ADBLUE® DIGITAL FLOW METER

MODEL NO: **ADB02.V2**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions, and properly maintained, give you years of trouble free performance.

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.



Refer to instruction manual

1. SAFETY

- ❑ **WARNING!** Ensure health & safety, local authority, and general workshop practice regulations are strictly adhered to when using this equipment.
- ✓ Familiarise yourself with product application and limitations, as well as the specific potential hazards peculiar to this product.
- ✓ Maintain the meter in good condition (use an authorised service agent).
- ✓ Replace or repair damaged parts. Use genuine parts only. Non authorised parts will invalidate the warranty.
- ✓ Use only to meter water/urea solutions.
- ✓ Ensure safety eye protection and protective clothing are worn when using this product.
- ✓ Keep the work area clean, uncluttered and ensure there is adequate lighting.
- ✓ Maintain correct balance and footing. Ensure the floor is not slippery and wear non slip shoes.
- ✓ Keep children and unauthorised persons away from the working area.
- ✓ After use, drain any fluids from the equipment before storage.
- ✓ Dispose of waste liquids in accordance with local authority regulations.
- × **DO NOT** exceed the maximum pressure of 10bar.
- × **DO NOT** use the equipment near open flames.
- × **DO NOT** smoke whilst using this equipment.
- × **DO NOT** use for corrosive fluids.
- × **DO NOT** dismantle, tamper with or adapt the equipment for any purpose other than for which it is designed.
- × **DO NOT** use the unit if it has been dropped or mishandled, check the unit to ensure there is no damage.
- × **DO NOT** use taper connections, use parallel connectors only.
- × **DO NOT** use compressed air on the turbine, the excessive rotation will damage the unit.

Keep the meter clean and store in a safe dry, childproof location.

- ❑ **WARNING! DO NOT** allow uncontrolled discharge of fluids thus polluting the environment. All liquids must be disposed of according to local authority regulations.

2. INTRODUCTION

Robust rubber housing with integral digital electronic metering. Easy-to-read large, 4-digit, 28mm high LCD display calibrated in litres. Features flow rate indication. 1” x 1”BSP Male/Female fittings. Suitable for use with AdBlue®. Powered by 2 x AAA batteries (supplied). IP55 Rated protection.

3. SPECIFICATION

Model No: ADB02.V2
Flow Rate:..... 7-120L/min
Maximum Working Pressure: 145psi



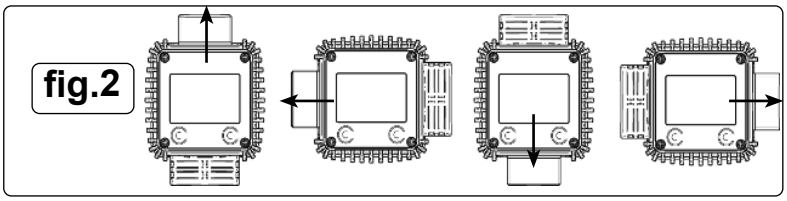
fig.1

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4. INSTALLATION

4.1. Connect the ADB02 into the system, ensuring that the arrow on the side of the meter is pointing in the direction of the flow.
NOTE: Use 1" BSP threaded connectors only, **DO NOT** use taper threaded connectors.
NOTE: To improve the life of the turbine, a strainer should be fitted upstream of the meter.

4.2. The facia of the meter can be rotated to match the orientation of the meter (fig.2). Remove the four screws from the front of the unit and carefully separate from the rubber protection surround, rotate the facia to the desired position taking care to not trap the wires against the reed switch. Push gently into the rubber surround and refit the screws.

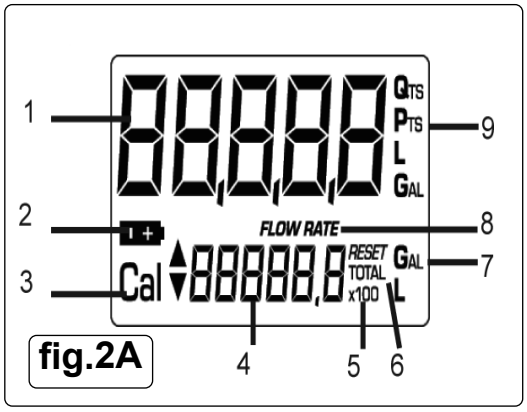


5. OPERATION

5.1. LCD DISPLAY (fig.2A)

The "LCD" of the METER features two numerical registers and various indications displayed to the user only when the applicable function so requires.
Key:

1. Partial register (5 figures with moving comma FROM 0.1 to 99999) indicating the volume dispensed since the reset button was last pressed.
2. Indication of battery charge.
3. Indication of calibration mode.
4. Totals register (6 figures with moving comma FROM 0.1 to 99999), that can indicate two types of Total:
   a) General Total that cannot be reset (TOTAL).
   b) Resettable total (Reset TOTAL).
5. Indication of total multiplication factor (x10 / x100).
6. Indication of type of total, (TOTAL / Reset TOTAL).
7. Indication of unit of measurement of Totals: L=Litres, Gal=Gallons
8. Indication of Flow Rate mode.
9. Indication of unit of measurement of Partial: Qts=Quarts, Pts=Pints, L=Litres, Gal=Gallons.



5.2. USER BUTTONS

5.2.1. The ADB02 (fig.1) features two buttons (RESET and CAL) 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).
CAL key - entering instrument calibration mode.

5.2.2. Used together, the two keys permit entering configuration mode, useful for changing the units of measurements and calibration factor.

5.3. STANDBY MODE

When the media is not flowing through the meter, the meter shows only the word TOTAL on the display. This mode is called STANDBY and majority of adjustments are carried out in this mode.

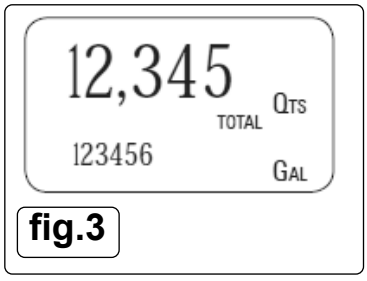
5.4. MEASUREMENT UNITS CONFIGURATION

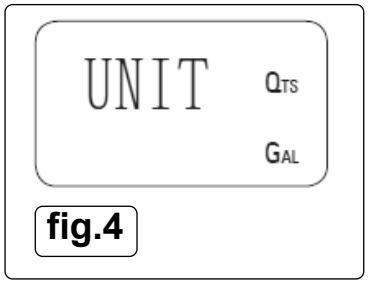
The user can select the main measurement unit, Quarts (Qts), Pints (Pts), Litres (L), Gallons (Gal); according to the following predefined combinations:

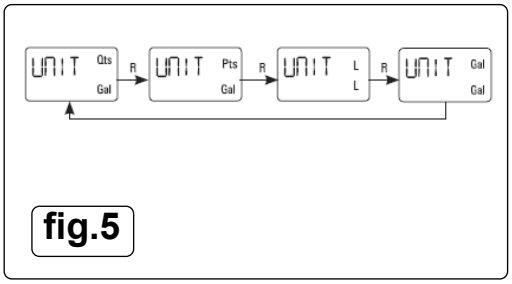
REF. NO	UNIT OF MEASUREMENT RESETTABLE BATCH TOTAL	UNIT OF MEASUREMENT BATCH TOTALIZER
1	Litres (L)	Litres (L)
2	Gallon (Gal)	Gallon (Gal)
3	Quarts (Qts)	Gallon (Gal)
4	Pints (Pts)	Gallon (Gal)

5.5. SETTING THE UNIT OF MEASUREMENT

Wait for the meter to go to STANDBY mode (fig.3). Press the CAL and RESET keys together. Hold it until the word "UNIT" appears on the screen together with the current unit (fig.4). Press RESET key to scroll among the four combinations of units of measurement as shown (fig.5). Press CAL key for more than 2 seconds to store the new settings. The METER will return to the Stand by Mode.
NOTE: No new calibration is required after changing the Unit of Measurement.







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5.6. NORMAL DISPENSING MODE

While the media is flowing through the meter, Batch Total and Reset Total are displayed at the same time (fig.6). A few seconds after dispensing has ended, the display switches from Reset TOTAL to TOTAL: the word RESET above the word TOTAL disappears and the Reset TOTAL is replaced by TOTAL (fig.7).

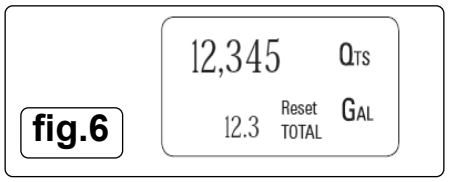


fig.6

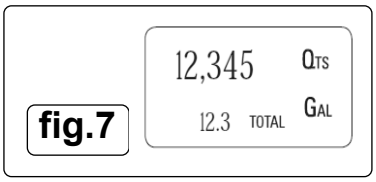


fig.7

NOTE: This situation, where only "TOTAL" is displayed, is called STANDBY mode. It remains stable until the user operates the meter again.

5.7. RESETTING THE BATCH TOTAL

While in standby (i.e when the display shows TOTAL), press the RESET button (fig.8). During reset, the display screen shows all the lit-up digits (fig.9). After resetting, the display shows zero value on Resettable Batch TOTAL (fig.10).After a few moments, the Reset TOTAL is replaced by TOTAL (fig.11).

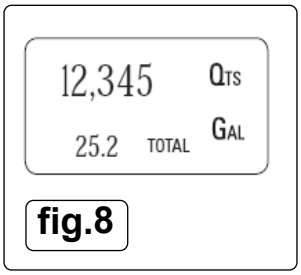


fig.8

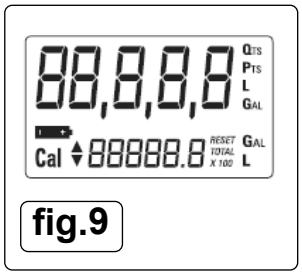


fig.9

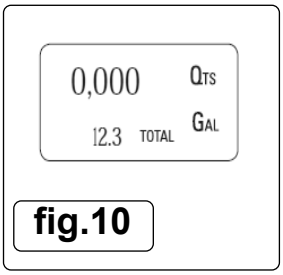


fig.10

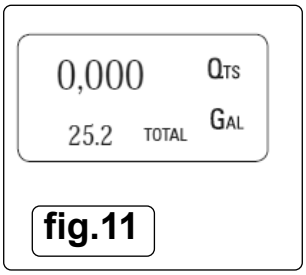


fig.11

5.8. RESETTING THE RESET TOTAL

The Reset TOTAL can be reset by pressing the RESET key at length while the display screen shows Reset TOTAL. The steps to be taken are:

5.8.1. Wait until the display shows TOTAL only (Standby mode) (fig.12).

5.8.2. Press the RESET key. The display screen again shows all the segments of the display followed by all the switched-off segments (fig.13).

5.8.3. While the display page showing the Reset TOTAL is displayed, press and hold the Reset key again till the Resettable TOTAL turns to zero (fig.14).

5.8.4. Finally the page with the new Reset TOTAL is displayed (fig.15).

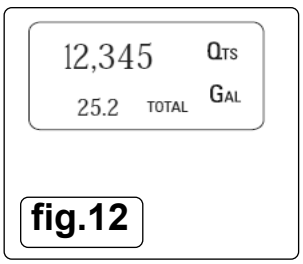


fig.12

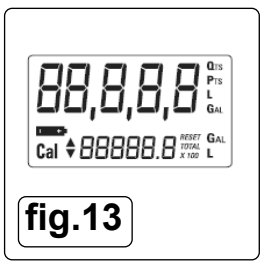


fig.13

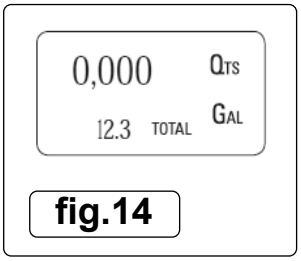


fig.14

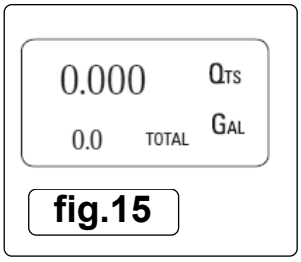


fig.15

5.9. CALIBRATION

In standby mode, press and hold the CAL key to see the current calibration factor.

• Factory K Factor: Factory-set default factor.

It is equal to 1 (indicated as 1,000).

• User K Factor: Customized calibration factor, meaning modified by calibration.

5.9.1. CALIBRATION PROCEDURES

By pressing the CAL key while the meter is in Standby, the display shows the current calibration factor used. Two cases can occur:

Case 1: "FACT". If no calibration has ever been performed, or the factory setting has been restored after previous calibrations, the following display page will appear (fig.16).

NOTE: The word "FACT" is an abbreviation for "factory" shows that the factory calibration factor is being used.

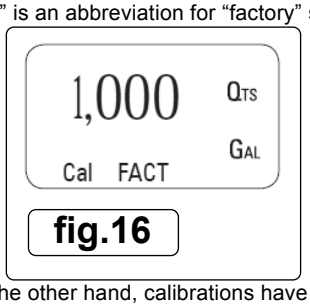


fig.16

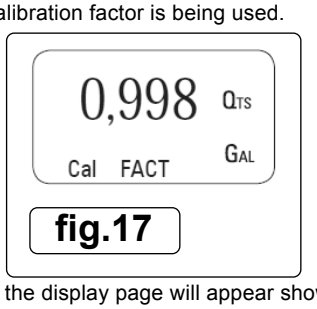


fig.17

Case 2: "USER". If, on the other hand, calibrations have been made by the user, the display page will appear showing the currently used calibration factor (in our example 0,998) (fig.17).

NOTE: The word "USER" indicates that a calibration factor, set by the user is being used.

` To confirm the choice of calibration factor, quickly press CAL while "USER" or "FACT" are displayed.

5.9.2. IN-FIELD CALIBRATION SEQUENCE

Wait until the METER comes in Standby (Display shows TOTAL) (fig.18). Press CAL key for more than 2 seconds. The METER enters calibration mode and shows “CAL”. The words “FACT” or “USER” indicate which factor (factory or user) is currently in use(fig.19, fig.20). Press and hold RESET key. The METER shows “FIELD” and the Batch Total at zero. The meter is ready to perform in-field calibration (fig.21).

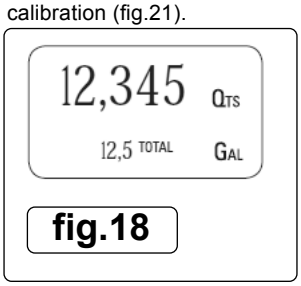


fig.18

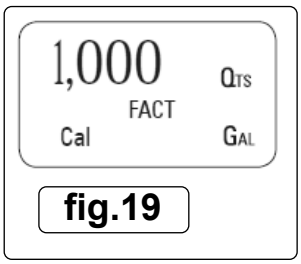


fig.19

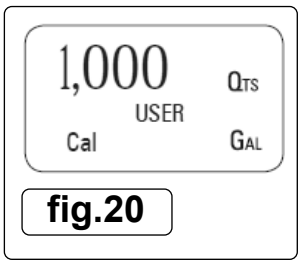


fig.20

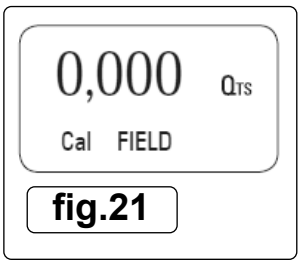


fig.21

5.9.2.1. PROCESS FOR IN-FIELD CALIBRATION

5.9.2.2. Dispensing into sample container: without pressing any key, start dispensing into the sample container (fig.22).

5.9.2.3. Continue dispensing until the level of the fluid in the sample container has reached the graduated area (fig.23).

5.9.2.4. Press RESET key once. The METER detects that the calibration dispensing is finished. An arrow (up/down) appears which indicates the direction in which the value can be changed via steps 5.9.2.5 and 5.9.2.6. To calibrate the METER, the value indicated by the Batch total (example 9.800) must be forced to the Container value 9,860 marked on the graduated sample container (fig.24).

5.9.2.5. Press RESET key once. The arrow changes direction. The operation can be repeated to alternate the direction of the arrow (fig.25).

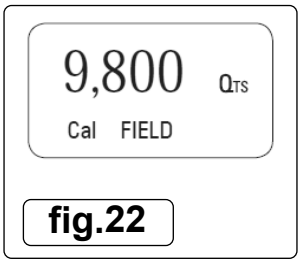


fig.22

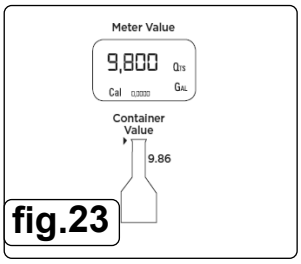


fig.23

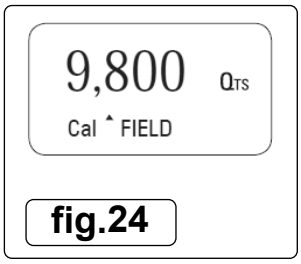


fig.24

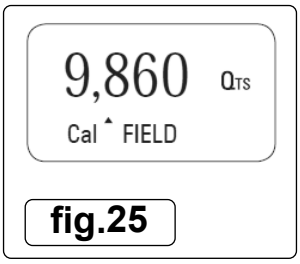


fig.25

5.9.2.6. Press “CAL” key to change the value in the direction indicated by the arrow. The reading changes either by one unit for every short press of CAL key or continually if the CAL key is kept pressed (fig.25).

5.9.2.7. Press and hold RESET key for more than 2 seconds. The METER is informed that the calibration procedure is finished. The meter calculates the new USER K FACTOR factor for a few seconds (fig.26).

5.9.2.8. The new USER K FACTOR is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition (fig.27).

5.9.2.9. The METER stores the new calibration factor and is ready to begin dispensing (fig.28).

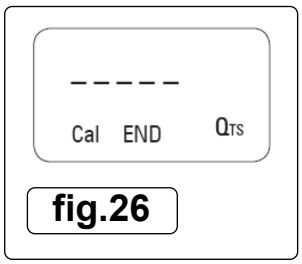


fig.26

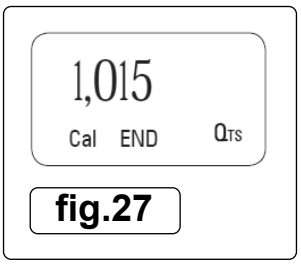


fig.27

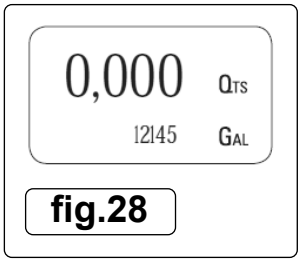


fig.28

5.9.3. DIRECT CALIBRATION SEQUENCE

5.9.3.1. If normal METER operation shows a mean percentage error E, (obtainable on the basis of several performed dispensing operations), this can be corrected by applying a correction to the current calibration factor as shown below :

$$\text{New cal. Factor} = \text{Old Cal Factor} \times \left\{\frac{100 - E}{100}\right\}$$

Example:

Error percentage found E% = - 0.3 % (value observed is 0.3% less than actual)
CURRENT calibration factor = 1.000
New USER K FACTOR = 1.000 * [(100 – (- 0.3))/100]
= 1.000 * [(100 + 0.3)/100]
= 1.003

5.9.3.2. Wait until the METER comes in Standby (Display shows TOTAL) (fig.29).

5.9.3.3. Press and hold CAL key. The METER enters calibration mode and shows “CAL”. The words “Fact” or “USER” indicate which factor (factory or user) is currently in use (fig.30).

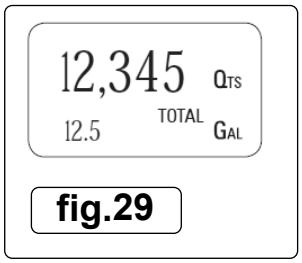


fig.29

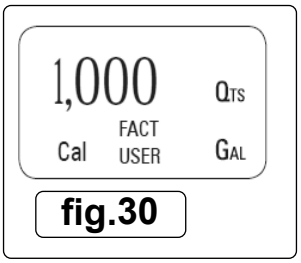


fig.30

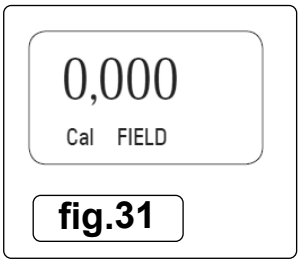


fig.31

5.9.3.4. Press and hold RESET key. The METER shows “CAL”, “Field” and the Batch Total at zero. The meter is ready to perform in- field calibration (fig.31).
5.9.3.5. Press and hold RESET key. “Direct” appears together with the Current calibration factor. An arrow appears (upwards or downwards) defining the direction (increases or decreases) of the reading (fig.32).
5.9.3.6. By pressing RESET key the user can change the direction of the arrow.
5.9.3.7. By pressing CAL key, the Meter value changes in the direction indicated by the arrow, either one unit for every short press of CAL key or continually if the CAL key is kept pressed. The speed increases or decreases by keeping the key pressed.
5.9.3.8. Press RESET key for more than 2 seconds. The METER detects that the desired reading has been set and the calibration procedure is finished (fig.33).
5.9.3.9. At the end of the calculation, the new USER K FACTOR is shown for a few seconds (fig.34).
5.9.3.10. The restart cycle is repeated to finally achieve standby mode (fig.35).

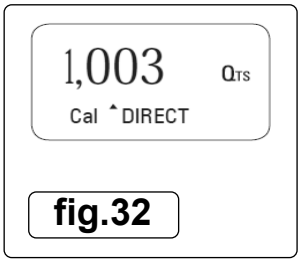


fig.32

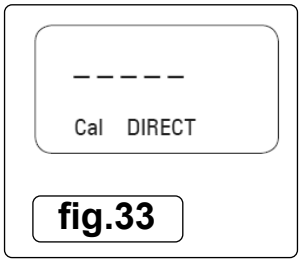


fig.33

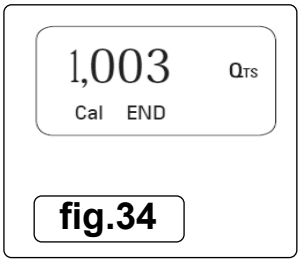


fig.34

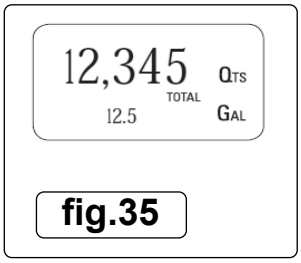


fig.35

5.9.4. MAINTENANCE

The Meter has been designed to require a minimum amount of maintenance. The only maintenance jobs required are:
Battery change: Necessary when the batteries have run down.
Cleaning the turbine assembly: Due to the presence of solid particles following bad filtering.

5.9.4.1. CHANGING THE BATTERY

The METER features two low-battery alarm levels

5.9.4.2. When the battery charge falls below the first level on the LCD, the fixed battery symbol appears. In this condition, the METER continues to operate correctly, but the fixed icon warns the user that it is time to change the batteries (fig.36).
5.9.4.3. If meter operation continues without changing the batteries, the second battery alarm level will be reached which will prevent any operation. In this condition the battery icon starts to flash and is the only one to remain visible on the LC (fig.37).

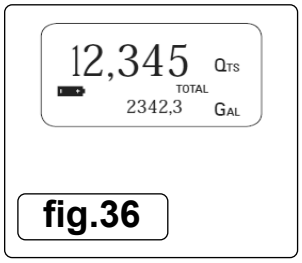
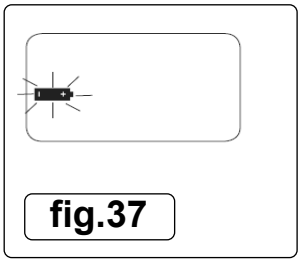


fig.36


fig.37

5.9.4.4. BATTERY REPLACEMENT PROCEDURE:

5.9.4.5. Press RESET to update all the totals
5.9.4.6. Remove the four screws from base and separate the battery cap.
5.9.4.7. Remove the old batteries.
5.9.4.8. Place the new batteries in the same position as the old ones, making sure the positive pole is positioned as indicated.
5.9.4.9. Re-attach the battery cap and the four screws.
5.9.4.10. The METER will switch on automatically and normal operation can be resumed.

NOTE: The old calibration will stay same as before.

5.9.5. CLEANING OF THE TURBINE ASSEMBLY

After removing the meter from pipes, any residual elements can be removed from the turbine by simply washing it with water.

- ❑ **WARNING** Always make sure the liquid has been drained from the meter and the line pressure is released before cleaning. Never use compressed air for cleaning as it may damage the turbine assembly.

6. TROUBLESHOOTING

Problem	Possible Cause	Remedy
No LCD display	Bad battery connection	Check /Clean Battery terminals
	Batteries expired	Replace batteries
Incorrect measurements	Wrong K Factor	Refer to Section 5.9 Calibration
	Flow rate below meter limits	Increase flow rate
Reduced or zero flow rate	Turbine blocked	Clean turbine
Meter not recording flow	Faulty PCB	Contact your Sealey dealer
	Faulty turbine	Contact your Sealey dealer

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Parts support is available for this product. Please log on to
www.sealey.co.uk, email sales@sealey.co.uk or telephone 01284 757500



WEEE REGULATIONS

Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment (WEEE). When the product is no longer required, it must be disposed of in an environmentally protective way. Contact your local solid waste authority for recycling information.



BATTERY REMOVAL

Under the Waste Batteries and Accumulators Regulations 2009, Jack Sealey Ltd are required to inform potential purchasers of products containing batteries (as defined within these regulations), that they are registered with Valpak's registered compliance scheme. Jack Sealey Ltd's Batteries Producer Registration Number (BPRN) is BPRN00705.



ENVIRONMENT PROTECTION

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.

Note: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.
Important: No Liability is accepted for incorrect use of this product.
Warranty: Guarantee is 12 months from purchase date, proof of which is required for any claim.

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