

Thank you for purchasing Lumax® Electronic Flow Meter. Please read this Operational Manual carefully. It is important that you read the entire manual to become familiar with the unit before you begin assembly and/or operate the unit. Lumax Electronic Flow Meter is ideal for metering the transfer of fluids. It is simple and easy to use. It can be installed in-line or at the end of the delivery hose before the nozzle. Using precision turbine measuring technology, Lumax Electronic Flow Meter measure liquids accurately and conveniently. Large 1" (25mm) LCD display can be calibrated in Gallons, Quarts, Pints and Liters. It has an easy-to-read five-digit LCD display for accurate readings while dispensing fluids, with a Totalizer (resettable) to track total usage. The display can be rotated at any angle which simplifies the reading in any position. Field replaceable batteries provide power and are easily accessible - simply loosen four screws on the back of the unit.

#### Technical Specifications:

- Construction: Ryton® Polyphenylene Sulfide (PPS)
- LCD Display: Up to 5 digits
- Maximum Liquid Temperature: 140° (60°C)
- Accumulative Count: 0.00-99999.9
- Connections Size: 1" NPT Inlet/Outlet
- Maximum Pressure: 300 PSI (20 Bar)
- Single Count: 0.00-9999.99
- Standby Time: 2 years
- Flow Range: 3-30 GPM (10L-120L/min)
- Accuracy: ±1%
- Working Voltage: 2.3-3.3V
- Measures in - Quarts - Pints - Liters - Gallons

**WARNING:** Please read instructions carefully before using the device. To ensure operator safety and to protect the device from potential damage, you must be fully acquainted with this instruction manual before performing any operation. The Instructions contained in this Manual must be read and understood by the operator prior to operating the device. The meter installation work shall be performed in strict observance of the procedures and rules described in this manual. If instructions are not followed, it could result in malfunctions and damage to the device! Please store this Operational Manual, for later reference.

- Do not expose the electronic meter to direct sunlight. Use Cover or Shield for outdoor installation.
- 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.
- 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.
- When metering flammable liquids, observe precautions against fire or explosion. Do not meter in the presence of any source of ignition including running or hot engines, lighted cigarettes, or gas or electric heaters.
- If handling hazardous liquids, always follow the manufacturer's safety precautions. Wear protective clothing such as goggles, gloves and respirators as instructed. Always dispose of used cleaning solvents in a safe manner according to the solvent manufacturer's instructions.
- During meter removal, liquid may spill. Follow the liquid manufacturer's safety precautions to clean up minor spills.
- Do not blow compressed air through the meter.
  - Do not submerge air through the meter.
- Do not allow liquids to dry inside the meter.
  - Do not use a wrench to install plastic meters. Hand tighten only.

### WARNING: NOT APPROVED FOR USE IN EXPLOSIVE ATMOSPHERES OR HAZARDOUS LOCATIONS

**Wetted Components:** Ryton® Polyphenylene Sulfide (PPS); Stainless Steel (SS 316); Viton® (Fluoropolymer Elastomer); Teflon® (PTFE)

**Materials (Can be Pumped):** Anti Freeze (Alcohol & Glycol Base); Detergent Solutions; Fruit Juices; Salt Water; Sea Water (Brine); Soap Solutions; Urea/DEF/AdBlue; Vegetable Juices; Water: Fresh and Distilled (Deionized), Water-based Mild Chemicals, Low Viscosity Oil or Petroleum-based products such as Kerosene, Diesel, and Gasoline, Wines.

**Warning:** Although Gasoline is oil based, it is Explosive & Extremely Dangerous to pump. Ground Wires are essential and required for Gasoline and Flammables

**Warning:** This product is not intended for potable water applications (human consumption – drinking and cooking) and has not been designed to be compliant with the "Safe Drinking Water Act" requirements for low lead in potable water applications. This item is for use only in non-potable (non-human consumption) water applications.

**Materials (Cannot be Pumped):** Acetone, Ammonia, Bleach Solutions, Brake Fluid (Hexylene Glycol) Chlorine, Hydraulic Oil, Lacquers & Lacquer Solvents and Methanol

**Caution:** The above Materials List is to be referred for guidance only in selecting equipment for appropriate chemical compatibility. **ALWAYS** test your equipment under the specific conditions of your application before permanent installation. Ratings of chemical behavior listed in this manual apply at a 48 hour exposure period. Lumax has no knowledge of possible effects beyond this period. All recommendations are based on room temperature (72°F/22°C) exposure. Compatibility results may deviate from these recommendations at elevated temperatures. Recommendations are based on presence of listed chemical only. Mixtures containing more than one chemical can greatly affect chemical compatibility. Polypropylene products and components should not be used with low flash point chemicals, regardless of chemical compatibility results. Failure, improper selection, or improper use of the products referred to and described herein or related items can cause severe personal injury or property damage. This document and other information provides product options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system.

Due to the variety of operating conditions and applications for these products, the user, through his or her own analysis and testing, is solely responsible for making the final selection of the products and assuring that all performance, safety and warning requirements are met. The materials described and referred to herein are subject to change at any time without notice. Lumax does not warrant (neither express nor implied) that the information in this chart is accurate or complete or that any material is suitable for any purpose. If there is any question about any Material that can or cannot be pumped, do not operate the device. Check with Lumax as to whether it is safe or unsafe, to operate the device.

**Caution:** Always check local area Laws and Ordinances regarding Handling, Pumping and Disposing of Liquids. Dispose of pumped fluid properly. **Do Not** drain into Street Drains, House Drains, or Backyards. Contact your local Municipal Waste Management officials for proper disposal methods. **If there is any question about a condition being safe or unsafe, do not operate the meter.**

**Before Installation:** Upon receipt, examine your meter for visible damage. If the item is damaged, contact your distributor. Make sure the meter model meets your specific needs. Refer to the Specifications Section and confirm the following:

1. The flow-rate is within the limits of your model.
2. The liquid is compatible with your meter's material.
3. The system's pressure does not exceed the meter's maximum pressure rating.

**Connections:** 1. To protect against leakage, make sure all threads are sealed with two or three turns of thread tape or a sealing compound compatible with the liquid being metered.

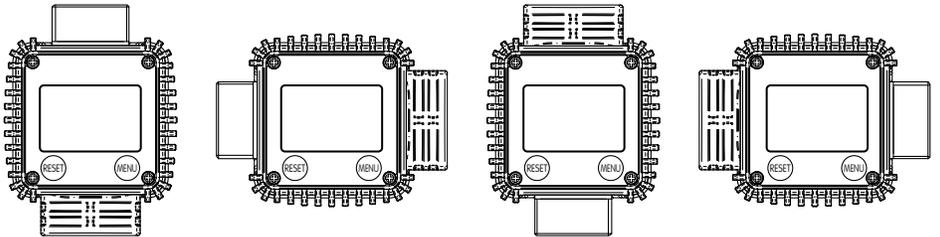
**Caution:** Make sure the thread tape or sealing compound does not interfere with flow.

2. Make sure the arrow on the outlet is pointing in the direction of the flow.
3. Tighten the meter onto the fittings. Hand tighten. Using a wrench could damage the meter.

**Display Positioning:** Square shape housing allows the LCD Display to be rotated in any position for easy display readings. The LCD Display Card is easily accessible, by removing the faceplate cover and unscrewing the four screws. The LCD Display can be rotated in any direction to suit the piping system.

**Caution:** Make sure you remove the LCD Display Card very slowly and carefully to ensure that any damage to the Wires, Connections, or the LCD Display Card is avoided.

**Operating Modes:** Choose between two modes of operation:  
 - Normal Mode: Display of Partial and TOTAL amount dispensed  
 - Flow Rate Mode: Display of Flow Rate and Partial dispensed quantities  
 The meter features a non-volatile memory, for storing the dispensing data for longer periods in the case of power outage.



The electronic measurements are displayed in the upper part of the LCD Display. They are isolated from the liquid measuring Chamber.

**LCD Display:** The LCD Display of the Lumax Electronic Flow Meters features two numerical registers and several function or status indicators:

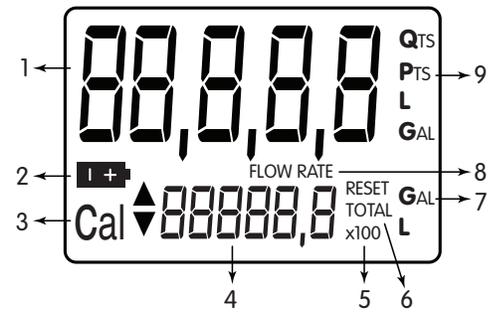
#### Key:

1. Partial Register (5 digit from 0.1 to 9999.9) indicating the volume dispensed since the reset button was last pressed. For Partial RESET - Press "RESET" Button for 1 Second
2. Battery Charge Indicator
3. Calibration Mode Indicator

4. Totalizer Register (6 figures from 0.1 to 99999.9), that can indicate two types of Totals:
  - 4.1 General TOTAL that cannot be reset (TOTAL)
  - 4.2 Resettable TOTAL (Reset TOTAL)
 For Totalizer Register - Press "RESET" Button for 3 Seconds
5. Indicator of Total Multiplication Factor (x10 / x100)
6. Display of type of TOTAL, (TOTAL / RESET TOTAL)
7. Display of Measurement of Totals: L = Liters; Gal = Gallons; Qts = Quarts; Pts = Pints
8. Display of Flow Rate: 3-30 GPM (10L-120L/min)
9. Display of Unit of Measure of the Subset: L = Liters; Gal = Gallons; Qts = Quarts; Pts = Pints

**User Buttons:** Lumax Electronic Flow Meters features Two Buttons (RESET and MENU) which individually perform two main functions and together, other secondary functions. The main functions performed are:

- "RESET" Key: Resetting the Partial Register and resettable TOTAL (RESET TOTAL)
- "MENU" Key: Entering Calibration Mode.



Used together (Press both Buttons for 5 Seconds), the two keys permit entering Configuration mode, useful for changing the units of measurements and calibration factor.

**Battery Housing:** Lumax Electronic Flow Meter uses two standard 1.5V power Batteries (size: AAA). Battery Housing is easily accessible - simply loosen four screws on the back of the Device. **Caution:** Make sure you remove the Batteries very slowly and carefully to ensure that any damage to the Wires, Connections, or the LCD Display Card is avoided.

**Installation:** The inlet and outlet for the Flow Meter is 1" NPT. It can be easily connected to a Pipe or Nozzle. It can be installed in any desired position and is suitable for stationary or mobile applications. Do not use a wrench to install the meter. Hand tighten only. **Tip:** To extend the life of the device, it is recommended to install a filter on inlet side of the meter.

**1. Daily Use:** The only operation that is necessary for daily use are, partial and/or resettable total register resetting. Occasionally the meter may be necessary to be configured or calibrated. For this, please follow the instructions in this manual. Below, are the two typical display figures displayed in normal operation.

Figure on the left denotes the Partial and the Resettable Total registers. The figure on the right denotes Partial and Non-resettable TOTAL. Resettable total amount adds to non-resettable TOTAL amount automatically. This is preset at the manufacturing plant and cannot be modified.

**NOTE:** 6 digits are available for Totals, plus two icons x 10 / x100. The increment sequence as follows: 0.0 - 99999.9 - 999999.9 - 9999999.9 - 100000 x 10 - 9999999 x 10 - 100000 x 100 - 9999999 x 100

**Dispensing in Normal Mode:** Normal mode is the standard dispensing. While the count is made, the partial and resettable total are displayed at the same time: Reset Total (Fig. 1). Should one of the keys be accidentally pressed during dispensing, this will have no effect. A few seconds after dispensing has ended, on the lower register, the display switches from Resettable TOTAL to General TOTAL: the word Reset above the word TOTAL disappears, and the RESET TOTAL is replaced by the General TOTAL (Fig. 2). This situation is called standby and remains stable until the user operates the Flow Meter again.

**Partial RESET:** The Partial Register can be reset by pressing the RESET key when the meter is in standby, meaning when the display screen shows the word "TOTAL" (Fig. 3).

After pressing the RESET key, during reset, the display screen first shows all the lit-up digits and then all the digits that are not lit up (Fig. 4).

At the end of the process, a display is first shown with the RESET Partial and the RESET Total (Fig. 5) and, after a few moments, the RESET TOTAL is replaced by the Non-Resettable Total (Fig. 6).

**Resetting the RESET TOTAL:** The RESET TOTAL resetting operation can only be performed after resetting the partial register. The RESET TOTAL can in fact be reset by pressing the RESET key at length while the display screen shows RESET TOTAL (Fig. 7). Schematically, the steps to be taken are:

1. Wait for the display to show Normal Standby display page - with total only displayed (Fig. 8).
2. Press the RESET key quickly
3. The meter starts to reset the Partial
4. While the display page showing the RESET TOTAL is displayed (Fig. 9). Press the RESET key again for at least 1 second
5. The display screen again shows all the segments of the display followed by all the switched-off segments and finally shows the display page where the reset "RESET TOTAL" (Fig. 10) is shown.

**Dispensing with Flow Rate Mode Display:** It is possible to dispense fluids, displaying at the same time, as shown (Fig. 11):

- \* the dispensed partial
- \* the Flow Rate in [Partial Unit / Minute]

**Procedure for entering this Mode:**

- wait for the Remote Display to go to Standby, meaning the display screen shows TOTAL only
- quickly press the MENU key.
- Start dispensing

The Flow Rate is updated every 0.7 seconds. Consequently, the display could be relatively unstable at lower Flow Rates. The higher the Flow Rate, the more stable the displayed value. **IMPORTANT** - The Flow Rate is measured with reference to the unit of measurement of the Partial. For this reason, in case of the unit of measurement of the Partial and TOTAL being different, as in the example shown below, it should be remembered that the indicated Flow Rate relates to the unit of measurement of the partial. In the example shown, the Flow Rate is expressed in Qts/min. The word "Gal" remaining alongside the Flow Rate refers to the register of the Totals (Reset or NON Reset) which are again displayed when exiting from the Flow Rate reading mode (Fig. 12).

To return to "Normal" mode, press the MENU key again. If one of the two keys RESET or MENU is accidentally pressed during the count, this will have no effect.

**Important:** Even though in this mode they are not displayed, both the RESET TOTAL and the General Total (TOTAL) increase. Their value can be checked after dispensing has terminated, returning to "Normal" mode, by quickly pressing MENU key.

**Partial RESET:** To reset the Partial Register, finish dispensing and wait for the Remote Display to show a Flow Rate of 0.0 as indicated in the illustration then quickly press RESET (Fig. 13).



**2. Calibration**

**Definitions: Calibration factor or "k factor":** Multiplication factor applied by the system to the electrical pulses received, to transform these into measured fluid units.

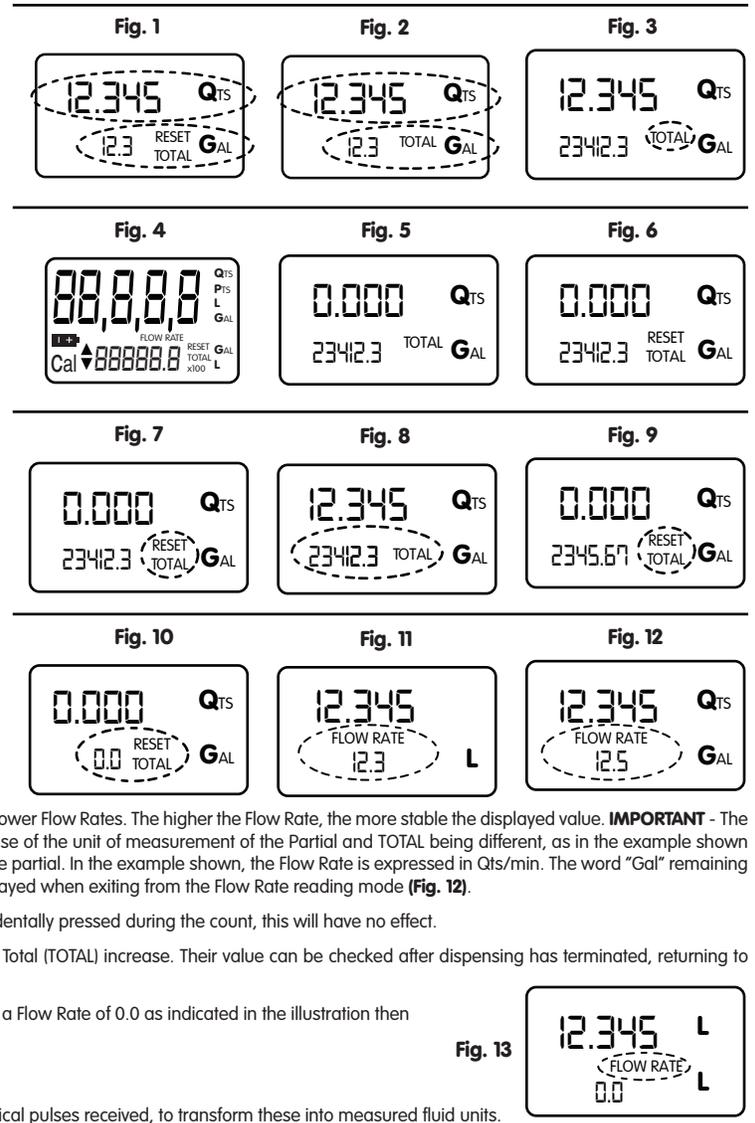
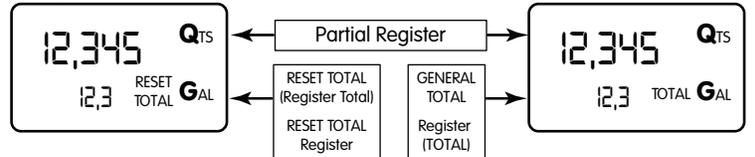
**FACTORY "K FACTOR":** Factory-set default factor. It is equal to 1,000. This calibration factor ensures utmost precision in the following operating conditions:

**Fluid:** Diesel Fuel      **Temperature:** 20°C (68°F)      **Flow Rate:** 10-120 litres/min. (2.65-31.75 Gal.)

Even after any changes have been made by the user, the factory k factor can be restored by means of a simple procedure.

**USER K FACTOR:** Customized calibration factor, meaning modified by calibration.

**Why Calibrate?:** When operating close to extreme conditions, such as for instance with fluids close to acceptable range extremes (like Diesel Fuel at Low Temperatures) or in extreme Flow Rate conditions (close to minimum or maximum acceptable values), an on-site calibration may be required to suit the real conditions in which the Flow Meter is required to operate.



**Calibration Procedure:** The Lumax Electronic Flow Meter permits making quick and precise electronic calibration by changing the calibration factor (k factor). There are 2 different ways of calibration:

1. On-site calibration, performed by means of a dispensing operation.

2. Direct calibration, performed by directly changing the k factor.

To enter the calibration phases it is necessary to press and hold down the "Menu" button.

Why enter the calibration phases?

- Display the currently used calibration factor
- Change the calibration factor using one of the two previously indicated procedures.

- Return to factory k factor after a previous calibration with user k factor

In calibration mode, the partial and total dispensed quantities indicated on the display screen take on different meanings according to the calibration procedure phase. During the calibration, the Flow Meter cannot perform any normal dispensing operations. In calibration mode, the totals are not increased.

**Caution:** The Lumax Electronic Flow Meter features a non-volatile memory. It keeps the calibration and dispensing data stored even after replacing new batteries or long periods of inactivity.

**3. Display of Current "K Factor" and Restoring "Factory K Factor":**

By pressing the MENU key while the appliance is in standby (Press Button for 3 Seconds), the display page appears showing the current calibration factor used. If you are using the Flow Meter with "factory k factor", the display page shown in the diagram will be displayed, with the word "fact" (Fig. 14). If one "user k factor" has been set, the calibration factor set by the user (in our example 0.998) will be displayed. The word "user" indicates a calibration factor set by the user is being used (Fig. 15).

The Flow chart alongside shows the switchover logic from one display page to another. In this condition, the Reset key permits switching from "User" factor to "Factory" factor. To confirm the choice of calibration factor, quickly press MENU while "User" or "Fact" are displayed. After the restart cycle, the meter uses the calibration factor that has just been confirmed.

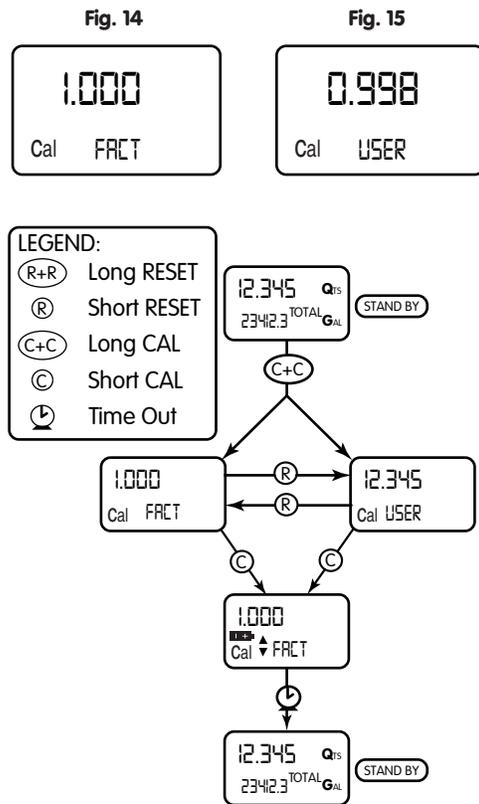
**Attention:** When the "Factory Factor" is confirmed, the old "User Factor" is deleted from the memory.

**In-field Calibration:** This procedure calls for the fluid to be dispensed into a graduated sample container in real operating conditions (Flow Rate, Viscosity, etc.) requiring absolute precision.

**WARNING:**

For correct Flow Meter calibration, it is most important to:

- Completely eliminate air from the system before calibrating
- Use a precise Sample Container with a capacity of not less than 5 liters, featuring an accurate Graduated indicator.
- Ensure calibration dispensing is done at a constant flow rate equivalent to that of normal use, until the container is full
- Not reduce the flow rate to reach the graduated area of the container during the final dispensing stage (the correct method during the final stages of sample container filling consists in making short top-ups at normal operation flow rate)
- After dispensing, wait a few minutes to make sure any air bubbles are eliminated from the sample container; only read the Real value at the end of this stage, during which the level in the container could drop.
- If necessary, carefully follow the procedure indicated below.



**In-field Calibration Procedure**

Action	Display
1 <b>NONE</b> Flow Meter in "Stand By" (not in counting mode)	12.345 Q <sub>TS</sub> 12.5 TOTAL GAL
2 <b>LONG MENU KEY KEYING</b> Flow Meter enters calibration mode, shows "MENU" and displays the calibration factor in use instead of total. The words "FACT" and "USER" indicate which of the two factors is currently in use.	1.000 Q <sub>TS</sub> Cal FRACT (USER) GAL
3 <b>LONG RESET KEY KEYING</b> Flow Meter shows "MENU" and the partial at zero. Flow Meter is ready to perform on-site calibration.	0.000 Q <sub>TS</sub> Cal FIELD
4 <b>DISPENSING INTO SAMPLE CONTAINER</b> Without pressing any KEY, start dispensing into the sample container.  Dispensing can be interrupted and started again at will. Continue dispensing until the level of the fluid in the sample container has reached the graduated area. There is no need to reach a preset quantity.	
   	Indicated Value      Real Value
5 <b>SHORT RESET KEY KEYING</b> Flow Meter is informed that the calibration dispensing operation is finished. Make sure dispensing is correctly finished before performing this operation. To calibrate the Flow Meter, the value indicated by the partial totalizer (example 9.800) must be forced to the real value marked on the graduated sample container. In the bottom left part of the display an arrow appears (upwards and downwards), that shows the direction (increase or decrease) of the "USER" K Factor value change when the operations 6 or 7 are performed.	9.800 Q <sub>TS</sub> Cal FIELD

Action	Display
6 <b>SHORT RESET KEY KEYING</b> Arrow direction changes. The operation can be repeated if necessary.	9.800 Q <sub>TS</sub> Cal FIELD
7 <b>SHORT/LONG CAL KEY KEYING</b> The indicated value changes in the direction indicated by the arrow - one unit for every short "MENU" key keying - continually if the "MENU" key is kept pressed (for the first 5 units slowly and then quickly). If the desired value is exceeded, repeat the operations from point (6).	9.800 Q <sub>TS</sub> Cal FIELD
8 <b>LONG RESET KEY KEYING</b> Flow Meter is informed that the calibration procedure is finished. Before doing this, make sure the Displayed Factor is the Actual Factor.	----- Q <sub>TS</sub> Cal END
 	Indicated Value      Real Value
Flow Meter calculates the new "USER" K Factor. This calculation could require a few seconds, depending on the correction to be made. During this operation the arrow disappears but the "MENU" indication remains. If this operation is performed after operation (5), without changing the indicated value, the "USER" K Factor would be the same as the Factory K Factor, thus it is ignored.	
9 <b>NO OPERATION</b> At the end of the calculation, the new "USER" K Factor is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition. <b>ATTENTION:</b> From now on, the indicated factor will become the calibration factor used by the meter and will continue to remain such even after a battery change.	1.015 Q <sub>TS</sub> Cal END
10 <b>NO OPERATION</b> Flow Meter stores the new calibration factor and is ready for dispensing, applying the newly defined "USER" K Factor	0.000 Q <sub>TS</sub> Cal 12345 TOTAL GAL

**4. Direct modification of K Factor:** This procedure is especially useful to correct a "mean error" obtainable on the basis of several performed dispensing operations. If normal Flow Meter operation shows a mean percentage error, this can be corrected by applying to the currently used calibration factor a correction of the same percentage. In this case, the percentage correction of the "USER" K Factor must be calculated by the operator in the following way:

$$\text{New K Factor} = \text{Old K Factor} \times \left( \frac{100 - E\%}{100} \right)$$

Example:  
 Error percentage found E% - 0.9 %  
 Current Calibration Factor 1,000  
 New "USER" K Factor  $1,000 * [(100 - (-0,9))/100] = 1,009$   
 $1,000 * [(100 + 0,9)/100] = 1.009$

If the meter indicates less than the real dispensed value (negative error) the new calibration factor must be higher than the old one as shown in the example. The opposite applies if the meter shows more than the real dispensed value (positive error).

Action	Display
<b>1 NONE</b> Flow Meter in Stand By (not in counting mode)	
<b>2 LONG "CAL" KEY KEYING</b> Flow Meter enters calibration mode, shows "CAL" and displays the Calibration Factor being used instead of the Partial. The words "Fact" and "USER" indicate which of the two Factors (factory or user) is currently being used.	
<b>3 LONG RESET KEY KEYING</b> Flow Meter shows "CAL" and the Partial at zero. Flow Meter is ready to perform on-site calibration by dispensing.	
<b>4 LONG RESET KEY KEYING</b> We now go on to Direct change of the calibration factor: The word "Direct" appears together with the Currently used Calibration Factor. In the bottom left part of the display, an arrow appears (upwards or downwards) defining the direction (increase or decrease) of change of the displayed value when subsequent operations 5 or 6 are performed.	
<b>5 SHORT RESET KEY KEYING</b> Arrow direction changes. The operation can be repeated to alternate the direction of the arrow.	

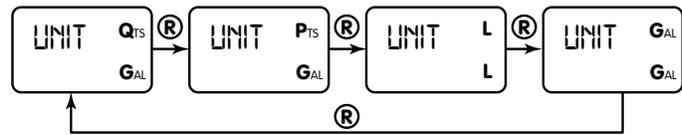
Action	Display
<b>6 SHORT/LONG CAL KEY KEYING</b> The indicated value changes in the direction indicated by the arrow:  - one unit for every short "MENU" key keying  - continually if the "MENU" key is kept pressed. The speed increase rises by keeping the key pressed. If the desired value is exceeded, repeat the operations from point (5).	
<b>7 LONG RESET KEY KEYING</b> Flow Meter is informed that the calibration procedure is finished. Before performing this operation, make sure the indicated value is that required.	
<b>8 NO OPERATION</b> At the end of the calculation, the new "USER" K Factor is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition. <b>Attention:</b> From now on, the indicated factor will become the calibration factor used by the meter and will continue to remain such even after a battery change.	
<b>9. NO OPERATION</b> The Flow Meter stores the new work calibration factor and is ready to begin dispensing, using the "USER" K Factor that has just been calculated.	

The Lumax Electronic Flow Meter features a menu with which the user can select as the main unit measurement: Quarts (Qts), Pints (Pts), Litres (Lit) or Gallons (Gal). The combination of the unit of measurement of the Partial register and that of the Totals is predefined according to the following table:

Combination No.	Unit of Measurement of the Partial Register	Register Unit of Measurement of the Totals Register
1	Litres (L)	Litres (L)
2	Gallons (Gal)	Gallons (Gal)
3	Quarts (Qts)	Gallons (Gal)
4	Pints (Pts)	Gallons (Gal)

To choose between the 4 available combinations:

- Wait for Flow Meter to go to Standby
- Press the "MENU" and "RESET" keys together and hold for five seconds. The current unit of measure will begin to flash. Press "RESET" to chose a different unit of measure, then press MENU to confirm.
- Flow Meter will pass through the start cycle and will then be ready to dispense in the set units.



**Note:** The Reset table Total and Total registers will be automatically changed to the new unit of measurement. NO new calibration is required after changing the Unit of Measurement.

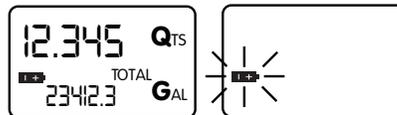
**Maintenance:** The Lumax Electronic Flow Meter has been designed to require a minimum amount of maintenance. The only maintenance required are the following:

1. Battery Change
2. Cleaning of the Turbine

**1. Battery Replacement:** The Lumax Electronic Flow Meter comes complete with 2 x 1.5 V. Alkaline Batteries (Size AAA). Lumax Electronic Flow Meter features two low-battery alarm levels:

- a. When the battery charge falls below the first level on the LCD, the fixed battery symbol appears. In this condition, Flow Meter continues to operate correctly, but the fixed icon warns the user that it is advisable to change the batteries.
- b. If Flow Meter operation continues without changing the batteries, the second battery alarm level will be reached which will prevent operation. In this condition the battery icon starts to flash and is the only icon that remains visible on the LCD. To change the Batteries, with reference to the exploded diagram positions, proceed as follows:

- Press RESET to update all the totals
- Loosen the 4 screws on the back cover
- Remove the old Batteries
- Place the new batteries in the same position as the old ones
- Close the cover again, by positioning the rubber protection as a gasket
- Flow Meter will switch on automatically and normal operation can be resumed.



The Flow Meter will display the same Reset Total, the same Total and the same Partial indicated before the Batteries were changed. After changing the Batteries, the meter does not need calibrating again.

**WARNING!**

Do not discard the old batteries in the environment. Refer to local disposal regulations.

**2. Cleaning:**

Only one operation is necessary to clean the Flow Meter. After removing Flow Meter from the plant where it was built in, any residual elements can be removed by washing or mechanically-handling. If this operation does not restore a smooth rotation of the turbine, it will have to be replaced.

**WARNING!**

Do not use compressed air onto the turbine in order to avoid its damage because of an excessive rotation

**Malfunctions**

Problem	Possible Cause	Corrective Action
LCD: No indication contact	Bad Battery	Check Battery Contacts
Precision Measurement not enough	Wrong K Factor The meter works below minimum acceptable Flow Rate	Check the K Factor according to the Instructions Increase the Flow Rate until an acceptable Flow Rate range has been achieved
Reduced or Zero Flow Rate The meter does not count, but the Flow Rate is correct	Turbine Blocked Incorrect Installation of Gears after Cleaning Possible Electronic Card issues	Clean the Turbine Repeat the Reassembly Procedure Contact your Dealer