

**Part No:**  
 AL1220 - Page 4  
 AL1260 - Page 5  
 AL1280 - Page 6  
 AL12100 - Page 7  
 AL12120 - Page 8  
 AL12150 - Page 9  
 AL12200 - Page 10

Battery Charging - Page 11  
 Bluetooth APP - Page 12



BC range of  
 AC to DC chargers  
 2 output  
 Live voltage output  
 Linear wave DC charger



Sterling Power's range of  
 DC to DC chargers  
 Live voltage output  
 Linear wave DC charger  
 Current limiting  
 Protects alternator + battery



Bluetooth APP -  
 SMART BMS  
 Page 12



**12V Lithium Iron Phosphate Batteries**  
 w/ built in bluetooth BMS



**Important information regarding charging our lithium batteries**

- Ensure your battery charger provides a live and linear wave form voltage to wake up battery's BMS (we recommend our BC range)
- Ensure your battery charger's current output is within the C rating of the battery / battery bank.
- Ensure your battery charger's charging voltage is within the charge voltage rating.
- Ensure the series voltage does not exceed 48V. Parallel is unlimited.
- No temperature sensor is required when charging our batteries (except AL1220) as the internal BMS trips the charging circuit.





## BATTERY PREFACE LITHIUM OVERVIEW

---

### General Information

The advantages of lithium batteries are well known over conventional batteries.

- Greater energy density, providing more usable power in the same space
- Superior charge and discharge capabilities
- Improved unit safety

They are superior on every level - everyone wants them. However installing them on vehicles was not simple and required a lot of knowledge because they have a very specific envelope for their charging and discharging curves. Failure to operate within these parameters will reduce the performance ability and life of the battery.

Lithium batteries require additional care over lead acid batteries. In AMPS batteries, much of this care is solved and monitored by the BMS onboard. The BMS tries to protect the cells from allow over-voltage, over-current, short circuit damage and over/under temperature situations.

Lithium poses a risk to alternators, and as such we cannot consider warranty claims where Lithium batteries are charged directly off of an alternator (IE, Not with a battery to battery charger to protect both the alternator and the Lithium from one another). When charging lithium from an alternator source (DC/DC charge on vehicles) we require a battery to battery charger for their current limiting and isolating properties.

Due to their very low internal resistance, Lithium batteries are very easy and quick to charge. This historically would be perceived as a good thing, however, on a mechanical source like an alternator this can rapidly lead to alternators running at 100% output for extended periods of time, and imminent degradation. Current limiting chargers limited to 80% of the alternators maximum output is AMPS' recommendation for DC/DC charge.

A.M.P.S recommends the Sterling Battery to Battery charger range for its current limiting features, its ability to isolate the battery from the alternator side, its Euro-6 compatibility and its complete voltage control.

### Lithium Benefits

- Capacity and performance - Lithium batteries allow, when the BMS allows it, full use of the battery capacity, as opposed to the 50% recommended depth of discharge of a lead acid battery. Their low internal resistance allows much faster charge than many other battery types and very impressive rates of discharge.
- Often significantly lighter and significantly smaller than their lead acid competition.
- Even when being discharged to significantly greater degrees than a lead acid battery, we will still expect to see between 10-20 times the service life of a lithium battery against a lead acid battery.

### A.M.P.S Warranty

Each battery comes with a 5 year limited factory warranty that is non transferable.

- Our warranty covers manufacture and material defects. Damages caused by abuse, neglect, accident, alterations and improper use are not covered under our warranty.

- Warranty is null and void if damage occurs due to negligent repairs.

- Customer is responsible for inbound shipping costs of the product to AMPS.

- AMPS will ship the repaired or warranty replacement product back to the purchaser at the purchasers cost. If your order was damaged in transit or arrives with an error, please contact us ASAP so we may take care of the matter promptly and at no expense to you. This only applies for shipping which was undertaken by our company and does not apply for shipping organised by yourself. Please do not throw out any shipping or packaging materials.

All returns for any reason will require a proof of purchase with the purchase date. The proof of purchase must be sent with the returned shipment. If you have no proof of purchase call the vendor who supplied you and acquire the appropriate documentation.

To make a claim under warranty, call our customer care line at ( England 01905 771771). We will make the best effort to repair or replace the product, if found to be defective within the terms of the warranty. AMPS will ship the repaired or warranty replacement product back to the purchaser, if purchased from us

Please review the documentation included with your purchase. Our warranty only covers orders purchased from AMPS. We cannot accept warranty claims from any other AMPS distributor. Purchase or other acceptance of the product shall be on the condition and agreement that AMPS Ltd shall not be liable for incidental or consequential damages of any kind. Additionally, AMPS neither assumes nor authorizes any person for any obligation or liability in connection with the sale of this product. This warranty is made in lieu of all other obligations or liabilities. This warranty provides you specific legal rights and you may also have other rights, which vary from state to state. This warranty is in lieu of all other, expressed or implied.

## MATERIAL SAFETY DATA SHEET

For Rechargeable Li-Ion Battery 4S20P 12V100Ah of AMPSystems Ltd

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT IDENTIFICATION

Lithium Ion Battery

12V100Ah 1,280Wh/battery pack

The UN classification number: Class 9

UN Number: UN3480 lithium ion batteries

AMPSystems Ltd, Droitwich, England WR90NX

Tel 01905 771771 www.ampsystems.com

### 2. COMPOSITION INFORMATION

Common chemical name / General name	CAS number	Concentration range
Lithium Cobalt Oxides (active Material)	12190-79-3	30 ~ 50 %
Polyvinylidene Fluoride (binder)	24937-79-9	0.5 ~ 3 %
Graphite (conductive material)	1333-86-4	0.1 ~ 1 %
Graphite (active material)	7782-42-5	10 ~ 30 %
Organic Solvent (gel type electrolyte)	N/A	7 ~ 17 %

### 3. HAZARDS IDENTIFICATION Emergency Overview

The battery should not be opened or burned since the following ingredients contained within the product that could be harmful under some circumstance if exposed or misuse.

#### PRIMARY ROUTES

Skin contact, Skin absorption, Eye contact, Inhalation, and Ingestion: NO

Skin contact No., Skin absorption No., Eye contact No., Inhalation No., Ingestion No

#### SIGNS AND SYMPTOMS OF EXPOSURE

Skin contact No effect under routine handling and use.

Skin absorption No effect under routine handling and use.

Eye contact No effect under routine handling and use.

Inhalation No effect under routine handling and use.

Ingestion No effect under routine handling and use.

Reported as Carcinogen Not applicable.

### 4. EMERGENCY AND FIRST AID MEASURES

INHALATION, EYE CONTACT, and SKIN CONTACT: Not a health hazard.

INGESTION: If swallowed, obtain medical attention immediately.

CAUTION: If exposure to internal materials within cell due to damaged outer casing, the following actions are recommended.

INHALATION: Leave area immediately and seek medical attention.

EYE CONTACT: Rinse eyes with water for 15 minutes and seek medical attention.

SKIN CONTACT: Wash area thoroughly with soap and water and seek medical attention.

INGESTION: Drink milk/water and induce vomiting; seek medical attention

### 5. FIRE FIGHTING MEASURES

Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

#### EXTINGUISHING MEDIA

Use extinguishing media suitable for the materials that are burning.

#### SPECIAL FIREFIGHTING INSTRUCTIONS

If possible, remove cell(s) from fire fighting area. If heated above 130°C, cell(s) may Swell/explode/vent.

If package is damage or heat, the package should be checked and repackaged well.

#### FIREFIGHTING EQUIPMENT

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

### 6. ACCIDENTAL RELEASE MEASURES ON LAND

Place material into suitable containers and call local fire/police department.

IN WATER: If possible, remove from water and call local fire/police department

#### EXTINGUISHING MEDIA

Use extinguishing media suitable for the materials that are burning.

### 7. HANDLING AND STORAGE

Storage: Store in a cool, well-ventilated area. Do not expose to high temperature (60C+). Since short circuit can cause burn hazard or safety vent to open - do not store with metal jewellery, metal covered tables, or metal belt.

Handling: Do not disassemble, crush or solder. Do not short + and – terminals with a metal. Do not open the battery. Charging: Charge within the limits Charge with specified charger designed for this battery.

Discharging: Discharge within the limits.

Disposal: Dispose in accordance with applicable federal, State and local regulations.

Warning: Fire/Explosion and Severe Burn Hazard. Do not Crush, Disassemble, Heat Above 100C, or Incinerate.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### ENGINEERING CONTROLS

Keep away from heat and open flame. Store in a cool dry place

#### PERSONAL PROTECTION

Respirator: Not required during normal operations. SCBA required in the event of a fire.

Eye/face protection: Not required beyond safety practices of employer.

Gloves: Not required for handling of cells.

Foot protection: Steel toed shoes recommended for large container handling.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

State	Solid
Odour	N/A
pH	N/A
Vapour density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

### 10. STABILITY AND REACTIVITY

REACTIVITY: None during normal operating or handling conditions.

INCOMPATIBILITIES: None (during normal operation). Avoid exposure to heat, open flame, and corrosives.

HAZARDOUS DECOMPOSITION PRODUCTS: None (during normal operating conditions). If cells are opened, hydrogen fluoride and carbon monoxide may be released.

CONDITIONS TO AVOID: Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

### 11. TOXICOLOGICAL INFORMATION

This product does not elicit toxicological properties during routine handling/use.

Sensitization / No. Acute toxicity / No. Teratogenicity / No. Reproductive toxicity / No.

This product does not contain any kinds of the following substances and halogen-type, flame retardants including Chlorine and Bromide type harmful flame retardants which are listed in appendix of TCO documents and relevant international ECO requirements.

Polybromated Biphenyls (PBB)

Polybromated Biphenyl Ethers (PBBE)

Polybromated Biphenyl Oxides (PBBO)

Polybromated Diphenylethers (PBDE)

Polychlorinated Biphenyl (PCB)

Polychlorinated Diphenylethers (PCDE)

Tetrabromophenol A (TBBPA)

Asbestos, Antimonytrioxide, Dioxine /

None of the following substances will be exposed, leaked, or emitted during transportation,

storage or any operation and any temperature condition:

Chlorinated Fluorohydrocarbon (FCKW), Acrylonitrile, Styrol, Phenol,

Benzol, Mercury of greater than 0.0001 wt% for alkaline battery, Mercury of greater than 0.0005 wt% for other battery, Polymer content of greater than 0.5g/cell, 1.5g/battery, Cadmium, lead, and other harmful heavy metal

This product does not contain mercury, cadmium and Polymer-metal.

Mercury content N/A. Polymer-metal N/A. Cadmium content N/A.

### CAUTION

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

### 12. ECOLOGICAL INFORMATION

Some materials within the cell are bio-accumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

### 13. DISPOSAL CONSIDERATIONS

CALIFORNIA REGULATED DEBRIS RCRA Waste Code: Non-regulated

Dispose of according to all federal, state, and local regulations.

### 14. TRANSPORT INFORMATION

UN Number: UN 3840

Proper Shipping Name: LITHIUM ION BATTERIES

Hazard class: 9

Packing group: II

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a pack. Please refer to Section 7-HANDLING AND STORAGE also.

### 15. REGULATORY INFORMATION

With regard to sea transport, the following regulations are cited and considered:

I) The International Maritime Dangerous Goods (IMDG) Code (2014 Edition) with SP188)

II) The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA (Part 49 CFR Sections 100-185),

III) The Office of Hazardous Materials Safety within the US Department of Transportation's (DOT) Research and Special Programs Administration (RSPA), and VI) The UN Recommendations on the Transport of Dangerous Goods Model Regulations and the Manual of Tests and Criteria (UN38.3)

Our products are properly classified, described, packaged, marked, and labelled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1/T8) on the Transport of Dangerous

Goods Model Regulations.

Manual of Test and Criteria(38.3 Polymer Lithium ion battery)

Test Item Test Results Remark

T1 Altitude Simulation Pass

T2 Thermal Test Pass

T3 Vibration Pass

T4 Shock Pass

T5 External Short Circuit Pass

T6 Impact Pass

T7 Overcharge Pass For Pack Only

T8 Forced Discharge Pass For Cell Only

### 16. OTHER INFORMATION

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. AMPSystems Ltd makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it except normal transport according to the correct transport conditions.

### Warranty:

**5 year warranty from date of purchase of the original battery. Based on correct installation and maintaining the charge profile and discharge limits as per specification. This does not include mishandling or damage to the battery due to misuse.**



## BATTERY SPECIFICATIONS AL1220

---

Battery Capacity	20 Ampere hour (20Ah)   256Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Cyclindrical cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	19.0L x 18.7H x 7.7W (CM) - 2.2KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	1C (20A)
Max Continuous Discharge Rate	1C (20A)   40A peak discharge
BMS Features	<ul style="list-style-type: none"><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect (40A draw, per battery)</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL1220





## BATTERY SPECIFICATIONS AL1260

---

Battery Capacity	60 Ampere hour (60Ah)   768Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Prismatic cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	28.0L x 17.2H x 17.6W (CM) - 8KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	0.8C (50A)
Max Continuous Discharge Rate	2C (120A)
BMS Features	<ul style="list-style-type: none"><li>• Bluetooth interface for battery information</li><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL1260





## BATTERY SPECIFICATIONS AL1280

---

Battery Capacity	80 Ampere hour (80Ah)   1024Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Prismatic cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	26.0L x 21.0H x 16.5W (CM) - 11KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	0.8C (60A)
Max Continuous Discharge Rate	1.75C (140A)
BMS Features	<ul style="list-style-type: none"><li>• Bluetooth interface for battery information</li><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL1280





## BATTERY SPECIFICATIONS AL12100

---

Battery Capacity	100 Ampere hour (100Ah)   1280Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Prismatic cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	33.0L x 21.5H x 17.0W (CM) - 14.4KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	0.7C (70A)
Max Continuous Discharge Rate	1.5C (150A)
BMS Features	<ul style="list-style-type: none"><li>• Bluetooth interface for battery information</li><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL12100





## BATTERY SPECIFICATIONS AL12120

---

Battery Capacity	120 Ampere hour   1536Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Prismatic cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	41.0L x 23.5H x 17.0W (CM) - 14.8KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	0.7C (80A)
Max Continuous Discharge Rate	1.25C (150A)
BMS Features	<ul style="list-style-type: none"><li>• BlueTooth interface for battery information</li><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL12120





## BATTERY SPECIFICATIONS AL12150

---

Battery Capacity	150 Ampere hour (150Ah)   1920Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Prismatic cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	41.0L x 23.5H x 17.0W (CM) - 14.8KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	0.7C (100A)
Max Continuous Discharge Rate	1.25C (200A)
BMS Features	<ul style="list-style-type: none"><li>• Bluetooth interface for battery information</li><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL12150





## BATTERY SPECIFICATIONS AL12200

---

Battery Capacity	200 Ampere hour (200Ah)   2560Wh
Nominal Voltage	12V
Battery Chemistry	LiFePO <sub>4</sub> Chemistry - Prismatic cells
Series Limit	4 (48V bank)
Parallel Limit	Infinite
Dimensions and Weight	53.2L x 20.7H x 21.5W (CM) - 22.0KG
Operating Temperature	Charge - 0°C to 60°C // Discharge from -20°C to 60°C
Operating Voltage	13.6V (4S x 3.4V)
Charge Voltage	14.2V-14.6V, 14.4V recommended
Float Voltage	13.4V-14.0V, 13.8V recommended
Max Continuous Charge Rate	0.7C (150A)
Max Continuous Discharge Rate	1.5C (300A)
BMS Features	<ul style="list-style-type: none"><li>• Bluetooth interface for battery information</li><li>• Low temperature battery disconnect (0°C for charge, -20°C for discharge)</li><li>• Over voltage disconnect (14.8V or above on input)</li><li>• Low voltage disconnect (Individual cells below 2.7V, battery voltage of 10.8V)</li><li>• Cell imbalance disconnect (Cell voltage differential of above 0.3V)</li><li>• Automatic cell voltage balancing</li><li>• Over current disconnect</li><li>• Short circuit protection</li></ul>
Operational Quiescent Current	10mA
Standby Quiescent Current	0.1mA
E Marking	E13 - 10R00-10R05-14430-00
Charge Curve	Constant Current / Constant Voltage - CC/CV

Appearance  
AL12200





**CHARGING** Recommend Battery Chargers and DC to DC charging

**AC-DC Charging**

AMPS AC to DC Battery Charger / from mains

To charge our lithium batteries we recommend using our very own range of battery chargers - the BC series.

Ensure, when charging your batteries, you keep the current rating and voltage rating within the specification of the batteries.

For example, the 12V 20Ah AL1220 battery should not be charged with our 12V 40A (BC1240) battery charger.

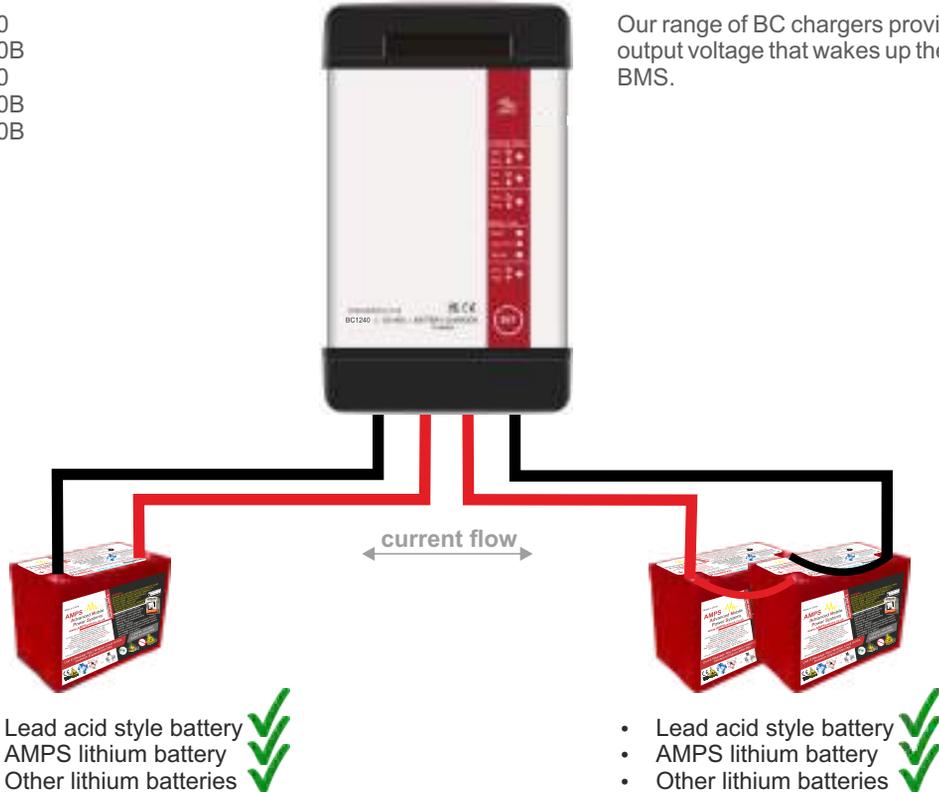
When paralleling batteries to increase Ah capacity, the charger current rating can increase proportionately. For example, 2x AL1220 in parallel can be charged with a BC1240.

Most of our battery chargers are comfortably under the charge rating of the batteries.

If charger rating is too high, the BMS inside the battery shall trip to protect the battery.

- BC1220
- BC1220B
- BC1240
- BC1240B
- BC2420B

Our range of BC chargers provide a live output voltage that wakes up the battery BMS.



**DC-DC Charging**

Sterling Power's DC to DC Battery Chargers - Charging when driving / cruising along

Battery to Battery Chargers / DC to DC chargers provides lithium batteries with the correct charging current and charging voltage.

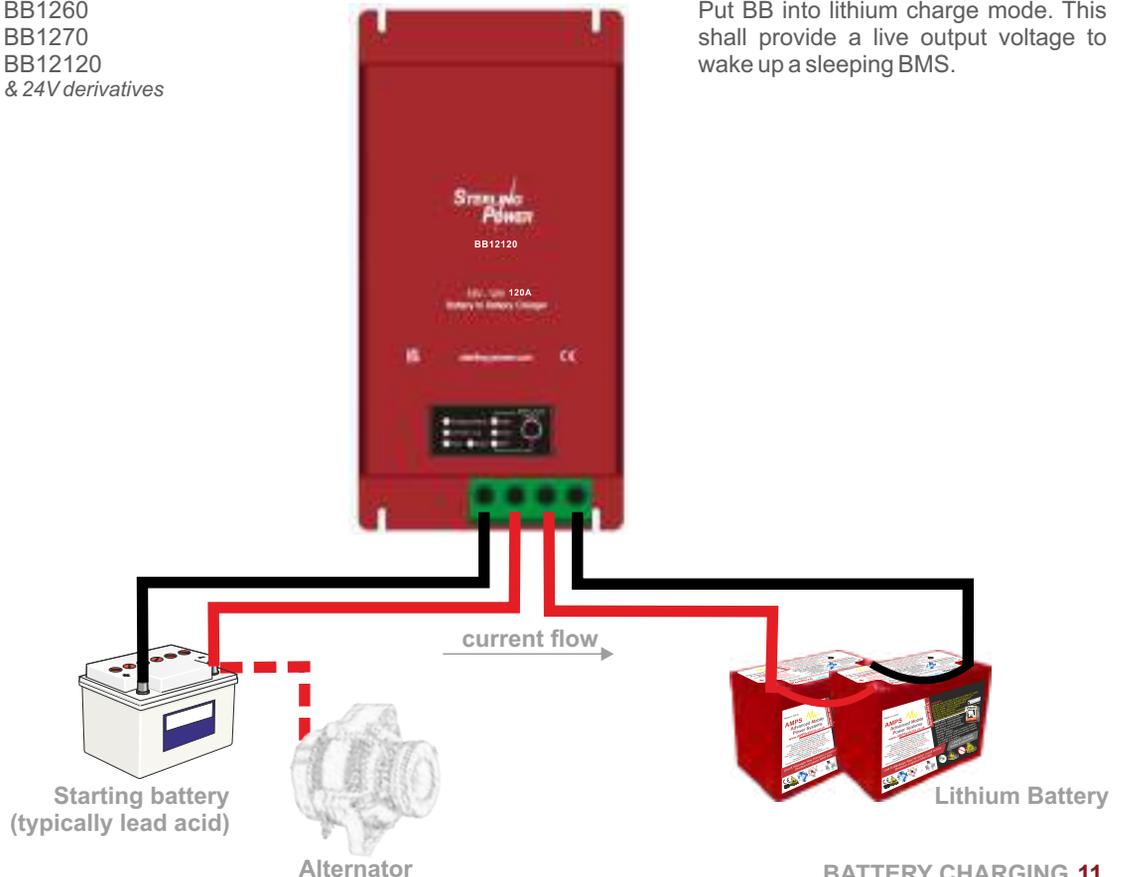
As above, ensure your DC to DC charger is within the current spec of the battery(s) you wish to charge up.

Also, ensure your DC to DC charger is ~70% or lower than your alternator's current rating. Lithium batteries are prone to asking maximum performance from your alternator - resulting in your alternator over heating.

The DC to DC chargers essentially provide appropriate current levels at the correct voltage charging profile.

- BB1230
- BB1260
- BB1270
- BB12120
- & 24V derivatives

Put BB into lithium charge mode. This shall provide a live output voltage to wake up a sleeping BMS.

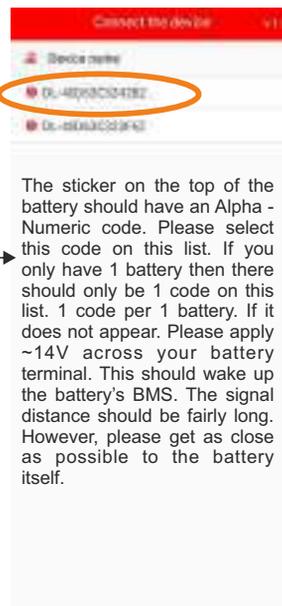
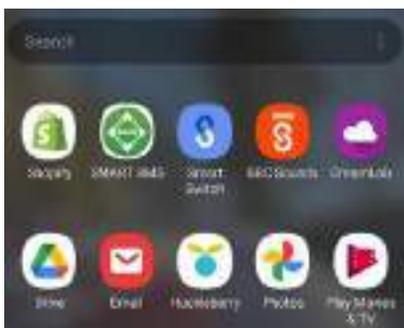




**Bluetooth BMS** Bluetooth BMS functions and Features

Please ensure your battery is Bluetooth compatible - there should be a round sticker on the top of the battery with a BLUETOOTH code on it. We began rolling out the bluetooth compatible models around the 2020/2021 winter period.

- 1) Please go onto the Play Store or the APP Store and download the free 'Smart BMS' app
- 2) Ensure you have Bluetooth activated on your phone.
- 3) Open the App on your phone follow the steps below:



The sticker on the top of the battery should have an Alpha - Numeric code. Please select this code on this list. If you only have 1 battery then there should only be 1 code on this list. 1 code per 1 battery. If it does not appear. Please apply ~14V across your battery terminal. This should wake up the battery's BMS. The signal distance should be fairly long. However, please get as close as possible to the battery itself.



**Main Status Display / What it means**

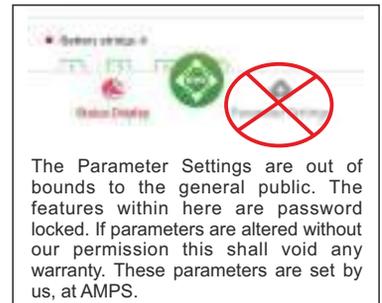


This is the main Status Display of the Smart BMS. The main features that shall be of greatest interest are as follows:

- 1) SOC (state of charge) - this is given as a % figure. This is a fairly accurate capacity figure of your battery.
- 2) sum volt (total battery voltage). This is the voltage of your battery.
- 3) current. Current going into the battery shall appear as a positive number and current leaving the battery shall appear negative.
- 4) The area in purple. The battery is made up of 4x strings of 3V cells. The string that has the highest voltage is displayed, the lowest voltage displayed, the average voltage and the differential voltage. The job of the balancer is to keep the differential voltage as low as possible and during charge cycle the balance slider shall turn green, if the balancer has engaged.
- 5) Cycles. This is the number of discharge and charge cycles the battery has had. The higher the number the more the battery has been charged and discharged (used). Even if the battery is brand new this number may be 1 or 2 as it may have been tested first.
- 6) Power KW. This is a simple P=IV calculation. The sum volt x the current. This gives an indication of the power being supply or drawn from the battery.

There is no need to manually engage this - it should do it automatically.

**Parameter Settings (out of bounds)**



The Parameter Settings are out of bounds to the general public. The features within here are password locked. If parameters are altered without our permission this shall void any warranty. These parameters are set by us, at AMPS.