

THIS USER'S GUIDE

was created by EverExceed application engineers and contains vital information regarding proper care and maintenance of your new battery. Please read through this User's Guide carefully and completely before using your battery. It will help you achieve optimum performance and long life from your new investment. If you have any questions concerning safety precautions or for any assistance in installing or using the battery in your system, contact EverExceed technical support engineers.



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1. THE INTELLIGENT LITHIUM BATTERY LINE

The EverExceed battery line is a range of deep-cycle lithium ion batteries designed to provide exceptional cycle life in a variety of applications*.



LDP Series batteries

2. SAFETY

ALWAYS	NEVER
Always wear proper personal protective equipment (eye protection and gloves)	Never wear jewelry or other metal objects when working on or around batteries
Always use insulated tools when working on batteries	Never place objects on top of the batteries
Always check connections for proper torque	Never charge a battery when the temperature is below -4° F (-20°C)
Always keep sparks and flames away from batteries. This includes sources of static electricity	Never charge a battery when the temperature is above 140°F (60°C)
Always use short cables of appropriate size to minimize voltage drop	Never store batteries below 20% State-of-Charge
Always make sure charger is set as recommended	Never dispose of batteries as household waste. Use recycling channels in accordance with local, state, and federal regulations
Always charge batteries before installing	Never connect or disconnect terminals from batteries without first disconnecting the loads
Always make sure chargers are off or disconnected while working on batteries	Never attempt to open the battery case
	Never use pressure-washers to clean the battery or immerse the battery in water
	Never short-circuit the battery terminals
	Never physically damage the battery (this includes, without limitation: puncturing, dropping, crushing, burning, penetrating, shaking, hammering, and misconnecting terminals)
	Never over-charge the battery
	Never over-discharge the battery



WARNING! RISK OF FIRE, EXPLOSION, OR BURNS. DO NOT DISASSEMBLE, HEAT ABOVE 140°F (60°C), OR INCINERATE.



THE MOST EFFECTIVE FIRE EXTINGUISHER TYPES FOR EVEREXCEED BATTERIES ARE CO2, DRY CHEMICAL (TYPE ABC) or Aerosol



3. EQUIPMENT NEEDED

Before installation or maintenance of your batteries, have the following equipment available:

- Proper personal protective equipment (eye protection and gloves)
- Insulated tools
- Voltmeter
- Battery charger

4. BATTERY INSTALLATION

To ensure you install your batteries properly and safely, please use the following guidelines.

4.1 INSPECTION

Check for visible damage including cracks, dents, deformation and other visible abnormalities. The tops of the batteries and terminal connections should be clean, free of dirt and corrosion, and dry. If any problems are detected with the batteries, contact EverExceed technical support or your battery distributor. If damage occurred in transit, contact your freight carrier.

4.2 TERMINALS

EverExceed batteries are equipped with the following terminal configurations: F2, M5, M6, and M8 as per the capacity of the battery.

4.3 CORRECT HARDWARE INSTALLATION

If using flat washers, it is very important to ensure the battery cable lug is contacting the top surface of the terminal, and the washer is placed on top of the lug. Do not place a washer between the battery terminal and the lug, as this will create high resistance and cause excessive heating of the connection.

4.4 CABLE SIZE

Battery cables should be sized to handle the expected load. Refer to Table 1 for the maximum amperage based on the cable/wire gauge size

CABLE/WIRE GAUGE SIZE, AWG (mm ²)	AMPACITY (amps)
16 (1.31)	10
14 (2.08)	20
12 (3.31)	25
10 (5.26)	35
6 (13.3)	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

Table values are from NEC Table 310.15(B) 16 for copper cables rated at 167°F (75°C), operating at an ambient temperature of no more than 86°F (30°C). Lengths in excess of 6 feet (1829 mm) may require heavier gauge wire to avoid unacceptable voltage drop. In series/parallel battery banks, it is preferable for all series cables to be the same length, and all parallel cables to be the same length.

For more information refer to the National Electrical Code for correct cable/wire size.



4.5 TORQUE VALUES



Tighten all cable connections to the proper specification to make sure there is good contact with the terminals. Over-tightening terminal connections can cause terminal breakage and loose connections can result in terminal meltdown or fire.

WARNING! USE AN INSULATED WRENCH WHEN MAKING BATTERY CONNECTIONS

4.6 CONNECTING BATTERIES IN BANKS

You can increase capacity, voltage, or both by configuring your batteries as shown in Table 2.

Note: The Maximum Nominal Bank Voltage for EverExceed Batteries is 51.2V.

In series and parallel large battery pack systems, the discharge current cannot exceed the current value specified for a single LDP module battery pack, otherwise it will cause damage to the battery pack

Table 2.

SERIES CONNECTION	PARALLEL CONNECTION	SERIES/PARALLEL CONNECTION
To increase voltage, connect batteries in series. This will not increase the system capacity.	To increase capacity, connect batteries in parallel. This will not increase the system voltage.	To increase both voltage and capacity, connect additional batteries in series and parallel.
CALL TECH SUPPORT FOR ADDITIONAL CONFIGURATIONS		
1). For the same model and batch, the batteries support to be connected in series up to max 4PCS(12.8V) and 2PCS(25.6V). Voltage difference of the batteries should be less than 100mV and batteries should be connected properly and firmly with thick wires while you connect them in series to use. 2). For the same model and batch. A parallel battery cannot increase the discharge current, it can only increase the backup time. Before using this battery pack in parallel, please use a lithium battery charger of the same specification to fully charge the battery, and let it stand for 1 hours before using it in parallel. This type of battery pack allows up to 2 sets of parallel use. 3) In series and parallel large battery pack systems, the discharge current cannot exceed the current value specified for a single LDP module battery pack, otherwise it will cause damage to the battery pack.		

4.7 VENTILATION

EverExceed batteries do not release gas during normal use. There are no specific ventilation requirements for EverExceed installations, although sufficient airflow should be provided to prevent excessive heat build-up.

4.8 BATTERY ORIENTATION



Batteries may be installed in any horizontal or vertical orientation except with the terminals facing downward

4.9 BATTERY ENVIRONMENT

Batteries should be stored and installed in a clean, cool and dry place, keeping water, oil, and dirt away from the batteries. If any of these materials are allowed to accumulate on the batteries, tracking and current leakage can occur, resulting in self-discharge and possible short-circuits. Battery chargers should also be installed in well-ventilated, clean areas that are easily accessible. Relative humidity should be <90%.

4.10 TEMPERATURE

The recommended operating temperature range for EverExceed batteries is -4°F (-20°C) to 140°F (60°C). Note that battery life diminishes as temperature increases, while capacity increases with temperature.

It is important to minimize temperature variations between the batteries. Therefore, avoid restricting airflow by tightly packing batteries together. The batteries should have a minimum of 0.50" (12.7 mm) of space between them to allow for adequate airflow.

4.11 BATTERY START-UP

The LDP series battery is fully automatic and no user action is required to place it in operating mode. Verify that the battery is either completely disconnected or correctly connected to the equipment and it will be powering.

See "Automatic Safety Shutdowns" for specific explanations of shutdown causes

5. PREVENTIVE MAINTENANCE

5.1 INSPECTION

Examine the outside appearance of the battery. The tops of the batteries and terminal connections should be clean, dry, and free of corrosion.

Check battery cables and connections. Replace any damaged cables and tighten any loose connections. Refer to Section 4.5.

5.2 CLEANING

Check the battery for cleanliness at regular intervals and keep terminals and connectors free of corrosion. Terminal corrosion may adversely affect the performance of the battery and present a safety hazard.

Step1: Disconnect the battery from the charging source and the load.

Step2: Clean the top of the battery, terminals, and connections with a damp cloth or non-metallic brush. If the battery is extremely soiled, a household cleaner may be used.

Step3: Dry with a clean cloth.

Step4: Keep the area around batteries clean and dry.

6. CHARGING

Charge: Charge mode: CC/CV, use a constant current, constant voltage (CC/CV), please use special lithium charger			
NO	Item	LDP 12-xx	LDP 24-xx
1	Allow maximum charging voltage	14.6V	29.2V
2	Recommended charging voltage for boost/ bulk/ absorption charge applications	14.2-14.6v	28.4-29.2v

3	Charging voltage for floating charge application	13.8V	27.6V
4	Charging allows maximum current	0.5C	0.5C
5	Recommend charging current	0.2C	0.2C

6.1. INITIAL CHARGING

Due to shipping laws and regulations, your battery may be received at a partial state-of-charge. Batteries should be given a full charge prior to first use.

14.4VDC LDP12-XX :Recommended Charger Range 14.6VDC

28.8VDC LDP24-XX :Recommended Charger Range 29.2VDC

Chargers which charge at lower voltages will not harm the battery, but will not provide a full charge to maximum capacity and may affect range and usable lifespan of the battery.

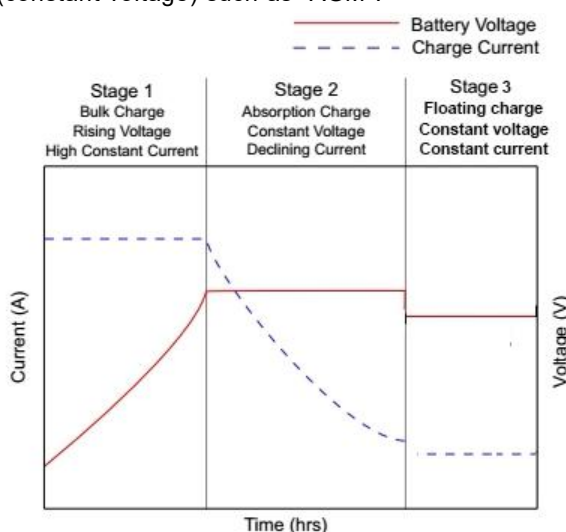
Chargers which charge at higher voltages will not harm the battery, but may not provide a full charge because the battery will shut off as soon as the voltage gets too high and your charger may not continue to charge the battery once it turns back on.

Most deep-cycle battery chargers will charge the battery, but many will shut off prior to the EverExceed battery reaching 100% SOC. Chargers which utilize an automatic desulfation or equalization mode is not recommended. Consult the appropriate data sheet for limits on charging current, particularly at temperatures below 32°F (0°C).

For batteries connected in series (24V to 48V systems), each of the batteries can be charged individually for best results or the batteries can also be charged with a multi-bank charging system. Bulk 48V chargers may not charge all series connected batteries and may require individual battery maintenance charging at periodic intervals to fully charge the set.

STEPS TO CHARGE YOUR BATTERY TO RECOMMENDED CAPACITY:

1. Verify that the battery is correctly hooked up to the charger with the positive wire on the red (+) terminal and the negative wire on the black (-) terminal.
2. If the charger has multiple settings, set it to a "bulk charge" mode (constant voltage / constant current) followed by a "float" mode (constant voltage) such as "AGM".



3. If the charger will not run until it detects battery voltage, If the charger provides charge without detecting battery voltage, and the battery is shut off, the battery will turn on automatically as soon as the charger starts.

4. Start charging, following the charger manufacturer's instructions.

5. After charge has completed, the charger may be shut off and disconnected, or if it remains in a “maintenance mode” at less than 14.4/28.8 VDC, it can remain connected to the battery indefinitely.

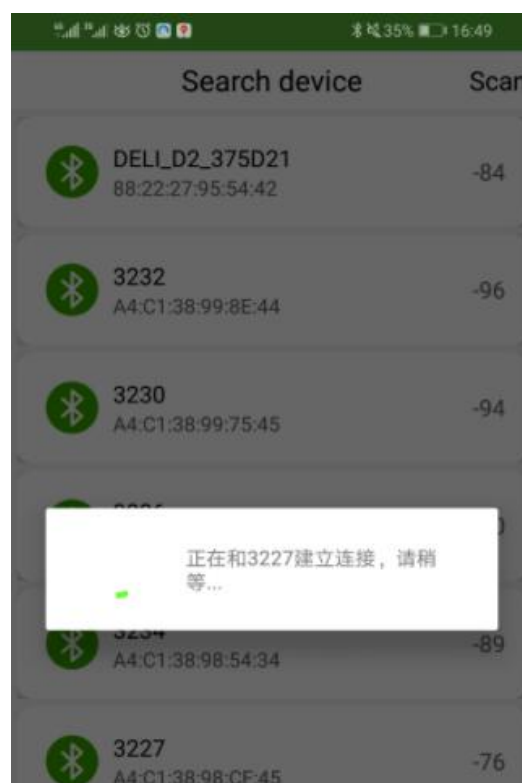
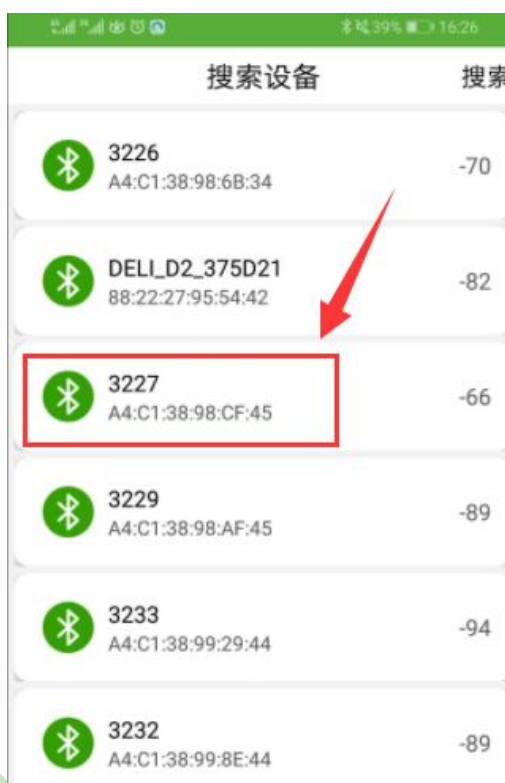
7. CONNECTING BMS WITH THE MOBILE APP BY BLUETOOTH

The following tips will help ensure to connect the battery BMS with the mobile app by Bluetooth and check the live parameters of the battery:

7.1 Turn on the Bluetooth and the GPS of your phone.

7.2 Open the app.

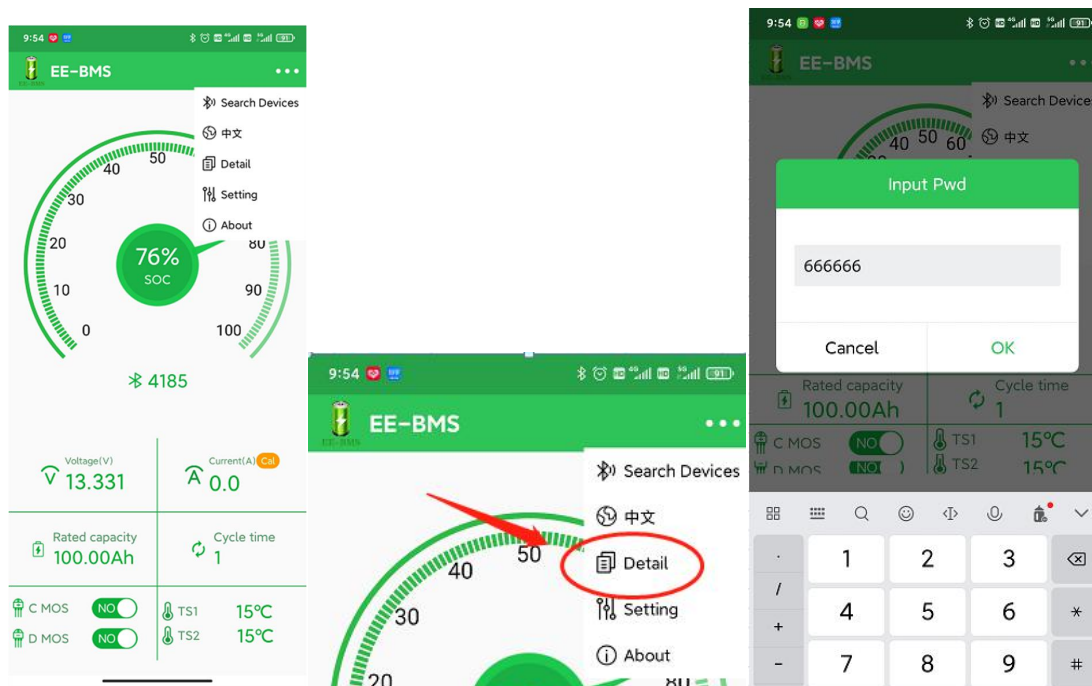
7.3 Match the last digits of this code of the battery sticker with the battery codes showing on the “search device” screen of the app.

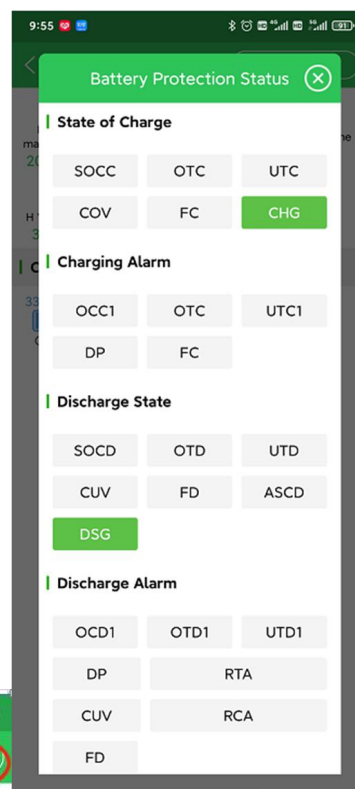
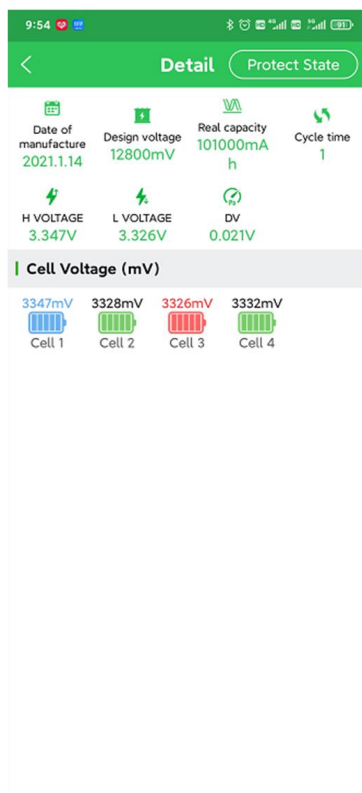


7.4 You can change the language from this drop down menu.



7.5 In the home interface, you can check the temperature, voltage and current parameters of the battery pack. If you want to check the single battery parameter, select the "Detail" option. Then enter the password 666666 to view





7.6 If you want to check the detailed battery parameters of charging and discharging, select the “Protect State” option.

Abbreviated interpretation

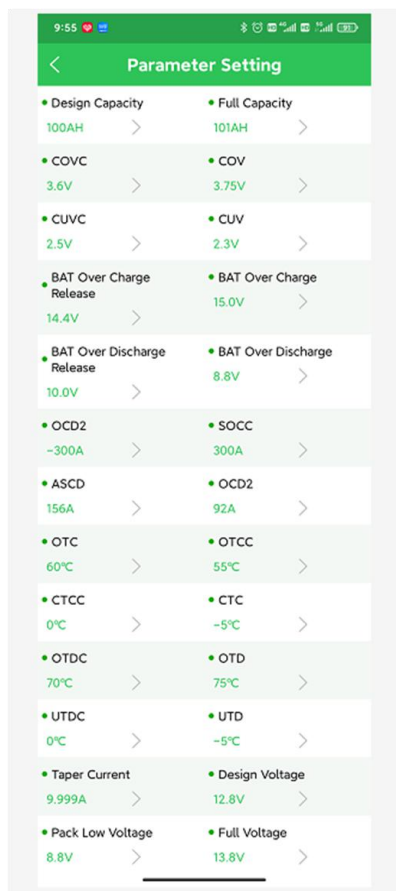
State of charge	
SOCC	Charging over-current protection
OTC	Charging over-temperature protection
UTC	Charging low-temperature protection
COV	Cell over-voltage protection
FC	Total voltage over-voltage protection
CHG	Allow charging

Charging warning	
OCC1	Charging over-current alarm
OTC	Charging over-temperature alarm
UTC1	Charging low-temperature alarm
DP	Cell voltage difference alarm
FC	Full charge

Discharge state	
SOC1	Discharge over-current protection
OTD	Discharge over-temperature protection
UTD	Discharge low-temperature protection
CUV	Cell low voltage protection
FD	Total voltage low voltage protection
ASCD	Short circuit protection
TDA	stop discharge
DSG	Allow discharge

Discharge warning	
OCD1	Discharge over-current alarm
OTD1	Discharge over-temperature alarm
UTD1	Discharge low-temperature alarm
DP	Cell voltage difference alarm
RTA	/
TDA	stop discharge alarm
RCA	low capacity alarm
CUV	cell over discharge alarm
FD	battery over discharge alarm

7.7 Currently, the function of modifying protection parameters is not enabled for the client



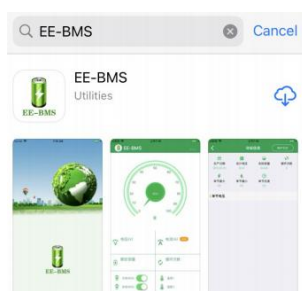
7.8 Mobile app download instructions

7.8.1. Use the mobile phone to scan the QR code issued to download the installation program.



, Or use your mobile browser to enter this URL <http://http://d.zqapps.com/xpdk>

7.8.2 Apple mobile phones can be downloaded directly from the Apple Store, just search for "EE-BMS"



8. STORAGE AND SHIPPING

The following tips will help ensure that your batteries emerge from storage in good condition:

8.1 Store in a cool and dry location, protected from the elements.

8.2 Disconnect from equipment to eliminate potential parasitic loads that may discharge the battery.

8.3 Prior to long-term storage of the battery, EverExceed Battery recommends that the battery be charged to at least 30% state-of-charge.

8.4 Batteries delivery from manufacturer with 50% power approx., please install batteries within 6months from the delivery date (including delivery time); Battery storage over these 6months (within 9months) needs to be charged to keep the battery power at 50% for storage.

8.5 If the battery is fully discharged, recharge it within 24 hours or it will be easily damaged.

Note: If the Battery is attached to a Charger when It is shut down, It may turn back on.

When batteries are taken out of storage they should be given an initial charge as outlined in Section 6 prior to use.

9. MAXIMIZING THE PERFORMANCE OF YOUR EVEREXCEED BATTERY

Follow all the procedures in this User's Guide for proper installation, maintenance, and storage

10. WHAT TO EXPECT FROM YOUR EVEREXCEED BATTERY

10.1 Your EverExceed battery will deliver rated capacity when it is new. No "break-in" period is required.

10.2 When operating batteries at low temperatures, they will deliver less than the rated capacity.

10.3 When operating batteries at high temperatures, battery life will be reduced.

10.4 The life of a battery is difficult to predict and will vary by application, frequency of usage and load characteristics.

11. AUTOMATIC SAFETY SHUTDOWN

The battery will automatically shut down under any excessive use conditions in order to prevent damage to the battery and connected equipment. Specified limits for excessive current, high voltage and low voltage are provided in each battery's data sheet.

The user is responsible for any damages resulting from a failure to properly monitor and control the charging or discharging of the battery.

CAUSE OF SHUTOFF	CONDITIONS FOR RESTART
LOW VOLTAGE The battery is designed to automatically shut off to avoid damage if voltage falls below specified limits.	• During cutoff, the battery voltage will slowly climb back up, and when it reaches the specified restart voltage, it will turn back on. • If the battery shuts itself off for low voltage, it will restart when a charger is attached (See Charging - Section 6).
HIGH VOLTAGE The battery is designed to automatically shut off to avoid damage if voltage increases to a level that would be harmful over the long term.	• During cutoff, the battery voltage will slowly decrease, and when it reaches the specified restart voltage it will turn back on.
EXCESSIVE DISCHARGE CURRENT The battery is designed to operate in a safe discharge range and will shut off to avoid damage if discharge current is detected above specified limits.	• After cutoff, the battery will restart after 30 seconds. • If the battery shut off for high current, it will restart when a charger is attached (See Charging - Section 6).

EXCESSIVE CHARGE CURRENT The battery is designed to shut off to avoid damage if charge current exceeds specified limits.	• After cutoff, the battery will restart after 30 seconds. • If the battery detects high charge current it will shut off again in a few seconds (See Charging - Section 6).
TEMPERATURE CONDITIONS The battery is designed to shut off to avoid damage if the internal temperature is beyond the following temperature limits: 1. Lower than -13°F (-25°C). 2. Higher than 140°F (60°C).	• The internal temperature of the battery must be brought to between -4°F (-20°C) and 140°F (60°C). • If the battery detects excess temperature it will shut off again in a few seconds.
SHORT CIRCUIT The battery is designed to shut off to avoid damage if a short circuit condition is detected.	• If the battery shuts itself off due to a short circuit, it will restart itself when a charger is attached (See Charging - Section 6). • If the battery detects a short circuit it will shut off again.

Except in the case of a short circuit, the battery will normally reset itself after the condition that caused the cutoff has cleared. If the battery is not shut off for overcharge, it will restart when it detects a charger.

12. BATTERY ABBREVIATIONS

A	Ampere	F2/M5/M6/M8	2/5/6/8mm terminal
Ah	Ampere-hour	SOC	State of Charge
AWG	American Wire Gauge	T	Temperature
°C	Degrees Celsius	V	Volt
DOD	Depth of Discharge	VDC	Volts DC
°F	Degrees Fahrenheit		