

Renogy 100W & 50W Eclipse Lightweight Suitcase



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Important Safety Instructions

Please save these instructions.

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

 **WARNING:** Indicates a potentially dangerous condition. Use 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 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.
- Make sure all connections going into and from the controller are tight.
- 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.

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

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General Information

The Renogy 100W & 50W Eclipse Lightweight Suitcase combines highly efficient monocrystalline solar panels with a 10A PWM charge controller to create an easy-to-use, 'plug and play' system.

This system is specifically designed for mobile off-grid applications, where space and weight limitations are abundant. The models support 12V/24V deep cycle battery varieties such as sealed-lead acid, gel, and flooded.

The alligator clips included in this package make it easy to connect the panel to a battery in seconds. If one ever needs to connect a battery with a different type of end terminal, the alligator clips are attached via MC4 Connectors.

Key Features

- High Efficiency monocrystalline solar cell with high conversion rate
- Lightweight and durable design with side bag
- Easy to read LCD displaying solar charge information
- Upgraded 3-stage PWM charging algorithm
- Protection against: overcharge, over discharge, overload and short-circuit.
- Positive ground controller.
- A wide range of load working modes facilitate the product's application to different types of loads.

Included Components



10A PWM Charge Controller

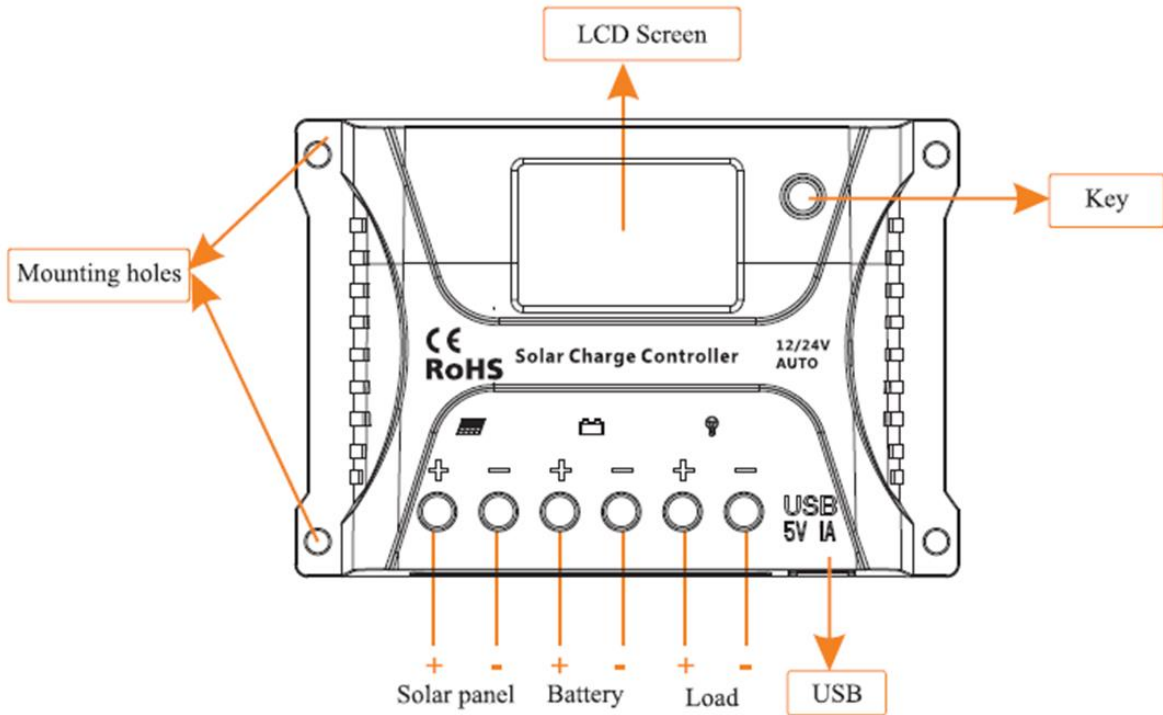
Regulates the voltage and amperage coming from the solar panel to properly charge the battery bank.



MC4 to Alligator Clips w/ Fuse

Used for connecting charge controller to battery. The entire cable from the charge controller to the alligator clips measures 3.3 feet with an in-line fuse of 10A

Controller Panel Structure



Controller Operation

Step 1: Connect the battery. If the connection is correct, the controller screen lights up; otherwise, check whether the connection is correct.

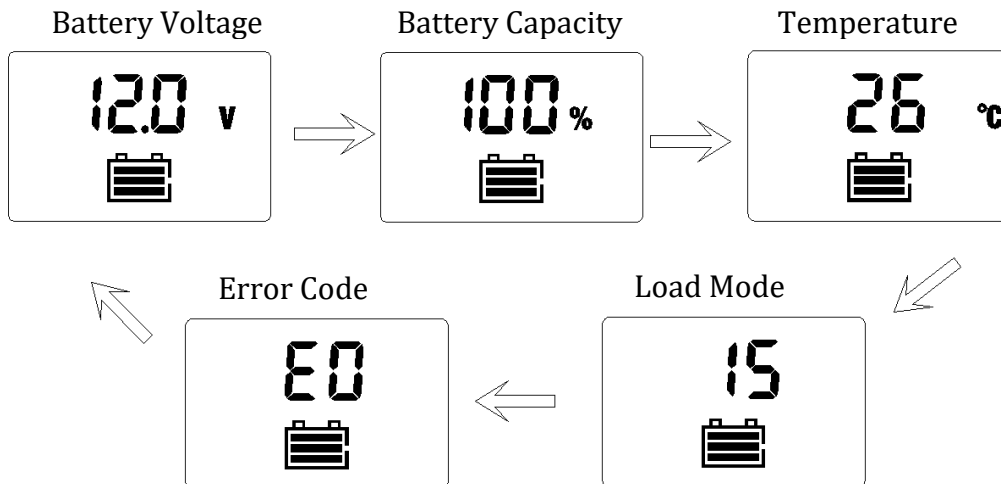
Step 2: Connect the solar panel. If sunlight is present and strong enough (the solar panel voltage is greater than battery voltage), the sun icon on the LCD screen is on; otherwise, check whether the connection is correct.

Step 3: Connect the load. Connect the load leads to the controller's load output terminal, and the current shall not exceed the controller's rated current.

**** The controller has a common positive pole inside. If grounding is needed, ground the positive pole.**

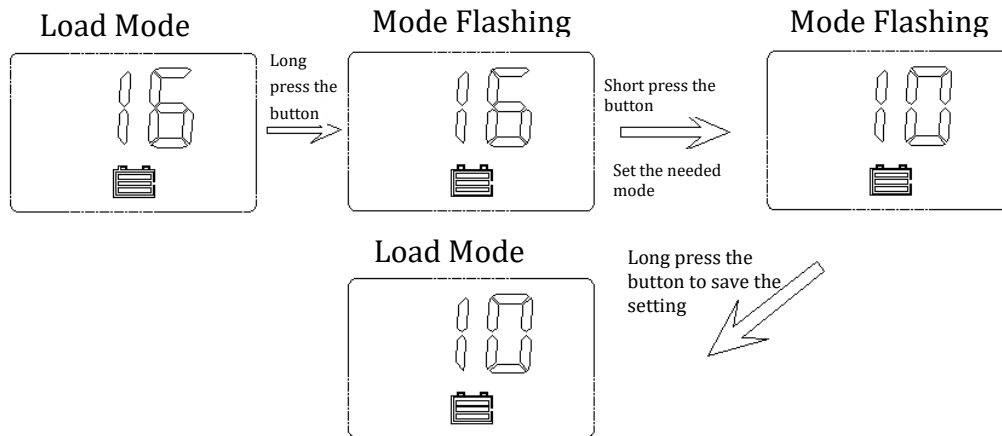
Normal Sequencing Display

The following menus are shown in an automatic cycle on the screen, with an interval of 3s.



Setting Menu on LCD Screen

Long press the red button in any mode to enter the load mode setting interface, and the load mode begins to flash. Short press the button to adjust the load mode, and long press the button again to save and exit mode setting or wait for 10s to let the system save and exit automatically.



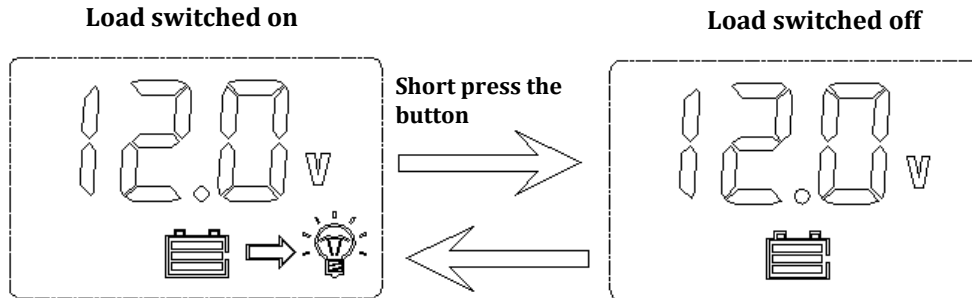
Five Load Working Modes

1. Pure light control (0): When sunlight disappears, and the light intensity drops to the starting point, the controller initiates a one-minute delay (settable) to confirm the starting signal, and then switches on the load for operation. When sunlight emerges, and the light intensity reaches the starting point, the controller initiates a one-minute delay to confirm the shutting-down signal, and then shuts down the output to stop the load's operation.
2. Light control + time control (1 to 14): The starting process is the same as pure light control. After operating for a preset period (settable from 1 to 14 hours), the load stops operation automatically.
3. Manual mode (15): In this mode, the user can switch the load on or off by the button, no matter whether it's day or night.
4. Debugging mode (16): In cases of 6V with light signals, the load will be shut off. In cases of 5V (varies according to the preset light-controlled voltage and system voltage) without light signals, the load will be switched on. This mode enables fast check of the correctness of system installation during installation and debugging.
5. Normal on (17): The energized load keeps in output state.

| LED Display | Mode |
|-------------|---|
| 00 | Pure light control mode |
| 01-14 | Light control + time control (1 to14 hours) |
| 15 | Manual mode (default) |
| 16 | Debugging mode |
| 17 | Always on mode |

Manually Switching On/Off Load

When the load mode is set to 15 (manual mode), short press the button (non-setting mode) in any interface to switch on or off the load.



Note: As load start is a type of soft start, display of the load icon on the LCD screen will be delayed after the load is switched on.

System Status Icons

Error Code List

| Code on LCD Screen | Corresponding Error |
|--------------------|-------------------------|
| E0 | No Error |
| E1 | Battery Over-discharged |
| E2 | Battery Overvoltage |
| E4 | Load short circuit |
| E5 | Overload |
| E6 | Controller overheated |

System Status Troubleshooting

| Description | Troubleshoot |
|---|--|
| Battery over voltage | Use a multi-meter to check the voltage of the battery. Make sure the battery voltage is not exceeding the rated specification of the charge controller. Disconnect battery. |
| Charge controller does not charge during daytime when the sun is shining on the solar panels. | Confirm that there is a tight and correct connection from the battery bank to the charge controller and the solar panels to the charge controller. Use a multi-meter to check if the polarity of the solar modules has been reversed on the charge controller's solar terminals. |

Everything is connected correctly, but the LCD on the controller does not turn on

Check the rated battery voltage. The LCD will not display on the charge controller unless there is at least 9V coming from the battery bank.

Maintenance

For best controller performance, it is recommended that these tasks be performed from time to time.

1. Check wiring going into the charge controller and make sure there is no wire damage or wear.
2. Tighten all terminals and inspect any loose, broken, or burnt up connections
3. Make sure readings in the LCD and LED are consistent.

Frequently Asked Questions

Q. Can the kit charge two or more 12V batteries connected in parallel?

A. Yes, it's possible if the batteries have the same type and capacity and are wired in parallel as a single 12V battery bank.

Q. Is there any risk that the solar kit will over charge my battery?

A. One of the functions of the solar charge controller is to ensure that your battery is not over charged; therefore there is no risk of overcharge.

Q. Can I extend the battery leads?

A. Yes, it's possible – please choose the same size of cable for extension. However, the longer the extension, the greater the line loss. Bigger gauge will be required for longer runs.

Q. Do I need to clean the solar panels?

A. Yes, it is recommended for better performance. Dust and dirt should first be swept off the panel surface using a soft brush. When the sweeping is complete, use a wet cloth to wipe the panel surface to remove remaining dirt and grime.

Q. Can rain damage the solar kit?

A. Yes, the charge controller is not waterproof.

Technical Specifications

Solar Panel Parameters

| Description | 100 W Parameters |
|-----------------------------|------------------------|
| Maximum Power | 100 W |
| Open Circuit Voltage (Voc) | 23.1 V |
| Short Circuit Current (Isc) | 6.07 A |
| Maximum Power Voltage (Vmp) | 18.3 V |
| Maximum Power Current (Imp) | 5.35 A |
| Cell Type | Monocrystalline |
| Operating Temperature | -40°F to +185°F |
| Folded Size | 21.25x21.5x0.35 inches |
| Net Weight | 7.25 lbs |

Charge Controller Parameters

| Electrical Parameters | |
|-----------------------------------|--|
| Model Rating | 10A |
| Normal Battery Voltage | 12V/24V |
| Maximum Solar Voltage(OCV) | 55V |
| Maximum Battery Voltage | 35V |
| Rated Charging Current | 10A |
| Electrical Protection and Feature | Over-temperature Overload and short circuit protection Reverse current from battery to solar panel protection at night |
| Grounding | Common Positive |
| Self-consumption | < 12mA |
| Overvoltage Protection | 17.0V; x2/24V |
| Equalization Voltage | 14.6V; x2/24V |
| Boost Voltage | 14.4V; x2/24V |
| Float Voltage | 13.8V; x2/24V |
| Equalization Charging Time | 1H |
| Boost Charging Time | 2H |
| Temperature Compensation | -3.0mV / °C |
| Mechanical Parameters | |
| Dimensions | L4.05 x W2.79 x H1.41 inches |
| Weight | 0.22 lbs. |
| Mounting | Vertical Wall Mounting |
| Ingress Protection Rating | IP30 |
| Maximum Terminals Wire Size | 14AWG |
| Operating Temperature | -13 °F to +131 °F |
| Temp. Comp. Range | -4°F ~ 122°F |

Charging Parameters Glossary

Equalization Voltage—equalization voltage is a corrective over-charge of the battery. The user should consult their battery manufacturer regarding specific battery equalization capacity. This parameter sets the equalization voltage to set the battery at when it reaches the equalization state.

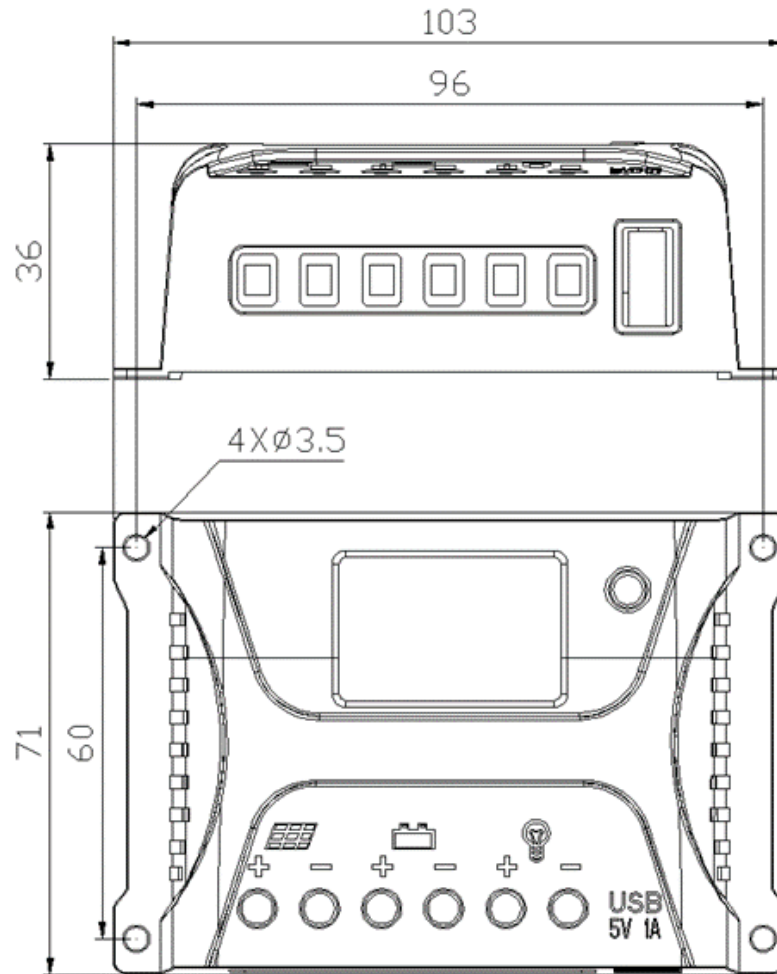
Boost Voltage—users should check with their battery manufacturer for proper charging parameters. In this stage, users set the boost voltage where the battery will reach a voltage level and remain there until the battery undergoes an absorption stage

Float Voltage—once the charge controller recognizes the set float voltage, it will commence floating. The battery is supposed to be fully charged in his state, and the charge current is reduced to maintain battery stability levels.

| State of Charge | 12 V Battery | Volts per Cell |
|-----------------|--------------|----------------|
| 100% | 12.7 | 2.12 |
| 90% | 12.5 | 2.08 |
| 80% | 12.42 | 2.07 |
| 70% | 12.32 | 2.05 |
| 60% | 12.20 | 2.03 |
| 50% | 12.06 | 2.01 |
| 40% | 11.9 | 1.98 |
| 30% | 11.75 | 1.96 |
| 20% | 11.58 | 1.93 |
| 10% | 11.31 | 1.89 |
| 0 | 10.5 | 1.75 |

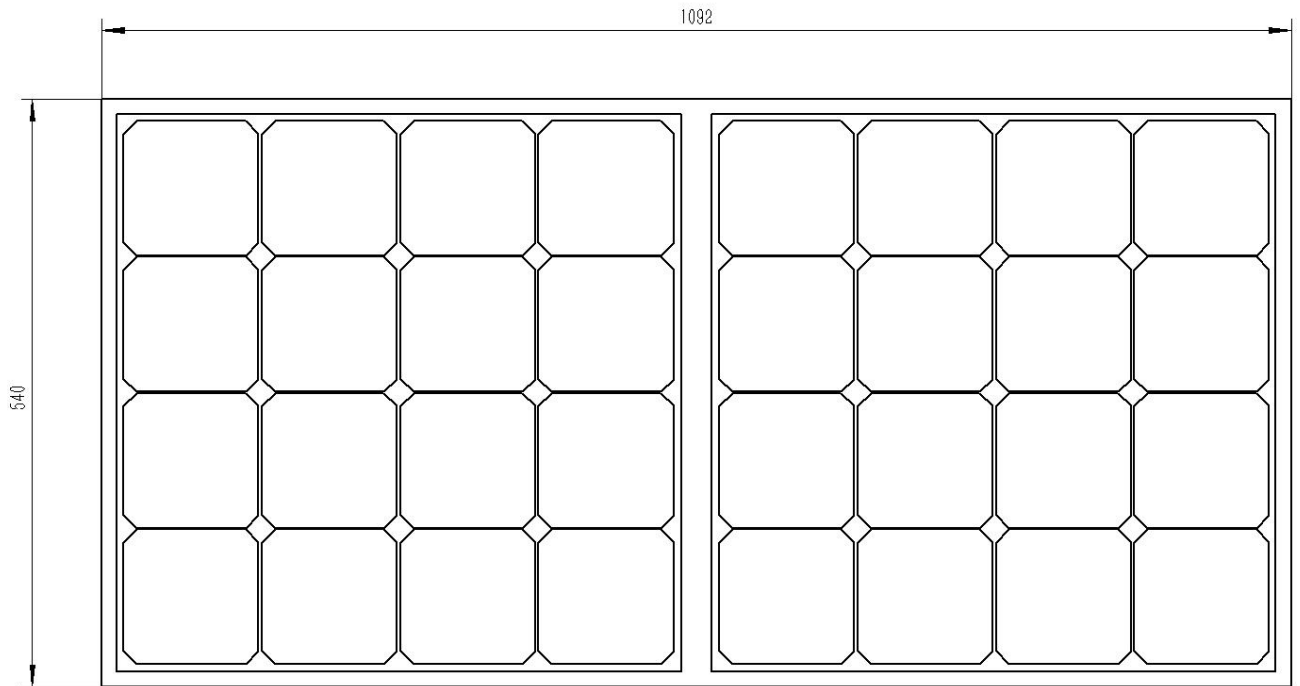
Dimensions

10A PWM



Unit: mm

100 W Suitcase



Unit: mm

50 W Suitcase

