

EPEVER XTRA3215N

EPEVER MPPT Solar Charge Controller XTRA3215N User Manual

Model: XTRA3215N

1. INTRODUCTION

The EPEVER MPPT Solar Charge Controller XTRA3215N is an advanced Maximum Power Point Tracking (MPPT) controller designed for off-grid photovoltaic systems. It efficiently charges 12V or 24V battery systems with a maximum PV input voltage of 150V and a 30A rated charge current. This controller supports various battery types, including Sealed (AGM), Gel, Flooded, and LiFePO₄, ensuring optimal charging and extended battery life. Its high tracking efficiency of up to 99.5% and peak conversion efficiency of 98% maximize energy harvest from solar panels.

2. SAFETY INSTRUCTIONS

- Ensure all wiring is correctly connected and securely fastened to prevent loose connections that could cause excessive heat.
- Always connect the battery first, then the DC load, and finally the solar panel. Disconnect in the reverse order: solar panel, then DC load, then battery.
- Install the controller in a well-ventilated area, away from flammable materials and direct sunlight.
- Use appropriate circuit breakers or fuses for the battery, load, and solar panel connections to protect against overcurrent.
- Do not attempt to repair or modify the controller yourself. Refer to qualified personnel for service.
- Wear eye protection when working with batteries.

3. PRODUCT OVERVIEW

3.1 Key Features

- Advanced MPPT technology with high tracking efficiency (up to 99.5%) and conversion efficiency (up to 98%).
- Supports 12V/24V DC auto work system voltage.
- Compatible with Sealed, Gel, Flooded, and LiFePO₄ batteries.

- Four-stage charging process (Bulk, Absorption, Float, Equalization) to optimize battery performance and lifespan.
- Comprehensive electronic protection against reverse polarity, overcharging, over-discharging, overload, short-circuiting, and reverse current.
- LCD display and three color LED indicators for intuitive system status monitoring.
- Real-time energy statistics function.
- Common negative grounding design for versatile applications.
- RS485 communication port for external accessories (MT50, BLE/WiFi Adapter, eLOG01, PC software).

3.2 Components

The package includes:

- EPEVER MPPT Solar Charge Controller (Model: XTRA3215N)
- Temperature sensor unit (Model: RT-MF58R47K3.81A)
- User Manual



Figure 1: EPEVER XTRA3215N MPPT Solar Charge Controller with dimensions. The controller measures 255mm (10.03in) in length, 185mm (7.28in) in width, and 67.8mm (2.66in) in height.



Figure 2: Back view of the EPEVER MPPT Solar Charge Controller, illustrating the heat sink fins designed for efficient heat dissipation.

4. SETUP AND INSTALLATION

4.1 Mounting the Controller

Mount the controller vertically on a flat, non-flammable surface in a well-ventilated indoor area. Ensure there is sufficient space around the controller for heat dissipation. The mounting hole size is $\Phi 5\text{mm}$.

4.2 Wiring Connections

Follow the connection order carefully to prevent damage to the controller or other components. The recommended wire cable size is #8AWG (10mm²).

1. **Connect the Battery:** Connect the battery to the controller's battery terminals. Ensure correct polarity.
2. **Connect the DC Load:** Connect the DC load to the controller's load terminals. Ensure correct polarity.
3. **Connect the Solar Panel:** Connect the solar panel to the controller's PV terminals. Ensure correct polarity.

To disconnect the system, reverse the order: first disconnect the solar panel, then the DC load, and finally the battery.

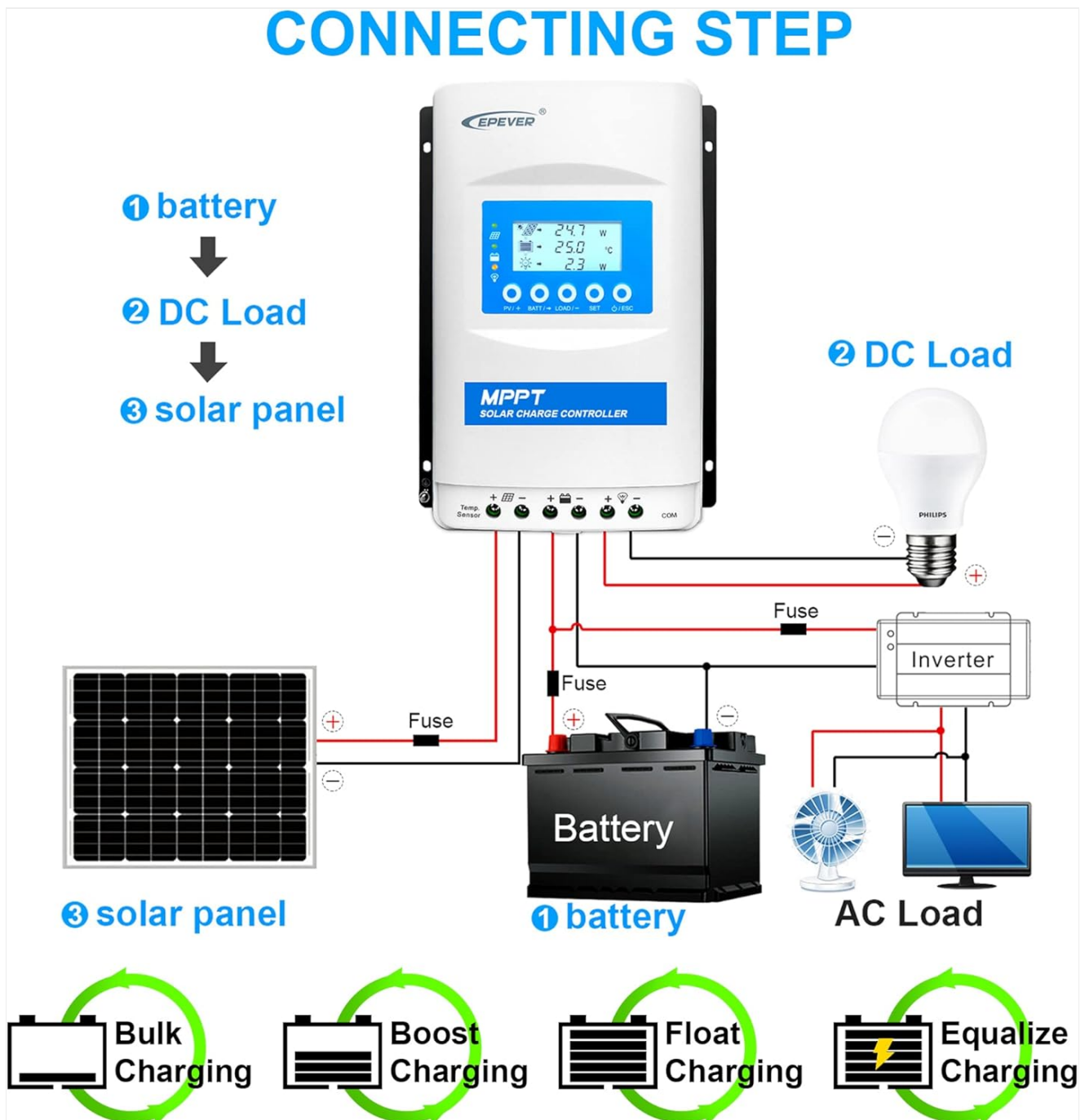


Figure 3: Connection diagram showing the proper sequence for connecting the battery, DC load, and solar panel to the EPEVER MPPT Solar Charge Controller. Fuses are recommended for protection.

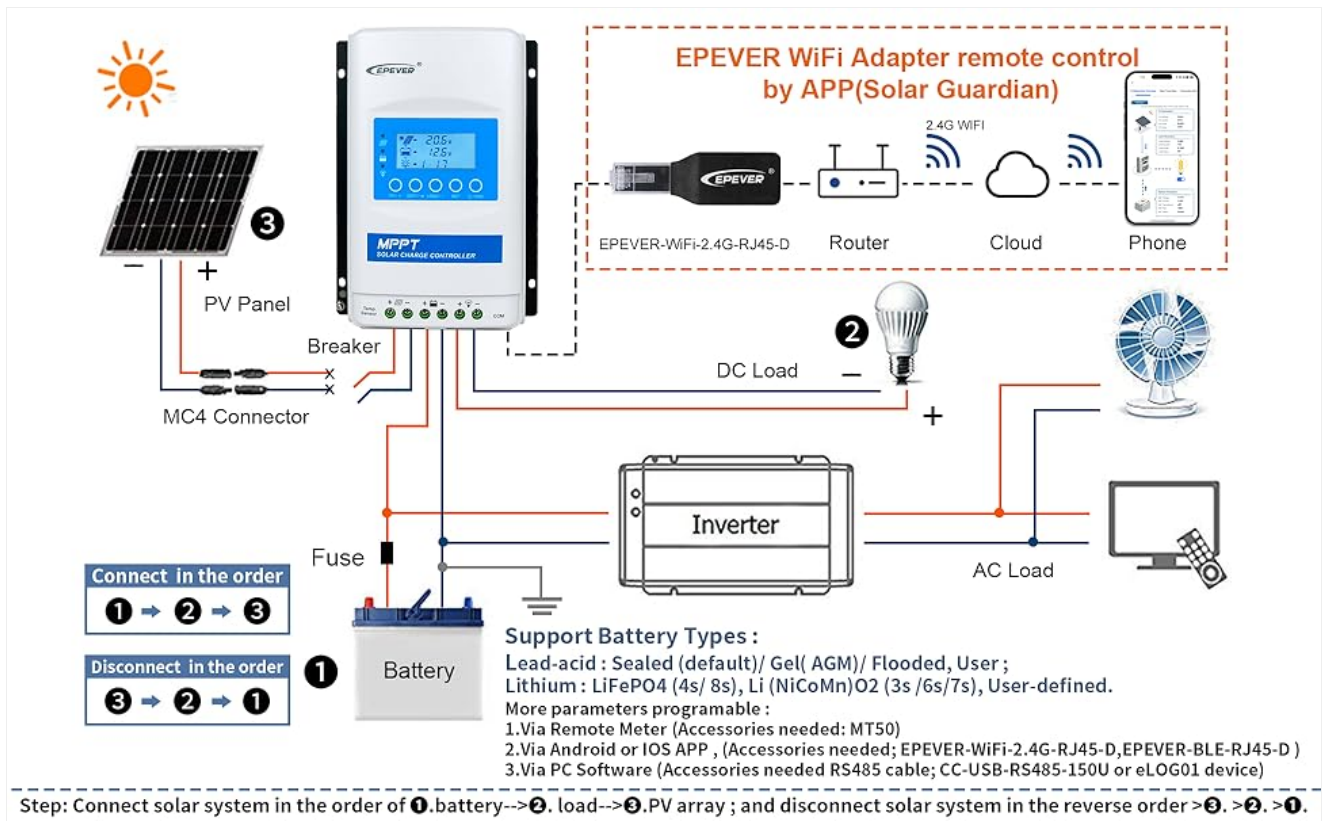


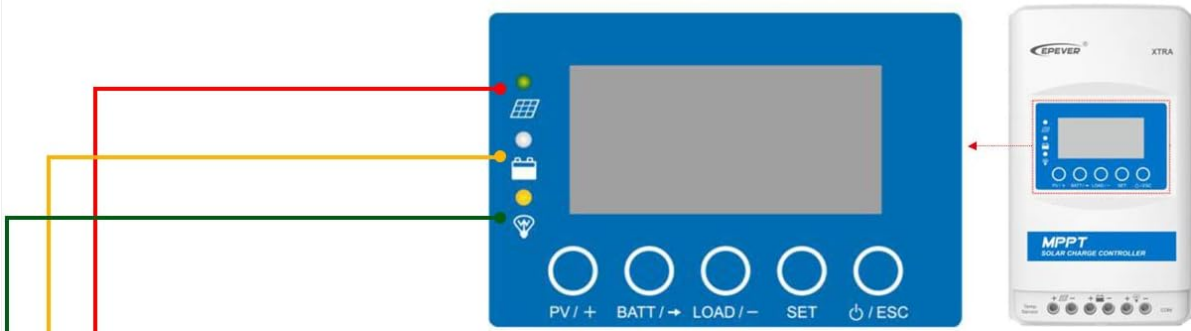
Figure 4: Detailed wiring diagram illustrating the connection of the solar panel, battery, and DC load to the controller, including optional inverter and remote monitoring accessories. Connection order is 1. Battery, 2. Load, 3. PV Array. Disconnection is in reverse order.




5. OPERATING INSTRUCTIONS

5.1 LCD Display and Buttons

The controller features a clear LCD display and five buttons for easy navigation and parameter adjustment. The buttons allow you to browse system parameters, turn the load on/off, and set battery types.

LED Indicator



Indicator	Color	Status	Instruction
	Green	On Solid	PV connection normal but low voltage(low irradiance) from PV, no charging
	Green	OFF	No PV voltage(night time) or PV connection problem
	Green	Slowly Flashing(1Hz)	In charging
	Green	Fast Flashing(4Hz)	PV Over voltage
	Green	On Solid	Normal
	Green	Slowly Flashing(1Hz)	Full
	Green	Fast Flashing(4Hz)	Over voltage
	Orange	On Solid	Under voltage
	Red	On Solid	Over discharged
	Red	Slowly Flashing(1Hz)	Battery Overheating Lithium battery Low temperature ^①
	Yellow	On Solid	Load ON
	Yellow	OFF	Load OFF
PV&BATTLED fast flashing			Controller Overheating System voltage error ^②

①When a lead-acid battery is used, the controller doesn't have the low temperature protection.

②When a lithium battery is used, the system voltage can't be identified automatically

Figure 6: LED Indicator table detailing the status and instruction for PV, Battery, and Load indicators. Green indicates normal operation or charging, orange indicates under voltage, and red indicates over-discharged or overheating conditions.

5.3 Battery Type Settings

The controller supports multiple battery types. You can select the battery type directly from the LCD or via external accessories.

Support battery types

Item	Lead-acid battery	Lithium battery
1	Sealed(default)	LiFePO4(4S/12V;8S/24V;16S/48V)
2	Gel	Li(NiCoMn)O ₂ (3S/12V;6S/24V;12S/48V)
3	Flooded	User
4	User	---



CAUTION: When the default battery type is selected, the battery voltage control parameters will be set by default and can't be changed. To change these parameters, select "User" battery type.



Lithium Battery Parameters need setting by EPEVER accessories:

- ① MT50(remote meter);
- ② WiFi Adapter or Bluetooth Adapter via APP(Solar Guardian);
- ③ CC-USB-RS485-150U via PC Software (Controller don't include accessories).

Figure 7: Interface for selecting battery types (Sealed, Gel, Flooded, LiFePO4, Li(NiCoMn)O2, User-defined). When 'User' type is selected, battery voltage control parameters can be manually adjusted via accessories.



Figure 8: A detailed table showing default voltage parameters for Lead-acid (Sealed, Gel, Flooded) and Lithium (LiFePO4, Li(NiCoMn)O2) battery types. The 'User' type allows for customized settings, which can be adjusted via accessories like MT50, eBox, or PC software.

5.4 Remote Monitoring

The controller can be monitored and configured remotely using various accessories:

- **MT50 Remote Meter:** Provides a remote display and control interface.
- **BLE/WiFi Adapter:** Allows monitoring and parameter modification via a mobile app (Solar Guardian).
- **eLOG01 Data Logger:** Records system data.
- **PC Software:** Connects via RS485 interface (CC-USB-RS485-150U cable) for detailed monitoring and configuration.



Figure 9: Overview of EPEVER remote monitoring accessories, including the MT50 remote meter, WiFi adapter, and PC connection options for comprehensive system management.



Figure 10: Illustration of real-time remote monitoring capabilities using the mobile APP via 2.4G WiFi and a PC cloud platform, allowing users to access system data anytime, anywhere.

6. MAINTENANCE

- **Regular Inspection:** Periodically check all wiring connections for tightness and corrosion.

- **Cleaning:** Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning. Do not use liquids.
- **Ventilation:** Ensure the ventilation openings are not blocked to allow proper heat dissipation.
- **Battery Check:** Regularly inspect battery terminals for corrosion and ensure battery fluid levels (for flooded batteries) are adequate.
- **System Performance:** Monitor the system's performance via the LCD or remote monitoring tools to ensure optimal operation.

7. TROUBLESHOOTING

Refer to the LED indicator table (Figure 6) for common status and error indications. If an issue persists, check the following:

- **No PV Voltage:** Check solar panel connections, ensure sufficient sunlight, and verify PV array voltage.
- **Battery Not Charging:** Verify battery connections, check battery voltage, and ensure PV input is sufficient.
- **Load Not Working:** Check load connections, ensure battery voltage is above the low voltage disconnect setting, and verify load current does not exceed the controller's rating.
- **Over-Discharged Battery:** The controller will protect the battery from over-discharge. Recharge the battery promptly.
- **Controller Overheating:** Ensure adequate ventilation and that the ambient temperature is within the operating range.

For complex issues, consult the detailed troubleshooting section in the full product manual or contact EPEVER technical support.

8. SPECIFICATIONS

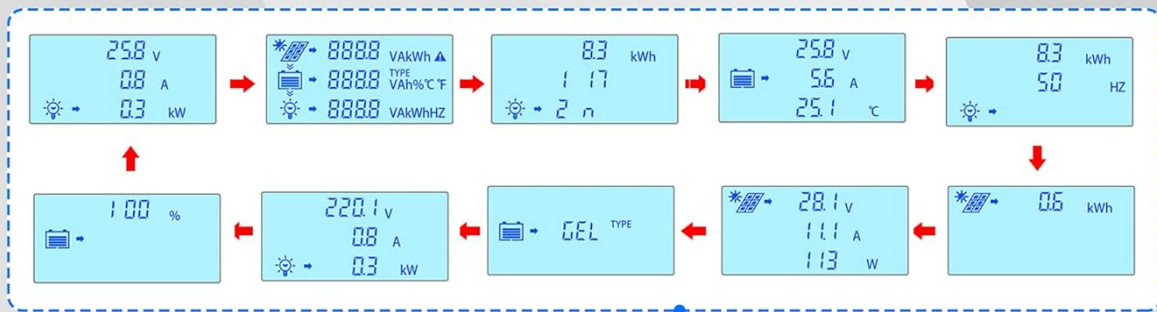
8.1 Electrical Parameters (XTRA3215N)

Parameter	Value
Nominal System Voltage	12V/24V DC Auto
Rated Charge Current	30A
Rated Discharge Current	30A
Battery Input Voltage Range	8~32V
Max. PV Open Circuit Voltage	150V (at min. operating temp), 138V (at 25°C)
MPPT Voltage Range	V(BAT+2V)~108V
Max. PV Input Power	390W (12V system), 780W (24V system)
Battery Type Support	Lead-Acid (Sealed, Gel, Flooded, User), Li-ion (LiFePO4, Li-NiCoMn, User)
Grounding	Common Negative
RS485 Interface	5VDC/200mA (RJ45)
MPPT Tracking Efficiency	≥99.5%
Max. Conversion Efficiency	98%

8.2 Mechanical Parameters (XTRA3215N)

Parameter	Value
Dimensions (L x W x H)	255 x 185 x 67.8 mm (10.04 x 7.28 x 2.67 inches)
Mounting Dimension	200 x 176 mm
Mounting Hole Size	Φ5mm
Controller Terminals	#6AWG (16mm ²)
Recommended Wire Cable	#8AWG (10mm ²)
Weight	1.70 KG
Working Environment Temperature	-25°C to +45°C
Storage Temperature Range	-20°C to +70°C
Material	Plastic
Display Type	LCD and LED

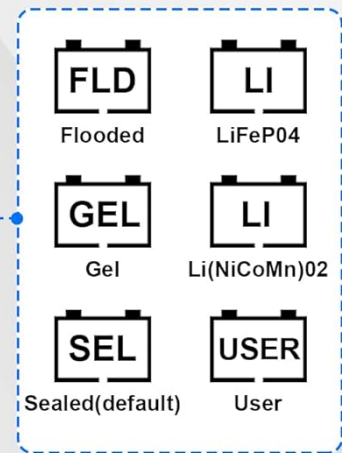
Browse interface



Upgraded version



Support Battery Type



Set the Battery Type with the LCD

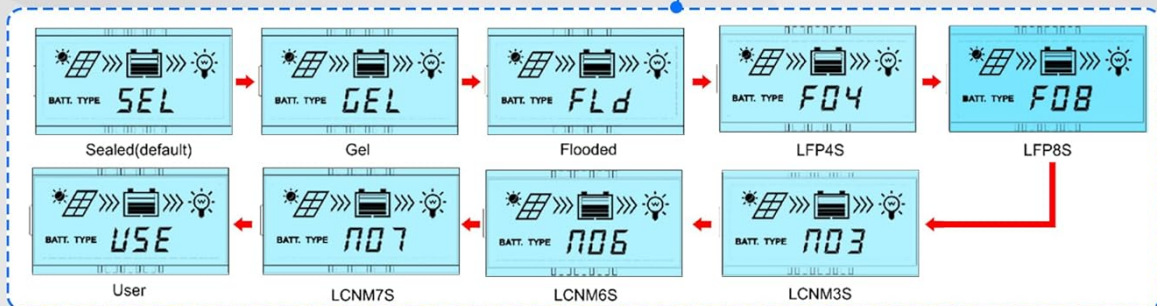


Figure 11: Table detailing mechanical parameters for various EPEVER XTRA series controllers, including dimensions, mounting dimensions, and weight.

Electrical Parameters

Model	XTRA 3210N	XTRA 3215N	XTRA 3415N	XTRA 4210N	XTRA 4215N	XTRA 4415N
Nominal system voltage	12/24VDC auto		12/24/36/48VDC auto	12/24VDC auto		12/24/36/48VDC auto
Rated charge current	30A			40A		
Rated discharge current	30A			40A		
Battery input voltage range	8~32V		8~68V	8~32V		8~68V
Max.PV open circuit voltage	XTRA**10N :100Vat Min operating environment temp;92Vat 25°Cenvironment temp XTRA**15N :150Vat Min operating environment temp;138Vat 25°Cenvironment temp					
MPPT voltage range	XTRA**10N :(Battery voltage +2V) ~ 72V XTRA**15N:(Battery voltage +2V) ~ 108V					
Max.PV input power	390W/12V 780W/24V	390W/12V 780W/24V	390W/12V 780W/24V 1170W/36V 1560W/48V	520W/12V 1040W/24V	520W/12V 1040W/24V	520W/12V 1040W/24V 1560W/36V 2080W/48V
Battery type	Lead-Acid:Sealed/Gel/Flooded/User Li-ion Battery:LiFePO4/Li-NiCoMn/User					
Dimension	230x165x63mm	255x185x67.8mm	255x187x75.7mm	255x185x67.8mm	255x187x75.7mm	255x189x83.2mm
Controller terminals	6AWG(16mm ²)					
Recommended cable	8AWG(10mm ²)			6AWG(16mm ²)		
Net weight	1.31kg	1.70kg	2.07kg	1.70kg	2.07kg	2.47kg



Figure 12: Table outlining electrical parameters for the EPEVER XTRA series, including nominal system voltage, rated charge/discharge current, PV input voltage, and supported battery types across different models.

9. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the official EPEVER website or contact your authorized dealer. Ensure you have your product model number (XTRA3215N) and purchase details available when seeking support.