

### Description

The 407010N Fuel & Water 1" BSPF digital in-line meters are ideal for measuring low viscosity fluids utilising a turbine type measuring system. Field calibratable, easy to install in-line or at the end of a pump & delivery hose, the meters are equipped with a clear & compact display. The meters are designed for outdoor, heavy duty applications with its strong polyamide body, protective rubber shroud & polypropylene turbine. Accurate to 1% and with a maximum flow rate of 120 litres per minute & powered by 2 easily replaceable AAA batteries, the meters even display a low battery icon. The meter features a rotational face plate for vertical or horizontal applications & even shows the current flow rate. The total batch can even be reset to zero if required. (An Adblue version meter is also available).

### Specifications

Suitable for:	Diesel, petrol, kerosene, water & windscreen fluid.
Flow rate:	5 to 120 litres per minute. Can be calibrated in the field.
Maximum Pressure:	300 PSI. Suitable for bulk tank gravity feed applications.
Weight:	400 grams
Accuracy:	-+1.0%
Temperature:	-10c-50c
LCD Display:	Current measure: 5 figures from 0.1 to 99,999 litres. Total: 6 figures from 1 to 999,999 litres.
Inlet/Outlet connections:	1" BSP FxF

### Operating Modes

The user can choose between two different operating modes:

- Normal mode: Mode with display of partial & total dispensed quantities.
- Flow Rate Mode: Mode with display of flow rate, as well as partial dispensed quantity.

The meter features a non volatile memory for storing the dispensing data, even in the event of a complete power break for long periods. The measuring electronics & the LCD display are fitted in the top part of the meter which is isolated from the fluid path measurement chamber & sealed from the outside by means of a cover.

### User Buttons

The 407010N features two buttons (reset and cal) which individually perform two main functions & together, other secondary functions. The main functions performed are for the reset key, resetting the partial register & resettable total. For the cal key, entering instrument calibration mode.

### Battery Housing

The 407010N is powered by two standard type 1.5V batteries (size AAA). The battery housing, easily accessible, is closed by a metal cover sealed through a rubber protection acting as a gasket as well. The whole unit can be easily removed by unscrewing the 4 screws fixing the cover and the protection to the body.

### Resetting the Reset Total

The reset total operation can only be performed after resetting the partial register. 1. Wait for the display to show normal standby display page (with total only displayed). 2. Press the reset key quickly. 3. The meter starts to reset the partial. 4. While the display page showing the reset the reset total is displayed, 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 total is shown.

### Dispensing with Flow Rate Mode display

It is possible to dispense fluids, displaying at the same time, 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 CAL key. Start dispensing. The flow rate is updated every 0.7 seconds. Thus the display could be relatively unstable at lower flow rates. The higher the flow rate, the more stable the displayed value. To return to "Normal" mode, press the CAL key again.



## Calibration

**Definitions**, calibration factor of “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, flow rate: 10-120 litres per minute.** 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**, customised 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-the-spot calibration may be required to suit the real conditions in which the 407010N is required to operate.

## Calibration procedure

The 407010N permits making quick & precise electronic calibration by changing the calibration factor (K Factor). There are 2 different ways of calibration:

1. In-field 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 “cal” button.

Why enter the calibration phases? 1. Display the currently used calibration factor. 2. Return to factory calibration (factory K factor) after a previous calibration with user K factor change the calibration factor using one of the two previously indicated procedures. 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 407010N cannot perform any normal dispensing operations. In calibration mode, the totals are not increased. **Note:** The meter features a non volatile memory. It keeps the calibration & dispensing data stored even after replacing new batteries or long periods of inactivity. Display of Current “K Factor” and Restoring “Factory K Factor”.

By pressing the cal key while the appliance is in standby, the display page appears showing the current calibration factor used. If you are using the meter with “factory K Factor” the display page shown in the diagram will be displayed, with the word “fact”. 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.

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 CAL while “User” or “Fact” is displayed. After the restart cycle, the meter uses the calibration factor that has just been confirmed. **Note: When the Factory Factor is confirmed, the old User factor is deleted from the memory.**

**Calibration** This procedure calls for the fluid to be dispensed into a graduated sample container in real life operating conditions (flow rate, viscosity, etc (requiring maximum precision). **Note:** For correct calibration, it is most important to; completely eliminate air from the system before calibrating; use a precise sample container with capacity of no less than 5 litres, 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. Do 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.

## Detailed Technical Specification

Measurement System		Turbine
Resolution (nominal)	Hi Flow Low Flow	0.010 litre / pulse 0.005 litre / pulse
Flow range	Hi Flow	5 to 120 LPM for diesel, petrol, kerosene, water & windscreen fluid
Operating Pressure (Maximum)		10 (Bar), 145 PSI
Bursting Pressure (Min)		45 (Bar), 580 PSI
Storage temperature (Range)		-20c to 70c
Storage humidity (Max)		95 (% RU)
Operating temperature (Range)		-10c to 50c
Pressure loss		4.4 PSI
Viscosity (Range)		2 to 5.35 cST
Accuracy		± 1% after calibration within 10-90 LPM
Reproducibility (Typical)		± 0.3%
Screen		Liquid crystals LCD featuring: - 5 digit resettable Total - 6 digit Total
Power Supply		2 x 1.5V alkaline batteries size AAA
Typical Battery life		18 to 36 months
Weight		0.25kg (including batteries)
Rated Protection		IP65

NSW

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QLD/PNG

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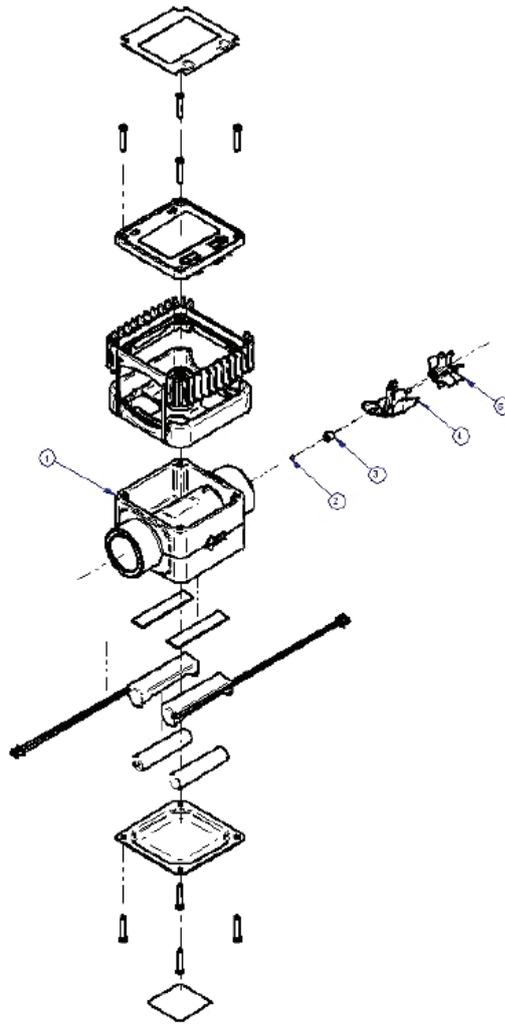
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# Parts and Drawing Breakdown For 407010N



## Ordering Spare Parts

Parts List – Part No. 407010N 1” In Line Electronic Fuel Meter

Suitable for use with diesel, petrol, kerosene, water & windscreen fluid

Item No.	Part No.	DESCRIPTION	QTY
1	-	Meter Body	1
2	-	Ball	1
3, 4, 5	407010N-3-4-5	Sleeve, Turbine & Diffuser Repair Kit	1
4	-	Turbine	1
5	-	Diffuser	1

## Trouble Shooting

Problem	Possible Cause	Corrective Action
<b>LCD: no indication</b>	Bad battery contact	Check battery contacts
<b>Not enough measurement precision</b>	Wrong K FACTOR	With reference to the instructions, check the K Factor
	The meter works below minimum acceptable flow rate	Increase flow rate until an acceptable flow rate range has been achieved
<b>Reduced or zero flow rate</b>	Turbine is blocked	Clean the Turbine
<b>The meter does not count, but the flow rate is correct</b>	Incorrect installation of gears after cleaning	Repeat the reassembly procedure
	Possible electronic card problems	Contact your distributor

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