



**Lithium Iron Phosphate
(LiFePO₄) Battery**

12.8V 100Ah 1280WH MINI
Model: 12100-70L

INSTALLATION AND OPERATION GUIDE

APPLICATIONS

- Outdoor Recreation
- Backup Power
- Off-Grid Systems

www.super-empower.com

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all product data sheets at any time. Consult
CALIVE LLC marketing
specialists for publication updates at
Service@super-empower.com*

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—PRODUCT OVERVIEW

12.8V 100AH BATTERY MINI

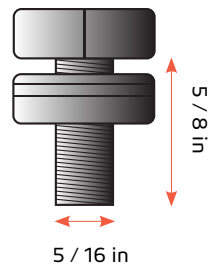
Operating Voltage:	12.8V
End of Charging Voltage:	14.6V
Recommended Charge Current:	20A (0.2C)
Max Continuous Discharge Current:	100A
Max. Continuous Output Power:	1280W



—ADDITIONAL COMPONENTS

M8-5/8" (16MM) TERMINAL BOLTS

The terminal bolts are used to secure multiple cable lugs to a single battery terminal. The bolts can be replaced with M8 bolts of other lengths based on actual needs.



INSULATING CAPS FOR BOLTS

—WARNING/AVERTISSEMENT

GENERAL SAFETY PRECAUTIONS / PRÉCAUTIONS

GÉNÉRALES DE SÉCURITÉ

ENGLISH

- Batteries may present potential hazards. Appropriate safety precautions must be taken during installation, operation, storage, and maintenance.
- Improper use of the battery may result in battery failure, equipment damage, personal injury, fire, or other hazards.
- Incorrect installation, configuration, or use of connected equipment may damage the battery or other components in the system.
- Wear appropriate personal protective equipment when installing or servicing the battery.
- Installation and maintenance should be performed by trained and qualified personnel.
- Failure to follow these safety instructions may result in personal injury or property damage.

FRANÇAIS

- Les batteries peuvent présenter des risques potentiels. Des précautions de sécurité appropriées doivent être prises lors de l'installation, de l'utilisation, du stockage et de l'entretien.
- Une utilisation incorrecte de la batterie peut entraîner une défaillance de la batterie, des dommages matériels, des blessures, un incendie ou d'autres dangers.
- Une installation, une configuration ou une utilisation incorrecte des équipements connectés peut endommager la batterie ou d'autres composants du système.
- Portez un équipement de protection individuelle approprié lors de l'installation ou de l'entretien de la batterie.
- L'installation et l'entretien doivent être effectués par du personnel formé et qualifié.
- Le non-respect de ces consignes de sécurité peut entraîner des blessures ou des dommages matériels.

1. AVOID SHORT CIRCUITS / ÉVITER LES COURTS-CIRCUITS

ENGLISH

Do not short-circuit the positive and negative battery terminals. Keep metal tools, jewelry, and other conductive objects away from the terminals.

FRANÇAIS

Ne court-circuitez pas les bornes positive et négative de la batterie. Tenez les outils métalliques, les bijoux et autres objets conducteurs éloignés des bornes.

2. DO NOT DISASSEMBLE OR MODIFY / NE PAS DÉMONTÉ NI MODIFIER

ENGLISH

Do not disassemble, open, puncture, or modify the battery. Doing so may cause an internal short circuit, gas generation, fire, explosion, or other hazards.

FRANÇAIS

Ne démontez, n'ouvrez, ne percez et ne modifiez pas la batterie. Cela pourrait provoquer un court-circuit interne, un dégagement de gaz, un incendie, une explosion ou d'autres dangers.

3. ELECTROLYTE HAZARD / DANGER LIÉ À L'ÉLECTROLYTE

ENGLISH

If electrolyte leaks from a damaged battery and comes into contact with the skin or eyes, rinse the affected area immediately with plenty of clean water and seek medical attention.

FRANÇAIS

En cas de fuite d'électrolyte provenant d'une batterie endommagée et de contact avec la peau ou les yeux, rincez immédiatement et abondamment la zone affectée à l'eau propre et consultez un médecin.

4. KEEP AWAY FROM WATER / TENIR À L'ÉCART DE L'EAU

ENGLISH

Do not immerse the battery in water or any other liquid. Keep the battery away from seawater, beverages, juice, coffee, and other liquids.

FRANÇAIS

N'immergez pas la batterie dans l'eau ni dans tout autre liquide. Tenez la batterie à l'écart de l'eau de mer, des boissons, des jus, du café et de tout autre liquide.

5. BATTERY SERVICE AND REPLACEMENT / ENTRETIEN ET REMPLACEMENT DE LA BATTERIE

ENGLISH

Battery servicing or internal cell replacement should only be performed by the manufacturer, an authorized supplier, or qualified service personnel. Do not attempt to replace the internal battery cells yourself.

FRANÇAIS

L'entretien de la batterie ou le remplacement des cellules internes doit être effectué uniquement par le fabricant, un fournisseur autorisé ou un personnel de maintenance qualifié. Ne tentez pas de remplacer vous-même les cellules internes de la batterie.

6. DO NOT USE A DAMAGED BATTERY / NE PAS UTILISER UNE BATTERIE ENDOMMAGÉE

ENGLISH

The battery may be damaged by impact during transportation or handling. Do not use the battery if any abnormal condition is observed, including:

- Cracks or damage to the housing
- Deformation or swelling
- Electrolyte leakage
- Unusual odor
- Excessive heat
- Other visible damage or abnormal conditions

If leakage, an unusual odor, excessive heat, or other abnormal conditions are detected, stop using the battery immediately and keep it away from fire, sparks, open flames, and other ignition sources.

FRANÇAIS

La batterie peut être endommagée par un choc pendant le transport ou la manutention.

N'utilisez pas la batterie si vous constatez une anomalie, notamment:

- Des fissures ou des dommages au boîtier
- Une déformation ou un gonflement
- Une fuite d'électrolyte
- Une odeur inhabituelle
- Une chaleur excessive
- Tout autre dommage visible ou état anormal

En cas de fuite, d'odeur inhabituelle, de chaleur excessive ou de toute autre anomalie, cessez immédiatement d'utiliser la batterie et éloignez-la du feu, des étincelles, des flammes nues et de toute autre source d'inflammation.

—WARNING/AVERTISSEMENT

7. BATTERY STORAGE / STOCKAGE DE LA BATTERIE

ENGLISH

For long-term storage, keep the battery at approximately 30% to 50% state of charge (SOC) and store it within the specified storage temperature range.

Recharge the battery approximately every six months to help prevent over-discharge.

Store the battery in a dry, well-ventilated location away from heat sources, direct sunlight, fire, and flammable materials.

FRANÇAIS

Pour un stockage de longue durée, maintenez la batterie à environ 30% à 50% de son état de charge (SOC) et stockez-la dans la plage de température de stockage spécifiée.

Rechargez la batterie environ tous les six mois afin d'éviter une décharge excessive.

Stockez la batterie dans un endroit sec et bien ventilé, à l'écart des sources de chaleur, de la lumière directe du soleil, du feu et des matériaux inflammables.

8. BATTERY AGING AND OPERATING CONDITIONS / VIEILLISSEMENT ET CONDITIONS D'UTILISATION

ENGLISH

Battery performance may gradually decrease over time, even when the battery is stored without being used.

Operating, charging, discharging, or storing the battery outside the specified conditions may shorten its service life or cause damage.

If the battery can no longer hold a charge properly even when charged according to the instructions, discontinue use and contact the supplier or qualified service personnel.

FRANÇAIS

Les performances de la batterie peuvent diminuer progressivement avec le temps, même lorsque la batterie est stockée sans être utilisée.

L'utilisation, la charge, la décharge ou le stockage de la batterie en dehors des conditions spécifiées peut réduire sa durée de vie ou provoquer des dommages.

Si la batterie ne parvient plus à maintenir correctement sa charge malgré une recharge effectuée conformément aux instructions, cessez de l'utiliser et contactez le fournisseur ou un personnel de maintenance qualifié.

—WARNING SYMBOLS /SYMBÔLES D'AVERTISSEMENT

ENGLISH



- Do not dispose of the battery with household waste.



- Recycle the battery in accordance with applicable local regulations.



- Read the product manual carefully before installation and use.



- Follow all safety instructions to avoid personal injury or property damage.



- Do not expose the battery to temperatures above 60°C (140°F).



- Keep the battery away from fire, sparks, and open flames.



- Do not immerse the battery in water or expose it to rain or excessive moisture.

FRANÇAIS



- Ne jetez pas la batterie avec les ordures ménagères.



- Recyclez la batterie conformément aux réglementations locales applicables.



- Lisez attentivement le manuel du produit avant l'installation et l'utilisation.



- Respectez toutes les consignes de sécurité afin d'éviter les blessures ou les dommages matériels.



- N'exposez pas la batterie à des températures supérieures à 60°C (140°F).



- Tenez la batterie à l'écart du feu, des étincelles et des flammes nues.



- N'immergez pas la batterie dans l'eau et ne l'exposez pas à la pluie ou à une humidité excessive.

If you have any questions or need any help, please feel free to contact us at Service@super-empower.com.

CONTENTS

BATTERY PARAMETERS	10
THINGS TO KNOW BEFORE USING	12
Long Term Storage	12
CHARGING METHODS	13
Solar Panel(s) & Controller	13
Battery Charger	14
Alternator / Generator	14
HOW TO ESTIMATE THE BATTERY CAPACITY	15
State of Charge (SOC)	15
RECOMMENDED CABLE SIZING	16

SERIES / PARALLEL CONNECTION

17

The Premise of Connection

17

Limitation for Series / Parallel Connection

17

HOW TO CONNECT BATTERIES

18

- Step 1 Wear Insulating Gloves
- Step 2 Voltage Balancing Before Connection
- Step 3 Battery-to-Battery Connection
- Step 4 Total Input & Output connection
- Step 5 Rebalancing Every Six Months

WHAT TO DO WHEN THE BATTERY STOPS WORKING?

24

NOTICE BEGORE USING

26

BATTERY PARAMETERS

Cell Type	Lithium Iron Phosphate (LiFePO ₄) Battery
Nominal Voltage	12.8V
Rated Capacity	100Ah
Energy	1280Wh
Internal Resistance	≤40mΩ
Cycle Life	4,000 Cycles (≥80% Capacity Retention)
Battery Management System (BMS) Board	100A
Charge Method	CC/CV
End of Charge Voltage	14.6V
Recommended Charge Current	20A(0.2C)
Max. Continuous Charge Current	100A
Max. Continuous Discharge Current	100A
Max. Continuous Output Power	1280W

Dimension	L 10.24 X W 6.61 X H 8.46 in
	L 260 X W 168 X H 215 mm
Housing Material	ABS (Flame Retardant Plastic)
Protection Class	IP65
Temperature Range	Charge: 0°C to 55°C / 32°F to 131°F
	Discharge: -20°C to 55°C / -4°F to 131°F
	Storage: ≤ 1 Month: -20°C to 45°C / -4°F to 113°F ≤ 3 Months: -20°C to 45°C / -4°F to 113°F ≤ 1 Year: -20°C to 20°C / -4°F to 68°F

—THINGS TO KNOW BEFORE USING

- When using the battery, please be careful to **avoid metal or conductive objects touching the positive and negative poles** of the battery **at the same time**. otherwise it may cause a short circuit.
- **Install the battery upright with post bolt facing up**, and it could not be mounted upside down. If you need to mount the battery at its side, please contact Service@super-empower.com to confirm the direction.
- **Tightly screw in the post bolts**. Having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery.
- This battery is not intended to be used to start any devices, please **DO NOT use it as a starting battery**.
- Suggestions for **Long-term storage**:

- Temperature

The batter can be operated at a temperature of -20°C to 60°C / -4°F to 140°F, and a temperature between 10°C to 35°C / 50°F to 95°F is ideal for long-term storage. Store in a fireproof container and away from children.

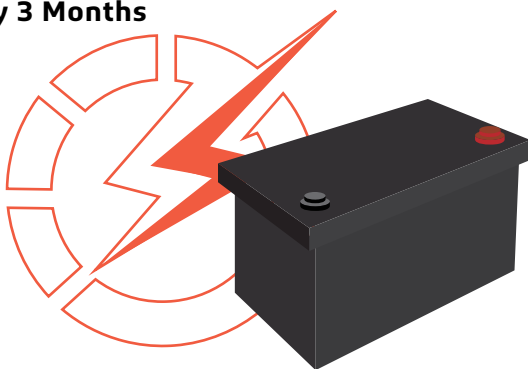
- Capacity

For a longer-lasting product, it is best to store your battery at a 50% charge level and recharge every three months if it is not going to be used for a one time



10°C ~ 35°C

**Recharge
Every 3 Months**



—CHARGING METHODS

SOLAR PANEL(S) & CONTROLLER

Solar Panel

Use a solar charge controller compatible with 12V LiFePO₄ batteries.

DO NOT connect solar panels directly to the battery.

Recommended Charging

Parameter Recommended Setting

Charge Method: CC/CV

Recommended Charge Current: 20A (0.2C)

Maximum Charge Voltage: 14.6V

Approx. Charging Time: 5–6 hours

Actual charging time may vary depending on the charging source, available power, temperature, and system conditions.

CONTROLLER SETTINGS

When manually configuring a compatible LiFePO₄ charge controller, make sure the charging voltage does not exceed 14.6V.

Use the controller's 12V LiFePO₄ / Lithium Battery Mode whenever available.

CHARGING	Charge / Bulk / Boost Voltage	14.4V ±0.2V
	Absorption Voltage	14.4V ±0.2V
	Over Voltage Disconnect	15V
	Over Voltage Reconnect	14.2V
	Tail Current	2A (0.02C)

DISCHARGING	Under Voltage Warning	11.6V
	Under Voltage Recover	12V
	Low Voltage Disconnect	10.8V
	Low Voltage Reconnect	12.4V

BATTERY CHARGER

Use 14.6V lithium iron phosphate (LiFePO₄) battery charger to maximize the capacity.

Recommended Charging Voltage: Between 14.2V to 14.6V

Recommended Charging Current:

20A (0.2C)	The battery will be fully charged in around 5hrs to 100% capacity.
50A (0.5C)	The battery will be fully charged in around 2hrs to around 97% capacity.

Tips

- Connect the charger(with alligator clips) to the grid power before connecting it to the battery in case of sparks.
- It's recommended to disconnect the charger from the battery after fully charging.

ALTERNATOR / GENERATOR

Super Empower battery can be charged by an alternator or generator.

If the alternator/generator supports DC output, a DC-to-DC charger needs to be added between the battery and the generator; if the alternator/generator supports AC output, please refer to the recommendations in "Battery Charger" above to add a suitable battery charger between the battery and the generator.

Recommended Charging Voltage: Between 14.2V to 14.6V

Recommended Charging Current:

20A (0.2C)	The battery will be fully charged in around 5hrs to 100% capacity.
50A (0.5C)	The battery will be fully charged in around 2hrs to around 97% capacity.

—HOW TO ESTIMATE THE BATTERY CAPACITY

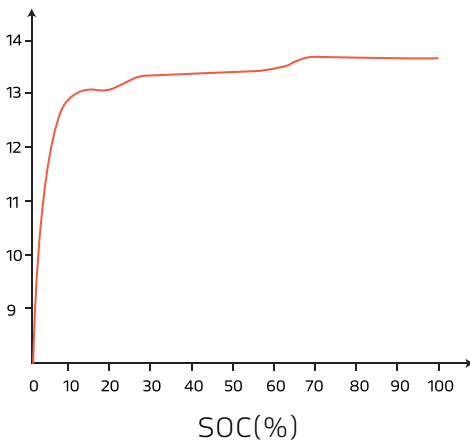
STATE OF CHARGE (SOC)

The battery capacity could be roughly estimated by its resting voltage (not charging/discharging voltage).

Since the voltage of each battery is slightly different, and the voltage measurement is affected by the measuring instrument, ambient temperature, etc., the following parameters are for reference only. The actual SOC of the battery is based on the discharge capacity under load.

Resting Voltage: The voltage is measured after the battery has been disconnected from the charger and loads with zero current, and left alone for 3 hours.

VOLTAGE(V)



SOC (%)	VOLTAGE (V)
0	10 to 12
25	13 to 13.15
50	13.15 to 13.2
75	13.3 to 13.33
100	≥13.33

- Based on the characteristics of LiFePO_4 batteries, the voltage measured by all LiFePO_4 batteries during charging/discharging is not the real voltage of the battery. Therefore, after charging/discharging and disconnecting the battery from the power source, the voltage of the battery will gradually drop/increase to its real voltage.

—RECOMMENDED CABLE SIZING

Battery cables should be properly sized to handle the expected load. Refer to the table below for amperage ratings for different sizes of copper cables.

PVC COPPER CABLE SIZE (6 AWG/13.3 mm²) AMPACITY(A)	
14 (2.08)	20
12 (3.31)	25
10 (5.25)	35
8 (8.36)	50
6 (6.13)	65
4 (21.1)	85
2 (33.6)	115
1 (42.4)	130
1/0 (53.5)	150
2/0 (67.4)	175
4/0 (107)	230

The above values are from NEC Table 310.15(B)16 for copper cables rated at 167°F (75°C) operating at an ambient temperature not exceeding 86°F (30°C). Cables longer than 6 feet (1829 mm) or ambient temperature higher than 86°F (30°C) may require heavier gauges to avoid excessive voltage drops with undersized ones.

— SERIES/PARALLEL CONNECTION

THE PREMISE OF CONNECTION

To connect in series or/and parallel, batteries should meet the below conaltions.

- a. identical batteries with the same battery capacity (Ah) and BMS (A);
- b. from the same brand (as lithium battery from different brands has their special BMS);
- c. purchased in near time (within one month).

LIMITATION FOR SERIES/PARALLEL CONNECTION

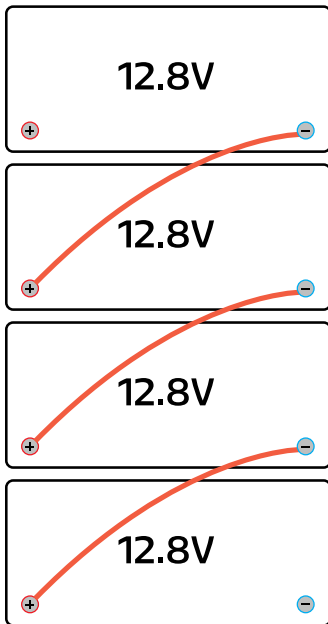
Support connecting up to 16 identical batteries for up to:

4 in series as 51.2V battery system/

4 in parallel as 400Ah battery system.

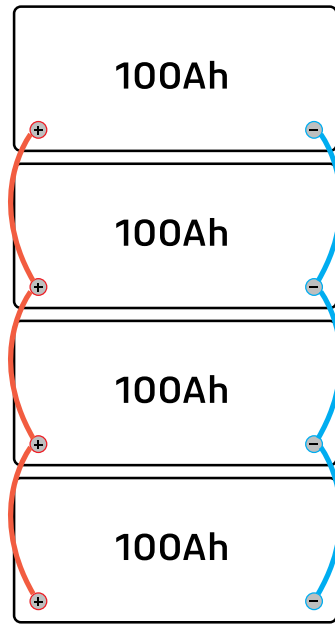
Series Connection

51.2V 100Ah



Parallel Connection

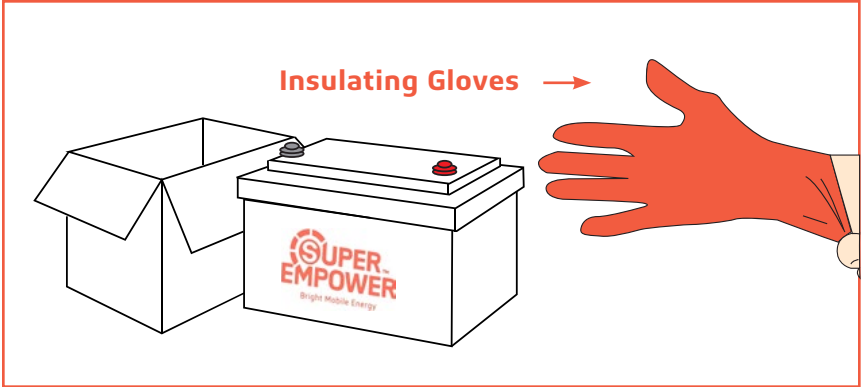
12.8V 400Ah



—HOW TO CONNECT BATTERIES

Step 1 Wear Insulating Gloves

Wear insulating gloves for protection before connecting. Please pay attention to operation safety in the process of connection



Step 2 Voltage Balancing Before Connection

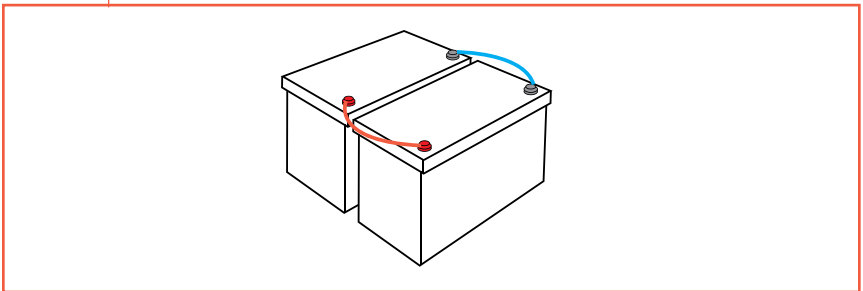
Below the steps are necessary to reduce the voltage difference between batteries and let the battery system perform the best of it in series or/and in parallel.

Step
1

Fully charge the batteries separately.
(voltage at rest: $\geq 13.33V$)

Step
2

Connect all of the batteries in parallel, and leave them together for 12–24hrs.



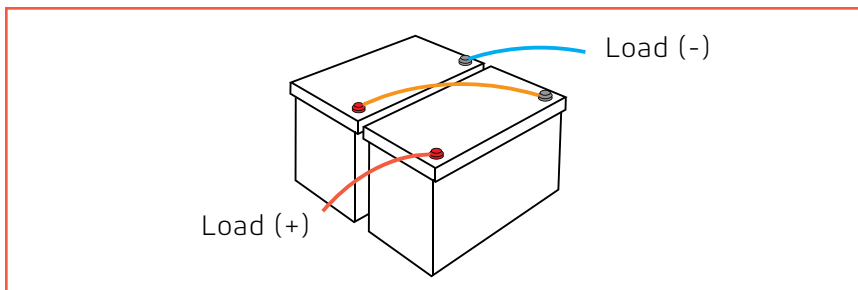
Step
3

They're now ready for the connection.

Step 3 Battery-to-Battery Connection

#1 Connect Batteries in Series

+ To **-**



After series connection, the system voltage increases according to the number of batteries connected, while the capacity remains unchanged.

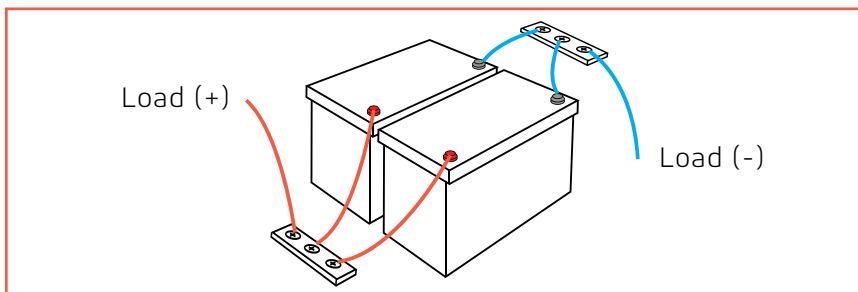
E.g., If two 12.8V 100Ah batteries are connected in series, the battery system will be 25.6V 100Ah.

#2 Connect Batteries in Parallel

+ To **+**

- To **-**

Refer to Page 23 for total input & output connection



After parallel connection, the system capacity increases according to the number of batteries connected, while the voltage remains unchanged.

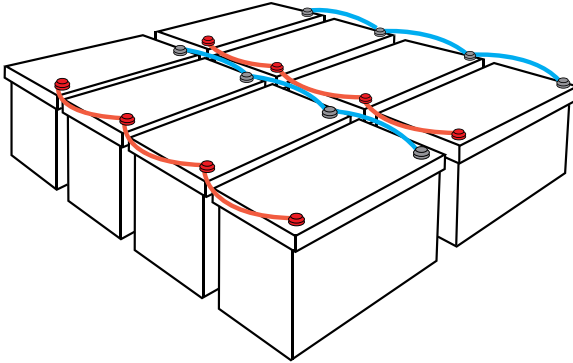
E.g., If two 12.8V 100Ah batteries are connected in parallel, the battery system will be 12.8V 200Ah.

#3 Connect Batteries Both in Series & Parallel

Connect in parallel first, then series.

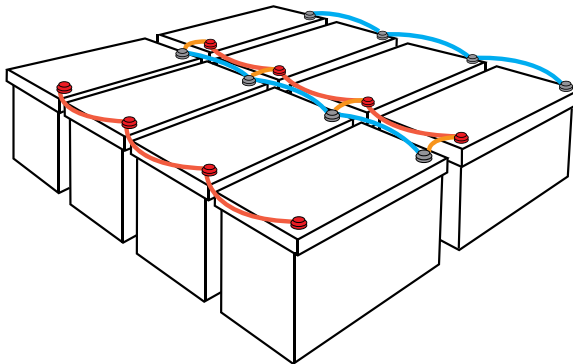
Step
1

Connect the batteries in parallel.



Step
2

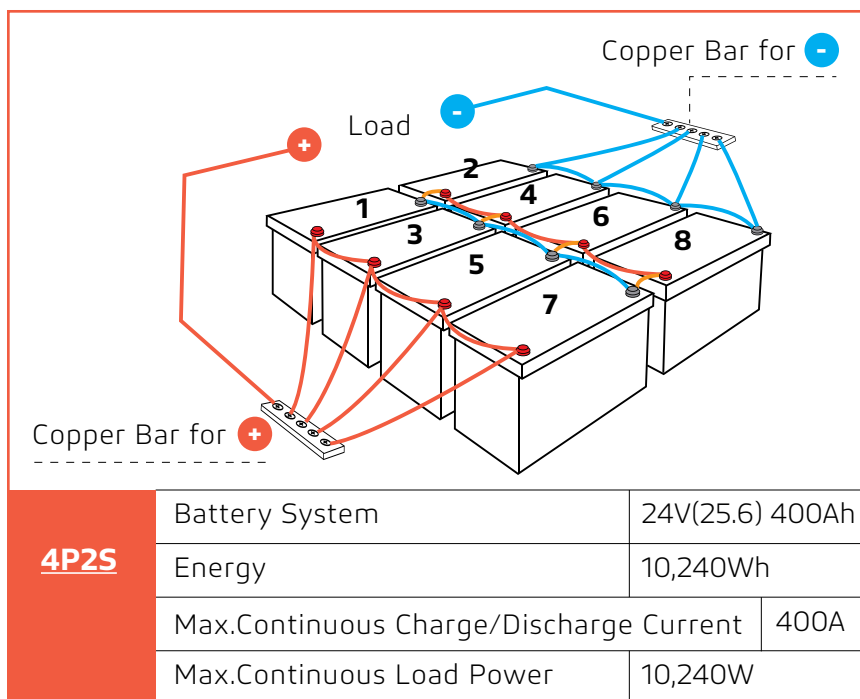
Connect the paralleled battery systems in series.



Step 4 Total Input & Output Connection

Use Two copper bars (instead of battery terminals) to connect all the positive and negative output/input cables, ensuring that the input & output currents of each battery are balanced. (Not required when connecting batteries only in series.)

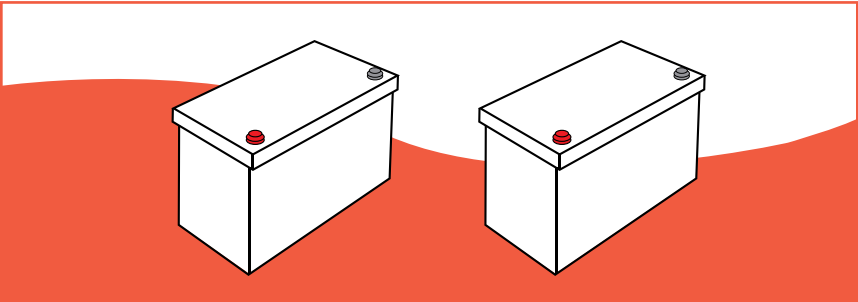
It is not recommended to use one terminal as the total positive or negative output/input of the battery system as the connected terminals may heat up or even melt if the total output/input current of the battery system is too high.



- As $\oplus$ of 1 / 3 / 5 / 7 is connected in series with $\ominus$ of 2 / 4 / 6 / 8, please do not connect $\oplus$ of 1 / 3 / 5 / 7 with $\oplus$ of load or $\ominus$ of 2 / 4 / 6 / 8 with $\ominus$ of load, otherwise the battery system will fail to connect in series.
- Please do not connect in reverse order, which may affect the use of the batteries.

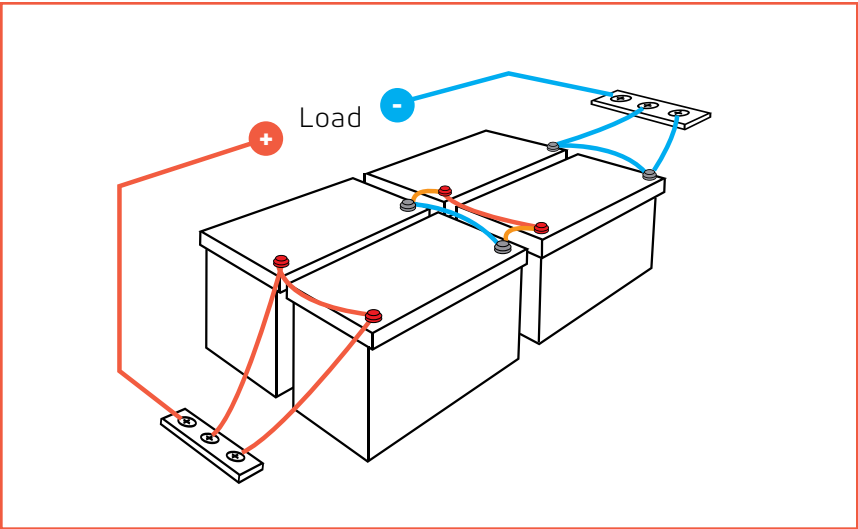
Step 5 Rebalancing Every 6 Months

It is recommended to rebalance the battery voltage every six months following Step 2 on Page 18 if you’re connecting multiple batteries as a battery system, as there might be voltage differences after six months of the battery system running.



Wiring Diagrams

2P2S	Battery System	24V(25.6) 200Ah
	Energy	5,120Wh
	Max.Continuous Charge/Discharge Current	200A
	Max.Continuous Load Power	5,120W



2P4S

Battery System

48V(51.2V) 200Ah

Energy

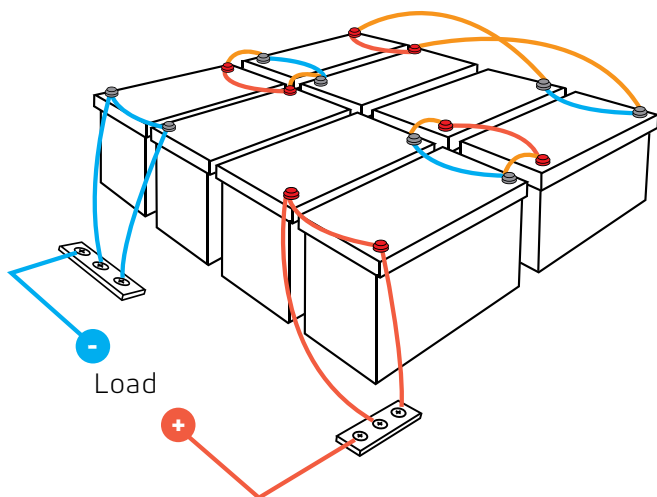
10,240Wh

Max.Continuous Charge/Discharge Current

200A

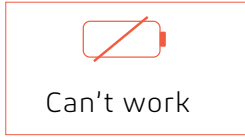
Max.Continuous Load Power

10,240W

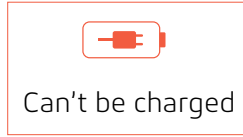


—WHAT TO DO WHEN THE BATTERY STOPS WORKING?

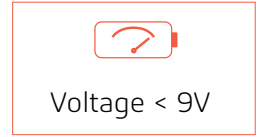
When the battery



Or



Or



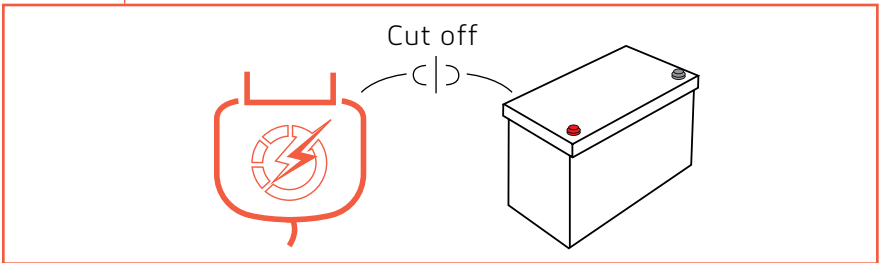
It has 85% chances that BMS has shut it off for protection, and you could try one of below ways to activate the battery.

GENERAL STEPS

If the BMS has cut off the battery for protection, follow the below steps to activate It.

Step
1

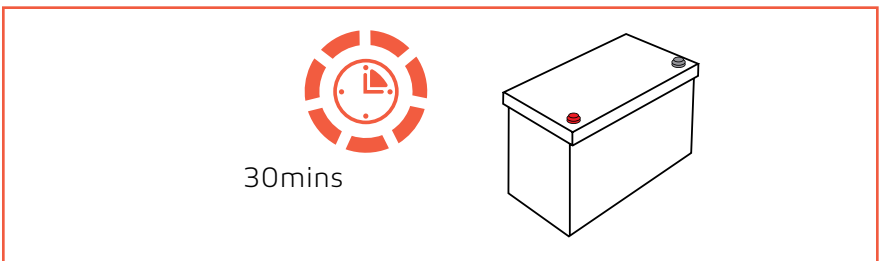
Cut off all the connections from the battery.



Step
2

Leave the battery aside for 30mins

Then the battery will automatically recover itself to normal voltage (>10V) and can be used after fully charged.

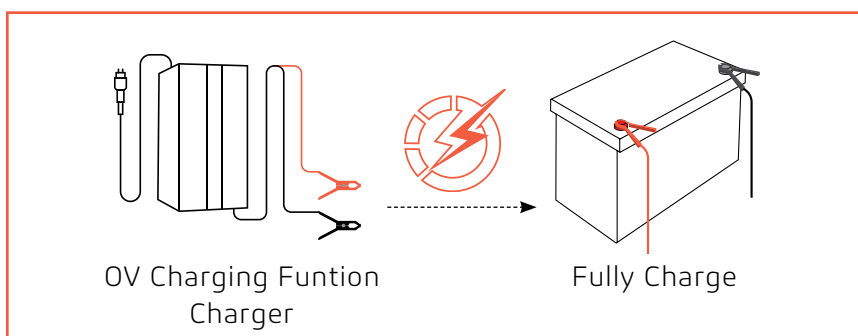


If the battery is unable to recover itself after the above steps, please try activating by **ONE OF BELOW TWO METHODS.**

After activated (voltage > 10V) and fully charged by the normal charging method. it can be used normally.

Method ①

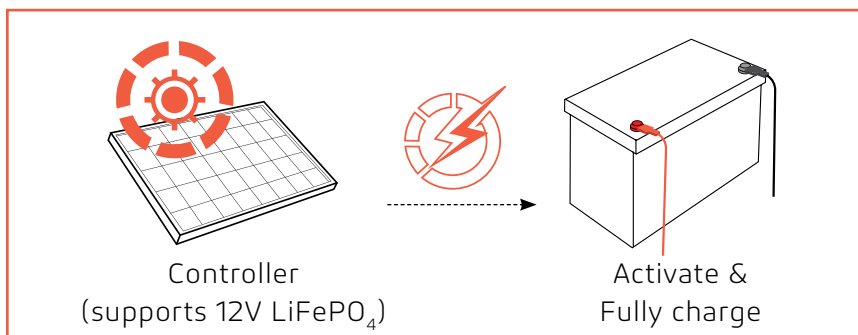
Use a charger with a 0V charging function^① to fully charge the battery.



① The charger can charge the battery starting from 0V.

Method ②

Connect a controller that supports 12V LiFePO₄ battery charging. to charge the battery for 3~10s in sunny daytime.



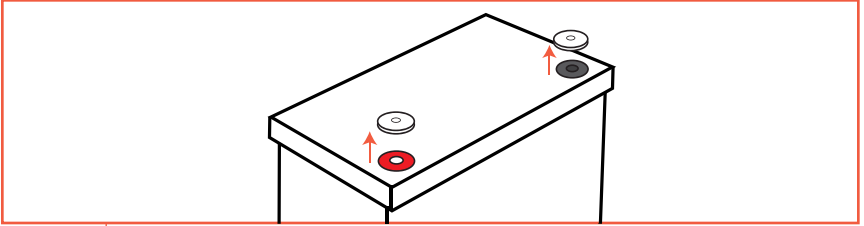
—NOTICE BEFORE USING

Step
1

BATTERY ACTIVATION

Step
2

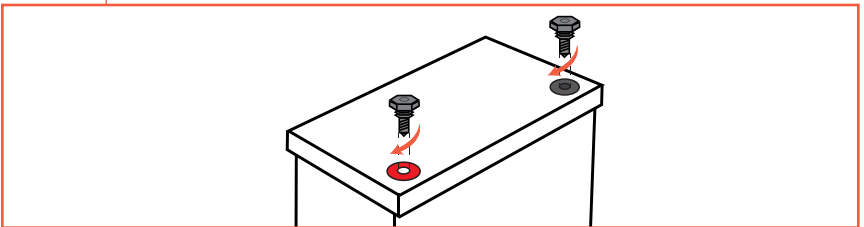
PULL OUT Insulating Plugs



Step
3

TIGHTLY SCREW IN Post Bolts

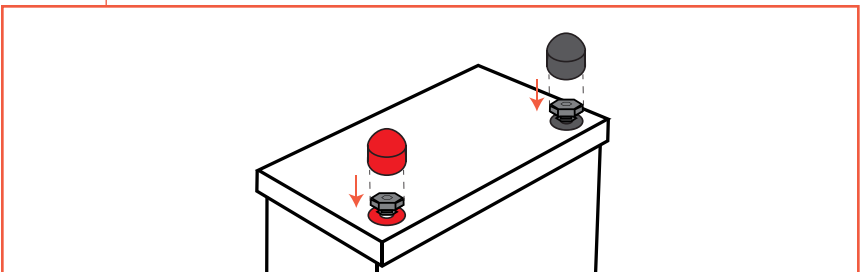
⚠ Please tightly screw in the post bolts. Having loose battery terminals will cause terminals to build up heat resulting in damage to the battery.



Step
4

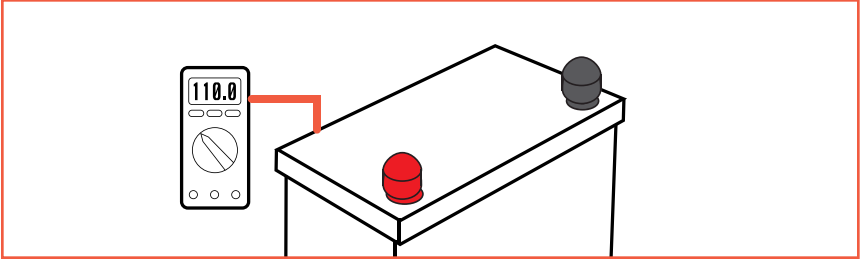
PUT ON Insulating Covers

Please put on the insulating covers to avoid metal or conductive objects touching the positive and negative terminals of the battery at the same time, otherwise it is likely to cause a short circuit.



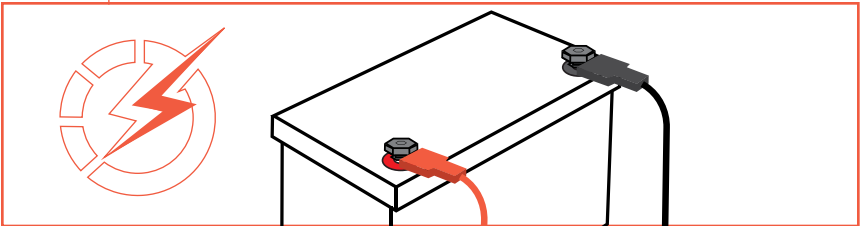
Step
5

TSET The Battery Voltage with a Multimeter
 $\geq 12.8V$ To Next Step
 $< 12.8V$ Contact us at
Service@super-empower.com
to help solve the problem.



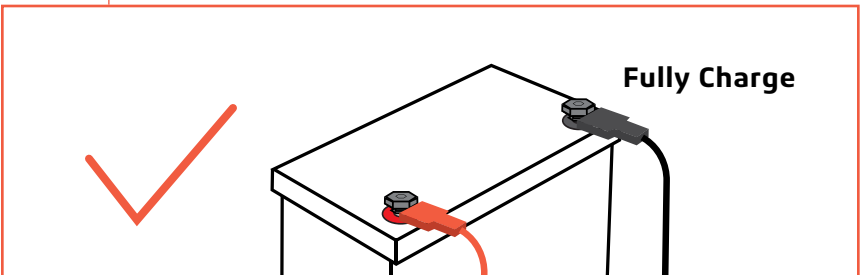
Step
6

FULLY CHARGE The Battery
(Refer to Page 17 for battery charging methods)



Step
7

CONNECT To Use





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