



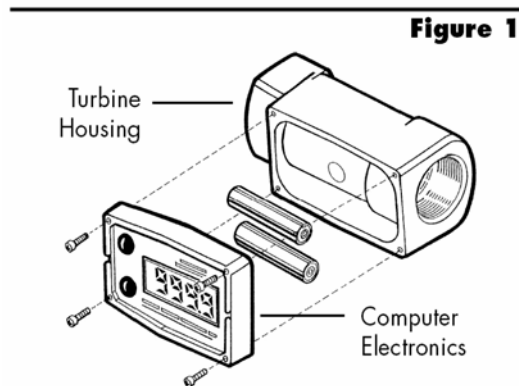
RMT

Residential Meter Tester

USER MANUAL

GENERAL INFORMATION

This manual will assist you in operating and maintaining the Computer Electronics of the Aquatech RMT. (See Figure 1) Calibration details are given in this manual. Information on turbine housings and accessory modules are contained in other manuals. Please reference those as necessary.



For best results, take the time to fully acquaint yourself with all information about all components of your Aquatech RMT prior to installation and use.

If you need assistance, contact the dealer from whom you purchased your RMT.



This symbol is used throughout the manual to call your attention to safety messages.

Safety Instructions

The CAL B configuration is programmed and calibrated in Cubic Feet from the factory, but the flow rate remains in gallons per minute.

For your safety, review the major warnings and cautions below before operating your equipment.

1. This equipment is approved to handle only fluids which are compatible with all wetted materials.
2. When measuring flammable liquids, observe precautions against fire or explosion.
3. When handling hazardous liquids, always follow the liquid manufacturer's safety precautions.
4. When working in hazardous environments, always exercise appropriate safety precautions.
5. For best results, always verify accuracy before use.

Product Description

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

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 is translated from the turbine into calibrated flow units shown on the computer's readout.

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.

INSTALLATION

If you ordered your computer electronics with turbine housing, it is installed at the factory.

If you ordered your computer separately from your turbine, simply mount the computer on the turbine with the four screws at the corners of the faceplate. Make sure the O-ring is fully seated before tightening the screws.

All RMT turbines are designed to measure flow in only one direction. The direction is indicated by the arrow cast-molded in the turbine outlet. If the opposite direction is desired, simply rotate the computer electronics 180 degrees prior to installation.

Avoid electronically “noisy” environments. Install at least 6 inches (15.2cm) away from motors, relays, or transformers.

All AMS Series meters are Factory Mutual Approved and carry a Class 1, Division 1 Approval for hazardous environments. In addition, RMT meters have NEMA Type 4 enclosures. They are tested and calibrated at the factory using state-of-the-art calibration procedures and testing equipment.

To ensure accurate measurement, remove all air from the system before use.

1. Ensure some back pressure on the turbine.
2. Open the discharge valve or nozzle and allow fluid to completely fill the system. Make sure the stream is full and steady.
3. Close the discharge valve or nozzle.
4. Start normal operations.

It is strongly recommended that accuracy be verified prior to use. To do this, remove all air from the system, measure an exact known volume into an accurate container, and verify the volume against the readout or recording equipment. If necessary, use a correction factor to figure final volume. For best results, accuracy should be verified periodically as part of a routine maintenance schedule.

OPERATIONS

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

The computer is powered by field replaceable batteries. When the readout becomes dim or faded, the batteries need to be replaced. Contact your local representative for details.

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

Turn On

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

Turn Off

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

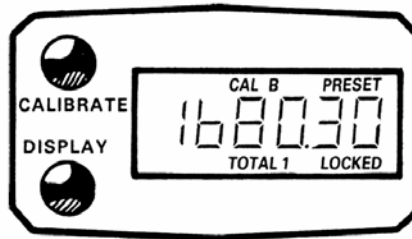
Batch and Cumulative Totals

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

Clearing a Totalizer

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

Figure 2



Changing Display Registers

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

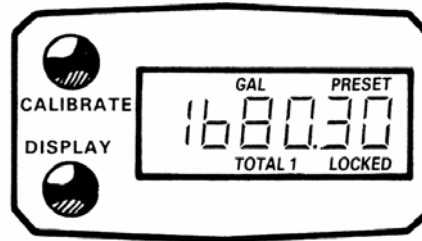
NOTE: Generally, display registers change when the buttons are released.

Factory and Field Calibration Curves

AMS series flow computers have enhanced calibration features. All calibration information is visible to the user as words in the upper part of the display, above the numeric digits.

All units will be configured with a “factory” calibration curve, for which units of gallons or liters may be selected by the user (“GAL” or “LTR” will be visible). This curve is NOT user adjustable: the word “PRESET” is displayed to show this. (See Figure 3) The factory calibration is stored permanently in the computer’s memory. The CAL B configuration is programmed and calibrated in Cubic Feet from the factory, but the flow rate remains in gallons per minute.

Figure 3



Selecting a Different Calibration Setting

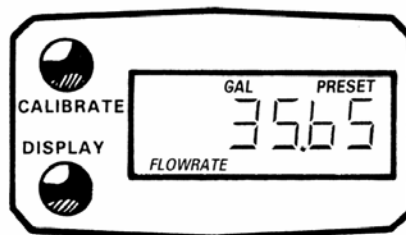
You can switch between GAL and LTR modes at will without “corrupting” totalizer contents. For example, the computer can totalize 10.00 gallons. If the user switches to LTR mode, the display will immediately change to “37.50” (the same amount in units of liters). GAL / LTR switching also works in FLOWRATE mode.

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

Flowrate Mode

The Rate of Flow feature is accessed by briefly pressing and releasing the DISPLAY button as described above. When this feature is activated, the word “FLOWRATE” displays to the left on the bottom line (See Figure 4) and the numbers in the middle of the display reflect the rate of flow (instead of total). Units are set to update the display.

Figure 4



Propeller

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

CALIBRATION

If the operator finds the RMT unit may be out of calibration it is recommended you contact your local Aquatech Measurement System Distributor, and they can make arrangements to have the unit evaluated and re-calibrated.

MAINTENANCE

The computer electronics are powered by lithium batteries which provide at least 9,000 hours (1 year). Under most conditions, the batteries need to be replaced about once a year. Removing the batteries before storing the meter will extend battery life. If the meter's readout should become dim or blank, the batteries should be replaced. Replacement batteries can be ordered from your distributor or the factory. See details in the Parts Section.

When batteries are disconnected or fail, the Batch and Cumulative Totals return to zero. Factory and Field Calibration Curves are retained in the meter's computer when power is lost.

It is strongly recommended that battery check 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 corner screws from the meter face and lift the computer electronics from the turbine.
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 readout displays information.
5. Make sure the O-ring is fully seated before placing the computer electronics on the turbine. Tighten the four screws.
6. Do not clean exterior of computer assembly with Isopropyl Alcohol.

TROUBLESHOOTING

Symptom	Probable Cause	Corrective Action
Meter is not accurate	<ol style="list-style-type: none"> 1. Field Calibration not performed properly 2. Factory Calibration not suitable for liquid being measured 3. Meter operated below minimum flowrate 4. Meter partially clogged with dried liquid 5. Turbine bearings partially clogged with dried liquid 6. Sealant material wrapped around rotor 7. Installed too close to fittings 8. Installed too close to motors or electrically "noisy" environment. 	<p>Field calibrate again or select Factory Calibration.</p> <p>Perform a Field Calibration according to 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>Remove meter. Make sure rotor spins freely.</p> <p>Install correctly.</p> <p>Install correctly.</p>
Readout faded or blank	<ol style="list-style-type: none"> 1. Batteries weak, dead, or not connected 2. Computer defective. 	<p>Remove computer, check and replace batteries if necessary.</p> <p>Contact the factory.</p>
Normal flowrate but meter does not count (Meter comes on when DISPLAY button pushed)	<ol style="list-style-type: none"> 1. Field Calibration not performed correctly 2. Rotor stuck or damaged 3. Sealant material wrapped around rotor. 4. Computer defective. 	<p>Field Calibrate again or select factory Calibration</p> <p>Remove meter. Make sure rotor spins freely.</p> <p>Remove meter. Make sure rotor spins freely.</p> <p>Contact the factory.</p>
Reduced flowrate and meter does not count (Meter comes on when DISPLAY button pushed)	<ol style="list-style-type: none"> 1. Meter clogged with dried liquids 2. Below minimum flowrate 	<p>Remove meter. Clean carefully. Make sure rotor spins freely.</p> <p>Increase flow.</p>

Cannot get meter into field calibration	<ol style="list-style-type: none">1. Factory Calibration (PRESET) curve active2. Computer circuit board defective3. Button Defective	<p>Hold down CALIBRATE and push and release DISPLAY until RESET flag goes off. Proceed with calibration according to the Calibration Section.</p> <p>Replace computer. Contact the factory.</p> <p>Replace computer. Contact the factory.</p>
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SPECIFICATIONS

Standard Features Include:

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

Input Pulse Rate:

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

K-Factor:

Minimum: 0.1 pulses/unit
Maximum: > 999,999 pulses/unit

Field Calibration:

Minimum Time: 10 seconds

Readout Totals:

Minimum Display: 0.01
Maximum Display: 999,999

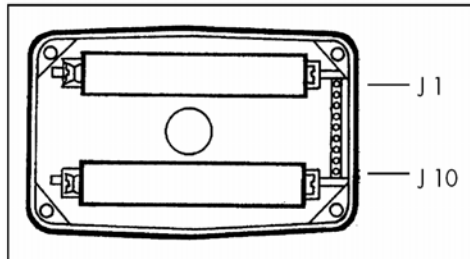
Temperatures:

Operational: +14° to +140°F (-10° to +60°C)
Storage: -40° to +158°F (-40° to +70°C)

If wider operating temperature ranges are desired please call Aquatech at 888.424.0733

Power:

Internal Power Supply: 2 Lithium Batteries at 3 volts each
Minimum Battery Life: 9,000 hours of use (1 year)



Computer Electronics Terminal Connections

J-1 Reset

Programming interfaces not accessible to user.

J-2 Pulse Signal Output

This supplies a high-level amplified open collector signal. Output will withstand a maximum open-circuit voltage of 60 volts DC and a maximum closed circuit of 100mA.

J-4 Pulse Signal Input

Requires a sine or square wave with open-circuit voltage of 3-30 volts P-P, a maximum rise/fall rate of 0.01 V/ μ second and a maximum frequency of 750 Hz.

J-5 Power Input

When used with Ground (J1-6), this has reverse polarity protection, but no on-board voltage regulation. Supplied voltage must be 5.75 volts DC \pm 5%.

J-6 Ground

J-7, 8, 9, 10 Programming interfaces. Not accessible to user.

NOTE: Safety approvals are void if any external connections are made to computer electronics.

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 given here.

Part No.	Description
113520-1	Battery Replacement Kit
901002-52	O-Ring

Part No. Description

113520-1 Battery Replacement Kit 901002-52 O-Ring

SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, call the Aquatech Measurement Systems Customer Service Department in Ocala, Florida, during normal business hours. **888.424.0733** To obtain prompt, efficient service, always be prepared with the following information:

1. The model number of your computer electronics.
2. The serial number or manufacturing date code of your computer electronics.
3. Specific information about part numbers and descriptions.

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

Returning Parts

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

CAUTION: Do not return computer electronics or meters without specific authority from the Aquatech Measurement Systems Customer Service Department or your local Distributor. Due to strict regulations governing transportation, handling, and disposal of hazardous or flammable liquids, Aquatech Measurement Systems will not accept computer electronics or meters for rework unless they are completely free of liquid residue.

Limited Warranty Policy

Aquatech Measurement Systems, Inc. 805 S. Magnolia Ave, Ocala, FL 34474 hereby provides a limited warranty against defects in material and workmanship on all products manufactured by Aquatech Measurement systems, Inc. This product includes a 1 year warranty. Manufacturer's sole obligation under the foregoing warranties will be limited to either, at Manufacturer's option, replacing or repairing defective Goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the Buyer, and Buyer's exclusive remedy for breach of any such warranties will be enforcement of such obligations of Manufacturer. The warranty shall extend to the purchaser of this product and to any person to whom such product is transferred during the warranty period.

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

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

To make a claim against this warranty, contact the Aquatech Customer Service Department at 888.424.0733 or 352.401.0733. Or by mail at:

Aquatech Measurement Systems, Inc.
PO Box 1988
Ocala, FL 34478

The company shall, notify the customer to either send the product, transportation prepaid, to the company at its office in Ocala, FL, 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.

AQUATECH MEASUREMENT SYSTEMS, 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).