

ENC series Automatic 3 Stage

User Manual

**AUTOMATIC
BATTERY CHARGER**



ISO9001:2000 ROHS CE

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Automatic 3 Stage Battery Charger User Manual



Keep this manual in a safe place for quick reference at any time.

This manual contains important safety and operation instructions for correct use of the battery charger. Read through the manual and pay more attention to the marking and labels of the charger, battery and equipment connected to the battery system.

1. Warning & Caution

- Pay more attention to these two types of notices used in this manual.
 - ⚠ **WARNING:** Failure to read this warning may cause injury to persons and damage to equipment.
 - ⚠ **CAUTION:** Failure to observe this warning may result in damage to equipment and improper functioning of the charger.
- ⚠ **WARNING:**
 - The Charger is designed for indoor use, protect the charger from water.
 - This Charger is made to charge only properly sized lead-acid batteries.
 - Don't recharging nonrechargeable batteries.
 - Charging other types of battery or undersized lead-acid batteries may cause fire or explosion.
 - Install the charger in accordance with all local codes.
 - Do not use the charger if it has been dropped or damaged.
 - Do not remove casing of the charger, there is no userserviceable parts inside.
 - Do not charge the battery on boats, which may have a risk of life.
 - Never attempt to charge a frozen battery.
 - Never attempt to charge a damaged battery.
 - Never place the charger top of a battery.
 - Never smoke, use fire or create sparks near battery or charger during normal charging operation as batteries may give out explosive gas.
 - Do not charge batteries in confined space which may cause explosion

⚠ CAUTIONS:

- Use of accessory that are not recommended may cause risk of fire,electric shock.
- Disconnect the mains supply before connecting or disconnecting the links to the battery.
- If the charger does not work properly or if it has been damaged ,unplug its AC and DC connection.
- Ensure all ventilation duct are not obstructed for efficient fan cooling, do not put any soft materials or paper at the bottom of the charger
- During charging, the battery must be placed in a well ventilated area.

2. Introduction

Thank you for purchasing our automatic 3 stage battery charger.
This battery charger is controlled by current, which is suitable for all kinds of storage battery. The battery can be SLI in car and deep cycle lead battery.
It is a "set and forget" automatic charger which can be permanently connected to battery.

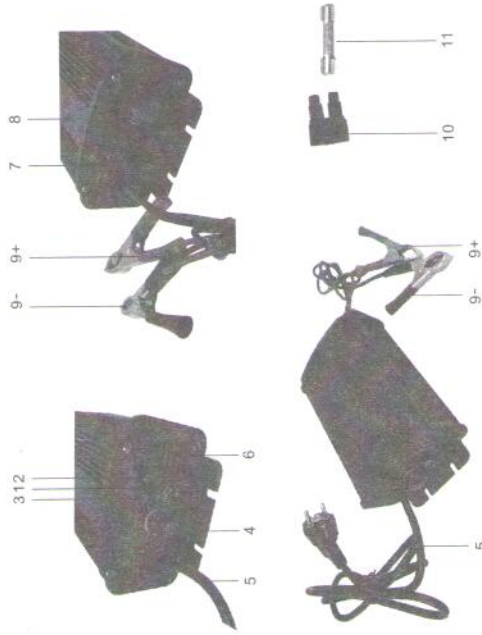
3.Feature

- ON/OFF Switch.
- Wide I/P Voltage Range: AC I/P voltage ranges from 100 to 240 volts AC(<12A).
- Battery Status indicators: Red LED displays fault, Green LED displays power ON, white LED(dual color LED) shows red displays under charging and green displays float charge).
- Short Circuit Protection: Charger O/P cut - off automatically when overload
- Intelligent Temperature Compensation: Adjust charging voltage to compensate for battery temperature, providing an accurate charging in any climate.
- Overcharge Protection: Constant voltage & constant current output to avoid overcharging.
- Compact & Reliable: Designed by reliable high frequency technology with smaller size.
- Strong & Stylish: Designed by stylish aluminum case with better cooling efficiency.
- Soft start bulk charge.

4.Environment

- Operating Temperature : -15~50℃, Ambient.
- Operating Humidity: 5~95%RH, No Condensing.
- Storage Temperature: -20~85℃, Ambient.
- Ultrabration: 2G, 10-500Hz, 3axes.

5.Instruction



(1) Power Switch

To turn on and off AC power to charger

(2)(3) LED indicators

Power	Charge Status
Indicate that the charger is in good condition and ready to charge	Charging state is red, full charge is green.

(4) AC fuse port

(5) AC power cord

(6) Ventilation hole

(7) DC fuse port

It melt when reverse polarity happens. You can change it by yourself.

(8) Cooling fan

The fan works when charger start working and stop work when charger in the stage of floating charging.

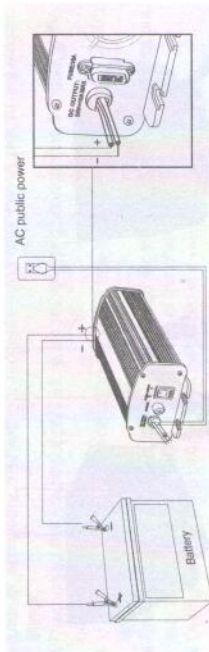
(9+) (9-) DC power plug

Red for positive terminal(+); Black for negative terminal(-)

(10) DC fuse

(11) AC fuse

6.Installation and Connection



Observe the warning & safety precautions before installing and operating the charger. Check the battery and clean the battery poles.

Ensure the battery charger in a well-ventilated area and make the mounting surface is flat and without soft covering material or loose paper sheet. Make sure the air inlets and air outlets are not blocked. Never place charger on top of battery. Before connecting or disconnecting the charging cable, turn off the power switch and unplug AC cord from the mains.

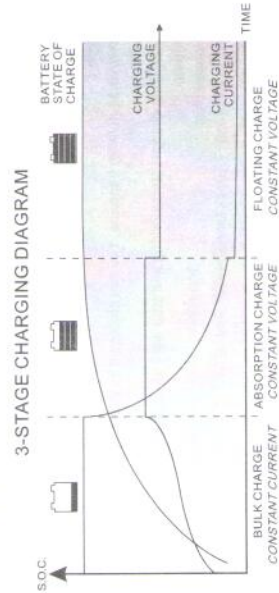
(1) First connect the red cable to positive+ terminal of charger and the battery Positive + pole, then connect the black cable to the Negative terminal and the Negative pole of the battery.

Note: Make sure all the connections are secure and tightened and double check if the polarity is correct. Plug to mains and turn on power switch, the LED should be green.

(2) Connect the AC cable (6+) to public power, LED (2)(3) lit, in normal state.

7.Normal 3-Stage (IUoU) Charging Operation

The 3 stage IUoU charge algorithm ensures fast, complete and at same time gentle charging of the lead acid battery.



State	Name	Explanation	Specification
Stage 1	The constant current charging.	Normally the battery is charged at constant maximum current until it get into the constant voltage charging stage.	Full Load Charge
Stage 2	The constant voltage charging.	In this stage, the charging switches to constant voltage charging and battery power is over 85%. The battery keep charging at this high voltage while the current reduces gradually until get into float stage.	12V: 14.5V $\pm$ 0.2V 24V: 29.5V $\pm$ 0.2V
Stage 3	The floating voltage charging.	In this stage, the battery is full and will be charged with a small current to avoid battery drain.	500-900mA

8.Protection Features

Reverse Polarity	If the polarity is reverse connected, the DC fuse(11) melts
Short-Circuit	If short circuit happens, LED lights off.
Over Charging	The current of DC output will be limited
Over Voltage	If use an improper battery, the charger will shut down
Over Temperature	When temperature over 80 $^{\circ}$ C, the charger will shut down and LED lights off.
Output Fuse	DC fuse melt, LED lights off.

9.Recommend Battery Capacity

Model	ENC1210	ENC2405	ENC1220	ENC2410	ENC1225
Battery Capacity	>50Ah; <100Ah	>10Ah; <50Ah	>100Ah; <200Ah	>50Ah; <100Ah	>150Ah; <250Ah

10. Specification

Model		ENC1210	ENC2405	ENC1220	ENC2410	ENC1225
Output	DC Voltage	12V	24V	12V	24V	12V
	Restrict Voltage	14.5V±0.2V	29.5V±0.2V	14.5V±0.2V	29.5V±0.2V	14.5V±0.2V
	Floating Voltage	13.8V±0.2V	27.7V±0.2V	13.8V±0.2V	27.7V±0.2V	13.8V±0.2V
	Wattage	144W	145W	288W	290W	360W
	Efficiency at maximum power	110V:>83% ; 230V:>87%				
Input	Max output charging current (continuous)	10A	5A	20A	10A	25A
	AC voltage range	110V(90-165V) / 220V(190-265V) or 90-265V(only for 12V 10A)				
Protection	Polarity Reverse	O/P Cut-off,Auto-Recover				
	Short Circuit	O/P Cut-off,Auto-Recover				
	Over load	O/P Current-Limited				
Fuse	Temperature	Inner Temp. More than 80℃, auto shut off				
	AC fuse	3A	3A	3A	3A	3A
	DC fuse	15A	15A	25A	15A	30A
Others	Dimensions	195X102X55.5mm			235X102X55.5mm	
Remarks	All values are based on the standard ambient temperature 25℃ and pressure					

Specifications are subject to change without prior notice.

11. Trouble Shooting

Problem	Indications	Possible Causes	Suggested Solution
Charger does not work	LED lights off.	No AC power AC input socket fuse blown	Check all connections are correct. Replace the AC fuse by skilled electrician
No DC output	LED lights off.	Output short circuit Over temperature protection triggered Severe over loading Reverse polarity connection	Check DC connections between charger and battery Check that the air inlet at the bottom of the charger is not blocked. Check charger ambient ventilation. Check battery Ah capacity within recommended range Check for correct polarity, replace car blade fuse(6)
LED light(4) in RED in an abnormal long period	Battery can not be fully charged	Bad battery connection Ambient temperature is too low Battery has damaged or battery is too old	Check for loose contact, right cable size, cable integrity Recheck battery type and change to correct battery selection Move battery to a room temperature location, or get an optional temperature sensor Replace battery