

# Instruction Manual

## Battery Chargers

### JOE-100 Series:

IP68 water resistant, microprocessor-based. With one (1) or multiple, selectable charge profiles, customized parameters.



## Safety Rules and General Warnings

- Persons, who are not able to use the charger in a safe way, because of their physical, sensory or mental incompetence, or because of their lack of experience, should not use without the control or instruction from a skilled or qualified person.
- The charger runs with 100-240 Volts alternating current, which is not suitable for children – Danger of Life. And beware of risk of electric shock at all times.
- Avoid flammable gases, solvents or vapours all the time. Prevent open flame or sparks while charging in progress. Explosion RISK!
- Ensure sufficient air ventilation and prevent open flame or sparks while charging in progress.
- The charger is exclusively designed for charging rechargeable batteries and must not be used for other purposes. Corresponding model should be selected for particular lithium-based or lead-based batteries.
- You should take into consideration of the charging instructions issued by the battery manufacturer before charging. Check also if the charge profile fits your battery and application.
- DO NOT OPEN or DISMANTLE the charger. Repair work must only be processed by authorized technical staff.
- If the mains connection of the charger is damaged, it must be replaced with an original wire which is available at MEC or authorized dealers.
- NEVER place the charger on top of the battery while charging in progress.
- The charger should be protected against direct solar radiation or temperatures over 40°C.
- In case of obvious damage or malfunctioning, disconnect the charger from the mains supply and protect against unintended reconnection.
- The DC cable must not be cut, shortened or extended under any circumstances.

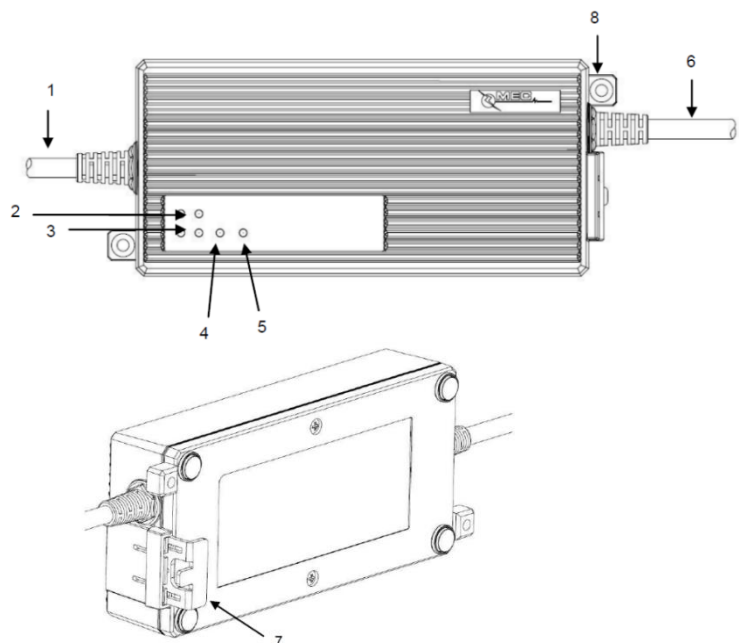
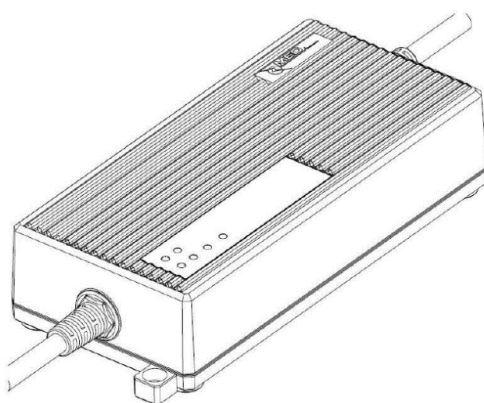
## Special Features

- IP68 Passive cooling; high-impact plastics housing
- Microprocessor-based 4-Step charging technology with soft start and automatic re-start of the charge cycle
- High frequency switching technology
- 5 Selectable battery types (GEL, AGM, WET, Calcium, +PS-Mode) and built-in battery temperature sensor for models targeting lead-based batteries
- LED indicators showing corresponding charge status and errors
- Protection against short circuit, reverse polarity, over temperature or overload
- Battery recovery function for attempting to revive a deeply discharged or "dead" battery with recurring series of voltage/current pulses

## Product Configuration

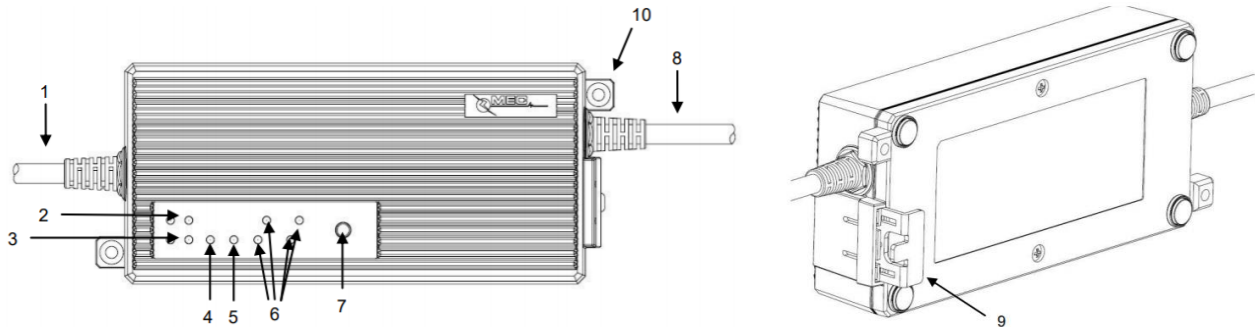
### Models Targeting Lithium-based Batteries

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 Bracket	9.



### Models Targeting Lead-based Batteries

1.	DC Output Cable	2.	Green Mains LED	3.	Red Error LED
4.	Yellow Charge LED	5.	Green Full LED	6.	Battery Type LED
7.	Press Button	8.	AC Cable	9.	Extractable Hook
10.	Wall Bracket				



## Preparation – Before Charging

### General Checking

- Check thoroughly the charger itself including all the cables show no damages
- Take into consideration the charging instruction issued by the battery manufacturer

### DC Mains Supply Checking

- Make sure the DC cable must not be cut, shortened or extended under any circumstances
- Make sure the mains supply complies with the technical specification requirements of the charger

### Before Connecting the Charger to the Battery

- <For models targeting lead-acid batteries> First connect charger to the mains to select the appropriate loader, then disconnect from the mains and connect the temperature sensor to the battery (the assembly depends on the battery manufacturer)
- <For all models> Make sure the charger is switched off and disconnected from the mains supply
- Then connect the terminals of the charger to the battery
- Finally connect the power cable of the charger to the mains supply, and switch on the charger

### For Models Targeting Lead-based Batteries

- Select the desired charge profile:  
With proper connection, the LED of the currently active charge profile lights up continuously. To change the charge profile, press and hold the "Press Button" for 5 seconds, the LED of the active profile will then change to slow flashing. Now you can switch between the different charge profiles by briefly pressing the "Press Button". When the desired profile is selected, confirm the selection by pressing the "Press Button" again for 5 seconds, the LED of the selected charge profile changes to steady lighting.
- Select the Power Supply Mode:  
Follow the steps above to select a charge profile; the Power Supply Mode is signaled by the lighting up of all the 4 charge profile LEDs.
- The latest selected charge profile will be kept unless you change it

## Charging the Battery

The charging process starts automatically and runs through the following stages:

### Getting Ready: Auto Wake-up

Yellow Charge LED (4) and Green Full LED (5) blinks alternately. During this pre-charge phase, the charger sends out series of controlled current pulses to reactivate the BMS (if any) and bring in a voltage to the battery for getting ready for the charging process. If no battery or defected battery pack is connected, the Red Error LED blinks. In this case, switch off the charger and check the battery pack.

### Phase 1: Soft Start

Yellow Charge LED (4) keeps on lighting. The charger regulates the initial charging current to better prolong the battery life.

### Phase 2: Constant Current Charging

Yellow Charge LED (4) blinks slowly. The battery is being charged to 80% of its capacity at this stage.

### Phase 3: Constant Voltage Charging

Yellow Charge LED (4) blinks quickly. The battery is being charged to its maximum capacity. When the Green Full LED (5) turns on, the charger can now be disconnected from the battery.

**Phase 4: Float Charging (for lead-based batteries only) or Auto Restart**

Green Full LED (5) keeps on lighting indicate the battery has reached its full capacity. If the battery keeps connecting to the charger, auto restart of the charging cycle will take place after 30 days or when the battery voltage has dropped to under 3.6V/cell (Li-ion Battery) or 3.2V/cell (LiFePO4 Battery).

**Disconnect the Charger from the Battery:**

1. First, disconnect the charger from the mains supply
2. Then, disconnect the charger from the battery

After disconnecting the charger from the mains, please wait at least 5 seconds to reactivate the charger if in need – otherwise damages may be resulted.

## Charging Advice and Battery Care

**Charging Advice:**

- If the charger must be disconnected from the battery during the charging process, please FIRST disconnect the charger from the mains supply. The continuation of the charging process is equal to a new charging cycle; all relevant points of the Operating Instructions have to be considered.
- To lengthen the lifetime of the battery, please do not stop the charging process before the battery is fully charged. The charger will automatically stop when the charging process is completed.

**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 period of time.
- Store battery in a dry and cool place at about 40-60% of its rated capacity.

## Errors and Troubleshooting

General Errors Description	Solutions
No LED lighting or blinking after connecting to the mains	<ul style="list-style-type: none"> <li>• Check if the charger is connected to mains supply properly</li> <li>• Check if there are any problems with the mains supply</li> </ul>
Green Mains-LED is on, charger is connected to the battery, but the charging process seems not working	<ul style="list-style-type: none"> <li>• Check the connection to battery</li> <li>• Check if the battery is damaged or has been deeply discharged</li> </ul>
Error-LED blinking (N x blinking / 2 secs pause)	<ul style="list-style-type: none"> <li>• Please refer to the table below for LED Blinking Signals</li> </ul>

**LED Blinking Signals**

Blinking Signal (continuous looping)	Error Description
1 x	Battery damaged
2 x	Battery voltage is too high or wrong battery connection
5 x	Charger temperature is too high during the charging process
6 x	Short-circuited

## Advice for Disposal



It is prohibited to dispose the charger with household or residual waste removal (WEEE-Richtlinie 2012/19/EU und EAG-VO). The charger must be disposed at designated disposal points. For the protection of our environment, please check at your communal administrative agency of your nearest disposal point.



The charger conforms to the RoHS-directive EU 2015/863, for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



## Disclaimer of Warranty

The warranty period (see our General Terms and Conditions) starts with the charger being dispatched by the manufacturer. MEC-Energietechnik GmbH accepts 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 dismantling, reconstructions or modifications of the charger, the warranty claim expires and MEC-Energietechnik GmbH assumes no liability for consequential damages to any properties or persons in connection with or arising from the purchase and use of the charger.

We reserves the rights to configure the charger as per actual needs and the manual may not reflect the most updated conditions of the product at all times. Please contact us should you need any technological support.



## Technical Specifications

DC Ausgang   DC Output													
	LiFePO4 Batteries 3.2V/cell (nom.)					Li-ion Batteries 3.6V/cell (nom.)				Lead-based Batteries			
	4S	8S	12S	14S	16S	4S	7S	10S	14S	12V	24V	36V	48V
Ladespannung max. Charge Voltage max. (+/-1%)	12.8V	25.6V	38.4V	44.8V	51.2V	14.4V	25.2V	36.0V	50.4V				
Ladestrom max. Charge Current max. (+/-1%)	7A	4A	2.5A	2.2A	2A	7A	4A	2.5A	2A	7A	4A	2.5A	2A
Wirkungsgrad max.   Efficiency max.		>89% @ 230V											
Ausgangsleistung, nom.   Output Power, nom.		100W											
Restwelligkeit   Ripple		<1%											
Rückstrom   Back Current		<1mA											
Ladekabel   Charge Cable		1.2m offene Kabelenden   1.2m open cable ends											
AC Eingang   AC Input													
Eingangsspannung   Input Voltage		100...240VAC / 50...60Hz											
Netzkabel & Stecker   Power Cord & Plug		1.2m, Länderspezifisch   Country Specific											
Gehäuse   Enclosure													
Werkstoff   Material		Kunststoffgehäuse   Plastics Housing											
Abmessungen / Gewicht   Dimension / Weight		175 x 85 x 45 mm / ca. 850g											
LED-Anzeigen   LED-Indicators		Netz-, Error-, Laden-, Batt.-Voll Anzeige Mains-, Error-, Charging-, Batt.-Full Indicator											
Schutzklasse   Protection Class		2											
IP Klasse   IP Code		IP68											
Einsatztemperaturbereich   Operating Temp.		-30°C to +40°C											
Kühlung   Cooling		Passive Kühlung   Passive Cooling											
Besonderheiten   Special Features													
4-Stufen Ladecharakteristik** 4-Step Charge Characteristics**		Abschaltung bei "Batterie-Voll" (Ladestromerkennung) Charge Cut-off at "Battery-Full" (Current Detection)											
Ladefreigabe (opt.)*** Charge Enable (opt.)***		Kabel f. Ladefreigabe / Ladesperre Cable f. Charge Enable / Charge Disable											
Wegfahrsperrung*** Ignition-Lock Function***		2-Adriges Kabel -> (Relaiskontakt) 2-Core Cable -> (Dry-contact)											
Ladeparameter   Charge Parameter		Ladeprofilanpassung über IR-Schnittstelle Charge Profile Configurable via IR-Port											
Automat. Batterie Weckfunktion Automat. Battery Wake-up		Nach dem Einschalten weckt der Lader das BMS durch definierte Spannungspulse The charger, after "Power-on", activates the BMS with pre-defined voltage pulses											
Geräteschutz   Device Protection		Übertemperatur-, Kurzschluss-, Überlastschutz Over temperature-, Short Circuit-, Overload Protection											
Zertifizierungen   Certification													
		CE											

Spezifikationen der Akkuhersteller sind vorrangig zu beachten! | Specifications of the battery manufacturer take priority!

\*\* Abweichende Ladeprofile auf Anfrage | Different charge profiles available on request.

\*\*\* Optionale Varianten auf Anfrage | Optional features available on request.

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

