

KICKASS[®]

LITHIUM BATTERIES USER MANUAL



KA12120-LION | KA12120SLIM-LION | KA12200-LION

INTRODUCTION

Thank you for purchasing a KickAss Lithium Battery. The battery allows you to power all your 12V camping equipment with the following features:

- Lithium Iron Phosphate (LiFePO₄) Battery
- Internal Battery Management System (BMS)
- BMS supervised lithium battery protection and alarms
- Bluetooth compatibility with KA app (Android and iOS)
- LCD screen unit connection to BMS
- Approximately 2000 cycles at 80% DOD discharge, and up to 4000 cycles at lower discharge rates.
- Low self-discharge and long shelf life

BMS Protection Features

- Battery over and under voltage protection
- Battery over and under temperature protection
- Battery over charge and discharge protection
- Battery short circuit protection

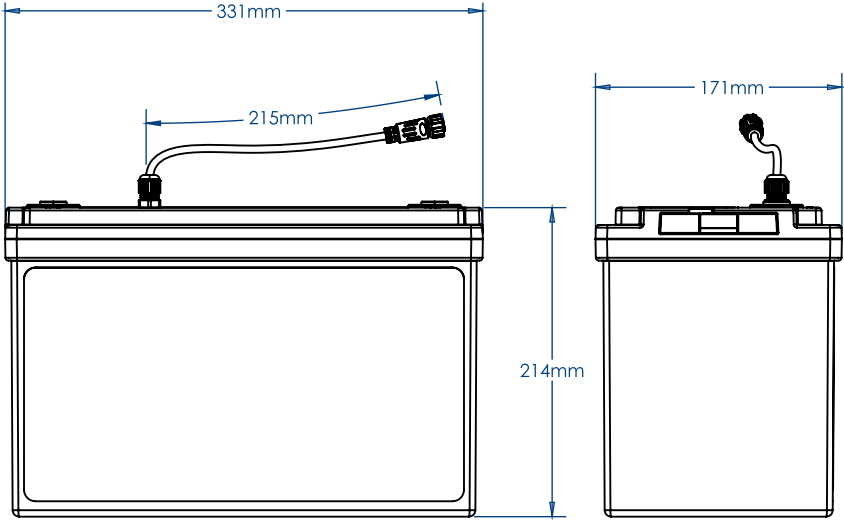
Applications

- Solar System
- Telecommunications
- 4WD Dual Battery Systems
- Caravan, Motorhome Systems
- Emergency Power System

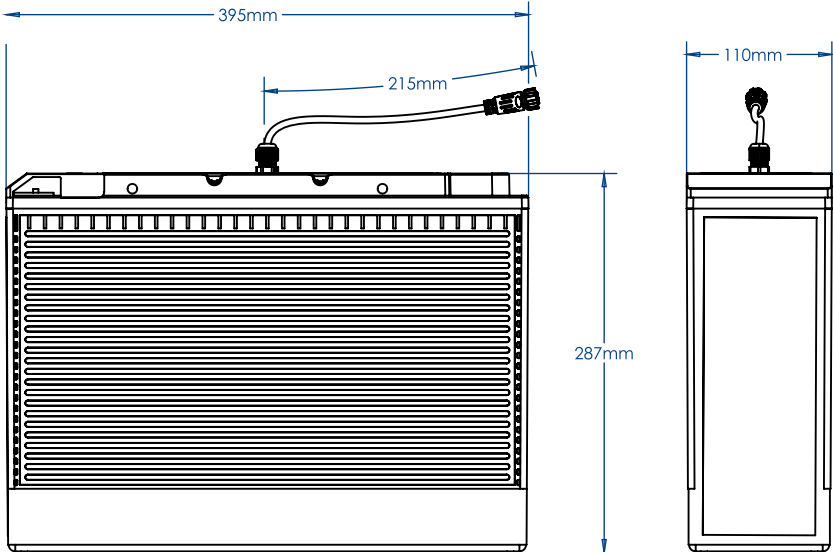


DIMENSIONS

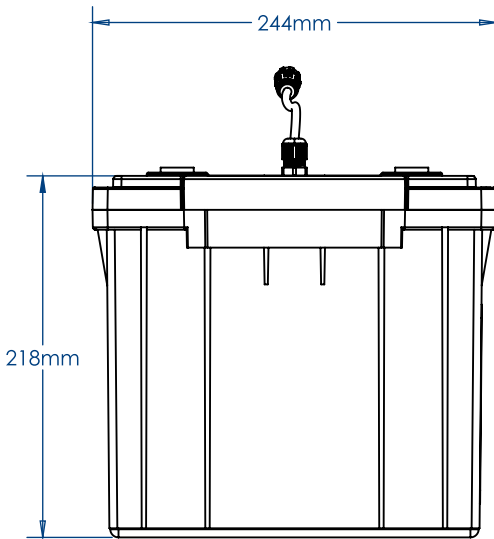
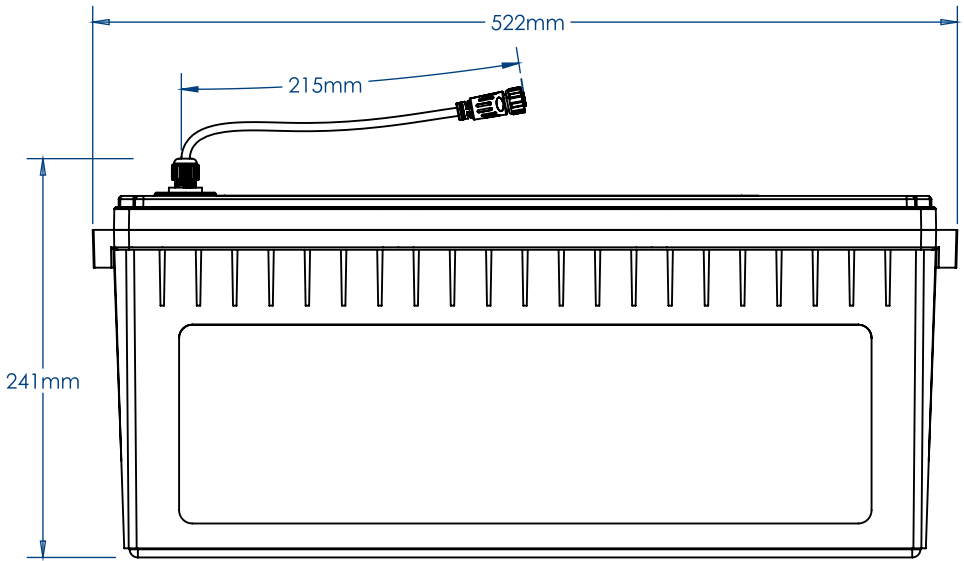
KA12120-LION



KA12120SLIM-LION



KA12200-LION



SAFETY PRECAUTIONS

- The total current draw from the battery must not exceed BMS rated capacity.
- Ensure that the charger used is compatible with lithium batteries.
- Do NOT allow any metal objects to come into contact with the battery terminals.
- Do NOT try to jumpstart a vehicle with this battery.
- Do NOT use the battery for cranking/starting applications.
- Do NOT connect the battery in series to increase the overall voltage.
- Do NOT connect the battery in parallel to increase the overall amperage.
- Do NOT allow the battery to sit in a discharged state ≤ 10.0 V.
- The battery must be installed away from major heat sources, high voltage, and avoid exposed sunlight for long periods of time.

BATTERY SPECIFICATIONS

KA12120-LION & KA12120SLIM-LION

120AH LiFePO4 Battery Specifications	
Nominal Voltage	12.8V
Nominal Capacity	120Ah
Cycle Life (DOD – 80% under controlled conditions)	≥ 2000 Cycles
Bluetooth battery monitoring app	Yes
Optional hardwired remote screen monitoring	Yes

Charging Specification (Only use chargers with lithium profiles as specified)	
Battery Charge Temperature	0 ~ 60°C
Normal Charge Voltage CV/CC ¹	14.4 ~ 14.6V
Standby (Float) Voltage	13.5 ~ 13.8V
Maximum Charge Current	50A
Recommended Charge Current	25 - 40A

Standard Discharge Specification	
Battery Discharge Temperature	-20 ~ 65°C
Battery Operating Voltage Range	10 ~ 14.6V
Maximum Continuous Discharge	100A
Pulse Discharge Current	280A for 320mS
Discharge Cut-Off Voltage	≤10V

Dimensions	KA12120-LION	KA12120SLIM-LION
Length	329mm	395mm
Width	171mm	110mm
Height	217mm	287mm
Weight	14.3Kg	14.6Kg

Storage Information	
Temperature & Humidity Range	≤ 30 days -20°C ~ 60°C, 5 ~ 75% RH ≥ 90 days -10°C ~ 45°C, 5 ~ 75% RH
Self-discharge Rate	≤ 3% Per Month @ 25°C

KA12200-LION

200AH LiFePO4 Battery Specifications	
Nominal Voltage	12.8V
Nominal Capacity	200Ah
Cycle Life (DOD – 80% under controlled conditions)	≥ 2000 Cycles
Bluetooth battery monitoring app	Yes
Optional hardwired remote screen monitoring	Yes

Charging Specification (Only use chargers with lithium profiles as specified)	
Battery Charge Temperature	0 ~ 60°C
Normal Charge Voltage CV/CC ¹	14.4 ~ 14.6V
Standby (Float) Voltage	13.5 ~ 13.8V
Maximum Charge Current	100A
Recommended Charge Current	40 - 90A

Standard Discharge Specification	
Battery Discharge Temperature	-20 ~ 65°C
Battery Operating Voltage Range	10 ~ 14.6V
Maximum Continuous Discharge	200A
Pulse Discharge Current	440A for 320mS
Discharge Cut-Off Voltage	≤10V

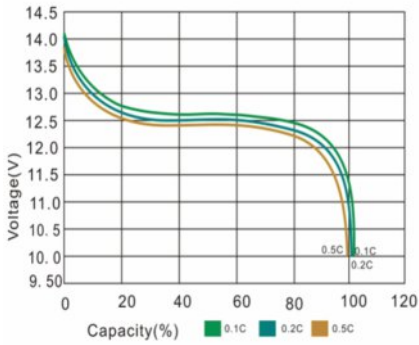
Dimensions	
Length	522mm
Width	244mm
Height	241mm
Weight	19.8Kg

Storage Information	
Temperature & Humidity Range	≤ 30 days -20°C ~ 60°C, 5 ~ 75% RH ≥ 90 days -10°C ~ 45°C, 5 ~ 75% RH
Self-discharge Rate	≤ 3% Per Month @ 25°C

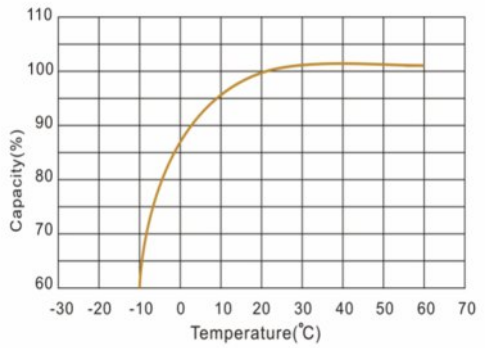
1. CV/CC - Constant Voltage, Constant Current

Note: Specifications subject to change without prior notice

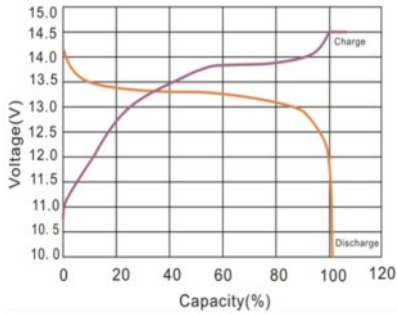
Discharge Performance at 25°C



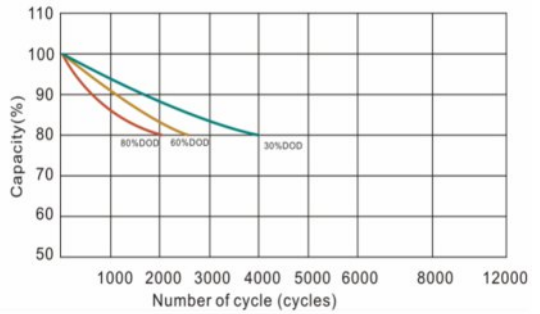
Temperature effects on capacity at 0.2C



Charge Performance at 25°C, 0.2C



Cycle life with DOD at 25°C, 0.2C



BMS CUT OFF FEATURES

The KickAss Lithium Batteries are built with a Battery Management System (BMS) inside to protect the battery from overcharging, over discharging, short circuiting and extreme temperature.

Overcharge Protection	
Overcharge Protection Per Cell	3.75 ± 0.1V
Overcharge Release Per Cell	3.60 ± 0.1V
Overcharge Release Method	Connect load and discharge below release voltage

Overdischarge Protection	
Overdischarge Protection Per Cell	2.50 ± 0.1V
Overdischarge Release Per Cell	3.00 ± 0.1V
Overdischarge Release Method	Apply Lithium Compatible Charger/Voltage ≥12.00V

Over Current Protection	120AH	200AH
Discharge Over Current	110A	210A
Protection Delay	8-12 Seconds	
Protection Reset Time	Approx 32 Sec Auto Release	
Over Current Release Method	Disconnect load and wait for reset	

Battery Discharge High Temperature	65 ± 5°C Release 55 ± 5°C
Battery Charge High Temperature	60 ± 5°C Release 50 ± 5°C
Battery Discharge Low Temperature	-20 ± 5°C Release -10 ± 5°C
Battery Charge Low Temperature	0 ± 5°C Release 5 ± 5°C

Note: Specifications subject to change without prior notice

OPTIONAL ACCESSORIES



KickAss Lithium Remote Display Unit
SKU: KARDUV1



RDU Extension Cables
SKU: KARDUEXT5M

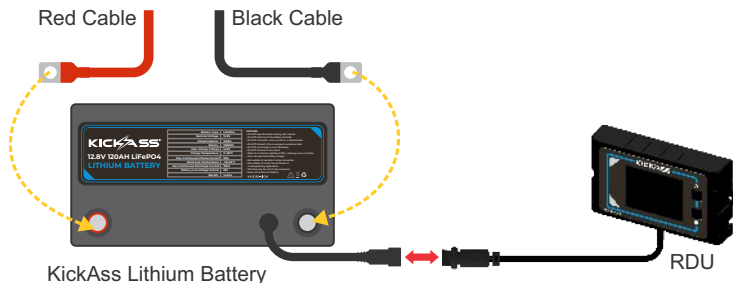


KickAss Lithium LiFePO4 Power station
SKU: KAJBLITBOX

CONNECTING THE BATTERY

Install the battery cables onto the terminal posts of the battery. Ensure the red cable is connected to the positive (+) terminal and black cable is connected to the negative (-) terminal.

If connecting the Remote Display Unit to your KickAss Lithium Battery, connect the black data dongle on the RDU to the black data connector on the battery.



CHARGING THE BATTERY

A key function of the BMS is to protect your battery by internally disconnecting the load when the battery's voltage drops below specific parameters, this will then result in the battery entering into a "sleep" mode. (Load includes any accessories and/or device/s drawing charge from the battery, Eg: fridges, pumps, food sealers, inverters, etc).

The charger used to charge the battery must be lithium compatible and be designed to recover lithium batteries from a sleep mode. The KickAss Lithium Battery may be charged in a number of ways:

- Connecting to an alternator via a lithium compatible DCDC charger.
- Connecting to a solar panel via a lithium compatible regulator/controller
- Connecting to an AC power source via a 240V lithium compatible 12V charger

Note: When charging the lithium battery, ensure the charger is located close to the battery to avoid voltage drop. Failing to do this may result in the charger entering float mode and not being able to complete a recovery from sleep mode.

STORING THE BATTERY

A lithium battery can be stored at any state of charge due to a very low rate of discharge. It is recommended that if storing for long periods, the battery be charged to 100% before disconnecting the battery from all loads and chargers.

NOTE: The battery will not go into storage mode if:

- There are loads connected to it
- It is being charged
- The RDU's screen is turned on
- It is communicating to App.

USING THE BATTERY FOR THE FIRST TIME OR AFTER A PERIOD OF STORAGE

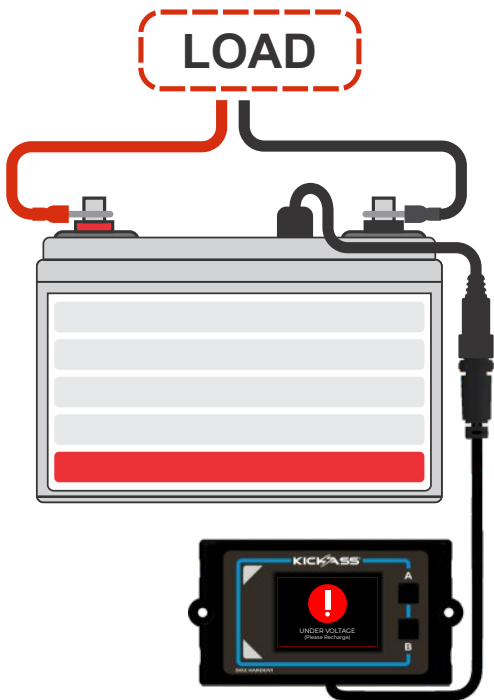
When using the lithium battery for the first time or after more than a month in storage, KickAss recommends to fully discharge the battery until the BMS system cuts out. Once discharged, using a lithium compatible charger, fully charge the battery until 100% SOC is achieved. This will recalibrate the SOC in your BMS.

Failure to do these steps will not affect the performance or lifespan of your battery however the SOC reading from the Display screen or App may not display the actual SOC of the battery due to it being out of synchronisation.

STEP 1:

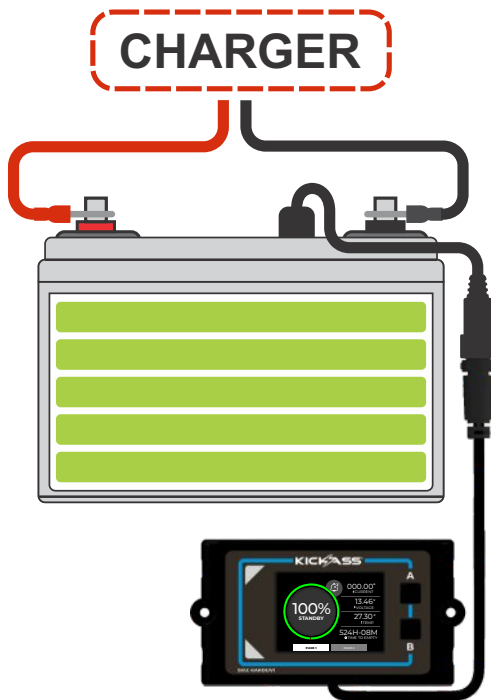
Connect load and discharge until undervoltage alarm is activated

Note: Continue to discharge when low battery alarm comes on at 10% SOC. Doing this will NOT damage your battery



STEP 2:

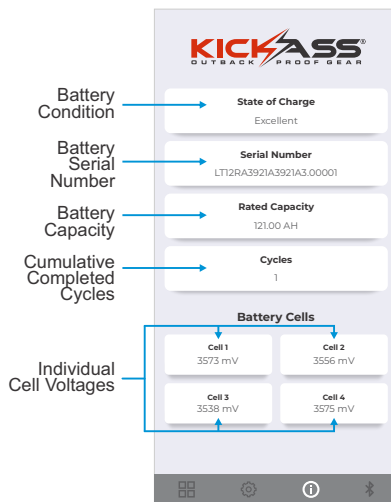
Connect battery to charger and charge to 100%

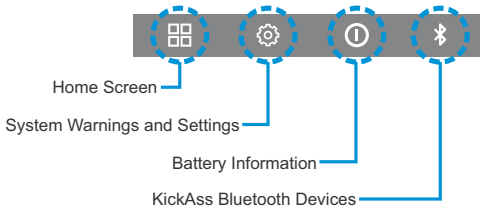


KICKASS LITHIUM APP

The KickAss Lithium Battery has been designed with the latest bluetooth technology to remotely monitor your battery from your smartphone. The app features the following:

- State of Charge (SOC)
- Instantaneous current flow, positive when charging, negative when discharging
- Battery pack and cell voltage.
- Battery temperature
- Remaining time to full/empty at the current rate of charge/discharge
- Total capacity of battery
- Number of full cycles the battery has completed. A full cycle is defined by 100% discharge and re-charge of a battery. Depleting a battery to 50% and recharging it twice will result in 1 cycle.
- Low battery alarm
- Battery capacity health indicator
- Battery protection alarms





Connecting to the App

To get started please download the KA Outback Proof Gear app from the Google Play store or the Apple iTunes Store.

If the app is already downloaded on your device for use with your KickAss Bluetooth fridge, you must ensure that any updates to the app are installed prior to connecting.

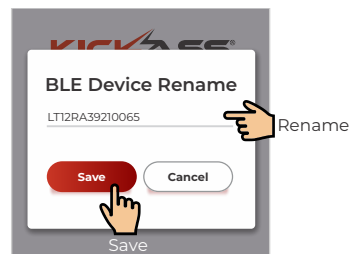
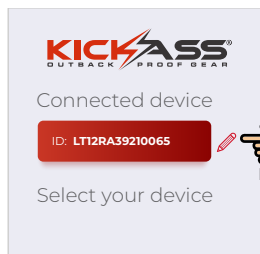
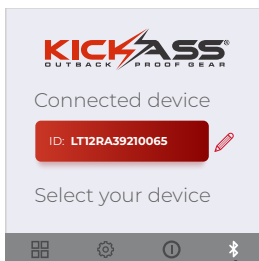
Once the APP is installed, locate your battery's serial number on the side of your battery. On the KA Outback Proof Gear app, find the device ID that corresponds to the first 10 digits and the last 4 digits of the battery's serial number and click connect device.



Rename Device ID

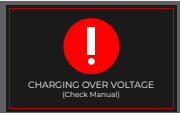
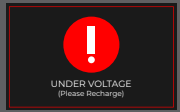
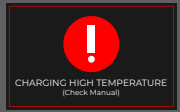

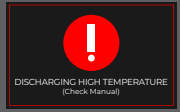
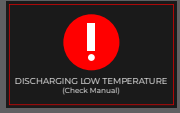
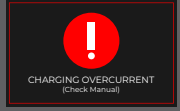
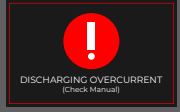
To rename your bluetooth device, connect to the device and then navigate to the fourth tab on the bottom toolbar. Click the pencil icon next to the connected device, edit the name and then click save.

Note: Editing your devices name, will only edit it on your device. It will not change the name of the battery for other people who try to connect to it.



KICKASS LITHIUM BMS ALARM MODES

The KickAss Lithium Battery is fitted with battery protection features which protect the cells from damage. When these protection features are activated, the following will be displayed on the App and RDU display:

ALARM MODE	APP SYSTEM WARNING	LCD SCREEN SYSTEM WARNING
<p>Over Voltage Protection: The voltage of your battery has exceeded the normal range. Remove charger from battery</p>	<p>Charging Over Voltage Error</p> <p>View Error</p>	
<p>Under Voltage Protection: The voltage of your battery is below the normal range. Connect charger to battery</p>	<p>Under Voltage Error</p> <p>View Error</p>	
<p>Charging High Temperature Protection: The temperature of your battery has exceeded the normal range. Disconnect all loads/chargers and place your battery in a cooler location</p>	<p>Charging High Temperature Error</p> <p>View Error</p>	
<p>Charging Low Temperature Protection: The temperature of your battery is below the normal range. Disconnect all loads/chargers and place your battery in a warmer location</p>	<p>Charging Low Temperature Error</p> <p>View Error</p>	
<p>Discharging High Temperature Protection: The temperature of your battery has exceeded the normal range. Disconnect all loads/chargers and place your battery in a cooler location</p>	<p>Discharging High Temperature Error</p> <p>View Error</p>	
<p>Discharging Low Temperature Protection: The temperature of your battery is below the normal range. Disconnect all loads/chargers and place your battery in a warmer location</p>	<p>Discharging Low Temperature Error</p> <p>View Error</p>	
<p>Charging Over Current Protection: The charging current of your battery has exceeded the normal range. Disconnect all chargers from the battery</p>	<p>Charging Overcurrent Error</p> <p>View Error</p>	
<p>Discharging Over Current Protection: The discharging current of your battery has exceeded the normal range. Disconnect all load from the battery</p>	<p>Discharging Overcurrent Error</p> <p>View Error</p>	
<p>Short Circuit Protection: The battery is short-circuited. Check all wiring and connections for short circuits</p>	<p>Short Circuit Protection Error</p> <p>View Error</p>	