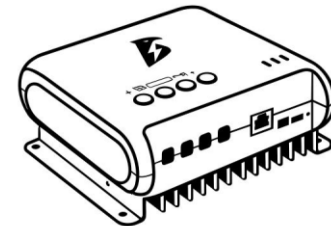




## **HALMPPT SERIES SOLAR CHARGE CONTROLLER**

### **HALMPPT100/30 and HALMPPT100/50**

#### **PRODUCT MANUAL**



| Model                        | HALMPPT100/30                                | HALMPPT100/50 |
|------------------------------|----------------------------------------------|---------------|
| Battery Voltage              | 12V/24V                                      |               |
| Max. PV Open Circuit Voltage | 92V (25C); 100V (Lowest ambient Temperature) |               |
| Charge Current               | 30A                                          | 50A           |
| Max PV Input Power           | 400W/12V                                     | 600W/12V      |
|                              | 800W/24V                                     | 1320W/12V     |

**Version : 1.00**

The above information is subject to change without prior notice.

Dear Customer, Thank you very much for choosing our Halcon Power products!

Safety Instructions

- The controller operates at voltages exceeding safe human contact levels. Read this manual thoroughly before use and operate the controller only after completing appropriate safety training.
- The controller contains no user-serviceable parts. Do not disassemble, modify, or attempt to repair the unit.
- Install the controller indoors in a dry environment. Protect it from moisture, dust, and direct exposure to the elements.
- Ensure the controller is installed in a well-ventilated area to prevent overheating of the heat sink.
- Install an appropriate external fuse or circuit breaker to provide overcurrent protection.
- Before installation or making any wiring adjustments, disconnect the PV array and isolate the battery using a fuse or circuit breaker.
- After installation, verify that all electrical connections are secure to prevent overheating or fire hazards caused by loose connections

 **Warning:**  
**Electrical Shock and Fire Hazard**

- All wiring should be done by qualified personnel to ensure compliance with all applicable installation codes and regulations. Design the power system using a certified recreational vehicle or PV system designer and install using a certified RV technician/electrician.
  - Comply with all applicable installation codes and regulations.
  - Do not connect to power sources during installation.
  - Connect only to PV modules of the same size and rating to build a PV array. Mixing and matching different PV modules are not recommended.
- Failure to follow these instructions can result in death, serious injury, or equipment damage.**

 **Warning:** This operation is dangerous, so before operation, safety preparations must be made.

 **Caution:** This operation may have a destructive effect. .

 **Reminder:** Suggestions and tips for operator.

Table of Contents

1. Introduction.....3

1.1 Overview ..... 3

1.2 Features.....3

1.3 Appearance ..... 4

1.4 Introduction to MPPT Technology.....4

1.5 Charging Stage Introductions.....5

2. Installation.....7

2.1 Installation Precautions.....7

2.2 Wiring Specifications..... 8

2.3 Installation and Wiring..... 8

3. Product Operation and Display..... 10

3.1 LED Indicators.....10

3.2 Keys to Operation.....11

3.3 TTL Communications.....11

3.4 CAN Communication (optional) ..... 11

4. Product Protection and System Maintenance.....11

4.1 Protections.....11

4.2 System Maintenance.....12

5. Technical Parameters.....13

5.1 Electrical Parameters..... 13

5.2 Battery Type Fault Parameters.....14

6. Commercial Efficiency Curve.....15

7. Product Dimensions..... 16

# 1. Introduction

## 1.1 Overview

- Featuring industry-leading MPPT technology, the HALMPPT series solar charge controller maximizes energy harvesting from solar panels. It rapidly and accurately tracks the maximum power point (MPP) of the PV array under all environmental conditions, ensuring real-time optimization of solar energy capture and significantly improving overall system efficiency.
- The controller supports connection to an external LCD display, Bluetooth communication module, and PC monitoring software, enabling real-time visualization of operating status, parameters, logs, and control settings. Users can easily monitor system performance and adjust parameters to meet specific application requirements.
- The controller uses the standard Modbus communication protocol, allowing convenient access to system data and parameter configuration. In addition, free monitoring software is provided to support flexible and efficient remote monitoring.
- The controller includes comprehensive self-diagnostic capabilities and advanced electronic protection features, reducing the risk of

## 1.2 Features

- Our Halcon MPPT technology helps the controller find the best power point from solar panels, even in difficult conditions. It responds faster and works more efficiently than standard MPPT methods. • The built-in MPPT system improves energy use, delivering about 15–20% higher efficiency compared to traditional PWM charging.
- The controller automatically regulates charging voltage. If the battery is disconnected or protected by a lithium BMS, it will still output a stable rated charging voltage. MPPT tracking efficiency can reach up to 99.9%. Advanced digital power technology enables up to 98% energy conversion efficiency.
- Compatible with multiple battery types, including lithium, sealed, gel (colloidal), and flooded (vented) batteries. Includes current limiting. If solar input is too high, the controller automatically reduces charging current to a safe, rated level.
- Automatically detects lead-acid battery voltage. Supports connection to an external LCD screen or Bluetooth module for monitoring system data and adjusting settings.
- Optional built-in Bluetooth allows wireless monitoring and parameter adjustment.
- Optional built-in CAN communication supports system monitoring and control.
- Supports the standard Modbus protocol for flexible system integration.
- Built-in temperature protection reduces charging current if the controller overheats, preventing damage.
- Temperature compensation automatically adjusts charging settings to help extend battery life.
- Includes protection features such as solar panel short-circuit protection, battery open-circuit protection, and lightning (TVS) protection.

## 1.3 Appearance

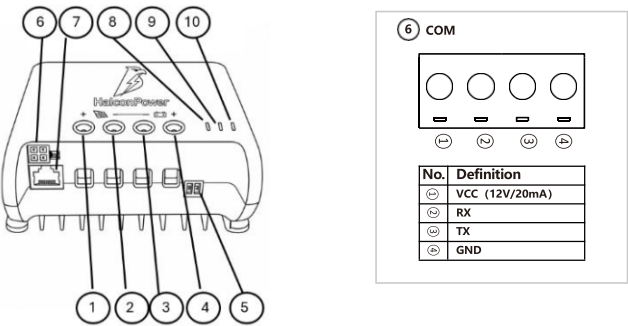


Figure 1-1 : Appearance of Solar Controller Ports

| No. | Name                            | No. | Name                          |
|-----|---------------------------------|-----|-------------------------------|
| ①   | Solar panel "+" interface       | ⑥   | CAN Communication interface   |
| ②   | Solar panel "-" interface       | ⑦   | RS485 Communication Interface |
| ③   | Battery "-" interface           | ⑧   | PV charging indicator         |
| ④   | Battery "+" interface           | ⑨   | Battery level indicator       |
| ⑤   | External temperature interfaced | ⑩   | Battery type indicator        |

## 1.4 Introduction to MPPT Technology

Maximum Power Point Tracking (MPPT) is a smart charging technology that helps solar panels produce more energy by operating at their most efficient point. Solar panels have a specific point where they generate the most power, called the maximum power point. Traditional controllers, such as PWM, cannot stay at this point, so some energy is lost. An MPPT controller continuously adjusts the panel's voltage and current to capture the maximum available power at all times. For example, in a 12V system, a solar panel may operate best at around 17V, while the battery is about 12V. A traditional controller reduces the panel voltage to match the battery, lowering power output. An MPPT controller keeps the panel near its optimal voltage and converts the extra power efficiently to charge the battery. As a result, MPPT controllers can provide higher charging current and improve energy efficiency by about 15–20% compared to PWM controllers.

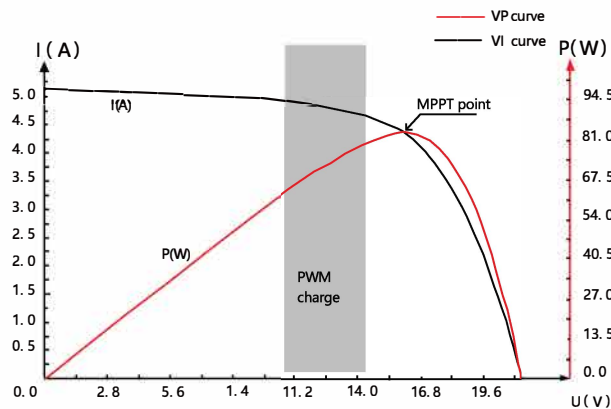


Figure 1-2 Solar panel output characteristics curve

In addition, due to the difference in ambient temperature and light conditions, the maximum power point often changes. The MPPT controller can adjust parameters according to different conditions from time to time to keep the system near to its maximum working point. The whole process is fully automatic and does not require any adjustments by users

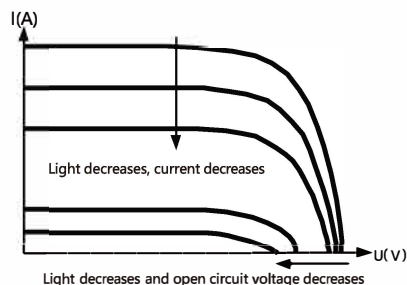


Figure 1-3 Relationship between solar panel output characteristics and light

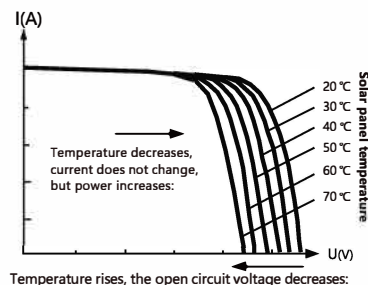


Figure 1-4 Relationship between solar panel output characteristics and temperature

## 1.5 Charging Stage Introductions

As MPPT produces only one charging stage, MPPT cannot be used alone. It is usually required to combine boost charge, floating charge, equalizing charge and other charging methods to complete the battery charging process. A complete charging process includes: Quick charge, holding charge and floating charge. Charging curve is shown below:

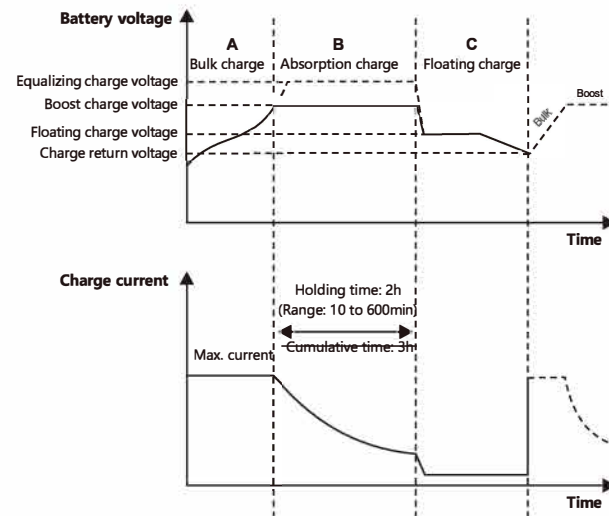


Figure 1-5 Battery charging stages curve graph

### a) Bulk charge

In quick charge stage, the battery voltage has not yet reached the set value of full charge voltage (i.e. equalizing/boost charge voltage) and the controller will perform MPPT charging, which will provide maximum solar energy to charge the battery. When the battery voltage reaches the pre-set value, constant voltage charge will start.

### b) Absorption charge

When the battery voltage reaches the set value of holding voltage, the controller will perform constant voltage charging. This process will no longer include MPPT charging, and the charging current will gradually decrease with time. Holding charge comes in two stages, i.e. equalizing charge and boost charge. The two stages are conducted without repetition, in which equalizing charge is started once every 30 days.

### ➤ Boost charging

The default duration of boost charge is 2 hours. The customer can also adjust the holding time and the pre-set value of boost voltage point according to actual needs. When the duration reaches the set value, the system will switch to floating charge.

### ➤ Equalizing charging (next page)

#### ⚠ Warning: Risk of explosion!

Equalizing vented lead-acid battery may generate explosive gases. So, the battery compartment must be well ventilated.

⚠ Caution: Damage of device!

Equalization can increase the battery voltage to levels that may damage sensitive DC loads. It is necessary to verify that the allowable input voltage of all system loads is greater than the equalizing charge set value.

#### ⚠ Caution: Damage of device!

Over charge and excessive gas evolution may damage the battery plates and cause active substances on the battery plate to come off. Equalizing charge may cause damage if voltage is too high or time is too long. Please carefully check the specific requirements of battery used in the system.

Certain types of battery benefit from regular equalizing charge, which can stir electrolyte, balance battery voltage, and complete a chemical reaction. Equalizing charge increases the battery voltage above standard voltage, causing vaporization of battery electrolyte. If it is detected that the controller automatically controls the next stage to be equalizing charge, the equalizing charge will last for 120 minutes (default). The equalizing charge and boost charge are not repeated in a full charge process to avoid too much gas production or battery overheating.

#### Note:

1) When the system cannot continuously stabilize the battery voltage at a constant voltage due to the influence of installation environment or load, the controller will monitor time until the battery voltage reaches the set value. When the monitored time reaches 3 hours, the system will automatically switch to floating charge.

2) If controller clock is not calibrated, the controller will perform regular equalizing charge according to its internal clock.

#### ►Floating charging

Floating charge is conducted following the absorption charge stage, where the controller will reduce the battery voltage by reducing charge current and allow the battery voltage to remain at the floating charge set value. During the floating charge stage, the battery is charged in a very low voltage to maintain full charge state of the battery. In this stage, the load can get nearly all of the solar energy. If the load exceeds the energy that solar panel can provide, the controller will not be able to maintain the battery voltage in the floating charge stage. When the battery voltage is as low as the recovery charge set point, the system will exit floating charge stage and re-enter the bulk charge stage.

## 2. Installation

### 2.1 Installation Precautions

#### • Caution: Risk of Battery Damage

Overcharging and excessive gas buildup can damage battery plates and cause loss of active material. Equalization may harm the battery if the voltage is set too high or the duration is too long. Always follow the battery manufacturer's specifications.

**Warning: Danger.** When installing a vented lead acid battery, wear protective eye classes. If battery comes in contact with your skin or eyes, follow the emergency procedures laid out in the battery's MSDS sheet.

**Warning: Danger.** Do not place metal objects near battery terminals as you may cause a short circuit and arking.

**Warning: Danger.** Ensure good ventilation around lead acid batteries as acid gas may be generated during charging.

**Warning: Danger.** The battery may generate flammable gas. Please keep away from an ignition source.

#### • Caution: Risk of Equipment Damage

Do not install outdoors in direct sunlight or where HALMPPT can come in contact with moisture or water. Product may be damaged as a result and stop working.

**Warning: Danger.** Loose terminal connections and the corroded wires may cause extreme heat to melt the wire insulation layer, burn surrounding materials and cause a fire. Therefore, it is necessary to ensure all terminal connections are tight and use cable ties for long wiring runs

**Warning: Danger.** Use proper protective tools when installing the MPPT solar charge controller and wire connection avoid wet hands to avoid electrical shock.

• The system connection wires are selected according to the current density of not more than

4A/mm<sup>2</sup>. Make the controller ground

• The battery terminals on the controller can be connected to a single battery or batteries in parallel.

Observe the safety recommendations of battery manufacturer.

### 2.2 Wiring Specifications

Wiring and installation must comply with national and local electrical code requirements.

PV and battery connection wires must be selected according to rated current. Refer to the following table for wiring instructions:

| Models | PV maximum Input current | Max. wire diameter at PV end(mm <sup>2</sup> /AWG) | Rated charge current | Battery wire diameter (mm <sup>2</sup> /AWG) |
|--------|--------------------------|----------------------------------------------------|----------------------|----------------------------------------------|
|--------|--------------------------|----------------------------------------------------|----------------------|----------------------------------------------|

|              |    |      |     |      |
|--------------|----|------|-----|------|
| HALMPPT10030 | 30 | 8/8  | 30A | 8/8  |
| HALMPPT10050 | 50 | 12/6 | 50A | 12/6 |

### 2.3 Installation and Wiring

**Warning: Danger, Explosion!** Never install the controller and a vented battery in the same enclosed space! Also do not install in an enclosed place where battery gas may collect.



**Warning: Danger, High Voltage!** Photovoltaic arrays may generate very high open circuit voltages. Disconnect circuit breaker or fuse before wiring and be very careful during wiring.



**Caution:** When installing the controller, ensure that there is enough air to flow through the controller's heat sink, leaving at least 150mm above and below the controller to ensure natural convection for heat dissipation. If installed in a closed box, ensure there is reliable heat dissipation in the box (i.e. vent or exhaust fans).

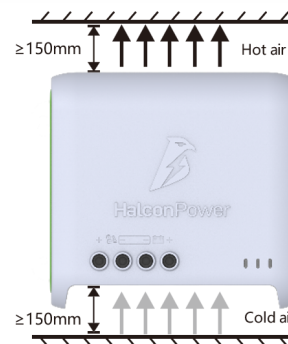


Figure 2.1 Installation & Heat Dissipation

**Step 1:** Choose an installation location

Avoid installing the controller in a place free of direct sunlight, high temperature, and water, and ensure good ventilation around the controller.

**Step 2: Mark the mounting position according to the mounting dimensions of the controller. Drill 4 mounting holes of the appropriate size at the 4 marks. Fix screws into the upper two mounting holes.**

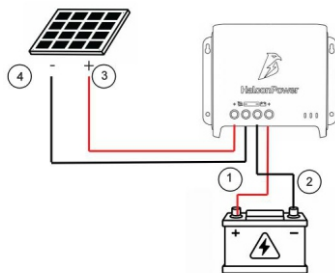
**Step 3: Fasten the Controller**

Align fixing holes of the controller with the two pre-fixed screws and hang the controller up. And then fix the lower two screws.



#### Step 4: wire

For installation safety, we recommend a wiring sequence as follows; however, wiring in other sequence insteads of this one will not damage the controller.



**Warning: Danger, Electric shock hazards!** We strongly recommend connect a fuse or circuit breaker to the PV array and battery terminals to prevent electric shock hazards during wiring or during operation, and make sure that fuse or circuit breaker is disconnected before wiring.

**Warning: Danger, High voltage hazards!** Photovoltaic arrays may generate very high open circuit voltages. Disconnect circuit breaker or fuse before wiring and exercise caution when wiring components.

**Warning: Danger, Explosion hazards!** If the positive and negative terminals of battery and the wires connect together, they will short-circuit, short circuiting the battery may cause a fire or explosion. Please be very careful when connecting to the battery terminals..

1) and 2) Please connect the battery first, and then the solar panel, 3) and 4). Please follow the “+” first and “-” next method when wiring.

When all wires are connected firmly and reliably, check whether the wiring is correct and ensure that the polarity is not reversed. After confirmation, connect the battery fuse or circuit breaker and observe whether the LED indicator is on. If not, disconnect the fuse or circuit breaker immediately and check whether wiring is correct.

When the battery is properly energized, connect the solar panel. If there is sufficient sunlight, the charge indicator of controller will be steady on or flash and start to charge the battery.

**Warning:** Reverse polarity of the battery can damage the controller's internal components.

#### Note:

1) Note that the battery fuse shall be installed as close as possible to the battery terminal. The recommended distance is not more than 150mm.

2) The battery temperature is assumed to be 25°C (fixed value) when the controller is not collected to a remote temperature sensor.

### 3. Product Operation and Display

#### 3.1 LED Indicators

There are a total of three light indicators on the controller

| ①            | ② | ③ |                         |                                                  |
|--------------|---|---|-------------------------|--------------------------------------------------|
| ①            | ② | ③ | ①---PV array indication | Indicate the current charging mode of controller |
| 0            | 0 | 0 | ②---BAT indication      | Indicate the current state of battery.           |
| 3 Light Bars |   |   | ③---BAT Type indication | Indicate the current battery type.               |

#### ➤ PV array indicator:

| No. | CHARGE STATUS   | Indicator state                                                                | Charging state           |
|-----|-----------------|--------------------------------------------------------------------------------|--------------------------|
| ①   | BULK            | Steady on                                                                      | MPPT charging            |
| ②   | ACCEPTANCE      | Slow flashing<br>(On:1s, off: 1s, cycle: 2s)                                   | Boost charging           |
| ③   | FLOAT           | Single flashing<br>(On:0.1s, off: 1.9s, cycle: 2s)                             | Floating charging        |
| ④   | EQUALIZE        | Quick flashing<br>(On:0.1s, off: 0.1s, cycle: 0.2s)                            | Equalizing charging      |
| ⑤   | CURRENT-LIMITED | Double flashing<br>(On:0.1s, off: 0.1s, then, On:0.1s, off: 1.7s, cycle: 0.2s) | Current-limited charging |
| ⑥   |                 | Off                                                                            | No charging              |

#### ➤ BAT indicator:

| Indicator color | Indicator status                                 | Battery status                            |
|-----------------|--------------------------------------------------|-------------------------------------------|
| Green           | Steady on                                        | Battery full charge                       |
| Yellow          | Steady on                                        | Battery voltage normal                    |
| Red             | Steady on                                        | Battery voltage below under-voltage point |
|                 | Quick flash<br>(On:0.1s, off: 0.1s, cycle: 0.2s) | Battery over-voltage or over temperature  |

## ➤ BAT Type Light Indicator:

| Indicator color | Battery status                     |
|-----------------|------------------------------------|
| Green           | Sealed lead-acid battery           |
| Yellow          | Colloidal lead-acid battery        |
| Red             | Vented lead-acid battery           |
| Blue            | Lithium iron phosphate battery 12V |
| Purple          | Lithium iron phosphate battery 24V |
| White           | Custom                             |

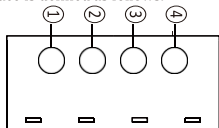
### 3.2 Keys to Operation

There is a key on the solar controller, which is used in conjunction with the battery type light indicator to select the battery type. To select the battery type do as follows:  
In the current operating state, press and hold the key for 8 seconds. The battery type light indicator (the color displayed is that of the previously saved battery type) starts to flash (the controller enters an idle state). At this point, each time the key is pressed, the battery type indicator changes to a color which corresponds to a battery type. After the battery type is selected, press and hold the key for 8 seconds again or maintain no operation for 15 seconds. Then, the controller will automatically save the current battery type setting and enter the normal operating mode;  
In addition, if you press and hold the key for 20s, the controller will restore the factory default parameters.

### 3.3 TTL Communication

Users can utilize external communication equipment (such as Bluetooth BT-2) or communication protocol to perform data monitoring, parameter setting and other operations for the controller via the TTL port.

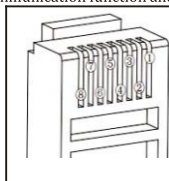
The interface is defined as follows:



| No. | Definition                               |
|-----|------------------------------------------|
| ①   | Controller supplies +12.8V outwards.     |
| ②   | Data receiving terminal RX of controller |
| ③   | Data sending terminal TX of controller   |
| ④   | GND                                      |

### 3.4 CAN communication (optional)

Optional built-in CAN communication function and RV-C protocol.



| S/N | Definition |
|-----|------------|
| ①   | /          |
| ②   | /          |
| ③   | /          |
| ④   | GND        |
| ⑤   | /          |
| ⑥   | /          |
| ⑦   | CANH       |
| ⑧   | CANL       |

## 4. Product Protection and System Maintenance

### 4.1 Protections

#### ➤ Waterproofing protection

Rating: IP32

#### ➤ Input power limited protection

When the power of solar panel is higher than the rated value, the controller will limit the power of solar panel within the rated power range to prevent damage by over current, and the controller enter the current-limiting charge.

#### ➤ Battery reverse polarity protection

If the battery polarity is reversed, the system will not work but it will not burn out the controller.

#### ➤ PV input end voltage is too high

If the voltage at the PV array input end is too high, the controller will automatically shut off the PV input.

#### ➤ PV input end short circuit protection

If the voltage at the PV array input end is short circuited, the controller will turn off charging; after short circuit is removed, charging will automatically recover.

#### ➤ PV input reverse polarity protection

When the polarity of PV array is reversed, the controller will not be damaged, and normal operation will continue after wiring error is corrected.

#### ➤ Night reverse charging protection

Prevent battery discharge through the solar panel at night.

#### ➤ TVS lightning protection

#### ➤ Over-temperature protection

When temperature of the controller exceeds the set value, it will reduce charging power or stop charging.

### 4.2 System Maintenance

- In order to maintain the best long-term performance of your solar controller, it is recommended to conduct product inspections twice a year.
- Make sure the airflow around the solar controller is not obstructed and remove any dirt or debris from the heat sink.
- Check to see if the insulation layers of all exposed wires are damaged due to sun exposure, friction with other objects nearby, dry rot, destruction by insects or rodents, etc. If so, it is necessary to repair or replace the wire.
- Verify if light indicators are consistent with the expected device operations. Please take corrective actions if any malfunctions or error are observed.
- Check all wiring terminals for corrosion, insulation damage, signs of high temperature or burning/discoloration.
- Check terminal screws and tighten terminal screws if the wire connections are loose.
- Check solar controller for dirt, insects nesting, corrosion and clean as required.
- If the lightning arrester has failed, replace it ASAP in order to protect solar controller and other devices from being damaged by lightning. Please take corrective actions if any malfunctions or error are observed.

 **Warning:** Danger, electric shock hazards! Make sure that all power supplies to the controller have been disconnected before performing any maintenance!

## 5. Technical Parameters

### 5.1 Electrical parameters

| Items                                | Parameters                                                                  |                              |
|--------------------------------------|-----------------------------------------------------------------------------|------------------------------|
| Model                                | HALMPPT100/30                                                               | HALMPPT100/50                |
| System voltage                       | 12V/24V                                                                     |                              |
| Zero load loss                       | <10mA                                                                       |                              |
| Battery voltage                      | 9V~32V                                                                      |                              |
| Maximum PV open circuit voltage      | 92V(25°C); 100V(Lowest ambient temperature)                                 |                              |
| Maximum power point voltage range    | (Battery voltage +2V) ~ 72V                                                 |                              |
| Rated charging current               | 30A                                                                         | 50A                          |
| Maximum PV input power               | 400W/12V<br>800W/24V                                                        | 660W/12V<br>1320W/24V        |
| Charging conversion efficiency       | ≤98%                                                                        |                              |
| MPPT tracking efficiency             | > 99%                                                                       |                              |
| Temperature compensation coefficient | -3mv/°C/2V (default) ; Lithium battery features no temperature compensation |                              |
| Operating temperature                | -35°C ~ +60°C                                                               |                              |
| IP rating                            | IP32                                                                        |                              |
| Weight                               | 0.83kg (1.8lb)                                                              | 1.34kg(2.9lb)                |
| Communication mode                   | TTL Serial communication                                                    |                              |
| Optional features                    | Built-in bluetooth and CAN communication                                    |                              |
| Altitude                             | ≤ 3000 meters                                                               |                              |
| Dimensions (mm)                      | 150*105.6*67.5<br>(5.9x4.2x2.7")                                            | 183*127*69.5<br>(7.2x5x2.8") |

### 5.2. Battery type default parameters

| Comparison of parameters of various types of battery |                             |                                |                             |                 |                                                                  |
|------------------------------------------------------|-----------------------------|--------------------------------|-----------------------------|-----------------|------------------------------------------------------------------|
| Set voltage<br>Battery type                          | Sealed lead-acid<br>battery | Colloidal lead-acid<br>battery | Vented lead-acid<br>battery | Lithium battery | User defined                                                     |
| Overvoltage disconnection voltage                    | 16.0V                       | 16.0V                          | 16.0V                       | —               | 9 ~ 17V                                                          |
| Equalizing charge voltage                            | 14.6V                       | —                              | 14.8V                       | —               | 9 ~ 17V                                                          |
| Bulk charge voltage                                  | 14.4V                       | 14.2V                          | 14.6V                       | 14.4V           | 9 ~ 17V                                                          |
| Floating charge voltage                              | 13.8V                       | 13.8V                          | 13.8V                       | —               | 9 ~ 17V                                                          |
| Boost charge recovery voltage                        | 13.2V                       | 13.2V                          | 13.2V                       | —               | 9 ~ 17V                                                          |
| Equalizing charge duration                           | 120 min.                    | —                              | 120 min.                    | —               | 0 ~ 600 min.                                                     |
| Equalizing charge interval                           | 30 days                     | 0 days                         | 30 days                     | —               | 0 ~ 250D<br>(0 indicates turning off equalizing charge function) |
| Bulk charge duration                                 | 120 min.                    | 120 min.                       | 120 min.                    | —               | 10 ~ 600 min.                                                    |

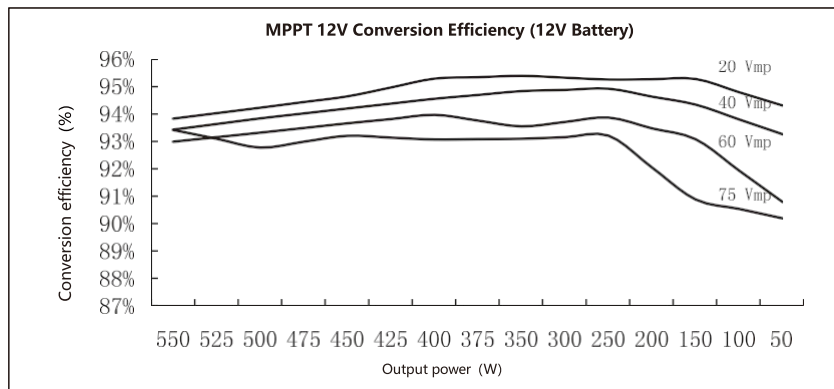
If a user-defined battery is used, the default voltage parameters of the system are the same as those of the sealed lead-acid battery. The following logic must be followed when you modify battery charge and discharge parameters:

Overvoltage disconnection voltage> charge limit voltage ≥ equalizing charge voltage ≥ boost charge voltage ≥ floating charge voltage> boost charge recovery voltage;

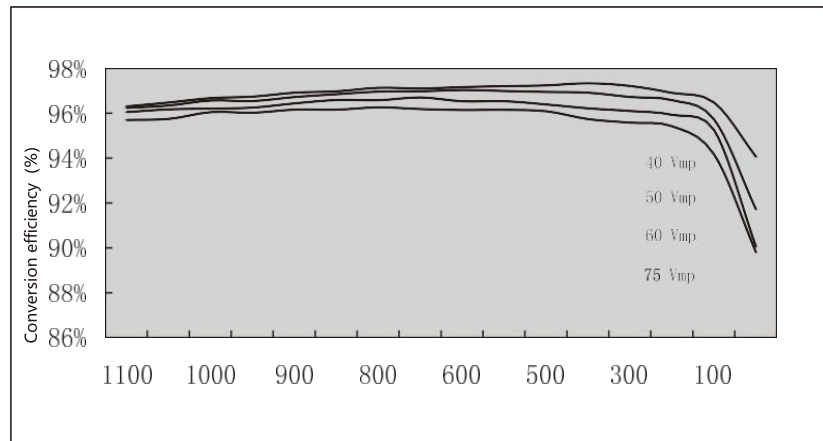
Overvoltage disconnection voltage> Overvoltage disconnection recovery voltage;

## 6. Conversion Efficiency Curve

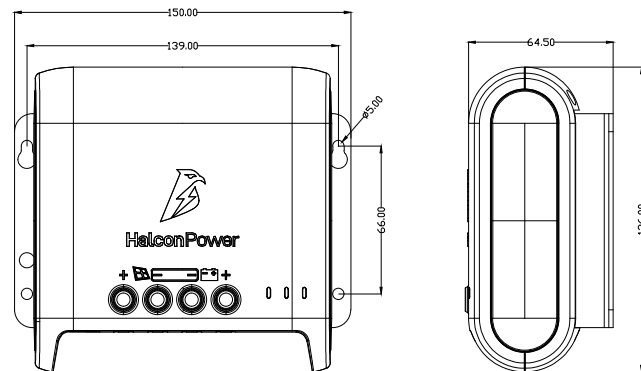
### 6.1 12V System



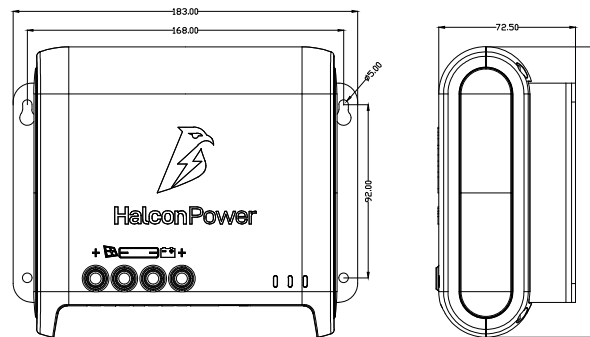
### 6.2 24V System



## 7. Product Parameters



Product Model: HALMPPT10030  
 Product Dimensions: 150x136x65 mm  
 Installation Hole Spacing: 139x66mm  
 Installation Hole Diameter: 5.0mm



Product Model: HALMPPT10050  
 Product Dimensions: 183x154.2x72.5mm  
 Installation Hole Spacing: 168x92mm  
 Installation Hole Diameter: 5.0 mm

## Limitation of Liability

To the maximum extent permitted by applicable law, the Halcon Power Ltd. shall not be liable for any direct, indirect, incidental, consequential, or special damages, including but not limited to property damage, personal injury, loss of use, loss of data, or financial loss, arising from or related to the use of this product.

The Company assumes no liability for damages resulting from, but not limited to, the following:

Improper installation, application, use, or maintenance of the product, including use in an unsuitable or non-compliant environment

MPPT Controller  
Operation of the outside its specified ratings, including exceeding current, voltage, or power limits

Failure to follow the instructions, warnings, labels, or safety guidelines provided in this manual

- Unauthorized disassembly, modification, or repair of the product
- Damage caused by external factors, including but not limited to power surges, lightning, fire, water exposure, or other environmental conditions
- Events beyond the Hub Power Ltd.'s reasonable control, including acts of God (force majeure)
- Damage occurring during transportation, handling, storage, or installation after the product has been delivered
- Use of incompatible components, accessories, or batteries not approved or recommended by the Company

This product is intended for use only as described in this manual. Any other use may result in damage or injury and will void the warranty.