INSTRUCTIONS FOR

DIGITAL DIESEL & FLUID FLOW METER

MODEL NO: **TP101.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 diesel fuel, kerosene, petrol, water, windscreen washer or 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 50bar.
- ✗ **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, four digit, 28mm high LCD display calibrated in litres, quarts, pints and gallons. Features flow rate indication. 1" x 1" BSP male/female fitting. Powered by 2 x AAA batteries (supplied). IP65 rated protection.

3. SPECIFICATION

Model no:..TP101.V2
Flow rate:...7-120ltr/min

4. OPERATION

❑ **WARNING! DO NOT** use the meter without a filter installed BEFORE the meter.

4.1. **Installation refer to fig's 1 & 3**
4.1.1. This is a bi-directional meter with 1" threaded male & female ports. The meter can be fixed in any position - fixed inline or mobile on a control nozzle.
4.1.2. Remove the four screws (2) and separate the card housing (5) from the turbine assembly (6).
4.1.3. Rotate the card housing in any of the four positions as shown in fig.1 and tighten the card housing with four screws (2)
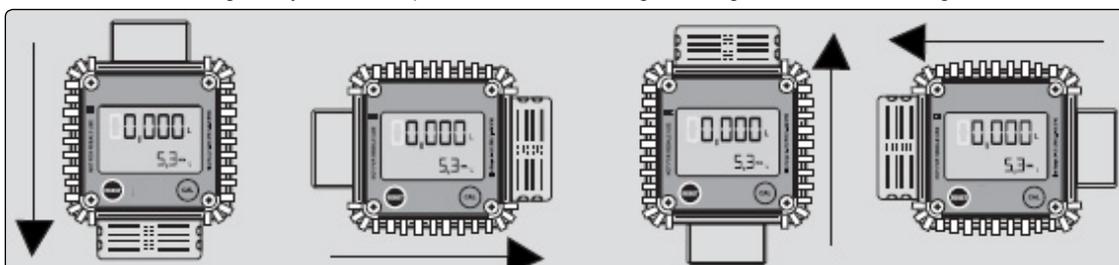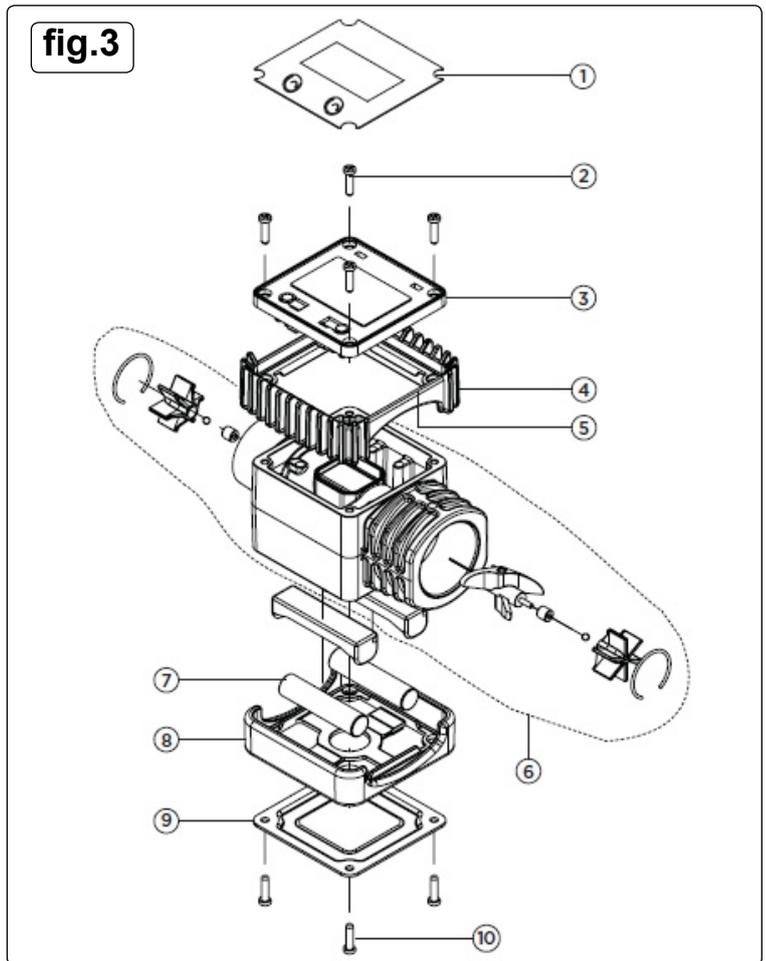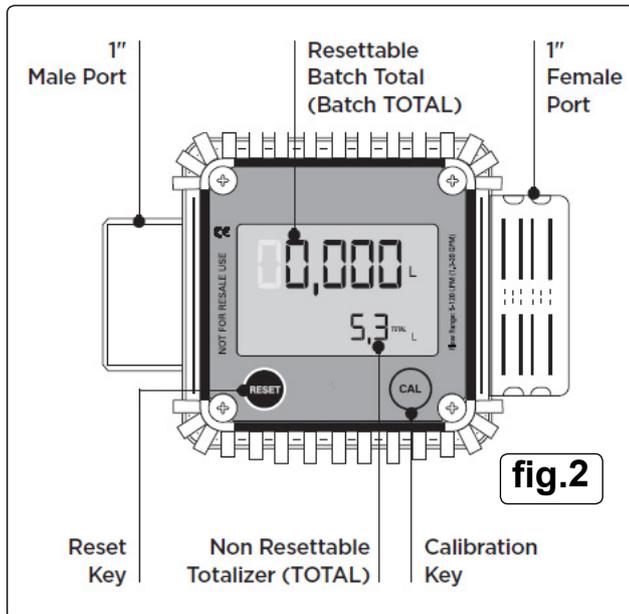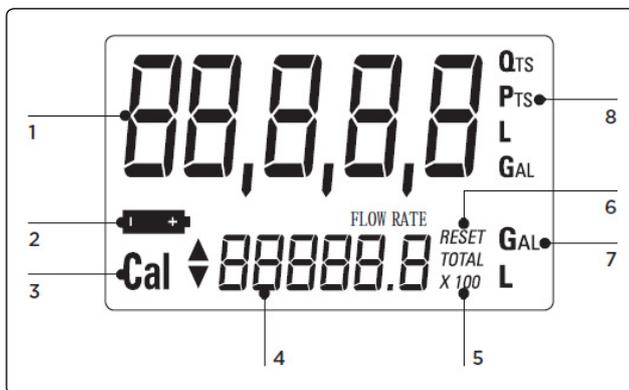

fig.1

4.2. Major components

fig.2

- 1" Male Port
- Resettable Batch Total (Batch TOTAL)
- 1" Female Port
- Reset Key
- Non Resettable Totalizer (TOTAL)
- Calibration Key

0,000 L
5,3 TOTAL L

NOT FOR RESALE USE

RESET   CAL

fig.3

1	Meter label
2	Screws
3	Display with microprocessor
4	Rubber shroud
5	Card housing
6	Turbine assembly
7	Batteries
8	Battery case
9	Battery cap
10	Screws

4.3. LCD display

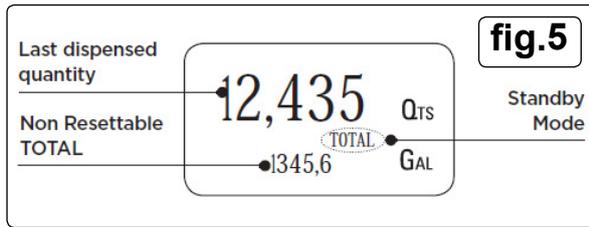| 1	Resettable Batch TOTAL (5 digits with moving comma): indicates volume dispensed after RESET button was last pressed.
2	Indication of battery charge.
3	Indication of calibration mode.
4	Totalizer (6 figures with moving comma in multiples of 10 &100): indicates two types of TOTAL: • Non-Resettable TOTAL (TOTAL) • Resettable TOTAL (Reset TOTAL)
5	Indication of TOTAL multiplication factor (x10 or x100).
6	Indication of type of TOTAL, (TOTAL / Reset TOTAL).
7	Indication of unit of measurement of TOTALIZER: L=Litres Gal=Gallons
8	Indication of unit of measurement of resettable batch TOTAL: Qts=quarts Pts=pints L=litres Gal=gallons

4.4. Functions see fig.2

4.4.1. User Buttons: The meter features two buttons (RESET and CAL) which individually perform two main functions and together perform other secondary functions.

4.4.1.1. **RESET key:** is used to reset the Batch TOTAL and Reset TOTAL.

4.4.1.2. **CAL key:** is used to enter the calibration mode.

4.4.1.3. **Combination of RESET + CAL keys:** is used to change the unit of measurement and other secondary functions.

4.4.2. **Turbine Assembly:** it has two threaded ports: 1 male and 1 female. It contains a turbine which turns when the media passes through it at sufficient pressure. This action generates electrical pulses which are processed by a microprocessor and the result is displayed on the LCD.

4.5. **What is Standby? Refer to fig.5**

4.5.1. 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.

fig.5

Last dispensed quantity — 12,435 Qts — Standby Mode

Non Resettable TOTAL — 1345,6 GAL

Note: Last dispensed quantity can be brought to zero by pressing and holding the RESET button.

4.6. **Measurement Units Configuration**

4.6.1. 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 totaliser
1	Litres (L)	Litres (L)
2	Gallon (Gal)	Gallon (Gal)
3	Quarts (Qts)	Gallon (Gal)
4	Pints (Pts)	Gallon (Gal)

4.7. **Setting the Units of Measurement Refer to fig's 6 & 7.**

4.8. Wait for the METER to go into Standby Mode.

4.8.1. Press the CAL and RESET keys together, hold until the word "UNIT" appears on the screen together with the current unit of measurement.

4.8.2. Press RESET key to scroll among the four combinations of units of measurement as shown in fig.7.
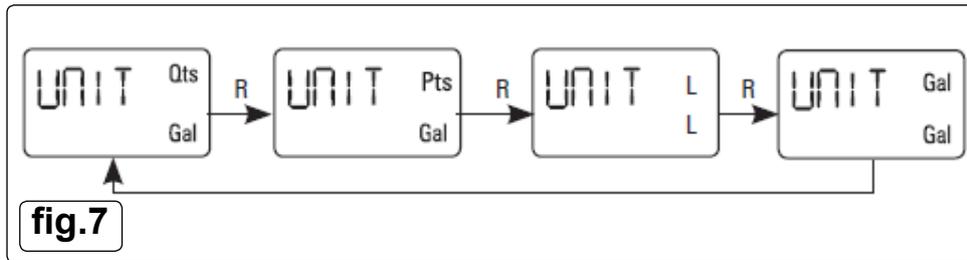
fig.6

fig.7

4.8.3. Press CAL key for more than 2 seconds to store new settings. The METER will return to Standby Mode, see fig.8.
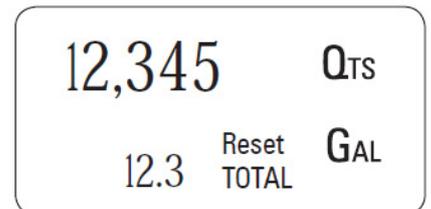**Note: No new calibration is required after changing the Unit of Measurement.**

fig.8

fig.9

4.9. **Normal Dispensing Mode see fig.9**

4.9.1. While the media is flowing through the meter, Batch Total and Reset Total are displayed at the same time.

4.9.2. A few seconds after dispensing has ended, the display switches from Reset TOTAL to TOTAL: the word TOTAL disappears and the Reset TOTAL is replaced by TOTAL, see fig.10.

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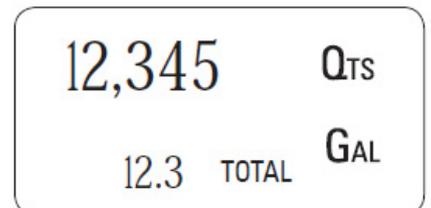It remains stable until the user operates the meter again.**

fig.10

4.10. Resetting the Batch Total

4.10.1. While in standby (i.e. when display shows TOTAL) press the RESET button, see fig.11.

fig.11

fig.12

4.10.2. During reset the display screen shows all the digits lit up, see fig.12.

4.10.3. After resetting the display shows zero value on Resettable Batch TOTAL, see fig.14.

fig.13

fig.14

4.10.4. After a few moments the Reset TOTAL is replaced by TOTAL.

4.11. Resetting the Reset Total

4.11.1. The Reset TOTAL can be reset by pressing the RESET key at with a long press, while the display screen shows Reset TOTAL. Follow this procedure:

4.11.1.1. Wait until the display shows TOTAL only , see fig.15.

fig.15

fig.16

4.11.1.2. Press the RESET key. The display screen again shows all the segments of the display followed by all segments of the display turned off, see fig.16.

4.11.1.3. When the display page is showing the Reset TOTAL is shown, press and hold the Reset key again until the Resettable TOTAL turns to zero, see fig.17 and fig.18.

fig.17

fig.18

4.11.1.4. Finally the page with the new Reset TOTAL is displayed, see fig.19.

fig.19

4.12. Calibration

4.12.1. 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: Customised calibration factor, mening modified by calibration.

4.12.2. The meter has been calibrated at the factory under the following operating conditions:

Fluid: Diesel fuel

Temperature: 20°C (68°C)

Flow Rate: 10-120 litres/min

4.12.3. Calibration is neede to make the meter suitable for actual conditions.

Note: Calibration must be carried out if there is a change in any of the above operating conditions.

4.12.4. Calibration Procedures

1. In-Field Calibration
2. Direct Calibration

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, see fig.20:

fig.20

fig.21

Note: The word "Fact" abbreviation for "factory" shows that the factory calibration factor is being used.

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 this example 0.998), see fig.21.
Note: The word "user" indicates that a calibration factor set by the user is being used.

To confirm the choice of the calibration factor quickly press CAL while "User" or "Fact" are displayed.

4.12.4.1. In-field Calibration Sequence

1. Wait until the METER returns into Standby, (display shows TOTAL), see fig.22.

fig.22

fig.23

2. 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, see fig.23.

3. Press the meter and hold the RESET key. The METER shows "FIELD" and the Batch Total is zero. The meter is ready to perform in-field calibration, see fig.24.

fig.24

4.12.4.2. Process For In-field Calibration

4. Dispense fluid into a sample container without pressing any key, see fig.25.
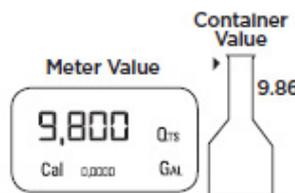
fig.25

fig.26

Continue dispensing until the level of the fluid in the sample container has reached the graduated area, see fig.26.

5. 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 6 & 7.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, see fig.27.

fig.27

6. Press RESET key once. The arrow changes direction. The operation can be repeated to alternate the direction of the arrow, see fig.28.

fig.28

fig.29

7. Press "CAL" key to change the value in the direction indicated in the arrow. The reading changes:
- by one unit for every short press of the CAL key.
- continually if the CAL key is kept pressed, see fig.29.

8. 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 for a few seconds, see fig.30.
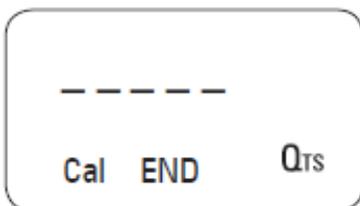

fig.30

fig.31

9. The new USER K FACTOR is shown for a few seconds, after which the restart cycle is repeated to finally achieve standby condition, see fig.31.
10. The METER stores the new calibration factor and is ready to begin dispensing, see fig.32.

fig.32

4.12.4.3. Direct Calibration Sequence

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 :

New cal. Factor = Old Cal Factor x $\left\{\dfrac{100 - E\%}{100}\right\}$

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

1. Wait until the METER enters Standby (display shows TOTAL), see fig.33.

fig.33

fig.34

2. 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, see fig.34.

3. 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, see fig.35.

fig.35

fig.36

4. 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, see fig.36.

5. By pressing RESET key the user can change the direction of the arrow, fig.37.

fig.37

fig.38

6. By pressing CAL key, the Meter value changes in the direction indicated by the arrow:
- one unit for every short press of the CAL key
- continually if the CAL key is kept pressed. The speed increases or decreases by keeping the key pressed, see fig.38.

7. Press RESET key for more than 2 seconds. The METER detects that the desired reading has been set and the calibration procedure is finished, see fig.39.
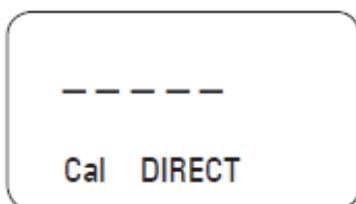

fig.39

fig.40

8. At the end of the calculation, the new USER K FACTOR is shown for a few seconds, see fig40.

9. The restart cycle is repeated to finally achieve standby mode, see fig.41.

fig.41

5. MAINTENANCE

5.1. The Meter has been designed to require a minimum amount of maintenance.
5.2. 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.
5.2.1. **Battery Low Alarm**
5.2.1.1. The METER features two low battery alarm levels:
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, see fig.42.

fig.42

fig.43

5.2.1.2. 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 LCD, see fig.43.

5.2.2. **Battery Replacement**
• Press RESET to update all the totals
• Remove the four screws (10) and separate the battery cap (9).
• Remove the old batteries.
• Place the new batteries in the same position as the old ones, making sure the positive pole is positioned as indicated.
• Re-tighten the battery cap (9) & tighten the screws (10).
• The METER will switch on automatically and normal operation can be resumed.
Note: The old calibration will stay same as before.

5.2.3. **Cleaning the Turbine Assembly**
❑ **WARNING!** Always make sure the liquid has been drained from the meter and that the line pressure has been released before cleaning.
5.2.4. After removing the pipes any residual elements can be removed from the turbine by simply washing it with water.

6. TROUBLESHOOTING

Problem	Cause	Solution
No indication on display	Bad battery contact	Check battery contacts
Inaccurate measurement	Wrong calibration	Follow calibration procedure
	The meter is working below minimum acceptable flow rate	Increase the flow rate until an acceptable flow rate range has been achieved
Reduced or zero flow rate	Turbine blocked	Clean the turbine
The meter does not count but the flow rate is correct	Incorrect installation of the card	Reinstall the card
	Possible electronic card problems	Contact your stockist

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.

BATTERY REMOVAL
REFER TO SECTION 5.2.2
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 Batteries Producer Registration Number (BPRN) is BPRN00705.

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.