

# Battery



SMART LITHIUM IRON PHOSPHATE

48V 50Ah

Version 2.0

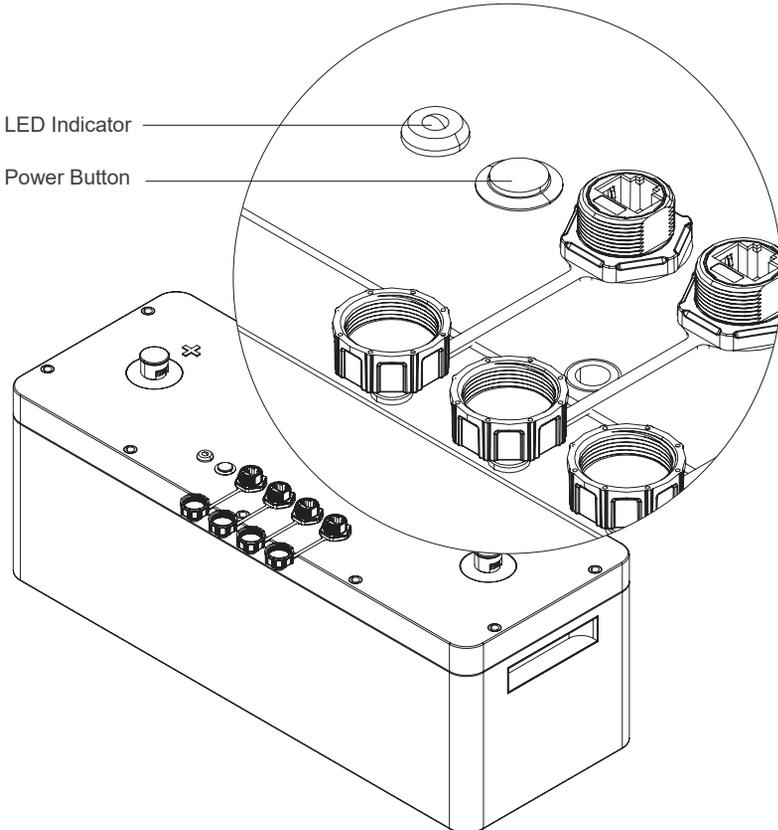


# SAFETY INSTRUCTIONS

- DO NOT puncture, drop, crush, burn, penetrate, shake, or strike the battery.
- DO NOT open, dismantle, or modify the battery.
- Please keep the battery away from water, heat sources, sparks, and hazardous chemicals.
- DO NOT short-circuit the battery terminals. Doing so can cause current bursts and lead to irreversible damage to the system and the battery.
- Please verify the polarity before connecting the wiring. Reversing polarity can and will destroy the battery.
- Please secure all cable connections to the proper specification in order to ensure good contact between the cable lugs and the terminals. Over-tightening cable connections can cause terminal breakage and loose cable connections can cause terminal meltdown or fire.
- DO NOT string batteries in series. Doing so can cause catastrophic failure.
- ONLY connect batteries of the same manufacturer and model in parallel.
- Please avoid too high a voltage difference between paralleled batteries, despite the auto-balancing function, to avoid triggering the over-current protection.
- DO NOT discharge the battery at high temperatures above 140°F (60°C).
- ONLY charge the battery with a battery charger or charge controller that is compatible with lithium iron phosphate batteries.
- If the battery shuts off due to low state of charge (SoC), please disconnect the battery from the discharge equipment to eliminate potential parasitic loads and recharge the battery as soon as possible. Failure to do so may cause irreversible damage to the battery.
- It is recommended to pair the battery with discharge equipment featuring low voltage disconnect in the system.
- DO NOT exceed the maximum charge and discharge current to the battery.
- Please charge the battery at least once every 3~6 months for maintenance and to prevent over-discharge. Long periods of storage can lead to deterioration of battery performance.

## SAFETY INSTRUCTIONS

- The battery leaves the factory in shelf mode. To switch the battery to active mode, please long press the Power Button for 1 second. The LED Indicator will illuminate after 1~2 seconds of software initialization to indicate that the battery has been successfully switched to active mode. Please check the battery voltage to validate an active battery.
- Prior to long periods of storage, please disconnect the battery from the system and long press the Power Button for 3 seconds to switch the battery to shelf mode. The LED Indicator will go out to indicate that the battery has been switched to shelf mode. In shelf mode, the battery has a low self-discharge rate and can hold the charge for a longer period of time.



- The LED Indicator indicates the battery operation status. Please refer to the following table for more details.

LED Indicator	Battery Operation Status
Slow Flashing Green	Standby
Fast Flashing Green	Normal Discharging
Solid Green	Normal Charging / Fully Charged
Solid Yellow	Charge Over-current Warning / Discharge Over-current Warning
Flashing Yellow	Battery Under-voltage Warning / Battery Cell Under-voltage Warning
Solid Red	Charge Over-current Protection / Discharge Over-current Protection / Battery High Temperature Protection / Battery Low Temperature Protection / Short Circuit Protection
Flashing Red	Battery Under-voltage Protection / Battery Cell Under-voltage Protection / Battery Over-voltage Protection

- The normal operation of the self-heating function requires a stable charge current greater than 3A for each battery in the parallel battery bank. The self-heating function will start operating automatically once the battery temperature drops below 41°F (5 °C) and stop operating automatically once the battery temperature rises above 50 °F (10°C).
- The battery leaves the factory with the self-heating function enabled. To disable the self-heating function, please switch the battery to shelf mode and long press the Power Button for 8 seconds. The LED indicator will flash red, yellow, and green 3 times respectively\* to indicate that the self-heating function has been disabled. To re-enable the self-heating function, please repeat the previous steps. The LED indicator will flash red, yellow, and green in sequence for 3 times\*\* to indicate that the self-heating function has been re-enabled. The battery will switch to active mode automatically after disabling or re-enabling the self-heating function. When the self-heating function is disabled, the LED indicator will flash red, yellow, and green 3 times respectively\* every time the battery is switched to active mode.

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\* Red-Red-Red-Yellow-Yellow-Yellow-Green-Green-Green

\*\* Red-Yellow-Green-Red-Yellow-Green-Red-Yellow-Green

**CAUTION**

- Please leave the battery in shelf mode during installation. DO NOT switch the battery to active mode until making sure all the connections are correct and secure. Connecting active batteries to the system may trigger the short circuit protection of battery.
- The self-heating function needs to be disabled or enabled individually on each battery in the parallel battery bank. Please make sure to disable or enable the self-heating function uniformly on all the batteries in the parallel battery bank.
- It is not recommended to connect more than 8 batteries in parallel if taking advantages of the auto-balancing function.

**NOTE**

- Paralleled batteries can be switched to active mode simultaneously by charging them or using the Power Button on any battery. To switch paralleled batteries to shelf mode, please disconnect them and use the Power Button to switch each battery to shelf mode.
- The self-heating function will not be able to operate normally if a PWM charge controller or a small current battery charger is used to charge the battery at low temperatures. It is recommended to disable the self-heating function to prevent it from starting and stopping operation frequently and consuming the battery.

## TROUBLESHOOTING

- If the Power Button is not able to switch the battery to active mode or the battery resting voltage is under 41.62V in active mode at room temperature, the battery may have been severely over-discharged due to self-discharge or parasitic loads. Please revive the battery using a battery charger or charge controller with the lithium battery activation function.
- If the battery terminal voltage shows 0V in active mode, the battery internal fuses may have blown due to severe over-current. Please contact us for assistance.
- If the battery voltage gets too low to reliably power electric loads or triggers the battery under-voltage protection, please disconnect the battery from electric loads and charge the battery as soon as possible.
- If the battery temperature gets too high/low during the operation and triggers the battery high/low temperature protection, please disconnect the battery from the charging source and electric loads and cool down/warm up the battery to room temperature. The battery will automatically recover from the battery high/low temperature protection.
- If too high a current passes through the battery and triggers the charge/discharge over-current protection, please disconnect the battery from the charging source/electric load immediately. The battery will automatically recover from the charge/discharge over-current protection after 1 minute. If the charge/discharge over-current protection is triggered 3 times in a row, the battery will no longer recover automatically. Please discharge/charge the battery with a current greater than 1A to recover the battery from the charge/discharge over-current protection.
- If the battery is short circuited and triggers the short circuit protection, please remove the short circuit immediately and charge the battery with a current greater than 1A to recover the battery from the short circuit protection.

## SPECIFICATIONS

Cell Type	LiFePO4
Rated Capacity (0.2C)	50Ah
Nominal Voltage	48V
Voltage Range	42V~55.5V
Maximum Charge/Discharge Current	50A
Charge Voltage	54V
Charge Temperature Range	32°F~131°F / 0°C~55°C
Discharge Temperature Range	-4°F~140°F / -20°C~60°C
Storage Temperature Range	-13°F~149°F / -25°C~65°C
Recommended Storage Temperature	14°F~77°F / -10°C~25°C
Cycle Life (0.2C, 25°C)	4500 Cycles (80% DOD)
Protection Rating	IP55
Connection Method	Parallel
Dimension	22.7 x 8.5 x 7.9 inch / 576 x 215 x 200 mm
Weight	61.7 lb. / 28.0 kg
Long Replacement Terminal Bolts	M8 x 1 x 20 mm

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