



**Adam Pumps**

**cabinets, meter, DC and AC pumps, accessories, repair kit**

## **USE AND MAINTENANCE MANUAL**

**DIGITAL FLOW METER**

**IN-LINE**

**IN-LINE 12V** pulses version



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### 0.EC COMPLIANCE STATEMENT

ADAM PUMPS SPA

Via della Resistenza, 46/48

41011 Campogalliano (Modena) - Italy

states, taking full responsibility, that the following meter models digital flow meter "DI-FLOW IN LINE" version

"diesel", "AddBlue®" comply with the Directive for Safety of Machinery: **2006/42/CEE 91/368/CEE, 93/44/CEE, 93/68/CEE 89/336/CEE 93/68CEE 73/23CEE and the specific EN 60529, EN 60204-1, EN 50081-2, EN 55011C/A.**

This document has been signed by:

Mr. Bernard Gilson

Via della Resistenza, 46/48

41011 Campogalliano (Modena) - Italy

Phone +39 059 528128

Fax +39 059 528437

who has full legal authority to represent the firm in the European Community.

january 2013, 1.

ADAM PUMPS S.p.A.

This machine has been designed and built for INSTALLATION in NORMAL WORKING CONDITIONS, according to CEI standards 17-13 / 6.1. This use and maintenance manual and related EC certification of compliance should be considered as part of the machine, if the machine is sold they must be handed down to new owner..



Questions?  
Technical difficulties?

*Don't worry!*

**CALL US!**



**ADAM PUMPS SPA**

Via della Reistenza 46/48

41011 Campogalliano

(Modena) ITALY

phone +39.059.528.128

fax +39.059.528.437

info@adampumps.com

www.adampumps.com

# 1. GENERAL ALTERS

## 1.1 INTRODUCTION

This flow meter has been designed for measuring the transfer of Diesel, AddBlue® depending of purchased model. It is not to be used to measure for resale purposes.

**NOTICE: ANY MODIFICATION TO THIS METER WITHOUT "ADAM PUMPS" WRITTEN PERMISSION WILL VOID ANY GUARANTEE AND FREE "ADAM PUMPS" FROM ANY RESPONSIBILITY.**

## 1.2 FOREWORD

This manual has been made to give the user a general knowledge about the equipment and the necessary maintenance and operation instructions. Carefully read and understand this manual before starting installation, maintenance or repair. Maintenance schedules proposed in this manual are meant to be the minimal required for efficiency, safety and endurance of the equipment in normal operating conditions. Be observant for any type of malfunction or potential safety issue at all times. Disconnect electrical power before removing protective covers as prescribed by the Standard 292/2 Nov. 1992. for maintenance, repair and general lubrication by authorized personnel.

## 1.3 PRECAUTIONS

Improper use or installation of this product can cause serious bodily injury or death!

To ensure safe and efficient operation, it is necessary to read and follow each of these warnings and precautions:

- Do NOT smoke near meter or use meter near an open flame;
- This product should NOT be used for fluid transfer into aircraft;
- Any type of service, maintenance, control must be done by qualified personal.
- During maintenance operations and services, make sure to have disconnected the power supply.
- Do not exceed the maximum pressure of 3,5 bar

## 1.4 GENERAL SAFETY NORMS

Always wear a protection equipment that is suitable to the operations to carry out according to the liquid that is being used. If any doubt review the product safety sheet. During installation, use and maintenance always wear the correct protection equipment:

- gloves
- glass
- shoes
- clothings



## 1.5 DISCARDING AND RECYCLING

The metallic parts must be separated and sent to appropriate metal recycling mills.

The fuels in the tanks of the installation will be collected and sent to an authorized disposer. All plastic and non-degradable material parts will be separately collected and sent to an authorized disposer or recycler.

In conformity with the European Directive 2002/96/EC concerning the elimination of electric and electronic equipments, (WEEE), the symbol herewith on the pump and/or on its packaging indicates that you have to dispose of packaging for the product in a responsible manner. It is suitable for recycling. Help to protect the environment, take the packaging to the local recycling service and place into the appropriate recycling bin.

Never dispose of electrical equipment or batteries in with your domestic waste. If your supplier offers a disposal facility please use it or alternatively use your local recycling service and dispose in the correct manner. This will allow the recycling of raw materials and help protect the environment.



## 1.6 HARMFUL EMISSIONS

Both steam emission and noise emission are negligible.

## 1.7 FIRE PREVENTION

In case of fire, never use water, but use extinguishing powders charged with CO<sub>2</sub> only. Extinguishers should be kept near to the meter. Combustion of paints and plastic parts may produce toxic emissions: use the normal precautions in case of fire (always refer to the security supervisor of the place of installation).

## 2. PRELIMINARY OPERATIONS

### 2.1 2.1 PRODUCT AND MANUFACTURER IDENTIFICATION DATA

Name and address of the manufacturer::

ADAM PUMPS SpA

Via della Resistenza 46/48

41011 Campogalliano (Modena) - Italy

**Machine identification:** Contalitri flussimetro

Models: DI FLOW IN LINE Gasolio, DI FLOW IN

LINE AddBlue®.

### 2.2 PRODUCT DESCRIPTION

THE In-Line digital flowmeter is a device with a turbine to accurately measure fluids with low viscosity. It could be installed on piping or on mobile installation, generally close to the nozzle.

The display has 6 digits and two buttons:

R(RESET) and T(TOTAL), allowing to visualize multiple data:

- Visualize the liquid served at each transaction -"Partial"
- Visualize the total quantity served during a period "Total Period"
- Visualize the total quantity transferred during its life "Total"
- visualize calculated tank stock level (initial stock level encoder manually) "Stock"
- Set a low stock alarm "Alert"
- Visualize instantaneous flow rate
- Scroll between last 5 transactions with possibility of making sub-totals
- Calibrate the device for higher accuracy
- Modify the unit of measure choosing between Litre, Gallon, Pint, Quart of Custom (configured by the customer).

For major information about these option refer to the appropriate paragraph.

## 2.3 AUTHORIZED & FORBIDDEN USE

The flowmeter can be used with different fluids depending of purchased version:

1-DI FLOW IN LINE Diesel (black meter body)

- Diesel
- Kerosene (for heating)
- Solvents
- Anti-freeze
- Light oils: max cinematic viscosity = 300 cSt

2-Di FLOW IN LINE AdBlue® (blue meter body)

- AdBlue®
- Aus 32
- Water

THE METER IS **NOT COMPATIBLE** with other liquids and particularly not compatible with gasoline, gas, alcohol and hydrochloric acid.

If in doubt about the compatibility of a specific fluid, contact the supplier of fluid to check for any adverse reactions to the wetted materials in the parts list.

### 2.4 TRANSPORT AND PACKAGE CONTENT

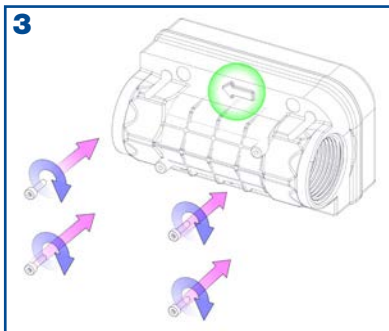
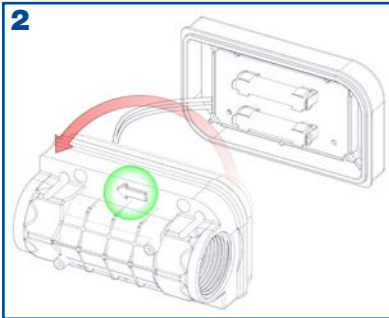
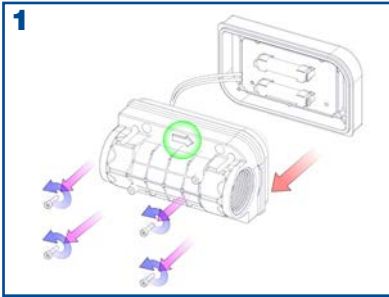
Due to its lightweight and compact design, the unit can easily be unpacked and transported by hand. Inspect the package and the product for damage. Report immediately any damage remediation. **When opening the package, make sure the meter is in the box as well as the CD containing its manuals.** If it is not the case, call your supplier immediately..

## 3. INSTALLATION AND USE

### 3.1 DISPLAY ORIENTATION

The meter is supplied with a calibration carried out for liquid diesel at 20 °C. Calibration is required when metering a different fluid, after disassembly, at different temperature or after significant wear. A proving container or a container of KNOWN volume will be needed for the calibration procedure. It is **possible to invert the flow direction** using following steps:

1. Remove the 4 screws from the back of the meter
2. Rotate the meter body by 180°
3. Reposition the body on the cover taking care of not squeezing wires.
4. Screw the 4 screws to tighten the body to the cover.



### 3.2 CONNECTIONS

When adding the flow meter to an existing system, connect the flow meter inlet to the outlet at the pump, and connect the delivery hose into the flow meter outlet. It is important to respect the flow direction looking at the arrows on the meter body. In case you need the opposite flow, rotate the meter as described above in paragraph 3.1.

The meter has a double Reed switch system to avoid false readings due to vibrations or erroneous installation and turbine reverse rotation. The meter is threaded 1" BSP-P female both at inlet and outlet. Sealing is made using O - ring 30x3 70Sh.



It is necessary, if not already installed in the system, to install a filter or screen of at least 40 mesh prior to the flow meter.

### 3.2.1 ELECTRICAL WIRING FOR PULSER VERSION


If you bought our pulser model, the flowmeter is fitted with a 2m cable with 5 internal wires to be connected as follows:

1. Yellow wire: power + 12 Vdc
2. Brown wire: power 0 Vdc
3. Green wire: pulser channel 100 imp/unit
4. White and grey wires: Relay contact should you desire to control the pump with the meter ( max 24Vdc 500mAh)

Once connected to power supply, the meter will "Beep", this sound beeps at each button pressure (this happens only with pulser version). It is important to know that the system is generating pulses 0-12Vdc with maximum frequency 2 milliseconds.

Should the meter control the pump, the  button will activate the pump while  button stops it.

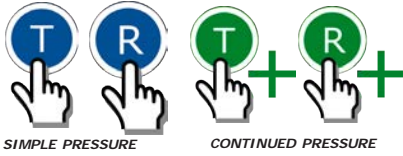
Two default settings are available and settable in the system:

1. 60 seconds: to start the transaction after pressing  button
2. 20 seconds: seconds without pulse will stop the transaction.

### 3.3 KEY DISPLAY



### 3.3.1 SIMBOLS



### 3.4 MAIN FUNCTIONS

The meter switches on automatically when a transaction starts or when a button is pressed. The display switches off automatically when no transaction nor pulse is being detected during 120 seconds. Each time the display switches off, the “partial” resets to “0”. It is then not necessary to reset the meter after it has switched off. When the meter switches on, it will automatically show the “partial” counter, it will also go back to this screen if buttons are not pressed during 10 seconds. There are 5 main screens that can be scrolled using **T** button, last 5 transaction however could be visualized using **R** button.

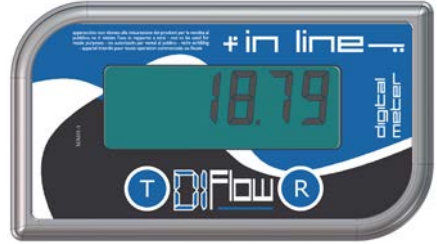
#### 3.4.0 SCROLLING THROUGH 5 MAIN SCREENS

Starting from the “Partial” screen and at each time **T** button is pressed, following screens sequence will be displayed:

- 1) **TOTAL**, preceded by message “Total Litres”
- 2) **TOTAL PERIOD**, preceded by message “TotPer”
- 3) **TANK STOCK**, preceded by message “Stock”
- 4) **MINIMUM STOCK ALARM**, preceded by message “Alert”
- 5) **PARTIAL**

Starting from the “Partial” screen and at each time **R** button is pressed, system will scroll between last 5 transactions. To go back to “partial” screens wait 10 seconds without pressing buttons.

### 3.4.1 “PARTIAL” SCREEN



Displays 4.2 digits, switches on while pressing a button or detecting pulses at transaction start. An active meter will go back to this screens after 10 seconds without activity.

**This screen is used as initial condition to describe other 4 available screens:**

#### 3.4.2 “TOTAL” SCREEN WITH MESSAGE “TOTAL LITRES”



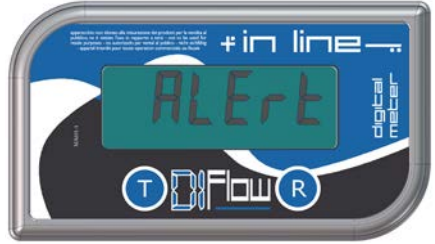
**T**, displays 6 digits, no decimal, shows all litres transferred since first use. Cannot be reset.


#### 3.4.3 “TOTAL PERIOD” SCREEN WITH MESSAGE “TOTPER”








### 3.4.5 “MINIMUM STOCK ALARM” SCREEN WITH MESSAGE “ALERT”



displays 5 digits, no decimal place, settable at maximum 65000 litres. Such number identifies the minimum stock in the tank under which the meter will display the alarm. To set this alarm level, go to “Alert” screens and press  button.


Value on display will start blinking and will be then modifiable, increasing the value pressing  button or decreasing it pressing  button until

you reach the desired number. Should you maintain the button pressed, the value will change rapidly. To confirm, wait 10 seconds until the “partial” screen I displayed.

NB. Setting the value “0”, alarm will be deactivated. 

### 3.4.6 “LAST TRANSACTIONS SCREENS”





displays 5.1 digits, identifica shows all litres transferred in a defined period of time. This totalizer can be reset by pressing  button.




### 3.4.4 “TANK STOCK” SCREENS WITH MESSAGE “STOCK”



displays 5 digits, no decimal, shows the calculated available stock. To insert available stock, it is necessary to go to “Stock” screen and press  button. Value on display will

start blinking and will be then modifiable, increasing the value pressing  button or decreasing

it pressing  button until you reach the desired

number. Should you maintain the button pressed, the value will change rapidly. To confirm, wait 10 seconds until the “partial” screen I displayed.



ton, displays 4.2 digits, allows you to see last 5 transactions. Each time **R** button is pressed,

display shows the transaction number and the amount transferred. It is possible to sum the last transactions by pressing **T** button. Total is

made depending off in which screens we currently are, example if we are currently displaying the fourth transaction, pressing **T** button will **T-04**

and the sum of the 4 preceding transactions. It is possible to do this in any position of the transactions history.

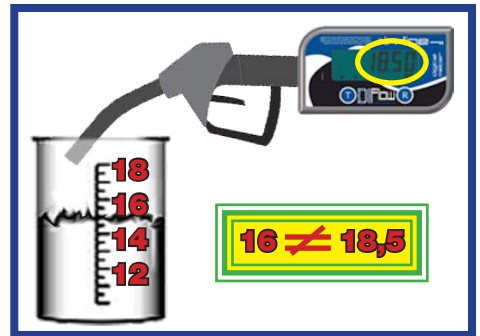


### 3.5 SECONDARY FUNCTIONS

The device has some secondary function, necessary to the good operation of the meter which are: calibration, unit selection and instantaneous flow rate.

#### 3.5.1 CALIBRATION

The meter is supplied with a pre-calibration carried out for liquid diesel at 20 °C. Calibration is required when metering a different fluid, after disassembly, at different temperature or after significant wear. A proving container or a container of KNOWN volume will be needed for the calibration procedure. It is recommended that the container volume be at least 19 liters (5 gallons).



**ATTENTION:** the system does not allow a calibration if quantity transferred is under 5 litres.


#### Calibration procedure

- Starting from “Partial” screen, fill up the calibration jug to a known volume; it is important to do this at a flow rate of minimum 10 litres a minute without topping up else calibration could be inaccurate. Use the nozzle fully open.
- if the displayed quantity is not matching the measured quantity the meter must be calibrated.
- R** + to enter in calibration mode, display will show “CAL” blinking
- R** to confirm, will display last quantity transferred blinking in current unit of measure
- Increase or decrease that quantity using **R** or **T** buttons until correct quantity is displayed.
- Wait 10 seconds to confirm and save automatically this new calibration.



With this new calibration last transaction as well as last 5 in history will be adapted to new calibration. TOTAL and TOTAL PERIOD will remain unchanged.

### 3.5.2 INSTANTANEOUS FLOW RATE


The device is capable of showing the instantaneous flow rate during a transaction. To visualize the flow rate press and maintain  button during transaction.




### 3.5.3 SELECTING UNIT OF MEASURE

The system has 4 standard units of measure (Litre - US Gallon - Quarts & Pint) plus one “Custom” unit that can be configured by the user. To select the unit, do as follows:

1. Start from “Partial” screen, to do this do not press buttons for 10 seconds.

2. press  to enter in “unit of measure” mode, the message “Unit” will be displayed

3. press  to confirm

4. press  to scroll between unit:

“litres”- “us-gal” -“quarts” - “pints” - “custom”


5. press  to confirm.





### CUSTOM UNIT OF MEASURE

Default factory setting is decalitre (1/10 litre). This value can be configured as follows:

1.Repeat operations 1 to 5 from paragraph 3.5.3 “Selecting unit of measure”.

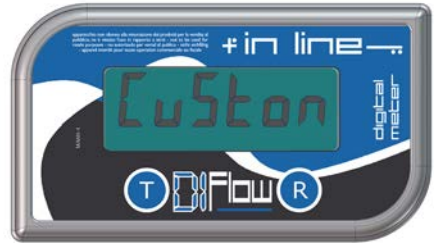
2.Once the choice of “custom” has been confirmed pressing  button, the meter will propose

the default value blinking 0.100

3.Increase or decrease this value with  and 

button until you reach the desired value taking into account that reference unit is the litre.






















4. Once the correct value is displayed wait 10 seconds, the meter will save the value and return to “Partial” screen.



### 3.5.4 BUTTONS COMBINATIONS:

Starting from “Partial” screen:  
(see table page 9)

## TASTO/ COMBINAZIONE TASTI FUNZIONE

	reset partial screen (only if transaction is not going on)
	visualize the instantaneous flow rate (only when transaction is ongoing)
	visualize first transaction in history
	visualize second transaction in history
	visualize third transaction in history
	visualize fourth transaction in history
	visualize fifth transaction in history
	visualize first transaction in history
	visualize total of first two transactions in history
	visualize total of first three transactions in history
	visualize total of first four transactions in history
	visualize total of all transactions in history
	visualize total "Total"
	visualize period total "totPer"
	reset period total "totPer"
	visualize the "Stock" situation
	modify the value in "Stock"
	visualize minimum stock level "Alert"
	modify minimum stock level "Alert"
	modify "unit of measure"
	enter in "calibration mode"

## 4. MAINTENTION & STOCK

### 4.1 TEST LCD & BATTERY CHANGE

While pressing  together for 2 seconds, the system will run a test one the LCD display



The system will then show following information:

1. Product name: "DI FLOW"
2. Firmware version: "r1.0"
3. Current unit of measure: "Unit" "Litres"
4. Current calibration factor (imp/l): "CAL" "40.00"
5. Power supply in Volt: "bat Vol" "2.79" (if value is < 2.8V else "FULL")
6. Percentage of residual battery charge: "bat Per" "52.95"(displayed only if supply tension is < 2.8 Volt)

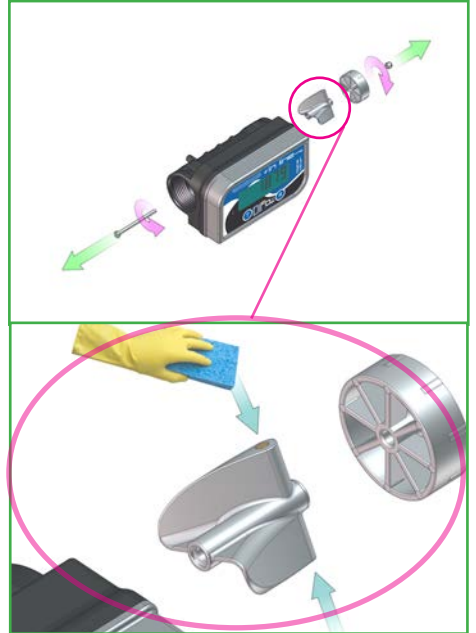
When battery power is < 0.9Volt the displays shows a battery icon (bottom left). When this happens, display brightness will be low. It will be necessary to change batteries:



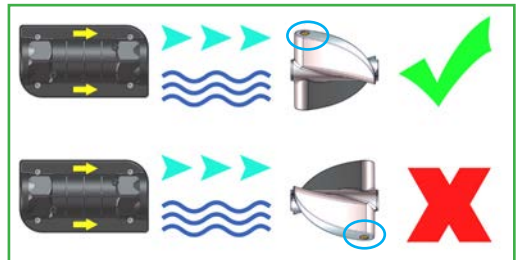
1. Remove the 4 screws on the back of the meter
2. Exchange the 2 batteries with 2 AAA 1.5V alkaline batteries
3. Reposition the body on the cover taking care of not squeezing wires.
4. Screw the 4 screws to tighten the body to the cover.

### 4.2 CLEANING THE TURBINE

The meter has 2 magnets fitted into the turbine. This magnets could attract metallic powders (if present) that could block the turbine into the meter body. For that reason, it could be necessary to periodically verify and eventually clean the magnets. To do this, unscrew the internal shaft and its bolt. Take care to reassemble the turbine in the correct mode as illustrated hereafter. .



Be careful when reassembling the turbine in the correct direction, as in the following figure:



### 4.3 STOCK

If the meter has to be positioned in stock for a while, clean it carefully. This will help to prevent eventual damages.

### 4.4 DIAGNOSTIC

PROBLEM	POSSIBLE CAUSE	SOLUTIONS
The meter is not reading	1. turbine is blocked 2. wrong installation 3. Reed switches are broken 4. turbine has been reassembled reverse	1. Disassemble & clean turbine 2. verify thanks to the arrow on the meter that it is correctly fitted on the line. 3. contact your supplier to get an Exchange board 4. rotate the turbine by 180°
The display is not switching on	1. exhausted batteries 2. bad contact on batteries	1. change batteries 2. verify batteries positioning
Inaccurate precision reading	1. flow rate too low or too high 2. wrong calibration 3. air inside system 4. dirty magnets	1. verify technical data on pump flow rate 2. calibrate 3. verify that pump is not sucking air 4. clean magnets

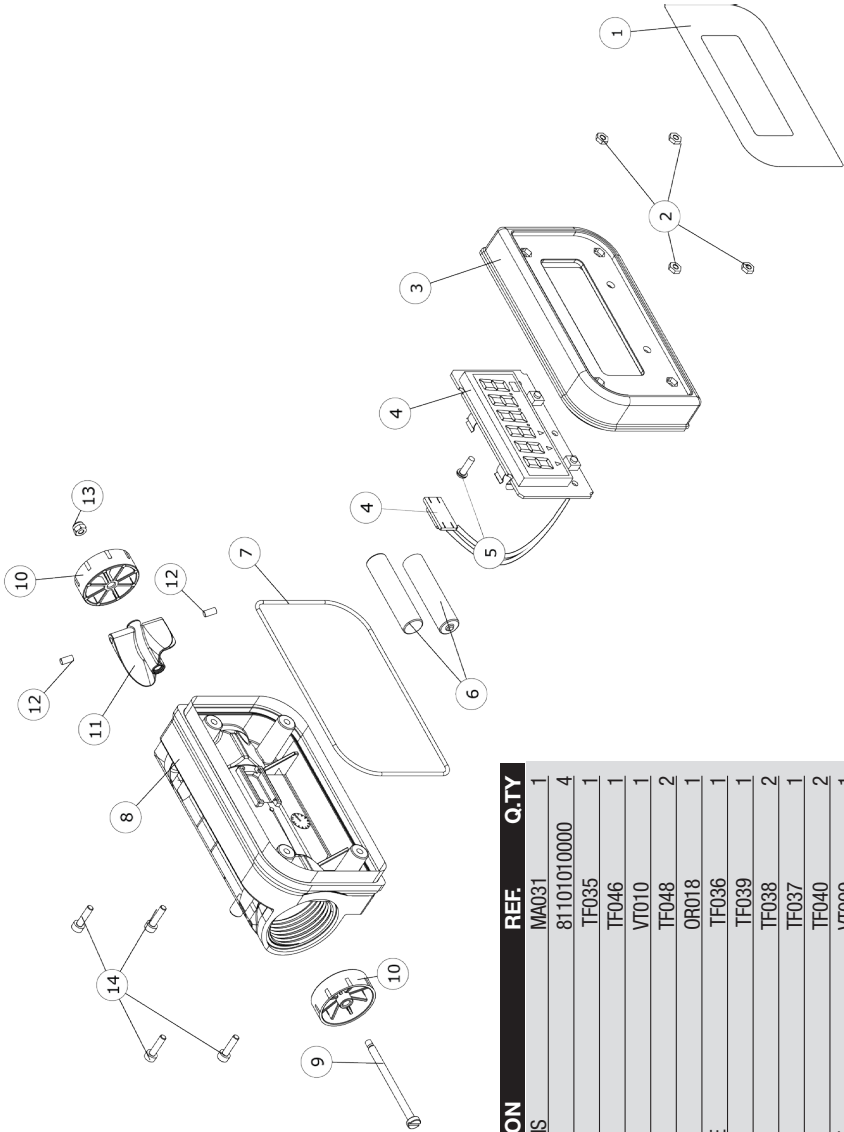
## 5 .TECHNICAL DATA BATTERY MODEL

1. Measuring system: Turbine
2. Inlet/Outlet : 1" BSP/G female
3. Measuring range: 5 - 150 lpm
4. Accuracy  $\pm 0.5\%$
5. Repeatability (typical):  $\pm 0.3\%$
6. Max Pressure of use: 3,5 bar (50 psi)
7. Temperature of use:  $-10^{\circ}\text{C} + 60^{\circ}\text{C}$
8. Display: 6 digits LCD
9. Power supply: Alkaline batteries 2x1.5V AAA
10. Impermeability rating: IP65
11. Weight: 0.25Kg

## 5 .TECHNICAL DATA DI-FLOW 12V PULSER MODEL

1. Measuring system: Turbine
2. Inlet/Outlet : 1" BSP/G female
3. Measuring range: 5 - 150 lpm
4. Accuracy  $\pm 0.5\%$
5. Repeatability (typical):  $\pm 0.3\%$
6. Max Pressure of use: 3,5 bar (50 psi)
7. Temperature of use:  $-10^{\circ}\text{C} + 60^{\circ}\text{C}$
8. Display: 6 digits LCD
9. Connection cable ant flame: 2m
10. Power supply: 12vDC - 10mAh (yellow +12, brown 0v)
11. Relay contacts: max.voltage 24vdc 500mA (white, grey)
12. Pulser output: 0-12vDC, 100 imp/unit (green)
13. Impermeability rating: IP65
14. Weight: 0.25Kg

## 6 . EXPLODED VIEW & SPARE PARTS



POS.	DESCRIPTION	REF.	Q.TY
1	STICKER WITH BUTTONS	MA031	1
2	BOLT M3	81101010000	4
3	METER COVER	TF035	1
4	ELECTRONIC PCB	TF046	1
5	SCREWS M3	VT010	1
6	BATTERY/AAA	TF048	2
7	O-RING	OR018	1
8	BODY DIFLOW – INLINE	TF036	1
9	TURBINE SHAFT	TF039	1
10	TURBINE HOLDER	TF038	2
11	TURBINE	TF037	1
12	MAGNET	TF040	2
13	SELF BLOCKING BOLT	VT009	1
14	SCREW M3 X 12	VT011	1