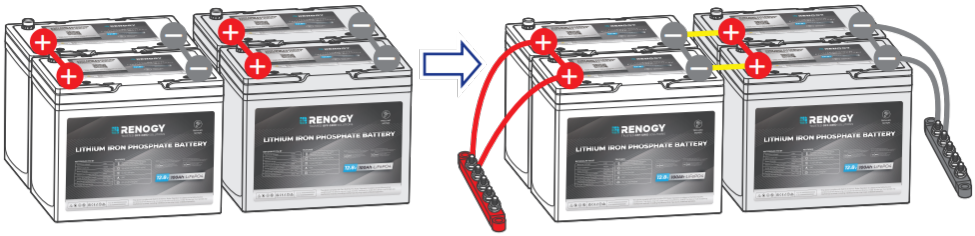
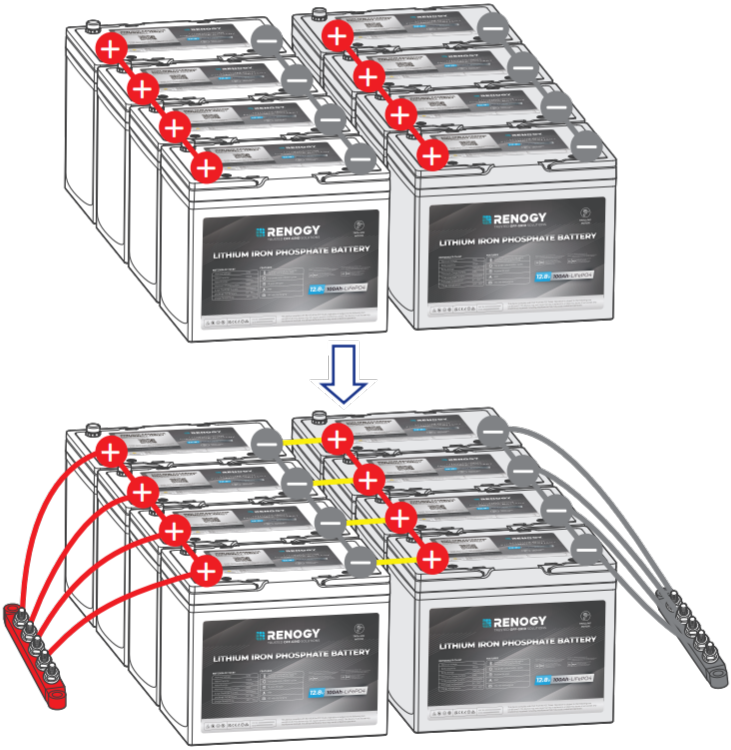
Parallel & Series Connection



2P2S	Battery System	24V (25.6V) 200Ah
	Energy	5120Wh
2P4S	Battery System	48V (51.2V) 200Ah
	Energy	10240Wh



4P2S	Battery System	24V (25.6V) 400Ah
	Energy	10240Wh
4P4S (Max)	Battery System	48V (51.2V) 400Ah
	Energy	20480Wh

Battery Cell Balancing

The battery employs bypass circuit to maintain the balance between each battery cell group. Each battery cell group is connected with a bypass resistor and a switch in parallel. During the charging process, if the highest-voltage battery cell group reaches the set balancing starting voltage and the voltage difference between the highest-voltage and the lowest-voltage battery cell group exceeds the set voltage difference, the switch connected to the highest-voltage battery cell group will be closed to shunt the charge current around the highest-voltage battery cell group through the bypass resistor until the voltage difference drops below the set value. To avoid excessive energy loss, the battery cell balancing is only performed during the charging process.

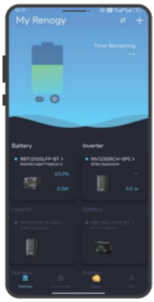
Monitoring

Depending on the specific application, the battery can establish either short-range or long-range communication connections with monitoring devices. These monitoring devices facilitate real-time monitoring, programming, and complete system management, offering comprehensive control and enhanced flexibility.

You can monitor the performance of the battery through the DC Home app (free of charge).

- Ensure the Bluetooth of your phone is turned on.
- The version of the DC Home app might have been updated. Illustrations in the user manual are for reference only. Follow the instructions based on the current app version.
- To ensure optimal system performance, keep the phone within 10 feet (3 m) of the battery.

Step 1: To ensure the optimal device compatibility, download and log into the latest DC Home app.



DC Home App

GTE IT ON Google Play

Download on the App Store

Step 2: Pair the battery with the DC Home app. Monitor the battery parameters via the app.

Charging/Discharging Parameter Settings

It is recommended that a single 12.8V 100Ah battery should be charged at 50A with a maximum allowable charging current at 100A. For single-battery scenarios, we recommend using 12V charge controllers rated at least 50A. For added safety and flexibility, a 12V 100A charge controller or battery charger is an ideal choice. For scenarios containing multiple batteries connected in series or parallel, consider the total voltage and capacity.

Charge (for Charge Controllers & Battery Chargers)

Charge/Boost Voltage	14.6V	**Overvoltage Disconnect**	14.6V
Bulk/Absorption Voltage	14.6V / Disabled	**Overvoltage Reconnect**	14.2V
Boost Return Voltage	13.3V		

Discharge (for Inverters)

Low Voltage Reconnect	11.2V	**Undervoltage Shutdown**	9.2V

The parameters in the table are applicable to 12V (12.8V) battery packs. For 24V (25.6V) packs, multiply the values by 2, and for 48V (51.2V) packs, multiply by 4.

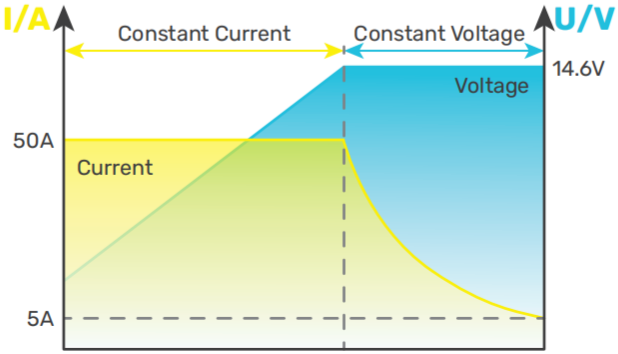
Battery Charging and Discharging Logic

The battery may be received at a partial state of charge (SOC) depending on the time between manufacturing and shipping. It is crucial to fully charge the battery before its initial use. In case the battery shuts off due to low SOC, promptly disconnect it from loads and charge it to prevent irreversible damage. Follow the instructions in this user manual for proper charging and usage to ensure optimal battery performance and longevity.

Charging Logic

The standard charging process for the battery involves charging at a constant current of 50A until the battery voltage reaches 14.6V, followed by charging at a constant voltage of 14.6V while tapering the charge current. The charging process is considered complete when the charge current is less than 5A (also known as tail current).

The standard charging process typically takes 2.5 hours and requires battery temperatures to be between 32°F and 131°F (0°C and 55°C) for safe charging. Leaving the battery on float will continue to balance the battery cells without damaging the battery.



Lithium batteries are compatible with various charging methods, including MPPT charge controller, AC charger, and DC-DC charger. The crucial parameter setting for these chargers is to set the charge voltage, boost voltage, or bulk voltage at 14.6V (±0.2V).

Do not overcharge or overdischarge the battery.

Do not charge the battery at high temperatures above 131°F (55°C).

Only charge the battery with a battery charger or charge controller that is compatible with lithium iron phosphate batteries.

Do not exceed the maximum continuous charge current (100A) of the battery.

Discharging Logic

During standard discharging, the battery is discharged at a constant current of 50A until the voltage drops to 10.8V. To ensure safe discharging, the battery temperature should be between -4°F (-20°C) and 131°F (55°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 connect large loads to the battery when it is running low.

Do not exceed the maximum continuous discharge current (150A) of the battery.

How to Estimate the Battery SOC?

The SOC values listed below are estimated based on the resting voltage (open-circuit voltage at rest) when the battery is at rest for 120 minutes, not in charging or discharging state.

SOC	Charge Voltage	SOC	Charge Voltage
100%	13.69V	25%	13.08V
95%	13.32V	15%	12.92V
55%	13.18V	10%	12.82V
45%	13.16V	5%	12.77V
30%	13.15V	0%	11.19V

The table above is for reference only because slight variations in battery voltage may occur among different batteries.

Balance Logic

When the voltage reaches 3.4V, the balance is turned on, and the working mode is pulse mode, that is, it is turned on for a period of time and then turned off for a period of time (200ms a cycle), and then turned on again. When the balance is turned on, the voltage balance effect is achieved through the resistance consumption mode.

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.

Battery Operating Status		Condition (For Reference Only)	
Battery Cell Overvoltage	Protection	Trigger	Battery Cell Voltage ≥ 3.75V (2s)
		Recover	Battery Cell Voltage ≤ 3.6V
Battery Cell Undervoltage	Protection	Trigger	Battery Cell Voltage ≤ 2.2V (2s)
		Recover	Battery Voltage ≥ 2.6V
Charge High Temperature	Protection	Trigger	Battery Temperature ≥ 149°F (65°C)
		Recover	Battery Temperature ≤ 122°F (50°C)
Charge Low Temperature	Protection	Trigger	Battery Temperature ≤ 32°F (0°C)
		Recover	Battery Temperature ≥ 41°F (5°C)
FET High Temperature	Protection	Trigger	Battery Temperature ≥ 221°F (105°C)
		Recover	Battery Temperature ≤ 167°F (75°C)
Discharge High Temperature	Protection	Trigger	Battery Temperature ≥ 149°F (65°C)
		Recover	Battery Temperature ≤ 122°F (50°C)
Discharge Low Temperature	Protection	Trigger	Battery Temperature ≤ -4°F (-20°C)
		Recover	Battery Temperature ≥ 32°F (0°C)
Charge Overcurrent	Protection	Trigger	Charge Current ≥ 120A (2s)
		Recover	When the charger is removed from the battery. or Automatic recover after a delay of 1 min
Discharge Overcurrent	Primary Protection	Trigger	Discharge Current ≥ 160A (32s)
		Recover	Charge battery or Recover automatically after 1 min
	Secondary Protection	Trigger	Discharge Current ≥ 320A (500 ms)
		Recover	Charge battery or Recover automatically after 1 min
Short Circuit	Protection	Trigger	Discharge Current ≥ 2170A (560 µs)
		Recover	Recover by releasing load after approximately 5s

Troubleshooting

Problem	Possible Causes	Solution
• The battery is unable to be activated with a charge/discharge current greater than 1A • The battery is activated at resting voltage below 10.8V	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.	1. Disconnect the battery from the charging source. 2. Reduce charge voltage by 0.2V to 0.4V for 6 hours. 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.
The battery temperature gets too high/low during operation and triggers high/low temperature protection	The battery temperature exceeds the preset threshold.	1. Disconnect the battery from the charging source or loads. 2. Cool down/Warm up the battery. 3. The battery recovers from high/low temperature protection automatically and continues operating.
The battery is shorted and triggers short circuit protection.	Short circuit occurs in the battery.	1. Remove the short circuit as soon as possible 2. Charge the battery with a current greater than 1A.
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

General

Battery Cell Type	Lithium Iron Phosphate
Rated Capacity (0.5C, 25°C)	100Ah
Nominal Voltage	12.8V
Voltage Range	10.8V to 14.6V
Cycle Life (0.2C, 25°C)	6000 Cycles (80% DOD)
Dimension	10.24 x 6.61 x 8.23 in / 260 x 168 x 209 mm
Weight	22.71 lbs / 10.3 kg
Connection Method	Series & Parallel (4S4P)
Terminal Bolt Size	M8 x 1.25 x 12 mm
Recommended Terminal Torque	53.1 inch•lbs to 70.8 inch•lbs / 6 N•m to 8 N•m
Protection Rating	IP67
Certification	RCM, MSDS, UN38.3, FCC, CE, PSE, IC, RoHS, and UKCA

Operation Parameters

Charge Voltage	14.6V
Maximum Continuous Charge Current	100A
Maximum Continuous Discharge Current	150A
Peak Discharge Current	300A@30s
Charge Temperature Range	32°F to 131°F (0°C to 55°C)
Discharge Temperature Range	-4°F to 131°F (-20°C to 55°C)
Storage Temperature Range	32°F to 113°F (0°C to 45°C)
Operation Relative Humidity	5% to 95%

Maintenance & Storage

Inspection

Please perform regular inspections following the steps below:

- Examine the external appearance of the battery. The housing and terminals of the battery shall be clean, dry, and free of corrosion.
- Check battery 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 at regular intervals following the steps below:

- Disconnect the battery from the system.
- Clear the leaves and debris from the battery.
- Clean the battery with a soft, lint-free cloth. The cloth can be dampened with water or mild soap and water if the battery is extremely dirty.
- Dry the battery with a soft, lint-free cloth.
- Keep the area around the battery clean.
- Reconnect the battery 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 an resting voltage below 10.8V, 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 32°F (0°C) and 113°F (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 three to six 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.

Replacement

Use a replacement battery of the same type and brand to ensure proper compatibility, peak performance, and reliable system operation.

Do not dispose of the battery as household waste. Comply with local, state, and federal laws and regulations and use recycling channels as required.

Important Safety Instructions

Servicing the battery must be carried out or overseen by qualified personnel with expertise in battery systems and awareness of necessary safety precautions. 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 the manufacturer.

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.
- Keep the battery out of the reach of children.
- In case of fire, put out the fire with a FM-200 or CO_2 fire extinguisher.
- Do not expose the battery to flammable or harsh chemicals or vapors.
- Clean the battery regularly.
- It is recommended that all cables should not exceed 10 meters because excessively long cables result in a voltage drop.
- The cable specifications listed in the quick guide account for critical, less than 3% voltage drop and may not account for all configurations.
- Do not expose the battery to strong electrostatic fields, strong magnetic fields, or radiation.

Battery Safety

- Please keep the battery away from water, heat sources, sparks, and hazardous chemicals.
- Do not puncture, drop, crush, burn, penetrate, shake, strike, or step on the battery.
- Do not open, dismantle, repair, tamper with, or modify the battery.
- Do not touch any terminals or connectors.
- Please make sure any battery charger or charge controller has been disconnected before working on the battery.
- Do not connect or disconnect terminals from the battery without first disconnecting loads.
- Do not place tools on top of the battery.
- Please use suitable handling equipment for safe transportation of the battery.
- Do not insert foreign objects into the positive and negative terminals of the battery.
- Check if the battery is unintentionally grounded. If grounding is detected, eliminate the connection to prevent potential hazards. Contact with any part of a grounded battery may lead to electrical shock. The risk of shock can be minimized by removing such grounds during installation and maintenance, especially for equipment and remote battery supplies without a grounded supply circuit.

Renogy Support

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

renogy.com/support/downloads

contentservice@renogy.com

Questionnaire Investigation

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

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

1(909)2877111

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

Canada	ca.renogy.com	China	www.renogy.cn
Australia	au.renogy.com	Japan	jp.renogy.com
Other Europe	eu.renogy.com	Germany	de.renogy.com
United Kingdom	uk.renogy.com		

Join Our Facebook Community Today. Scan the QR code to connect with like-minded people and Renogy engineers. You will get:

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

Battery Recycling

The proper disposal and recycling of batteries are essential for environment protection and circular economy. We encourage correctly disposing of your batteries when they become depleted.

You can dispose your used batteries at any of Call2Recycle or Earth911 locations that accepts Renogy rechargeable Lithium-ion and Lead-acid batteries (AGM&GEL).

Enjoy our community's incentive program when you properly dispose of your batteries. You can earn $20 gift cards to purchase any products on our website by participating. It's a simple way to be environmentally responsible and be rewarded for recycling.

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.

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) Orient 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.

This device complies with Innovation, Science and Economic Development Canada’ s License exempt RSS standard(s). 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 of the device.

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_2 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.

YouTube @Renogy Solar @renogyofficial @Renogy

Manufacturer: RENOGY New Energy Co.,Ltd
Address: No.66, East Ningbo Road Room 624-625 Taicang German Overseas Students Pioneer Park JiangSu 215000 CN

EC REP
eVatmaster Consulting GmbH
Battinastr. 30, 60325
Frankfurt am Main, Germany
contact@evatmaster.com

Manufacturer: RENOGY New Energy Co.,Ltd
Address: No.66, East Ningbo Road Room 624-625 Taicang German Overseas Students Pioneer Park JiangSu 215000 CN

UK REP
EVATOST CONSULTING LTD
Office 101 32 Threadneedle Street,
London, United Kingdom, EC2R 8AY
contact@evatost.com

FCC ID: 2ANPB-RBT12100TM
IC ID: 23590-RBT12100TM