

assemblad®

## UNIVERSAL COUNTER RPM 111



## OPERATING MANUAL

Edition: March 2015 - Vers. 1.30  
ASSEMBLAD - Technical office - Automotive Division



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# 1 NORMS AND GENERAL WARNINGS

The RPM 111 is an RPM counter device for automotive engines, 2 and 4 strokes from 1 to 20 cylinders.

Please read carefully this manual before operating on the equipment and follow the instructions when doing any action on it, in particular when doing maintenance procedures.

Open the equipment only when explicitly indicated. Then, at the end of operations, close it restoring its original conditions, in particular the casing and the gasket, before switching on it again.

The manufacturer disclaims any responsibility for any kind of event arising from a improper use of the equipment or for a procedure not explicitly described on this manual. In any case, the responsibility is limited to the repair of the instrument.

For more detailed information please read the chapter “Warranty”.

The equipment performs measures in conformity with the Italian Ministerial Decree of law n. 628 of 23/10/1996 and following modifications as Circular n. 88/95 of 06/09/1999

## 1.1 NOTE FOR THE USERS



The symbol “crossed” urban trash-bin is stamped on the equipment or on its box and it means that the product must be disposed into the appropriate collecting facility at the end of its life.

The disposal of the equipment will be managed by the producer. The user shall contact the producer and follow the method that has been implemented for collecting the appliance at the end of its life.

A correct waste disposal of the appliance and its subsequent treatment contributes to avoid serious environmental and health damages and allow the recycling of materials used into the equipment.

An incorrect waste disposal of the product is subject to administrative sanctions.

In accordance with art. 13 – D.L. 25 July 2005 – n. 151 for the Actuation of European Directives 2002/95/CE, 2002/96/CE and 2003/108/CE, related to reduction of dangerous substances in the electric appliance and to the waste disposal (RoHS RAEE).

## 2 TECHNICAL DATA

### MEASUREMENT RANGE

RPM	300	÷	9999 giri/1'	Res.	1 rpm / 1'
Oil Temperature	0	÷	150 °C	Res.	1 °C

### OPERATING FEATURES

Power supply	- from 10 to 28 Volt DC (vehicle battery)
Operation temperature	- from 0 to 40°C
Consumption	- 0,5 A DC
Size	- 100 x 220 x 40 mm
Weight	- 0,4 Kg circa

### DISPLAY - LED - KEYBOARD

- N. 1 LCD 2 x 16 characters
- N. 2 LED green and red color.
- N. 6 Keys.

### CONNECTIONS

- USB interface
- Bluetooth interface

### 3 DESCRIPTION

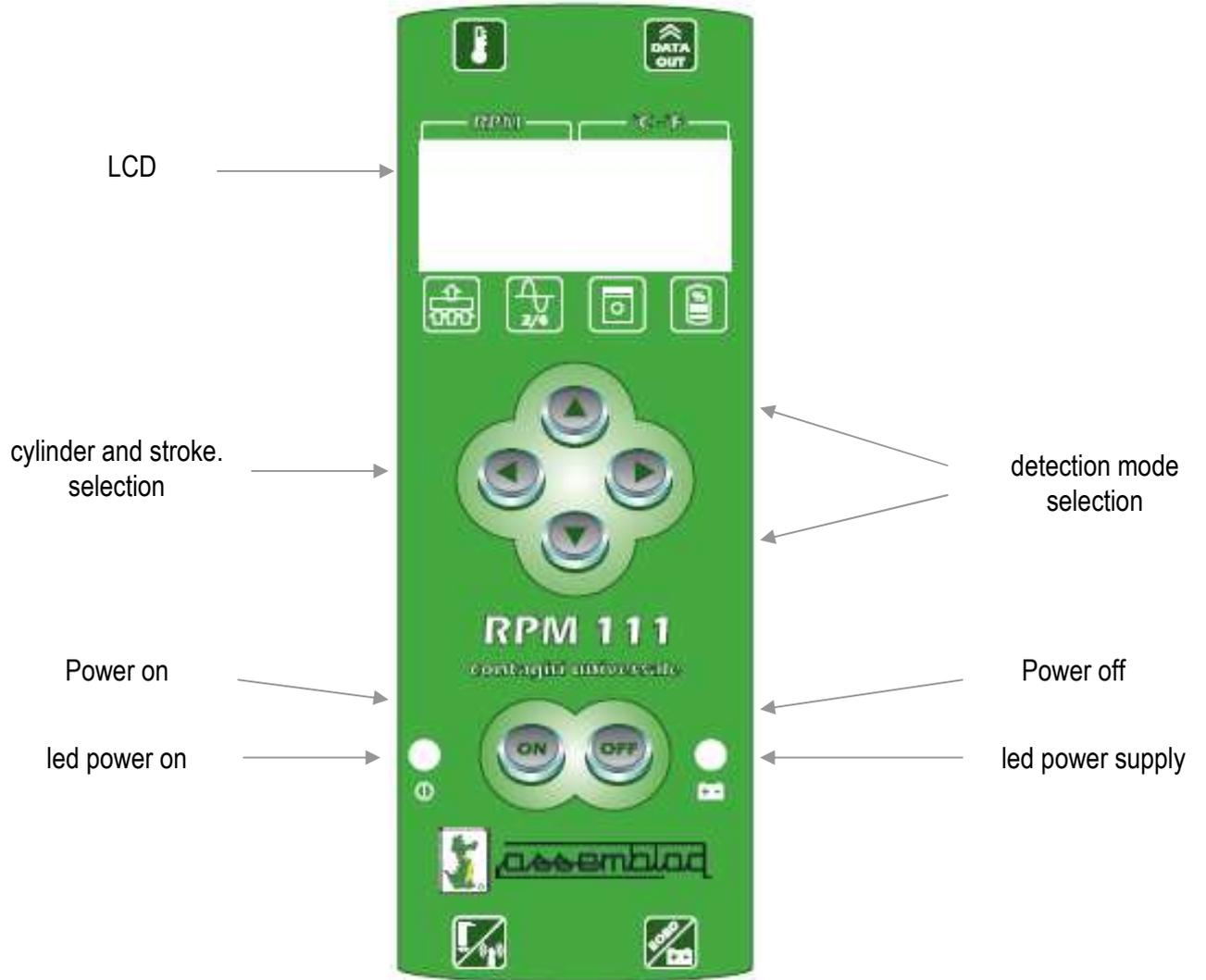
#### 3.1 UPPER PANEL



#### 3.2 LOWER PANEL



### 3.3 FRONT PANEL



## 3.4 ACCESSORIES

### STANDARD ACCESSORIES

- 1) Magnetic vibration sensor
- 2) Battery cable
- 3) USB A – mini B cable

### OPZIONAL ACCESSORIES

- 1) E.OBD interface for RPM 111
- 2) Oil temperature probe
- 3) Radio antenna sensor (racket)
- 4) Power supply 230 Vac for RPM 111
- 5) Bluetooth interface for master/slave connection

## 4 INSTALLATION

The installation is very simple and can be executed by the operator.

### 4.1 TRANSPORT AND INSTALLATION

Due to the reduced dimensions of instrument, the transport is executed manually; pay attention particularly to avoid any hits and falls: the eventual damages deriving from these causes are not covered by the guarantee.

It is suggested to conserve the packing for possible shipments of the apparatus for periodic calibration, technical attendance, etc.

Connect cables in equipment to the respective connectors on the instrument.

### 4.2 POWER UP

The RPM 111 has an internal rechargeable battery, this allow to perform measurement without external power supply, it is necessary to connect only the required sensors.

The battery life duration is variable under a lot of conditions, status of battery, connected sensors, bluetooth connection and temperature, with a fully charged and good battery, in detection mode it is about 1 hour.

To recharge the internal battery connect RPM111 to an external 12V battery with battery cable or its power supply adapter or to an E-OBD connector, the red led on indicates the presence of external power-on and battery charged is operative.

For best performance it is preferred to operate with an external power supply.

When operate with internal battery, the RPM battery detection is not active.

## 5 OPERATION

### 5.1 WARNINGS AND PRECAUTIONS

- Verify that the voltage of the battery of the vehicle is that one prescribed in the technical characteristics.
- Don't let the instrument at the direct sunbeam, verify that ambient temperature is compliant with instrument data.
- Do not put the magnetic probe in particularly warm places of the motor (es. exhaust manifolds)
- Do not remove the systems of protection and/or emergency from the equipment, do not bring modifications to the aim of increase the use or the performances.
- Do not leave for too long time the instruments operative; turn off the instrument if an immediate use is not previewed.
- Pay attention to the DANGER or ATTENTION when operating on the motor .
- Protect face, hands and feet with adapted apparel, to avoid contacts with the superficial warmth which candles, radiators, pipes of the cooling system. The catalytic stock-pots catch up the highest temperatures, can cause burn or fires. Do not smoke and do not use free flames when you work on the motor.
- In the vehicles the cooling fan is independently active also when the engine is off: be careful when it is operating near the fan.
- Do not pull sensors or interfaces from its cables but use their connectors, make attention to do not pull the wires. The disconnection of wires is not covered by warranty.
- Do not use the oil temperature sensor in water, flame or other but only into the motor oil. The wrong use is not covered by warranty.
- The complete discharge of the battery reduces its capacity and can damage it.

### 5.2 POWER UP OF THE INSTRUMENT

Turn on pushing the key ON for about one second. Turn off pushing the key OFF, this key is active after the start-up messages.

After measurement, turn off the instrument to don't discharge the battery.

After power on the instrument, on the LCD is reported the message for search the connection with an USB port, if it is found there will be the message that this port is configured, only in this condition the communication of data and the updated via USB is working.

If the communication of data is made via bluetooth, the USB communication is not used.

### 5.3 STANDARD MEASURE

Set the engine at minimum rate, connect the sensor or cable, turn on RPM111, select the type of motor, number of cylinders and type of detection.

If the reading is wrong or not stable, search a new sensor position.

If the reading is stable, before to make the measurement, perform a slow acceleration and deceleration, verify that the reading is regular in all the range.

#### Magnetic sensor

On the motor block search the point with maximum vibration, apply the sensor to a planar metallic surface, if there is not a place to have sensor stability, apply a metallic tweezer and apply over it the magnetic sensor, after turn on the RPM 111 and select VIB. If the reading is not stable, move the sensor in a point where it will have a more regular vibration.

#### Battery

Connect the tweezers of battery cable to the vehicle battery, turn on the vehicle lights, turn on the RPM 111 and select BAT.

#### Antenna

Turn on the RPM 111, approach the planar surface of the antenna sensor (racket) perpendicular to the cables of vehicle spark plugs, the detection of the radio noise is marked with led flashing, to have a sound indication use an earphone. Verify the instrument reading. If the antenna is too near or too far away to the cables, the reading will be wrong and unstable.

#### E-OBD interface

Connect the interface to the vehicle and to the RPM 111, verify the red led on, turn on the instrument and select the connection with EOBD, if the connection is not detected try to turn off the instrument and after repeat the turn on and selection.

When the connection with EOBD interface is active, the instrument is powered from the vehicle and the inside battery is recharged.

#### N.B.

The initial procedure must be executed with engine at minimum rate.

If the magnetic sensor is not used it is suggested to disconnect it from the instrument.

After measurement, turn off the instrument to don't discharge the battery.

## 6 LCD AND KEYBOARD

### 6.1 LCD DISPLAY

When the instrument is powered on, the LCD shows if the USB connection is active, after it shows the model, name and version of the firmware, after it shows the measure display, an example is report below

R: 870	T: 83
VIB 4T	5 95

In the first line there are reported the rpm and temperature values detected.

In the second line there are reported the detection mode, fuel type, number of cylinders and battery level indication.

If rpm is not detected it is showed the symbol "---"

If the temperature is not detected it is showed the symbol "--". When it is used the oil probe, the temperature showed is the one detected from the sensor, if it is connected to the E-OBD interface the temperature is the motor temperature received from the vehicle.

The detection mode can be one of the following:

VIB = vibration sensor

BAT – battery detection

ANT – antenna radio noise detection

IND – Induction clamp

EOBD – data received from E-OBD interface

### 6.2 KEYS

To select the detection mode press the key UP or DOWN

To change the fuel type or number of cylinders press the RIGHT or LEFT key, in front of the value to change will be showed the symbol ">", change the value with the keys UP or DOWN, exit with its selection.

Be careful to the use of the selection RESTORE, this delete all instrument data and it restores the default ones.

## 8 WARRANTY

This device was built with care and carefully inspected before it left the factory. It is guaranteed for one year from the date of purchase by the final user.

The warranty covers all defects in materials.

The warranty does not cover: wiring, probes, sensors and the accessories. These items are subject to wear and their efficiency depends on how they are handled.

The warranty does not cover damage caused by accidents, impact or dropping the instrument, or by negligence, improper use, non-compliance with the instructions and improper storage.

If the device has such defects as to require technical service, you must return it to Assemblad or an authorized service centre. Shipping charges shall be covered by the customer.

ASSEMBLAD, even supplying support on demand for the first installation of the equipment, disclaims any liability for damages and injuries caused, even to third parties, by an improper installation, maintenance, defective or unsafe electrical connections. Further, ASSEMBLAD disclaims any claim for damages from anyone due to a miss utilization of the equipment for any reason.

The warranty shall immediately become invalid if the device shows any signs of tampering.

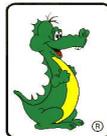
The exclusive court of jurisdiction for any disputes arising from the application and/or interpretation of this warranty is the Court of Florence (Italy).

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