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GREAT PLAINS INDUSTRIES, INC.

"A Great Plains Ventures Subsidiary"

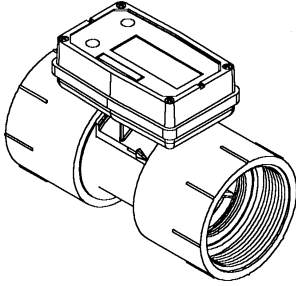
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1-800-835-0113

TM-200 Electronic Water Meter

Manual No. 921745-1

FOR WATER ONLY



IMPORTANT NOTICE

The meter is for use with water only. Do not use to meter fuel or chemicals. The TM-200 will measure in gallons or litres. Refer to the Calibration section for details.

This meter is not legal for trade applications.

The meter is very sensitive to electric noise if operated within one to two inches of some electric motors or other sources of electronic noise.

INSTALLATION

This meter may be installed in-line either horizontally or vertically or at the end of the hose adjacent to the nozzle. Installation to metal connections is not recommended. Install as follows:

1. Install with 40 inches (102cm) of straight pipe upstream and 10 inches (26cm) of straight pipe downstream.
2. Wrap all connections with 3 to 4 wraps of Teflon® tape. Ensure the tape does not intrude into the flow path.
3. Attach meter with arrow pointed in the direction of flow.
4. Hand tighten the meter at the housing ends. Do not use a wrench or similar tools to tighten the meter housing. The housing could be damaged.

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 the flow using a valve or nozzle.
2. If desired, hold down DISPLAY for three seconds to zero the meter's Batch Total. When zeros appear, release the button.
3. Meter an exact known volume into an accurate container. For best results, meter with one continuous full stream.
4. Check the readout. If the amount metered is accurate, field calibration is not necessary. If not, refer to the Calibration Section for further instructions.

OPERATION

Batch and Cumulative Totals

The meter maintains two totals. The batch total can be reset to measure flow during a single use. The cumulative total provides continuous measurement and cannot be manually reset. Batch Total is labeled with TOTAL 2. The Cumulative Total is labeled with TOTAL 1 Locked indicating that this total is locked and cannot be manually zeroed.

When the cumulative total reaches a maximum reading of 999,999, it will automatically reset to zero.

Press the DISPLAY button briefly to switch between the batch, cumulative total, and flowrate.

NOTE: Totalization counts total units without differentiating between gallons, litres or field calibrated units.

Flow Rate Feature

When this feature is activated, the word FLOWRATE displays to the left on the bottom line.

When FLOWRATE is displayed, the numbers on the middle line reflect the rate of flow, for example, the current gallons per minute (GPM) or liters per minute (LPM).

Display FLOWRATE

To use this feature, press and release DISPLAY until FLOWRATE appears to the left of the bottom line.

Activate the Meter

Turn the meter ON by starting water flow or briefly pressing the DISPLAY button. The meter will display the batch or cumulative total from last use.

Press DISPLAY briefly to display the batch total. Hold the DISPLAY button down for three seconds to reset the batch total to zero.

The meter is programmed to turn off automatically if not used for four minutes.

Calibration

Calibration information is shown on the top line of the readout. There are two types of calibration: Field Calibration and Factory Calibration.

CAL A = preset displays in gallons.

CAL B = preset displays in litres.

CAL C = field calibration.

Field Calibration is set by the user. It can be changed or modified at any time using procedures given in the Calibration Section.

Factory Calibration is "preset" by the manufacturer and stored permanently in the meter's computer. Factory Calibration displays PRESET on the top line.

Select Calibration

To change between a Field Calibration and a Factory Calibration, hold CALIBRATE down while pressing and releasing DISPLAY. When the desired calibration appears, release both buttons.

"NO" Flag

The NO flag displays on the left of the top line when particular conditions have not been met during calibration procedures.

While the NO flag displays, normal flow does not register on the meter. To resume normal flow counting, return to CAL A Preset and back to CAL B before continuing Field Calibration.

Calibration Container

The desired calibration container should be uniformly dependable and constructed with a graduated neck. The container's volume indicator should be clearly and precisely marked. It is helpful if the container's material allows a window through which the level of liquid can be viewed. Contact GPI Customer Service to purchase a calibration container.

Field Calibration

The Field Calibration should be considered carefully due to high flow rate. Field Calibration of these meters should be completed with a combination of volume and weight.

Before Beginning Field Calibration

Review the following instructions before beginning field calibration.

For most accurate results, dispense at full flow. Quickly start and stop a full flow as many times as necessary to reach the desired volume. Do not "choke" or "trickle" the flow to reach that volume.

Use an accurate calibration container.

The meter's minimum requirements for flow rate is 20 GPM (76 LPM).

The maximum volume dispensed and adjusted during the Calibration Procedure below should not exceed 999.9 units. During calibration, the two left-hand digits on the readout are ignored.

Install your meter on your system according to the Installation instructions given earlier in this manual.

Dispense/Display Calibration Procedures

1. Hold down CALIBRATE while pressing and releasing DISPLAY until the Field Calibration (CAL C) appears. Release both buttons.

NOTE: Remember, Field Calibration is *not* preset.

2. Press and release DISPLAY until the Batch Total appears.

NOTE: Remember, a Batch Total is *not* locked.

3. Hold down DISPLAY for three seconds to zero the total.
4. Dispense the desired volume and stop.

NOTE: For the most accurate results, dispense at a flow rate which best simulates your actual operating conditions. Avoid stopping or "trickling" the flow.

5. Press CALIBRATE then hold down DISPLAY (both) for approximately three seconds until CAL-dd flashes. Release both buttons.
6. When the buttons are released, the volume dispensed returns with one digit flashing. Set this readout to the amount you dispensed. DISPLAY moves from left to right. CALIBRATE changes the value from 0 - 9.

NOTE: Remember, the two left-hand digits are ignored during calibration.

7. With the readout set to the dispensed amount, hold down CALIBRATE as you briefly press DISPLAY. Cal End flashes and the original amount appears without any flashing digits.

NOTE: Calibration is complete. Verify field calibration accuracy and resume normal operations.

MAINTENANCE

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.

Battery Replacement

The meter is powered by two 3-volt lithium batteries which may be replaced while the meter is installed. When batteries

are removed or lose power, the batch and cumulative totals reset to zero but the field and factory calibrations are retained.

If the meter display becomes dim or blank, replace the batteries as follows:

1. Remove the four Phillips-head screws from the face of the meter and lift the faceplate from the turbine.
2. Remove the old batteries and clean any corrosion from the terminals.
3. Install new batteries. Make sure the positive post is in the correct position.
4. When the batteries are replaced, the faceplate will power ON. Check the display to ensure normal functions have resumed before assembling again.
5. Reseat batteries, if necessary, and position the faceplate on the turbine housing. To avoid moisture damage, make sure the O-ring is fully seated. Tighten the four screws on the faceplate.

SPECIFICATIONS

Threads:	NPT
Inlet and Outlet:	2 inch
Design Type:	Turbine
Wetted Components:	
Housing:	PVC
Journal Bearings:	Ceramic
Shaft:	Tungsten Carbide
Rotor and Supports:	PVDF
Max. Working Pres.:	150 PSIG

U.S. Measurement

Unit of Measure:	Gallon
Flow Range:	20 to 200 GPM
Operating Temp.:	+14° to +140° F
Storage Temp.:	-40° to +158° F
Weight:	1.0 pound
Dimensions:	
Width:	3 inches
Height:	4 inches
Length:	5.5 inches

Metric Measurement

Unit of Measure:	Litre
Flow Range:	76 to 760 LPM
Operating Temp.:	-10° to +60° C
Storage Temp.:	-40° to +70° C
Weight:	.454 kg
Dimensions:	
Width:	7.6 cm
Height:	10.1 cm
Length:	14 cm

PARTS

The following replacement parts and accessories are available for the TM-200 meter.

Part No.	Description
113520-1	Battery Replacement Kit
125502	Computer Assembly Replacement Kit
116001-1	Large (5 gallon) Calibration Container
901002-52	O-Ring
125503	Turbine Assembly Kit

SERVICE

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

1-800-835-0113

You will need to:

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



!!! CAUTION !!!

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

Great Plains Industries, Inc. Limited Warranty Policy

Great Plains Industries, Inc., 5252 East 36th Street North, Wichita, KS USA 67220-3205, hereby provides a limited one year warranty against defects in material and workmanship on all products manufactured by Great Plains Industries, Inc. This 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 the original new equipment purchase. Warrantor's obligation hereunder shall be limited to repairing defective part or parts. 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, notice of claim must be given in writing to the company at its above address no later than 30 days after the expiration of the warranty period. Such notice shall identify the defect in the product. The company shall, within 14 days of receipt of such notice, notify the customer to either send the product, transportation prepaid, to the company at its office in Wichita, Kansas, or to a duly authorized service center. The company shall perform all obligations imposed on it by the terms of this warranty within 60 days of receipt of the defective product.

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

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

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

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



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