



5 Step Fully Automatic

*Intelligent*

**BATTERY/CHARGER**

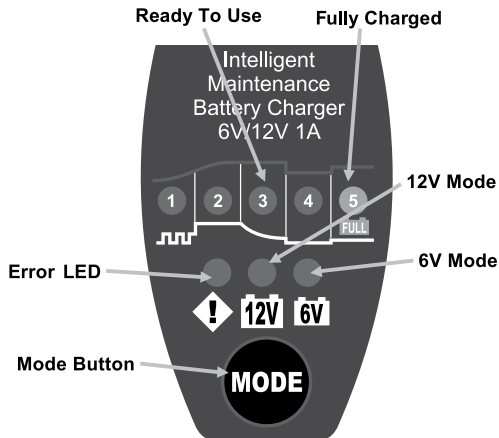
»» 6V/12V 1A ««

USER'S MANUAL

**Charges & Maintains**

Flooded (WET), MF, VRLA, AGM, GEL & Calcium batteries





### For Your Safety

This manual contains important safety and operating instructions.

Read this manual carefully before using the charger for the first time and keep the manual in a safe place for future reference.

## Safety Information

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- NL1 5 Step Intelligent Battery Charger is designed for charging 12V 1.2-20Ah Lead-Acid rechargeable batteries. Flooded (WET), MF, VRLA, AGM, GEL & Calcium. Do not use for any other purpose.

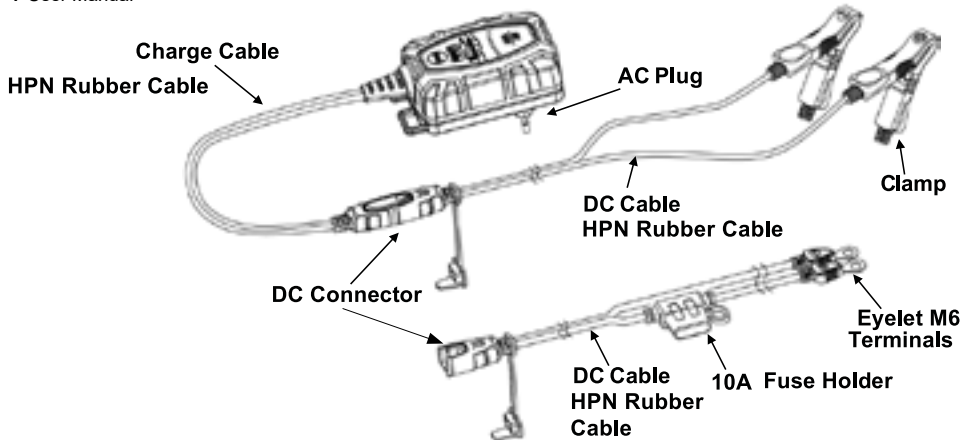
### **WARNING! DO NOT ATTEMPT TO CHARGE A NON-RECHARGEABLE BATTERY (PRIMARY CELLS)**

- Do not charge a 6V battery using 12V mode
- Before charging make sure that the AC input power is as per rated specifications.
- Do not use the charger with a damaged cable. It must be replaced by the manufacturer, its service agent or similarly qualified technician in order to ensure safety.
- Never charge a damaged battery.
- Never charge a frozen battery.
- Never place charger above the battery being charged. (Gasses from the battery will corrode/damage the charger).
- Do not cover the charger while charging.
- During charging place the battery in a well ventilated area.
- While charging always use safety glasses, gloves, protective clothing and keep your face away from the battery.
- **Explosion hazard!** A battery being charged could emit explosive gasses. Avoid smoking or open sparks or flames in the vicinity of the battery. Explosive and flammable substances such as fuel or solvents should not be kept in the vicinity of the charger or the battery.
- **Danger of chemical burns!** Battery acid is highly corrosive. If your skin or eyes come into contact with acid, immediately rinse the affected part of the body with water and seek medical advice.
- All batteries eventually fail. If that happens during charging, the charger's advance control system will detect it. There may be some rare errors that still exist in the battery, so do not leave charging unattended for a long period of time.
- Normally, a battery is grounded either on negative or positive terminal to the vehicle's chassis. The charger's DC battery clamps are to be connected to the battery terminal **not connected to the chassis first**. The second connection is then to be made to the other battery terminal. The battery charger is then connected to the AC power supply.
- After charging, first disconnect the battery charger from the AC mains before removing the battery connections.
- **NB: Do not leave the charger connected to the battery without AC power, as this will have a "back drain" and flatten the battery over time.**
- **Children should not play with this appliance.** Adult supervision is required for children and people with reduced physical, sensory or mental capabilities or lack of experience and knowledge. They must be under adult instruction concerning safe use of this appliance and understanding of the hazards involved. *Cleaning and user maintenance should not be made by children without adult supervision.*

## Kit Includes



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- 1 **NL1 5 Step Intelligent Battery Charger**
- 2 Quick contact battery leads with clamps
- 3 Quick contact battery leads with eyelet terminals ( $\varnothing$  6.3mm) with in-line battery protection fuse (10A) for permanent attachment to the battery posts to allow quick connection/disconnection using a snap-connector.
- 4 User Manual



## Specifications

### Charging Modes

SYMBOL	DESCRIPTION
<b>Mode 6V/1A</b>  	This mode is normally used for WET, MF, VRLA, AGM, GEL & Calcium batteries
<b>Mode 12V/1A</b>  	This mode is normally used for WET, MF, VRLA, AGM, GEL & Calcium batteries

### Bulk Charging Time

Battery Size (Ah)	For ± 80% Charge (hours)
1.2	2
6	7
8	9
12	14
20	23

### Technical Data

Input Voltage AC	220V-240Vac - 50/60Hz	
Input Current	0.18A RMS Max	
Charge Current	1A max	
Output Power	14.4W	
Stand-By Power	< 1W	
Maximum Efficiency	> 70%	
Battery Types	6V & 12V Lead acid (Flooded WET, MF, VRLA, AGM, GEL & Calcium)	
Battery Capacity	6Volt Mode: 1.2Ah - 20Ah	12Volt Mode: 1.2Ah - 20Ah
Minimum Battery Voltage	>2.5V for 6V battery mode	>7.5V for 12V battery mode
* Back Current Drain	<10 mA	
Storage Temperature	-25°C to 70°C	
Operation Temperature	0°C to +40°C	
Safety Class	Class II	
Type of Charger	5-step, fully automatic charger	
Housing Protection	IP60 (dust proof) for indoor use only	
Noise Level	<50dB (Tested from a distance of 50cm)	
Weight	0.35 kg	
Dimensions (L x W x H)	109.4 x 65.0 x 38.5mm	

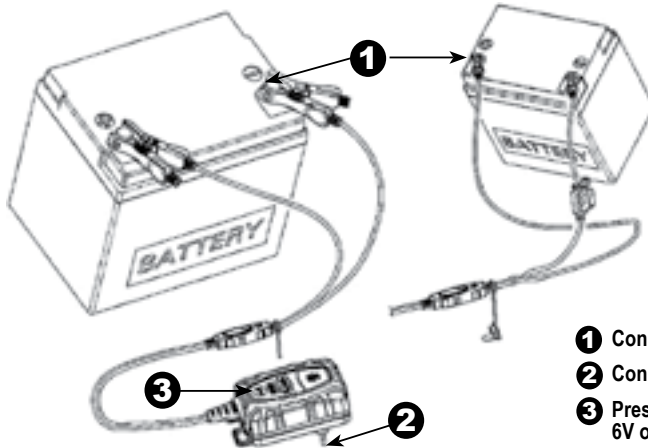
\*The NL1 Battery Charger has extremely low back current drain.  
 (Back current drain is the amount of current drawn by the charger from the battery, when the charger is connected to the battery without the **AC** power cord connected.)

## Charging Operation

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Charging using battery clamps

Charging using M6 eyelets



AC Power supply

- 1 Connect clamps or ring terminals to battery
- 2 Connect the charger to AC outlet
- 3 Press MODE button for 3 seconds to select 6V or 12V charging option

**6V** Batteries < 20Ah

**12V** Batteries < 20Ah

## Charging Operation

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### Charging of a battery not connected to a vehicle.

- ❶ a) Before connecting or disconnecting the battery leads, the AC power cord should be removed from the mains.  
b) Connect the red clamp or M6 eyelet terminal to the positive (+) terminal of the battery and the black clamp or eyelet terminal to the negative (-) terminal.
- ❷ **Connect charger to the mains.**
- ❸ **Select charging mode (6V or 12V).**

### Charging of a permanently installed battery in a vehicle.

- a) Before connecting or disconnecting the battery leads, the power cord should be removed from the mains.
- b) Check polarity of the battery terminals. A positive battery terminal (+) usually has a larger diameter than a negative (-) battery terminal.
- c) Identify the terminal of the battery which is connected to the chassis (earth). Normally the negative terminal is connected to the chassis.
- d) In some cases the battery is installed in a vehicle in such a manner as to be inaccessible. The user would then have to use the vehicle chassis as a connection point. The positive charge point is normally clearly identified with a red protection cap.  
Alternatively, one can purchase an extension connector to reach the inaccessible battery (see page 10)

### Charging of a negatively earthed battery:

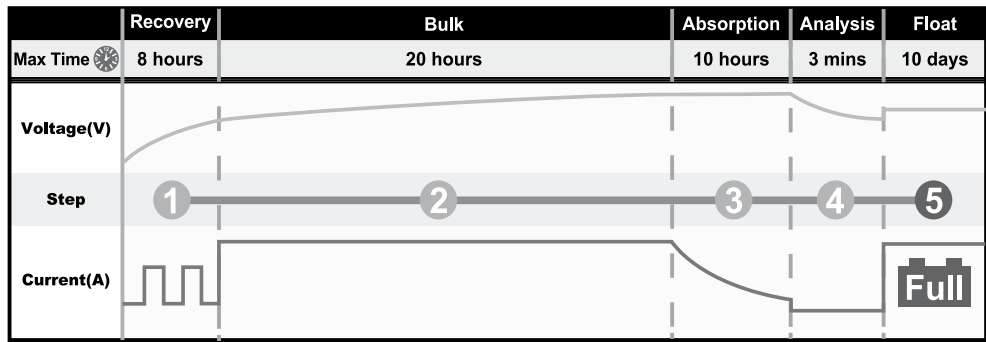
- Connect the red clamp or eyelet terminal (+) to the identified positive (+) terminal of the battery and the black clamp or eyelet terminal (-) to the vehicle chassis.
- Make sure the black clamp or eyelet terminal connection has no contact with the fuel line.

### Charging of a positively earthed battery:

- Connect the black clamp or eyelet terminal (-) to the negative (-) pole of the battery and the red clamp or eyelet terminal (+) to the vehicle chassis.
- Make sure the red clamp or terminal (+) pole connection has no contact with the fuel line or the battery.

## Charging Operation




### NL1 Charger Performs a 5-step Fully Automatic Charging Cycle



- 1 Recovery:** A deeply discharged battery of over 2.5V can be recovered and charged with pulse charging of a small current.
- 2 Bulk:** 80% of energy is returned in this phase with maximum charging current.
- 3 Absorption:** With use of declining current technology charging up to almost 100% is achieved.
- 4 Analysis:** Checks status of charge. If battery does not retain energy, it must be replaced.
- 5 Float:** Battery is fully charged and ready to use. The battery is maintained at maximum level by applying low current charge.



## Trouble Shooting

Problem	Indication	Possible Cause	Solution
Charger does not work	Indicator lights are not on	<ul style="list-style-type: none"> <li>a) Charger is not plugged in</li> <li>b) Poor electrical connection</li> <li>c) AC outlet is dead</li> </ul>	<ul style="list-style-type: none"> <li>a) Plug in</li> <li>b) Check AC connections and make sure mains is switched on</li> <li>c) Check receptacle</li> </ul>
Charger has no DC output		<ul style="list-style-type: none"> <li>a) Battery is connected with reverse polarity poles</li> </ul>	<ul style="list-style-type: none"> <li>a) Check DC connection between charger and battery and make sure they are not short circuited</li> </ul>
No charging current	 "Flashing"	<ul style="list-style-type: none"> <li>a) Battery may be defective / excessive current draw</li> <li>b) Battery may be severely sulfated</li> <li>c) Charging is interrupted in Phase 1</li> <li>d) Charging is interrupted in Phase 4</li> </ul>	<ul style="list-style-type: none"> <li>a) Dead battery, it should be replaced</li> <li>b) If battery cannot be de-sulfated, it must be replaced</li> <li>c) Battery cannot accept charge, it must be replaced</li> <li>d) Battery cannot retain charge, it must be replaced</li> </ul>
No charging Phases	 "Flashing"	<ul style="list-style-type: none"> <li>a) Charger is not connected to battery for over 2 minutes</li> <li>b) Poor contact from charger to battery</li> <li>c) MODE button is not pressed</li> </ul>	<ul style="list-style-type: none"> <li>a) Charger is in energy save mode</li> <li>b) Check if connectors are not greasy, corroded and making a poor connection, as well as loose or damaged connections</li> <li>c) Select MODE</li> </ul>

## Additional Accessories

Optional Connectors to accommodate different batteries with M6, M8 or M10 eyelets as well as to reach those “inaccessible areas” in some vehicles.



**BMS-61004**



**BMS-61005**



**BMS-61008**



**BMS-61101**

**BMS-61004** — Snap-on connector (female) with in-line fuse and M 6 eyelet terminals (1000mm)

**BMS-61005** — Snap-on connector (female) with in-line fuse and M 8 eyelet terminals ( 450mm)

**BMS-61008** — Snap-on connector (female) with in-line fuse and M10 eyelet terminals (1000mm)

**BMS-61101** — Panel Mount Housing to suit (female) snap-on connector. A special Panel Mount Housing/bracket has been developed to provide for an easy and secure fitment for the snap-on connector.



## Declaration of Compliance

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### EU Statement:

National Luna declares that NL6V/12V 1A charger (NL1) complies with the essential requirements and other relevant provisions of Directive 2014/30/EU.

A copy of the Declaration of conformatiy is available on request.

Tested and approved by



and conforms to:

EN 60335-1

EN 61000-3-2

EN 60335-2-29

EN 61000-3-3

EN 55014-1

EN 62233:2008

EN 55014-2

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