CUTTING EDGE POWER CEP440 Rebel Charge Controller User Manual

Contents

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Safety Instructions

Please save these instructions
General Safety Information

1. Read all of the instructions and cautions in the manual before installation.
2. There are no repairable parts for this controller, do not disassemble or attempt to repair the controller.
3. Keep the controller from the water.
4. Make sure all connections with controller are tight.

Charge Controller Safety

1. NEVER connect the solar panel array to the controller without a battery. The battery must be connected first.
2. Ensure input voltage does not exceed 150 VDC to prevent permanent damage.
3. Ensure that the output current of the solar panel does not exceed the rated charging current of the controller.

Battery Safety

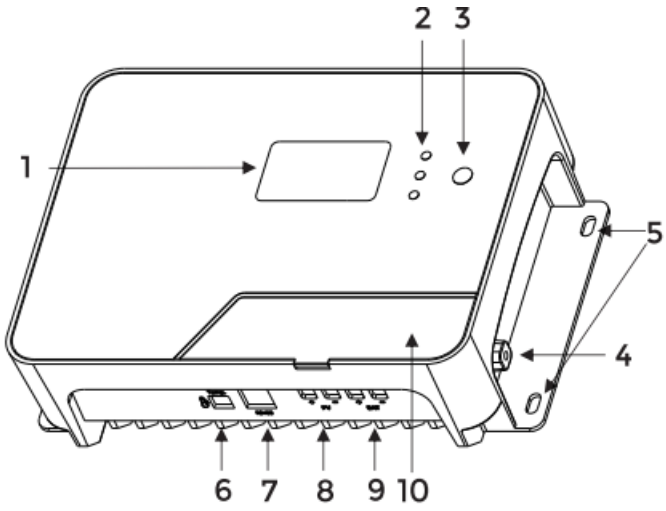
1. Do NOT let the positive(+) and negative(-) terminals of the battery touch each other.
2. Explosive battery gases may be present while charging. Be certain there is enough ventilation to release the gases.
3. Be careful when working with large lead-acid batteries. Wear goggles and have fresh water available in case there is contact with the battery acid.
4. Over-charging and excessive gas precipitation may damage the battery plates and activate material shedding on them. Too high of an equalizing charge or too long of one may cause damage. Please carefully review the specific requirements of the battery used in the system.

Features

1. Aluminum shell and tempered glass cover, the controller has good heat dissipation effect.

2. Built-in BT communication module mobile phone APP operation {Android and 105).
3. Filled with silicon/polyurethane inside for better cooling and waterproofing.
4. Compatible with lead-acid batteries and lithium batteries, support 12V/ 24V battery system, and can automatically identify the voltage of lead-acid batteries.
5. Backlit display on the screen, touch button operation.
6. Built-in reverse connection protection, open circuit protection, high temperature protection, over current/short circuit protection, all of which are self-healing, no damage to the controller.

Identification Of Parts



1. LCD Display Screen
2. LED Indicator (PV, BAT, FAULT)
3. Touch Screen Button
4. Grounded Terminal
5. Installation Mounting Holes
6. External Temperature Sensor Port
7. RS485 Communication Port
8. Solar Input Terminals
9. Battery Terminals
10. Magnetic Cover

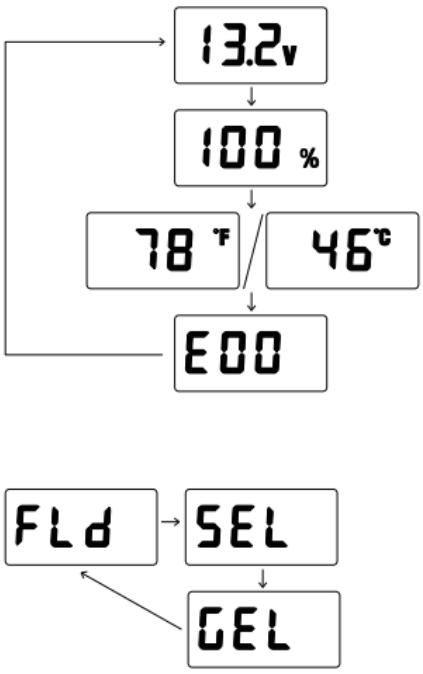
LCD Display Interface

Main Menu Interface

Setting Battery Mode

Battery Type	Description	NOTE
FLD	Flooded Lead Acid battery	Parameters set on default, not
SEL	Sealed Lead Acid battery (SLD/AGM)	adjustable. Battery system
		voltage
GEL	Gel Battery	automatically recognized.

LCD Display Setting



13.2v **Battery Voltage**

100 % **Battery SOC**

Temperature

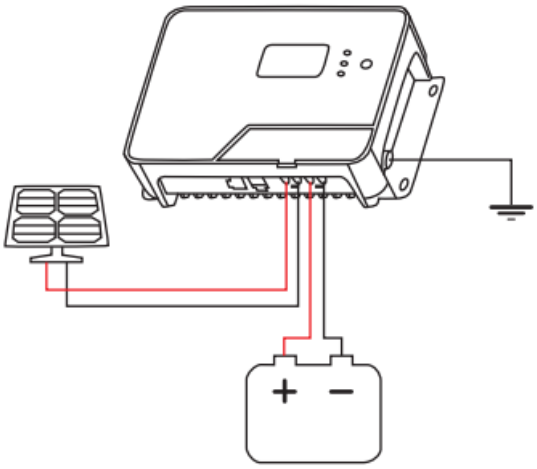
46°C
78 °F

(Enter the temperature sub-menu, press and hold the button for more than 2s to make the button parameters flash, short press to adjust Celsius/Fahrenheit), Finally, long press to save the parameters.

E00 **Error Code**

System Wiring

1. The positive and negative poles of the battery must be connected to the battery terminals of the controller first.
2. Connect the positive and negative poles of the solar panel to the PV terminals of the controller.
3. Make sure that the Bluetooth of the mobile phone is turned on, and open the APP “ChargePro 2.0” to enter the setting interface.



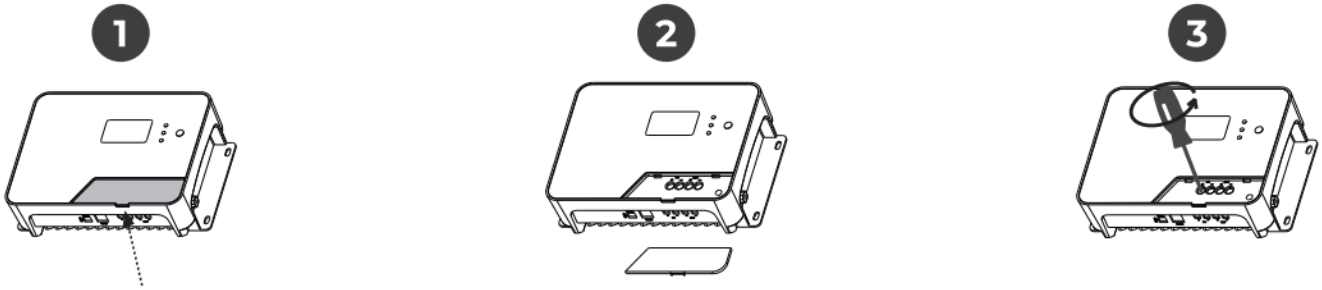
Note: Please strictly follow the above sequence for connection, otherwise the controller may be damaged. The disassembly sequence is opposite to the wiring one.

Caution

1. First make sure your battery system is 12V / 24V (Lead-acid batteries can automatically identify the battery voltage, if you use lithium batteries, you must manually adjust the voltage to ensure that the battery voltage is consistent with the system voltage)
2. Ensure that the maximum open-circuit voltage of the solar system does not exceed ISOV.
3. Ensure that the maximum output current of the solar panel does not exceed 40A.
4. Ensure that the voltage of the solar panel is higher than the battery voltage.

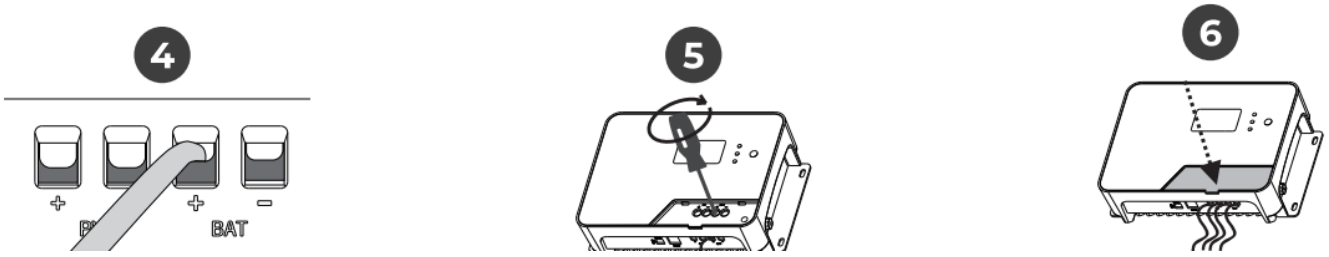
Wiring Instructions

1. Remove the magnetic cover. (Pick up)
2. Put the magnetic cover aside.
3. Unscrew the screws. (Counterclockwise)



4. Plug the cable into the correct port.
5. Tighten the screws. (Clockwise)

6. Check the wiring condition and put the magnetic cover back.



APP operation

1. Click the “BT icon” in the upper right corner to search for the BT device “PVChargePro”.
2. Click the “menu”  in the upper left corner to check whether BT is connected.
3. Click “Parameter Setting” 

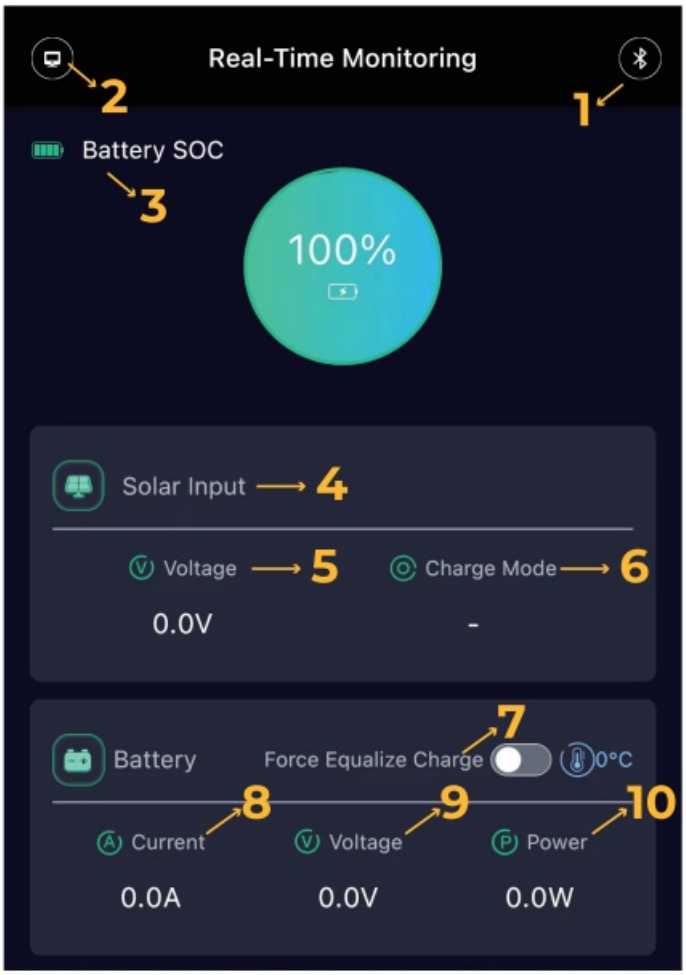
in the bottom right Paramater ettmgs corner to set the parameters.
4. Click the “unlocked” 

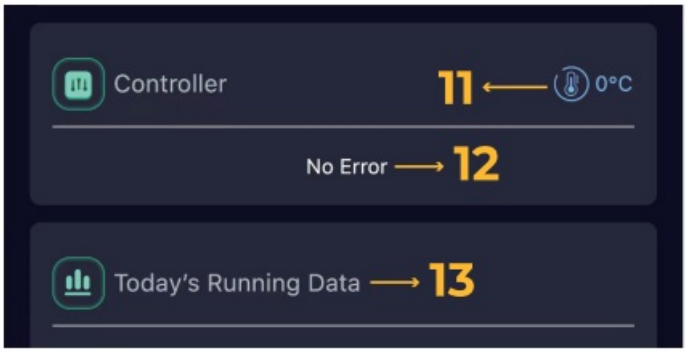
Locked I lock shape icon to confirm the unlocking for parameter setting.
    1. Select the battery type, {FLD, SEL, GEL) battery do not need to set other parameters because the voltage is automatically identified by default, and other parameters are in accordance with the default values.
    2. Select LI, you need to manually click the system voltage to set the voltage, other parameters are recommended to follow the default value {the boost charge voltage is allowed to set}.
    3. Select USE, you can set all parameters.
5. Click to confirm after setting the above parameters.
6. The “Real-Time Monitoring” 

can check the real-time working status of the solar system, and the “Historical Data” 

can check the historical working status of the solar system.

APP MAIN INTERFACE


Real-Time Monitoring
1
2
Battery SOC
3
100%
Solar Input
4
Voltage
5
Charge Mode
6
0.0V
-
Battery
Force Equalize Charge
7
0°C
8
9
10
Current
Voltage
Power
0.0A
0.0V
0.0W

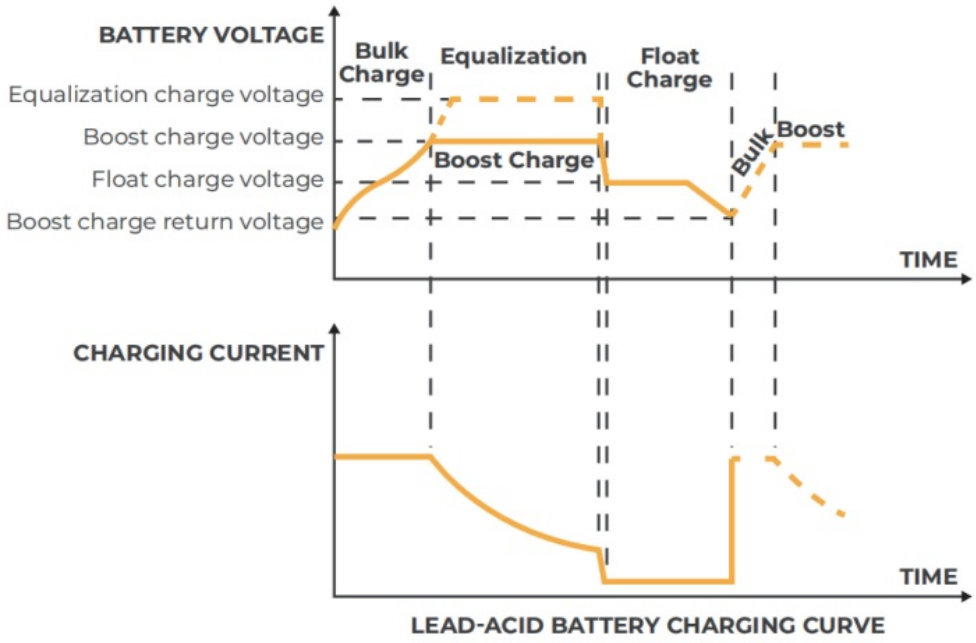

Controller
11
0°C
No Error
12
Today's Running Data
13


14
15
16
Real-Time Monitoring
Historical Data
Parameter Settings

NO	Item	Description
1	BT connection	Mobile phone BT connection controller
2	Device Information	Check the BT connection status and modify the display font size
3	Battery SOC Information	Display the present battery capacity
4	Solar Input Information	
5	PV Voltage	Real-time output voltage of solar panel
6	Charge Mode	Display the present charge mode: MPPT (Buck) / Boost / Float / Equalize
7	Equalization charge	If equalization charging is turned on, charge according to the default equalization charging method; If equalization charging is turned off , you need to disconnect the solar panel and battery, disconnect the Bluetooth device and finally reconnect to restore the off state
8	Battery Charge Current	Display the real-time charging current of the battery
9	Battery Voltage	Display the real-time voltage of the battery
10	Battery Charge Power	Display the present battery charge power
11	Controller Temperature	
12	Controller Error Info	See the error code introduction in the manual
13	Today's Running Data	Display system working status at present
14	Real-Time Monitoring	Check the real-time working status of the solar system
15	Historical Data	Check the historical working status of the solar system
16	Parameter Setting	Set the charging parameters of the solar panel to the battery

Lead-acid Battery Working Stage

1. **Lead-acid Battery Working Stage**
    1. **Bulk Charge:** Constant current charging, providing the maximum current to the battery until the battery voltage reaches the constant voltage stage (boost charging voltage or equalize charging voltage).
    2. **Boost Charge:** Constant voltage charging, the battery is charged for 120 minutes at an elevated charging voltage.



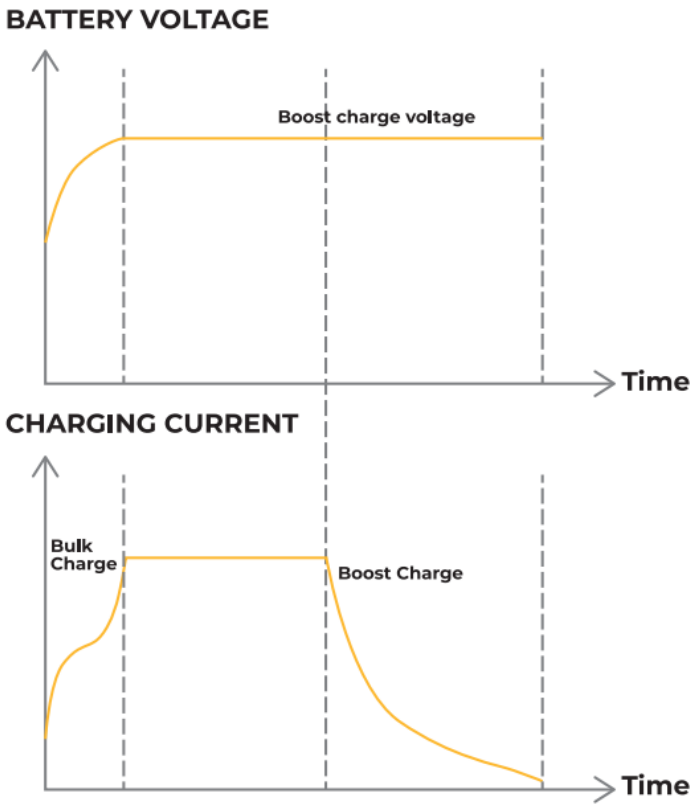
    3. **Float Charge:** After the boost charge, the controller will reduce the battery voltage by reducing the charging current, and let the battery voltage be maintained at the set value of the floating charge voltage. During the floating charge stage, the battery is charged very weakly to ensure that the battery is maintained in a fully charged state. In the floating charge stage, the load can obtain nearly all solar power. If the load exceeds the power that solar energy can provide, the controller will not be able to maintain the battery voltage at the floating charge stage. When the battery voltage is low to the set value of boost charge return voltage, the system will exit the floating charging stage and enter the bulk charging stage again.
    4. **Equalization:** Equalization charging raises the battery voltage to higher than the standard supplementary voltage to charge the battery. Certain types of lead-acid batteries benefit from regular equalization charging, which can agitate the electrolyte, balance the battery voltage, complete a chemical reaction, and prevent battery vulcanization.

       Note: Only FLD, SLD and AGM can perform equalization charging. The equalization charge will be carried out every 30 days, and the charge time is 120 minutes. When the battery is charged in equalization, the boost charge stage will not be performed.

Lithium Battery Working Stage

1. **Bulk Charge:** Constant current charging, providing the maximum current to the battery until the battery reaches the boost charge voltage.
2. **Boost Charge:** Charge with a constant current. When it is about to be fully charged, the charging current begins to drop, and finally charges with a small current. During this process, the charging voltage is constant to

maintain the boost charge voltage.



LITHIUM BATTERY CHARGING CURVE

Error Code

Error code	Cause of failure	Solution
E00	No Error	/
E02	The battery voltage is higher than the system voltage	The battery voltage drops to the return value.
E06	The controller temperature is too high	The temperature drops to the return value
E07	The ambient temperature is too high	Disconnect the controller and lower the ambient temperature
E10	The input voltage of the solar panel is too high, exceeding 150V	Change the solar panel series-parallel connection, the solar panel is connected in parallel, and the voltage is lower than 150V to recover.
E13	The positive and negative connections of the solar panel are reversed	Disconnect and reconnect with correct wire polarity.
E14	The positive and negative connections of the battery are reversed	Disconnect and reconnect with correct wire polarity.

LED Signal Instruction

LED NAME	LED Color	LED Display	Signal Indication
PV	Green	Off	Not In Charge
		Steady On	In Charge
BAT	Green	Fast Flash	Battery Over Voltage
		Steady On	Battery On & Normal
FAULT	Red	Off	No Error or Alarm
		Steady On	System with Error or Alarm

BASE SPECIFICATION

System voltage:	12V/24V Auto (FLD/GEL/SLD) Manual (Li/User)
Rated charging current:	40A
Maximum PV input voltage:	150V
Maximum input of PV system:	600W/12V; 1200W/24V
Communication function:	APP
No-load loss:	12ma (12V),10ma(24V)
Working temperature:	-35°C ~ +45°C/-31°F～113°F
Protection level:	IP34
Altitude:	≤3000m
Net weight:	2.1KG
Dimensions:	8.6*5.9*2.6 (inch)
Installation size:	8.1*2.4(inch)
Installation aperture:	ϕ 0.2(inch)

BATTERY CHARGE PARAMETER

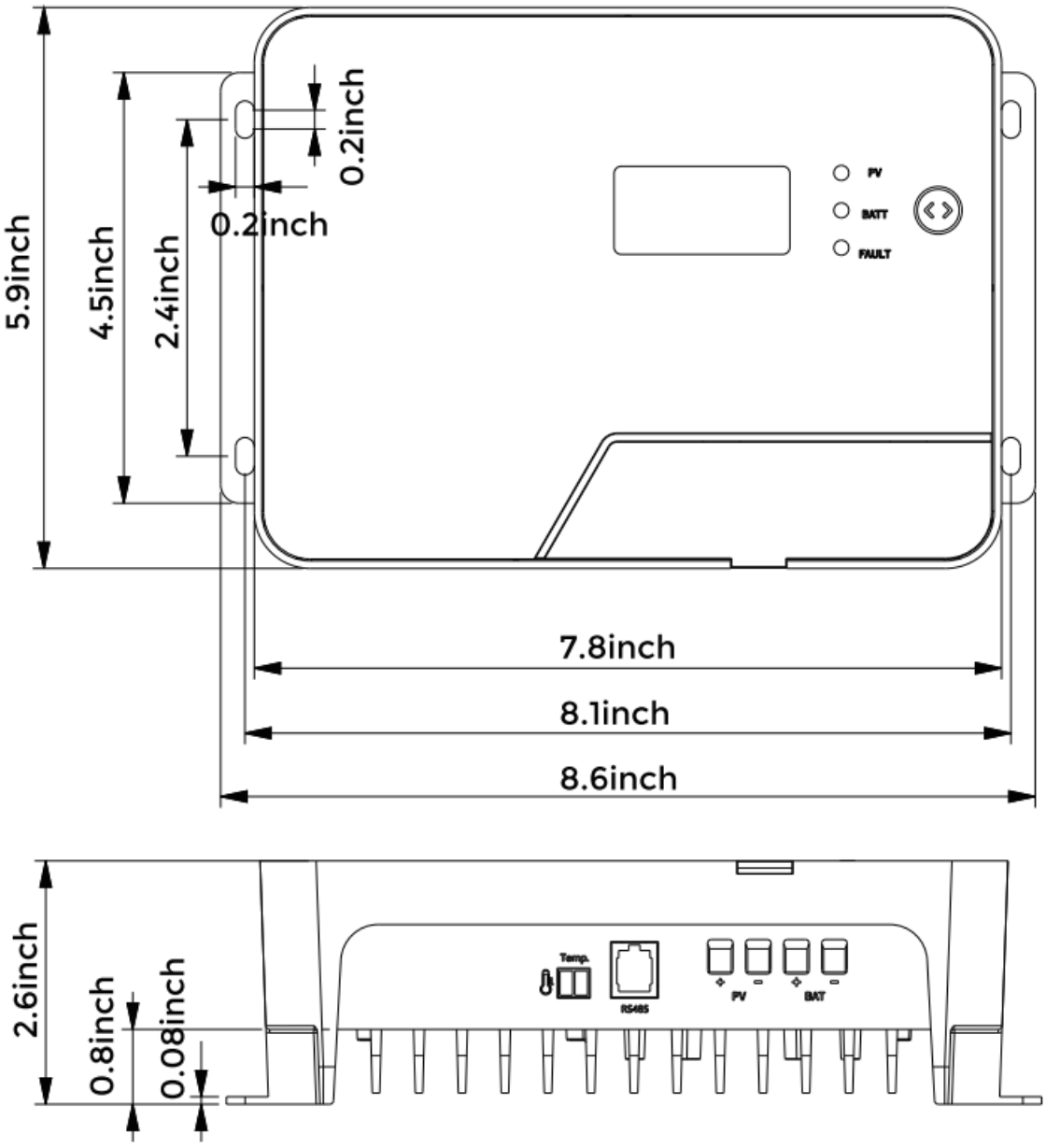
Battery Types	FLD	SEL	GEL	USER	LI
Equalizing Charge Voltage	14.8V*n	14.6V*n		Default: GEL	
Boost Charge Voltage	14.6V*n	14.4V*n	14.2V*n	Default: GEL	Default: 14.2V*n
Floating Charge Voltage	13.8V*n			Default: GEL	
Boost Charge Return Voltage	13.2V*n			Default: GEL	
Equalization Charge Time	2 hour	2 hour		Default: GEL	
Equalizing Charge Interval	30 day	30 day		Default: GEL	

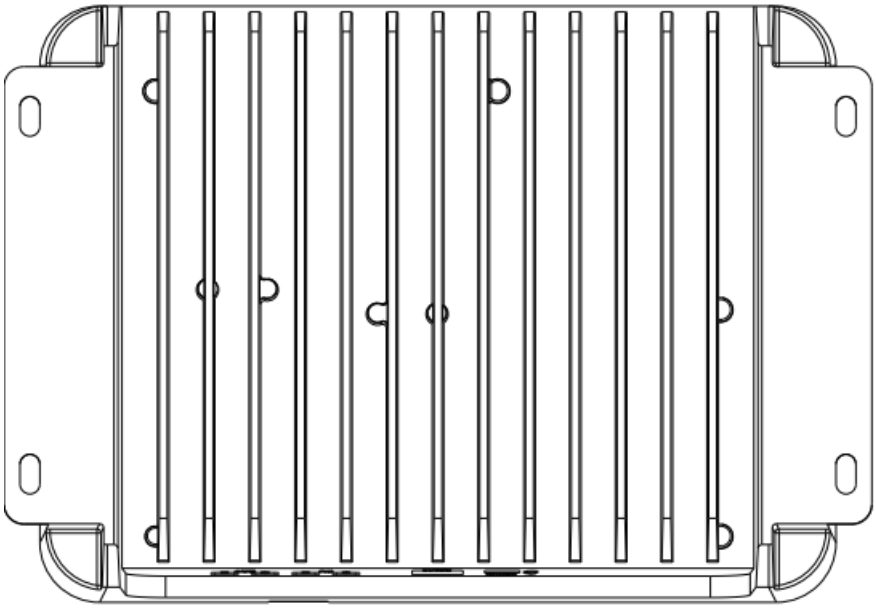
Temperature Compensation	-3mV / 2v / 0 c	Default: GEL	

Note:

1. n=l for 12V system; n=2 for 24V system; n=3 for 36V system; n=4 for 48V system;
2. The parameters corresponding to the yellow font can be modified by APP, and the other parameters cannot be modified.

CONTROLLER DIMENSION





- **Product Dimension**: 8.6*5.9*2.6inch
- **Installation Area Dimension:** 8.1*2.4inch
- **Installation Hole Size:** 0.2*0.2inch
- **Connection Socket Size:** 0.3*0.3inch

Documents / Resources

	CUTTING EDGE POWER CEP440 Rebel Charge Controller [pdf] User Manual CEP440 Rebel Charge Controller, CEP440, Rebel Charge Controller, Charge Controller, Controller