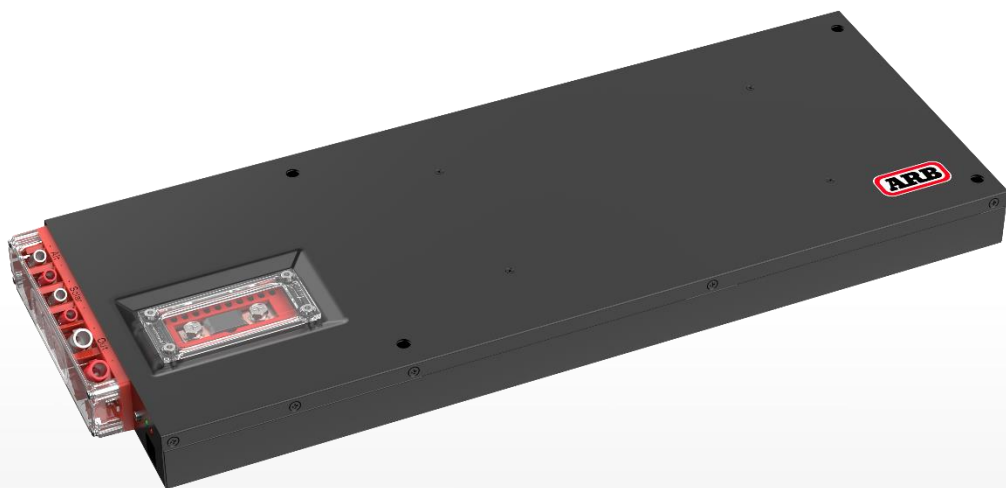




Slimline 100

LiFePO4 Battery with Built-In DCDC Charger.



SLB100A40

USER GUIDE

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1. Scope of Application

This specification document is only applicable to the ARB Slimline Battery SLB100A40.

2. Simplified EU Declaration of Conformity

[EN] Hereby, ARB Corporation Limited declares that the radio equipment type SLB100A40 is in compliance with Directive 2014/30/EU. The Full text of the EU declaration of conformity is available at the following internet address: qr.arb.com.au

[DE] Hiermit erklärt, ARB Corporation Limited, dass der Funkgerätetyp SLB100A40 der Richtlinie 2014/30/EU entspricht. Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar: qr.arb.com.au

[FR] Par la présente, ARB Corporation Limited déclare que l'équipement radio de type SLB100A40 est conforme à la directive 2014/30/EU. Le texte intégral de la déclaration UE de conformité est disponible à l'adresse Internet suivante : qr.arb.com.au

[ES] Por la presente, ARB Corporation Limited declara que el equipo de radio tipo SLB100A40 cumple con la Directiva 2014/30/EU. El texto completo de la declaración UE de conformidad está disponible en la siguiente dirección de Internet: qr.arb.com.au

[IT] Con la presente, ARB Corporation Limited dichiara che l'apparecchiatura radio tipo SLB100A40 è conforme alla Direttiva 2014/30/EU. Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo internet: qr.arb.com.au

3. Compliance

- UN38.3 (safety standard certification)
- MSDS
- DGM
- IEC 62619:2022
- CISPR 11 Class B
- CE (emission and immunity)
- ECE R10
- RCM (Australia)
- FCC (BT module and Battery)
- RoHS
- EU 2023/1542

4. Warnings

- Do not leave the battery at low voltage. ARB recommend to always maintain a SOC above 20%.
- When the battery has low voltage, all loads must be disabled before charging the battery.
- Do not connect the load or charging terminals in reverse polarity, positive to negative or negative to positive.
- Do not connect the battery's input or charge terminals an AC power supply.
- The battery's terminals, positive and negative, must not contact unintended wires or metal. The positive and negative terminals must not be shorted out, this may cause battery short-circuit and damage.
- The battery must not have impacts including penetration, hitting, punching, stamping, thrown, or dropped.
- Do not disassemble the battery or alter the outside structure.
- Do not use or leave the battery in the hot sun, this may cause overheating and damage.
- Do not put the battery into fire or excessive heat.
- Do not store the battery in a high temperature or humid environment.
- Do not submerge the battery in water or allow the battery to get wet.
- Store the battery in a shady, cool, dry location.
- Do not charge the battery continuously for over 24 hours.
- When charging or discharging the battery, if any abnormal smells or noises are observed, discharge the battery immediately and contact ARB for advice.
- When using the battery outside the normal operating temperature range, the capacity and longevity may decrease.
- Do not install battery outside the vehicle. The battery must be installed in a clean and dry location.

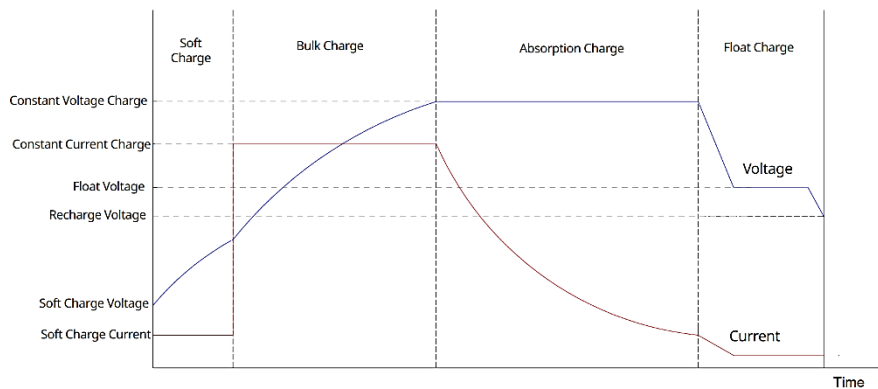
5. General Information

a) Features

- LFP Prismatic Cells 3.2V.
- 40 Amp DCDC charger.
- Internal BMS (Battery Management System).
- 100AmpHr nominal capacity.
- Easily replaceable 300A Mega fuse.
- Smartphone / device App including DCDC charger information and battery monitoring.
- Firmware updates available via the App.
- Enclosure with four thru-hole mounting design.
- Alternator and Solar charging with independent terminal connections.
- Solar charging with Maximum Power Point Tracking (MPPT) function.
- 200 Amp discharge for 20min.
- Sleep mode for low power draw. The battery enters Sleep mode after idle for 48hrs or low battery voltage. Automatic wakeup with Alternator charge, Solar charge, or Output load.
- Cell and MOSFET temperature monitoring with over temperature protection.
- Cell balancing function, to increase battery life.
- Master rocker switch for battery safety.
- LED indicator for status and diagnostic information.
- Self-test, to determine and report the battery status.
- Input reverse polarity protection.
- Overvoltage protection.
- Low voltage protection.
- Overcurrent protection.
- High and low temperature protection.
- Short circuit protection.

b) Charge Control

DCDC charger monitors the battery condition and charges according to the profile and table below.



Charging Phase	Battery Voltage	Charging Current
Soft	< 10V (released >12V)	≤ 20A
Bulk (Constant Current)	10 ~ 14.2V (or after Soft charge 12 ~ 14.2V)	40A
Absorption (Constant Voltage)	14.2V	≤ 40A
Float	13.6V	≤ 40A
Recharge	13.2V	≤ 40A

- Soft charging stage.
When the battery voltage falls below 10V or cell undervoltage protection is activated, the battery charging is limited to 20A until the battery voltage reaches 12V.
The rocker switch can be turned ON-OFF-ON to release Soft charging and commence Bulk charging.
- Constant current charge.
When the battery voltage is below 14.2V, the charging current is 40A.

- Constant voltage charge.

When the battery voltage reaches 14.2V, the charging current gradually decreases until the battery state is full.

- Full state.

When the battery is supplying power, the battery will stop charging after battery voltage reaches 14.2V or cell voltage reaches 3650mV.

When the battery is not supplying power, the battery will stop charging when the current is below 4A and the battery is full for 30 seconds, or when the charging current is below 2A charging will end immediately, or when the cell voltage reaches 3650mV charging will end immediately.

- Float.

When the battery voltage falls to 13.6V, floating charge is performed. The floating current is limited to 40A.

When the battery voltage falls below 13.2V, float charging ends and standard charging is enabled.

c) Charge Conditions

- Alternator input conditions to start charging.

ACC	ACC ON, (above 8V)	ACC OFF, (below 4V)
DC input voltage	above 12.0V	above 12.9V
Battery voltage	above 7V	
Result	Alternator Charge	

- Alternator input conditions to stop charging.

ACC	ACC ON, (above 8V)	ACC OFF, (below 4V)
DC input voltage	below 11.3V	below 12.7V
Result	Do not Alternator Charge	

When the charging current exceeds 5amps, every 100 seconds the DCDC reduces the current to 5amps and checks if the input (alternator) voltage meets the conditions to stop charging.

- Solar input conditions to start charging.

Solar input voltage	above 9V
Battery voltage	above 7V
Working condition	Solar Charge

When there is input from the solar panel, the BMS actively tracks the MPPT to obtain the maximum charging efficiency.

- Solar input conditions to stop charging.

Solar panel input voltage	below 8V
Working condition	Power Off

- Solar input charging function.

The BMS has two solar charging modes; MPPT and PWM.

When the charging current is less than 2amps, the BMS automatically switches to PWM mode.

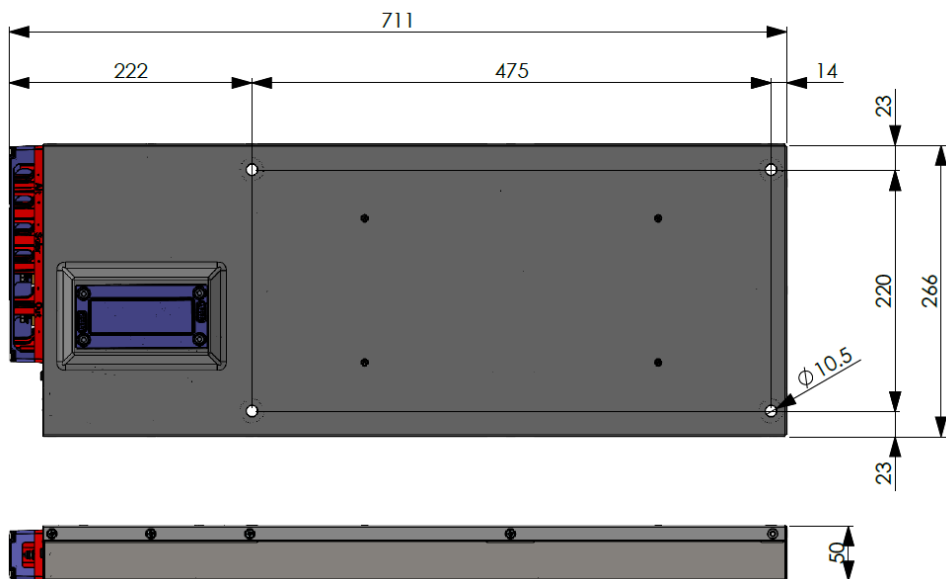
In PWM mode, when the charging current exceeds 3amps, the BMS automatically switches to MPPT mode.

- Charging input selection priority.

If both alternator and solar inputs meet the conditions to start charging, the alternator input will priority charge. When the solar input is already in the charging process, the DCDC will check if the alternator input meets the charging conditions and change the charging input accordingly.

6. Product Diagram

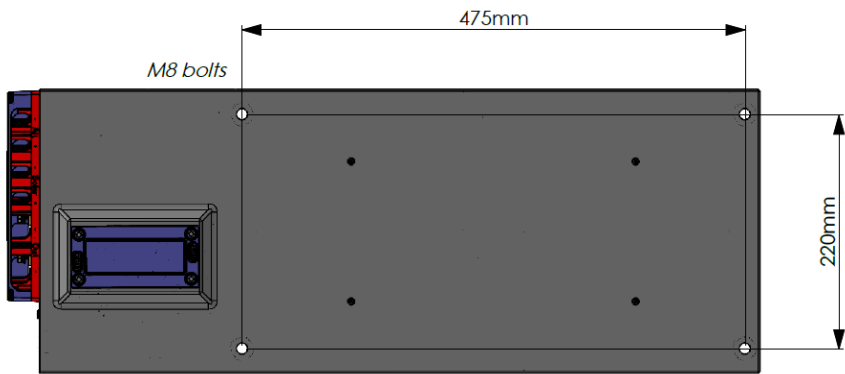
The battery external dimensions are shown below.



7. Installation

a) General

The battery structure includes four mounting holes as shown below. These holes pass through the battery structure with crush tubes for secure fastening. The battery should be installed on a hard flat surface and secured with four M8 mounting bolts through these holes, and tightened to 22Nm (16lbft). The mounting hole dimensions are 475mm wide and 220mm high.



ARB have designed custom bracket assemblies to suit various common vehicle applications. All required fasteners, fitting instructions and a wiring harness to support vehicle alternator charging are included with these kits. These bracket kits can be purchased at ARB stores and stockists.

The battery must be installed inside a clean and dry environment. The battery has been designed for in cabin installation, this may include service bodies and canopy tubs if the environment is free from water and dust ingress.

The battery can be installed in any mounting orientation including vertical, horizontal, upside-down, and inverted.

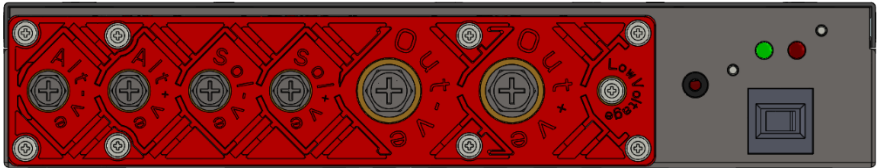
ARB offer wiring solutions for alternator connection, solar connection, and output connection (60amp max). These harnesses include ring terminals which are connected to the terminal block on the side of the battery.

To complete the installation, first turn the rocker switch OFF and remove the terminal block cover. The terminal block has labels adjacent each terminal point, connect each harness ring terminal to the appropriate terminal point. The table below defines the application of each terminal point.

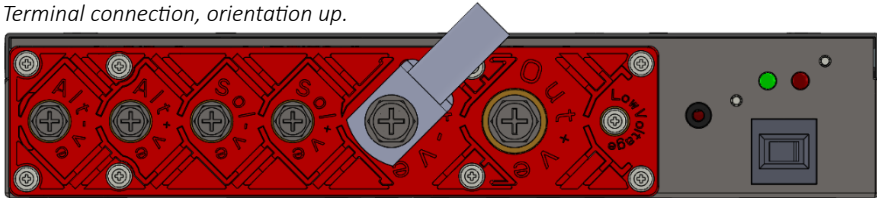
Terminal Point	Function
Alt -ve	Connect with vehicle battery (alternator) negative.
Alt +ve	Connect with vehicle battery (alternator) positive.
Sol -ve	Connect with Solar panel(s) negative, regulator is not required.
Sol +ve	Connect with Solar panel(s) positive, regulator is not required.
Out -ve	Connect with load, battery output negative terminal.
Out +ve	Connect with load, battery output positive terminal.
Low Voltage	Connect with vehicle ignition for low voltage (smart) alternators only.

The terminal block allows the cables to exit in either direction as per the images on the next page. For high current draw applications (including 200amp), two cables can be stacked and exit the terminal block in opposite directions. For this installation, the terminal block cover may be trimmed to allow the cable to exit in both directions.

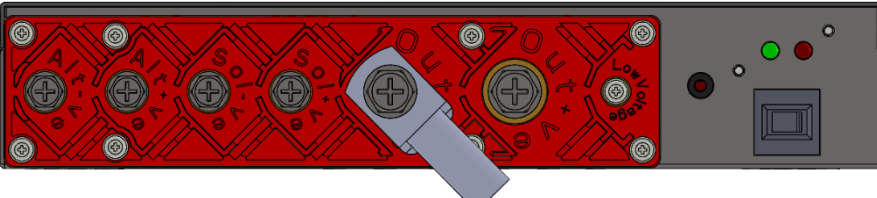
Terminal block without ring terminal connection.



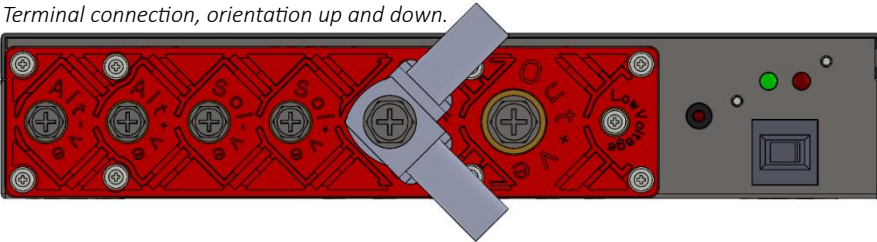
Terminal connection, orientation up.



Terminal connection, orientation down.



Terminal connection, orientation up and down.



Torque all terminal bolts as per table below.

SIZE	Torque Nm	Torque lbft
M6	9	7
M8	22	16

For custom built input (alternator) harnesses, the minimum wire gauge for cable lengths up to 6m is 6B&S (13.5mm²). For cable lengths exceeding 6m, contact an automotive electrician for advice.

ARB strongly recommend that ARB stores and stockists conduct the installation for the best performance and longevity of the ARB Slimline Battery.

b) Parallel and Series

For parallel battery connection, connect the two battery positives (Out +ve) and negatives (Out -ve) with adequately sized cable. The accessories should be connected with positive connected to the first battery and the negative connected to the second battery.

Since each battery has an internal DCDC charger, each battery must be connected to the vehicle start battery independently with their own harness. Parallel connection will double the AmpHr and double the output current, ensure cable size is adequate between batteries and to the powered accessories.

Series battery connection is not allowed. Connecting batteries in series will cause damage to the battery internal electronics.



8. Master Switch



The BMS and DCDC charger are inert when the master switch is OFF.

Toggleing the rocker switch ON-OFF-ON for greater than 0.3sec will clear all BMS protections.

Battery State	Green LED	Red LED
OFF (Master Switch OFF)	OFF	OFF
Sleep Mode Enable options: 1. Cell undervoltage protection >3min 2. SOC protection >3min 3. Current draw <1A for 48hrs	OFF	OFF
Full (%95~100% SOC)	SOLID	OFF
Charging (DC source)	FLASHING (2 flashes every 5sec)	OFF
Charging (Solar input)	FLASHING (3 flashes every 5sec)	OFF
Low Power (≤ 10% SOC)	OFF	SOLID
BMS Protection Active	OFF	FLASHING (1 flash per second)
Fault	OFF	FLASHING (3 flashes per second)
Programming	FLASHING (1 flash per second)	FLASHING (1 flash per second)
Idle (none of the above)	FLASHING (1 flash every 10sec)	OFF

9. Bluetooth App

The ARB Slimline 100 battery is compatible with the ARB Battery Connect App. This App provides battery information including protection activation and fault code information.

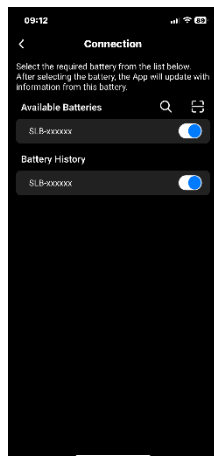
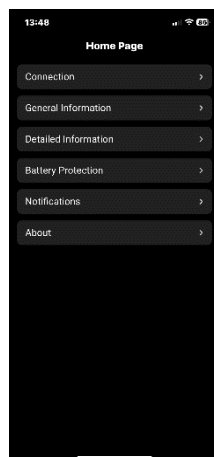
This App is free download for Android via Google Play, and Apple IOS via the App Store.

a) Home

Loading the App will automatically open the Home page. This Home page contains the main menu where all other pages are accessible by tapping the desired selection.

b) Connection

Entering the Connection page will allow connection with the ARB battery. There are two methods to connect, to search tap the magnifying glass icon and select the desired battery from the list. Alternatively, tap the scan icon and scan the battery QR barcode to connect. The App will connect and load all the required information for that battery automatically.



c) General Information

This page contains information regarding the battery including:

- Current battery voltage.
- Battery nominal capacity (100AH).
- Status, either Standby, Charging or Discharging.
- Cycle life, the number of charge-discharge cycles.

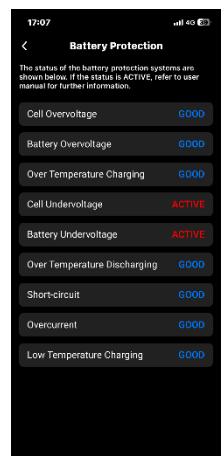
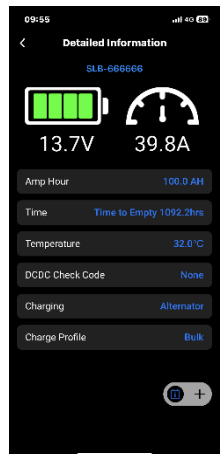
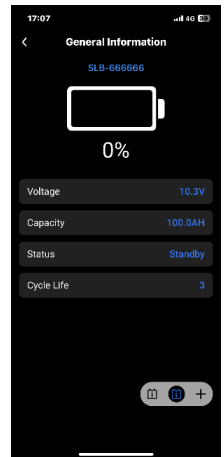
d) Detailed Information

This page contains information regarding the battery's current state including:

- Battery AmpHr remaining.
- Time to full / empty, calculated from the previous 60seconds of current draw, maximum time displayed 1092.2hrs.
- Temperature, inside the battery case.
- DCDC Check Codes, notifies any concerns or issues with the DCDC charger (see Troubleshooting section).
- Charging, either Alternator, Solar or None.
- Charge Profile, either Soft, Bulk, Absorption, Float or None.

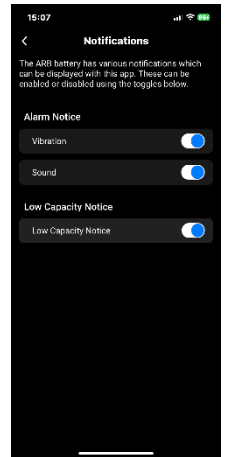
e) Battery Protection

To avoid failure of critical components, the battery has various protection features. This page notifies which protection(s) are active. The protections are activated and released automatically when certain conditions are satisfied.



f) Notifications

The App supports popup notifications where the smart phone will vibrate and/or beep when relevant information is available including DCDC check codes and protection activation. The vibrate and sound features can be toggled ON and OFF on this Notifications page. The notification for Low Capacity can be toggled ON and OFF on this page, low capacity is below SOC20 (20% charge).

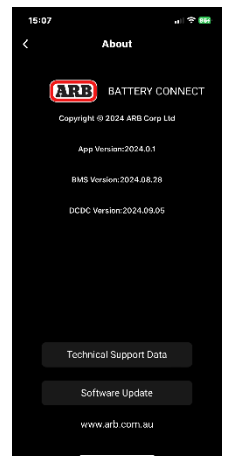


g) About

The About page contains important information regarding the battery, DCDC charger and App software version.

The Technical Support Data button copies the smart phone and battery information to the phone clipboard. This information can be pasted into an email to provide this information as required.

The Software Update button will update the battery and DCDC charger software. This should only be necessary as instructed by the App.



10. Troubleshooting

Category	Notification	Issue	Solution
BMS Protection	Cell Overvoltage	One of cells has exceeded its recommended voltage upper limit.	1. Wait, and the battery should discharge to correct the fault. 2. Toggle the rocker switch ON-OFF-ON to release the protection.
	Over Temperature Charging	One of cells has exceeded its recommended charging temperature upper limit.	1. The cell(s) temperature must not exceed 65°C before charging will resume. 2. Toggle the rocker switch ON-OFF-ON to release the protection.
	Cell Undervoltage	One or more of the cells have reduced below their recommended voltage limit.	1. Immediately disconnect all loads, then apply charge (alternator or solar) to the battery until the cell voltages exceed their lower limit.
	Battery Undervoltage	The battery voltage has reduced below its recommended limit.	1. Immediately disconnect all loads, then apply charge (alternator or solar) until the battery voltage exceeds its lower limit.
	Over Temperature Discharging	One of cells has exceeded its recommended discharging temperature upper limit.	1. The cell(s) temperature must not exceed 50°C before discharging will resume. 2. Toggle the rocker switch ON-OFF-ON to release the protection.

BMS Protection	Short-circuit	The battery output wiring has a short circuit.	1. Check and correct battery output wiring. The MOSFET temperature must not exceed 50°C before current will resume.
	Overcurrent	The current draw has exceeded the recommended current limit of 200Amps.	1. Toggle the rocker switch ON-OFF-ON to release the protection. 2. Reduce load on the battery to below 200Amps. The MOSFET temperature must not exceed 50°C before current will resume.
	Low Temperature Charging	The cells cannot charge at extreme low temperatures.	1. Warm the battery ambient temperature above 5°C to resume charging. 2. Toggle the rocker switch ON-OFF-ON to release the protection.
	Low Temperature Discharging	The cells cannot discharge at extreme low temperatures.	1. Warm the battery ambient temperature above 5°C to resume discharging. 2. Toggle the rocker switch ON-OFF-ON to release the protection.
	Over Temperature BMS	The BMS has exceeded its recommended temperature upper limit.	1. The BMS temperature must not exceed 85°C before charging will resume. 2. Toggle the rocker switch ON-OFF-ON to release the protection.

BMS Protection	Over Temperature Terminals	The Terminals have exceeded their recommended temperature upper limit.	1. The terminals temperature must fall below 90°C before charging will resume. 2. Review the output wire size, this maybe inadequate for the equipment installed. 3. Toggle the rocker switch ON-OFF-ON to release the protection.
DCDC Check Code	The DC source input is connected abnormally (alternator overvoltage)	The Alternator connection voltage exceeds 30V.	1. Connect the battery alternator input to a 12VDC source.
	The solar panel input is connected abnormally (solar overvoltage)	The Solar connection voltage exceeds 30V.	1. Connect the battery solar input to a source not exceeding 30V.
	Abnormal battery connection (battery overvoltage)	The Output voltage exceeds 14.6V.	1. Connect the battery output to equipment suitable for 12VDC.
	Communication is abnormal	The BMS and DCDC charger communication has failed.	1. Toggle the rocker switch ON-OFF-ON to retry. If unsuccessful, See ARB for assistance.
	Temperature too high at DCDC charger	The DCDC charger PCBA temperature has exceeded 80°C.	1. Wait until the temperature reduces below 65°C and charging will resume.
	ACC voltage is abnormal	The ACC voltage is between 4V and 8V.	1. Connect the Low Voltage terminal to either a 0VDC (unconnected) source or 12VDC source.
	Battery activation failed or overload	The DCDC charger has failed.	1. Disconnect load and toggle the rocker switch ON-OFF-ON to retry. If unsuccessful, See ARB for assistance.
	Soft start timeout	The Soft charge time has exceeded 2hrs.	1. Toggle the rocker switch ON-OFF-ON to retry. If unsuccessful, See ARB for assistance.

DCDC Check Code	Bulk charge timeout	The Bulk charge time has exceeded 20hrs.	1. Toggle the rocker switch ON-OFF-ON to retry. If unsuccessful, See ARB for assistance.
App	-	Time to empty/full is incorrect	1. This maybe normal, the time is calculated from the previous 60seconds of current draw. 1. This maybe normal, the maximum time displayed is 1092.2hrs.
	-	Connection to App failed	2. The battery can only connect with one device. Check the battery is not already connected to another device. 3. Check the battery SOC. If the battery SOC is 0, the battery will not connect. 1. Check the rocker switch. If the rocker switch is OFF, the battery will not connect.
	-	DCDC continues charger after 100SOC.	2. This is normal, the battery capacity exceeds 100AH however the battery is considered full at 100AH.
General	-	Flat vehicle cranking battery	1. The battery maybe incorrectly connected to Low Voltage Alternator terminal, check vehicle specification for low voltage alternator and disconnect terminal accordingly.

General	-	Battery will not charge on Alternator input	1. The battery maybe incorrectly unconnected to the Low Voltage Alternator terminal, check vehicle specification for low voltage alternator and connector accordingly.
	-	Output terminals are not supplying voltage	1. Check if battery fuse is blown, replace as necessary. 2. Check App for battery protection information.
	-	When alternator charging, the battery is not charging, however the output terminals are providing power.	1. Disable all load and try alternator charging again.

11. Technical Specifications

Category	Specification	Parameter		Comment
Lithium battery pack (incl. BMS)	Nominal voltage	12.8V		Output voltage 13.2 ~ 13.4V
	Nominal capacity	100Ah		0.2C
	Minimum capacity	100Ah		
	Internal resistance	≤5mΩ		
	Recommended charging voltage	13.6- 14.6V		Cell: 3.65V±0.02V
	Discharge cut-off voltage	10V		
	Standard charging current	40A		
	Standard discharge current	50A		0.5C
	Nominal discharge current	100A		1C @ 25°C
	Maximum discharge current	200A		Max. discharge time 20min, then overcurrent protection activates.
	Peak current	350A		Max. discharge time 5sec, then overcurrent protection activates.
DCDC charger	Alternator input	Rated input voltage	13.5V	
		Input overvoltage protection	30V	Solar panel input and alternator input. Charging will stop and retry every 60sec.
		Limit voltage	32V	Exceeding this limit may damage the product.

DCDC charger	Alternator input	Charging voltage	14.2V	When charging at constant voltage and the charging current falls below 4amps for 30sec, the charging will stop. Alternatively, when charging current falls below 2amps, the charging will stop immediately. Alternatively, when the cell voltage reaches 3650mV, the charging will stop immediately.
		Charge protection voltage	14.6V	When battery voltage reaches 14.6V (full voltage +0.4V) charging will stop.
		Maximum input current	45A	45A $\pm$ 2.5A
		Maximum charging current	40A	40A $\pm$ 2A
		Charge timeout protection		When the alternator input, constant current charging time exceeds 20hrs, or soft charging time exceeds 2 hours, charging will stop. The protection will release when the alternator input is powered again.
	Solar input	Rated input voltage	18V	When solar panel input voltage falls below 8V, charging will stop.
		Input over voltage protection	30V	Solar panel input and alternator input. Charging will stop and retry every 60sec.
		Limit voltage	32V	Exceeding this limit may damage the product.

DCDC charger	Solar input	Charging voltage	14.2V	When charging at constant voltage and the charging current falls below 4amps for seconds, the charging will stop. Alternatively, when charging current falls below 2amps, the charging will stop immediately. Alternatively, when the cell voltage reaches 3650mV, the charging will stop immediately.
		Charge protection voltage	14.6V	When battery voltage reaches 14.6V (full voltage +0.4V) charging will stop.
		Maximum input current	45A	45A ± 2.5A
		Maximum charging current	40A	40A ± 2A
General	Discharge temperature	-20 ~ 60°C		
	Charging temperature	0 ~ 60°C		0°C protection active, 5°C protection release.
	Ambient humidity	Relative humidity	0- 90%	Without condensation
	Idle current	≤80mA		
	Sleep mode current	≤8mA		The BMS+DCDC module are in sleep mode.

General	Sleep mode activation	≥ 48hrs	When charge or discharge falls below 1amp for 48hrs, the battery (BMS and DCDC) will enter sleep mode (for low power consumption). To wake up the battery, apply charge or discharge of greater than 1amp.
	Low voltage terminal is abnormal	Voltage >4V and <8V	This condition is considered abnormal and a fault code is reported. Charger will not charge, retry every 60sec.
	Battery weight	15.6kg	
	External dimensions	Width = 711mm Height = 266mm Depth = 50mm	
	Mounting hole dimensions	Width = 475mm Height = 220mm Ø10.5mm (suits M8)	

Additional notes:

1. When alternator or solar charging, the DCDC charger temperature may reach 70 degrees. To protect the battery from over-heating, the charging current may be reduced.
2. When the undervoltage protection causes the battery to enter low power mode, it may take 1~4min to charge normally again.
3. After the battery enters the undervoltage protection, the battery will consume ~3mA. This may cause battery damage after 20 days if no charge is applied. ARB recommend keeping the battery at full charge to increase battery life.
4. When undervoltage protection is activated and the charge conditions are not adequate to recharge the battery, the charger will not charge and the battery reports a fault. To protect the battery from damage, disconnect the alternator and solar inputs, remove the load, and turn off the master switch.

12. Technical Protections

Item	Standard	Function description	Release condition
Cell Overvoltage protection	3700mV±20mV	When the cell voltage is higher than the overvoltage protection value for more than 3sec, charging will stop. The battery will report fault.	When the discharge exceeds 1amp and the cell voltage is lower than the overcharge protection voltage, the cell will automatically discharge.
	4100mV±20mV	When the cell voltage is higher than the overvoltage protection value for more than 1sec, charging and discharging will stop. The battery will report fault.	After 20min, if the cell voltage falls below the 3400mV, the BMS will continue charging and discharging.
Cell Undervoltage protection	2500mV±20mV	When the cell voltage falls below the undervoltage valve for 3sec, cell undervoltage protection is activated. Discharging will stop and the battery will enter sleep mode after 3min.	The cell undervoltage is released when all the cell voltages exceed 2800mV±20mV.
Battery Undervoltage protection	10000mV±80mV	When the battery voltage falls below the undervoltage valve for 3sec, cell undervoltage protection is activated. Discharging will stop and the battery will enter low power mode after 3min.	The battery undervoltage protection is released when the battery voltage exceeds 11.2V.
Hardware undervoltage	1600mV±20mV	When the cell voltage falls below the undervoltage valve for 1sec, hardware undervoltage protection is activated. Discharging will stop.	The hardware undervoltage protection is released when the cell voltage exceeds 2800mV±20mV.

SOC protection	SOC = 0%, and $\leq 10800\text{mV} \pm 80\text{mV}$	When the SOC = 0% and battery voltage falls below the protection voltage, SOC protection will activate. Discharging will stop and the battery will enter sleep mode after 3min.	When charging is greater than 1amp, discharging can continue.
Charge overcurrent protection	$\geq 105\text{A}$	When charging exceeds the overcurrent protection value for 5sec, the charge overcurrent protection is activated. Charging will stop.	The protection is released with normal charging current after 3sec, or discharge current $> 1\text{amp}$ after 0.25sec.
	$284 \sim 345\text{A} \pm 10\%$	When charging exceeds the overcurrent protection value for 500msec, the charge overcurrent protection is activated. Charging will stop.	The protection is released with discharge current $> 1\text{amp}$ after 0.25sec.
Overcurrent protections	200~250A	When the discharge current exceeds the discharge protection lower limit for 20min, the discharge protection is activated. Discharging will stop.	Protection is released after 1min and the MOSFET temperature is less than 50°C.
	250~300A	When the discharge current exceeds the discharge protection lower limit for 5min, the discharge protection is activated. Discharging will stop.	Protection is released after 1min and the MOSFET temperature is less than 50°C.
	300~350A	When the discharge current exceeds the discharge protection lower limit for 3min, the discharge protection is activated. Discharging will stop.	Protection is released after 1min and the MOSFET temperature is less than 50°C.

Overcurrent protections	350~600A	When the discharge current exceeds the discharge protection lower limit for 5sec, the discharge protection is activated. Discharging will stop.	Protection is released after 1min and the MOSFET temperature is less than 50°C.
	600~1100A	When the discharge current exceeds the discharge protection lower limit for 640msec, the discharge protection is activated. Discharging will stop.	The BMS will retry 3 times, then activate protection. Once active, protection is released after 1min and the MOSFET temperature is less than 50°C.
Short-circuit protection	1100A	When the discharge current exceeds the short circuit protection current for 70μsec, the short circuit protection is activated. Discharging will stop.	Protection is released after 1min and temperature is less than 50°C.
DCDC Charger Over Temperature Protection	70°C	When the DCDC charger temperature exceeds the over temperature protection, the protection will activate. Charging will derate to reduce heat input.	Protection is released when the temperature falls below 65°C.
	80°C	When the DCDC charger temperature exceeds the over temperature protection, the protection will activate. Charging will stop.	
Cell Over Temperature Charging protection	60°C	When the cell temperature exceeds the protection value and charging / discharging for 3sec, the protection is activated. Charging and discharging will stop.	When the cell temperature falls below 50°C, the protection is released.

Cell Over Temperature Discharging protection	60°C	When the cell temperature exceeds the protection value and charging / discharging for 3sec, the protection is activated. Charging and discharging will stop.	When the cell temperature falls below 50°C, the protection is released.
Cell over temperature protection	80°C	When the cell temperature exceeds the protection value for 500msec, the protection is activated. Charging and discharging will stop.	When the battery temperature falls below 50°C for 3sec the protection is released.
Over Temperature BMS , MOSFET high temperature protection	90°C	When the MOSFET temperature exceeds the protection value for 3sec, the protection is activated. Charging and discharging will stop.	When the MOSFET temperature falls below 85°C for 3sec the protection is released.
Over Temperature Terminals protection	100°C	When the output terminals exceed their over temperature protection value for 3sec, the protection is activated. Charging and discharging will stop.	When the output terminals temperature falls below 90°C for 3sec the protection is released.
Low Temperature Charging protection	0°C ±2°C	When the cell temperature falls below the protection value and charging for 3sec, the protection is activated. Charging will stop.	When the cell temperature rises above 5°C, the protection is released.
Low Temperature Discharging	-20°C ±2°C	When the cell temperature falls below the protection value and discharging for 3sec, the protection is activated. Charging and discharging will stop.	When the cell temperature rises above -15°C, the protection is released.
Balance voltage (Open Voltage)	3400mV ±50mV	During the charging process, if the cell voltages exceed the opening voltage and the cell voltage difference exceeds the differential voltage, the balanced protection will activate.	During charging, when the cell voltage is less than 3.4V or the differential voltage is less than 30mV, the protection is released.

Balance voltage (Differential Voltage)	50mV	Balancing current 30mA- 120mA.	
Differential voltage	Differential voltage 700mV, 20% < SOC < 60%	When the voltage difference between cells exceeds the differential voltage for 10min, the protection will activate. Charging and discharging will stop.	When the voltage difference between cells is lower than the differential voltage for 3sec, the protection is released.
Communication is abnormal	When there is abnormal communication between the BMS and DCDC charger for 20sec, the protection will activate. Charging will stop.		
DCDC Charger Low Power Mode	When the charger has no activity for 10 seconds, it will enter low power mode to reduce energy consumption. If the DCDC charger is charging and does not receive BMS data for 20 seconds, it will enter low power mode to reduce energy consumption.		
Lithium over discharge protection	When the battery voltage falls below 3V, the BMS will automatically activate the undervoltage protection feature to avoid cell damage. The battery must undergo an activation process before normal charging can occur. The load (output terminals) must be disconnected from the battery for successful activation and to avoid damaging the cells. The charger terminals (alternator and/or solar) should remain connected to allow charging to occur. During the activation process, the DCDC charger provides an activation pulse to wake-up the battery before normal charging can start. The activation pulse will occur 180sec after charge voltage is available and every 100sec after that. For successful activation, the battery voltage must exceed 8V and current must exceed 2amps for 6sec. After successful activation, the next stage of charging can occur. An overload may occur during the activation process. When the activation current exceeds 18amps and the battery voltage is less than 8V, an overload has occurred. The DCDC charger will restart and the process will try again. To avoid an overload, the load (output terminals) must be disconnected from the battery. The activation process will timeout after 1800sec. To rectify, turn the master switch OFF and wait for 100sec. Turn ON the master switch to restart and try the activation process again. Warning. To avoid battery damage and for successful activation, ensure all loads are removed (disconnect the output terminals), and the charger terminals (alternator and/or solar) has good connection.		

13. Storage and Shipment Requirement

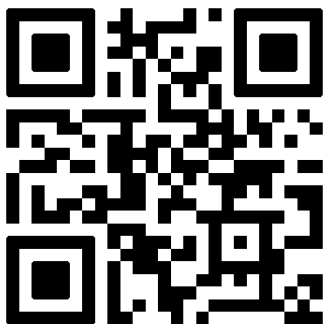
When not in use, to extend the battery service life, the battery should be charged every 3~6 months. Charge the battery with a standard charging source (Alternator or Solar) for 0.5~1hrs, to ensure that the battery maintains 40~60% power.

Items		Criterion
Storage temperature	Short period (less than 1 month)	-10°C ~ 45°C
	Medium period (less than 3 month)	-10 °C ~ 35°C
	Long period (more than 3 month)	0°C ~ 30°C
Relative Humidity		≤75% RH
State of Charge		40% ~ 60%

14. Warranty

Refer to arb.com.au for the “ARB Products and ARB Services Warranty Policy”.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.



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