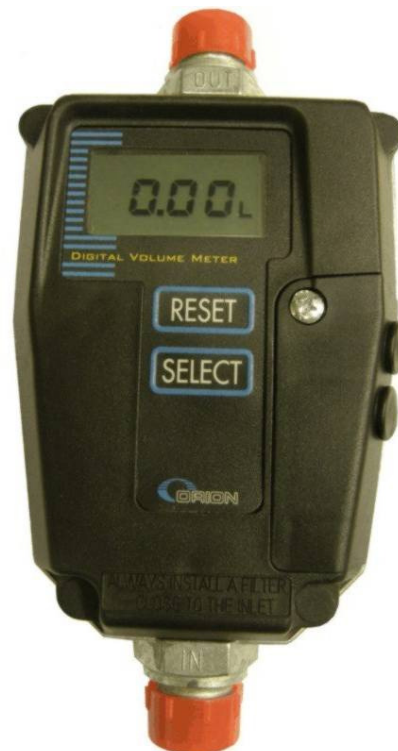




IN LINE METER



Part No. / Réf. / Art. Nr. / Cód.:

24720

Alentec & Orion AB Grustagsvägen 4, SE-13840, Älta, SWEDEN · Info@alentec.se · alentec.com

Manual 24720_EN_2B 2014-05-20

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1. Introduction

The In line meter 24720 is used to measure the volume of fluid filled in an object. The meter is based on the “oval-gear” Principle. It uses permanent magnets and REED-switches as signal pickup.

The integrated valve is pressure balanced to enable a smooth flow control almost independent of fluid pressure.

It is manufactured with small tolerances to assure a high degree of accuracy over a wide range of flow and viscosity.

To conserve battery the meter goes into sleep mode after 1 minute of inactivity. All data is stored so if it is waken up again it continues from where it was.

2. Mechanical installation

The meter is delivered in an environmental adapted paper box. The inlet and outlet of the meter is male G1/2 with inside 60° cone to fit standard hydraulic 60° cone adapters. Use liquid sealant if additional sealant is needed.

Note! –Do not use Teflon tape or other solid thread sealants and do not use excessive torque for the fittings!

3. Batteries

2 pieces of AAA 1,5 V batteries are used as power source. They are placed in a battery holder. To get access to the battery holder, loosen the screw on the front of the meter.



4. How to use

Always read the manual before using the meter.

4.1. Check before use

The meter will probably be in sleep mode when you grab it so press the RESET or SELECT button to wake it up. Then the display should look like this.



4.2. Dispense fluid

To dispense fluid press the <RESET> or <SELECT> button to wake the meter up if it is in sleep mode or just continue the last dispense. If a new dispense is to be started press <RESET> button after wake up to zero the meter.

4.3. “Trip” counter

The meter is equipped with a “Tripp” counter that shows the accumulated volume of fluid dispensed since it was last “RESET”. The “Trip” counter can be zeroed, “re-set”.

4.3.1. Check the “Trip” counter

When the meter is in normal dispense mode the TRIP-counter can be shown by pressing the <Select> button.

Normal dispense mode.



Press <SELECT>. May need to be pressed more than once depending on mode. The total volume (in whole units) since the last re-set is shown.



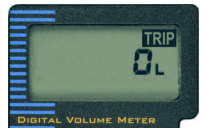
4.3.2. Reset the “Trip” counter

When the meter is showing the TRIP-counter it could be re-set. This only re-sets the TRIP-counter nothing else.

Press <SELECT>. May need to be pressed more than once depending on mode. The total volume (in whole units) since the last re-set is shown.



Press <RESET> to zero the TRIP-counter.



4.4. “Total” counter

The meter is equipped with a “Total” counter that shows the accumulated volume of fluid dispensed since the meter was put into use. The “Total” counter cannot be zeroed (RESET)

4.4.1. Check the “Total” counter

When the meter is in normal dispense mode the TOTAL-counter can be shown by pressing the <Select> button.

Normal dispense mode.



Press <SELECT>. May need to be pressed more than once depending on mode. The total volume (in whole units) since the last re-set is shown.



4.4.2. Reset the “Total” counter

The “Total” counter cannot be re-set to zero.

5. Calibration

Normally the meter does not need calibration if it is used for normal workshop oils but if fluids with high or low viscosities or high or low flows are used calibration may be needed.

Also calibration may be needed after a long time of use especially if dirt is present in the fluid.

To make a usable calibration some rules has to be followed.

1. The calibration works for any volume but recommended is at least 1 L.
2. The measuring vessel must be of laboratory grade and absolutely empty. A prior dispense can easily leave 0.1L or more even if it appears empty. Put the vessel upside down for a while or clean it before each calibration dispense.
A really accurate calibration can only be made by a scale and knowing the density of the fluid.
3. When a dispense is done all air has to be removed from the fluid. This can take a long time. It can be accelerated by vacuum. If a scale is used the air does not matter.

5.1.1. Calibration possibility

The meter can be calibrated $\pm 10\%$. If this is not enough the meter chamber should be replaced.

If the calibration factor exceeds this during calibration the display will show an error message “E3” for a while. Because of that this meter normally gives an accuracy of $\pm 0,5\%$ directly from stock for normal workshop oils and has proved to maintain the accuracy after several 100000 of litres the most probable causes for this error is

Bad measuring vessel.

Measuring vessel not empty from the beginning.

Air in the oil not evacuated properly.

Wrong measured volume input.

5.1.2. Calibration procedure

The calibration process is semiautomatic and started by entering configuration mode.

Press <RESET> and <SELECT> buttons simultaneous and hold them down for 5 s. If successfully done the display will change to this, showing that the meter is in configuration mode. Now release the buttons.



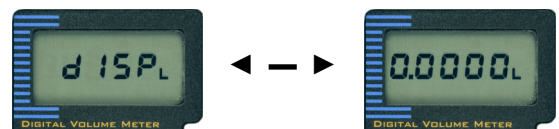
Then press <SELECT> button to get into “Set unit” mode. The display will change to.



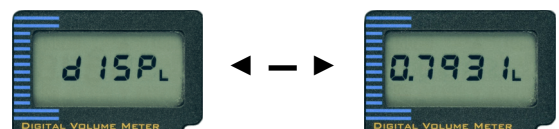
Then press <SELECT> button again to get into “Calibration” mode. The display will change to.



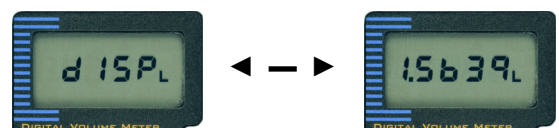
Then press <RESET> button to start the calibration process. The display start switching between “dISP” and “0.0000”.



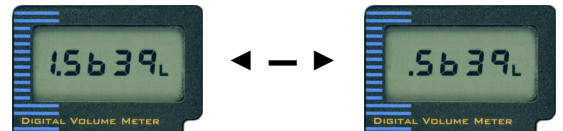
Now start dispensing. It does not matter how much you dispense but to get a good calibration at least 1L is recommended. During the dispense it will switch between “dISP” and the dispensed volume.



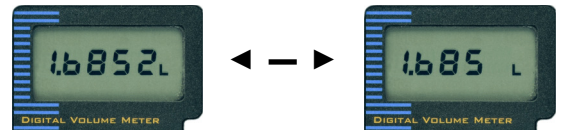
When the decided volume is reached, in this case 1.5639L, release the handle of the meter so the flow stops.



Then press <SELECT> and the display will move on to received volume input. The first figure will “blink” to show that it is changeable. Press <RESET> to change the value press <SELECT> to change to the next figure.



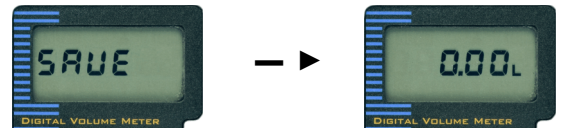
In this example we received 1.6852 L so we move to second figure with <SELECT> and change it from 5 to 6 with <RESET> move to third figure and change it from 6 to 8 and so on.



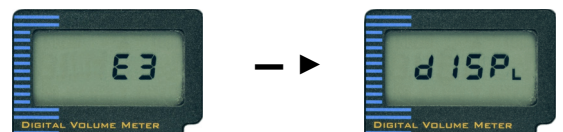
When the last figure is blinking and <SELECT> is pressed the display will change to show the calculated calibration factor. If <RESET> is pressed the new calibration is cancelled.



If <SELECT> is pressed the calibration is saved and then the meter goes back to normal dispense mode. The calibration is done.



If the calculated factor exceeds +/- 10% the error message “E3” will be shown for a while and then it will go back for a new calibration dispense.



5.2. Unit used for measuring

The meter can be set to use either [L]itre, [G]allon, [P]int or [Q]uater. The unit used is shown after the value.



5.2.1. How to set the unit

Press <RESET> and <SELECT> buttons simultaneously and hold them down for 5 s. If successfully done the display will change to this, showing that the meter is in configuration mode. Now release the buttons.



Press <SELECT> button to get into “Set unit” mode. The display will change to.



Scroll through the different units using the <RESET> button. L, G, P, Q, L,..... . When the wanted unit is shown release all buttons and wait. The will save and go back to “ConF” after a short time.



WAIT!



To get back to normal operation mode wait a short time or press <RESET> button. When the display looks like this it is done.



5.3. LCD segment test

The LCD can be checked by putting the meter in normal dispense mode.

Normal dispense mode.

Press <RESET> and the meter will do a re-set and show all the segments of the LCD for a short while.



5.4. Battery status

The status of the batteries is shown on the display.

Batteries OK.

Batteries LOW, needs to be replaced. Replace with 2 pieces of 1,5 IEC LR03 / ANSI AAA batteries. Be sure to put the new ones in the correct direction!



6. Technical specification

Type:	Oval gears on steel shafts in a casted metal chamber with pressure drain grooves.
Pickup system:	4 pieces of permanent magnets on one of the gears configured North-South-North-South to eliminate magnetic history. The rotation is detected through the measuring chamber lid by a REED-switch on the electronic printed circuit board eliminating the risk for shaft leakage.
Materials:	Measuring chamber = Zinc, Handle frame/Valve housing = Aluminium, Gears = Vectra®, Casing = Fibreglass reinforced Delrin®, Gear shafts = stainless steel, Overlay = Polycarbonate with 3M adhesive. The meter complies with the RoHS directive.
Output:	LCD display with 4 figures and 1 decimal (XXXX.X), battery check symbol, Trip, Total and Unit.
Data storage:	Static E2RAM for set-up, Trip counter and Total counter
Power supply:	2 pieces of 1.5V standard battery, IEC LR03 / ANSI AAA
Fluid connections:	Inlet male G1/2 with an inside 60° cone. Outlet male G1/2 with an inside 60° cone.
Pressure:	Max working pressure = 5MPa (50 bar). Min burst pressure = 15MPa (150 bar)
Flow range:	Normal = 1.5 to 15 L/min. Possible = 0.5 to 25 L/min (Dependant of fluid)
Viscosity range:	8-2000 cSt.
Accuracy:	From stock and normal fluids better than +/- 1%. After calibration within +/-0,3%.
Weight:	0.5 kg