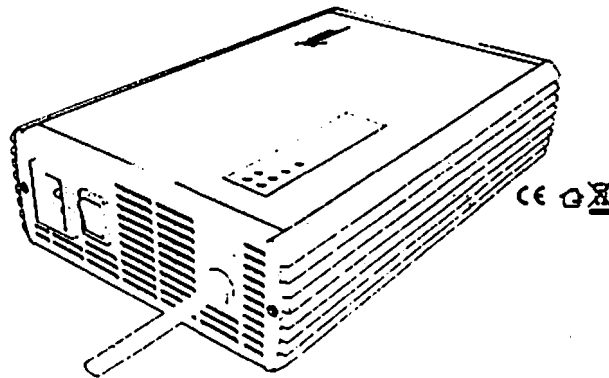


Operating Instructions

Nova-360SR Battery Charger

for Li-Ion battery packs



Version ⁷	MEC Art.-Nr.	Version ⁷	MEC Art.-Nr.
<input type="checkbox"/> 16.8V / 20A	165-04203-470 (4 cells)	<input type="checkbox"/> 50.4V / 7A	165-12702-470 (12 cells)
<input type="checkbox"/> 29.4V / 10A	165-07103-470 (7 cells)	<input type="checkbox"/> 54.6V / 6A	165-13602-470 (13 cells)
<input checked="" type="checkbox"/> 42.0V / 5A	165-14602-470 (10 cells)	<input type="checkbox"/> 58.8V / 6A	165-14602-470 (14 cells)

⁷ V= charge termination voltage | A= max. charging current

Dear Customer!



Thank you very much for your trust in us and our product.
Please read these operating instructions thoroughly before use.

MEC-Energietechnik GmbH

1. Safety Rules and general Warnings



- ATTENTION: 100...240 Volts AC voltage, device is not suitable for children – danger of life!
- ATTENTION: Please consider the charging instructions from the battery manufacturer before charging!
- ATTENTION: The charger is exclusively designed for rechargeable Li-Ion battery packs and must not be used for any other purpose.

- This device is only to be used for charging Li-Ion battery packs with overcurrent and overvoltage protection.
- Do not use the device near flammable gases, solvents or vapours. RISK OF EXPLOSION!
- Use the device only in dry rooms. Protect the charger against dust, heat >40°C, humidity >80% rel., and direct solar radiation.



- Persons with limited physical, sensory or mental abilities, or insufficient inexperience, are prohibited from using this device without supervision of a skilled person.

- Do not cover the vent outlet during operation!
- Clean with a dry cloth only – Prevent from the intrusion of fluids of any kind.
- Replace damaged mains connection immediately with an original spare part.



- In case of obvious damage or malfunction immediately disconnect the device from mains supply and protect against unintended reconnection.

- Do not open! Repair work through authorized companies or specialized technical staff only.

2. General Information

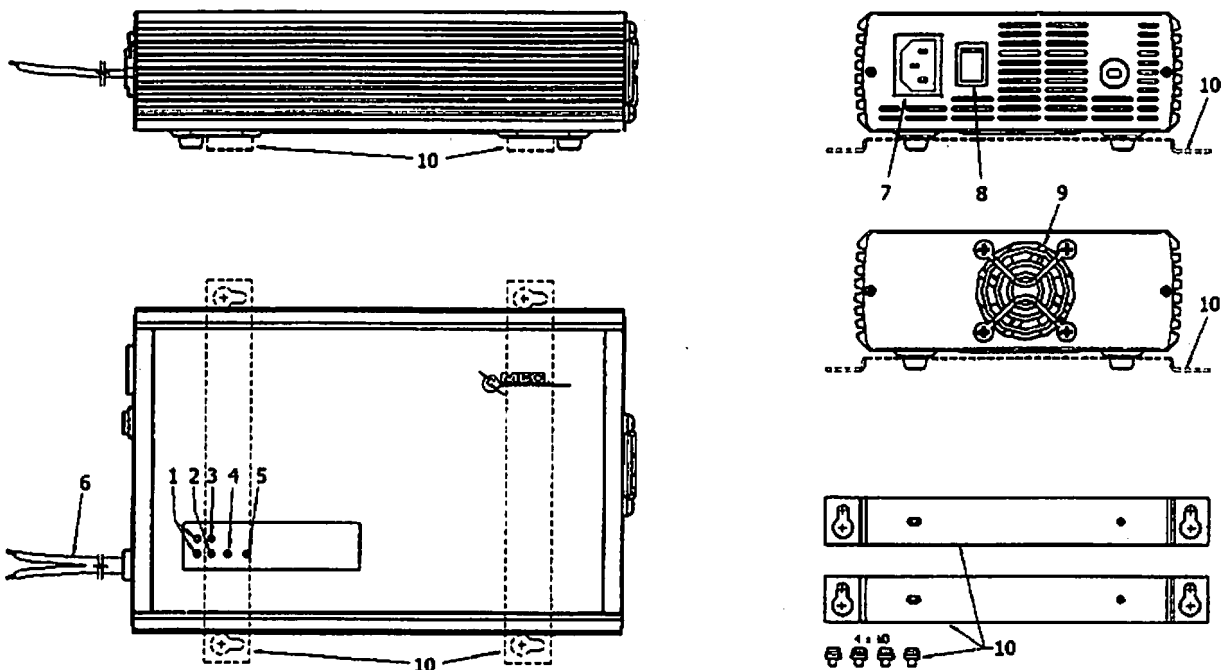
The microprocessor controlled charger serves to charge Li-Ion battery packs. The compact design in a metal housing is realized by high frequency switching technology. This advanced technology guarantees an optimal and gentle charging of your Li-Ion battery packs for the maximum possible number of charging cycles.

3. Special Features

- Lithium charging technology
- Charging profile with "Softstart"-phase
- Automatic Restart-function
- Cooling with load-dependent fan
- High frequent switching technology
- 4 LEDs to indicate operation and charging status
- Automatic Wake-Up Function for battery with safety shut-down
- Protection against reverse polarity and short circuit
- Power de-rating at elevated environmental temperature

4. Scope of delivery

- | | | | |
|------------------------------|------------------------|-----------------|------------------------------|
| 1. Infrared-LED [?] | 4. Yellow Charging-LED | 7. Mains socket | 10. Mounting bracket set |
| 2. Red Error-LED | 5. Green Full-LED | 8. Power switch | - - Power cable (no picture) |
| 3. Green Power-LED | 6. Charging cable | 9. Fan | |



[?] For factory programming use only

5. Charging cable - polarity

WARNING: Please check polarity before connecting the battery pack to the charger!

- Black/White striped or red cable = Plus (+)
- Black cable = Minus (-)

6. Operation

I. Connect the charger to the battery and start charging

- Make sure that the device is switched off and disconnected from the mains.
- Connect the terminals to the battery.
- Connect the power cable to the mains supply and switch ON the device.

☛ Power-LED (green) is constant lighting and all 3 charging LEDs flashing once.

Automatic Wake-up function:

After switching on the device, the charger will automatically try to wake up the battery pack with up to 10 voltage pulses. The green Full-LED and the yellow Charging-LED will flash alternately during this phase.

If no battery or a defect battery is connected, the charger will automatically switch to error mode after 10 attempts to wake up the battery pack, the red Error-LED is blinking.

In this case, please switch off the device and check if a battery pack or a defect battery is connected.

Once a battery is detected, the charging process starts automatically und runs through the following 3 charging phases:

1. Charging phase: Soft start-phase if battery voltage <3.0V / cell (CC1)

This stage is indicated by constant lighting of the yellow Charging-LED.

The battery is being charged with lower current till reaching a voltage of 3.0V / cell.

2. Charging phase: constant current (CC2)

This stage is indicated by a slowly flashing yellow Charging-LED.

During the constant current phase, the battery is being charged with maximum current.

3. Charging phase: constant voltage (CV)

This stage is indicated by a fast flashing yellow Charging-LED.

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

After reaching the maximum capacity the green Full-LED is constantly shining.

The charger can now be disconnected from the battery (see pt. II Disconnect the charger from the battery) or remain connected to the battery (see Auto-restart function).

Auto-restart function

If the charger remains connected to the battery after finishing the charging process, a new charging cycle automatically will be started after 30 days.

II. Disconnect the charger from the battery:

- Switch off the battery charger;
- Disconnect the battery charger from the battery;



When disconnecting the battery from the device during charging process, please switch off the charger using the power switch immediately. A continuation off the charging process is equal to a new charging cycle, all relevant points of the Operating Instructions have to be considered.

After switching off the charger, please wait at least 5 seconds until reactivating the device – otherwise this may result in damage.

Battery care:

- Never expose the battery to high temperatures, as this causes permanent battery capacity loss.
- Never deep-discharge or overcharge the battery, cells can be damaged irreversibly.
- If possible, always disconnect the battery from the load when being stored over long periods of time.
- Store battery in a dry and cool place at about 40-60% of its rated capacity.

☛ Please consider the charging instructions from the battery manufacturer!

7. Errors and Troubleshooting

Green Power-LED does not shine:

- Check if the power cable is connected correctly to the main socket.
- Check if the device is switched ON.
- Check if the power cable is damaged.

☛ If necessary, replace the mains cable with an original power cable from the manufacturer.

Red Error-LED is blinking:

Please see the cause of Error in the following table.

Blinking Signal ¹	Error Description	Troubleshooting
1 x blinking, 2 sec Pause	No battery or defect battery connected.	Please check if the battery is connected correctly or whether the connected battery is defective.
2 x blinking, 2 sec Pause	Battery voltage is too high or wrong battery is connected.	Please check the type of battery that is connected.
5 x blinking, 2 sec Pause	Device temperature is too high to start a charging cycle.	Please turn off the charger and give it some time to cool down.

¹ Blinking signals in continuous loop.

8. Technical Specifications

Version	4S 16.8V / 20A	7S 29.4V / 10A	10S 42.0V / 5A	12S 50.4V / 7A	13S 54.6V / 6A	14S 58.8V / 6A
Order Nbr	165-04203-470	165-07103-470	165-14602-470	165-12702-470	165-13602-470	165-14602-470
Input	100 - 240VAC 50/60Hz (IEC 60320-C14)					
AC-cable	1.5m ±0.1m IEC 60320-C13 - CEE 7/7					
Charging voltage max.	16.8VDC ±1%	29.4VDC ±1%	42.0VDC ±1%	50.4VDC ±1%	54.6VDC ±1%	58.8VDC ±1%
Charging current max.	20A	10A	5A	7A	6A	6A
Output power max.	336W	294 W	210W	353W	328W	353W
Ripple	<1%					
Efficiency	>87%					
DC-cable	2 wires 2.0m ±0.1m with open ends Polarity: red = plus (+) / black = minus (-)					
Indicators	4 LEDs					
Cooling	Load-dependent fan					
Operating temperature range	±0°C...+40°C					
Device protection	Input: glass fuse - on board Output: Over Voltage, Over Temperature, Short circuit					
Certifications	CE					
Protection class	1					
Enclosure	metal housing, painted					
IP-class	IP20					
Dimensions/ Weight	235mm x 158mm x 66mm / 2.3kg					

9. Advice for Disposal



It is prohibited to dispose the charger into the house- and residual waste removal (WEEE directive 2002/96/EG and EAG-VO). It has to be disposed at a legally required collection point. For the protection of our environment please inform yourself at your communal administrative agency about your nearest disposal point.



This charger complies with the RoHS-directive 2002/95/EG, regulating the use of hazardous substances in electrical and electronic equipment.



10. Disclaimer of Warranty

- The warranty period (see our GTC) starts with device being dispatched by the manufacturer. The MEC-Energietechnik GmbH is accepting liability by 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!

Subject to technical modifications. We assume no liability for misprints.
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