

## Discharging Logic

During standard discharging, the battery is discharged at a constant current of 105A until the voltage drops to 40V. To ensure safe discharging, the battery temperature should be between -4°F (-20°C) and 131°F (60°C).



To ensure safe and optimal battery usage, it is recommended to pair the battery with discharge equipment that features a low voltage disconnect (LVD) function.



Do not exceed the maximum continuous discharge current (105A) of the battery.

## Battery Management System

The battery is equipped with a Battery Management System (BMS) that provides warnings and protections against overvoltage, undervoltage, overcurrent, short circuit, high temperature, and low temperature conditions. Refer to the table below for the triggering and recovery conditions of each warning and protection. The battery contains 16 cells in series.

### Protection Mechanisms

Battery Operating Status		Condition (For Reference Only)	
Battery Cell Overvoltage	Protection	Trigger	Battery Cell Voltage $\geq 3.65\text{V}$
		Recover	Battery Cell Voltage $\leq 3.45\text{V}$
Battery Cell Undervoltage	Protection	Trigger	Battery Cell Voltage $\leq 2.6\text{V}$
		Recover	Battery Voltage $\geq 2.8\text{V}$
Charge High Temperature	Protection	Trigger	Battery Temperature $\geq 140^{\circ}\text{F}$ ( $60^{\circ}\text{C}$ )
		Recover	Battery Temperature $\leq 131^{\circ}\text{F}$ ( $55^{\circ}\text{C}$ )
Discharge High Temperature	Protection	Trigger	Battery Temperature $\geq 140^{\circ}\text{F}$ ( $60^{\circ}\text{C}$ )
		Recover	Battery Temperature $\leq 131^{\circ}\text{F}$ ( $55^{\circ}\text{C}$ )
Charge Low Temperature	Protection	Trigger	Battery Temperature $\leq 32^{\circ}\text{F}$ ( $0^{\circ}\text{C}$ )
		Recover	Battery Temperature $\geq 37.4^{\circ}\text{F}$ ( $3^{\circ}\text{C}$ )
Discharge Low Temperature	Protection	Trigger	Battery Temperature $\leq -4^{\circ}\text{F}$ ( $-20^{\circ}\text{C}$ )
		Recover	Battery Temperature $\geq 5^{\circ}\text{F}$ ( $-15^{\circ}\text{C}$ )
Charge Overcurrent	Protection	Trigger	Charge Current $\geq 180\text{A}$ (5s)
		Recover	Discharge Current $\geq 1\text{A}$ or manual recovering by using the On/Off Switch
Discharge Overcurrent	Protection	Trigger	Discharge Current $\geq 400\text{A}$ (30s)
		Recover	Charge Current $\geq 1\text{A}$ or manual recovering by using the On/Off Switch

Battery Operating Status		Condition (For Reference Only)	
Discharge Short Circuit	Protection	Trigger	There is short circuit on the load circuitry.
		Recover	Remove the short circuit or manual recovering by using the On/Off Switch


## ■ Warnings

Warning	Condition (For Reference Only)	
Battery Cell Overvoltage	Trigger	Battery Cell Voltage $\geq 3.6V$
	Recover	Battery Cell Voltage $\leq 3.5V$
Battery Overvoltage	Trigger	Battery Voltage $\geq 57.6V$
	Recover	Battery Voltage $\leq 56.0V$
Charge High Temperature	Trigger	Battery Temperature $\geq 131^{\circ}F$ ( $55^{\circ}C$ )
	Recover	Battery Temperature $\leq 127.4^{\circ}F$ ( $53^{\circ}C$ )
Charge Low Temperature	Trigger	Battery Temperature $\leq 32^{\circ}F$ ( $0^{\circ}C$ )
	Recover	Battery Temperature $\geq 35.6^{\circ}F$ ( $2^{\circ}C$ )
Charge Overcurrent	Trigger	Battery Current $\geq 120A$
	Recover	Battery Current $\leq 70A$
Primary Low SOC	Trigger	Battery SOC $\leq 15\%$
Secondary Low SOC	Trigger	Battery SOC $\leq 5\%$
Battery Cell Undervoltage	Trigger	Battery Cell Voltage $\leq 2.85V$
	Recover	Battery Cell Voltage $\geq 2.90V$
Battery Undervoltage	Trigger	Battery Voltage $\leq 43.0V$
	Recover	Battery Voltage $\geq 45.0V$
Discharge High Temperature	Trigger	Battery Temperature $\geq 131^{\circ}F$ ( $55^{\circ}C$ )
	Recover	Battery Temperature $\leq 127.4^{\circ}F$ ( $53^{\circ}C$ )
Discharge Low Temperature	Trigger	Battery Temperature $\leq 5^{\circ}F$ ( $-15^{\circ}C$ )
	Recover	Battery Temperature $\geq 37.4^{\circ}F$ ( $-13^{\circ}C$ )
Discharge Overcurrent	Trigger	Battery Current $\geq 400A$
	Recover	Battery Current $\leq 350A$
MOS High Temperature	Trigger	MOS Temperature $\geq 158^{\circ}F$ ( $70^{\circ}C$ )
	Recover	MOS Temperature $\leq 152.6^{\circ}F$ ( $67^{\circ}C$ )

## Troubleshooting

Check the table below for common problems and relative solutions of the battery.

Problem	Possible Causes	Solution
<ul style="list-style-type: none"> <li>The battery is unable to be activated with a charge/discharge current greater than 1A</li> <li>The battery is activated at resting voltage below 40V</li> </ul>	Severe battery overdischarge due to self-discharge or parasitic loads	Revive the battery with a battery charger or charge controller featuring lithium battery activation or force charging.
The battery shuts off due to undervoltage protection.	The battery voltage drops below the preset threshold	Disconnect the battery from loads, and charge the battery with a current greater than 1A as soon as possible.
The battery cuts off the charging current due to overvoltage protection.	The battery voltage exceeds the preset threshold during charging.	<ol style="list-style-type: none"> <li>1. Disconnect the battery from the charging source.</li> <li>2. Reduce charge voltage by 0.2V to 0.4V for 6 hours.</li> <li>3. Attempt to fully charge the battery again with the correct voltage setting. If the problem persists with a lithium iron phosphate compatible charging source and correct voltage setting, repeat the above steps.</li> </ol>
The battery temperature gets too low during operation and the self-heating function doesn't work very well.	The charger connected to the battery has very little current.	Check the charging current of the charger for each battery more than 10A.
The battery is shorted and triggers short circuit protection.	Short circuit occurs in the battery.	<ol style="list-style-type: none"> <li>1. Remove the short circuit as soon as possible</li> <li>2. Charge the battery with a current greater than 1A.</li> </ol>
Charge/Discharge over-current protection is triggered due to too high current passing through the battery.	Excessive current flows through the battery during charging or discharging.	Disconnect the battery from the charging source or loads as soon as possible.

 For further assistance, contact Renogy technical support service at <https://www.renogy.com/contact-us>.

## Specifications

### Battery Specifications

<b>Rated Capacity (0.5C, 25°C)</b>	105Ah
<b>Nominal Voltage</b>	51.2V
<b>Charge Voltage Range</b>	40V to 58.4V
<b>Recommended Charge Current</b>	15A to 105A
<b>Recommended Discharge Current</b>	105A (210A, Max)
<b>Peak Discharge Current</b>	400A @30s
<b>Charge Temperature Range</b>	32°F to 113°F (0°C to 45°C)
<b>Discharge Temperature Range</b>	-4°F to 140°F (-20°C to 60°C)
<b>Storage Temperature Range</b>	41°F to 113°F (-5°C to 45°C)
<b>Operation Relative Humidity</b>	10% to 95%
<b>Cycle Life (0.5C, 25°C)</b>	5000 Cycles (80% DOD)
<b>Communication</b>	Bluetooth
<b>Dimensions</b>	15.55 × 12.99 × 10.63 in / 395 × 330 × 270 mm
<b>Weight</b>	106.92 lbs / 48.5 kg
<b>Terminal Bolt Size</b>	M8 × 15 mm
<b>Protection Rating</b>	IP65
<b>Certification</b>	UN38.3, MSDS, FCC ID, and IC ID
<b>Warranty</b>	5 years

### Battery Charger Specifications


<b>Nominal Charge Voltage</b>	51.2V
<b>Maximum Charge Voltage</b>	58.4V
<b>Maximum Continuous Charge Current</b>	20A
<b>AC Input Voltage Range</b>	90V to 264V
<b>Operating Temperature</b>	-40°F to 122°F (-40°C to 50°C)
<b>IP Rating</b>	IP66
<b>Dimensions</b>	11.1 × 5.75 × 3.24 in / 282 × 146 × 82.4 mm
<b>Operation Relative Humidity</b>	10% to 95%

## Maintenance & Storage

### Inspection

Please perform regular inspections following the steps below:

- Examine the external appearance of the battery and battery charger. The housing and terminals of the battery and battery charger shall be clean, dry, and free of corrosion.
- Check battery and battery charger cables and connections. Replace any damaged cables and tighten any loose connections.

 In certain application scenarios, corrosion may occur around the terminals. Corrosion can cause increased resistance and poor contact. It is recommended to regularly apply insulation grease to each terminal. Insulation grease can form a moisture-resistant seal and protect the terminals from corrosion.

### Cleaning

Please clean the battery and battery charger at regular intervals following the steps below:

- Disconnect the battery and battery charger from the system.
- Clear the leaves and debris from the battery and battery charger.
- Clean the battery and battery charger with a soft, lint-free cloth. The cloth can be dampened with water or mild soap and water if the battery and battery charger is extremely dirty.
- When cleaning the battery or battery charger with water, do not touch the device terminals. Do not let water flow into the cooling fan of the battery charger to prevent damage to the device.
- Dry the battery and battery charger with a soft, lint-free cloth.
- Keep the area around the battery and battery charger clean.
- Reconnect the battery and battery charger to the system.


### Checking Voltage

Please check the battery voltage periodically to assess battery health. If the battery is unable to be activated with a charge/discharge current greater than 1A or the battery is activated with a resting voltage below 40V, the battery may have been severely overdischarged due to self-discharge or parasitic loads. Please stop using the battery until the fault can be corrected and the battery can be charged.

### Storage

Please follow the steps below to ensure that the battery emerges from storage in a good condition:

- Charge the battery to 30% to 50% SOC.
- Disconnect the battery from the system.
- Store the battery in a well-ventilated, dry, clean area with temperatures between 41°F and 113°F (-5°C to 45°C).
- Do not expose the battery to direct sunlight, moisture, or precipitation.
- Handle the battery carefully to avoid sharp impacts or extreme pressure on the battery housing.
- Charge the battery at least once every 3 to 6 months to prevent it from overdischarge.
- Fully charge the battery when it is taken out of storage.

 Please follow the steps above to store the battery. Otherwise, the warranty will be void.

## Important Safety Instructions

Renogy accepts no liability for any damage caused by:

- Force majeure including fire, typhoon, flood, earthquake, war, and terrorism.
- Intentional or accidental misuse, abuse, neglect or improper maintenance, and use under abnormal conditions.
- Improper installation, improper operation, and malfunction of a peripheral device.
- Contamination with hazardous substances or radiation.
- Alterations to the product without express written consent from Renogy.

### General

- Wear proper protective equipment and use insulated tools during installation and operation. Do not wear jewelry or other metal objects when working on or around the battery and battery charger.
- Keep the battery and battery charger out of the reach of children.
- Do not dispose of the battery and battery charger as household waste. Comply with local, state, and federal laws and regulations and use recycling channels as required.
- In case of fire, put out the fire with a FM-200 or CO<sub>2</sub> fire extinguisher.
- Do not expose the battery and battery charger to flammable or harsh chemicals or vapors.
- Clean the battery and battery charger regularly.
- Do not expose the battery and battery charger to strong electrostatic fields, strong magnetic fields, or radiation.
- Please keep the battery and battery charger away from water, heat sources, sparks, and hazardous chemicals.
- Do not place the battery and battery charger in areas exposed to rain or water.
- Do not puncture, drop, crush, burn, penetrate, shake, strike, or step on the battery and battery charger.
- Do not open, dismantle, repair, tamper with, or modify the battery and battery charger.
- Do not touch any terminals or connectors.
- Do not insert foreign objects into the positive and negative terminals of the battery and battery charger.

### Battery Safety

- Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- Before operating the battery, ensure that the battery charger is not connected to a power outlet.
- Do not place tools on top of the battery.
- Please use suitable handling equipment for safe transportation of the battery.
- Do not connect the battery in series or parallel.

### Battery Charger Safety

- Ensure the charger is properly grounded to prevent electric shock from induced currents on the chassis and to guarantee personal safety.
- The charger contains high-voltage components. Do not attempt to disassemble or repair it without proper authorization.
- Do not block the cooling fans of the charger to ensure proper cooling.
- Always disconnect the power cable and charging plug before moving the charger to prevent damage or electrical hazards.
- The battery voltage must match the rated voltage of the charger.

## Renogy Support

To discuss inaccuracies or omissions in this quick guide or user manual, visit or contact us at:

 | [renogy.com/support/downloads](https://renogy.com/support/downloads)

 → [contentservice@renogy.com](mailto:contentservice@renogy.com)



Questionnaire Investigation




To explore more possibilities of solar systems, visit Renogy Learning Center at:

 | [renogy.com/learning-center](https://renogy.com/learning-center)

For technical questions about your product in the U.S., contact the Renogy technical support team through:

 | [renogy.com/contact-us](https://renogy.com/contact-us)

 1(909)2877111

For technical support outside the U.S., visit the local website below:

Canada |  | [ca.renogy.com](https://ca.renogy.com)

China |  | [www.renogy.cn](https://www.renogy.cn)

Australia |  | [au.renogy.com](https://au.renogy.com)

Japan |  | [jp.renogy.com](https://jp.renogy.com)

Other Europe |  | [eu.renogy.com](https://eu.renogy.com)

Germany |  | [de.renogy.com](https://de.renogy.com)

United Kingdom |  | [uk.renogy.com](https://uk.renogy.com)

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- Priority access to our latest launches & special events
- Insider Q&A sessions with our engineers
- Endless solar project ideas & sources



## FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- (1) Reorient or relocate the receiving antenna.
- (2) Increase the separation between the equipment and receiver.
- (3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- (4) Consult the dealer or an experienced radio/TV technician for help.

## FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cet appareil est conforme aux normes RSS d'Innovation, Sciences et Développement économique Canada en matière d'exemption de licence. Son fonctionnement est soumis aux deux conditions suivantes:

- (1) l'appareil nedoit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Le présent appareil est conforme Après examen de ce matériel aux conformité ou aux limites d' intensité de champ RF, les utilisateurs peuvent sur l' exposition aux radiofréquences et compliance d' acquérir les informations correspondantes. La distance minimale du corps à utiliser le dispositif est de 20cm.





## Renogy Empowered

Renogy aims to empower people around the world through education and distribution of DIY-friendly renewable energy solutions.

We intend to be a driving force for sustainable living and energy independence.

In support of this effort, our range of solar products makes it possible for you to minimize your carbon footprint by reducing the need for grid power.



## Live Sustainably with Renogy

Did you know? In a given month, a 1 kW solar energy system will...



Save 170 pounds of coal from being burned



Save 300 pounds of CO<sub>2</sub> from being released into the atmosphere



Save 105 gallons of water from being consumed



## Renogy Power PLUS

Renogy Power Plus allows you to stay in the loop with upcoming solar energy innovations, share your experiences with your solar energy journey, and connect with like-minded people who are changing the world in the Renogy Power Plus community.



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Renogy reserves the right to change the contents of this manual without notice.

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