

# FLOMEC®



**TM SERIES®**  
water meters



## TM Series® Electronic Water Flowmeters

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1/2 INCH - 2 INCH METER SIZES  
[TM05XXXXXX - TM20XXXXXX MODELS]

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*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](mailto:meters@gplains.com)**

**SAVE FOR YOUR RECORDS**

**Model #:** \_\_\_\_\_

**Serial #:** \_\_\_\_\_

**Purchase Date:** \_\_\_\_\_

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## BEFORE YOU BEGIN

### Usage Requirements

- Use TM Series meters with water and other chemicals compatible with wetted components.
  - **DO NOT** use to meter fuel or incompatible chemicals.
  - TM Series meters are very sensitive to electric noise if operated within 1 to 2 inches of some electric motors or other sources of electronic noise.
  - This meter is not legal for trade applications.
- 

## 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.

## 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.

**▲ 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.*

**▲ WARNING**

*Always use appropriate thread sealant or flange gaskets when connecting product to process piping.*

**▲ CAUTION**

*To protect against leakage, seal all pipe threads with an appropriate sealing compound. Make sure the sealing compound does not intrude into the flow path.*

*NOTE: If connecting to new male pipe threads, burrs and curls can adversely affect accuracy. Correct the problem prior to turbine installation.*

**▲ CAUTION**

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

## SPECIFICATIONS

	TM05 1/2 INCH	TM07 3/4 INCH	TM10 1 INCH	TM15 1-1/2 INCH	TM20 2 INCH
Type	Turbine Flowmeter				
Unit of Measure	Gallon or Litre				
Flow Range	1-10 GPM 3.8-38 L/min	2-20 GPM 7.6-76 L/min	5-50 GPM 19-190 L/min	10-100 GPM 38-380 L/min	20-200 GPM 76-760 L/min
Accuracy w/Computer	+/- 3.0% of Reading (Accuracy can be improved with field calibration)				
Max. Working Pressure	225 PSIG @ 73°F (15.5 bar @ 23°C); BSP - 150 PSIG @ 73°F (10.3 bar @ 23°C)				
Operating Temperature	+32°F to +140°F (0°C to +60°C) - Do not allow fluid to freeze inside meter				
Storage Temperature	-40°F to +140°F (-40°C to +60°C)				
Field Calibration	Yes				
Wetted Components	Housing: PVC   Journal bearings: Ceramic   Shaft: Tungsten carbide Rotor and supports: PVDF   Retaining washer: Stainless steel				
<b>Inlet / Outlet Connections</b>					
	TM05	TM07	TM10	TM15	TM20
S - (Spigot)	1/2 inch Schedule 80	3/4 inch Schedule 80	1 inch Schedule 80	1-1/2 inch Schedule 80	2 inch Schedule 80
N - (NPT)	1/2 inch NPT	3/4 inch NPT	1 inch NPT	1-1/2 inch NPT	2 inch NPT
B - (BSP)	N/A	N/A	1 inch BSP	1-1/2 inch BSP	2 inch BSP
<b>Weight</b>					
S - (Spigot)	0.38 lbs. (0.172kg)	0.43 lbs. (0.195kg)	0.49 lbs. (0.222kg)	0.66 lbs. (0.299kg)	0.78 lbs. (0.354kg)
N - (NPT)	0.55 lbs. (0.249kg)	0.67 lbs. (0.304kg)	0.84 lbs. (0.381kg)	1.38 lbs. (0.628kg)	1.78 lbs. (0.807kg)
B - (BSP)	N/A	N/A	0.84 lbs. (0.381kg)	1.47 lbs. (0.666kg)	1.93 lbs. (0.875kg)

Weight shown is with computer display. Output modules add 0.30 lbs/0.14 kg

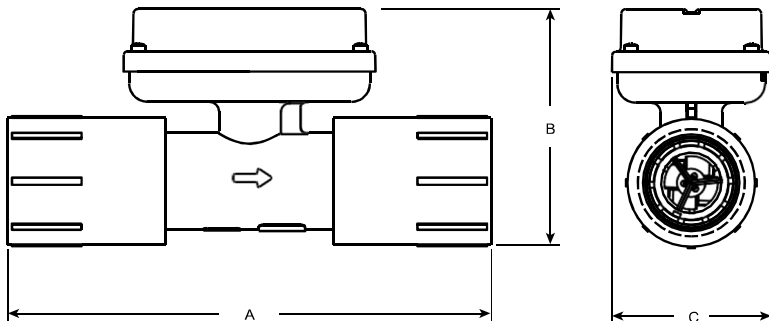
## SPECIFICATIONS (continued)

### Dimensions

TM Meter Size & Fitting	Length (A)	Height (B)	Width (C)
TM05S - Spigot	4.3 in. (109 mm)	2.5 in. (63 mm)	2.1 in. (53 mm)
TM05N - NPT	6.0 in. (152 mm)	2.7 in. (68 mm)	2.1 in. (53 mm)
TM07S - Spigot	4.4 in. (112 mm)	2.7 in. (68 mm)	2.1 in. (53 mm)
TM07N - NPT	6.1 in. (155 mm)	2.9 in. (73 mm)	2.1 in. (53 mm)
TM10S - Spigot	4.5 in. (114 mm)	2.9 in. (73 mm)	2.1 in. (53 mm)
TM10N - NPT	6.5 in. (165 mm)	3.1 in. (79 mm)	2.1 in. (53 mm)
TM10B - BSP	6.7 in. (170 mm)	3.1 in. (79 mm)	2.1 in. (53 mm)
TM15S - Spigot	5.4 in. (137 mm)	3.6 in. (91 mm)	2.1 in. (53 mm)
TM15N - NPT	7.6 in. (193 mm)	3.8 in. (96 mm)	2.3 in. (58 mm)
TM15B - BSP	7.6 in. (193 mm)	3.7 in. (94 mm)	2.2 in. (56 mm)
TM20S - Spigot	5.5 in. (140 mm)	4.1 in. (104 mm)	2.4 in. (61 mm)
TM20N - NPT	7.9 in. (200 mm)	4.4 in. (112 mm)	3.5 in. (89 mm)
TM20B - BSP	7.8 in. (198 mm)	4.2 in. (107 mm)	2.7 in. (69 mm)

Length guidelines are estimates; actual length can vary up to  $\pm 1/2$  in. (13 mm).

Output modules add 0.90 in. (23 mm) to height.



**Figure 1**

**APPROVAL RATINGS****CE****IP65****RoHS**  
2002/95/EC**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.

**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.



## INSTALLATION

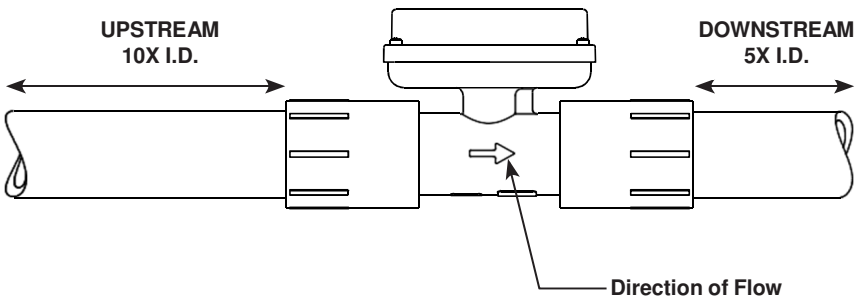
TM Series meters are available with either a computer for local electronic display, or three versions of output modules (see PARTS section of this manual) to provide a digital signal to customer interfacing equipment.

TM Series meters with computer display ship pre-configured from the factory in either gallons or litres calibration. The volume unit can be changed to several other options. Refer to the Q9 owner's manual for details on changing or customizing the volume unit.

## CONNECTIONS

Install your meter in-line either horizontally or vertically. Installation to metal connections is not recommended. Install as follows:

1. Plan to install turbine with a minimum straight pipe length as follows (see Figure 2):
  - Upstream from the turbine, allow a minimum straight pipe length of (10) times the internal diameter of the turbine.
  - Downstream from the turbine, allow a minimum straight pipe length of (5) times the internal diameter of the turbine.
2. For Spigot (Pipe) end: Use only primer and solvents approved for PVC gluing.
3. For NPT and BSP fittings: Wrap all connections with 3 to 4 wraps of thread tape (optional to use pipe thread sealant). Make sure the tape does not intrude into the flow path.
4. Attach meter with arrow pointed in the direction of fluid flow.
5. For NPT and BSP Fittings: Hand tighten the meter at the housing ends. DO NOT use a wrench or similar tool to tighten. This can damage the housing.



**Figure 2**

## OPERATION / CALIBRATION

### VERIFY METER ACCURACY

Before using, check the meter's accuracy and verify calibration.

1. Make sure there is no air in the system by starting the flow until it runs steadily. Then, stop or divert the flow using a valve or nozzle.
2. Meter an exact known volume into an accurate container. For best results, meter with one continuous full stream.
3. Check the volume against the display or recording equipment. If the amount metered is accurate, further calibration is not necessary. If not, refer to the Q9 Owner's Manual (Non-Agency) Field Calibration Section for further instructions (see below).

**NOTE:** Make sure you meet the meter's minimum flowrate requirements:

TM Series Meter Minimum Flowrate	
TM05 - 1/2 inch	1 GPM (3.8 L/min)
TM07 - 3/4 inch	2 GPM (7.5 L/min)
TM10 - 1 inch	5 GPM (18.8 L/min)
TM15 - 1-1/2 inch	10 GPM (37.5 L/min)
TM20 - 2 inch	20 GPM (75 L/min)

You can download the Q9 Owner's Manual (Non-Agency) here:



or visit [flomecmeters.com](http://flomecmeters.com) to download owner's manuals and other technical documents.

## MAINTENANCE

**NOTE:** *Proper handling and care will extend the life and service of the meter.*

### TURBINE ROTOR

The meter is virtually maintenance-free. However, it is important the rotor moves freely. Keep the meter clean and free of contaminants.

If the rotor does not turn freely, apply a penetrating lubricant on the rotor, shaft and bearings. Remove any debris or deposits from the rotor using a soft brush or small probe. Be careful not to damage the turbine rotor or supports.

**▲ CAUTION**

***Blowing compressed air through the turbine assembly could damage the rotor.***

**▲ CAUTION**

***Do not allow liquids to dry inside the turbine.***

**▲ CAUTION**

***Handle the rotor carefully. Small scratches or nicks can affect accuracy.***

## PARTS / ACCESSORIES FOR TM SERIES METERS

PART NUMBER	DESCRIPTION
116000-1	Calibration container, Large (5 gallon)
901002-52	Seal
113435-10	Conditioned Signal Module (GEN 2)
125060-10	Pulse Access/External Power/Scaled Module (GEN 2)
125100-10	4-20mA Module

## SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, contact the GPI Product Support Department in Wichita, Kansas, during normal business hours.

A toll free number is provided for your convenience.

**1-888-996-3837**

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

- The model number of your meter.
- The serial number or manufacturing date code of your meter.
- Part descriptions and numbers.

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

**IMPORTANT:** Please contact GPI before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call.

### **▲ CAUTION**

*Do not return this product without prior approval from the GPI Product Support Department. Due to strict government regulations, GPI cannot accept parts unless they have been drained and cleaned.*









## 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 36<sup>th</sup> St. North  
Wichita, KS 67220-3205  
USA

**888-996-3837**

**[www.flomecmeters.com](http://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](http://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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Great Plains Industries, Inc. / 888-996-3837 / [flomecmeters.com](http://flomecmeters.com)



**FLOMEC**<sup>®</sup>



**TM SERIES**<sup>®</sup>  
water meters



# TM Series<sup>®</sup> Electronic Water Flowmeters

3 INCH & 4 INCH METER SIZES  
[TM30XXXXXX & TM40XXXXXX MODELS]



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**SAVE FOR YOUR RECORDS**

**Model #:** \_\_\_\_\_

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## BEFORE YOU BEGIN

### Usage Requirements

- Use TM Series meters with water and other chemicals compatible with wetted components.
  - **DO NOT** use to meter fuel or incompatible chemicals.
  - TM Series meters are very sensitive to electric noise if operated within 1 to 2 inches of some electric motors or other sources of electronic noise.
  - This meter is not legal for trade applications.
- 

## 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.

**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.

**▲ 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.*

**▲ WARNING**

*Always use appropriate thread sealant or flange gaskets when connecting product to process piping.*

**▲ CAUTION**

*To protect against leakage, seal all pipe threads with an appropriate sealing compound. Make sure the sealing compound does not intrude into the flow path.*

**NOTE:** *If connecting to new male pipe threads, burrs and curls can adversely affect accuracy. Correct the problem prior to turbine installation.*

**NOTE:** *Do not over tighten the flange bolts. This may cause the gasket to be compressed into the flow stream and may decrease the accuracy of the meter.*

**▲ CAUTION**

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

## SPECIFICATIONS

	TM30 3 INCH	TM40 4 INCH
Type	Turbine Flowmeter	
Unit of Measure	Gallon or Litre	
Flow Range	40-400 GPM 151-1514 L/min Accuracy: $\pm 3.0\%$ of Reading	60-600 GPM 227-2271 L/min Accuracy: $\pm 3.0\%$ of Reading
	30-600 GPM 113-2271 L/min Accuracy: $\pm 2.0\%$ Full scale	40-800 GPM 151-3028 L/min Accuracy: $\pm 2.0\%$ Full scale
Accuracy w/Computer	+/- 3.0% of Reading (Accuracy can be improved with field calibration)	
Max. Working Pressure	Non-CE Applications: 225 PSIG @ 73°F (15.5 bar @ 23°C) CE Applications: 135 PSIG @ 73°F (9.3 bar @ 23°C)	
Operating Temperature	+32°F to +140°F (0°C to +60°C) - Do not allow fluid to freeze inside meter	
Storage Temperature	-40°F to +158°F (-40°C to +70°C)	
Field Calibration	Yes	
Wetted Components	Housing: PVC   Journal bearings: PEEK   Shaft: Stainless steel Rotor and nose cone: Acetal   Washers: Stainless steel	
<b>Inlet / Outlet Connections</b>		
S - (Spigot)	3 inch Schedule 80	4 inch Schedule 80
N - (NPT)	3 inch NPT	4 inch NPT
A - (ANSI Flange)	3 inch ANSI Flange	4 inch ANSI Flange
D - (DIN Flange)	3 inch DIN Flange	4 inch DIN Flange
<b>Weight</b>		
S - (Spigot)	2.4 lbs. (1.09kg)	3.7 lbs. (1.68kg)
N - (NPT)	3.9 lbs. (1.77kg)	6.1 lbs. (2.77kg)
A - (ANSI Flange)	5.8 lbs. (2.63kg)	9.2 lbs. (4.17kg)
D - (DIN Flange)	6.5 lbs. (2.95kg)	8.8 lbs. (3.99kg)

Weight shown is with computer display. Output modules add 0.30 lbs/0.14 kg

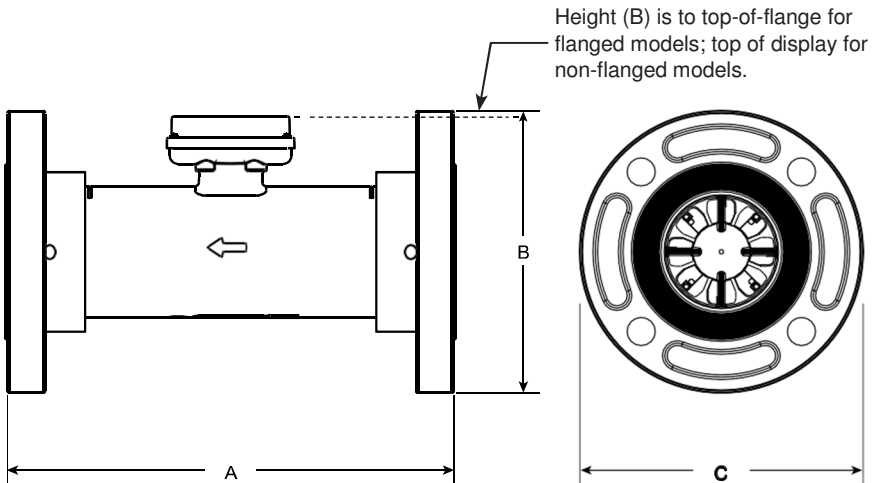
## SPECIFICATIONS (continued)

### Dimensions

TM Meter Size & Fitting	Length (A)	Height (B)	Width (C)
TM30S Spigot	11.5 in. (292 mm)	5.34 in. (136 mm)	3.5 in. (89 mm)
TM30N NPT	14.7 in. (373 mm)	5.78 in. (147 mm)	4.37 in. (111 mm)
TM30F ANSI Flange	12.0 in. (305 mm)	7.5 in. (190 mm)	7.5 in. (190 mm)
TM30D DIN Flange	12.0 in. (305 mm)	8.0 in. (203 mm)	8.0 in. (203 mm)
TM40S Spigot	13.5 in. (343 mm)	6.34 in. (161 mm)	4.5 in. (114 mm)
TM40N NPT	17.0 in. (432 mm)	6.7 in. (170 mm)	5.87 in. (149 mm)
TM40F ANSI Flange	14.0 in. (356 mm)	9.0 in. (229 mm)	9.0 in. (229 mm)
TM40D DIN Flange	14.0 in. (356 mm)	8.5 in. (216 mm)	8.5 in. (216 mm)

Length guidelines are estimates; actual length can vary up to  $\pm 1/2$  in. (13 mm).

Output modules add 0.90 in. (23 mm) to height.



**Figure 1**

**APPROVAL RATINGS****CE****IP65****RoHS**  
2002/95/EC**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.

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## INSTALLATION

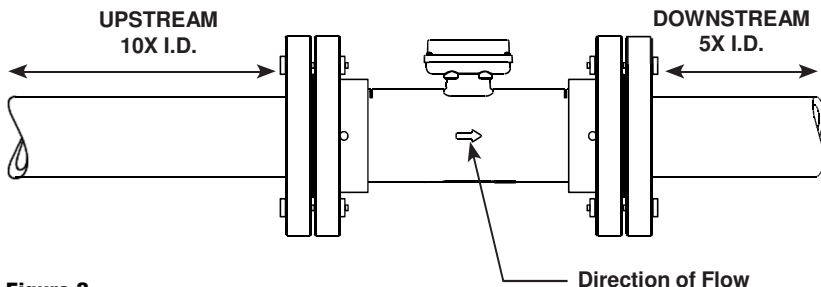
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TM Series meters with computer display ship pre-configured from the factory in either gallons or litres calibration. The volume unit can be changed to several other options. Refer to the Q9 owner's manual for details on changing or customizing the volume unit.

## CONNECTIONS

Install your meter in-line either horizontally or vertically. Installation to metal connections is not recommended. Install as follows:

1. Plan to install turbine with a minimum straight pipe length as follows (see Figure 2):
  - Upstream from the turbine, allow a minimum straight pipe length of (10) times the internal diameter of the turbine.
  - Downstream from the turbine, allow a minimum straight pipe length of (5) times the internal diameter of the turbine.
2. For Spigot (Pipe) end: Use only primer and solvents approved for PVC gluing.
  - **NOTE:** Cutting to Length - The meter housing can be shortened by the customer. Each meter has a "dotted" line feature molded on the top surface of the housing tube. The housing can be cut up to this line without harming any internals. Most glue on fittings will fit without interfering with the computer display area. However, the customer should check all parts before attempting cut.
3. For NPT fittings: Wrap all connections with 3 to 4 wraps of thread tape (optional to use pipe thread sealant). Make sure the tape does not intrude into the flow path.
4. Attach meter with arrow pointed in the direction of fluid flow.
5. For NPT Fittings: Hand tighten the meter at the housing ends. DO NOT use a wrench or similar tool to tighten. This can damage the housing.



**Figure 2**

## INSTALLATION (continued)

### CONNECTIONS (continued)

6. For ANSI or DIN Flange Fittings: Customer to provide:
  - Ring Gaskets or Full-Face Gaskets approved for use with type flange installed (ANSI or DIN) and the fluid being monitored (2 required).
  - 5/8-inch bolts and nuts for ANSI flanges. Four per side for 3-inch meters; eight per side for 4-inch meters.
  - 6 mm bolts and nuts for DIN flanges. Eight per side for 3-inch and 4-inch meters.
  - Torque bolts using a star pattern to 25 ft-lbs (33.8 Nm). Supplied flanges are two-piece Van Stone style and allow the meter to be oriented regardless of the mating flanges position.

For best results, always verify accuracy before use.

## OPERATION / CALIBRATION

### VERIFY METER ACCURACY

Before using, check the meter's accuracy and verify calibration.

1. Make sure there is no air in the system by starting the flow until it runs steadily. Then, stop or divert the flow using a valve or nozzle.
2. Meter an exact known volume into an accurate container. For best results, meter with one continuous full stream.
3. Check the volume against the display or recording equipment. If the amount metered is accurate, further calibration is not necessary. If not, refer to the Q9 Owner's Manual (Non-Agency) Field Calibration Section for further instructions (see below).

**NOTE:** Make sure you meet the meter's minimum flowrate requirements:

TM Series Meter Minimum Flowrate	
TM30 – 3 inch	30 GPM (113.6 L/min)
TM40 - 4 inch	40 GPM (151.4 L/min)

You can download the Q9 Owner's Manual (Non-Agency) here:



or visit [flocemeters.com](http://flocemeters.com) to download owner's manuals and other technical documents.

## MAINTENANCE

**NOTE:** *Proper handling and care will extend the life and service of the meter.*

### TURBINE ROTOR

The meter is virtually maintenance-free. However, it is important the rotor moves freely. Keep the meter clean and free of contaminants.

The rotor can be removed for cleaning and inspection. Begin by unscrewing the nose cone from the outlet end of the meter. A 1/4" square socket extension can be used. Remove the lock and flat thrust washers. Rotor can then be removed from shaft.

**NOTE:** *Notice the rotor orientation during removal. The rotor is not bi-directional.*

Remove debris or deposits using soft brush or small probe. Reassemble in reverse order.

**▲ CAUTION**

***Blowing compressed air through the turbine assembly could damage the rotor.***

**▲ CAUTION**

***Do not allow liquids to dry inside the turbine.***

**▲ CAUTION**

***Handle the rotor carefully. Small scratches or nicks can affect accuracy.***

## PARTS / ACCESSORIES FOR TM SERIES METERS

PART NUMBER	DESCRIPTION
12517601	Gasket
125175-11	Computer mount assembly
901002-52	Seal
113435-10	Conditioned Signal Module (GEN 2)
125060-10	Pulse Access/External Power/Scaled Module (GEN 2)
125100-10	4-20mA Module

## SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, contact the GPI Product Support Department in Wichita, Kansas, during normal business hours.

A toll free number is provided for your convenience.

**1-888-996-3837**

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

- The model number of your meter.
- The serial number or manufacturing date code of your meter.
- Part descriptions and numbers.

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

**IMPORTANT:** Please contact GPI before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call.

### CAUTION

***Do not return this product without prior approval from the GPI Product Support Department. Due to strict government regulations, GPI cannot accept parts unless they have been drained and cleaned.***







## 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 36<sup>th</sup> St. North  
Wichita, KS 67220-3205  
USA

**888-996-3837**

**[www.flomecmeters.com](http://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](http://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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Great Plains Industries, Inc. / 888-996-3837 / [flomecmeters.com](http://flomecmeters.com)





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# Q9 COMPUTER ELECTRONICS (Non-Agency)

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*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](mailto:meters@gplains.com)**

**SAVE FOR YOUR RECORDS**

**Model #:** \_\_\_\_\_

**Serial #:** \_\_\_\_\_

**Purchase Date:** \_\_\_\_\_



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## BEFORE YOU BEGIN

### Usage

- This computer electronics is designed specifically for use on FLOMEC® Turbine housings. It is also designed to work with several other FLOMEC products.



### Power Source Requirements

- This computer requires DC power. For this application, the power is provided by (2) AAA size alkaline batteries installed in the computer at the factory.



### Tools and Materials Needed

- Phillips screwdriver.

---

## UNPACKING



### Contents

- Qty. 1 - Q9 Computer Electronics w/Batteries Installed
- Qty. 1 - Owner's Manual



### Inspect

- Upon receipt, examine your equipment for visible damage. The computer is a precision measuring instrument and should be handled as such. If any items appear damaged or missing, contact your distributor.



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

## GENERAL SAFETY INSTRUCTIONS

### Non-Agency Approved Q9 Computer Electronics

**IMPORTANT:** It is your responsibility to:

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

**▲ WARNING**

The apparatus enclosure may contain 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**

Part of the enclosure is constructed from plastic. To prevent the risk of electrostatic sparking, the plastic surface should only be cleaned with a damp cloth.

**▲ WARNING**

This product should never be electrically connected to any other device in the hazardous location. Consult manufacturer for exceptions.

**▲ WARNING**

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

**▲ WARNING**

This product should never be operated outside its published specifications for temperature.

**▲ WARNING**

(Battery) - Avoid mechanical or electrical abuse. Batteries may explode or cause burns, if disassembled, crushed, or exposed to fire or temperatures in excess of 212° F (100° C). Do not short circuit or install with incorrect polarity. **DO NOT INCINERATE.**

**▲ WARNING**

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

**▲ WARNING**

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

**▲ WARNING**

This device will operate using off-the-shelf AAA size alkaline or lithium batteries. Do not mix brands or technologies. Do not mix old and new batteries. Do not use rechargeable batteries

- When working in hazardous environments, always exercise appropriate safety precautions.
- Open battery cells should be disposed of in accordance with local regulations. Lithium batteries are best disposed of as a non-hazardous waste when fully or mostly discharged. EPA does not list or exempt lithium as a hazardous waste. If waste lithium batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of unconsumed lithium remaining in the battery. Such batteries may qualify as "Universal Waste" in many jurisdictions within the U.S. and thus can be shipped for disposal or recycling in accordance with Universal Waste requirements.



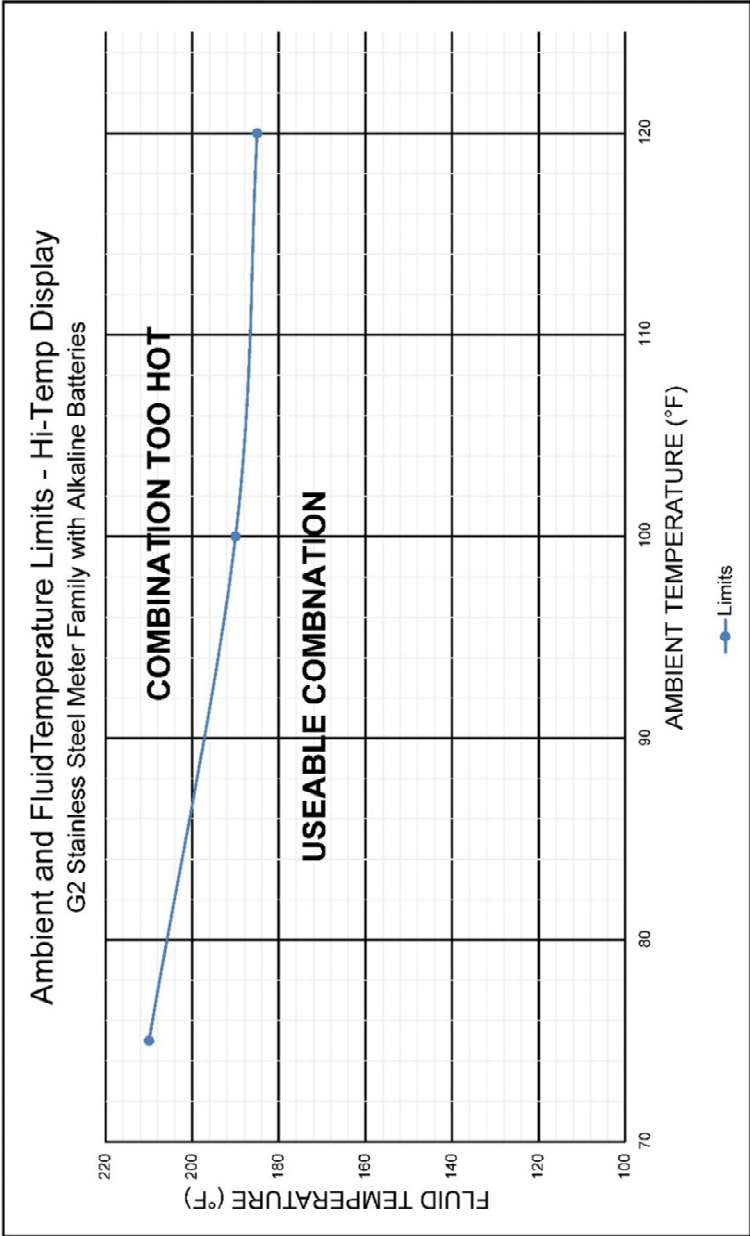
## SPECIFICATIONS

### Q9 COMPUTER ELECTRONICS

MECHANICAL	
Housing Material	Transparent Amorphous Nylon
Operating Temperature (Standard Display)	+0°F to +130°F (-18°C to +55°C) With following Alkaline batteries installed: Energizer, E92 or En92 (or) Duracell, Mn2400. ----- +0°F to +140°F (-18°C to +60°C) With following Lithium batteries installed: Energizer, L92.
Storage Temperature	-40°F to +158°F (-40°C to +70°C) With batteries removed from display.
Hi-Temp Display (G2S Meters Only)	See Ambient and Fluid Temperature Limits graph on next page. If wider operating temperature ranges are desired, reference information on FLOMEC® Remote Kits.
ELECTRICAL	
Input Pulse Rate	Frequency Range: 0.25 Hz – 3kHz
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
Power	Internal Power Supply: (2) Alkaline AAA batteries @ 1.5-volts each Battery Life: 2+ years <i>NOTE: For externally powered daughter board modules see specific module owner's manual for voltage specifications.</i>
STANDARD FEATURES INCLUDE	
<ul style="list-style-type: none"> <li>• (2) Totalizing Registers</li> <li>• (1) Factory Calibration Curve</li> <li>• (1) Field Calibration Curve</li> <li>• Rate of Flow Feature</li> <li>• Flowrate Time Period in Day, Hour, minutes, or Seconds</li> </ul>	

**SPECIFICATIONS (continued)**

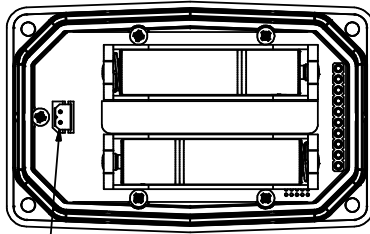
**AMBIENT AND FLUID TEMPERATURE LIMITS - HI-TEMP DISPLAY**



**NOTE:** The upper limit of the “Useable Combination” area can be increased by 10°F (6°C) when lithium batteries are installed in the Q9 Display.

**SPECIFICATIONS (continued)**

**COMPUTER ELECTRONICS TERMINAL CONNECTIONS**



FEMALE TERMINAL HOUSING  
(PICKUP COIL CONNECTION)

Figure 1

**DIMENSIONS**

	Length	Height	Height (Mounted)	Width (Widest Point)
Standard Display	A1	B1	C1	D1
	3.40 in. (8.6 cm)	0.85 in. (2.1 cm)	0.72 in. (1.8 cm)	2.14 in. (5.4 cm)
Hi-Temp Display (With Riser)	A2	B2	C2	D2
	3.45 in. (8.8 cm)	1.72 in. (4.4 cm)	1.62 in. (4.1 cm)	2.18 in. (5.5 cm)

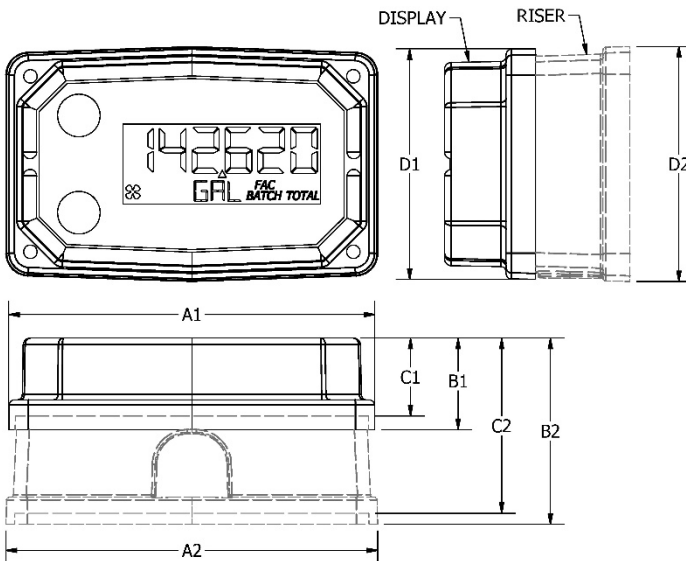


Figure 2



**SPECIFICATIONS (continued)**

**COMPUTER DISPLAY FEATURES**

Familiarize yourself with the computer features before installation and use.

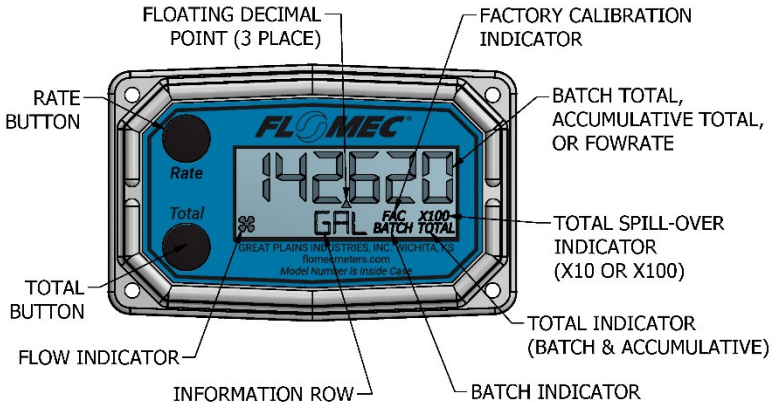


Figure 3

**APPROVAL RATINGS**

Q9 Computer Electronics



## INSTALLATION

### PRODUCT DESCRIPTION

This computer electronics is designed specifically for use on FLOMEC® Turbine Housings. It is also designed to work with several accessory output modules.

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.

In a FLOMEC turbine meter, liquid flows through the turbine housing causing an internal rotor to spin. As the rotor spins, an electrical signal is generated in the pickup coil. This pulse data from the turbine is translated into calibrated flow units shown on the computer's display readout.

### INSTALLATION

Before installation, ensure your computer model meets your specific needs. Refer to the Specifications Section to confirm required features. The model number of your computer is displayed on the outside wall of the computer housing and also inside the computer housing on the floor of the battery holder.

If you ordered your computer electronics with a turbine body, the electronics are installed at the factory.

If you ordered your computer separately as a replacement, simply plug in the pickup coil connector and mount the computer on your turbine body with the four screws at the corners of the faceplate. Make sure the seal is fully seated before tightening the screws.

If you ordered the computer with a turbine body and an accessory module, please review and thoroughly understand all installation instructions before proceeding.

All FLOMEC turbine meters are designed to measure flow in only one direction. The direction is indicated by the arrow on the turbine outlet port. If the computer display is upside down in your installation, remove the four corner screws, turn the display 180 degrees and reinstall the screws. (See Figure 4-Screws not shown.)

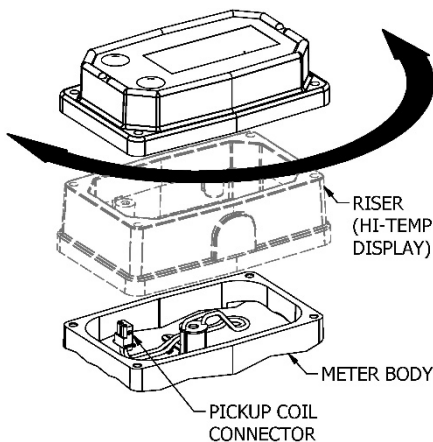


Figure 4

**NOTE:** When rotating the computer display, it is not necessary to disconnect the pickup coil connector; however, care should be taken to avoid inadvertent strain on the connector wires.

Hi-Temp Displays have a riser located between the meter body and the display. (Shown in phantom lines in Figure 4.)

## 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.



Figure 5

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. (See Figure 5)



Figure 6

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 software installed on the display. Example: “FW V03” indicates firmware version 3 installed on the display. (See Figure 6)

### 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 can only be reset by removing the batteries, pressing and holding down the **Total** button, and replacing the batteries.

The button usage map on the next page, and the user configuration process map later in the manual, is useful for understanding where the various menus are located within the software programming and the route to get to a specific menu.

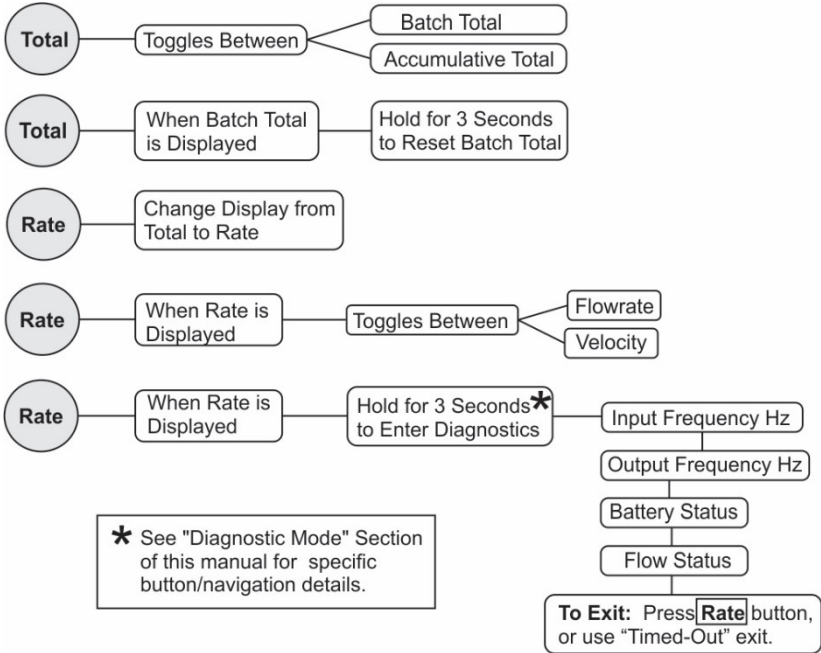
Each of these maps are followed by user instructions explaining each menu.

**OPERATION**

**NORMAL OPERATION MODE**

**Button Usage Map – Normal Operation Mode**

**BUTTON**



**Button Operation (Normal Operation Mode)**

**Total** Button: Change between batch total and accumulative total.

When a total is displayed, pressing the **Total** button changes the top row of large display digits between batch total and accumulative total. The information row will change to the proper units and the corresponding icons will be shown, i.e. **TOTAL** or **BATCH TOTAL**. (See Figures 7-1 and 7-2)



(Batch Total-Litres)

Figure 7-1



(Accumulative Total-Gallons)

Figure 7-2

**OPERATION (continued)**

**NORMAL OPERATION MODE (continued)**

**Total** Button: Batch total reset.

When a batch total (see Figure 8-1) is displayed, press and hold the **Total** button for 3 seconds; the software will display a three-second count down, and then reset the batch total to zero. (See Figures 8-2 thru 8-4)



Figure 8-1

**NOTE:** If the **Total** button is released prior to count down completion, the software returns to batch total screen. (See Figure 8-1)



Figure 8-2



Figure 8-3

**NOTE:** After count down completes, display will show 0.000 until user releases the **Total** button. (See Figure 8-3)

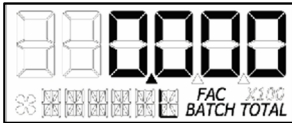


Figure 8-4

**NOTE:** After the **Total** button is released, the display will return to Batch Total screen and will increment the total if flow is detected. (See Figure 8-4)

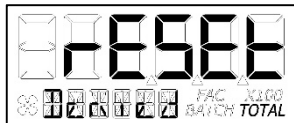


Figure 8-5

**NOTE:** When the accumulative total is displayed in Normal Operation Mode, it cannot be reset using the **Total** button.

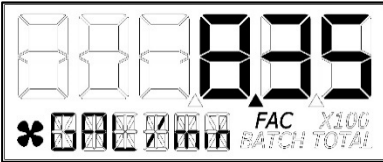
Accumulative total can only be reset by removing the batteries, holding down the **Total** button, and replacing the batteries. If the user attempts to reset it using the **Total** button, the software will display a "Reset Denied" message on the LCD until the button is released. (See Figure 8-5).

**OPERATION (continued)**

**NORMAL OPERATION MODE (continued)**

**Rate** Button: Change display from total to rate.

When a total is displayed, pressing the **Rate** button changes the top row of large display digits from a total to a rate display. The information row will change to the proper units and the corresponding icons will also be shown, i.e. GPM, L, etc. (See Figure 9)

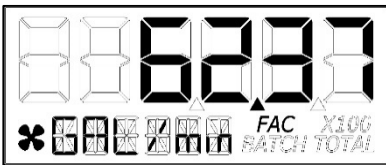


**NOTE:** To go back to a total when a rate is displayed, press the **Total** button and the display changes to the last shown total, either accumulative or batch. The information row will change to the proper unit and the corresponding icons will also be shown, i.e. TOTAL or BATCH TOTAL.

Figure 9

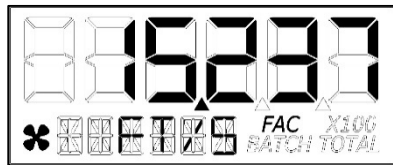
**Rate** Button: Change display from rate to velocity.

When a rate (see Figure 9) is displayed, pressing the **Rate** button changes the display between flow rate and velocity. The information row will change to the proper units and the corresponding icons will also be shown. (See Figures 10-1 and 10-2)



(Flowrate)

Figure 10-1



(Velocity)

Figure 10-2

**Diagnostic Mode**

**Rate** Button: Display diagnostic menu.

When a rate is being displayed, press and hold the **Rate** Button for 3 seconds; the software will display a three second diagnostic count down (see Figure 11-1), then display the first of four diagnostic screens (see Figures 11-2 thru 11-6).



Figure 11-1

**NOTE:** The diagnostic screens are reference information screens only. They cannot be edited.

Within the diagnostic menu: Pressing the **Total** button will advance to the next screen; pressing the **Rate** button at any time will exit the diagnostic menu. Upon exit, the display will return to the rate display.

There is a **90 second "no action" clock** running when in diagnostic mode. After 90 seconds with no button push to reset the clock, the computer will automatically exit and return to the rate display.

**OPERATION (continued)**

**NORMAL OPERATION MODE (continued)**

**Diagnostic Mode (continued)**

**Screen 1 – Input Frequency**

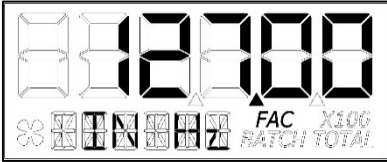


Figure 11-2

After the button is released, the software will advance and display the input frequency in Hz.

The top row is used to indicate frequency. The information row will display messages. (See Figure 11-2)

**Screen 2 – Output Frequency**

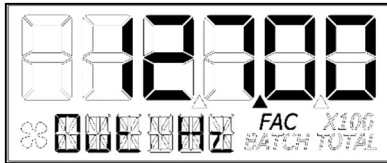


Figure 11-3

Advancing to next screen will display the output frequency in Hz.

The top row is used to indicate frequency. The information row will display messages. (See Figure 11-3)

**Screen 3 – Battery Status**

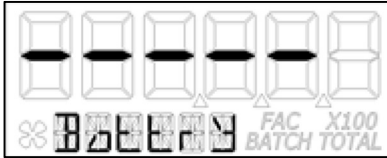


Figure 11-4

Advancing to the next screen will display the battery status.

The top row is used to indicate battery life with each dash indicating a percentage of battery life remaining. The information row will display messages. (See Figure 11-4)

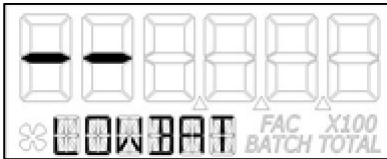


Figure 11-5

**NOTE:** If the battery life is sufficiently low, “LOWBAT” will be displayed in the information row. This low battery message will be displayed automatically without running a diagnostic battery check. (See Figure 11-5)

**Screen 4 – Flow Status**

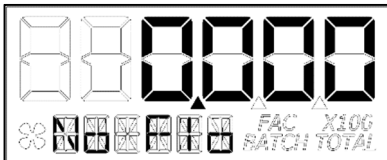


Figure 11-6

Advancing to the next screen will display the flow status.

The top row is used to indicate flow rate in the volume units programmed into the computer. The information row will display messages, i.e.: No Flo, Lo Flo, or Hi Flo. (See Figure 11-6)

**OPERATION (continued)**

**USER CONFIGURATION MODE**

**General Notes for User Configuration Mode Menus**

1. The term “**focus**” as used in this manual indicates an active editable item. Focused items will constantly flash ON/OFF.
2. **Advance focus:** Press the **Total** button. Advancing focus will move focus to the next editable item to the right. If already on right most item, the focus will go back to the start position in a round robin fashion. If only (1) item is editable, advancing focus will move the focus to next menu.
3. **Increment the value of editable item:** Press the **Rate** button. If editing a number, the number will increment in a round robin fashion. If editing a text option, focus will advance thru a predefined list of text depending on the active menu and item. Advancing to the next item or menu with a unit in focus will select that unit.
4. **Advance focus to next menu:** Press and hold the **Total** button and then press the **Rate** button.
5. **Retgress focus back to previous editable item or previous menu:** Press and hold the **Rate** button and then press the **Total** button.
6. **Exit any user configuration mode menu:** Press and hold the **Total** button first and immediately press and hold the **Rate** button, holding both buttons down for 3 seconds.

**NOTE:** Unless an exception is noted, there is a **90 second “no action” clock** running when in user configuration mode. After 90 seconds with no button push to reset the clock, the computer will automatically exit and return to normal operating mode. There is **no automatic “save”**, all entries made up to that point would be lost.

**Entering User Configuration Mode**

While in normal operation mode, the user can enter the display user configuration mode by pressing and holding the **Total** and **Rate** buttons simultaneously for 3 seconds from any screen; the software will display a three second count down sequence (see Figure 12-1), then reset the display to configuration mode. (See Figure 12-2)



Figure 12-1



Figure 12-2

**NOTE:** After three seconds, the LCD will display “ConFig” on the top row and “Mode” on the bottom row until the user releases both of the buttons; the display will then immediately show the first menu (PIN) of the configuration process menus.

**NOTE:** If the user releases both or either button before the countdown completes, the display will return to normal operation mode.



**OPERATION (continued)**

**USER CONFIGURATION MODE (continued)**

**General Notes for User Configuration Mode Menus**

Once in configuration mode, the user can then proceed thru the configuration process menus as shown on the “configuration process map” below.

The software will retain your entries as you progress through the user configuration menus, however, there is **no automatic “save”** when exiting. Instead, you will be shown a “save” screen to enter “yes or no” to save your entries. (See Figure 13)

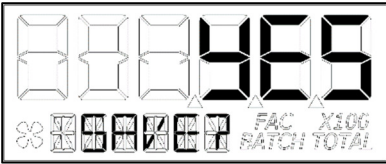
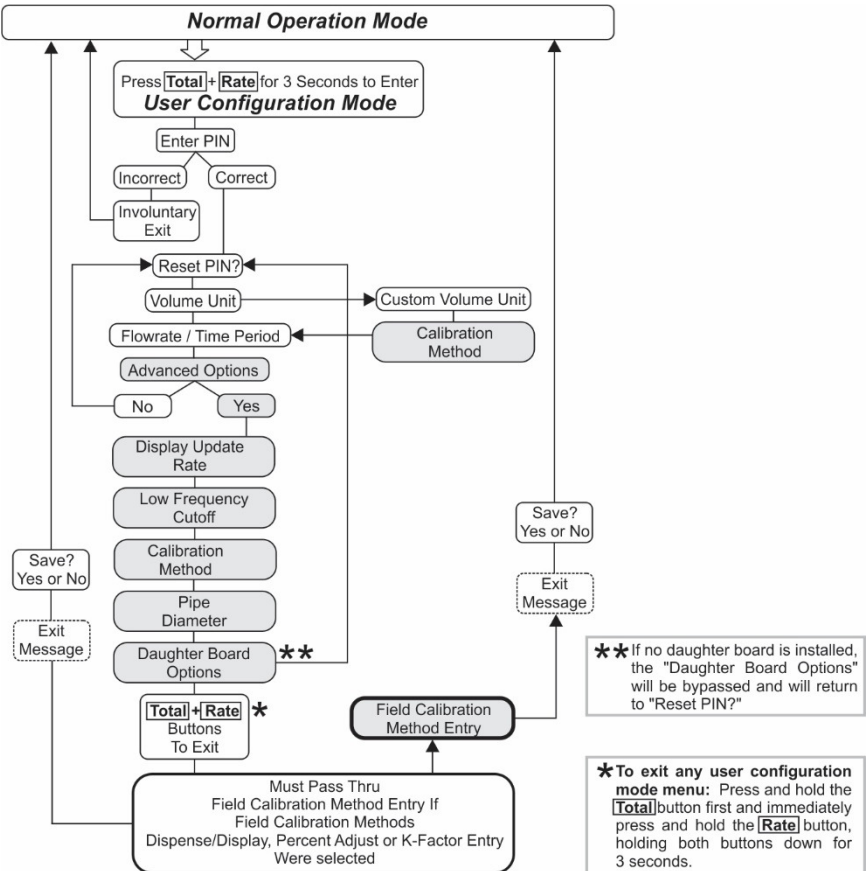


Figure 13

Use the **[Rate]** button to change between “yes” or “no”. Use the **[Total]** button to advance to the next display. Advancing to the next display will perform the “save” selection you made and return the display to normal operation mode. The last shown screen in that mode will be displayed.

**NOTE:** The **[Total]** button must be pressed twice (to verify the end user is “certain” of selection).

**Configuration Process Map – User Configuration Mode**



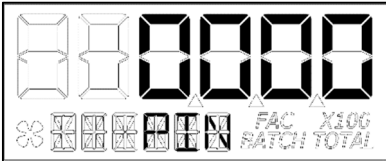
**OPERATION (continued)**

**USER CONFIGURATION MODE (continued)**

**PIN Menu**

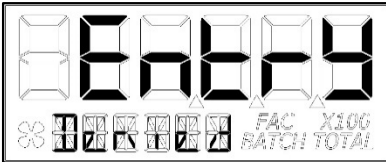
The first menu in the configuration mode is for the user to enter a Personal Identification Number (PIN) to secure the configuration of the computer and continue with making changes.

The default user PIN is 0000. Using this default PIN will unlock the meter unless the PIN has been reset by the user.



The initial user PIN entry screen will show 0000. The left most digit will be flashing ON/OFF to indicate focus if the user wants to change the PIN. (See Figure 14-1)

**Figure 14-1**



If the entered PIN was incorrect, the screen momentarily displays "Entry Denied" (See Figure 14-2) then returns automatically to normal operation display.

**Figure 14-2**

**NOTE:** Using the user default PIN, or the user specific PIN (if previously reset), and advancing focus to the next menu, the software will compare the entered PIN with the PIN stored in the computer. If a match is found, the next menu will be shown allowing the user to reset the PIN if desired.

**Reset PIN Menu**

If the PIN was entered correctly, the next menu will be displayed and allow reset of the PIN if desired. (See Figure 15-1)



**Figure 15-1**



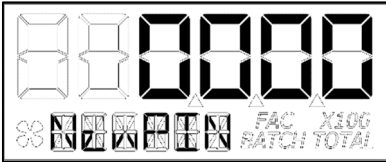
**Figure 15-2**

The "N" will be in focus (flashing). To decline resetting the PIN, advance focus to next menu. To reset the PIN, increment the "N" to "Y" (see figure 15-2) and advance focus to next screen. (See Figure 16)

**OPERATION (continued)**

**USER CONFIGURATION MODE (continued)**

**Reset PIN Menu (continued)**



If “Y” was selected, the previous PIN will be shown. The left most digit of PIN is in focus. Increment the value of each digit as desired as you advance focus through the digits.

After reset of the PIN, advance focus to next menu.

Figure 16

**Volume Unit Menu**

On this menu the user will be allowed to enter their volume unit of measure from a list of options. (See Figure 17).

Volume Unit	Abbreviation	Volume Unit	Abbreviation
Gallon	GAL	Litre	L
Imperial Gallon	IGAL	Millilitre	mL
Custom	Set by user	Cubic Metre	m3
Acre-Foot	Ac--Ft	Cubic Centimetre	cm3
Quart	Qt	Cubic Foot	FT3
Ounce	OZ	Barrel	bbl

Figure 17



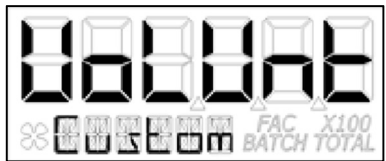
On the volume unit menu (see Figure 18) the bottom row of characters will be in focus to indicate they are editable.

Advancing to the next menu with a unit in focus will select that unit of measure.

Figure 18

Changing between different volume units will not corrupt the Total's contents. For example, in GAL (gallon) mode, the computer totalizes 10.000 gallons, if the user changes to L (litre) mode, the display will read 37.854 litres (the same volume, different unit).

**Custom Volume Unit Label Menu**



The software also allows the user to create their own “Custom” volume unit (see Figure 19). Advancing to the next menu with the “Custom” volume unit in focus will shunt the user to a new menu (see below) that will allow the user to create a new label, or reuse one already stored in computer memory.

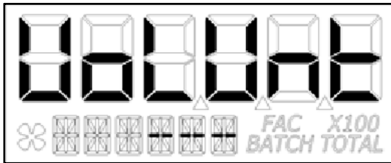
Figure 19

**OPERATION (continued)**

**USER CONFIGURATION MODE (continued)**

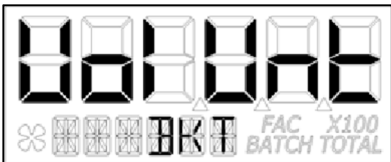
**Custom Volume Unit Label Menu (continued)**

If the computer is new or has no previous custom volume unit label stored in memory, the screen will appear with three dashes. (See Figure 20)



**Figure 20**

The left most of the dashes will be in focus and the user can select a letter from the list of upper case letters. An empty space will be shown on the menu screen as an underscore “\_” during creation, but the underscore will not show when displaying the unit label in operation.



**Figure 21**

If the user has previously entered a custom volume unit label, it will be read from computer memory and the unit label will be displayed (see Figure 21) with the left most character in focus. The label can then be changed if desired.

**NOTE:** Once the custom volume unit label is created, the user will be required to enter a calibration method for the custom volume unit created. Therefore, upon advancing focus to next menu, the user will be shunted to the calibration method menu to select a method of calibrating their custom volume unit.

**NOTE:** The calibration method section that defines the methods of calibration can be found later in this manual.

After selecting the calibration method, advance focus to the next menu that will be flow rate/ time period menu.

**NOTE:** The computer will remember your calibration method selection. If you selected field calibration methods dispense display, percent adjust, or K-factor method, you will be given the opportunity to configure that method at the point you decide to exit the user configuration mode. At that point, the software will automatically shunt you to the field calibration method entry menu.

The field calibration method entry section that defines the field calibration procedure of the selected method can be found later in this manual.

**NOTE:** The factory calibration stored in the unit will never be lost.

**OPERATION (continued)**

**USER CONFIGURATION MODE (continued)**

**Flow Rate / Time Period Menu**

This menu is used to choose the period of time over which the flow rate is calculated. The options for this menu are: per day, hour, minute, or second. (See Figure 22-1)

Time Base	Abbreviation
Day	d
Hour	h
Minute	min
Second	s

**Figure 22-1**



**Figure 22-2**

When the screen is displayed, the software will show the current selected volume unit and time period (see Figure 22-2) and will display both in the bottom row with a back-slash between them. The time period unit will be in focus and can be edited by the user.

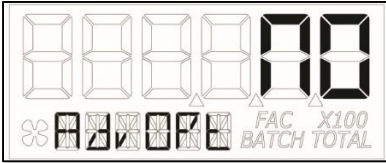
After advancing to the next configuration menu, the time period will be temporarily stored (see Figure 13 and its description for permanently saving) to computer memory.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Advanced Options)**

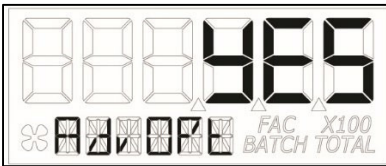
**Advanced Options Menu**

This menu is used to access the Advanced Options. The **[Rate]** button is used to change between NO and YES selections. The **[Total]** button is used to select either NO or YES for the Advanced Options menu.



Select NO to return to Normal User Configuration menu (See Figure 23-1).

**Figure 23-1**

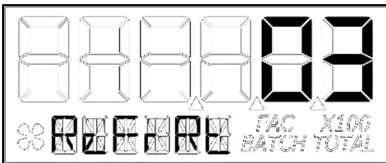


Select YES to enter into the Advanced Options menu (See Figure 23-2).

**Figure 23-2**

**Display Update Rate Menu**

This menu allows a validated user to change the update rate of the display for flow rate, velocity, batch total, and accumulative total.



The range of this menu is from 1 to 60 seconds. Although the computer is maintaining constant calculations, the rate that the new information is displayed is controlled by this menu. (See Figure 24)

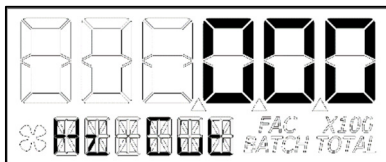
NOTE: "00" may be selected, but that value will represent "01" (1 second).

**Figure 24**

**Low Frequency Cutoff Menu**

This menu allows a validated user to enter a minimum allowed pulse input frequency to filter out any low frequency input pulses which can be generated when the meter is subject to mechanical vibrations. These vibrations could cause the totalizer to add "phantom" volume to the display totalization values. (See Figure 25)

The software will read the minimum input frequency from the computer and display it on the top row with the left most digit in focus. Increment range is from 0 Hz to 255 Hz.



If 0 is set, the software will disable the input frequency filtering algorithm.

When advancing to the next menu, the software will temporarily store (see Figure 13 and its description for permanently saving) the selected value to the computer.

**Figure 25**

**OPERATION (continued)**

**USER CONFIGURATION MODE (Advanced Options) (continued)**

**Calibration Method Selection Menu**

This menu is used to define which calibration method will be used in normal operation. The calibration method the user previously selected (if any) will be shown on the display first. The bottom row of characters will be in focus indicating that the user can change the calibration method. Use the **Rate** button to move through the various calibration method options, and use the **Total** button to make "Calibration Method" selection/advance to next menu option.

**Factory Calibration:** All units are configured with a "factory" calibration. This factory calibration (FAC icon displayed below 6-digit display) is permanently programmed into the computer and is not user adjustable.

**NOTE: The factory calibration stored in the unit will never be lost**

Factory calibration is the typical use method (see Figure 26-1). Prior to shipping from the factory, the display will be configured and calibrated to the meter body on which it is installed (or going to be installed).

When the user selects this option the FAC icon will be "ON" to indicate that the display is using its factory calibration table. This method does not support field calibration.

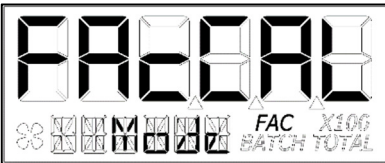


Figure 26-1

**Field Calibration:** If one of the following calibration methods is selected (dispense display, percent adjust, or K-factor entry), the user will be routed through the field calibration method entry menu, before saving configuration options, to make specific entries for the selection.



Figure 26-2

**Dispense/Display** is a field calibration method by which the user will dispense a known volume of fluid and the software will keep track of the pulse count during the dispense operation. The user will then enter the known volume into the display and the software will calculate a K-factor for the volume dispensed. (See Figure 26-2)



Figure 26-3

**Percent Adjust** method is a field calibration method by which the user will enter a percentage amount to adjust K-factor values in the factory programmed K-factor table. Once the percentage is input by the user, the software will apply this percentage adjustment to all calculated and displayed values. (See Figure 26-3)

This method is good for users who simply want to adjust their meter by a percentage amount.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Advanced Options) (continued)**

**Calibration Method Selection Menu (continued)**

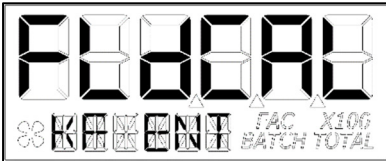


Figure 26-4

**K-Factor Entry** method (see Figure 26-4) is a field calibration method by which the user can input either a single point or multipoint calibration table.

From 1 to 5 unique K-factor and frequency values can be entered and will be stored in the custom K-factor table in the computer.

**Inner Pipe Diameter Menu**

This menu is to allow the user to enter a pipe inner diameter (ID) which will allow the display to calculate and display the fluid velocity thru the meter. The pipe dimension unit can be selected as either inches (IN) or millimetres (mm) as preferred by user (see Figure 27-1).

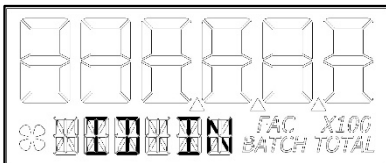


Figure 27-1

On this screen, the software will read the pipe ID measurement unit label from the computer and display it on the bottom row as either English (IN) or metric (mm) units. The unit label (IN or mm) will have the focus to indicate that it can be changed.

Pressing the **Rate** button will change between inches (IN) and millimetres (mm). Pressing the **Total** button will temporarily store (see Figure 13 and its description for permanently saving) the selection and allow the user to edit the pipe inner diameter value.

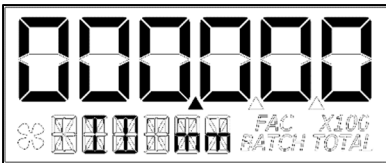


Figure 27-2

The software will also read the pipe ID numeric value including decimal point from the computer. The left most decimal point is in focus to indicate it can be changed (see Figure 27-2).

Pressing the **Rate** button moves the decimal point focus to the next decimal point to the right until reaching the end, then, turns off all three. An additional button press will cycle the focus back to the left most decimal point in a round robin fashion. When the decimal point is in the correct position, pressing the **Total** button will lock its location. The screen then advances focus to the left most numeric value digit to allow the user to edit the pipe ID value.

Pipe ID values can be from 0.001 to 999999. The inner pipe diameter entries will be used in the fluid velocity rate calculation during normal operation.

Pressing the **Rate** button will increment the digit in focus. Pressing the **Total** button will advance focus to the next digit. To advance focus to the next menu, press and hold the **Total** button and then press the **Rate** button (see Configuration Process Map).

**NOTE:** Upon entering the next menu, the software will temporarily store the pipe ID entries in the computer.

**NOTE:** Failure to save your entries on the “save” screen will cause the entries to be discarded.



**OPERATION (continued)**

**USER CONFIGURATION MODE (Advanced Options) (continued)**

**DAUGHTER BOARD MODULES**

**Output K-Factor Menu**

**(Requires Pulse Access or 4-20mA Daughter Board Module)**

The scaled pulse output K-factor menu allows the user to enter a K-factor for the pulse output of the meter or advance focus to the next menu.

The software will read the pulse output K-factor from the computer and display it on the top row. The **Total** and **Rate** button presses for this menu function the same as the button presses for the Inner Pipe Diameter Menu shown on the previous page. (See Figure 28–The zero values shown represent an unscaled Pulse Output.)

**NOTE:** Pulse output values cannot exceed pulse input values. Pulse output can only be scaled down.

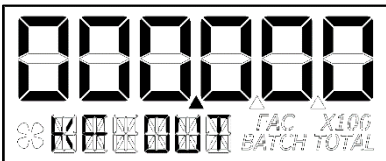


Figure 28

When advancing focus to the next menu the software will temporarily store (see Figure 13 and its description for permanently saving) the Scaled Pulse K- factor to the computer.

**4-20mA Menu (Requires 4-20mA Daughter Board Module)**

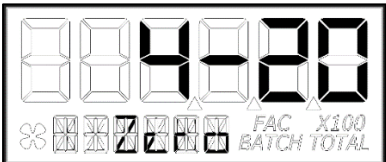


Figure 29-1

**“Zero” Setting:** This figure will flash for 1 second before allowing the user to change the 4mA or “zero” setting (see Figure 29-1). This setting will already be configured for the minimum flowrate of the meter this Q9 was attached to, when shipped from the factory.

The **Total** and **Rate** button presses for this menu function the same as the button presses for the Inner Pipe Diameter Menu shown on the previous page.

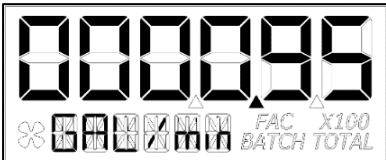


Figure 29-2

**NOTE:** Figure 29-2 shows the display when changing “zero” or 4mA Flowrate Settings.



Figure 29-3

**“Span” Setting:** This figure will flash for 1 second before allowing the user to change the 20mA or “span” setting (see Figure 29-3). This setting will already be configured for the maximum flowrate of the meter this Q9 was attached to when shipped from the factory.

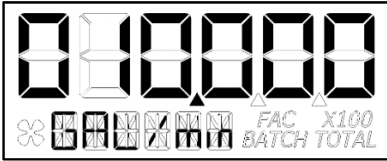
The **Total** and **Rate** button presses for this menu function the same as the button presses for the Inner Pipe Diameter Menu shown on the previous page.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Advanced Options) (continued)**

**DAUGHTER BOARD MODULES (continued)**

**4-20mA Menu (Requires 4-20mA Daughter Board Module) (continued)**



**NOTE:** Figure 29-4 shows the display when changing "span" or 20mA Flowrate Settings.

Figure 29-4

**USER CONFIGURATION MODE (Field Calibration Mode)**

**Field Calibration Method**

**General**

The field calibration method may be set by the user, and can be changed or modified at any time using a field calibration method described in this section. Totals or flowrate derived from the field calibration are being invoked when the (FAC) icon is no longer visible below the 6-digit display.

Factory calibration settings are programmed into each computer during manufacturing, using Stoddard test solvent at 70° F (21° C) for meters up to 1 inch. Meters 1-1/2 inch and larger are factory calibrated using water at 70° F (21° C).

Settings are correct for light liquids such as water, gasoline or diesel. Readings using the factory calibration (FAC) may not be accurate in some situations, for example, "heavy" liquids such as motor oil, under extreme temperature conditions, non-standard plumbing configurations or with fluids other than those mentioned above.

For improved accuracy under such conditions, the computer allows for field calibration, that is, user entry of custom calibration parameters. A "single point" field calibration curve may yield acceptable accuracy when used in a non-standard application; however, the computer is capable of programming a "five point" field calibration curve.

**NOTE:** If the calibration method is changed when in user configuration mode, i.e., not using the default factory calibration (FAC), the programming will allow the user to adjust the user programmable calibration table for the calibration method selected. This is done by shunting the user to the field calibration method entry menu specific to that calibration method upon exit from the user configuration mode.

**Verify Accuracy before Beginning Field Calibration**

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. This can result in less accurate calibrations. Make sure you meet the meter's minimum flowrate requirements.

The use of a uniformly dependable, accurate calibration container is recommended for the most accurate results. A five-gallon calibration container is available in the parts section of this manual. For best results, the meter should be installed and purged of air before field calibration.

Due to high flowrates on meters 2 inch and larger, it is strongly recommended that field calibration be completed with a combination of volume and weight determined with fine resolution scales.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Field Calibration Mode) (continued)**

**Field Calibration Method Entry**

At the beginning of the calibration method entry menu, the software will allow the user to start the calibration process or to exit back to normal operation. (See Figures 30-1 & 30-2)

The bottom row of characters will be in focus to indicate that the user can select between either “Start” or “Exit” by advancing focus. The **Rate** button changes between START & EXIT while the **Total** button makes the actual selection.

**NOTE:** The **Total** button must be pressed twice (to verify the end user is “certain” of selection).

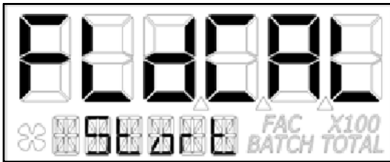


Figure 30-1

If “Start” is in focus when advancing to the next menu, the software will automatically advance to the calibration menu for the calibration method the user previously selected.

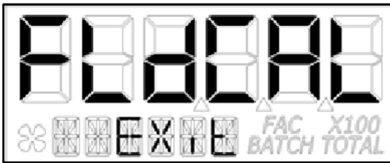


Figure 30-2

If “Exit” is in focus when advancing to the next menu, the software will display a “save” screen (see Figure 13) to enter “yes or no” to save your entries.

**Dispense Display Method**

Dispense/Display is a field calibration method by which the user will dispense a known volume of fluid and the software will keep track of the pulse count during the dispense operation. The user will then enter the known volume into the display and the software will calculate a K-factor for the volume dispensed. (See Figure 31-1)



Figure 31-1

The software will allow the user to dispense a known volume in order to create a custom K-factor. This will not over write the existing factory calibration table.

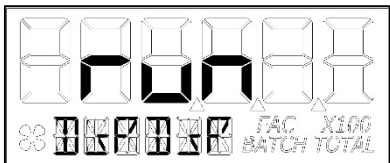


Figure 31-2

The first screen in this calibration method will show “run” indicating that the computer is waiting for flow to start. (See Figure 31-2)

**NOTE:** Pressing any single button while on this screen will not have any effect. Pressing and holding the **Total** button first and immediately pressing and holding the **Rate** button, holding both buttons down for 3 seconds, will allow the user to exit the calibration mode.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Field Calibration Mode) (continued)**

**Dispense Display Method (continued)**

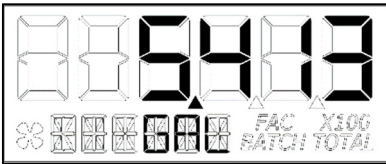


Figure 31-3

Begin dispensing into a container of known accurate volume. As soon as pulses are detected by the software, the screen will change to display the volume being dispensed on the top row and the volume unit on the bottom row. (See Figure 31-3)

**NOTE:** The user is permitted approximately 10 minutes to dispense fluid into the container. Dispensing fluid longer than 10 minutes will prompt a configuration mode exit, and any configuration mode edits/changes the user made will **NOT BE SAVED**.

When the user is finished with the run, press and hold the **Total** button until the left most digit begins to flash indicating it is in focus, then release the **Total** button.

Pressing the **Rate** button will increment the digit in focus. Pressing the **Total** button will advance focus to the next digit.

To advance focus to the next menu, press and hold the **Total** button and then press the **Rate** button.

**NOTE:** Advancing focus to the next menu will lock in the entered volume.

The software will then calculate the K-factor for the volume entered based on the pulse count for the run and the volume entered. The average frequency and the K-factor will be entered into the custom user K-factor table for "run".

**Exit Dispense Display Method**



Figure 32

**NOTE:** "FldCAL" will then be displayed on the top row and "Exit" on the bottom row (see Figure 32). The software will temporarily store the sorted table of frequencies and K-factors, then display the "Save" screen. (See Figure 13)

**NOTE:** Failure to save your entries on the "save" screen will cause the entries to be discarded.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Field Calibration Mode) (continued)**

**Percent Adjust Method (Correction Factor)**

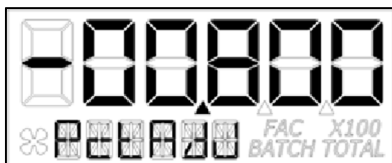
Percent adjust method is a field calibration method by which the user will enter a percentage amount to adjust K-factor values in the factory programmed K-factor table. Once the percentage is input by the user, the software will apply this percentage adjustment to all calculated and displayed values. (See Figure 33-1)



This will not over write the existing factory calibration table, instead, it applies a calculation to the existing values for use by the computer.

This method is good for users who simply want to adjust their meter by a percentage amount.

Figure 33-1



The top row left most character will be in focus to indicate the user can change the value. The left most character is the sign of the value. The decimal point is not adjustable. The range for the values are: -99.999% to +99.999%. The software will display the user applied percent adjustment on the top row. (See Figure 33-2)

Figure 33-2

Press the **Rate** button to change between (dash "-") and (underscore "\_"). A dash indicates a negative value. An underscore indicates a positive value. Press the **Total** button to select/lock dash "-" (*negative value*) or underscore "\_" (*positive value*). The focus will then advance to the left most digit.

**NOTE:** A selected positive value will show no sign while a negative value will show a solid dash.

Once the left most digit is in focus, pressing the **Rate** button will increment the digit in focus. Pressing the **Total** button will advance the focus to the next digit.

When all digits are entered correctly, exit by pressing and holding the **Total** button and then pressing the **Rate** button.

**NOTE:** "FldCAL" will then be displayed on the top row and "Exit" on the bottom row (see Figure 32). The software will temporarily store the adjusted percentage correction, then display the "Save" screen. (See Figure 13)

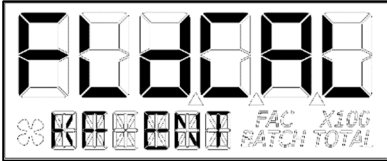
**NOTE:** Failure to save your entries on the "save" screen will cause the entries to be discarded.

**OPERATION (continued)**

**USER CONFIGURATION MODE (Field Calibration Mode) (continued)**

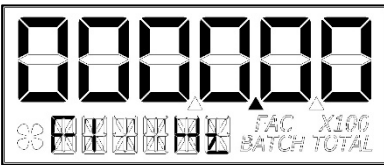
**K-Factor Entry Method - Frequency**

K-factor entry method (see Figure 34-1) is a field calibration method by which the user can input either a single point or multipoint calibration table.



**Figure 34-1**

From 1 to 5 unique K-factor and frequency values can be entered and will be stored in the custom K-factor table in the computer. This will not overwrite the existing factory calibration table.



**Figure 34-2**

The software will read the existing K-factor table from the computer and will display the first frequency on the top row (see Figure 34-2) with the left most character in focus to indicate the user can change the value. Minimum frequency value allowed is 0.25 Hz and the maximum allowable frequency value is 3000.00 Hz. The decimal point for the frequency value is fixed.

Pressing the **Rate** button will increment the digit in focus. Pressing the **Total** button will advance the focus to the next digit.

Once the correct frequency is entered, pressing and holding the **Total** button, then pressing the **Rate** Button will advance to the next screen. (See Figure 34-3)

**NOTE:** Entering all zeros (see Figure 34-2) will store the value as a minimum frequency (0.25 Hz).

**OPERATION (continued)**

**USER CONFIGURATION MODE (Field Calibration Mode) (continued)**

**K-Factor Entry Method – K-Factor Value**

The software will read the existing K-factor table from the computer and will display the first K-factor on the top row. The bottom row displays the K-factor table entry position (1 thru 5) for the volume unit shown. (See Figure 34-3.)

Pressing the **Rate** button moves the decimal point focus to the next decimal point to the right until reaching the end, then, turns off all three. An additional button press will cycle the focus back to the left most decimal point in a round robin fashion. When the decimal point is in the correct position, pressing the **Total** button will lock its location. The screen then advances focus to the left most numeric value digit to allow the user to edit the K-Factor value.

Pressing the **Rate** button will increment the digit in focus. Pressing the **Total** button will move the focus to the next digit. Pressing and holding the **Total** button, then pressing the **Rate** button will advance to the next screen (see Figures 34-4 and 34-5).

**NOTE:** User input K-factor entry values will disable the (FAC) icon. The K-factor range is 0.001 to 999999.

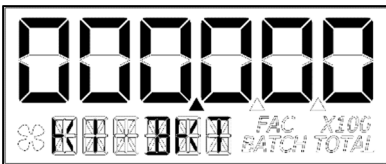


Figure 34-3

After completing the first table entry of frequency and K-factor, the display will ask the user if there are additional points to enter. The **Rate** button changes between Y (Yes) & N (No) while the **Total** button makes the actual selection (See Figures 34-4 & 34-5)

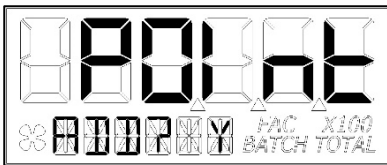


Figure 34-4

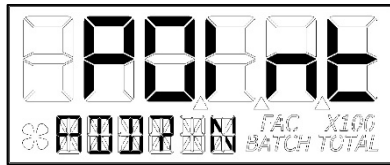


Figure 34-5

If the user chooses YES, the previous screens will repeat for Frequencies 2 – 5 and K-factors 2 – 5.

**NOTE:** If the table stops short of 5 points, then only the points entered will be used to define the calibration curve.

If the user chooses NO (or after the fifth table entry of frequency and K-factor) the software will show the FLdCAL Exit screen (see Figure 32) for one second, and will then exit field calibration mode. The software will temporarily store the K-factor table values in the computer, and then display the “Save” screen (see Figure 13).

**NOTE:** Failure to save your entries on the “save” screen will cause the entries to be discarded.

**TROUBLESHOOTING**

<b>Symptom</b>	<b>Probable Cause</b>	<b>Corrective Action</b>
<p>A. INACCURATE TOTALS / FLOWRATE.</p>	<ol style="list-style-type: none"> <li>1. Field Calibration not performed properly.</li> <li>2. Factory Calibration not suitable for liquid being measured.</li> <li>3. Meter operated below minimum flowrate.</li> <li>4. Meter partially clogged with dried liquid.</li> <li>5. Turbine bearings partially clogged with dried liquid.</li> <li>6. Sealant material wrapped around meter rotor.</li> <li>7. Meter installed too close to fittings.</li> <li>8. Meter installed too close to motors or electrically "noisy" environment.</li> </ol>	<p>Field calibrate again or select Factory Calibration.</p> <p>Perform a Field Calibration according to Field Calibration Section.</p> <p>Increase flowrate.</p> <p>Remove meter. Clean carefully. Make sure rotor spins freely.</p> <p>Remove meter. Clean carefully. Make sure rotor spins freely.</p> <p>If applicable, remove rotor. Make sure rotor spins freely.</p> <p>Install correctly.</p> <p>Install correctly.</p>
<p>B. BUTTON NOT WORKING.</p>	<ol style="list-style-type: none"> <li>1. Button plunger not fully pressed.</li> <li>2. Button only operates upon release.</li> <li>3. Assembly issue.</li> <li>4. Configuration issue.</li> </ol>	<p>Ensure finger covers entire button.</p> <p>Release button to see display change.</p> <p>Contact the factory.</p> <p>Contact the factory.</p>
<p>C. "BA0.000" IS DISPLAYED.</p>	<ol style="list-style-type: none"> <li>1. Configuration issue.</li> </ol>	<ol style="list-style-type: none"> <li>a. Reset Batch and Accumulative Totals.</li> <li>b. Performing a Field Calibration may allow desired performance.</li> <li>c. Contact the factory.</li> </ol>
<p>D. WEIRD CHARACTERS ON SCREEN.</p>	<ol style="list-style-type: none"> <li>1. Assembly issue.</li> <li>2. Bad LCD.</li> </ol>	<p>Contact the factory.</p> <p>Contact the factory.</p>
<p>E. DISPLAY IS FADED OR BLANK.</p>	<ol style="list-style-type: none"> <li>1. Batteries weak, dead, or not connected.</li> <li>2. Ambient temperature is too cold.</li> <li>3. Computer defective.</li> </ol>	<p>Remove display. Check and replace batteries.</p> <p>Place bare hand or warmer on display for temporary readability.</p> <p>Contact the factory.</p>



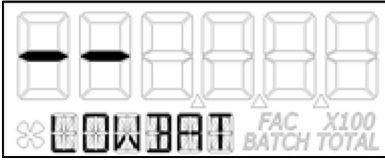
**TROUBLESHOOTING (continued)**

<b>Symptom</b>	<b>Probable Cause</b>	<b>Corrective Action</b>
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. Rotor stuck or damaged. 3. Sealant material wrapped around rotor. 4. Computer defective.	Field calibrate again or select Factory Calibration. Remove meter. Make sure rotor spins freely. Remove meter. Make sure rotor spins freely. Contact the factory.
H. EXCESSIVE FLOW ON SCREEN WHEN FLUID IS <b>NOT</b> 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. DAUGHTER BOARD MODULE OUTPUT INACCURATE.	1. See specific Daughter Board Module owner's manual.	See specific Daughter Board Module owner's manual.

**MAINTENANCE****Batteries**

The computer electronics are powered by alkaline batteries. Removing the batteries before storing the meter will extend battery life since the computer is always on (either standby or active) when the batteries are installed.

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

The computer is shipped with (2) alkaline AAA size batteries (1.5-volts each) installed.

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

**Alkaline (AAA size, 1.5-volts each)**  
Energizer, Alkaline, E92 or En92  
Duracell, Alkaline, Mn2400

**Lithium (AAA size, 1.5-volts each)**  
Energizer, Lithium, L92

***Do not mix brands or technologies. Do not mix old and new batteries. Do not use rechargeable batteries.***

When batteries are disconnected or fail, the computer memory will retain the batch total, accumulative total, factory calibration curve, and field calibration curve indefinitely.

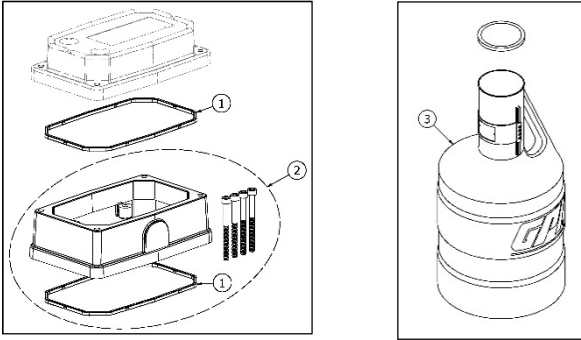
It is strongly recommended that battery checks and terminal cleaning be a part of a routine maintenance schedule. Battery terminals should be cleaned annually. Batteries can be replaced without removing the meter from the piping system.

**Replace Batteries**

1. Remove the (4) corner screws attaching the computer electronics to the meter and lift the computer electronics from the meter.
2. Remove the batteries.
3. Check the battery terminals and remove any corrosion.
4. Install the new batteries and make sure the positive posts are positioned correctly. When the batteries are 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 electronics back on the turbine. Tighten the (4) screws previously removed.
6. Do not clean exterior of computer assembly with Isopropyl Alcohol.

## PARTS

The factory, when provided with model number and serial number, can replace your entire computer electronics assembly. Order replacement kits, parts, and accessories with the part numbers shown below.



Item No.	Part No.	Description	No. Reqd.
1	901002-52	Seal (Display) Seal (Hi-Temp Riser, If Installed)	1 1
2	125527-01	Kit, Q9 Hi-Temp Riser (G2S Meters Only) <i>Includes: Riser, Seal, (4) screws</i>	1
3	116000-1	Large Calibration Container (5 Gallon)	Optional

## 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, during normal business hours.

A toll free number is provided for your convenience.

**1-888-996-3837**

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

- The model number of your computer.  
*(Printed on label located on bottom of one of the battery holders.)*
- The serial number or manufacturing date code of your computer.  
*(Printed on label located on bottom of one of the battery holders.)*
- Part descriptions and numbers.

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

**IMPORTANT:** Please contact GPI before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call.



**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 36<sup>th</sup> 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.

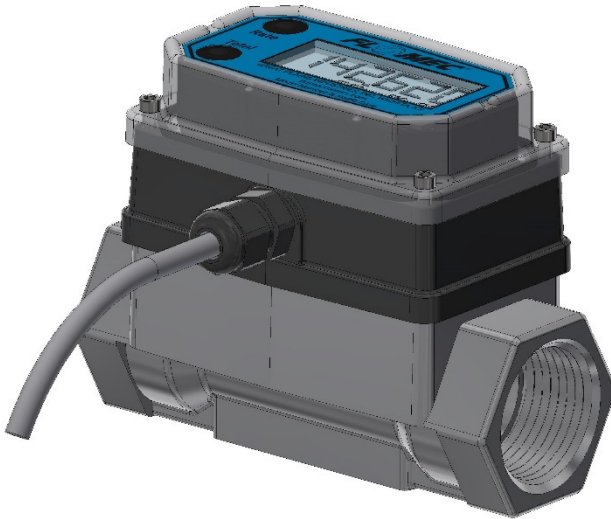
NOTE: In compliance with MAGNUSON MOSS CONSUMER WARRANTY ACT – Part 702 (governs the resale availability of the warranty terms).

Wichita / Sydney

GREAT PLAINS INDUSTRIES



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Great Plains Industries, Inc. / 888-996-3837 / flomecmeters.com



Module shown installed on G2 1" stainless steel flowmeter

## 4-20mA MODULE

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FOR USE WITH MOST\* FLOMEC TURBINE METERS  
WITH Q9 DISPLAY

*\*FLOMEC QSE meters have their own 4-20mA module*

---



*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](mailto:meters@gplains.com)**

**SAVE FOR YOUR RECORDS**

**Model #:** \_\_\_\_\_

**Serial #:** \_\_\_\_\_

**Purch. Date:** \_\_\_\_\_

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## BEFORE YOU BEGIN

### **Usage Requirements**

- This 4-20mA module is not FM Approved. Therefore, use of this module with an approved metering system voids FM Approval.
- This 4-20mA module requires an input power of 8-32 volts DC (24 VDC is recommended).
- This 4-20mA module is designed for use with most\* FLOMEC meters that are equipped with the Q9 display option. The 4-20mA module can be field calibrated through the configuration menu options on the Q9 display.

*\*FLOMEC QSE meters have their own 4-20mA module.*

---

## 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.



## SPECIFICATIONS

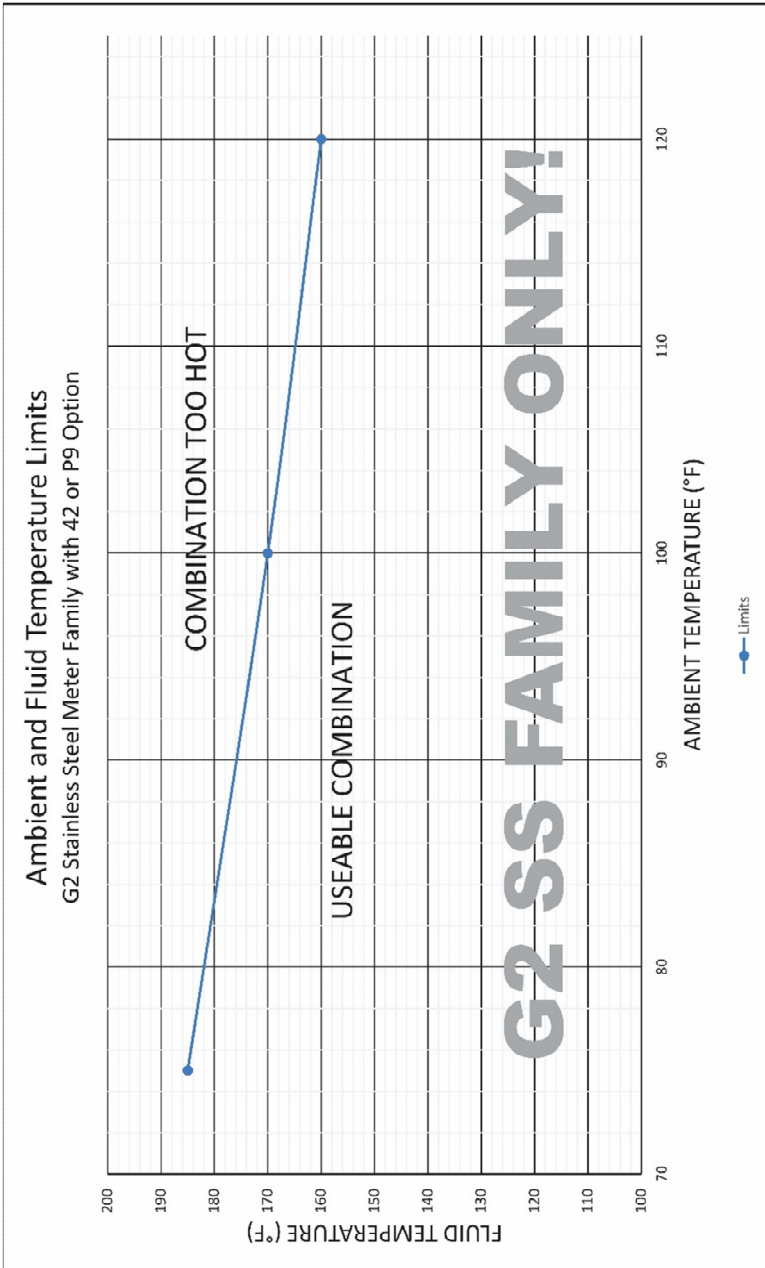
<b>Mechanical</b>	
Housing material:	Nylon 6/6
Strain relief:	Hubble PG7. Grip range (Cable Outside Diameter) 0.11 - 0.26 in. (2.8 – 6.6 mm)
Housing port thread:	Female 1/2-20 UNF-2B (Compatible with PG7)
Cable	Belden 9363 (22 AWG-3 conductor with drain wire and shield)
Cable length	10 ft. (3m), provided
Operating Temperature	0° to +140°F (-18° to +60°C)
Higher Process Fluid Temperatures Obtainable with G2 Stainless Steel Meters	When installed on G2 Stainless Steel Flowmeters, see Ambient and Fluid Temperature Limits graph on next page for higher process fluid temperature Limits.  If wider process fluid temperature ranges are desired, reference information on FLOMEC® Remote Kits.
Storage temperature:	-40° to +180°F (-40° to +82°C)
<b>Power:</b>	
Type:	Loop powered
Voltage minimum:	8 VDC
Voltage maximum:	32 VDC
Isolated:	No
<b>Primary Output (4-20mA):</b>	
Type:	Loop
Minimum:	4 mA
Maximum:	25 mA
<b>Scaled Pulse Output:</b>	
Type:	Open Collector (NPN), Current Sinking
External Pull Up Voltage <sup>1</sup>	8.0 to 26 VDC
Internal Pull Up Voltage <sup>2</sup>	5.0 VDC

<sup>1</sup> **NOTE:** Customer supplied external voltage with separate power supply and a minimum external pull up resistance of 820 ohms.

<sup>2</sup> **NOTE:** 5VDC supplied internal on the 4-20mA board, no external supply or pull up resistor required. Internal pull up is fixed at 100K ohm

**SPECIFICATIONS (continued)**

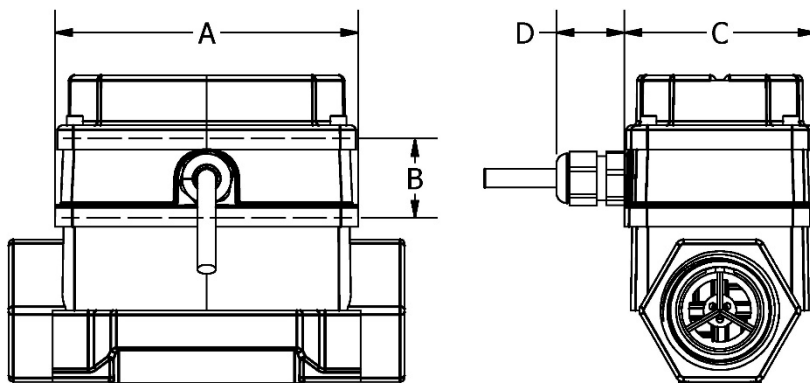
**AMBIENT AND FLUID TEMPERATURE LIMITS**



**NOTE:** The upper limit of the “Useable Combination” area can be increased by 10°F (6°C) when lithium batteries are installed in the Q9 Display.

**SPECIFICATIONS (Continued)**

Dimensions	Length (A)	Height (B)	Width (C)	Strain Relief (D)
4-20mA Module	3.45 in. (88 mm)	0.90 in. (23 mm)	2.18 in. (55 mm)	0.86 in. (22 mm)



**Module shown installed on G2 1" stainless steel flowmeter**

**Figure 1**

**Note:** This 4-20mA module is designed for use with most\* FLOMEC meters that are equipped with the Q9 display option. The 4-20mA module can be field calibrated through the configuration menu options on the Q9 display.

\*FLOMEC QSE meters have their own 4-20mA module.

**APPROVAL RATINGS**



## INSTALLATION

### Installing Module

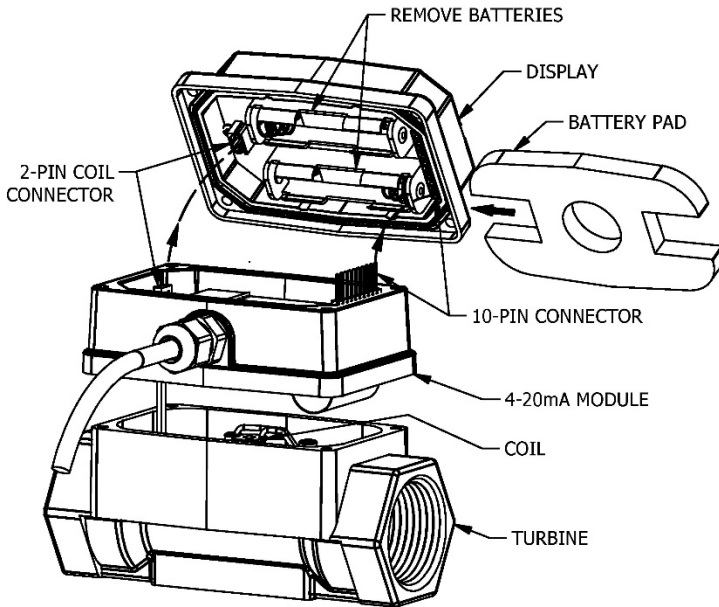
**NOTE:** Factory installed 4-20mA modules will have the zero set to the meter's minimum specified flow rate and the span will be set to the meter's maximum specified flow rate.

1. Remove the display electronics from the front of the turbine.

**NOTE:** If you are installing more than one module at a time, take care to keep the proper electronics paired with the original turbine.

**NOTE:** If your display currently has batteries installed, you will need to remove them to enable the 4-20mA and scaled pulse output to function.

2. Disconnect 2-pin coil connector from display. Make sure coil remains firmly attached to meter body (DO NOT pull on wires or attempt to remove from meter body).
3. Connect the 4-20mA Module to the 10-pin connector located on the backside of the computer electronics (see Figure 2).
4. Reconnect the coil connector to the 2-pin terminal block on the other end of the computer backside. Once the cables are installed on the display, the housing of the display can be placed on top of the 4-20mA module (see Figure 2).
5. Install the computer electronics to the front side of the turbine. Tighten the four screws snugly.



Module shown installed on G2 1" stainless steel flowmeter

Figure 2

## INSTALLATION (Continued)

### Wiring

The 4-20mA module comes pre-wired for external connections to external power and provides an open collector output, which can be set to either raw or scaled pulse output. The wires are color coded to connect as shown in Figures 3 & 4.

Wire Color	Feature
Red	4-20mA (+)
Black	4-20mA (-)
White	Pulse Out (+)
Uninsulated	Pulse Out (-)

**NOTE:** The 4-20mA board provides a pulse output on the White wire with the cable shield as the ground (return). This is set to raw pulse output as the default setting on the Q9 display. If your application requires a scaling of the pulse output, refer to the installation instructions to enable the scaled pulse feature and refer to the Q9 owner's manual for instructions on the configuration of the scaled pulse feature.

**NOTE:** If using the scaled pulse output feature, use the scaled K-factor in the user interface device.

**NOTE:** The ground of the pulse output must be galvanically isolated from the 4-20mA loop ground (return).

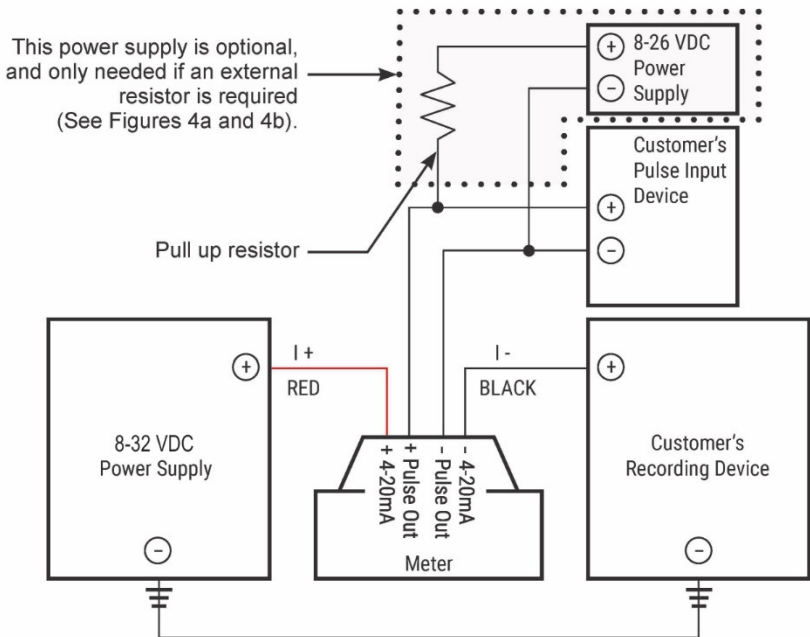


Figure 3

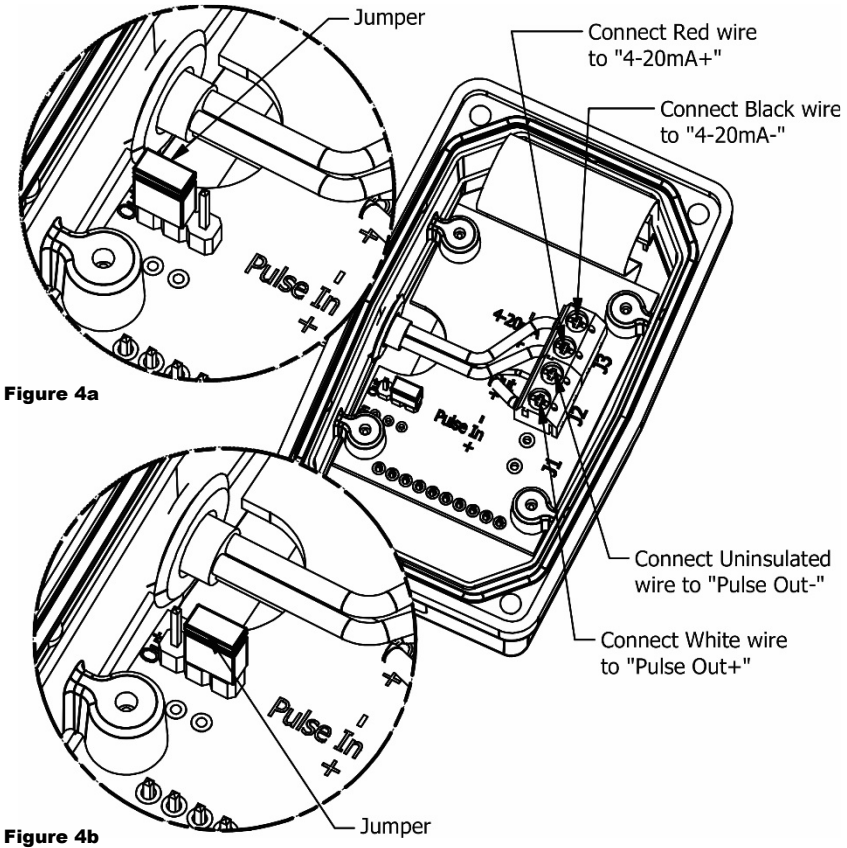
**INSTALLATION (Continued)**

**WIRING (Continued)**

**NOTE:** The internal and external options for the pull up resistance and voltage is selectable by the header on the 4-20mA board (see Figures 4a & 4b).

When the Jumper is on the top two pins, the "external resistor required" option is selected (Figure 4a). This external resistor can be installed as shown on Figure 3, but could also be built into the existing customer equipment.

When the Jumper is located on the bottom two pins, the "internal resistor" option is selected (Figure 4b).



## **OPERATION / CALIBRATION**

### **Adjusting ZERO and SPAN**

To set or adjust ZERO and SPAN settings, refer to the Q9 Owner's Manual (Non-Agency) Configuration Mode (Daughter Board Options) and Calibration Mode Section for further instructions.

**NOTE:** The Q9 Display controls the 4-20 mA settings. It is recommended to verify and set (if necessary) the most optimal Calibration Method of the Q9 Display (see Q9 Owner's Manual referenced above) before adjusting 4-20mA settings.

You can download the Q9 Owner's Manual (Non-Agency) here:



or visit [flomecmeters.com](http://flomecmeters.com) to download owner's manuals and other technical documents.

## TROUBLESHOOTING

Symptom	Possible Cause(s)	Corrective Action
A. No output signal.	<ol style="list-style-type: none"> <li>1. Incorrect or no input power.</li> <li>2. Not wired correctly.</li> <li>3. Broken connection.</li> <li>4. Defective PC board connector.</li> <li>5. Defective unit.</li> <li>6. Batteries installed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Supply correct power requirements.</li> <li>2. Check owner's manual for correct installation.</li> <li>3. Check resistance to determine location of break.</li> <li>4. Contact distributor or factory for replacement</li> <li>5. Contact distributor or factory for replacement.</li> <li>6. Remove batteries and cycle loop power.</li> </ol>
B. Signal not between 4-20mA when fluid is flowing.	<ol style="list-style-type: none"> <li>1. ZERO and SPAN not set correctly on the Q9 display.</li> <li>2. 4-20 mA Module output signal "ZERO" and "SPAN" does NOT match customer's recording device "ZERO" and "SPAN" settings.</li> <li>3. Q9 display calibration is NOT optimized for best results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check Q9 owner's manual for instructions on how to set ZERO and SPAN for meter.</li> <li>2. Reconfigure 4-20mA Module output signal "ZERO" and "SPAN" to match Customer's recording device "ZERO" and "SPAN" (or vice versa).</li> <li>3. Verify Q9 display value is giving correct flowrate.</li> </ol>
C. Scaled Pulse output not working or not shown in Q9 configuration options menu.	<ol style="list-style-type: none"> <li>1. Batteries being installed will disable the Scaled Pulse output feature.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove batteries, cycle loop power and reconfigure the Scaled Pulse output feature on Q9 display.</li> </ol>
D. Pulse output values are not giving accurate total volumes.	<ol style="list-style-type: none"> <li>1. Customer's "pulse Input device" (pulses per unit of volume) does not match module pulse output (pulses per unit of volume).</li> <li>2. Q9 display calibration is NOT optimized for best results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconfigure module pulse output (or customer's "pulse input device") to match in pulses per unit of volume (module output pulses per unit of volume = input pulses per unit of volume).</li> <li>2. Verify Q9 display value is giving correct volume totals.</li> </ol>



## TROUBLE SHOOTING (Continued)

<p>E. Q9 display value not giving correct Flowrate.</p>	<ol style="list-style-type: none"> <li>1. Q9 display showing velocity or volume totals instead of flowrate.</li> <li>2. Q9 display calibration is not optimized for best results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press "top button" of Q9 display until flowrate is displayed (see Operation Section in Q9 owner's manual).</li> <li>2. If "1" above is not the Issue, See Operation/Calibration Section of this manual</li> </ol>
<p>F. Q9 display value not giving correct volume totals.</p>	<ol style="list-style-type: none"> <li>1. Q9 display showing velocity, flowrate, or accumulative total instead of batch total.</li> <li>2. Q9 display calibration is not optimized for best results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press "bottom button" of Q9 display until correct volume is displayed (see Operation Section in Q9 owner's manual).</li> <li>2. If "1" above is not the Issue, see Operation/Calibration Section of this manual.</li> </ol>



## PARTS LIST

Part Number	Description
901002-52	Seal

## PARTS & SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, contact the GPI Product Support Department in Wichita, Kansas, during normal business hours.

A toll free number is provided for your convenience.

### 1-888-996-3837

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

- The model number of your meter.
- The serial number or manufacturing date code of your meter.
- Part descriptions and numbers.

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

**IMPORTANT:** Please contact GPI before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call.

**CAUTION** *Do not return this product without prior approval from the GPI Product Support Department. Due to strict government regulations, GPI cannot accept parts unless they have been drained and cleaned.*

## 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.



## 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:

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- 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 36<sup>th</sup> 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



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Module shown installed on G2 1" stainless steel flowmeter  
Module can be installed on all FLOMEC meters with Q9 display.

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## **Pulse Access, External Power & Scaled Pulse Module**

FOR USE WITH ALL TURBINE METERS WITH Q9 DISPLAY

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*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](mailto:meters@gplains.com)**

**SAVE FOR YOUR RECORDS**

**Model #:** \_\_\_\_\_

**Serial #:** \_\_\_\_\_

**Purchase Date:** \_\_\_\_\_

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## BEFORE YOU BEGIN

### Usage Requirements

- This Pulse Access, External Power & Scaled Pulse module is not FM Approved. Therefore, use of this module with an approved metering system voids FM Approval.
- This module is designed for use with all meters that are equipped with the Q9 display option. The PA-EP-SC module can be field calibrated through the configuration menu options on the Q9 display.



### Power Source Requirements

- This module requires an input power of 5.0-26 VDC (24 VDC is recommended).

---

## 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 Instruction, and all Cautions, Warnings, and Dangers as shown.



## SPECIFICATIONS

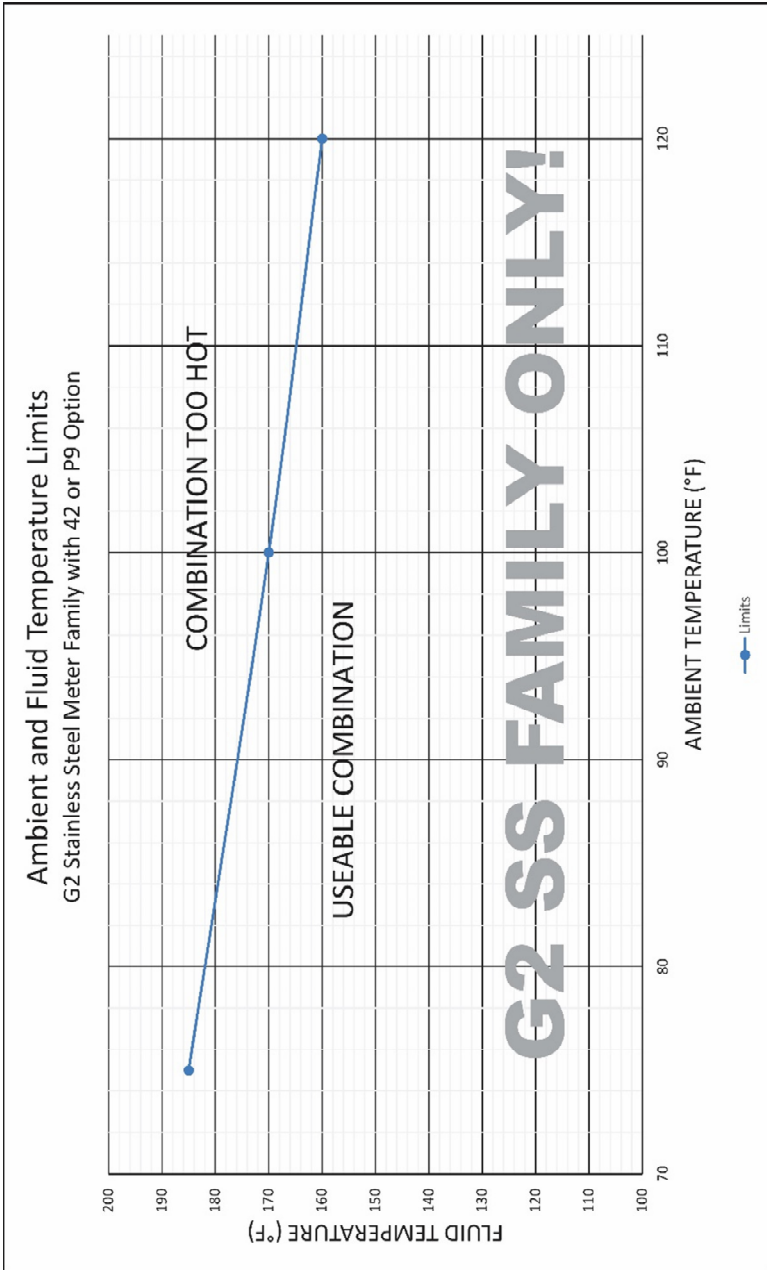
<b>MECHANICAL</b>	
Housing Material	Nylon 6-6
Strain Relief	Hubble PG7. Grip range 0.11-0.26
Housing Port Thread	Female 1/2-20 UNF-2B (Compatible with PG7)
Cable	Belden 9363 (22 AWG-3 conductor with drain wire and shield)
Cable Length	10 ft. (3m), provided
Operating Temperature	0° to +140°F (-18° to +60°C)
Higher Process Fluid Temperatures Obtainable with G2 Stainless Steel Meters	When installed on G2 Stainless Steel Flowmeters, see Ambient and Fluid Temperature Limits graph on next page for higher process fluid temperature Limits. If wider process fluid temperature ranges are desired, reference information on FLOMEC® Remote Kits.
Storage Temperature	-40° to +180°F (-40° to +82°C)
<b>POWER</b>	
Voltage Minimum	5.0 VDC
Voltage Maximum	26 VDC
Isolated	No
<b>PULSE OUTPUT</b>	
Type	Open Collector (NPN)
* External Pull-up Voltage	5.0 to 26 VDC
** Internal Pull-up Voltage	5.0 to 26 VDC

\* **Note:** Customer supplied external voltage with separate power supply and a minimum external pull up resistance of 820 ohms.

\*\* **Note:** When configured for internal pull up resistor, no external pull up resistor is required. Internal pull up is fixed at 100K ohm.

**SPECIFICATIONS (continued)**

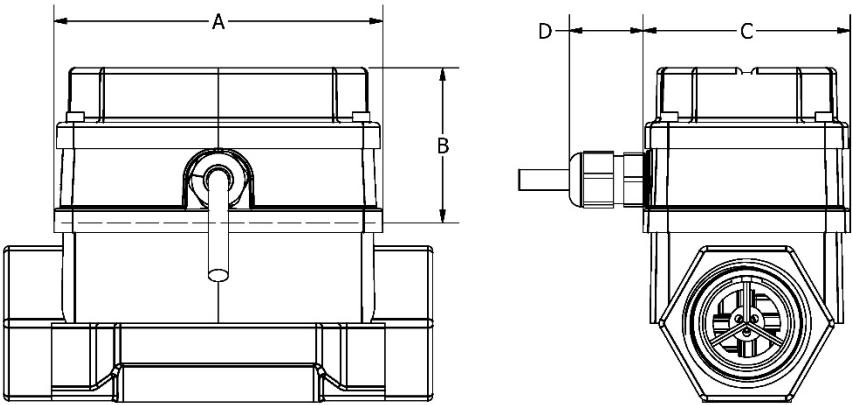
**AMBIENT AND FLUID TEMPERATURE LIMITS**



**NOTE:** The upper limit of the “Useable Combination” area can be increased by 10°F (6°C) when lithium batteries are installed in the Q9 Display.

**SPECIFICATIONS (continued)**

<b>DIMENSIONS</b>			
<b>Length (A)</b>	<b>Height (B)</b>	<b>Width (C)</b>	<b>Strain Relief (D)</b>
3.45 in. (8.8 cm)	0.90 in. (2.3 cm)	2.18 in. (5.5 cm)	0.77 in. (1.96 cm)



Module shown installed on G2 1" stainless steel flowmeter

**Figure 1**

**APPROVAL RATINGS**

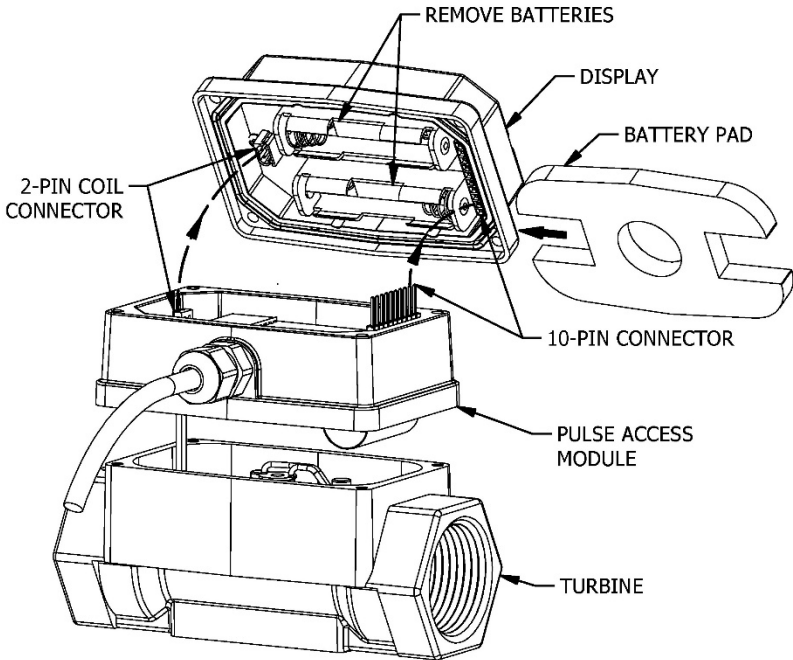


## INSTALLATION

### INSTALLING MODULE

1. Remove the display electronics from the front of the turbine.
 

**NOTE:** If you are installing more than one module at a time, take care to keep the proper electronics paired with the original turbine.
2. **If your display currently has batteries installed, you will need to remove them to enable the scaled pulse output to function.**
3. Disconnect 2-pin coil connector from display. Make sure coil remains firmly attached to meter body (DO NOT pull on wires or attempt to remove from meter body).
4. Connect the module to the 10-pin connector located on the backside of the computer electronics (see Figure 2).
5. Reconnect the coil connector to the 2-pin terminal block on the other end of the computer backside. Once the cables are installed on the display, the housing of the display can be placed on top of the module (see Figure 2).
6. Install the computer electronics to the front side of the turbine. Tighten the four screws snugly.



Module shown installed on G2 1" stainless steel flowmeter

Figure 2

**INSTALLATION (continued)**

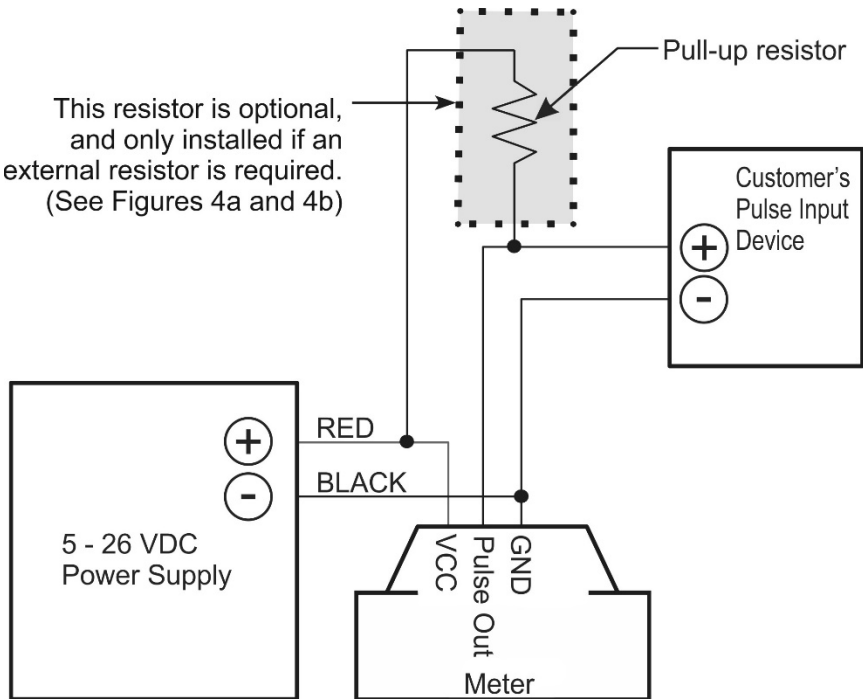
**WIRING**

The Pulse Access module comes pre-wired for external connections to external power and provides an open collector output, which can be set for either raw or scaled pulse output. The wires are color-coded and are to be connected as shown in Figures 3 & 4.

Wire Color	Feature
Red	VCC
Black	GND
White	Pulse Out

**NOTE:** The pulse output is set to raw pulse output as the default setting on the Q9 display. If your application requires a scaling of the pulse output, refer to the installation instructions to enable the scaled pulse feature and refer to the Q9 owner's manual for instructions on the configuration of the scaled pulse feature.

**NOTE:** If using the scaled pulse output feature, use the scaled K-factor in the user interface device.



**Figure 3**

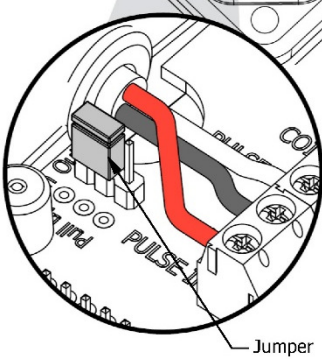
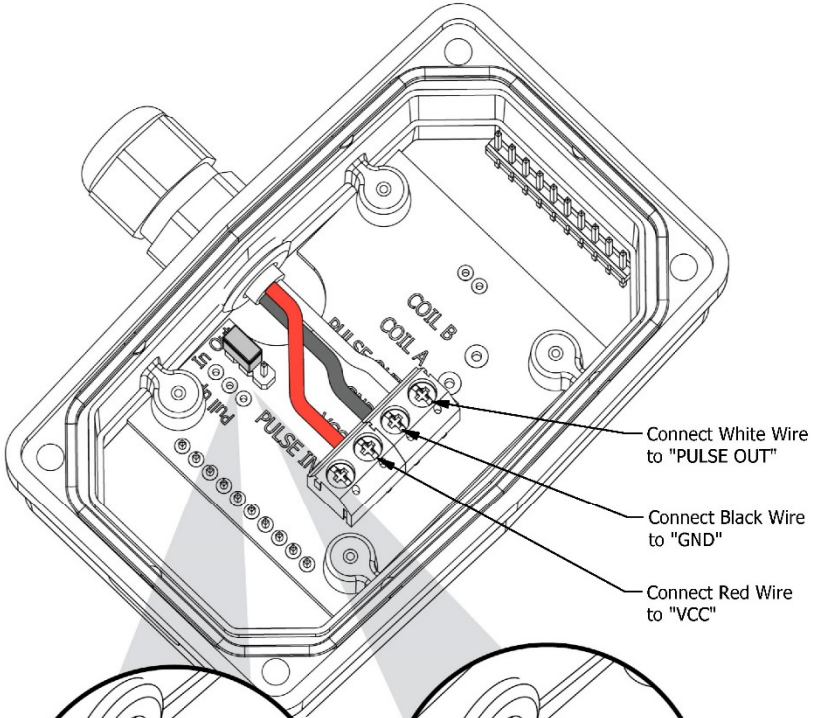
**INSTALLATION (continued)**

**WIRING (continued)**

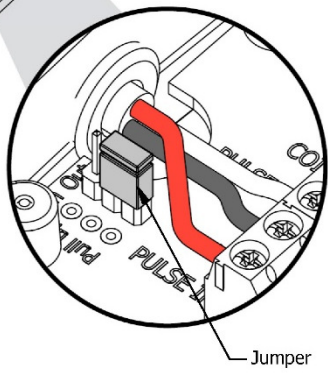
**NOTE:** The internal and external options for the pull up resistance and voltage is selectable by the header on the pulse access board (see Figures 4a & 4b).

When the Jumper is on the top two pins, the “external resistor required” option is selected (Figure 4a). This external resistor can be installed as shown on Figure 3, but could also be built into the existing customer equipment.

When the Jumper is located on the bottom two pins, the “internal resistor” option is selected (Figure 4b).



**Figure 4a**



**Figure 4b**

## INSTALLATION (continued)

### WIRING (continued)

#### Wiring Example 1

- Customer's Equipment:
- Built in Power
  - Built in Pull-Up Resistor (via Customer's Equipment)
  - Use Scaled Pulse Output Module's External Pull-up Resistor Jumper Setting (Fig 4a).

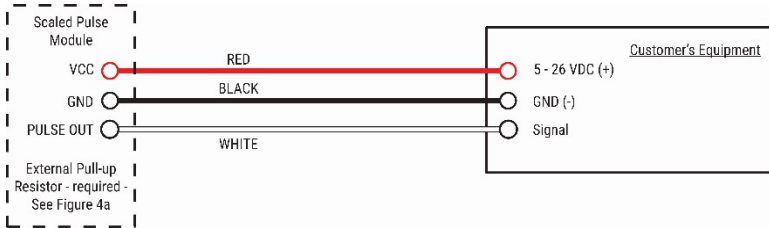


Figure 5a

#### Wiring Example 2

- Customer's Equipment:
- No Built in Power
  - No Built in Pull-Up Resistor
  - Use Scaled Pulse Output Module's Internal Pull-up Resistor Jumper Setting (Fig 4b).

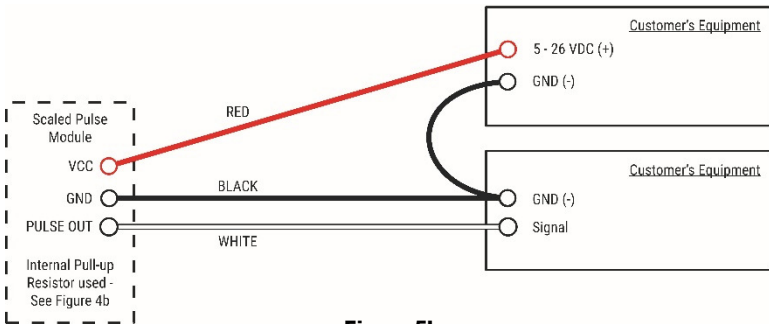


Figure 5b

#### Wiring Example 3

- Customer's Equipment:
- Built in Power
  - No Built in Pull-Up Resistor
  - External Pull-up Resistor added by user.
  - Use Scaled Pulse Output Module's External Pull-up Resistor Jumper Setting (Fig 4a).

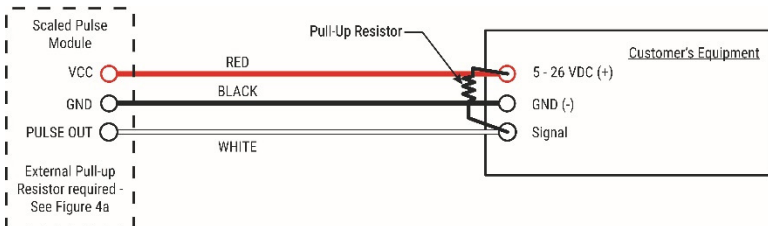


Figure 5c

## OPERATION / CALIBRATION

### ADJUSTING SCALED PULSE K-FACTOR

To set or adjust Scaled Pulse K-Factor settings, refer to the Q9 Owner's Manual (Non-Agency) Field Calibration Section for further instructions (see below).

You can download the Q9 Owner's Manual (Non-Agency) here:



or visit [flomecmeters.com](http://flomecmeters.com) to download owner's manuals and other technical documents.

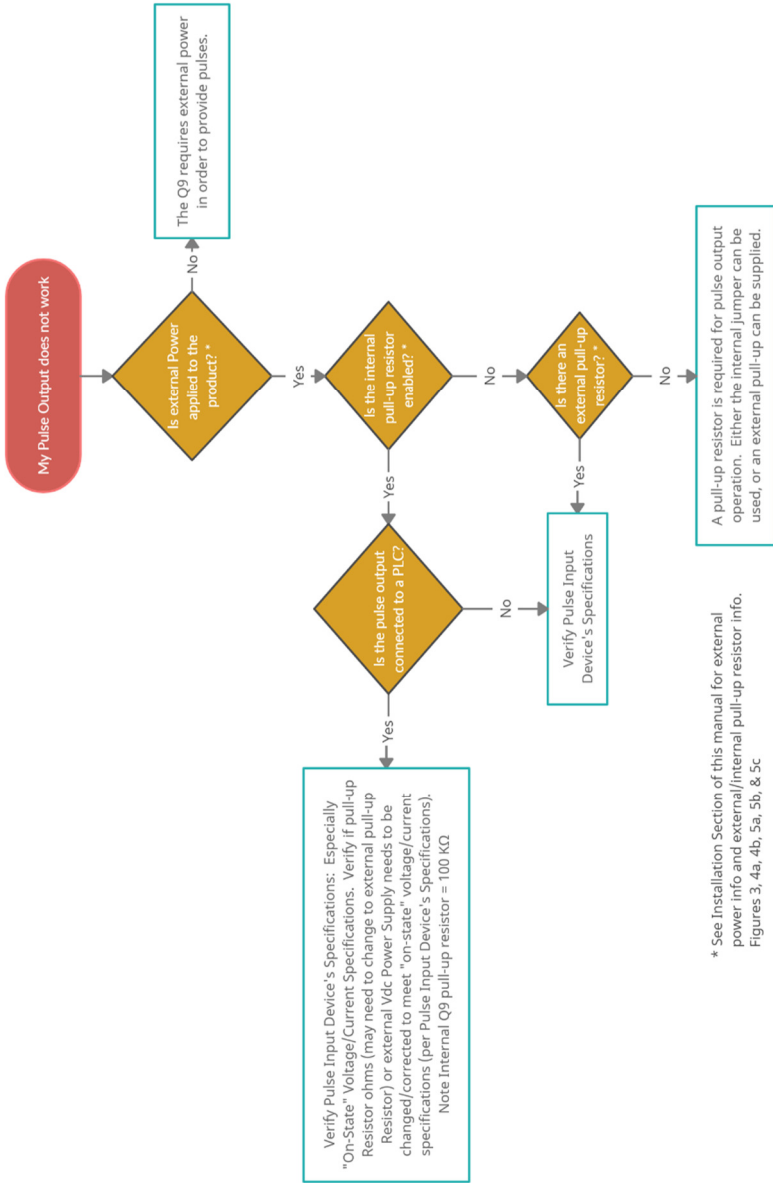


## TROUBLESHOOTING

Symptom	Possible Cause(s)	Corrective Action
A. No output signal.	<ol style="list-style-type: none"> <li>1. Incorrect or no input power.</li> <li>2. Not wired correctly.</li> <li>3. Broken connection.</li> <li>4. Defective PC board connector.</li> <li>5. Defective unit.</li> <li>6. Batteries installed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Supply correct power requirements.</li> <li>2. Check owner's manual for correct installation.</li> <li>3. Check resistance to determine location of break.</li> <li>4. Contact distributor or factory for replacement.</li> <li>5. Contact distributor or factory for replacement.</li> <li>6. Remove batteries and cycle loop power.</li> </ol>
B. Scaled Pulse output not working or not shown in Q9 configuration options menu.	<ol style="list-style-type: none"> <li>1. Batteries being installed will disable the Scaled Pulse output feature.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove batteries, cycle loop power and reconfigure the Scaled Pulse output feature on Q9 display.</li> </ol>
C. Pulse output values are not giving accurate total volumes.	<ol style="list-style-type: none"> <li>1. Customer's "pulse Input device" (pulses per unit of volume) does not match module pulse output (pulses per unit of volume).</li> <li>2. Q9 display calibration is NOT optimized for best results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconfigure module pulse output (or customer's "pulse input device") to match in pulses per unit of volume (module output pulses per unit of volume = input pulses per unit of volume).</li> <li>2. Verify Q9 display value is giving correct volume totals.</li> </ol>
D. Q9 display value not giving correct volume totals.	<ol style="list-style-type: none"> <li>1. Q9 display showing velocity, flowrate, or accumulative total instead of batch total.</li> <li>2. Q9 display calibration is not optimized for best results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press "bottom button" of Q9 display until correct volume is displayed (see Operation Section in Q9 owner's manual).</li> <li>2. If "1" above is not the Issue, see Operation/Calibration Section of this manual.</li> </ol>

**TROUBLESHOOTING (continued)**

**PULSE OUTPUT FLOWCHART**



\* See Installation Section of this manual for external power info and external/internal pull-up resistor info. Figures 3, 4a, 4b, 5a, 5b, & 5c

## PARTS LIST

Part No.	Description
901002-52	Seal

## PARTS & SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, contact the GPI Product Support Department in Wichita, Kansas, during normal business hours.

A toll free number is provided for your convenience.

### 1-888-996-3837

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

- The model number of your meter.
- The serial number or manufacturing date code of your meter.
- Part descriptions and numbers.

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

**IMPORTANT:** Please contact GPI before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call.

### CAUTION

*Do not return this product without prior approval from the GPI Product Support Department. Due to strict government regulations, GPI cannot accept parts unless they have been drained and cleaned.*

## 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.



**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 36<sup>th</sup> 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



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