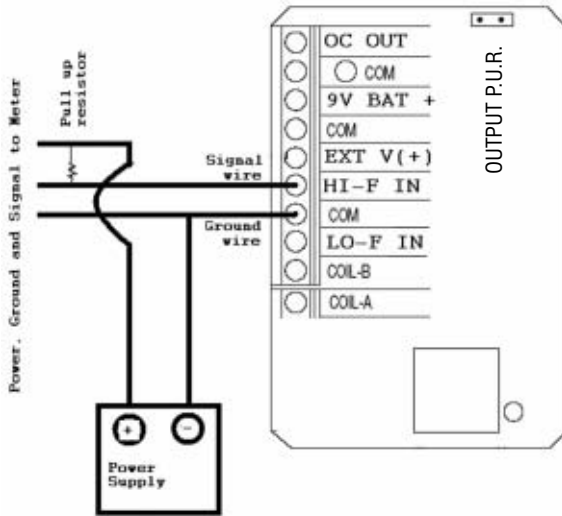


Connect either wire to **LO-F\_IN** terminal.  
 Connect other wire to any **COM** terminal.

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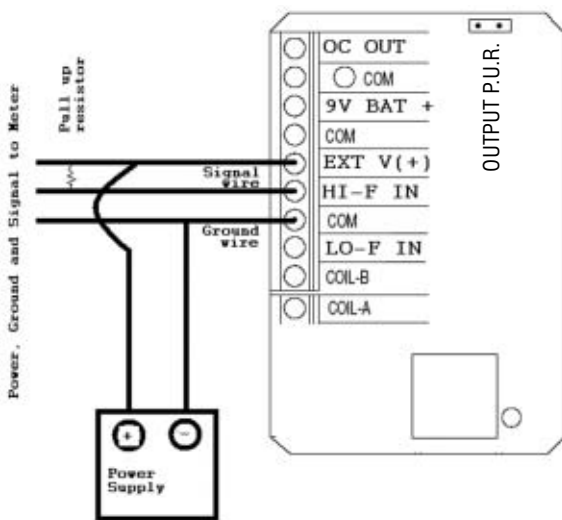
**SIGNAL INPUT**

**Open-Collector**



Connect signal wire to **HI-F\_IN** terminal.  
 Connect ground wire to any **COM** terminal.  
 Connect 1K pull up resistor between (+) power wire and signal wire.

**Open Collector with External Power to Display**

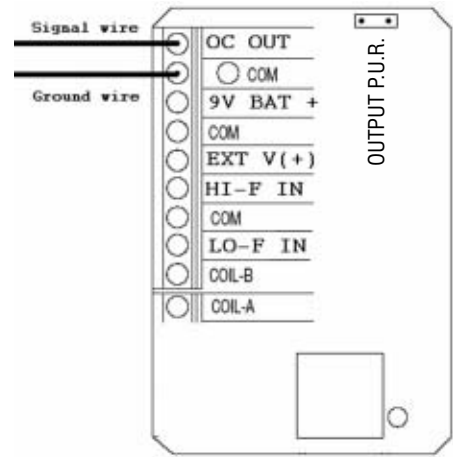


Connect signal wire to **HI-F\_IN** terminal.  
 Connect ground wire to any **COM** terminal.  
 Connect power wire (+) to **EXT\_V (+)** terminal.  
 Connect 1K pull up resistor between (+) power wire and signal wire.

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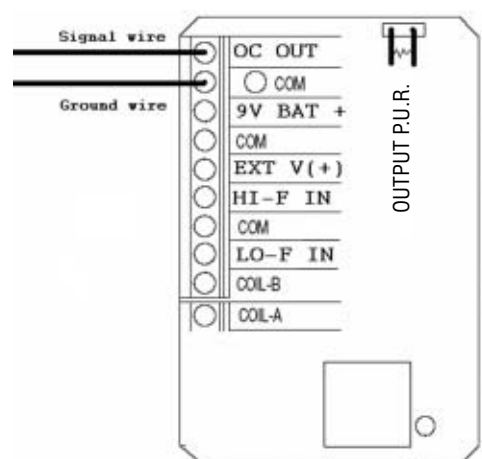
**SIGNAL OUTPUT**

**Open Collector**



Connect signal wire to **OC\_OUT** terminal.  
 Connect ground wire to any **COM** terminal.  
 NOTE: Jumper should *not* connect pins marked Output P.U.R.

**Active-Drive Output**

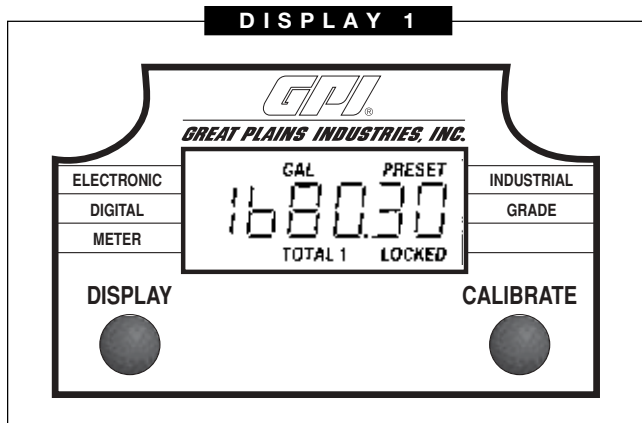


Connect signal wire to **OC\_OUT** terminal.  
 Connect ground wire to **COM** terminal.  
 Place JUMPER (supplied) over both pins marked OUTPUT P.U.R.

NOTE: Multiple COM terminals are provided for convenience in making connections.

## OPERATIONS

The calibration and display features may have been programmed at the factory, indicated by the word “PRESET” on the display (see Display 1), and further user programming is not required. If the unit was purchased as an accessory, remote or as a spare part, the calibration features **will not** be appropriate for the user installation and must be calibrated before use. If desired, the display features can be changed in the field.



## CONFIGURATION

Configuration determines what information is present on the LCD display. For instance, total, flowrate, number of decimal places, number of calibration curves, etc.

The Display has been programmed with many features, which can be enabled by the end user through the configuration process. By disabling unnecessary features, day-to-day flow-meter operation can be greatly simplified, making the unit easier to use. Alternately, there are several features not found in the default configuration.

### Available features include:

- 0 to 3 totals, either resettable (Batch) or non-resettable (Accumulative).
- Flowrate in units per minute, hour or day or no flowrate.
- 1 to 3 different calibration curves.
- K-factor entry or Dispense-Display calibration procedure.
- 0 to 3 decimal resolution (0000; 000.0; 00.00)

### Changing Configuration Settings

Access to the configuration settings require a specific procedure and a pin code available through the GPI website at [www.gpi.net](http://www.gpi.net) or call GPI Customer Service at 888-996-3837.

## About Calibration

Calibration determines that the information presented matches your particular meter. For instance, the “S20N” 2 inch turbine has approximately 100 pulses per US gallon whereas the “GM020” 2 inch oval gear meter has 25.3 pulses per US gallon. The display must be calibrated for correct and accurate display information.

To determine if the Pulse Out with Display has been configured and calibrated at the factory to your specific meter, view the display. If “GAL” is followed by the word “PRESET,” it has been configured and calibrated. If “GAL” is **not** followed by the word “PRESET,” the display must be calibrated.

### !!! WARNING !!!

All non-PRESET displays must be calibrated before use!

All operations are reflected in the LCD readout. The top line identifies the calibration curve. The middle line reflects flow information. The bottom line shows information from the totalizer. Words or “flags” display on the top and bottom line to further identify specific information.

NOTE: Operations can be practiced prior to installation. To simulate flow conditions, blow gently through the meter.

### Turn On

The unit is on when any display is present. It turns on automatically when liquid flows through the meter. It can be turned on manually by pressing and releasing the DISPLAY button.

### Turn Off

Whenever no flow has been sensed for one minute, the unit automatically switches to a power-saving “sleep” mode with a blank display. The unit will automatically “wake up” the moment any flow is sensed and will remain awake as long as fluid is flowing. Totals are never lost during sleep periods.

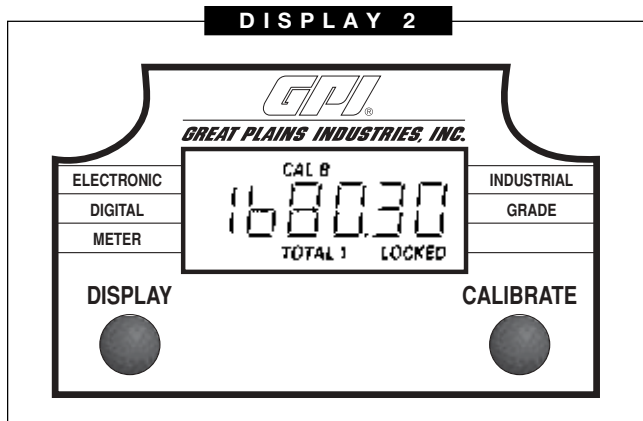
### Batch and Cumulative Totals

Total flags are displayed on the bottom line. The Cumulative Total (labeled TOTAL 1 LOCKED) is the total of all fluid measured since the meter’s power was connected. (At your first use, the Cumulative Total may not read zero because of calibration at the factory.) The Batch Total (labeled TOTAL 2) indicates flow during a single use.

### Clearing a Totalizer

The Batch totalizer register (TOTAL 2) may be independently cleared to 0.00 at any time. To clear a batch totalizer, with the desired totalizer displayed, press and hold the DISPLAY button. At about 3 seconds, the displayed total will be cleared to “0.00.” You can do this even while fluid is flowing, in which case counting will resume after you release the DISPLAY button.

The Cumulative totalizer register is labeled as TOTAL 1 LOCKED indicating that it cannot be manually zeroed (See Display 2). The Cumulative totalizer can be cleared only when the batteries are removed, go dead or when the Cumulative Total reaches the maximum value of 999,999.



### Changing Display Registers

To change to another totalizer register or to FLOWRATE mode during normal operation, watch the bottom line display flags while you briefly press and release the DISPLAY button. When you press and release the display buttons, the mode will advance as follows: TOTAL 1 LOCKED (Cumulative Total), TOTAL 2 (Batch Total), FLOWRATE, TOTAL 1 LOCKED (etc.). You can change registers at any time, even during flow. Non-visible totalizer registers will continue to accumulate.

NOTE: Generally, display registers change when the buttons are released.

### Calibration Curves

The GPI electronics have enhanced calibration features. All calibration information is visible to the user as words in the upper part of the display, above the numeric digits.

The calibration curve(s) may be set by the user, and can be changed or modified at any time using the calibration procedure described below in the CALIBRATION section. Totals or flowrate derived from the field calibration are visible when the field calibration setting is selected.

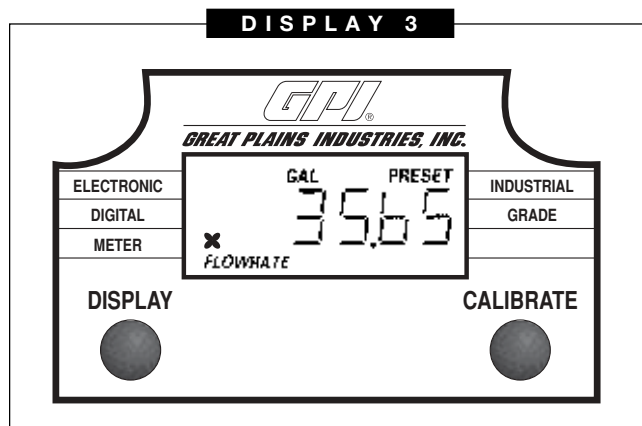
### Selecting a Different Calibration Setting

You can switch between GAL and LTR modes at will without “corrupting” totalizer contents. For example, the computer can totalize 10.00 gallons. If the user switches to LTR mode, the display will immediately change to “37.85” (the same amount in units of litres). GAL / LTR switching also works in FLOWRATE mode.

To select a different calibration setting, first press and hold the CALIBRATE button. Continue to hold it while also briefly pressing and releasing the DISPLAY button (you may then also release the CALIBRATE button). The flag indicators in the upper area of the display will change to show the newly selected calibration setting. Calibration settings change in this order: GAL, LTR, CAL B, CAL C, GAL, etc. While fluid is flowing only the GAL and LTR selections may be made, however, when NO fluid flow is occurring, any setting may be selected.

### Flowrate Mode

The Rate of Flow feature is accessed by briefly pressing and releasing the DISPLAY button as described above. When this feature is activated, the word “FLOWRATE” displays to the left on the bottom line (See Display 3) and the numbers in the middle of the display reflect the rate of flow (instead of total). Units are set to update the display every 5 seconds, so the first reading after flow starts or changes and the last reading after flow stops or changes will not be correct. This is normal.



### Propeller

A small propeller displays to indicate liquid is flowing through the meter.

## CALIBRATION

The GPI electronics allows for “field” calibration, that is, user entry of custom calibration parameters. A “single point” calibration may be used on the GPI GM series, or any other positive displacement meter, with excellent results. Any pulse generating device that changes K-factor with varying flowrate (turbine meter, paddlewheel, etc.) should be calibrated to at least three points throughout the anticipated flow range for best accuracy. Up to 15 points can now be entered. The use of dependable, accurate calibration equipment is highly recommended for the most accurate results. Additionally, each curve can be calibrated to a different fluid.

The display will have either a K-factor Entry or a Dispense/Display Field Calibration. If you need to switch from one kind of calibration to another, please see CONFIGURATION section.

The K-factor of your meter is usually located on the housing or nameplate of the meter body. It will also appear on the Calibration report. Or call GPI Customer Service at 888-996-3837 for assistance.

The litre calibration is determined using the gallon calibration information. Enter the K-factor as pulse per gallon in the GAL curve. This will correctly calibrate the LTR PRESET curve. You may still remove the GAL indication on the display using the computer electronics configuration procedure.

## K-FACTOR CALIBRATION PROCEDURES


Your Actions	Notes
<p>1. First select a Calibration Curve. To do so, hold down CALIBRATE while pressing and releasing DISPLAY until the desired Field Calibration curve appears (GAL, CAL B or CAL C message will be displayed). Release both buttons.</p>	<p>Remember that Factory Calibration curves are displayed with the word PRESET. If LTR is present, it will always show PRESET.</p> <p><b>Local Mount:</b> The Field Calibration curves are shown as CAL B or CAL C with the PRESET message absent.</p> <p><b>Remote Mount:</b> The Field Calibration curves are shown as GAL, CAL B or CAL C with the PRESET message absent.</p>
<p>2. To calibrate, press and hold both the CALIBRATE button and the DISPLAY button. Hold for about 3 seconds until the KF CAL message appears. Then release both buttons. You are now in K-factor input mode.</p>	<p>This step puts the unit in K-factor input mode (KF CAL).</p>




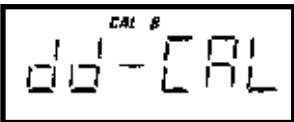
Your Actions	Notes
<p>3. Once you release the buttons, the display will show the blinking message KF 01 (or KF 02, KF 03, etc., if you are repeating this step).</p>	<p>The computer is waiting for you to make a decision to either enter a K-factor or exit calibration. If you want to exit the calibration now, go to Step 11.</p>
<p>4. If you want to continue with the calibration, press either button briefly and release it.</p>	<p>It is possible to set up to 15 cal-curve points, and the KF ## and Pr ## messages will increase increments each time you repeat the calibration process (KF 01, Pr 01, KF 02, Pr 02, KF03, Pr 03, etc., up to KF 15 Pr 15).</p>
<p>5. The display will change to a numeric representation of the current K-factor for this point (for example 00564.0) with the left hand digit blinking. Use the CALIBRATE button to change the numeric value and the DISPLAY button to change the digit location, enter the K-factor of the new cal point. When you are finished, press both buttons briefly and release.</p>	<p>NOTE: K-factors are entered as number of pulses per unit measure. When calibrating GAL, use only pulses per gallon. When calibrating CAL B or CAL C, most unit measures are acceptable (for example, per litre,</p>
<p>6. Once you release the buttons, the display will show the blinking message “Pr 01” (or Pr 02, Pr 03, etc., if you are repeating this step). Press either button briefly and release it.</p>	<p>The computer is waiting for you to enter a pulse rate. Pulse rates are entered as pulses per second. NOTE: If you elected to enter a single K-factor, you must still enter a pulse rate (any rate will work, such as 100), otherwise you will receive an Error message.</p>
<p>7. After you have released one of the buttons, the display will change to a numeric representation of the old pulse rate for this point (for example 00047.1) with the left hand digit blinking. Enter the pulse rate of the new cal point.</p>	<p>To enter numbers, use the CALIBRATE button to change the value of the digit that is blinking and use the DISPLAY button to shift the blink to the next digit.</p>
<p>8. Once the correct number has been entered, press both buttons, and the display will show a “KF CAL” message. When you release the buttons, the display will change to a blinking “KF 02” (or greater) message. At this point the computer is reminding you that the next value to be entered will be a K-factor.</p>	<p>You have installed the new cal-curve point. You are ready to end calibration (Step 10) or enter another new calibration point (Step 9).</p>

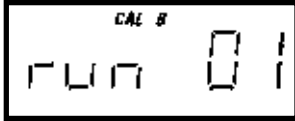


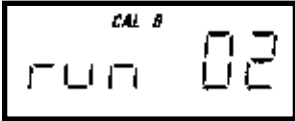






Your Actions	Notes
9. To enter another calibration point, go back and repeat Steps 3 through 8.	
10. To end calibration, press and hold both buttons for about 3 seconds until you see the "CAL End" message.	After you release the buttons, the computer will resume normal operations with the new cal point(s) active.
	
11. If you HAVE NOT entered a K-factor, you can exit calibration without changing the cal curve. If the message KF 01 is showing and you have not entered a K-factor, hold both buttons for about 3 seconds until you see a "CAL End" message.	After you release the buttons, the computer will resume normal operations and the old curve (if you have entered one in the past) is still intact.

## DISPENSE / DISPLAY FIELD CALIBRATION PROCEDURES

Your Actions	Notes
1. Hold down CALIBRATE while pressing and releasing DISPLAY until the Field Calibration curve appears ("CAL B" or "CAL C" message will be displayed). Release both buttons.	Remember that Field Calibration curves are not preset.
	
2. To calibrate, press and hold the CALIBRATE button. While continuing to hold CALIBRATE, also press and hold the DISPLAY button. Hold both buttons for about 3 seconds until you see a blinking "dd-CAL" message. Once the "dd-CAL" message appears, release both buttons. You are now in field calibration mode.	This step puts the unit in dispense-display field calibration mode ("dd-CAL").
	

Your Actions	Notes
3. Once the buttons have been released from Step 2, the display will show the blinking message "run 01."	The computer is waiting for you to make a decision to either exit from field calibration mode or to begin a dispense run. If you want to exit the calibration now, go to Step 11.
	
4. If you want to continue with the calibration, but have not dispensed any fluid yet, make your final preparations to your pumping system, but don't start pumping yet.	
5. Start your pumping system so that fluid flows through the meter. The display will stop blinking and show the "run 01" message. Dispense into a container that allows you to judge the amount of fluid pumped. When you have pumped the desired amount (for example, 10 gallons), stop the fluid flow quickly.	When the computer displays a non-blinking "run 01" message, it is sensing fluid flow. For the most accurate results, dispense at a flowrate which best simulates your actual operating conditions. Avoid "dribbling" more fluid or repeatedly starting and stopping the flow - these actions will result in less accurate calibrations.
6. Once the flow has stopped, briefly press and release both buttons. At this point the computer display will change to "0000.00" with the left-hand digit blinking.	When the display shows "0000.00" the computer has stopped "watching" for fluid flow and is now waiting for you to enter some numbers.
	
7. Enter the volume (amount) of fluid that you dispensed (for example, if your 10-gallon container is full, enter "10.00" for gallons or "37.5" for litres). To enter numbers use the CALIBRATE button to change the value of the digit that is blinking and use the DISPLAY button to shift the "blink" to the next digit.	
	
8. Once the correct number has been entered, briefly press and release both buttons. The display will now change to a blinking "run 02" message.	You have installed the new cal-curve point. You are ready to end calibration (Step 10) or enter another new calibration point (Step 9).
	

Your Actions	Notes
9. To enter another calibration point, go back and repeat Steps 3 through 8.	It is possible to set up to 15 cal-curve points, and the "run ##" message will increment each time you repeat the calibration process (run 01, run 02, run 03, etc., up to run 15).
10. To end calibration, press and hold both buttons for about 3 seconds until you see the "CAL End" message. 	After you release the buttons, the computer will resume normal operations with the new cal point(s) active.
11. If you HAVE NOT dispensed any fluid, you can exit calibration without changing the cal curve. If the message "run 01" is showing and you have not dispensed any fluid, hold both buttons for about 3 seconds until you see a "CAL End" message. 	After you release the buttons, the computer will resume normal operation and the old curve (if you have entered one in the past) is still intact.

## MAINTENANCE

### Replacing the Battery

Replace the battery when the readout becomes dim or blank. Replace the battery with a 9-volt lithium battery. Order GPI part number 902006-44.

To replace the battery:

1. Remove the two large screws and two small screws from the battery coverplate.
2. Remove the battery coverplate and gasket.
3. Remove the battery and clean any corrosion from the terminals.

NOTE: Coat the terminals with petroleum jelly to protect against corrosion.

4. Install the new battery.
5. Check the gasket for damage and replace as needed. Position gasket and coverplate to align, insert screws and tighten.

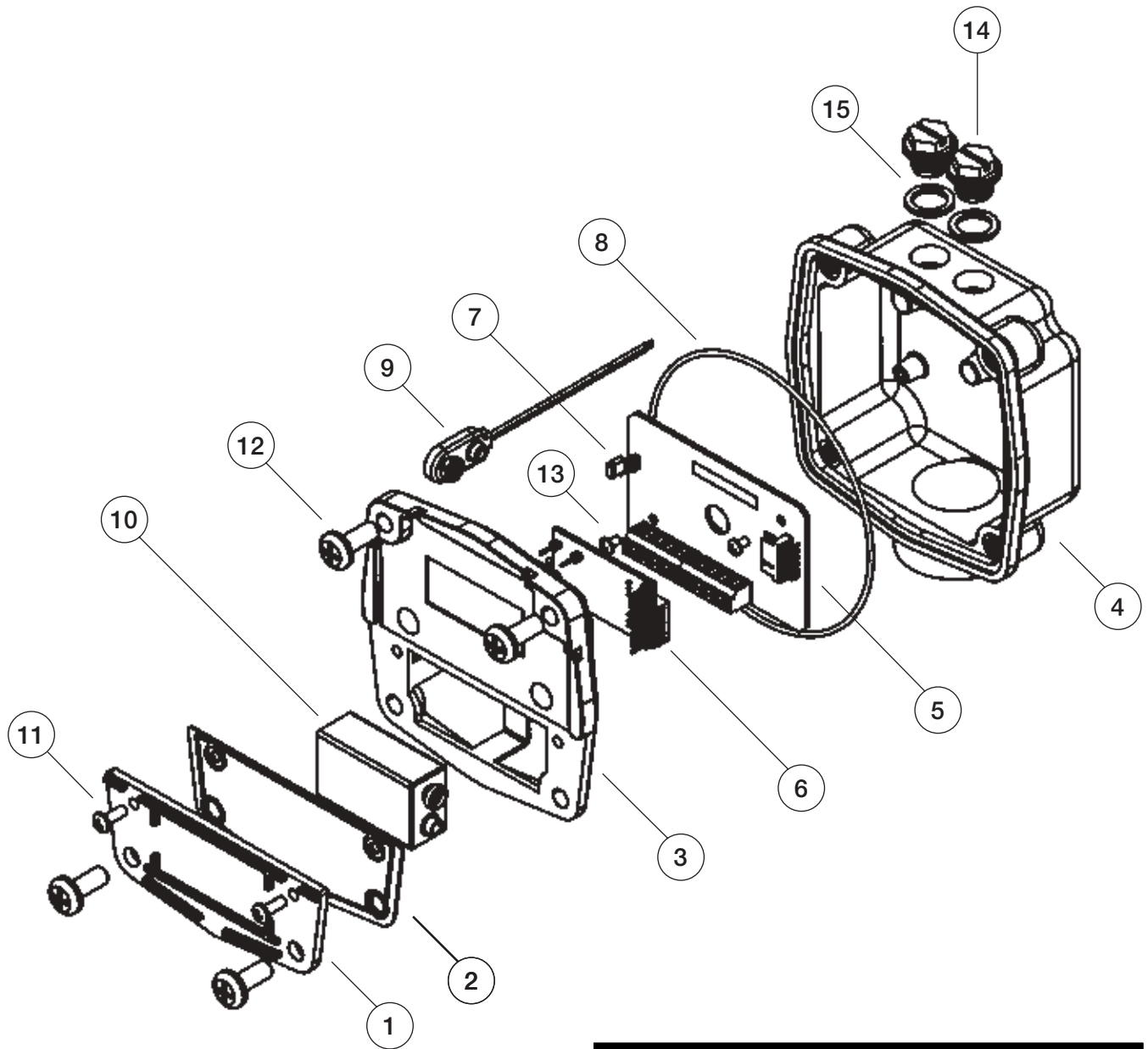
NOTE: Batch and Cumulative Total return to zero when the battery fails or is disconnected. The factory calibration is retained in the computer permanently and will display when the battery is replaced.

Store at temperatures between 14°F to 140°F (-10°C to +60°C).

## TROUBLESHOOTING

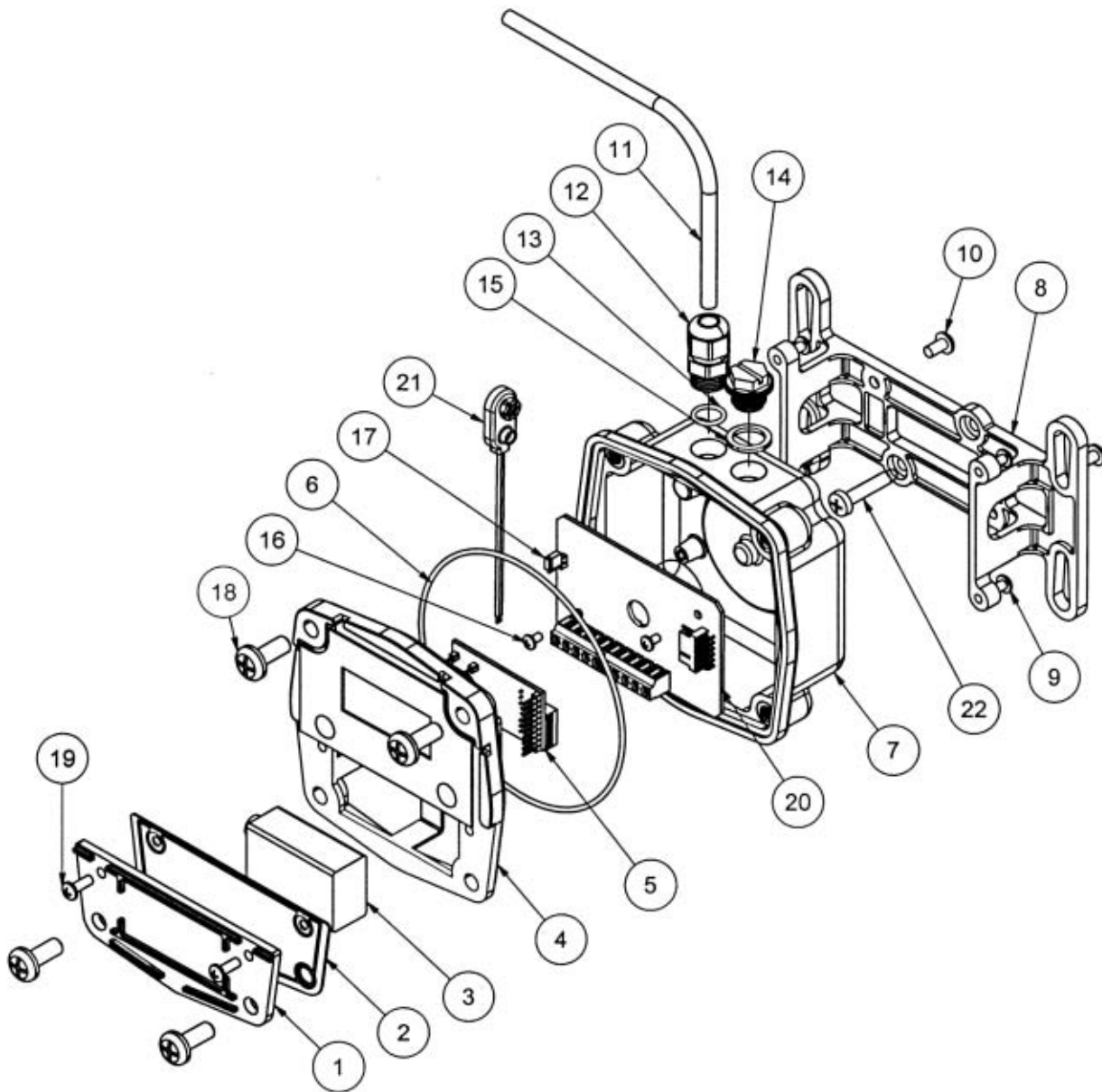
SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
A. LCD REGISTER NOT WORKING	<ol style="list-style-type: none"> <li>1. Battery not connected properly</li> <li>2. Battery flat</li> <li>3. Faulty wiring connections</li> <li>4. Faulty LCD</li> <li>5. Faulty connection from computer to Pulse PCB</li> </ol>	<p>Check battery connections.</p> <p>Replace battery.</p> <p>Check wiring for loose or faulty connections.</p> <p>Replace computer assembly.</p> <p>Check wiring connections.</p>

**ILLUSTRATED PARTS DRAWING – GG510 & GM SERIES GM005-GM020**



Item No.	Part No.	Description	No. Req'd.
1	120009-2	Battery Cover .....	1
2	120028-1	Battery Gasket .....	1
3	12051801	Computer Kit (Hours) .....	1
	12051802	Computer Kit (Minutes) .....	1
4	12051701	Adapter Kit (GG510) .....	1
	120509-02	Adapter Kit (GM005 & GM007) - Local .....	1
	120509-03	Adapter Kit (GM010, GM015 & GM020) - Local ....	1
5	12009601	Circuit Assembly (Core) .....	1
6	12009801	Circuit Assembly (Pigtail) .....	1
7	42100117	Jumper (2-Circuit) .....	1
8	901002-82	O-Ring .....	1
9	902004-97	Battery Terminal .....	1
10	902006-44	Battery, 9-volt Lithium .....	1
11	904005-27	Sems Screw, 6-32 x 3/8 in. & Plain Washer .....	2
12	904005-28	Sealing Screw, 1/4-20 x 5/8 in., m SS, Viton .....	4
13	904005-63	Screw, 4-40 x 3/16 in., X-Recess .....	2
14	906005-47	Threaded Plug .....	2
15	906005-48	Seal .....	2

**ILLUSTRATED PARTS DRAWING – GG500, G2 SERIES & GM SERIES GM001-GM003**



Item No.	Part No.	Description	No. Req'd.
1	120009-2	Battery Cover .....	1
2	120028-1	Battery Gasket .....	1
3	902006-44	Battery, 9-volt Lithium .....	1
4	12051801	Computer Kit (Hours) .....	1
	12051802	Computer Kit (Minutes) .....	1
5	12009801	Circuit Assembly (Pigtail) .....	1
6	901002-82	O-Ring .....	1
7	120509-01	Adapter Kit - Remote Display & Local (GM001, GM002 & GM003) .....	1
8	120058-01	Bracket .....	1
9	904005-13	Screw, 6-32 x 1/2 in. (Remote Model) .....	4
10	904002-44	Screw, 8-32 x 5/16 in. ....	2
11	125066-20	Cable, 20 ft. ....	1
	125066-3	Cable, 100 ft. ....	1

Item No.	Part No.	Description	No. Req'd.
12	902005-9	Strain Relief .....	1
13	901002-87	O-Ring .....	1
14	906005-47	Threaded Plug .....	1
15	906005-48	Seal .....	1
16	904005-63	Screw, 4-40 x 3/16 in. ....	2
17	42100117	Jumper (2-Circuit) .....	1
18	904005-28	Sealing Screw, 1/4-20 x 5/8 in. ....	4
19	904005-27	Sems Screw, 6-32 x 3/8 in. ....	2
20	12009601	Circuit Assembly (Core) .....	1
21	902004-97	Battery Terminal .....	1
22	904006-94	Screw, 10-16 x 5/8 in. (GM001, GM002 & GM003) .....	2
	12051901	Battery Conversion Kit (not shown) - Kit includes Items 3, 14, 15 and 21 .....	1

## SPECIFICATIONS – LOCAL MODEL

### Materials:

Acetal, Amorphous Nylon, PET Polyester, Polyester (decals), Viton (gasket & seals), Stainless Steel (fasteners)

### Power Source:

Battery (9V): 6.5V to 20V acceptable range.

Quiescent current (over and above current drawn by display module) at the battery input is typically less than 15uA.

External Power: 7V to 30V acceptable range. Quiescent current (over and above current drawn by display module) at the external power input is typically less than 90uA.

### Battery Life:

1,800 hours

### Configuration:

2-Totals (1 cumulative and 1 batch), Rate, 2 Cals (Factory calibration in gallons or litres; 2 field calibrations)

### Input Signal:

Hall Effect, Reed Switch, NPN, Open Collector or Sine Wave

### Time Base:

Hours or minutes

### Unit of Measure:

U.S. gallons or litres

### Accuracy:

No additional error over coupled flow meter's accuracy

### Frequency Range:

0 to 1,000 hertz

### Batch Total:

Up to 999,999

### Cumulative Total:

Up to 999,999

### Temperature:

+14°F to +140°F (-10°C to +60°C)

### Cable:

N/A

### Mechanical Connections:

Display is mounted directly to flow meter body

### Electrical Connections:

GG500 - One strain relief port: one threaded plug

GG510 - Two threaded plugs

G2 Series - One strain relief port: one threaded plug

GM Local Models - One strain relief port: one threaded plug (GM001, GM002 & GM003)

GM 1/2 in. and Larger - Two threaded plugs (GM005 - GM020)

### Shipping Weight:

1 lb. (.45 kg)

## SPECIFICATIONS – REMOTE MODEL

### Materials:

Acetal, Amorphous Nylon, PET Polyester, Polyester (decals), Viton (gasket & seals), Stainless Steel (fasteners), PVC (cable jacket)

### Power Source:

Battery (9V): 6.5V to 20V acceptable range.

Quiescent current (over and above current drawn by display module) at the battery input is typically less than 15uA.

External Power: 7V to 30V acceptable range. Quiescent current (over and above current drawn by display module) at the external power input is typically less than 90uA.

### Battery Life:

1,800 hours

### Configuration:

2-Totals (1 cumulative and 1 batch), Rate, 2 Cals (Factory calibration in gallons or litres; 2 field calibrations)

### Input Signal:

Hall Effect, Reed Switch, NPN, Open Collector or Sine Wave

### Time Base:

Hours or minutes

### Unit of Measure:

U.S. gallons or litres

### Accuracy:

No additional error over coupled flow meter's accuracy

### Frequency Range:

0 to 1,000 hertz

### Batch Total:

Up to 999,999

### Cumulative Total:

Up to 999,999

### Temperature:

+14°F to +140°F (-10°C to +60°C)

### Cable:

20 feet, 3-conductor (red, black & white), tinned drain wire, 22 AWG, PVC jacket .212 dia., (Reference Belden 9363 or equivalent cable)

### Mechanical Connections:

Wall or pipe mountable with standard U-bolts

### Electrical Connections:

GG500 - One strain relief port: one threaded plug

GG510 - Two threaded plugs

G2 Series - One strain relief port: one threaded plug

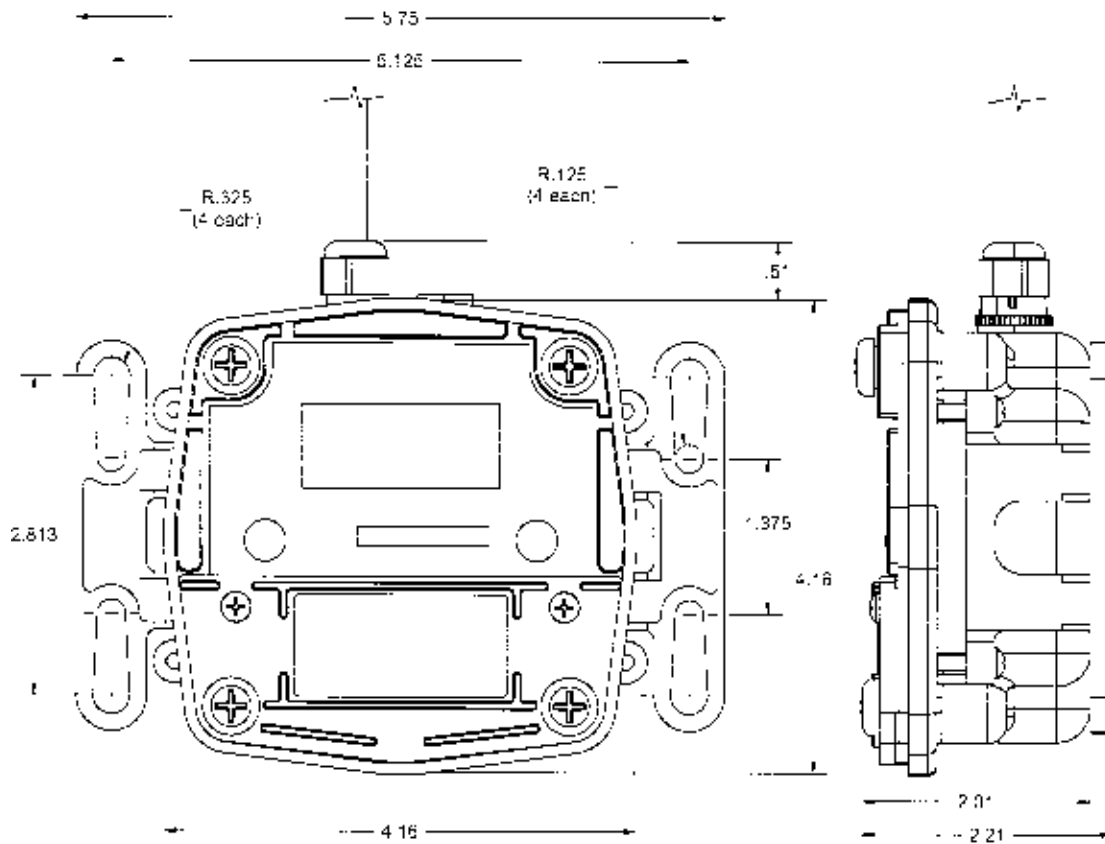
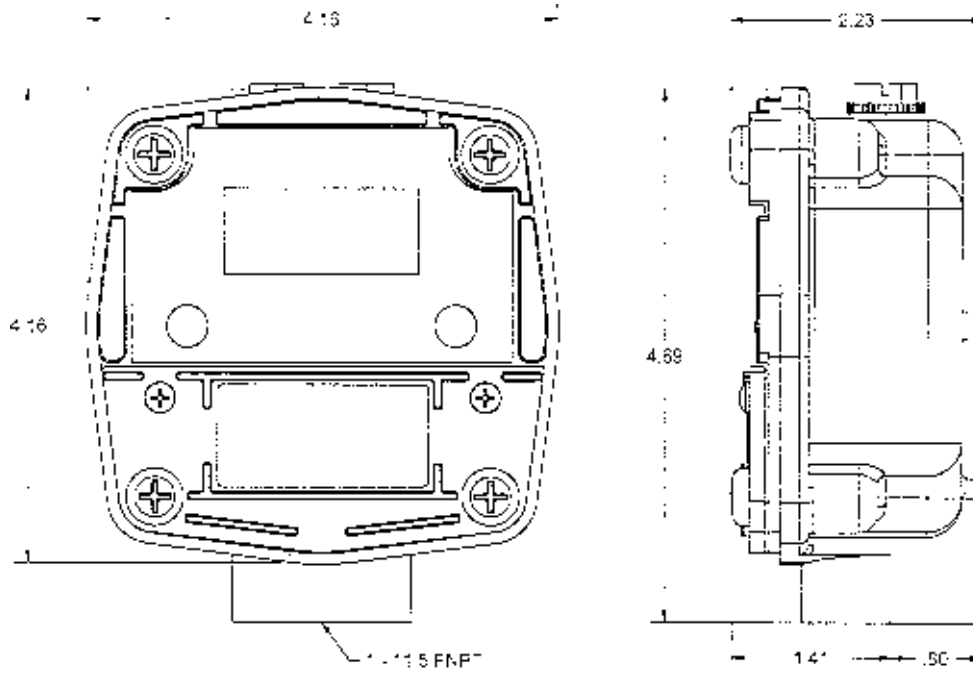
GM Local Models - One strain relief port: one threaded plug (GM001, GM002 & GM003)

GM 1/2 in. and Larger - Two threaded plugs (GM005 - GM020)

### Shipping Weight:

1 lb. (.45 kg)

# DIMENSIONAL DRAWINGS



## SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, contact the GPI Customer Service Department in Wichita, Kansas, Monday-Friday, 8:00 a.m. to 5:00 p.m. Central time.

**Tel: 316-686-7361**

**Fax: 316-686-6746**

**Toll free: 1-888-996-3837**

To obtain prompt, efficient service, always be prepared with the manufacturing date code, found behind the coverplate.

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

Please contact GPI before returning any part. It may be possible to diagnose the trouble and find a solution with a telephone call. GPI can also inform you of any special requirements you will need to follow for shipping.

## WEEE DIRECTIVE



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.

## Limited Warranty Policy

Great Plains Industries, Inc. 5252 E. 36<sup>th</sup> 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. 36<sup>th</sup> 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).



5252 East 36th Street North  
Wichita, KS USA 67220-3205  
TEL: 316-686-7361  
FAX: 316-686-6746

***GREAT PLAINS INDUSTRIES, INC.***

*"A Great Plains Ventures Subsidiary"*

[www.gpi.net](http://www.gpi.net)

**1-888-996-3837**