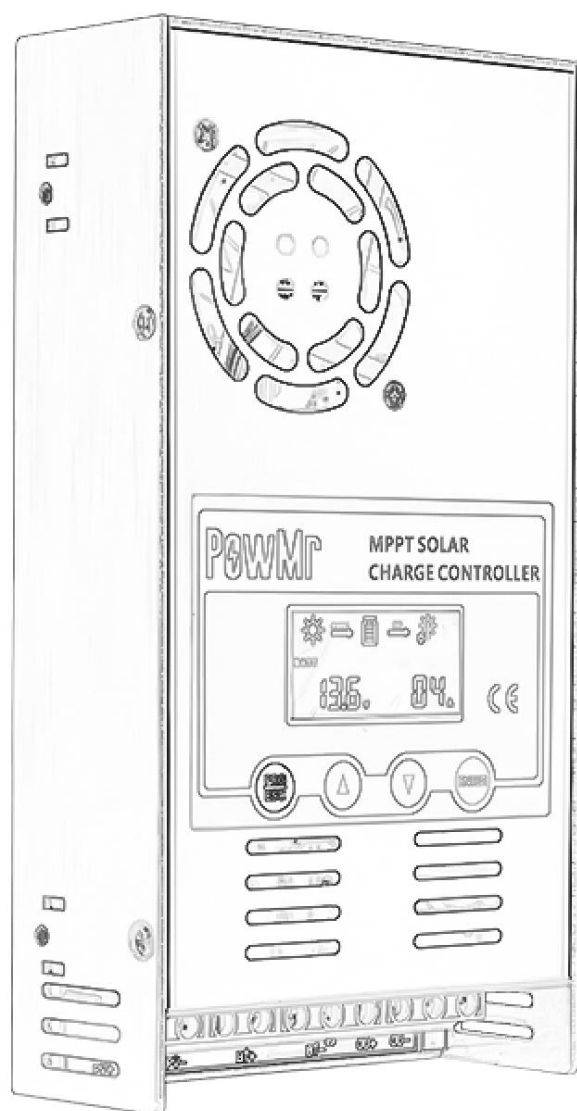


Product Type

HHJ-60A



POWMr

MPPT Solar Charge Controller

User Manual



Important Safety Instructions



Please save these instructions.

This manual contains important safety, installation, and operating instructions for the charge controller. The following symbols are used throughout the manual to indicate potentially dangerous conditions or important safety information.

WARNING

Indicates a potentially dangerous condition. User extreme caution when performing this task.

CAUTION

Indicates a critical procedure for safe and proper operation of the controller.

NOTE

Indicates a procedure or function that is important to the safe and proper operation of the controller.

➤ **General Safety Information**

- Read all of the instructions and cautions in the manual before beginning the installation.
- There are no serviceable parts for this controller. Do NOT disassemble or attempt to repair the controller.
- Do NOT allow water to enter the controller.
- Make sure all connections going into and from the controller are tight.

➤ **Charge Controller Safety**

- NEVER connect the solar panel array to the controller without a battery. Battery must be connected first.
- Ensure input voltage does not exceed 190 VDC to prevent permanent damage. Use the Open Circuit Voltage (Voc) to make sure the voltage does not exceed this value when connecting panels together.

➤ **Battery Safety**

- Use only sealed lead-acid, flooded, gel or lithium batteries which must be deep cycle.
- Explosive battery gases may be present while charging. Be certain there is enough ventilation to release the gases.
- Be careful when working with large lead acid batteries. Wear eye protection and have fresh water available in case there is contact with the battery acid.
- Carefully read battery manuals before operation.
- Do NOT let the positive (+) and negative (-) terminals of the battery touch each other. Recycle battery when it is replaced.

- 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.
- Equalization is carried out only for non-sealed / vented/ flooded / wet cell lead acid batteries.
- Do NOT equalize VRLA type AGM / Gel / Lithium cell batteries UNLESS permitted by battery manufacturer.

WARNING

- Connect battery terminals to the charge controller BEFORE connecting the solar panel(s) to the charge controller. NEVER connect solar panels to charge controller until the battery is connected.
- Do NOT connect any inverters or battery charger into the load terminal of the charge controller.
- Once equalization is active in the battery charging, it will not exit this stage unless there is adequate charging current from the solar panel. There should be NO load on the batteries when in equalization charging stage.

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Warranty

Dear Customers,

Thanks for choosing the MPPT series solar charge controller.

Please take time to read this user manual carefully, it will help you to make full use of many advantages the controller can provide your solar system.

This manual gives important recommendations for installing and using and so on. Read it carefully in your own interest and pay attention to the safety recommendations in it please.

According to the prescription, any damaged unit caused by the user's failure to install, disassemble or incorrect use of this product may provide maintenance.

1.1 Warranty regulations:

- 1) within 30 days from the date of purchased, the faulty controller will be free to be replaced the under normal using (with the authorized technical personnel authorized by the company).
- 2) within 2 years from the date of purchased, the faulty controller will be free to be repaired.

Notes: Disassembled privately, no warranty

General Safety Information and waiver liability

- 1) Read all of the instructions and cautions in the manual before beginning the installation.
- 2) There are no serviceable parts for this controller. Do NOT disassemble or attempt to repair the controller.
- 3) Make sure all connections going into and from the controller are tight. There may be sparks
- 4) when making connections, therefore, make sure there are not flammable materials or gases near installation and cool place.
- 5) Red wire connected positive Pole of controller and black wire connected positive Pole of controller
- 6) Contact us first if you have any questions.

➤ **Liability Disclaimer**

The manufacture shall not be liable for damages, especially on the battery, caused by use other than as intended or as mentioned in this manual or if the recommendations of the battery manufacturer are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorized person, unusual use, wrong installation, or bad system design.

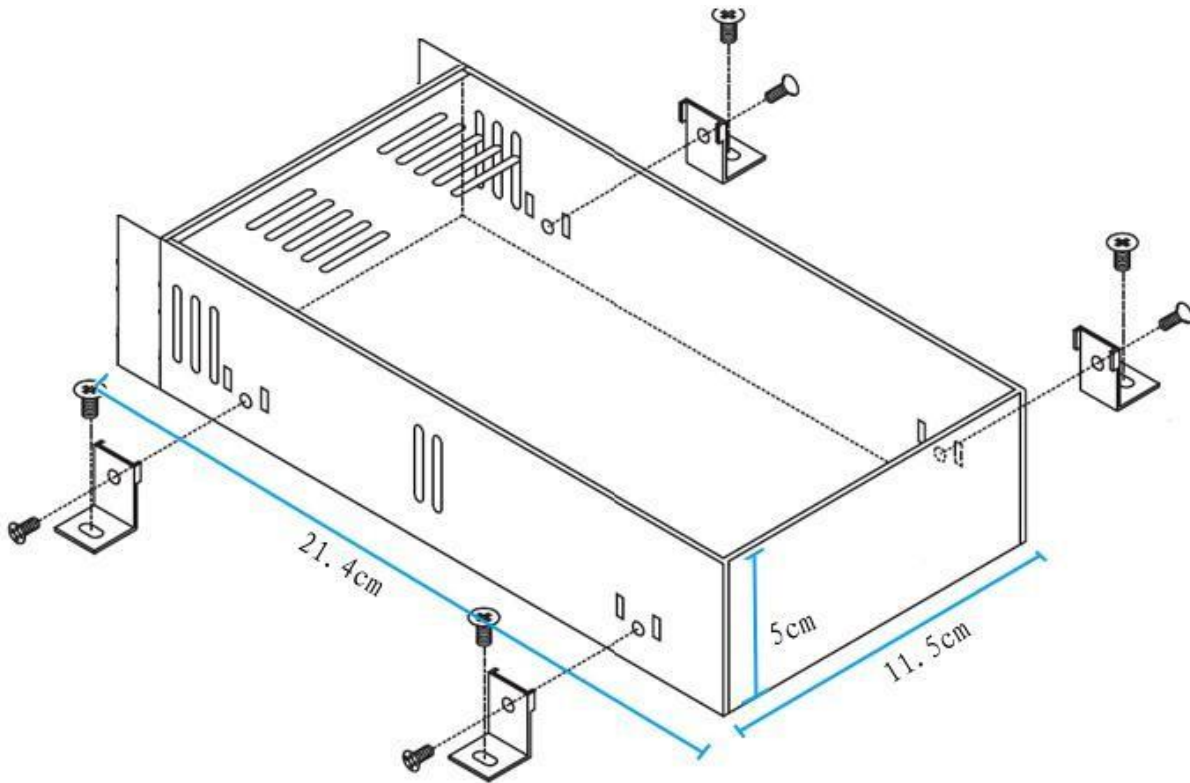
Overview

MPPT series solar charge controller is based on an advanced maximum power point tracking (MPPT) technology developed, dedicated to the solar system, the charge controller conversion efficiency up to 97%.

It comes with a number of outstanding features, such as:

1. HHJ-60A solar charge controller
2. 100% MPPT technology
3. Built-in DSP controller with high performance
4. Automatic switch for 12V/24V/36V/48V battery bank
5. stage charging optimizes battery performance
6. Overcharge protection, input PV polarity reverse protection, output limited current protection, over-temperature protection
7. Trouble shooting promotion function
8. Suitable for battery types such as sealed lead acid , vented gel and lithium battery.
9. Easy to be mounted

Dimensions



Notes:

Please use our screws only since it damaged the internal PCB if using other screws. Please use proper torque to push the screws into casing since it may damage the internal PCB by strong torque

Installation

➤ Instruction Notes

1st step: Connect the batteries

Connect the battery connection cable with the correct polarity to the middle pair of terminals on the solar charge controller (with the battery symbol). If the system is 12V, please make sure your battery voltage is more than 12V, then the controller can boot up.

2nd step: Connect the solar panel

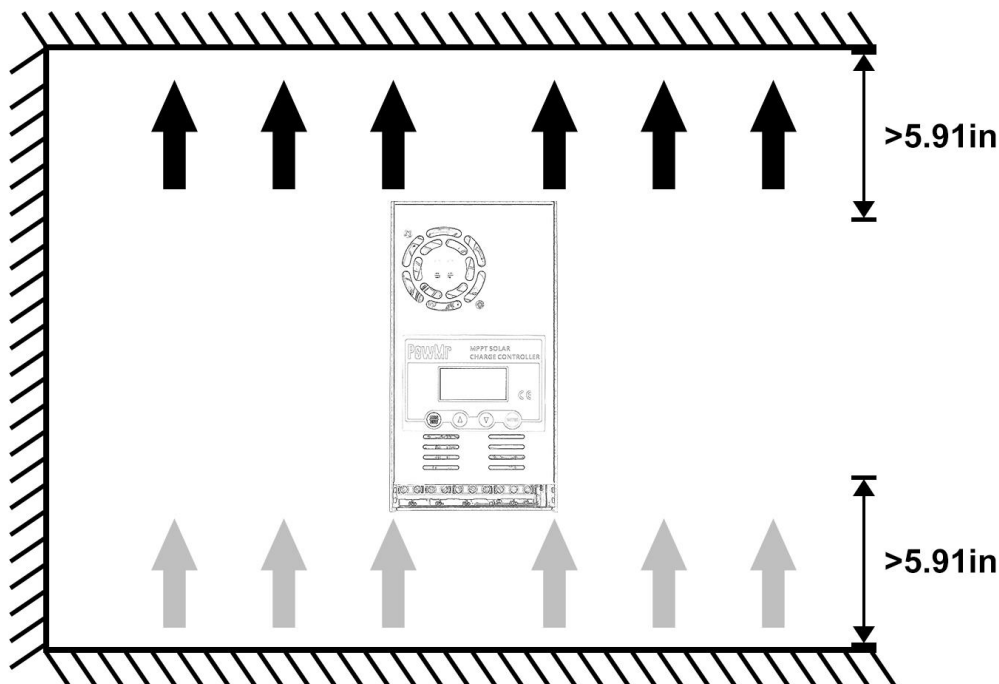
Ensure that the PV modules are protected from incident light. Ensure that the solar panel doesn't exceed the maximum permissible input current. Connect the PV modules connection cable to the correct polarity of the left pair of terminals on the solar charge controller (with the PV modules symbol).

3rd step: connect loads

Connect the load cable to the correct polarity of the right pair of terminals on the solar charge controller (with the lamp symbol).to avoid any voltage on the wires, please connect the wire to the load before connect to the controller.

4th step: Final worked

Tight all cables connected to the controller and remove all the debris around the controller (leaving a space of approx. 5.91 in)



Notes:

When the reading data of PV or battery is constantly changing, don't worry about it, the controller is finding MPP point, it's caused by your PV input power or voltage isn't enough, please contact us soon, our technological team will assist you.

➤ Air Circuit Breaker Installation

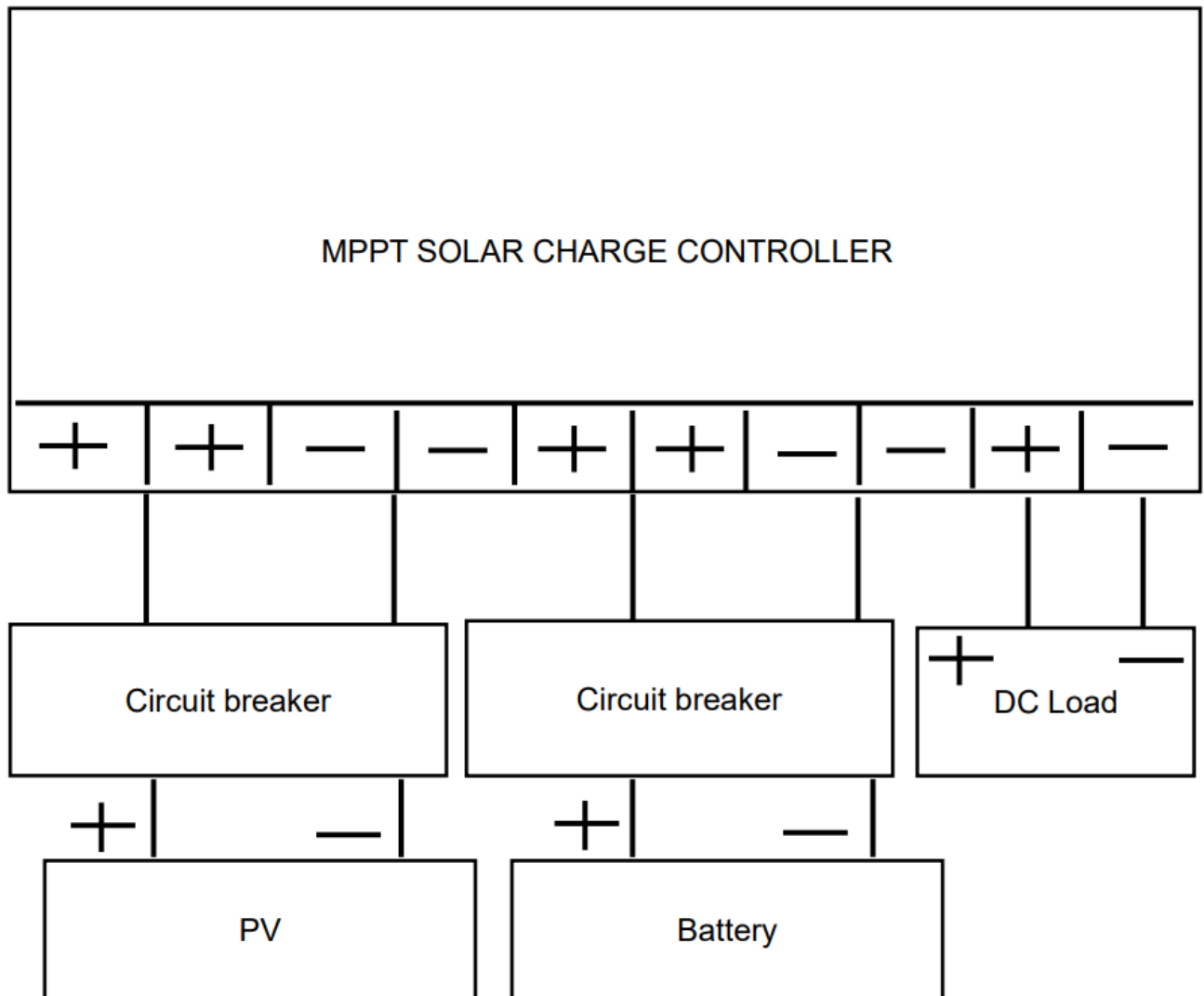
We strongly recommend connecting a fuse directly to the battery to protect any short circuit at the battery wiring. Solar PV modules create current whenever light strikes them. The current created varies with the light intensity, but even in the case of low levels of light, full voltage is given by the modules. So, protect the solar modules from incident light during installation. Never touch uninsulated cable ends, use only insulated tools, and make sure that the wire diameter is in accordance with the expected currents of the solar charge controller. Connections must always be made in the sequence described below.

Air Circuit Breaker and Wires Requirement

Models	Copper wires	Air circuit breakers
HHJ-60A	6mm ² x2PCS	100A

Reminder

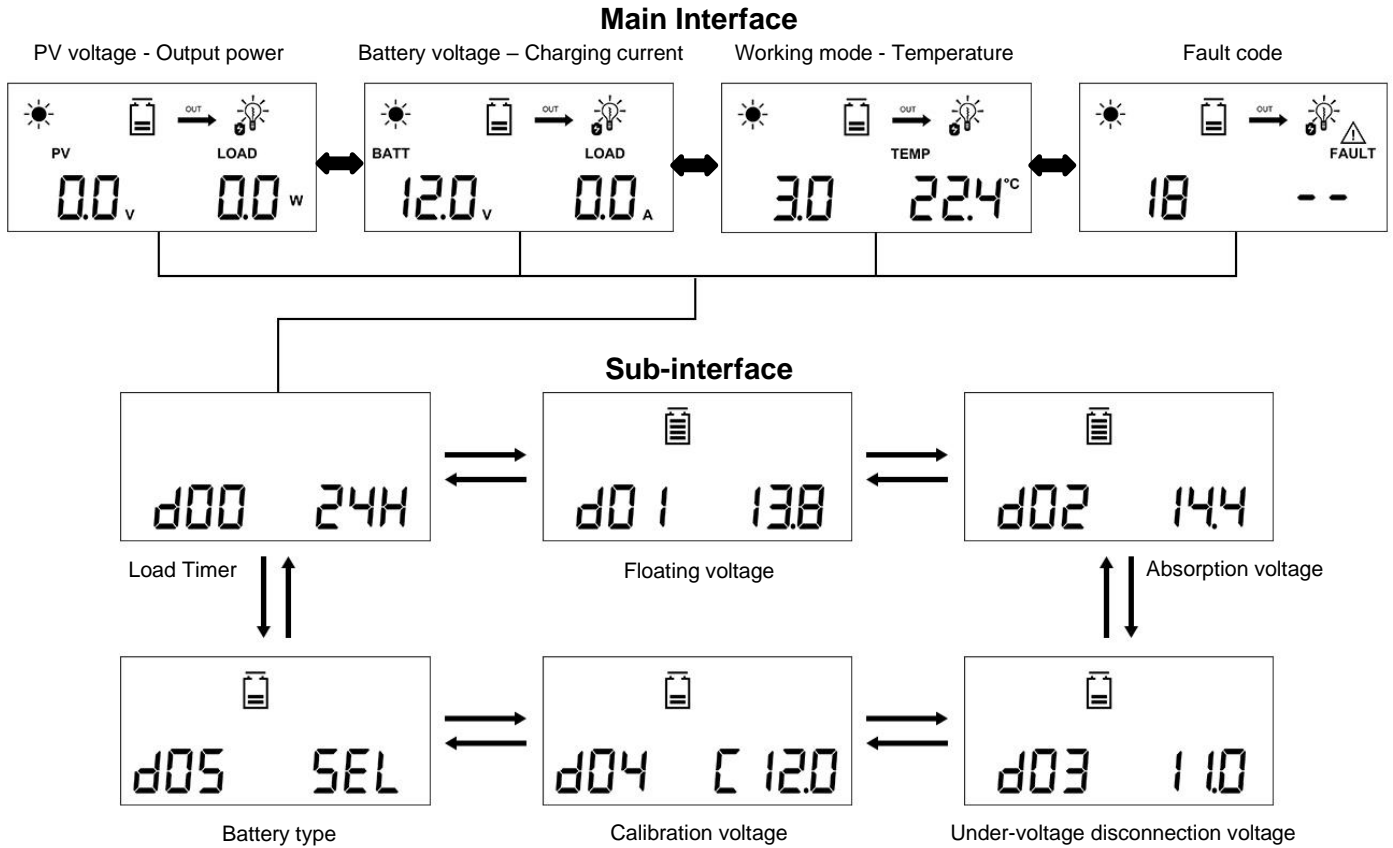
It's better to connect two wires to two PV+ and another two wires to two PV-. For BAT+ and BAT-, it's same way to connect wires.



1. Install air circuit breaker between controller and batteries. Turn off the circuit breaker, then connect batteries to controller with correct polarity.
2. Install air circuit breaker between controller and PV modules. Turn off the circuit breaker, and ensure the PV polarity correct, then connect wires between PV modules and controller.
3. Turn on the air circuit breaker between controller and batteries.
4. Turn on the air circuit breaker between controller and PV modules.
5. The controller goes into the self-test mode. Its LCD displays the parameters if all is correct. And RUN lamp (under the fan inside of casing) will flash every one second. If the controller is no response, please read full manual again for reinstalling or contact us for help.

Operation

LCD display



Item	Description
1	PV voltage / Output power
2	Battery voltage / Charging current
3	Working mode / Temperature
4	Fault code

Working mode

3.0	Night mode, no charging
4.0	MPPT mode
7.0	Absorption mode
8.0	Floating mode

Batteries charge voltage reference

Battery Type	Float Charging Voltage	Absorption Charging Voltage	Under-voltage Protection
SEL	13.8	14.4	11.0
GEL	13.8	14.2	11.0
FLd	13.8	14.6	11.0
L04	13.8	14.5	11.2
L08	27.6	29.0	22.4
L15	51.8	54.4	42.0
L16	55.2	58.0	44.8
USE	Defined by users		

NOTICE

- When selecting the options of SEL, GEL, and FLd battery types, the controller can automatically detect the system voltage.

Manual Setting

Reminder: The controller will work fine under default setting except lithium battery.



Caution! All steps must be carried out when the PV modules are disconnected to controller.

Step 1: D00

Press the button PRG, then LCD displays D00. This is setting for load working time (Default is 24-hour). Press ENT until numbers flash, then press UP/DOWN to set up time that you want, long-press ENT to confirm it. This output voltage is same as battery. The load is only for small DC loads less 5A current. If no load, just leave it.

Step 2: D01

Press the button UP, LCD shows 13.8. This is default value of floating charging. Press ENT until numbers flash, then press UP/DOWN to set up voltage that you want, long-press ENT to confirm it.



Caution! This value is for one 12V battery. If there are many batteries in series, the controller will multiply them in proportion automatically and the LCD only displays the voltage of one battery (For example, if your battery is 4x12V, and if you set the voltage at 14.1, the charge voltage will be 4x14.1 automatically, but the LCD only displays 14.1).

Step 3: D02

Continue to press the button UP, LCD shows 14.5. This is highest absorption charging

voltage for battery. Press ENT until numbers flash, then press UP/DOWN to set up voltage that you want, long-press ENT to confirm it.



Caution! This value is for one 12V battery. If there are many batteries in series, the controller will multiply them in proportion automatically and the LCD only displays the voltage of one battery.

Step 4: D03

Continue to press the button UP, LCD shows 10.0. This is protection value of battery discharge. Press ENT until numbers flash, then press UP/DOWN to set up voltage that you want, long-press ENT to confirm it.

It means it's protected when 12V battery is less 10.0V and there is no output power from OU+ and OU-.

Step 5: D04

Continue to press the button UP, LCD shows C12.2. This setting item is used to calibrate the battery voltage by adjusting the value, ensuring that the battery voltage detected by the controller matches the actual battery voltage.

Step 6: D05

Continue to press the button UP, LCD shows setting program of battery type. The default option is USE. The available battery types are:

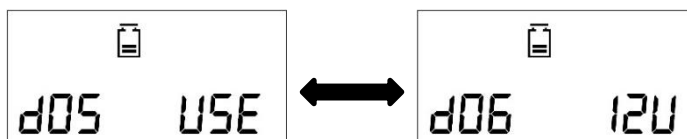
SEL	Sealed Lead-Acid Battery
GEL	Gel Sealed Lead-Acid Battery
FLd	Flooded Lead-Acid Battery
L04	4-series Lithium Iron Phosphate Battery
L08	8-series Lithium Iron Phosphate Battery
L15	15-series Lithium Iron Phosphate Battery
L16	16-series Lithium Iron Phosphate Battery
USE	User-defined Battery Type



Caution! When selecting the options of SEL, GEL, and FLd battery types, the controller can automatically detect the system voltage.

Step 7: D06

If you choose the USE option in the D05 battery type setting, you will need to manually configure the system voltage in the D06 setup program. The configuration range is 12V/24V/36V/48V.



Press ESC to exit the setting menu.

Reminder: When you set up all steps, please disconnect battery. And reconnect controller to see if all setting is successful. When all setting is ok, then connect PV modules to controller.

Troubleshooting and Protections

Troubleshooting

Code	Description	How to solve
18	Input PV voltage is low	Increase the PV voltage
60	Over-temperature protection	Fan will work and temperature reduction automatically
63	Battery voltage is high	Battery high voltage protection and wait for recovery
65	Battery voltage is low	Battery over-discharge and wait for recovery
71	Input PV voltage is high	Decrease the PV voltage
73	Over-charging current	Decrease the PV power

Protections

① PV Over Current

The controller will limit charging power in rated charge power. An over-sized PV array will not operate at maximum power point.

② PV Short Circuit

When PV short circuit occurs, the controller will stop charging. Remove it to start normal operation

③ PV Reverse Polarity

Fully protection against PV reverse polarity, no damage to the controller. Correct the connection to start normal operation.

④ Battery Over Voltage

If there are other energy sources to charge the battery, when the battery voltage exceeds 15.5/31.0/46.5/62.0V, the controller will stop charging to protect the battery from overcharging damage. (Pay attention to the stop charging means charging current is very low)

⑤ Battery Over Discharge

When battery voltage drops to the setting voltage point of low voltage disconnect, the controller will stop discharging to protect the battery from over discharging damage.

⑥ Load Over Current protection

If the load current exceeds the maximum load current rating 1.25 times, the controller will disconnect the load.

⑦ Load Short Circuit Protection

Once the load short circuit happens, the Load Short circuit protection will start automatically.

⑧ Over Temperature Protection

Technical Data

Models	HHJ-60A
Charging mode	3-stage
Max.PV Input Power	
12V system	720W
24V system	1440W
36V system	2100W
48V system	2800W
Input specification DC	
12V system	20V~80V
24V system	37V~105V
36V system	50V~160V
48V system	72V~160V
Battery voltage automatic recognition	
12V system	DC9V~DC15V
24V system	DC18V~DC29V
36V system	DC30V~DC39V
48V system	DC40V~DC60V
Overcharging protection voltage	60V
Limited current protection	61A
Max efficiency	≥98.1%
PV utilization	≥99%
Protection function	
Temperature protection	75°C / 167°F
Fan-on temperature	>45°C / 104°F
Fan-off temperature	<40°C / 95°F
Properties	
Size (mm)/(in)	214x115x50mm/ 8.43x4.53x1.97in
Net weight(Kg)/(lb)	1.1/2.43
Gross weight(Kg)/(lb)	1.2/2.65
Electromagnetic compatibility	EN61000, EN55022, EN55024
Enclosure	IP21
Environmental temperature	-20°C ~ +55°C
Storage temperature	-40°C ~ +75°C

➤ **Content Included**

1x MPPT Solar Charge Controller

4x Corner connections

4x Screws for controller casing

1x English manual



POWMr

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