

Manufactured and Packaged for

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User Manual

For Lead Acid Batteries

12V
Battery
Charger
HU6560




4 Banks
4x4 Amp

Charging Current
16 Amp
(Total)

Battery Capacity
1.2-120Ah

5 Stage
Charging

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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.

Product Features

Congratulations on your purchase of the **HULK Professional 4 Bank Battery Charger** is designed for charging simultaneously and independently up to 4x12 Volt lead-acid rechargeable batteries, widely used in motorbikes, cars etc. The **HULK Professional Battery Charger** also charges batteries in cold conditions. Using state-of-the art technology, the charger enables the recharging of the batteries to almost 100% of their original capacity. It recovers slightly sulphated batteries. It provides trickle charge and maintenance charging which increases battery life and gives superb performance. It also features low back current drain and low ripple.

Product Safety Features

- Electronically safe against user errors. The charger will not damage vehicle electronics. It is totally safe for permanent connection and maintenance of irregularly or seasonally used batteries even while the battery is still connected to the vehicle. It provides optimal condition without damage. No risk of over-charging!
- Full protection against wrong connection and against short circuit ensuring safe charging operation.
- Provided with Spark protection mechanism. The charger will not begin operation upon connection to the battery unless a charging mode has been selected. This embedded feature eliminates the possibility of a spark that often appears during connections.
- Fully controlled by internal MCU (Micro-Computer-Unit), which makes it faster, powerful, more reliable and smarter. It detects the state of charge of the battery and initiates charging.
- Dust and splash proof (IP64), approved for outdoor use.
- Double insulated.


Overheating Protection

HULK Professional Battery Charger charger is protected by NTC control. During the charging process, if the charger becomes too hot or due to extreme ambient temperature, the power output is automatically reduced to protect itself from damage. The charger continues to trickle charge and charger increases power automatically when the ambient temperature drops.

Safety Information

- **HULK Professional Battery Charger** charger is designed for charging 12V 1.2-120Ah Lead-Acid rechargeable batteries. Do not use it to supply power to low voltage electrical system other than designated applications. Do not use it for any other purposes. It may cause an explosion.

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

- Before charging make sure the input power is as per rated specifications, otherwise the charging performance may be seriously affected.
- **Do not** use the battery charger for charging dry-cell batteries. They may burst and cause injury to persons and damage to property.
- Never charge a frozen battery.
- Never charge a damaged battery.
- **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.
- **Do not** operate the charger if it appears to be damaged or malfunctioning. Take it to qualified person for inspection and repair.
- **Do not** disassemble charger, the incorrect reassembly may result in electric shock or fire. Locate charger as far away from battery as DC cable permit.
- Never place the charger above battery being charged, gases from battery will corrode and damage charger.
- While charging always use safety glasses, gloves, protective clothing and keep your face away from the battery.
- Remove metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to melt such metallic objects, causing a severe burn.
- 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.
- Disconnect the supply before making or breaking connections to the battery. While connecting the charger to the battery, maintain correct polarity connection and avoid short-circuiting. Connect the appropriate DC clip to the battery post which is not connected to the automobile chassis. *(The battery terminal not connected to the chassis has to be connected first.)* Connect the other DC connector to the chassis, away from the battery and fuel line. The connector to be fixed to the positive pole shall be coloured red and that to be connected to the negative pole shall be coloured black. Then connect the battery charger to the supply mains.

- Do not cover the charger while charging.
- Do not touch the battery clips together when charger is connected with mains.
- Charging must be ceased immediately if battery is found to be too hot or leaks out liquid during charging.
- In case of malfunction or damage, immediately disconnect the charger from the mains.
- Do not use vehicle when charging permanently installed batteries.
- During charging the battery must be placed in a well ventilated area.
- 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 excessive water and seek medical advice.
- The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, far from the battery and fuel line. The battery charger is then to be connected to the power supply.
- After charging, disconnect the battery charger from supply mains. Remove the chassis connection and the battery connection, respectively. This will reduce back drain current.
- This appliance is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Keep away from children.
- Ensure that charger switches to maintenance charge mode, before it is left unattended and connected for long time.

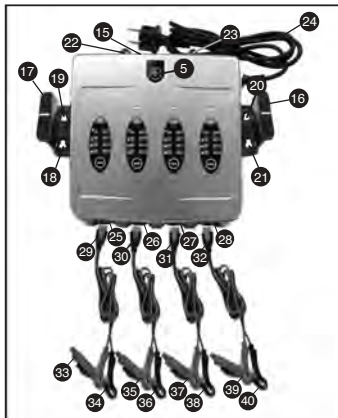
Locate Charger

- Locate the charger as far away from battery as the DC cord permits.
- While charging do not place the charger directly above or below the battery. Gases or fluids from the battery may corrode and damage the charger.
- Never allow battery acid to drip on the charger

Contents

- 1) **HULK Professional Battery Charger**
- 2) 4 - Sets Quick connect battery leads with clamps
- 3) 1 - Pair Mounting brackets
- 4) 6 pcs of stainless steel Ø8 x 25mm flat Phillips countersunk head screws and wall plug set
- 5) User Manual

Equipment Description



Component Description:

Indication	Description
15	Charger
16 17	Detachable mounting brackets
18 19 20 21 22 23	Mounting holes
24	Mains cable with power plug
25 26 27 28	Built-in female connectors
29 30 31 32	Detachable lockable male connectors
33 35 37 39	“+” Pole quick clamp (red)
34 36 38 40	“-” Pole quick clamp (black)

Fig. 1: Equipment Description

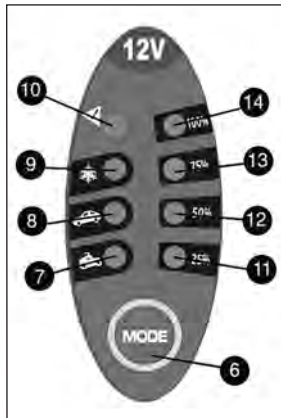


Fig.2: Control Panel

Indication:

Indication	Symbol	Description
5		Red LED ON for “ POWER ” In case of open circuit or short circuit or reverse connection, LED lights up
6		Blue light ON for “ Mode ” selection
7		Red LED displays “ Mode1 ” (14.4V/0.8A)
8		Red LED displays “ Mode 2 ” (14.4V/4.0A)
9		Red LED displays “ Mode 3 ” (14.7V/4.0A)
10		Red LED displays “ Incorrect polarity ”
11		Red LED flashes “ Charging in progress ” (Below 25%)
11 12		Red LED 11 ON, Red LED 12 flashes “ Charging in progress ” (Between 25% to 50%)
11 12 13		Red LEDs 11, 12 ON, Red LED 13 flashes “ Charging in progress ” (Between 50% to 75%)
11 12 13 14		Red LEDs 11, 12, 13 ON, Green LED 14 flashes “ Charging in progress ” (Between 75% to 100%)
11 12 13 14		Red LEDs 11, 12, 13 ON, Green LED 14 ON “Charging completed”(100%)

Charging Batteries

- Charging of a battery permanently installed in a vehicle.
 - Before connecting or disconnecting the battery leads, the power cord should be removed from the mains.
 - Check polarity of the battery post. A positive (“+”) battery post usually has a larger diameter than a negative (“-”) post.
 - Identify the pole of the battery that is connected to the chassis (earth). Normally the negative terminal is connected to the chassis.
 - Charging of negative earthed battery:
 - Connect the red wire 33 (“+”) to the positive (“+”) pole of the battery and the black wire 34 (“-”) to the vehicle chassis or non moving engine part.
 - Charging of positive earthed battery:
 - Connect the black wire 34 (“-”) to the negative (“-”) pole of the battery and the red wire 33 (“+”) to the vehicle chassis or non moving engine part.
- Charging of a battery not connected to a vehicle
 - Before connecting or disconnecting the battery leads, the power cord should be removed from the mains.
 - Connect the red wire 33 (“+”) to the positive (“+”) pole of the battery and the black wire 34 (“-”) to the negative (“-”) pole. (For multi-Bank charging, connect the red wire 33, 35, 37, 39 (“+”) to the positive (“+”) pole of the battery and the black wire 34, 36, 38, 40 (“-”) to the negative (“-”) pole)

DC Output Cable Wiring Diagrams

HULK Professional Battery Charger. Each DC jacketed bank cable must be properly connected to independent 12VDC battery and observe the polarity of all connections. Series connection wire must be removed during charging. Please refer to our typical wiring diagram.

16 Amp For 4 x 12 Volt DC Batteries



* Series connections must be removed during charging

Wiring diagrams of **HULK Professional Battery Charger** Quadruple output charger for 4 batteries

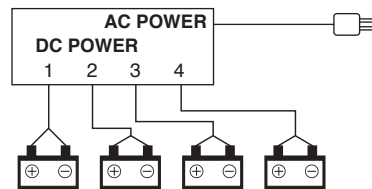


Fig 3: Four 12VDC Battery configuration

Select Charging Mode

Power ON/OFF

Plug the AC lead to a 220~240VAC outlet. By pressing On/Off Power button 5 power will turn on and it will be indicated by the red illumination of the mode button 6. Power will turn off if power button 5 is pressed again. Red LED will turn off.

To charge various batteries at different ambient temperature you can select the correct voltage charging mode by pushing the selection button 6 of charging station(s) 1 to 4 until the light for the correct voltage is lit.

Charging stations 1 to 4 can be used independently or simultaneously. Selection button(s) 6 will illuminate blue.

Reset / Deleting Settings

After connection to the power supply and turning ON the switch 5, the charger automatically resets itself to basic settings and remains in low power mode unless further action is executed by the user.

Switching over between Modes 1, 2 and 3

By repeatedly pressing the selection button 6 it displays the charging modes in the following order-

MODE 1 , **MODE 2** , **MODE 3** and repeats this cycle.

If you press 6, charging mode automatically switches to the next operation mode and begins functioning in that specific mode. However after a full charge, if the battery is not disconnected from the charger, it remains in float charge mode, even if user switches it over to another mode. This protects battery from being damaged.

MODE 1 (14.4/0.8A)

This mode is suitable for charging small batteries with a capacity below 14Ah.

MODE 2 (14.4/4.0A)

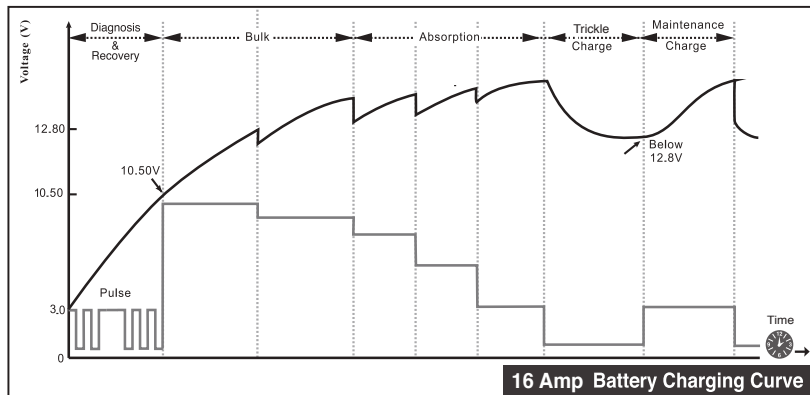
This mode is mainly applied for charging large batteries with a capacity over 14Ah in normal conditions.

MODE 3 (14.7/4.0A)

This mode is mainly applied for charging large batteries with a capacity over 14Ah in cold conditions or charging several AGM batteries with capacity of more than 14Ah.

Charging Phases

HULK Professional Battery Charger charger performs 5-step fully automatic charging cycle.



1) Diagnosis & Recovery:

When a charging instruction is given to the charger, the unique diagnostic function automatically checks status of battery (detects voltage). If a deeply discharged battery's voltage is over $3.0V \pm 0.5V$ the charger begins pulse charging with small current to recover it, which terminates when voltage reaches to $10.5V \pm 0.5V$. If battery voltage is over $10.5V \pm 0.5V$ the charger skips pulse charging and switches over to pre-selected charging mode.

2) Bulk :

80% of energy is returned in this phase of charging. Here charger performs in two-stages-

- a) **High Rate Charging:** Charger delivers constant current of 4.0A until the voltage reaches to 12.8V
- b) **Medium Rate Charging:** Charger delivers reduced constant current until the voltage reaches to 14.1V at which point the charger switches to Absorption phase.

Bulk Charging Time

Battery size (Ah)	Mode	For About 80% Charge (hours)
2		2
8		8
20		4.5
60		14
100		23
120		28

3) Absorption:

A constant low charging current is applied at 0.8A to raise voltage from 14.1V to 14.4V. In this phase complete charging up to almost 100% is achieved. The Charger switches to float charge phase after sensing that the battery is fully charged.




4) Trickle Charge:

The battery is fully charged and ready to use. The battery will signal to the charger and will only take enough current to sustain small loads such as alarms etc or current leaks in the vehicle wiring circuit. Very low current of 200mA is given to the battery. When voltage drops below 12.8V, the monitoring circuit senses that battery needs more current to maintain its charge than available in float charge phase. The Charger switches to the Maintenance Charge phase.

5) Maintenance Charge:

If the battery is loaded and/or terminal voltage falls below 12.8V, the charger starts a maintenance charging pulse at constant 0.8A until voltage reaches 14.4V. The maintenance charging is discontinued. Cycle of trickle charging and maintenance charging is repeated indefinitely to keep battery in good condition when it is not in use and enables charger to be left connected indefinitely.

Trouble Shooting

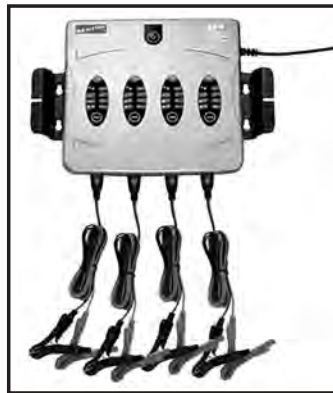
Problem	Indication	Possible Cause	Solution
Charger does not work	Indicator lights are not on	a) Charger is not plugged in b) Poor electrical connection c) AC outlet is dead	a) plug in b) Check AC connections and make sure mains are switched on c) Check receptacle
Charger has no DC output	 10 Or  5	a) Battery is connected with reverse polarity poles b) Output is short circuited c) Poor contact from charger to battery d) MODE button is not pressed	a) Check DC connection between charger and battery and make sure they are not short circuited b) Check clamps or ring connectors are connected to the correct polarity c) Check connectors are not greasy or corroded and making a clean connection and there are no loose or damaged connections d) Press the MODE button
No charging current	 5	a) Battery may be defective/ excessive current draw b) Battery may be severely sulfated	a) Check battery condition b) If battery can not be de-sulfated, it must be replaced
Excessive charging time	All LED indicators work normally	a) Wrong battery type selected b) Battery capacity too large	a) Check battery type selection b) Battery can not be charged and must be replaced

Maintenance

The **HULK Professional Battery Charger** does not need any specific maintenance. Only install, maintain or service this charger when it is disconnected from the mains. It may be cleaned with a dry cloth or soft tissue. Do not use any solvents or other cleaning agents.

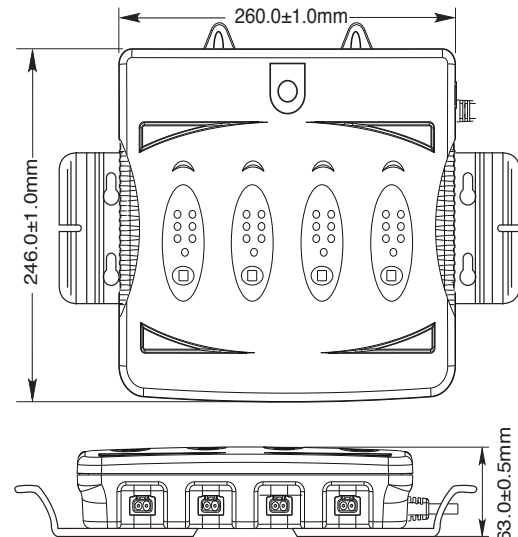
Equipment

The **HULK Professional Battery Charger** is supplied with four detachable and lockable snap connected, colour coded lead sets with clamps for bench charging.



Mounting & Product dimensions

The charger is easy to mount using screws. The charger is supplied with a pair of bracket containing 4 holes. Two additional built-in hangers are also provided.



Technical Data

MODEL	16 Amp
Input Voltage AC	220-240VAC, 50/60Hz
Output Voltage	Nominal: 12V
Starting Current	<25 A (No AC input)
Input Current	2.4A RMS max
Charging Voltage	14.4V±0.25V or 14.7V±0.25V
Charging Current	16 Amp (4.0A±10% or 0.8A±10% per Bank)
Back Current Drain*	5 mA
Ripple**	Max 150mV
Ambient Temperature	0°C to 40°C, Reduced output power at higher temperature
Type of Charger	Five step, fully automatic, switch mode with maintenance charging
Type of Batteries	12V Lead-acid rechargeable batteries (WET, MF,AGM and GEL)
Bank Configuration	Quadruple
Number of Batteries can be charged simultaneously	4
Battery Capacity	1.2-120Ah
Housing Protection	IP64 (Dust and Splash proof)
Weight	2.3kg
Noise Level	<50 dB (Tested from a distance of 50cm)

* = Back current drain is the amount of current drawn by the charger from battery, when the charger is connected to the battery, without power cord connected. HULK Professional Battery Charger has extremely low back current drain which corresponds to 0.7 Ah per month (1mA/hr).

** = A high current ripple heats up battery and reduces life of battery. Against a linear charger, which has a ripple of up to 400%, HULK Professional Battery Charger's ripple is below 2%, which is much lower than the max 5% for a sealed acid battery. Equipment connected to the battery could be damaged by high voltage ripple.

Declaration of Compliance

Conforms to EN55014-1, EN55014-2, EN61000-6-1, EN61000-3-2, EN61000-3-3, EN60335-1, EN60335-2-29, EN 62233.

Application



Motorcycle



Car



ATV



Golf Cart



Boat



SUV

Environmental friendly disposal

You can help protect the environment! Please remember to respect your local regulations. Please hand over the non-working electrical equipment to an appropriate waste disposal centre. The packing material is recyclable.

Note: We reserve right to carry out technical modifications for improvement of 4x4 Amp - 16 Amp Total Charger.