Digital Turbine Meter
4334

Digital Turbine Meter with Polyamide construction, designed especially for use with DEF, water etc.

Designed for in-line, end of the line application or use with a dispensing nozzle.

Polyamide turbine measuring mechanism.

Electronic display using two AAA 1.5V batteries.

Polyamide body & sealed electronic card makes it suitable for use in severe weather conditions.

Display can be rotated in 4 different positions.

Measures in Litres, Quarts, Pints & Gallons.

Easy user re calibration.

WETTED COMPONENTS
Polyamide, Viton, Stainless Steel

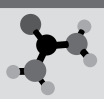
RECOMMENDED USE
DEF, Urea, Windshield fluids, Water & Water based media.

DO NOT USE WITH
Fuels & Oils

FEATURES

FLOW RATE	MAX. WORKING PRESSURE
1.3 TO 32 GPM	145 PSI
WORKING TEMPERATURE RANGE	
14°F TO 122°F	

FLUIDS

UREA	DEF / ADBLUE
	
WINDSHIELD FLUID	WATER
	

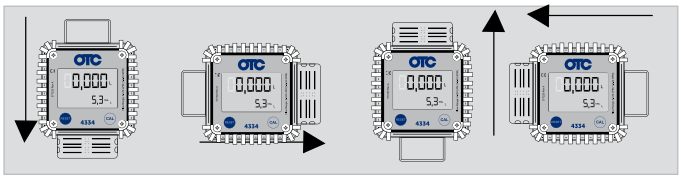
SPECIFICATIONS

METER TYPE	Digital
MECHANISM	Turbine Meter
INLET / OUTLET POSITION	In-line
INLET / OUTLET	1" BSP
FLOW RATE	1.3 to 32 GPM
WORKING TEMPERATURE RANGE	14°F to 122°F
ACCURACY	± 1%
REPEATABILITY	± 0.30%
MAX. WORKING PRESSURE	145 PSI
MAX RESETTABLE BATCH TOTAL	99,999 units
MAX NON RESETTABLE BATCH TOTALISER	9,99,999 units
WETTED MATERIALS OF CONSTRUCTION	Polyamide, Viton & Stainless Steel
LEAST COUNT / RESOLUTION	0.001 units
MAX. VISCOSITY OF MEDIA	45 SSU
WATER RESISTANCE	IP55

INSTALLATION (REFER FIG. 1)

This is a bi-directional meter with 1" threaded male & female ports. The meter can be installed in any position - fixed in line or mobile on a control nozzle.

1. Remove the four screws and separate the card housing from the turbine assembly.
2. Rotate the card housing in any of the four positions as shown in the picture below and tighten the card housing with four screws



Positions

MAJOR COMPONENTS

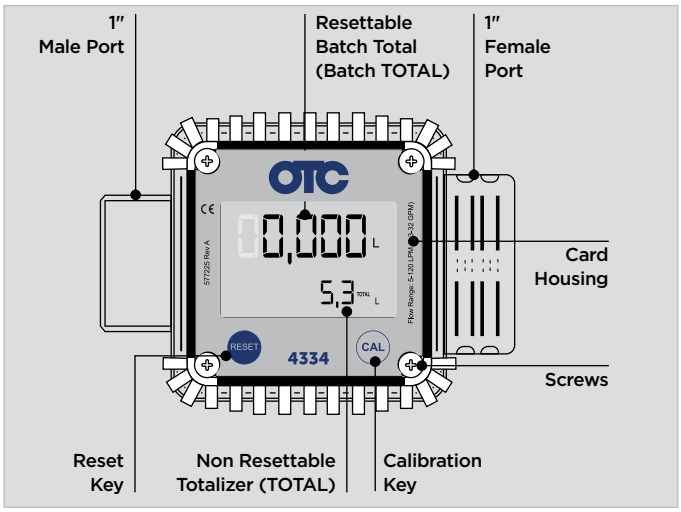
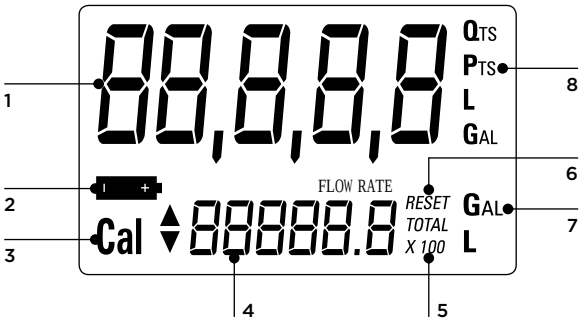


Fig. 1

LCD DISPLAY: Powered by two alkaline batteries of 1.5 V each. Includes three numerical TOTALS and other keys as given below:



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 digits 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

FUNCTIONS:

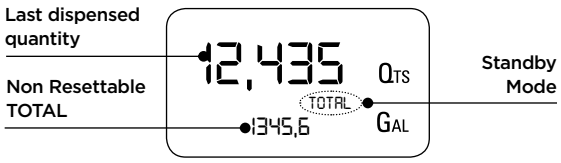
User Buttons: The meter features two buttons (RESET and CAL) which individually perform two main functions and together perform other secondary functions.

- **RESET key:** is used to reset the Batch TOTAL and Reset TOTAL
- **CAL key:** is used to enter calibration mode
- **Combination of RESET + CAL keys:** is used to change the unit of measurement and other secondary functions.

Turbine Assembly: It has two male threaded ports. It includes one additonal Stainless Steel adaptor to convert from 1" male to 1" female threads. It contains a turbine which turns when 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.

WHAT IS STANDBY?

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.



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

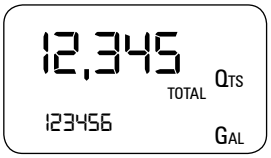
MEASUREMENT UNITS CONFIGURATION

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)

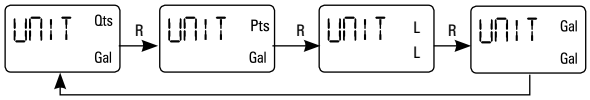
SEQUENCE OF SETTING THE UNIT OF MEASUREMENT

1. Wait for the METER to go to Standby Mode.



2. Press the CAL and RESET keys together. Hold it until the word "UNIT" appears on the screen together with the current unit of measurement.

3. Press RESET key to scroll among the four combinations of units of measurement as shown:

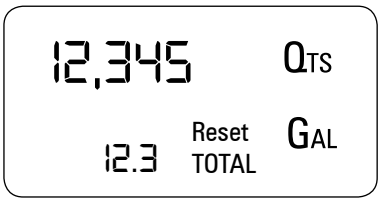


4. Press CAL key for more than 2 seconds to store the new settings. The METER will return to the Stand by Mode.

Note: No new calibration is required after changing the Unit of Measurement.

NORMAL DISPENSING MODE

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



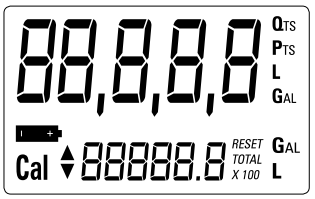
A few seconds after dispensing has ended, the display switches from Reset TOTAL to TOTAL: the word RESET above the word TOTAL disappears, and the Reset TOTAL is replaced by TOTAL.

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

RESETTING THE BATCH TOTAL

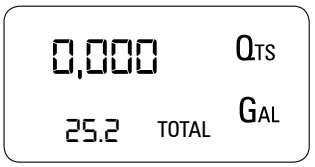
1. While in standby (i.e when the display shows TOTAL), press the RESET button.

2. During reset, the display screen shows all the lit-up digits.



3. After resetting, the display shows zero value on Resettable Batch TOTAL

4. After a few moments, the Reset TOTAL is replaced by TOTAL.

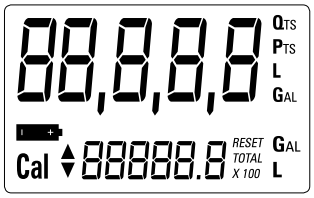


RESETTING THE RESET TOTAL

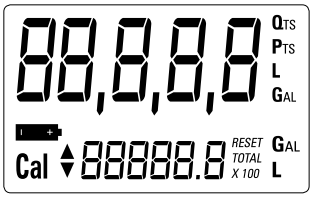
The Reset TOTAL can be reset by pressing the RESET key at length while the display screen shows Reset TOTAL. The steps to be taken are:

1. Wait until the display shows TOTAL only (standby mode)

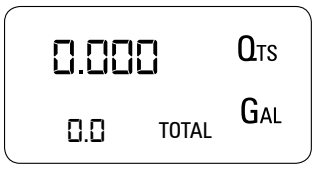
2. Press the RESET key. The display screen again shows all the segments of the display followed by all the switched-off segments.



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.



4. Finally the page with the new Reset TOTAL is displayed.



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.**

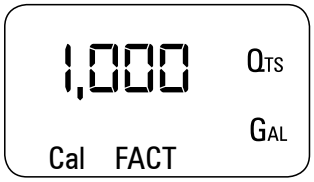
CALIBRATION PROCEDURES

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:

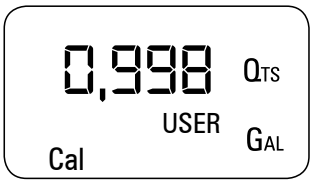
CASE 1: "FACT"

If no calibration has ever been performed, or the factory setting has been restored after previous calibrations, the following display page will appear:



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 our example 0,998).



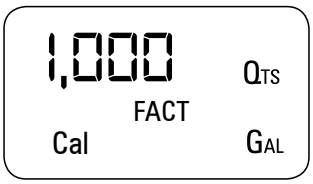
Note: The word "user" indicates that a calibration factor, set by the user is being used.

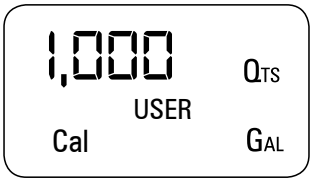
To confirm the choice of calibration factor, quickly press CAL while "User" or "Fact" are displayed.

IN-FIELD CALIBRATION SEQUENCE

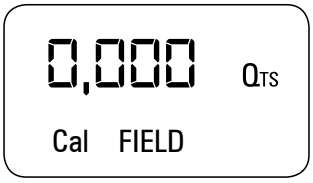
1. Wait until the METER comes in Standby (Display shows TOTAL).

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.



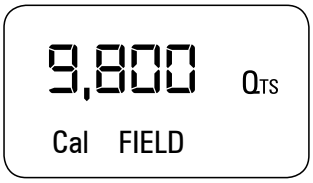


3. Press and hold RESET key. The METER shows"FIELD" and the Batch Total at zero. The meter is ready to perform in-field calibration.

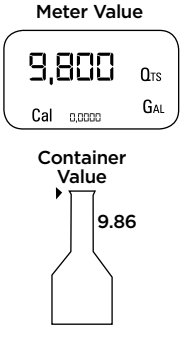


PROCESS FOR IN-FIELD CALIBRATION

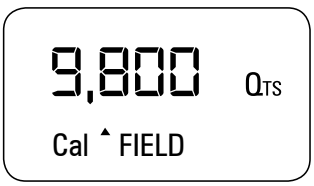
4. Dispensing into sample container Without pressing any key, start dispensing into the sample container.



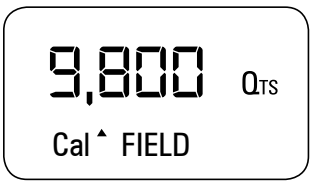
Continue dispensing until the level of the fluid in the sample container has reached the graduated area.



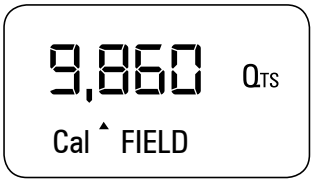
5. Press RESET key once .The METER detects that the calibration dispensing is finished. An arrow (up/down) appears which indicates the direction in which the value can be changed via steps 6 & 7. To calibrate the METER, the value indicated by the Batch total (example 9.800) must be forced to the Container value 9,860 marked on the graduated sample container.



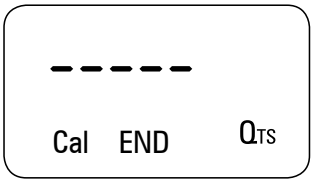
6. Press RESET key once. The arrow changes direction. The operation can be repeated to alternate the direction of the arrow.



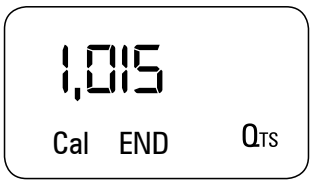
7. Press "CAL" key to change the value in the direction indicated by the arrow. The reading changes
   - by one unit for every short press of CAL key.
   - continually if the CAL key is kept pressed.



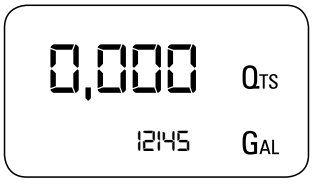
8. Press and hold RESET key for more than 2 seconds. The METER is informed that the calibration procedure is finished. The meter calculates the new USER K FACTOR factor for a few seconds.



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



10. The METER stores the new calibration factor and is ready to begin dispensing.



DIRECT CALIBRATION SEQUENCE

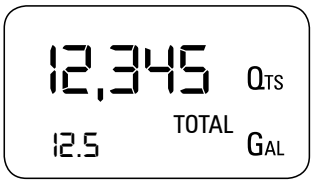
If normal METER operation shows a mean percentage error E, (obtainable on the basis of several performed dispensing operations), this can be corrected by applying a correction to the current calibration factor as shown below :

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

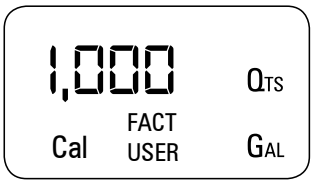
Example:

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

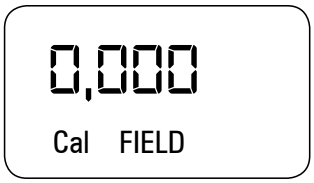
1. Wait until the METER comes in Standby (Display shows TOTAL).



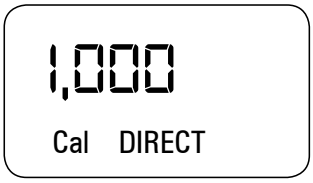
2. Press and hold CAL key. The METER enters calibration mode and shows “CAL”. The words “Fact” or “USER” indicate which factor (factory or user) is currently in use.



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.



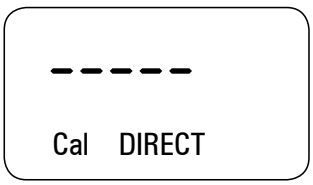
4. Press and hold RESET key. “Direct” appears together with the Current calibration factor. An arrow appears (upwards or downwards) defining the direction (increases or decreases) of the reading.



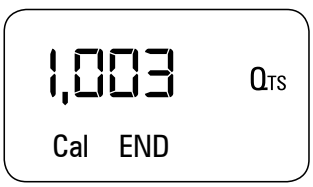
5. By pressing RESET key the user can change the direction of the arrow.

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

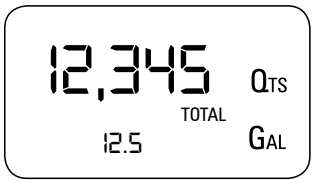
7. Press RESET key for more than 2 seconds. The METER detects that the desired reading has been set and the calibration procedure is finished.



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



9. The restart cycle is repeated to finally achieve standby mode.



MAINTENANCE

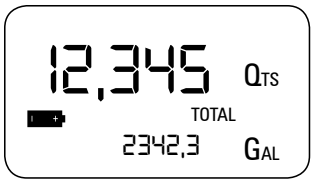
The Meter has been designed to require a minimum amount of maintenance.
The only maintenance jobs required are:

- **Battery change:** Necessary when the batteries have run down
- **Cleaning the turbine assembly:** Due to the presence of solid particles following bad filtering.

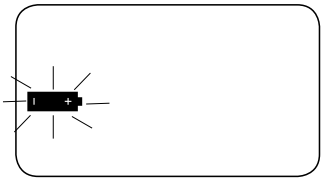
CHANGING THE BATTERY

The METER features two low-battery alarm levels

1. 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.



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.



BATTERY REPLACEMENT PROCEDURE:

- Press RESET to update all the totals
- Remove the four screws and separate the battery cap.
- 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.
- The METER will switch on automatically and normal operation can be resumed.

Note: The old calibration will stay same as before.

CLEANING OF THE TURBINE ASSEMBLY

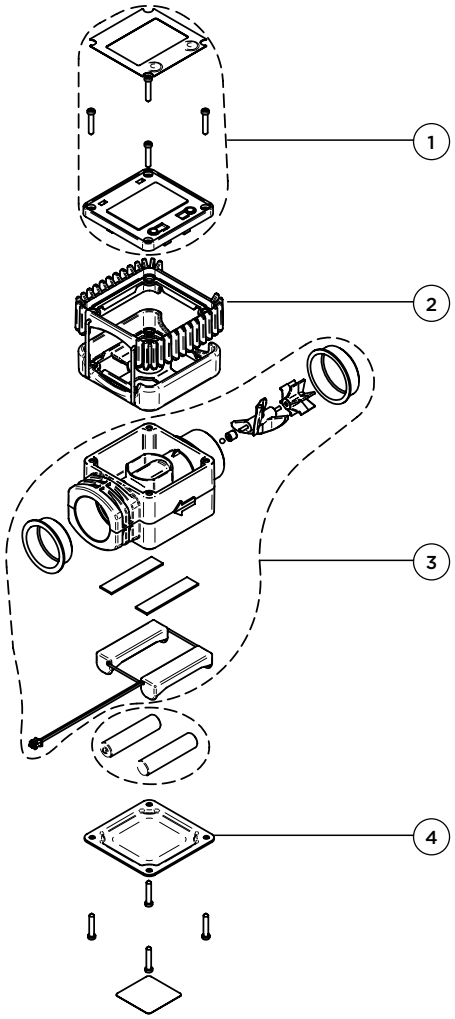
After removing the meter from pipes, any residual elements can be removed from the turbine by simply washing it with water.

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.

EXPLODED VIEW



PARTS LIST

REF NO.	PARTS DESCRIPTION
1	LCD Display
2	Shroud
3	Meter Body
4	Cap

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
No indication on display	Improper 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 dealer

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