MOTO ELECTRIC VEHICLES

LITHIUM CHARGER

Owner manual

84V / 15A

For 23S $LiFePO_4$ battery systems

Safe charging, status lights and care for your MotoEV lithium battery charger.

Read before use. Keep this manual with your charger.

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02 / READ FIRST

Safe charging

WARNING Read these instructions before charging. Incorrect use can cause electric shock, fire, arcing, battery damage, or serious injury.

Use a compatible battery and power supply

- Use this charger only with a compatible 23-cell series lithium iron phosphate (23S $LiFePO_4$) battery system. Confirm the battery voltage, capacity, chemistry, and permitted charge current before connection.
- Never charge a frozen battery or a non-rechargeable battery.
- Use a sound, properly grounded AC receptacle. A defective receptacle can cause charging failure. Inspect cables, connectors, and the charger before use.
- Keep the charger on a noncombustible surface, such as concrete, brick, or metal. Keep it away from flammable materials and vapors. Ventilate enclosed charging areas and keep the fan and heat sink clear.

Connect and disconnect safely

With AC power disconnected, verify the DC polarity and connect the charger using the vehicle's approved charging connection. Red is battery positive (+); black is battery negative (-). Connect AC power only after the DC connection is secure. The charger can begin output as soon as AC is connected.

Do not disconnect the charging cord while the charger is operating. Disconnect AC power and allow charging to stop before separating the DC connection. Follow the vehicle and battery instructions for the approved connection sequence.

Stop if equipment is damaged

Do not use a charger that has been dropped, struck, or physically damaged. Do not remove its cover or attempt internal repairs. Have a qualified service technician inspect and repair it.

IP66 describes the charger enclosure's protection rating. Keep the AC receptacle and cable connections protected from water; do not immerse the charger.



03 / PRODUCT DETAILS

Charger specifications

Specification	Rating
Model designation	84V15A
Battery compatibility	23S $LiFePO_4$ • 73.6V nominal
Maximum output voltage	84 ± 0.4V DC
Output current	15 ± 0.8A
Maximum output power	1250W
AC input range in specification	90–260V AC
AC input shown on example label	100–240V AC • 50/60Hz
Input frequency range	47–63Hz
Standby input power	No more than 10W
Efficiency at 220V AC	At least 91% at full load
Efficiency at 120V AC	At least 88% at full load
Enclosure	Die-cast aluminum • IP66
Dimensions L × W × H	11.1 × 5.71 × 3.15 in (282 × 145 × 80 mm)
Charger net weight	9.92 lb
Maximum operating altitude	9,842 ft (3,000 m)

Use the ratings on the supplied charger label when selecting the electrical supply. Contact Moto Electric Vehicles if the label and supplied specifications differ.



04 / STATUS LIGHTS

LED indicators and fault codes

The LED shows normal operating status or a fault pattern. Count the flashes and note their colors before contacting support.

LED indication	Meaning	Reset behavior
Steady green	Power on or charging complete	Confirm battery status to distinguish standby from full charge.
Flashing green	Charging	Normal operation.
Flashing red	AC input fault	Automatic restart after the input fault is corrected.
Red, green, repeating	Short circuit detected	Automatic restart after the fault is corrected.
Red, red, green, repeating	Reverse polarity detected	Automatic restart after the fault is corrected.
Two red flashes, then a 1-second pause	Overtemperature	Automatic restart after temperature returns to the permitted level.
Three red flashes, then a 1-second pause	Excessive output current	Correct the cause, then disconnect and reconnect AC power.
Four red flashes, then a 1-second pause	Excessive output voltage	Correct the cause, then disconnect and reconnect AC power.

Before attempting a restart

Disconnect AC power before inspecting or changing a DC connection. Correct the cause of the fault before restarting. If the fault returns, stop charging and contact Moto Electric Vehicles. Do not bypass a protection function.

A steady green light needs context

Green can indicate either power on without active charging or a completed charge. Check the battery’s charge status and the charging connection before assuming the battery is fully charged.



05 / BUILT IN PROTECTION

How charger protection works

Protection	Charger response
Software voltage control	Limits output to the battery charging voltage set for the charger.
Current limiting	Limits charging current to the configured value during constant-current operation.
Temperature above 176°F (80°C)	Reduces output current.
Temperature above 194°F (90°C)	Shuts down automatically.
Temperature below 140°F (60°C)	Returns to normal charging after thermal protection.
Excessive output voltage	Stops charging. After correcting the fault, disconnect and reconnect AC power to restart.
AC input outside the permitted range	Stops charging and restarts automatically after the input fault is corrected.
Reverse polarity or short circuit before charging	Checks battery voltage and prevents charging; restarts after the fault is corrected.

IMPORTANT The factory specifies reverse-polarity and short-circuit detection before charging begins. Creating either fault while charging may damage the charger. Never change polarity or short the output while it is operating.

Battery management system activation

The charger is designed to activate a compatible battery management system (BMS) when the battery is in over-discharge protection. This capability does not authorize recovery of a damaged or excessively discharged battery. Follow the battery manual and contact Moto Electric Vehicles before attempting recovery.

Use this charger only with an approved 23S $LiFePO_4$ battery system. Follow that battery's minimum voltage and charging requirements; do not use it with a 16S battery.



06 / CARE AND STORAGE

Connections and storage

AC and DC connections

Connection	Supplied specification
Built-in AC cable	US plug • 4.92 ft (1.5 m) • three 14AWG conductors
DC output cable	Black • 9.19 ft (2.8 m) • RVV 2 × 2.5 + 3 × 0.5 mm²
DC cable outside diameter	0.45 in
DC connector	M25 two-pin (M25-2P)
Adapter cable	15.75 in (400 mm) • male M25 connector to M8 ring terminals
Adapter preparation	Stripping length: 8.66 ± 0.79 in (220 ± 20 mm)
DC polarity	Red: positive (+) • black: negative (-)

Use the approved vehicle installation and connector supplied with your charger. Ring-terminal installation and cable preparation must be performed by qualified personnel.

Store and transport carefully

Store the charger in its original packaging in a cool, dry location. Handle it carefully during loading and unloading. Protect it from vibration, impact, strong magnetic fields, corrosive chemicals, harmful gases, and flammable or explosive materials.

Normal storage temperature: -4°F to 122°F (-20°C to 50°C). Extreme storage range: -40°F to 158°F (-40°C to 70°C). Packaged storage humidity: 5% to 95%.

Keep packaged units at least 7.87 in (200 mm) above the floor and 19.69 in (500 mm) away from walls, heat sources, and ventilation outlets. The factory specifies a two-year storage period under these conditions; inspect and retest units stored longer before use.

Packaging and identification

Carton dimensions: 14.17 × 9.06 × 7.87 in. The factory lists 8.38 lb alongside the carton data and 9.92 lb for the charger; confirm the actual unit and shipping weights before handling or shipment. Packaging identifies the product, model, manufacturer, safety markings, serial number, user manual, and packing list.



07 / CHARGING PROFILE

Charging stages

The 84V15A specification describes constant-current charging followed by constant-voltage charging and a final transition toward 84V. These are reference values, not user-adjustable settings.

Stage	84V15A reference values
Constant current	15A; output range 57.5V to 80.5V.
Constant voltage	80.5V; charging current decreases from 15A to 5A.
Final transition	5A transition current, with voltage rising toward 84V.
Charge complete	Output current below 1A.

Charging profile reference

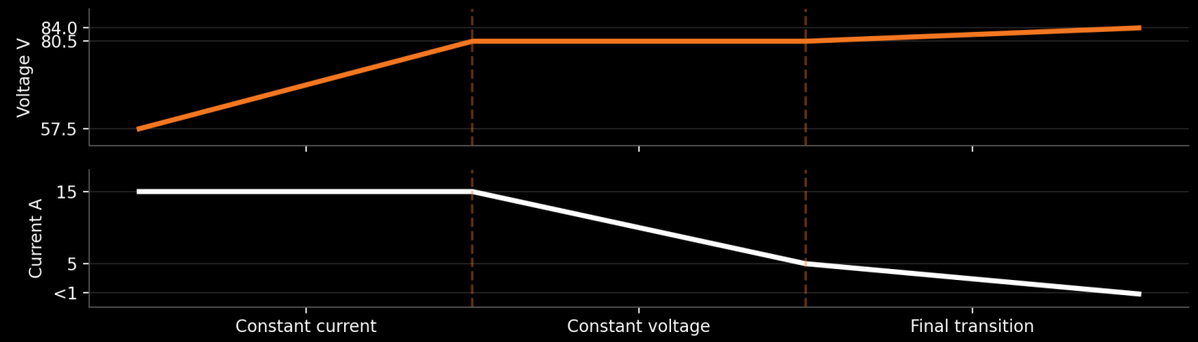


Diagram shows stage values only. Stage widths do not represent elapsed time. Charging duration depends on the battery and its condition. Follow the battery manufacturer’s requirements for low-voltage recovery.



08 / FACTORY TEST DATA

Environmental and reliability tests

These are factory test conditions. They are not a substitute for the operating limits on the supplied charger or battery.

Test	Factory condition or acceptance criterion
High ambient operating test	149°F (65°C) • functions normal
Low ambient operating test	-4°F (-20°C) • functions normal
High temperature storage test	158°F (70°C) • functions normal after 2 hours at normal temperature
Low temperature storage test	-40°F (-40°C) • functions normal after 2 hours at normal temperature
Random vibration	20–500Hz • acceleration 0.49 (unit not specified)
Repetitive shock	10–60Hz • amplitude 0.38 (unit not specified)
Thermal shock	-31°F to 167°F (-35°C to 75°C); transition below 3 minutes; 2.5-hour dwell; 200 cycles
Drop test	BS EN 60068-2-32:1993, Test Ed, free-fall Appendix B
Mean time between failures	At least 10,000 hours; factory reference at 77°F (25°C), full load

Warranty

The factory specification states a one-year charger warranty. Contact Moto Electric Vehicles for applicable warranty terms, service, and claim instructions. The MTBF rating is a reliability measure, not a guaranteed service life.

Serial number reference

Example: 8415 200612 B1 0001. “8415” identifies the 84V / 15A model family; “200612” represents June 12, 2020; “0001” is the sequential serial number. Provide the complete code, including the intervening version field, when requesting support.



09 / TECHNICAL REFERENCE

Electrical tests and listed standards

Electrical test	Factory requirement
Input to output dielectric strength	3000V AC for 2 seconds • leakage no more than 10mA • no breakdown
Input to ground insulation resistance	At least 300MΩ at 500V DC
Output to ground insulation resistance	At least 300MΩ at 500V DC
Leakage current	Less than 3.5mA

Standards listed in the factory specification

The source lists CE, RoHS, and EMC, together with the following references. These are reproduced as supplied and do not establish independent certification or compliance with current editions.

Category	Listed reference
EMC	EN 55014-1:2006 + A1:2009 + A2:2011
EMC	EN 61000-3-2:2006 + A1:2009 + A2:2009
EMC	EN 61000-3-3:2008
EMC	EN 55014-2:1997 + A1:2001 + A2:2008
Low voltage safety	EN 60335-1:2002 + EN 60335-2-29:2002

Support

Moto Electric Vehicles
motoelectricvehicles.com

Have the charger label, serial number, battery model, and LED flash pattern available when requesting assistance.

