

-- Instruction manual --

Nova-100 Battery Charger

Waterproof LiFePo4 battery charger



Version / MEC Art-No.

4S 14.4V / 7A → 125-04702-431IS

7S 25.2V / 4A → 125-07402-431IS

Dear Customer!

Thank you very much for your trust in us and our product.
Please read these operating instructions carefully **before** start of operation.

MEC-Energietechnik GmbH

1. Safety Rules and General Warnings

- Persons, which are not able to use the device in a safe way, because of their physical, sensory or mental competence, or because of their inexperience, should not use the charger without control or instruction of a skilled person.
- 100-240 Volts alternating current, device is not suitable for children – Danger of life!!!
- Ensure for enough air ventilation while charging!
- The charger is exclusively designed for rechargeable LiFePo4- batteries and must not be used for other purposes.
- Please consider the charging instructions from the battery manufacturer before charging!
- Do not open! Repair work must only be accomplished by authorized companies or specialized technical staff.
- If the mains connection of the device is damaged, it must be replaced with an original wire which is available at the manufacturer or customer service.
- Never place the device on top of the battery while charging!
- Protect against direct solar radiation and temperatures over 40°C.
- In case of obvious damage or malfunction disconnect the device from mains supply and protect against unintended reconnection.
- The DC cable must not be cut or shortened.

2. General Information

This microprocessor based waterproof Lithium-Based Battery Charger was especially developed for the outdoor use and for situations where water may be present. It can be used to charge any Lithium- based battery. With the 4-step charging program the battery will be charged safely in a fully automatic mode. The output of the charger is electronically protected against short circuit, reverse polarity connection. The charger is able to recover deep-discharged batteries. Coloured LED's on the top case are used to indicate charging status and errors. The integrated metal hook allows fixing the charger in different ways.

3. Special Features

- Convection cooled IP68 housing
- Short circuit and reverse polarity protection
- High frequent switching technology
- LED's to indicate operation and charging status
- 4-Step charging technology with automatically restart charging
- Safety charging with reduced charging current
- Indicating a non-chargeable ('dead battery') condition

4. Product Figure

1 DC-output cable
2 Green Mains-LED
3 Red Error-LED

4 Yellow Charge LED
5 Green Full-LED
6 AC-cable

7 Extractable hook
8 Wall brackets



5. Operation

ATTENTION:

- Before operating please make sure that the power cable and the charger including the charging cable show no damages and make sure that the mains supply complies with the specification.
- Please consider the charging instructions from the battery manufacturer before charging.

If you want to connect the charger to the battery, please have a look to the following points:

- Make sure that the charger is disconnected from the battery.
- Connect the charger to mains supply.
- Select a suitable battery type
- Connect the charging cable to the battery.

6. Charging the battery

The charging process starts automatically and runs through the following four charging phases:

1. charging phase: precharge

This charging step is indicated by **blinking alternately of the Charge-LED (4) and Full-LED (5)**.

Explanation: The precharge phase starts automatically at deeply discharged batteries (where the BMS is off). During this phase, the charger use controlled current pulses. That tries to reactivate the BMS and bring the battery in a voltage where it is possible to start the charging process.

2. charging phase: soft start

This charging step is indicated by **constant lighting of the Charge-LED (4)**.

Explanation: During the soft start phase the charger reduces charging current, in order to extend battery lifetime.

3. charging phase: constant current

This charging step is indicated by **blinking slowly of the Charge-LED (4)**.

Explanation: During the constant current phase, the battery is being charged to ~80% of its capacity.

4. charging phase: constant voltage

This charging step is indicated by **blinking quickly of the Charge-LED (4)**.

Explanation: During the constant voltage phase the battery is being charged to its maximum capacity.

If the **Full-LED (5) is constant lighting** the battery has reached the full capacity. Should the battery stays on charger, the automatic restart starts after 7 days or the battery voltage is under 3.4V/cell.

Disconnect the charger from the battery:

- a) Disconnect the charger from the mains supply;
- b) Disconnect the charger from the battery;

Charging advice:

- If the charger will be disconnected from the battery during the charging process, the charge current will be interrupted immediately. In that case please disconnect the charger from the mains supply. For starting a new charging process please comply with the relevant points (see pt.5)
- For increasing the lifetimes of the battery please do not stop a charging process before the battery is fully charged. The charger will automatically stop the charging process

7. Errors and Troubleshooting

Table 1: General errors:

Error description	Solution
No LED lighting or blinking after connecting mains	<input type="checkbox"/> Check if charger is connected to mains supply <input type="checkbox"/> Check function of mains supply
Green Mains- LED is on, charger is connected to battery and the charging process don't start	<input type="checkbox"/> Check connection to battery <input type="checkbox"/> Check if battery is damaged or deeply discharged
Error- LED blinking (N x blinking / 2 sec pause)	<input type="checkbox"/> Please see the table below for error description

Table 2: Error- LED blinking signals:

Blinking signal	Error description
1 x	Battery damaged
2 x	Battery voltage is too high or wrong battery connected
5 x	Charger temperature is too high as charging

8. Technical Specifications

Version	4S 14.4V / 7A	7S 25.2V / 4A
MEC Art.-no.:	125-04702-431IS	125-07402-431IS
Charge characteristic	4-Step charge profile	
Input	AC 100...240V / 50-60Hz	
AC cable	1.5m ±0.1m CEE 7/16	
Charging current max.	7A ±6%	4A ±6%
Charging voltage nom.	14.4V DC ±1%	25.2V DC ±1%
Output power max.	109W	109W
Start charging voltage	8V	14V
Back current	<1mA	
Efficiency	>84% @ 230V	>89% @ 230V
DC-Cable	Length: 1.6m ±0.1m / open wire ends	
Indicators	4 LEDs	
Cooling	Convection cooled	
Operating temperature range	-10°C...40°C	
Device protection	Over temperature, Reverse polarity, Short circuit, Over load	
Temperature sensor	Internal	
Certification	CE	
Enclosure	Plastic housing	
Protection class	2	
IP-code	IP68	
Dimensions / Weight	174 x 84 x 45 mm / ~ 850g	

9. Advice for Disposal



It is prohibited to dispose the charger into the house- and residual waste removal (WEEE-Richtlinie 2002/96/EG und EAG-VO), it must be disposed at the according collection points. For the protection of our environment please inform yourself at your communal administrative agency about your nearest disposal point.

The charger equates to the RoHS-directive 2002/95/EG, for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



10. Disclaimer of Warranty

- MEC-Energietechnik GmbH guarantees replacement or repair of chargers that are recognized as defective within 2 years under common environmental conditions. The validation of the warranty time starts with the delivery date from the manufacturer. MEC-Energietechnik GmbH is limiting the free guaranteeing to working hours and spare parts only.
- For damages caused by non-observance of the operating instructions, inappropriate start up or handling as well as reconstructions and modifications of the device, the warranty claim expires and MEC-Energietechnik GmbH assumes no liability for consequential damage to property or persons!
- Repair work must only be accomplished by authorized companies or professional staff!