

Installation Manual

SB7200/SB9600/SB14200 Smart Battery Systems

V4.1



HISTORY

VERSION	ISSUED	COMMENTS
1.0	23-Sep-21	For Print
1.1	10-Dec-21	Specification table; Firmware identification; other updates
1.2	11-Jan-22	P30: Neutral continuity statement added
1.3	04-Mar-22	Wi-Fi compatibility update
1.31	31-Mar-22	Application added to spec. table.
4.0	26-Jul-22	P1 Version synced to PN. P10 Added limitation not tested multi-inverter installations; Corrections to section 1.7 power ratings; Add warnings about warranty risk if systems are intentionally off-line P21 Ventilation requirements clarified P22 Add requirement for, when adding or replacing batteries, all batteries must be balance charged and firmware updated. P26 Warning added re: BMS-Enclosure earth continuity P29 Reformat and correct DRED information; P29 Improve Relays information P31 MCB Type added to connection diagram P46 Earth fault alarm information added P53 Noise emissions and footnote added; Added "Recommended application: Household" to spec table P55 Reformat and move Close-up and Handover checklist
4.1	27-Apr-23	P26 Revise BMS Module Earth Cable P. details

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PRIVACY NOTICE

Redback will use the personal information provided to us only for warranty purposes. Without this information we will not be able to process your warranty claim. If you require further information about our privacy policy, please visit our website at redbacktech.com.

Start here...

This manual describes the installation and commissioning of a Redback Smart Battery system, hereafter called the “Smart Battery” or the “System”. There are models: SB7200, SB9600 and SB14200. The differences are in performance, dimensions and weights, and minor variations in the installation procedure.

The Inverter is supplied as a two-part system.

Before you go to site...

1. Read this manual.

The installation manual contains all the information you will need for most installation scenarios.

2. Book a support call

If you think you will require assistance, book Redback Technical Support 2 days before going to site. This ensures that technical support is reserved for you if you are on-site and need assistance. Redback support is in Brisbane, Australia and is available 8am-4pm (Brisbane time) Monday to Friday. There are three ways to book a support call:

Web: redback.link/support

SMS: +61 417 632 065

Call from Australia: 1300 240 182

Call from New Zealand: +61 7 3180 2325

3. Register the installation

Early registration makes it possible to do a functional, testable installation even if some information is not available e.g., installation in a spec home where the owner's information is not available. You can also pre-assign the installation inspector.

Register the installation at redback.link/register (+Add device).

Need something else?

1. Visit the Redback Document Library

Installer and Owner documentation is available for our current products. Go to redback.link/docs

2. Contact the Redback Customer Support Team (Monday to Friday, 8am-4pm AEST)

In Australia: 1300 240 182

In New Zealand: +61 7 3180 2325

Email: customersupport@redbacktech.com

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1. Know your product

This manual describes the installation and commissioning of a Redback Smart Battery System, hereafter called the “Smart Battery” or the “System” or the “SB”. There are three Smart Battery models: SB7200, SB9600, and SB14200. The differences are in height and weight; battery capacity; and minor variations in the installation procedure.

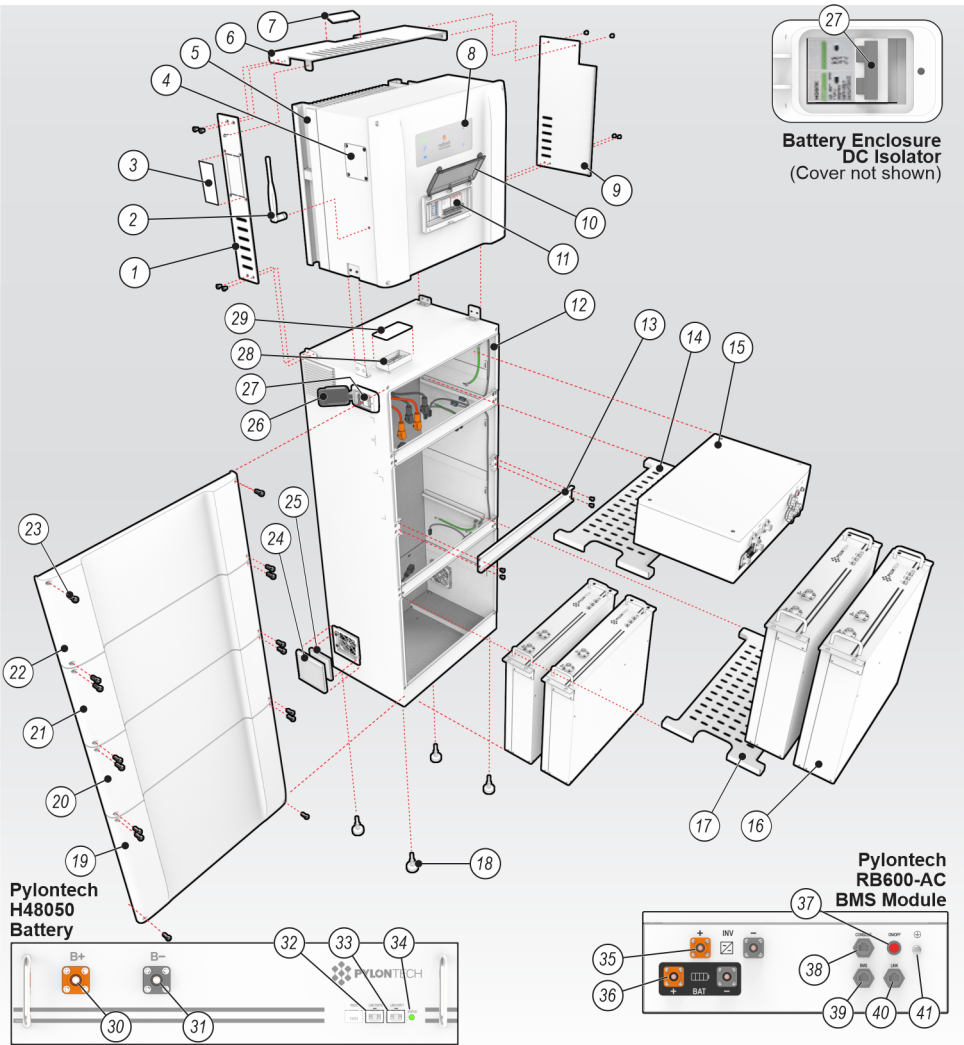
The Smart Battery has four major components, delivered in separate boxes:

1. Battery Enclosure (Box 1) (hereafter called the “Enclosure” or the “Battery Enclosure”)
2. Inverter Module (Box 2) (hereafter called the “Inverter” or the “Inverter Module” or the “Inverter Cabinet”)
3. Pylontech High Voltage Controller (hereafter called the “BMS” or the “BMS module”)
4. Pylontech Battery (hereafter called the “Battery”)

The Smart Battery enables the installation of battery storage and backup functionality to new or existing premises and may be installed to take advantage of an existing PV system.

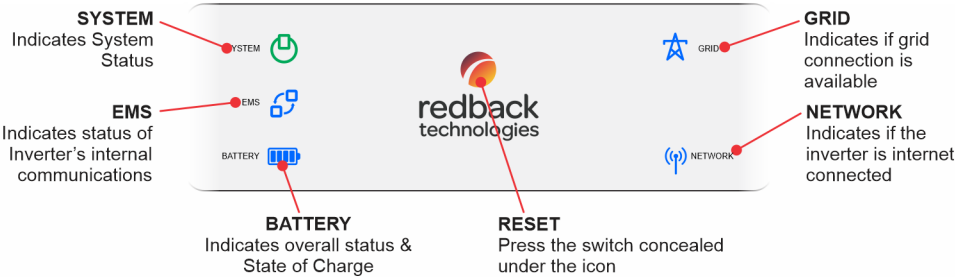
The goal is to minimise the cost of energy consumed from the utility.

1.1 Major components (SB9600 shown)

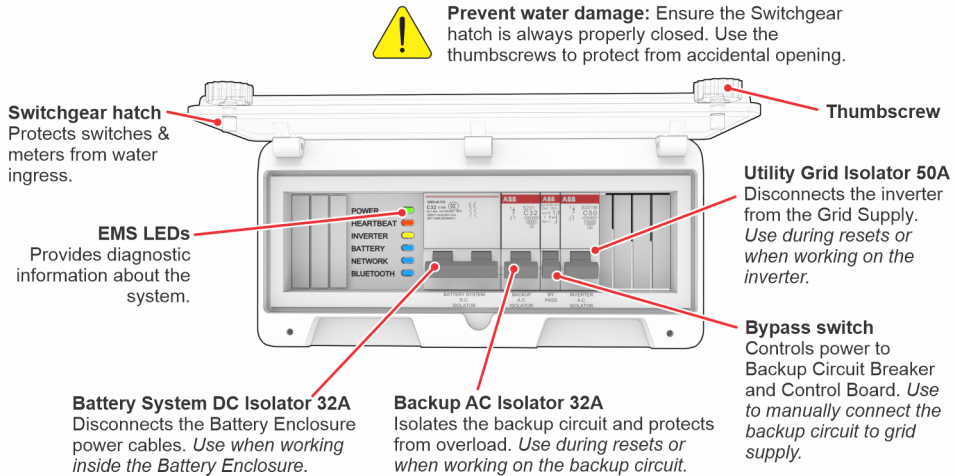


#	Part name	8	Status Panel	16	Battery (3,4 or 6)	33	Link1 port
1	Inverter LHS cover	9	Inverter RHS Cover	17	Battery Shelf	34	Status LED
2	Wi-Fi antenna	10	Switchgear Over	18	BE adjustable feet	35	BMS-Inverter DC Ports
3	Aux. Isolator breakout	11	Switchgear	19	Lower Front cover	36	BMS-Battery DC Ports
4	SD Card cover	12	Battery enclosure (BE)	20	Middle Front Cover	37	BMS Power Switch
5	Inverter Assembly	13	Cabinet Brace	21	Middle Front Cover	38	Console comms port
6	Inverter Top cover	14	BMS Shelf	22	Middle Front Cover	39	BMS-Inverter comms port
7	Cable entry breakout	15	BMS Module	23	Retainer Screws	40	LINK comms port
						41	Earth terminal

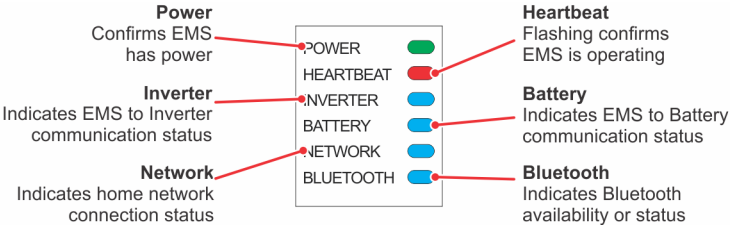
1.2 Status Panel LEDs



1.3 BoS switchgear



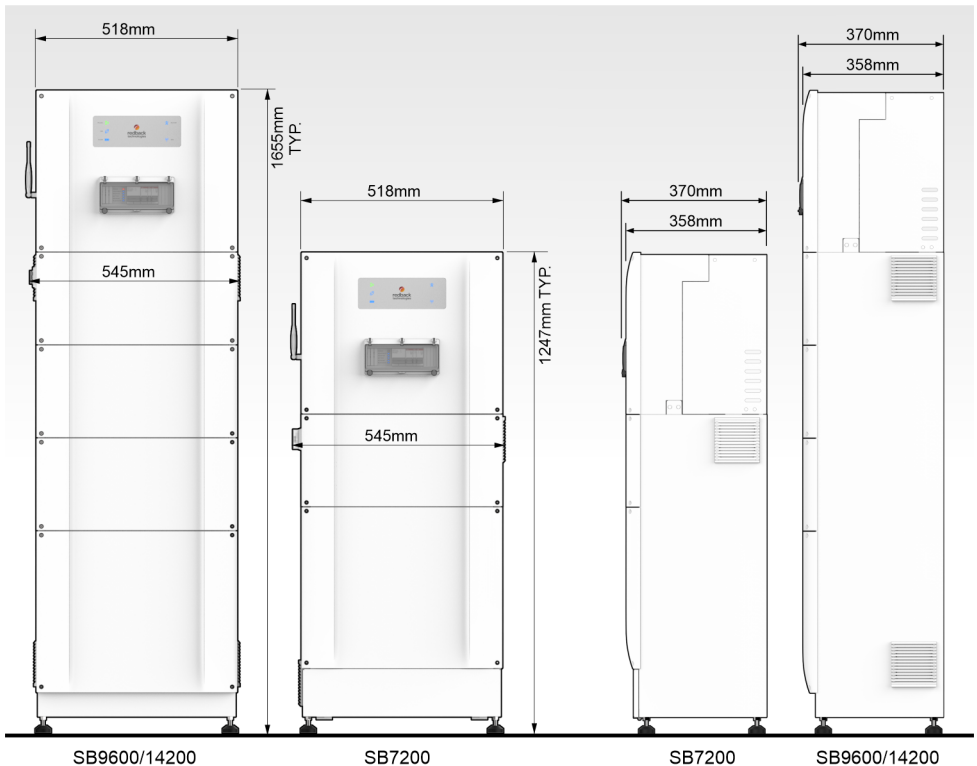
1.4 EMS LEDs



1.5 Dimensions, weights & configurations

Item	Width (mm)	Height (mm)	Depth (mm)	Shipping Mass (kg, ea) ❖	Component Mass (kg, ea) ❖
Inverter	518	412	370	32.0	28.0
Battery Enclosure (SB7200)	518	858	358	35.0	29 [●]
Battery Enclosure (SB9600/14200)	518	1655	358	50	42 [●]
BMS Module	400	132	283	6.0	5.0
Combined (SB7200)	545	1247	370	-	62.0
Combined (SB9600/14200)	545	1655	370	-	75.0
BATTERIES[Ⓢ]					
Pylontech H48050 2.4kWh	442	390	100	24.0	22.5
Pylontech H48074 3.55kWh	442	390	132	34.0	32.0
Fully Installed					
Installed (SB7200)	566 [■]	1238 typ [◆]	370	-	130
Installed (SB9600/14200)	566 [■]	1655 typ [◆]	370	-	165/203

● Excluding batteries and BMS module. ■ Includes Wi-Fi antenna and padlock hoops. ◆ May vary slightly due to installation variation ❖ For guidance only- weights may vary slightly.



1.6 Compatibility and limitations

The Redback Smart Battery system includes a transformer-less Inverter; all other components of the system must be compatible with this type of Inverter architecture.

AC-coupled installations are possible, enabling an existing grid-tie inverter's output to charge a Redback controlled battery.

The Redback Smart Battery is not suitable for:

- Batteries other than:
 - Pylontech H48050 (for SB7200 or SB9600)
 - Pylontech H48074 (for SB14200)
- Wall mounting. The system is approved for floor mounting only.
- Off-grid installations, where there is not normally a grid connection.
- Locations without internet: the system can operate off-line but will be unable to generate fault notifications, no data will exist for the period of disconnection, and remote support will be limited. You will be unable to remotely review consumption or performance; make informed decisions about system or consumption patterns; change settings; or control the system. The warranty coverage may be affected if the system is offline for extended periods.
- Installation in full-sun locations: the inverter may overheat resulting in reduced efficiency and or automatic shutdown.
- Exposed locations where wind driven rain may penetrate the enclosure.
- Use with generators.
- Connection to 5Ghz Wi-Fi networks.



WARNING. This equipment is NOT intended for use with life support equipment or other medical equipment or devices.



WARNING. Installation in violation of these limitations may void the warranty (refer to the Warranty document).

Multiple inverter energy systems

- Smart Batteries have not been tested for Section 5 of AS4777.2:2020—installation of Smart Batteries in a multiple inverter energy system requires they are installed & used in accordance with the requirements of AS/NZS 4777.1.

1.7 Backup circuit design notes

The Smart Battery includes one Backup circuit activated during a grid outage and powered by the system batteries (3.3kW max). Loads on the Backup circuit must be carefully selected to extend the backup power availability, noting:

- Maximum continuous power delivery up to 3300VA (SB7200) or 4500VA (SB9600/SB14200), from any source.
- Peak power delivery of 3.6kW (SB7200) or 4.6kW (SB9600/SB14200).
- System self-protects and shuts down if power limits are exceeded.
- Output is reduced above 45°C ambient temperature.
- System shuts down if 60°C ambient is exceeded.

Batteries must be fitted in all Smart Battery installations. The backup circuit may not be operated if batteries are not fitted or not active in the system.

The Backup circuit is suitable for low power or intermittent use devices such as refrigerators; freezers; LED or florescent lighting; small kitchen appliances; computers; radio or televisions.

High starting-current or high operating-current loads must not be connected to the Backup circuit e.g, hot water systems; air conditioners; ovens or cooktops; spas or saunas or pool pumps.

Backup circuit	New circuit required?	☐ Yes	☐ No
	Backup circuit inclusions	☒ Acceptable	☒ Not Acceptable
	Refrigerators and freezers		Critical medical devices
	Small, occasional use, plug-in appliances e.g., microwaves, kettles		Air conditioners
	TV, radio, computer, phone, router		Ovens and stoves
	Low energy lighting & fans		Hot water systems
	Household tank water pumps		Spas or saunas
			Pool pumps

2. Installation

Important safety instructions – please read

This document contains important safety instructions. Please read all the instructions and cautionary markings on the product and on any accessories or additional equipment included in the installation. Failure to follow these instructions could result in severe shock or possible electrocution. Always use extreme caution to prevent accidents.

Audience

Installation, maintenance, and connection of Inverters must be performed by qualified personnel, in compliance with local electrical standards, wiring rules and the requirements of local power authorities and/or companies (for example AS/NZS4777 and AS/NZS 3000 in Australia). The Redback Smart Battery strictly conforms to all related safety rules in design and test.

Safety regulations relevant to the location should be followed during installation, operation, and maintenance. Improper operation may cause electric shock, or damage property, inverter, or equipment.

These instructions are for use by skilled, qualified personnel who:

- Meet all local and governmental code requirements for licensing and training for the installation of electrical power systems with AC and DC voltage up to 600 volts.
- Hold the required qualifications for installing grid-connected and battery storage systems.
- Have knowledge of the functional principles and operation of grid-connected systems and knowledge of the installation of electrical devices.
- Understand the risk associated with installing and using electrical devices and can implement appropriate risk management strategies.
- During the preceding year, have completed Redback approved training on the installation of SB Inverters.

Symbols used in this manual

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	LETHAL DANGER! Risk of electrocution.		CAUTION! Hazard to equipment
	DANGER! Risk of electrical shock.		HEAVY LIFT Seek assistance.
	WARNING! Hazard to human life		TIPPING HAZARD Do not leave unattended.
	WARNING! Burn hazard		CAUTION! Risk of injury
	CAUTION! Fire hazard.		CAUTION! Risk of explosion
	Information. This symbol indicates the information provided is important for the correct installation, operation and or maintenance of the equipment. Failure to follow the recommendations could result in annulment of the equipment warranty.		Use appropriate personal protective equipment (PPE).

Symbols used elsewhere

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	HEAVY! Bend knees to lift.		DELAY. Wait specified time.
	HEAVY! Two-person lift required.		REFER TO DOCUMENTS.
	PACKAGE MASS. In kilograms.		Do not dispose as household waste.
	THIS SIDE UP. The package must always be transported, handled, and stored with arrows pointing up.		This product contains recyclable parts. Dispose of correctly.
	STACKING LIMIT. Stack packages six high or less.		FRAGILE. Handle with care. Do not tip. Do not sling.
	KEEP DRY The package/product must be protected from excessive humidity and must be stored under cover.		

General safety

SYMBOL	DEFINITION
	WARNING: LIMITATIONS ON USE This equipment is NOT intended for use with life support equipment or other medical equipment or devices.
	CAUTION: EQUIPMENT DAMAGE Only use components or accessories recommended or sold by Redback Technologies or its authorised agents.
	IMPORTANT Do not attempt to install this equipment if it appears to be damaged in any way. See the Warranty document for instructions on returning the equipment.

Personal safety

SYMBOL	DEFINITION
   	WARNING: PERSONAL INJURY - Use safe lifting techniques when handling this equipment. For guidance visit safeworkaustralia.gov.au or contact your local WHS authority. - Use standard safety equipment when working on this equipment e.g., safety glasses, ear protection, steel-toed safety boots, safety hard hats, etc. - Use standard safety practices when working with electrical equipment e.g., remove all jewellery, use insulated tools, wear cotton clothing etc. - Never work alone when installing or servicing this equipment. Have an assistant nearby. - Do not touch the inverter during operation. The temperature of some parts may exceed 60°C during operation. After shutdown, allow the inverter to cool for at least 5 minutes before touching. - Ensure that children, pets, and other animals are kept away from the inverter, batteries and battery enclosure and utility grid components. - If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Battery safety

SYMBOL	DEFINITION
	IMPORTANT - Use the battery type recommended by Redback Technologies. Follow the battery manufacturer's recommendations for installation and maintenance. - Insulate batteries appropriately against freezing temperatures. A discharged battery will freeze more easily than a charged one.

Equipment safety

SYMBOL	DEFINITION
	WARNING: LETHAL VOLTAGE - Review the system to identify all possible sources of energy. Ensure all sources of power are disconnected before performing any installation or maintenance on this equipment. Confirm that the terminals are de-energised using a validated voltmeter (rated for a minimum 1000 VAC and 1000 VDC) to verify the de-energised condition. - Do not perform any servicing other than that specified in the installation instructions unless qualified to do so or have been instructed to do so by Redback Technologies technical support personnel. - To avoid electric shock, disconnect the DC input and AC input of the Inverter at least 5 minutes before performing any installation or maintenance. - Completely disconnect all sources of power before proceeding with any maintenance. Do not remove the Inverter Upper Front Cover. - Do not tighten the AC and DC terminals or pull on the AC and DC wiring when the Inverter is running.
	WARNING: BURN HAZARD External and internal parts may be hot. Do not remove any cover during operation or touch any internal parts. Be sure to allow enough time for internal parts to cool down before attempting to perform any maintenance.
	WARNING: FIRE HAZARD - Do not keep combustible or flammable materials in the same room as the equipment. The Redback Smart Battery contains relays and switches which are not ignition protected. - Ensure AC, DC and ground cable sizes conform to local codes and are fit for purpose. See product manuals for minimum size requirements. Ensure all conductors are in good condition. Do not operate the unit with damaged or substandard cabling.
   	CAUTION: EQUIPMENT DAMAGE - When connecting cables from the Inverter to the battery terminals, ensure the proper polarity is observed. Connecting the cables incorrectly can damage or destroy the equipment and void the product warranty. - Thoroughly inspect the equipment prior to energising. Verify that no tools or equipment have been inadvertently left behind. - Ensure clearance requirements are strictly enforced. Keep all vents clear of obstructions that can prevent proper air flow around, or through, the unit. - Do not open the inverter Upper Front Cover. Apart from performing work at the wiring terminals (as instructed in this manual), touching, or changing components without authorisation may cause injury to people, damage to the Inverter and annulment of the warranty. - Static electricity may damage electronic components. Take appropriate steps to prevent such damage to the Inverter otherwise the warranty may be annulled.

2.1 Installation overview



Installation by non-approved installers may void the product warranty.

You are approved to install Redback products if you:

- Are a Redback registered and qualified installer, and
- Hold the required qualifications for installing grid-connected inverters, and
- Have a Redback Installer login.



Not sure?

Contact Redback on 1300 240 182 if you are unsure of your approval status.

2.1.1 BEFORE YOU GO TO SITE

A few simple preparations will help the installation run smoothly.

1. If you think you will require assistance, book a support call at redback.link/support
2. Register the installation at redback.link/register (+Add device)
3. Gather the required tools

- Normal electrician's tools including crimping kit and Cat5 cable tools
- Electric drill/driver with 4mm Hex bit; Phillips head screwdriver bit; drill bits suitable for drilling walls
- Tape measure and spirit level
- Internet connected device with RedbackINSTALL app

4. Gather information required

Gather the following information for use during registration, installation, onboarding, and commissioning.

System serial number:	
Your Redback Installer Login:	Apply at redback.link/apply
Homeowner details (required)	Full name:
	Installation address:
	Email:
	Mobile:
Homeowner Wi-Fi details	Wi-Fi Name:
	Wi-Fi Password:

Installation configuration

Regional Safety Zone	
Soft Export Limit	
Hard Export Limit	
Soft Generation Limit	
Hard Generation Limit	
Compliance Inspector	

2.1.2 AT SITE

Ensure Wi-Fi availability (if to be used)

A 2.4Ghz network is required. 5Ghz is not supported.

Measure the home Wi-Fi strength at the proposed installation site. Review installation plan if Wi-Fi strength is less than -70dBm, otherwise ongoing connection problems may occur.

Wi-Fi Strength ¹ :	☐ None ²	☐ Weak (< -70dBm) ³	☐ Good (approx. -70dBm)	☐ Strong (> -70dBm)
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1. Test inverter location before installation
2. Mandatory: Request Redback Customer Service to set the inverter to “Off Comms”
3. Find an installation site with Good or better Wi-Fi strength

Review the proposed Smart Battery location.

- Does it meet the requirements of AS/NZS5139? See section 2.2.
- Is it more than 2 metres from or out of view from the main switchboard? An auxiliary AC isolator may be required to maintain compliance with AS/NZS4777.1.
- Will cable entry be through wall behind the system or through the top cover?
- Is it out of direct sunlight?
- Will it be exposed to heavy rain and wind, or is there a flood risk?
- Is it a coastal environment? Will it be exposed to salt spray?
- The system is floor standing and attached to a wall to resist toppling. Is the mounting wall flat (to prevent distortion) and structurally sound (to resist toppling of the system). Is the floor structurally sound and able to support the weight of the system? Are spacers required?

Hardware

- Install Battery Enclosure
- Install BMS module
- Install batteries and associated cables
- Install inverter

Electrical

- Run and connect LV cables and conduits from main or sub-board
- Install any new backup circuit
- Install Redback Smart Meter and run ethernet from meter to Smart Battery.
- Run ethernet from home network router to Smart Battery (recommended)
- Complete connections to Smart Battery (main switchboard or sub-board, backup circuit)

Commissioning

- Test the electrical installation
- Power ON the Smart Battery
- Commission using RedbackINSTALL
- Fit covers and clean worksite
- Document the installation
- Handover to homeowner

2.2 Guide to AS/NZS5139 installation requirements for Redback Smart Batteries

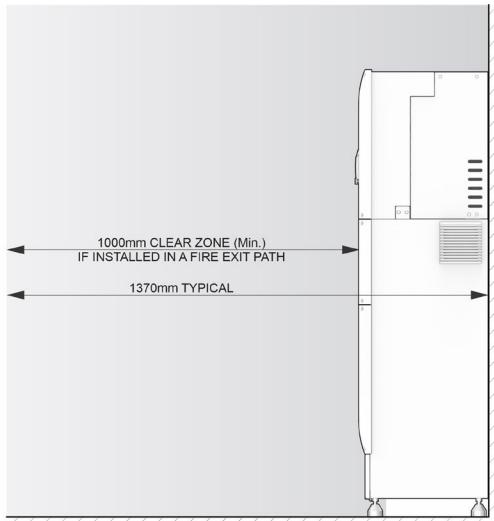
For AS/NZS5139:2019 compliance, the SB Battery Enclosure is defined as a pre-assembled integrated BESS. AS/NZS5139 prescribes allowable battery system locations and fire-proofing requirements. AS/NZS5139 is referenced in AS/NZS4777.1, AS3000 and the Building Code of Australia, and all new or modified battery system installations must comply.

The installer is responsible for completing installation in accordance with all relevant standards and regulations. The key AS/NZS5139 requirements for BESS installation are:

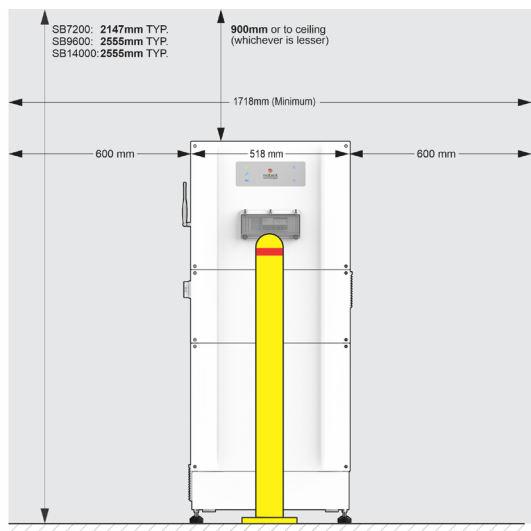
- Install the BESS against a wall in a clear-zone containing no windows, doors, exits, vents, or appliances not related to the BESS. The clear-zone extends 600mm from the sides and 900mm above the BESS.
- Fireproof any combustible wall in the clear-zone if a habitable room exists on the opposite side of that wall. Fire-proofing materials must comply with AS1530.1.
- Fireproof any structure e.g., ceiling or eave less than 900mm above the BESS to the full width of the clear-zone and the lesser of 970mm from the wall or to the edge of the structure.
- Use fire-retardant sealant to seal all penetrations through the wall that exceed 5mm internal diameter.
- Ensure 1m clearance in front of the BESS if it is located on a fire exit path.
- Protect the BESS from vehicle impact if this is a likely occurrence- use a bollard or similar device.

The most likely installation scenarios are illustrated below: any clear-zone may need to be fireproofed.

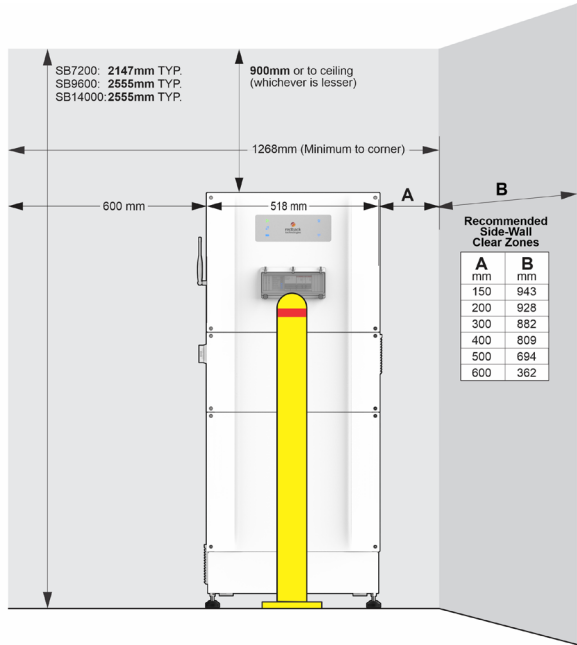
2.2.1 INSTALLATION ON AN EXIT PATH



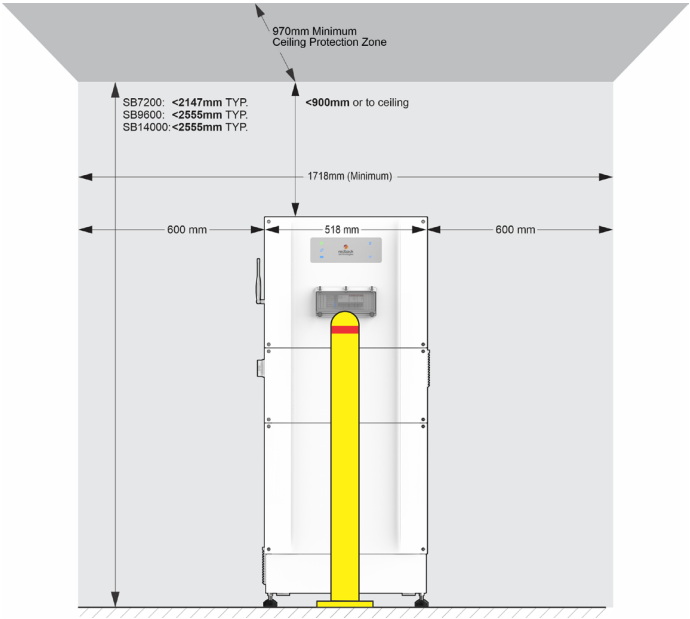
2.2.2 INSTALLATION ON A BLANK WALL



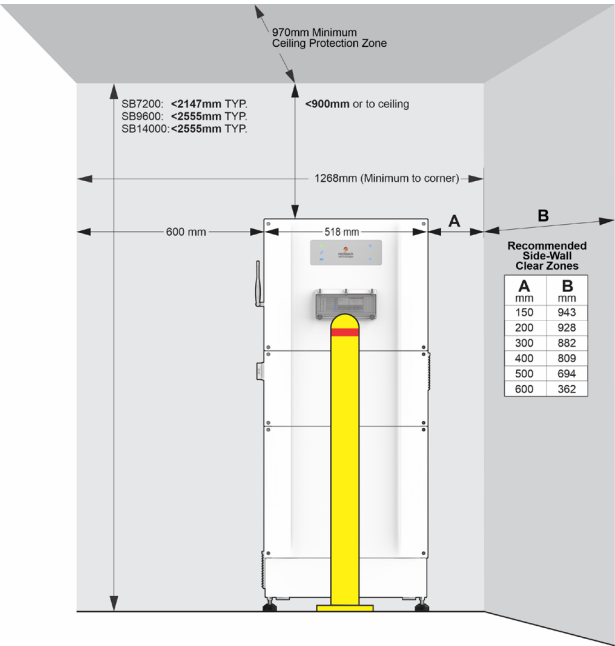
2.2.3 INSTALLATION NEAR A CORNER



2.2.4 INSTALLATION WITH A LOW CEILING



2.2.5 INSTALLATION NEAR A CORNER, WITH LOW CEILING



2.3 Preliminary electrical installation



No two installations are the same; variations occur due to age, equipment, technology, local regulations, and work practices. Installing electricians are required to adapt the information provided in this document to the current installation, adhering to all local regulations and standards, and good electrical practice.

2.3.1 RUN AC, BACKUP AND COMMUNICATIONS CABLES

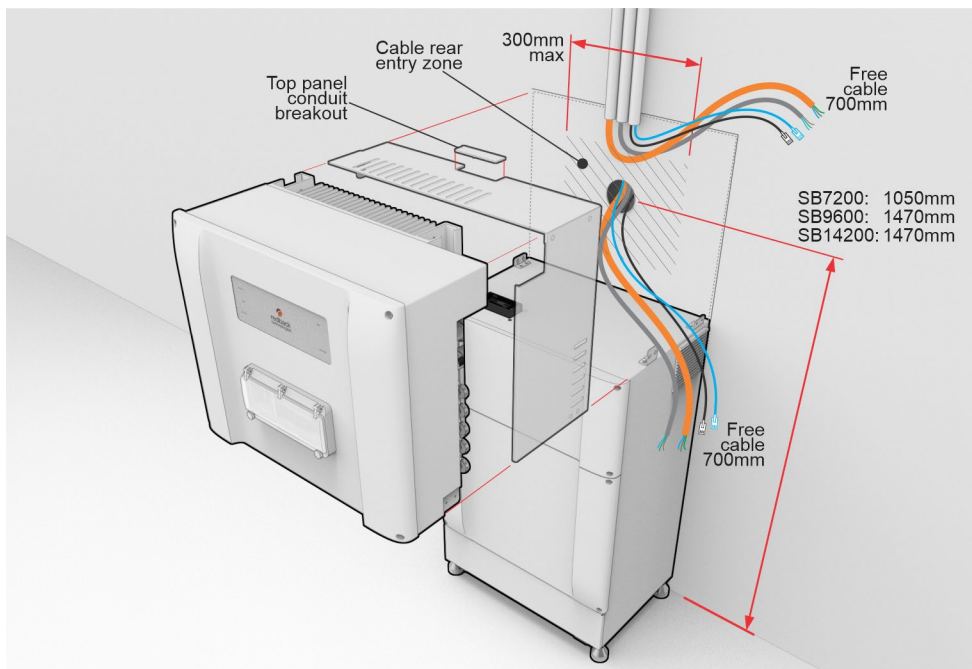
The Smart Battery accepts cables through the wall behind the inverter module, or from conduit routed through a breakout in the inverter top cover. The diagram below shows the possible cable entry routes.

It is recommended to run all cables prior to installing the SB, as the working space behind the system is tight.

Ensure that the cable tails have generous bend radii, are long enough to reach the Connectors panel, and form effective drip loops.

Cables to be pre-run include:

1	Grid connection from main or sub-board	Orange circular or flat TPA cable preferred for best water proofing. Installer to calculate cable size in accordance with AS3000.
2	From Backup circuit isolator on main or sub-board	
3	Communications cable	10m fitted cable supplied. Plain RJ45 plug goes to the Energy Meter.
4	Ethernet cable (recommended)	Connects to home network; Installer to supply and terminate CAT5/RJ45; configure as straight-through.



2.4 Installing the Battery Enclosure (Box 1)



WARNING TIPPING HAZARD. Keep children and animals out of the worksite. Do not leave the enclosure unattended during installation. Fasten enclosure to the wall as soon as practical.

2.4.1 OVERVIEW

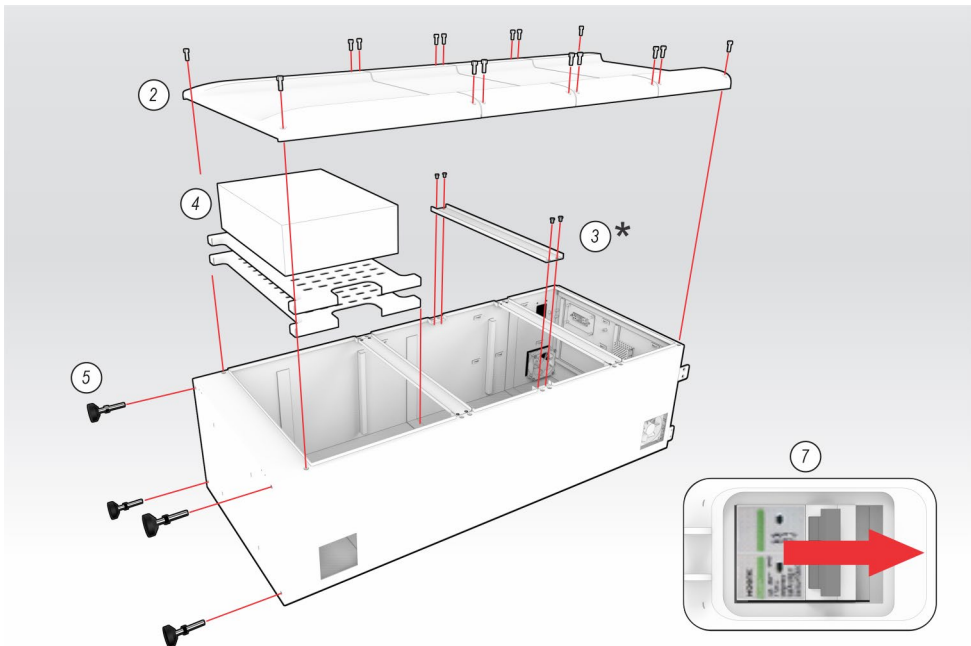
The Battery Enclosure is usually installed floor standing and fixed to a suitable wall to prevent toppling. Adjustable feet lift the enclosure above the floor and assist with levelling prior to fixing.

The enclosure holds the Battery Management System (BMS) module and Pylontech H48 batteries. The enclosure supports the inverter module: it is electrically connected using a connector.

2.4.2 PRE-ASSEMBLY

1. Open carton "BOX 1". Remove the Quick Start Guide, Packing List and Enclosure. Place the enclosure on a protective surface, front-side up.
2. Remove the enclosure front covers and set aside. Take care not to damage the internal seals.
3. Remove the Cabinet Brace as shown*. Take care not to damage or lose seals.
4. The BMS Shelf, Battery Shelf* and Accessories Box are cable-tied inside the enclosure. Cut cable ties and remove.
5. Open the Accessories Box. Verify all parts listed in the Packing List have been supplied.
6. Attach the four enclosure feet. Do not tighten lock nuts.
7. Ensure Battery Enclosure isolator is OFF (to the Right).

*SB9600 and SB14200 only



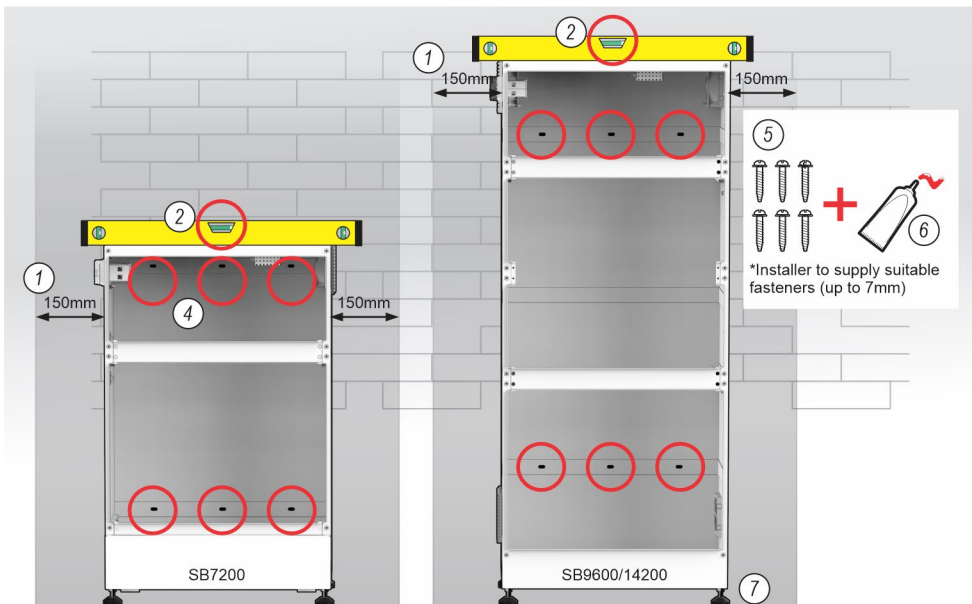
2.4.3 INSTALLATION

Installation notes

- The Smart Battery Enclosure is for use with the SB Inverter only.
- Reduce heat load by installing out of full sun: ideally, the installation will be against a south facing external wall, and under eaves.
- Ensure the location is not flood prone from water across ground, nearby downpipes, or guttering.
- Stand the enclosure on a stable surface.
- Fasten the enclosure to a flat, structurally sound wall. Waterproofing will be affected if the enclosure is twisted or damaged. Use spacers if required.
- Installer to supply suitable wall fasteners, up to $\phi 7\text{mm}$.
- The enclosure features fan-assisted cooling. Ensure there is at least 150mm clear space either side of the enclosure. Do not block the cooling intakes or exhaust vents.
- Ensure at least 600mm clear height is available above the enclosure (for inverter fitting and airflow).

Installation process

1. Place the enclosure in the required location: on the floor; against the wall; 150mm clear space both sides.
2. Set the enclosure level. Use a spirit level as required. Adjust feet as necessary to compensate for uneven surfaces.
3. If necessary, use spacers as required to ensure the enclosure does not distort when fastened to the wall.
4. Six fastening points are provided, as shown
5. Fix the enclosure to the wall using suitable fasteners.
6. Seal around the fasteners using the supplied sealant
7. Tighten the feet locknuts (concealed).



2.5 Batteries

2.5.1 INSTALLATION NOTES



WARNING. SHOCK HAZARD. New batteries contain charge. Handle with care. Turn the inverter Battery Enclosure DC isolator OFF during installation.



INFORMATION FOR FUTURE USE. When replacing or adding batteries, all batteries must be charge balanced and firmware must be updated, otherwise system performance will be affected.

- 1. To ensure even cooling, batteries must be installed in the approximate positions shown. Batteries must not touch the rear or sides of the enclosure, or each other.
- 2. Batteries are unrestrained in the enclosure; held in place by their own weight.
- 3. Batteries must be independently earthed to the cabinet using the earth posts provided.

2.5.2 PREPARE BATTERIES

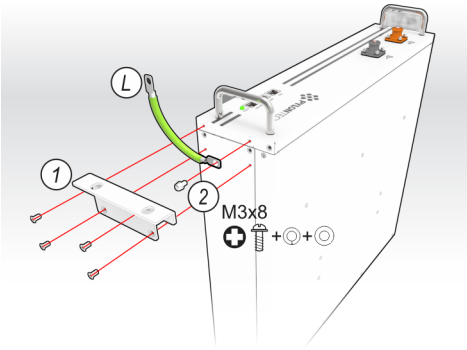
Batteries are connected in series. BMS cables connect the BMS module to the first battery, and between subsequent batteries. Each battery must be individually earthed to the enclosure cabinet.

CABLES REQUIRED

CODE	APPEARANCE	LOCATION	QUANTITY	
			SB9600	SB7200 SB14200
L		Accessories Box	3	4

PROCEDURE

- 1. Remove batteries from shipping cartons. Retain documentation.
- 2. Remove the rack-mounting brackets from each battery.
- 3. Connect earth cable L to the bracket mount point:
 - o The small terminal goes to battery
 - o Use the M3x8 screw and washer supplied in the accessory box.

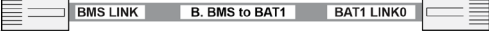
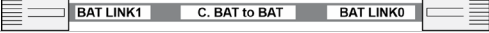
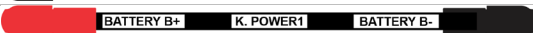


2.5.3 SB7200 - INSTALL AND CONNECT BATTERIES

Batteries are connected in series. BMS cables connect the BMS module to the first battery, and between subsequent batteries. Each battery must be individually earthed to the enclosure cabinet.

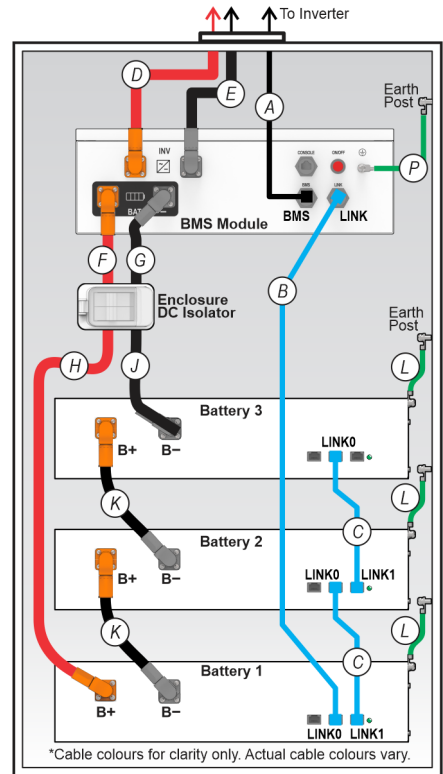
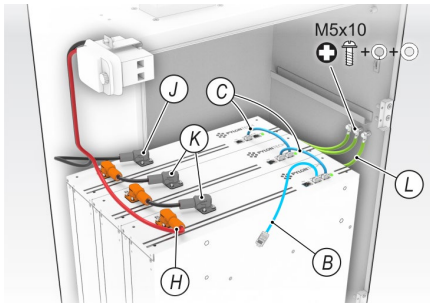
Position batteries in the cabinet as shown below. Place the batteries with approximately equal air gap all round, to optimize cooling.

CABLES REQUIRED

CODE	APPEARANCE	LOCATION	QUANTITY
B		Accessories Box	1
C		Accessories Box	2
H		Pre-fitted to Enclosure DC isolator	1
J		Pre-fitted to Enclosure DC isolator	1
K		Accessories Box	2

CONNECT DC POWER AND BMS CABLES

- Connect the earth cables **L**. from each battery to a nearby earth post
- Inside the enclosure, unclip the internal, pre-fitted DC cables. Plug in the DC cables as shown, observing polarity.
 - Red cable **H**. to **Battery #1 B+** socket
 - Black cable **J**. to **Battery #3 B-** socket
- Plug in the inter-battery DC cables **K**. Observe polarity.
- Plug in the two inter-battery BMS link cables **C**. Ensure the cables are plugged into the correct ports, as indicated by the labels.
- Plug the cable **B**-.**BAT1 LINK0** end into **Battery #1 LINK0** port, as shown. Do not connect the BMS LINK end.

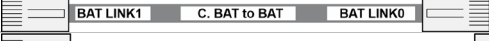
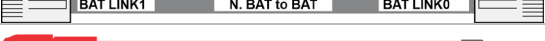
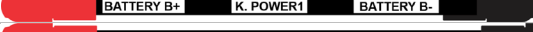
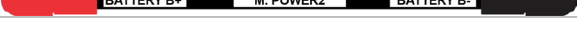


2.5.4 SB9600 SB14200 - INSTALL AND CONNECT BATTERIES

Batteries are connected in series. BMS cables connect the BMS module to the first battery, and between subsequent batteries. Each battery must be individually earthed to the enclosure cabinet.

Position batteries in the cabinet as shown below. Place the batteries with a roughly equal air gap all round, to optimize cooling.

CABLES REQUIRED

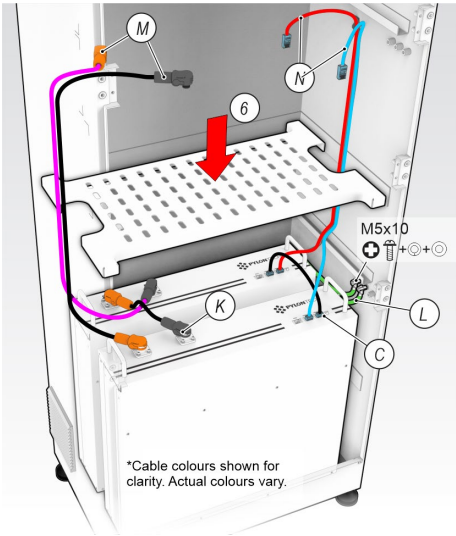
CODE	APPEARANCE	LOCATION	QUANTITY
B	 BMS LINK B. BMS to BAT1 BAT1 LINK0	Accessories Box	1
C	 BAT LINK1 C. BAT to BAT BAT LINK0	Accessories Box	1
N	 BAT LINK1 N. BAT to BAT BAT LINK0	Pre-fitted to enclosure	2
H	 H. TO BAT 1 B+	Pre-fitted to Enclosure DC isolator	1
J	 J. TO LAST BAT B-	Pre-fitted to Enclosure DC isolator	1
K	 BATTERY B+ K. POWER1 BATTERY B-	Accessories Box	1
M	 BATTERY B+ M. POWER2 BATTERY B-	Pre-fitted to enclosure	2

CONNECT DC POWER AND BMS CABLES

1. Inside the enclosure, release the internal, pre-fitted DC cables.
2. Place the lower two batteries.
3. Connect the earth cables L. from each battery to a nearby earth post.
4. Connect DC power cables K. and M. as shown.
5. Connect BMS cables C. and N. as shown.
6. Install the Battery Shelf
7. Route the cables as shown and fasten to the pre-fitted Cable Tie loops.



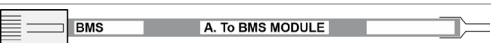
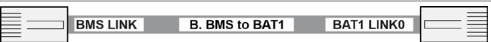
Note: BMS connection sequence must be the same as the Batteries i.e., 1,2,3,4 otherwise the BMS system may not communicate properly.



2.6 BMS module

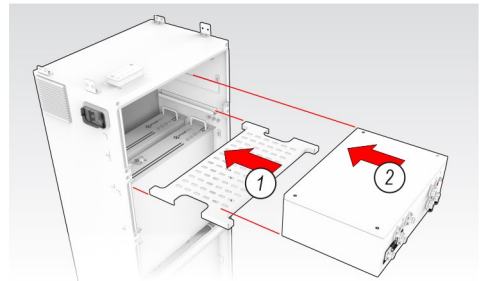
The BMS module manages the performance of connected batteries. The BMS connects to the Inverter (via the multi-connector); the Battery Enclosure DC isolator; and battery #1.

Cables required

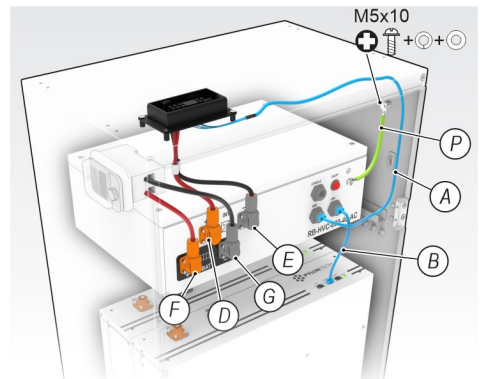
A		Pre-fitted to multi-connector
B		Already connected to Battery #1
D		Pre-fitted to Multi-connector
E		Pre-fitted to Multi-connector
F		Pre-fitted to Enclosure DC isolator
G		Pre-fitted to Enclosure DC isolator
P		Pre-fitted to BMS module

Install BMS module

- Place the BMS shelf on the rails provided. Take care not to pinch or trap any cables.
- Place the BMS module on the BMS Shelf. Push module to the back of the cabinet, ensuring no internal cables are affected.
- Connect the BMS-Cabinet earth cable **P** to the cabinet as shown.
- Plug in the inverter DC cables as shown, observing polarity.
 - Red Cable **D**. to BMS module **INV+** socket
 - Black cable **E**. to BMS module **INV-** socket
- Plug in the isolator DC cables as shown, observing polarity.
 - Red Cable **F**. to BMS module **BAT+** socket
 - Black cable **G**. to BMS module **BAT-** socket
- Plug the BMS cable **A**. to the BMS module **BMS** port.
- From battery #1, plug the BMS cable **B**. into the BMS module **LINK** port.
-  Check earth continuity between BMS and Enclosure.



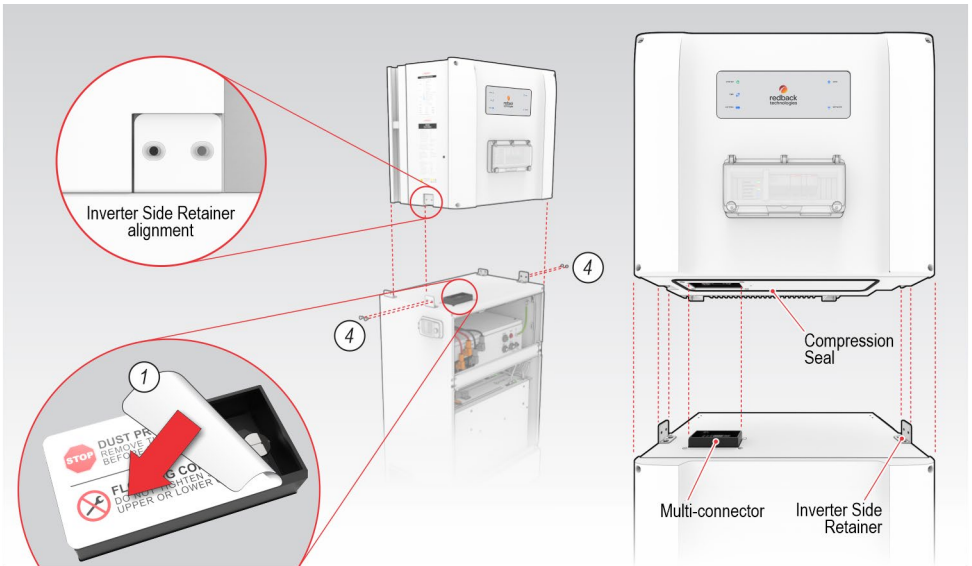
*For clarity, Upper Cabinet Brace is not shown.



2.7 Installing the Inverter module (Box 2)

2.7.1 MOUNT THE INVERTER MODULE

1. At the battery enclosure, peel off the dust cover from the multi-connector. Note: the multi-connector is a floating design—do not tighten the large screws that are revealed.
2. Unpack inverter.
3. Fit inverter to top of Battery Enclosure ensuring the multi-connector fully engages and side retainer brackets are aligned, noting:
 - angle brackets on top of the enclosure go *outside* of the matching brackets
 - the screw holes at side must align
 - The compressible seal on the bottom of the inverter may appear to “hold-up” the inverter—gently apply pressure to the top of the inverter until the side brackets align
4. Loosely fit the four retainer screws (tighten during installation of rear covers).



2.7.2 NOTES ON AC CABLE SIZES

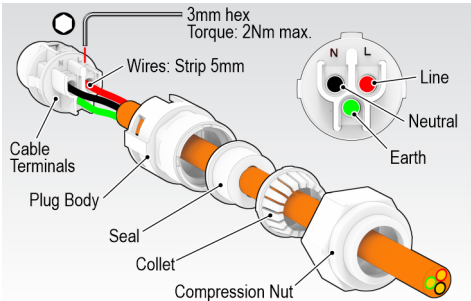
- Installer to calculate cable size in accordance with AS3008.
- If larger cables are required to combat voltage drops, the short cable run from Solar AC Isolator to GRID AC plug must not exceed the sizes shown right.
- All AC wiring must be installed in accordance with AS/NZS 3000 and AS/NZS 4777.1.
- UV resistant Orange circular cable preferred.

PLUG	WIRE	CABLE SIZE MM ²	
		Minimum	Maximum
GRID AC	Conductor	6	16
	Earth	2.5	16
BACKUP AC	Conductor	6	6
	Earth	2.5	6

2.7.3 PREPARE GRID AC CABLE

Terminate the AC cable using the supplied female connector, as shown. Ensure all components are assembled in the order shown and observe polarity.

- The AC connector is larger than the backup connector and is supplied with gland to suit TPS or circular cable.
- Wire stripping length: 5 mm.
- Clamp screw torque: 2.0Nm max.

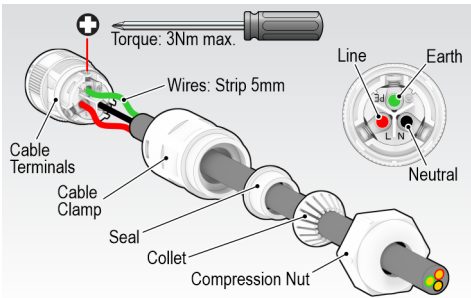


AC Plug Assembly

2.7.4 PREPARE BACKUP AC CABLE

Terminate Backup AC cable using supplied male connector. Ensure all components are assembled as shown and observe polarity.

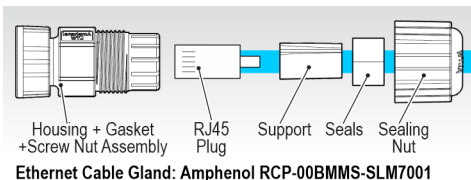
- The backup connector is supplied with gland to suit TPS or circular cable.
- Wire stripping length: 5mm.
- Clamp screw torque: 3.0Nm max.



Backup AC Plug assembly

2.7.5 PREPARE ETHERNET CABLE

Terminate Ethernet cable, if used (RJ45; straight thru; requires a waterproof gland- Amphenol RCP-00BMMs-SLM7001).



2.7.6 PREPARE ENERGY METER CABLE

Energy Meter cable: a 10m cable is supplied, pre-fitted with RJ45 at each end, and a gland at the inverter end. Longer cables must be fabricated by the installer—salvage the gland from the 10m cable or use a new Amphenol RCP-00BMMs-SLM7001.

2.7.7 PREPARE DRED CABLE

An RJ45 socket is provided at the connector panel to enable Demand Response Enabled Device control. Run the DRED cable from the DRED device to the Smart Battery. Terminate using 8-pin RJ45 and Amphenol RCP-00BMMs-SLM7001 gland. Assign pins as below.

PIN	ASSIGNMENT	ILLUSTRATION
1	DRM 1 / 5	DRED
2	DRM 2 / 6	
3	DRM 3 / 7	RJ45 Plug
4	DRM 4 / 8	
5	RefGen	
6	COM / DRM 0	
7	NC	
8	NC	

2.7.8 METHOD FOR ASSERTING DRM

MODE	RJ45 SOCKET ASSERT BY SHORTING PINS	FUNCTION
DRM 0	6 5	Operate the disconnection device

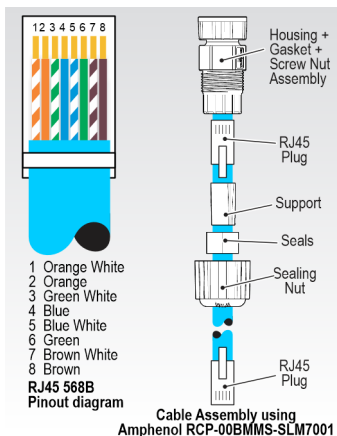
2.7.9 PREPARE RELAY CABLE (IF REQUIRED)

Relays are optional and enables programmed or remote control of connected circuits and attached devices e.g., pumps or hot water can be scheduled during daylight hours to consume excess solar.

Add relays using Redback RK-1 Relay Kits. The relays are typically located in the Main Switchboard.

1. Route Cat5 ethernet cable from the Relay to the Redback System, making the cable as short as practical and not more than 10m long.
2. At the relay end, terminate the cable with a RJ45 plug, configured 586B straight-thru as shown right.
3. At the Smart Battery, remove the cap from the Relay port.
4. Terminate the system end of the cable using Amphenol RCP-00BMMs-SLM7001.
5. Configure as RJ45; 586B straight-thru.

Relay end connections are described in Section 2.10.



2.7.10 COMPLETE INVERTER MODULE INSTALLATION

On the left-hand side

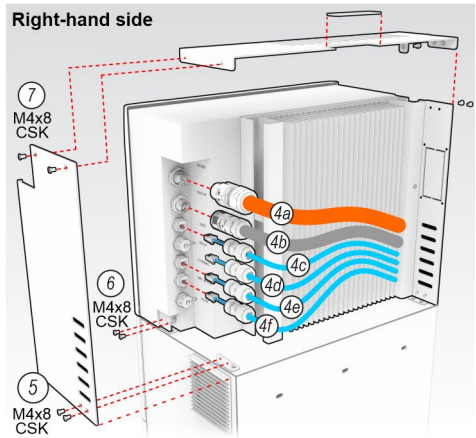
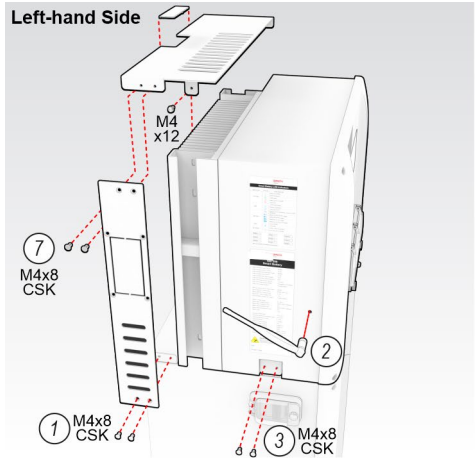
1. Fit the LHS Cover/Primary AC isolator assembly to the enclosure using two screws.
2. Fit the Wi-Fi antenna.
3. Fasten the side retainer bracket

On the right-hand side

4. Connect all required plugs, as shown
 - a. Primary AC isolator
 - b. AC Backup
 - c. DRED
 - d. Relays
 - e. Ethernet
 - f. kWh Meter
5. Fit RHS Cover (4 screws)
6. Tighten the side retainer bracket screws

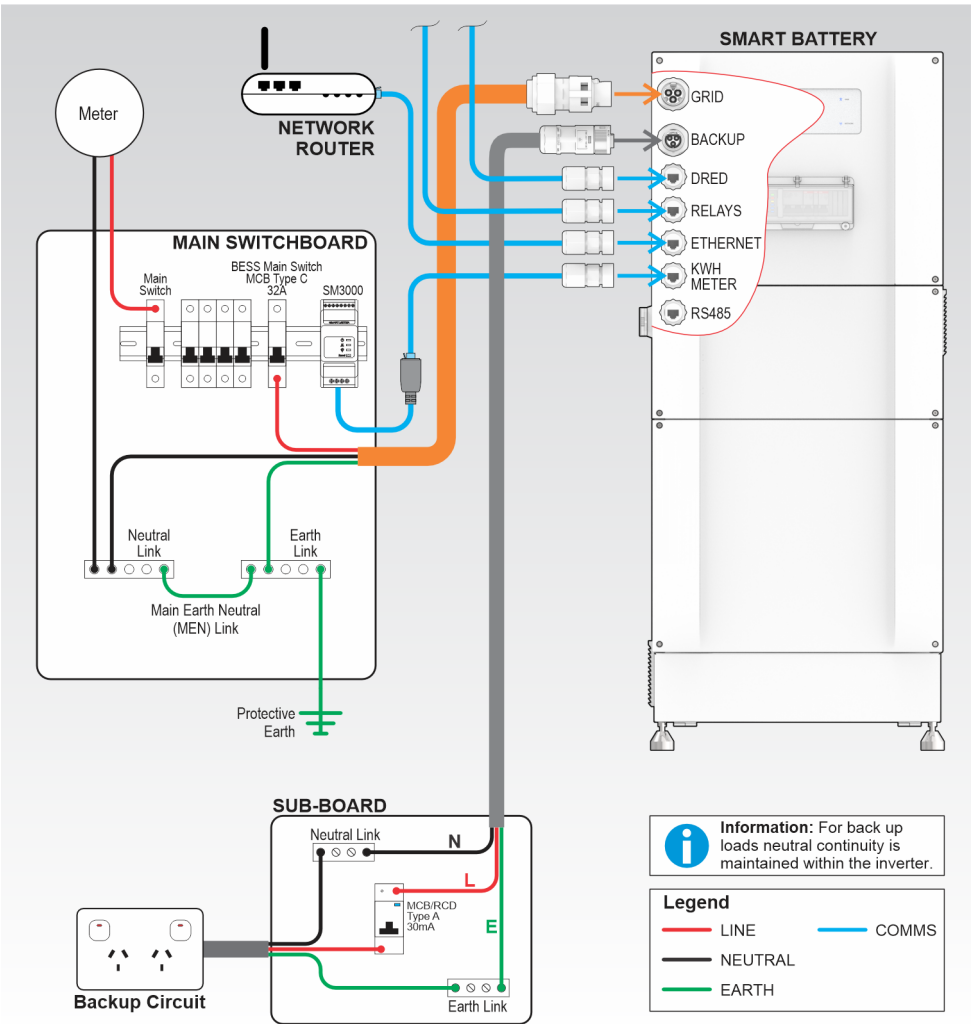
On top of the unit

7. Fit Top Cover (remove conduit breakout if required) (5 screws)



2.8 Smart Battery external connections

Connect AC and communications cables as shown below.



2.9 SM3000 meter installation



WARNING. Connect the Energy Meter as shown in the following sections. Ensure that Current Transformers (CTs) and corresponding supply cable are connected to the same phase. Incorrect connection will cause incorrect data and may damage the meter.

2.9.1 OVERVIEW

The Smart Battery includes a Redback SM3000 energy meter suitable for single-phase installations. The Smart Battery must be installed in:

- Single-phase, AC-Coupled configuration (section 2.9.3), or
- Single-phase, standalone configuration (section 2.9.4).

The SM3000 uses “split core” type current transformers (CT). The CT installations are not intrusive: they simply clip onto the target cable.

The SM3000 measures the instantaneous voltage, current, power and energy of one grid supply phase, and the PV (if installed) on the same phase. The power data is transmitted to the Redback inverter and used to manage grid inputs and exports.

The meter also directly indicates the system’s net energy flow—whether importing or exporting.

The installation process is:

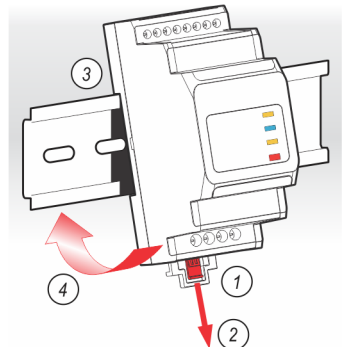
- Install the SM3000 in the meter box or suitable enclosure.
- Attach CTs, hook up supply, and run communication cable to the inverter.

2.9.2 INSTALLATION NOTES

1. Inspect the meter box or other installation site. Identify:
 - Mounting options for new meter (on 35mm DIN rail; SM3000: 36mm wide)
 - Attachment points for Current Transformers (CTs)
 - Supply take-off point (L1)
2. The meter is not waterproof and must be mounted in a weatherproof enclosure, preferably inside a meter box.
3. The meter and CTs are mated and calibrated at the factory. Ensure disconnected CTs are reconnected to the original terminals.
4. CTs have a 2m long cable. The cable can be shortened or coiled if necessary.
5. The communication cable is a straight-thru CAT-5 ethernet cable: the SM3000 has an adaptor to suit.

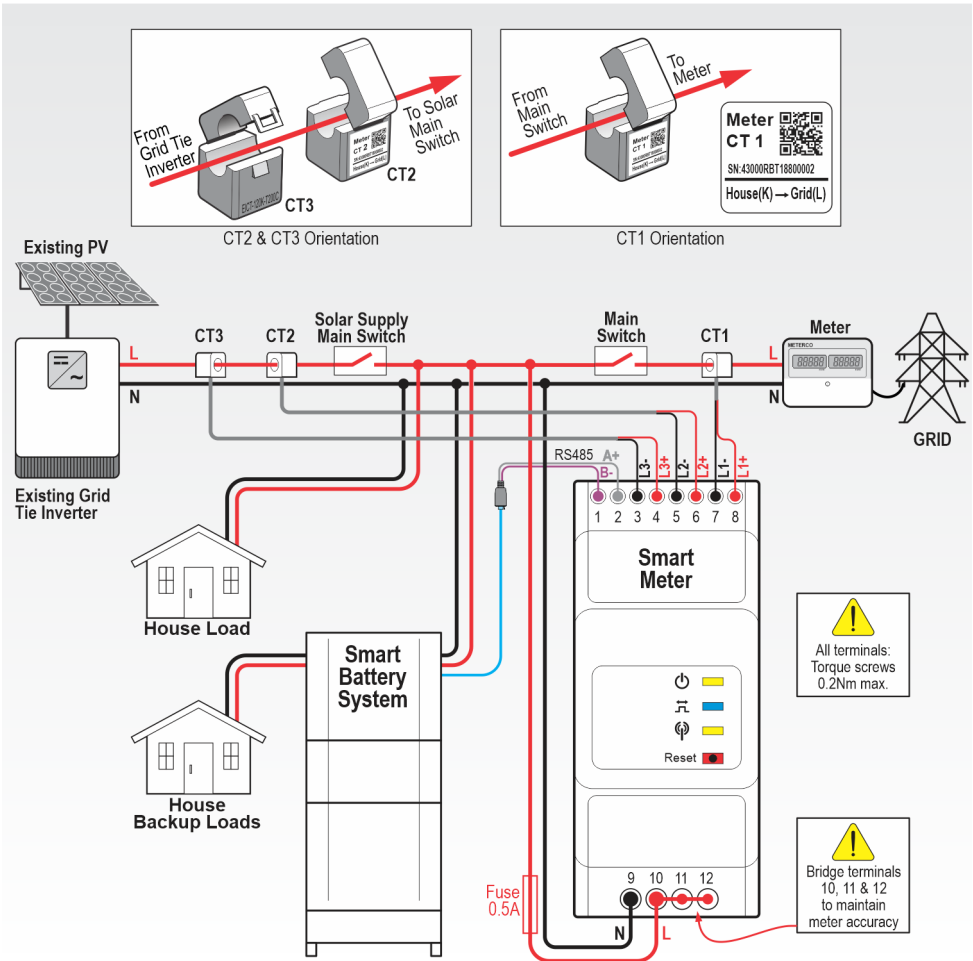
To mount the energy meter on a DIN rail:

1. Press the unlock lever
2. Release the clip
3. Hook meter onto DIN rail
4. Rotate so that body is flush against the rail
5. Push clip up until there is a “Click!”.



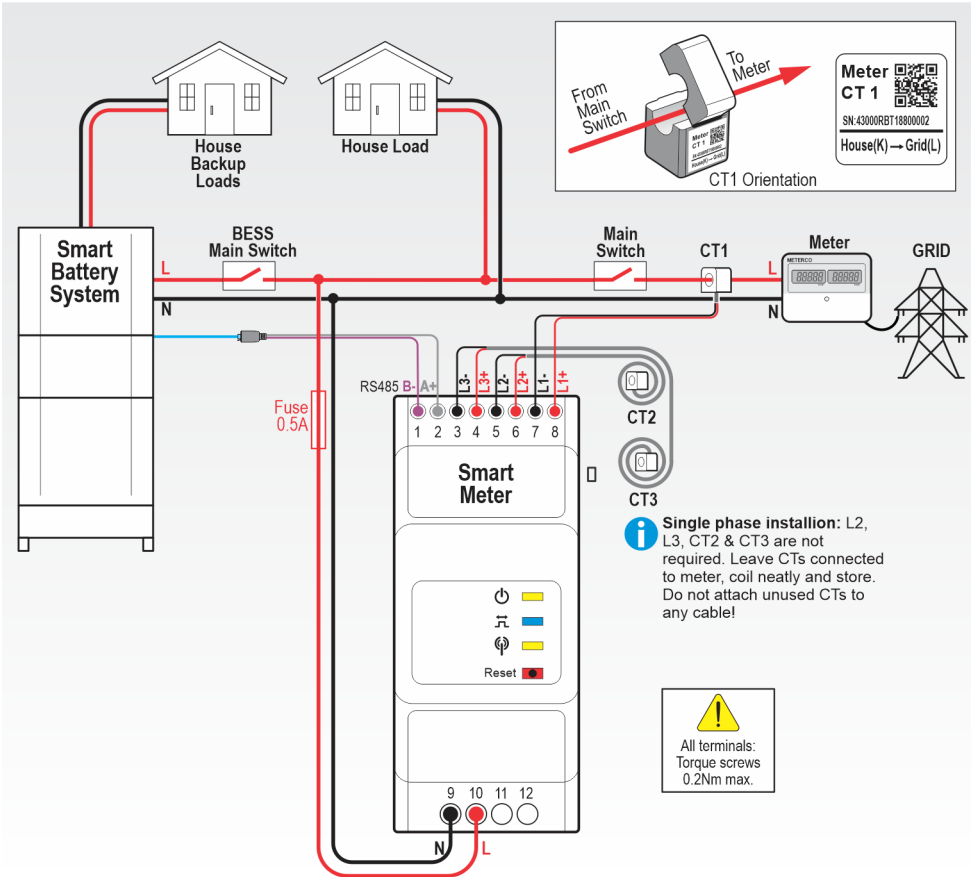
2.9.3 AC-COUPLED CONFIGURATION

1. Connect the SM3000 as shown below.
2. To ensure correct readings, ensure all CT1, CT2 and CT3 are attached to the active line L at the positions shown, and oriented as shown.



2.9.4 STANDALONE CONFIGURATION

1. Connect the SM3000 as shown below.
2. To ensure correct readings, ensure CT1 is clipped onto L1 as shown below.
3. Terminal screw torque: 0.2Nm maximum.
4. Do not remove CT2 or CT3. Leave connected to meter, coil cables neatly, and store. Do not clip unused CTs to any cable.



2.10 Relays

2.10.1 OVERVIEW

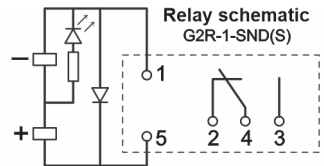
Relays are optional. The Smart Battery system supports up to three Redback RK-1 Relay Kits. Relays are typically installed in the main switchboard and connected to the Smart Battery using an installer-supplied Cat 5 cable. The Cat 5 cable plugs into the tail supplied with the Relay Kit, as shown below right.

The relay can directly control loads up to 10A@240V AC. Larger loads require the use of a secondary contactor.

Relays are software configured as Normally OFF or Normally ON. Setup, schedule, and control relays as described in Section 2.11.

Prepare the Relay cable as described in Section 2.7.8.

Find more relay information at redback.link/relays



2.10.2 RELAY CONNECTIONS

Loads up to 10A@240V AC

1. Connect the load directly as shown right.
2. During installation, in the RedbackINSTALL app, rename the relay to include its default state e.g., HWS Normally OFF, and set the default state to match—changing the default state will change the scheduling from ON/OFF to OFF/ON.

Loads over 10A@240V AC

Loads over 10A@240V AC must be controlled using a secondary contactor (installer to supply).

1. At the secondary contactor, mechanically configure or select the contactor to be Normally ON or Normally OFF as required. This will ensure the relay returns to the normal state if the inverter is off.
2. Connect the RK-1 relay as shown right.
3. In the app, configure the RK-1 to match the secondary relay i.e., Normally OFF or Normally ON.
4. Set the schedules as required.

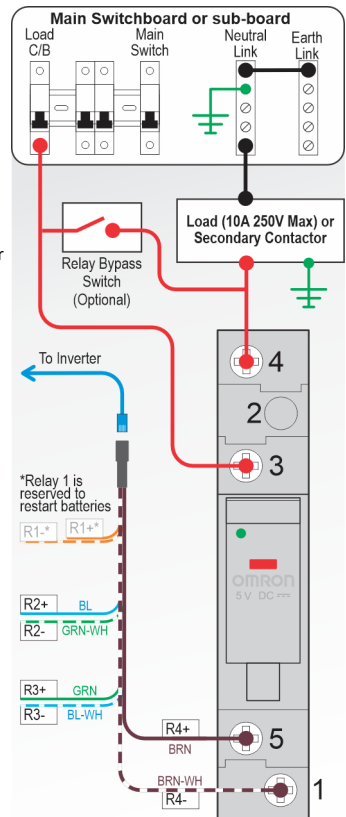
RK-1 connection

5. Connect relays as shown right.
6. Do not connect R1 leads: R1 is already assigned internally for BMS restarting.

Software notes

In the app and portal:

- R2 is aliased as "Relay 1 (RK2)"
- R3 is aliased as "Relay 2 (RK3)"
- R4 is aliased as "Relay 3 (RK4)"



2.11 Relay configuration notes (software)

The Smart Battery supports up to three relays, each controlling a dedicated circuit and attached loads. Each relay has its own switching schedule, enabling the owner to move energy consumption to the most beneficial time of day.

Typical app and portal screens are shown on the right.

Relay configuration rights vary.

Relay 4 (RK1) is not visible. It is reserved for system use.

Installers can:

- Enable relay visibility (RedbackINSTALL)
- Configure as normally ON or normally OFF (RedbackINSTALL)
- Schedule single or multiple relay events (Redback Portal).
- Schedule single or multiple daily relay events (Redback Portal).

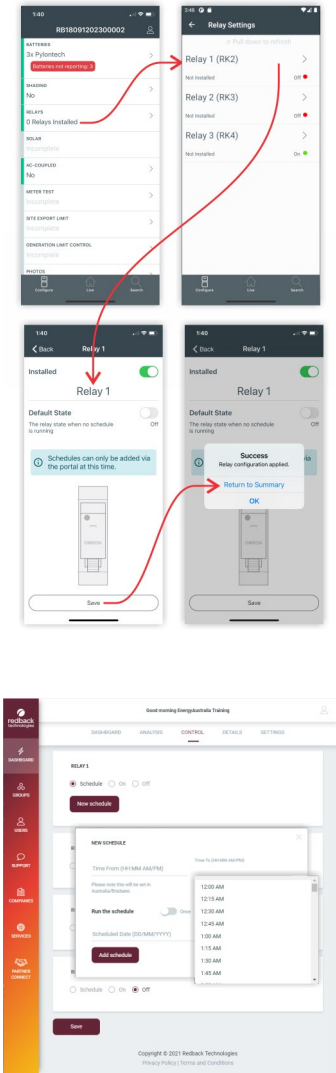
Owners can, using the Redback Portal:

- Turn relays ON and OFF manually
- Schedule single or multiple one-off relay events.
- Schedule single or multiple daily recurring relay events.

Configuration notes:

- Scheduled events must activate and deactivate the Relay i.e., ON and OFF (this is software enforced).
- The inverter must be internet connected to receive new or changed schedules. When received, the schedules are stored on the inverter: events occur even if the internet is not available.
- The relays are OFF when the power supply is lost. When power is restored, the device reads the configuration from memory, and restores the correct state.
- The relay control system is software based: features are frequently added or improved, and the latest documentation is accessible in the Redback Apps or Portal.

Find more relay information at:
redback.link/relays



3. Commissioning

3.1 Commissioning the Smart Battery

3.1.1 START THE SMART BATTERY

Start-up notes

- Ethernet connected systems will automatically connect to the LAN and the internet. This is indicated after startup: The EMS NETWORK LED and the Status Panel NETWORK icon are ON, and the EMS icon and EMS BLUETOOTH LED are flashing.
- Do not turn power OFF during start-up: this increases start-up time and may cause the EMS to crash.

#	PROCEDURE	ILLUSTRATION
1.	Switch the BATTERY ENCLOSURE DC isolator ON (to the left)	
2.	Switch BATTERY SYSTEM DC isolator ON (up)	
3.	Switch the BACKUP AC isolator ON (up)	
4.	Switch the INVERTER AC isolator ON (up)	
5.	Wait up to 10 minutes for the Inverter to start-up and begin advertising Bluetooth (EMS icon is flashing).	

3.1.2 START THE PYLONTECH BATTERIES

Under normal operating conditions, the batteries automatically start when you commission using the App and perform the battery selection. If the batteries do not start, or AC power is not available, the batteries can be started manually.

#	PROCEDURE	ILLUSTRATION
1.	Locate the BMS module ON/OFF switch and press ONCE.	
2.	In the battery cabinet, observe the Status LED on each battery. Within 10 seconds they will stabilise to green. The batteries are now initialised.	

3.1.3 CONNECT REDBACKINSTALL TO THE SMART BATTERY

The RedbackINSTALL app is user friendly: it requires little guidance, and there is in-app information.

#	PROCEDURE	ILLUSTRATION
1.	Ensure the Inverter Status Panel EMS LED is flashing, indicating that Bluetooth is available. If ON and not flashing- press Reset to restart the system. If OFF a problem exists- see troubleshooting (section 4).	
2.	Open RedbackINSTALL and login. RedbackINSTALL will scan for products advertising Bluetooth. Wait up to five minutes.  Do not select MINWINPC if it appears in the inverter list. Wait a few minutes for the EMS to restart and REDBACK to appear in the list.	
3.	REDBACK will appear. Tap to continue.	
4.	Wait up to two minutes.	
5.	A success message will appear. Tap Continue to begin onboarding.	

3.1.4 ONBOARDING (CONNECT TO THE LOCAL NETWORK)

RedbackINSTALL will advance to this stage after establishing a Bluetooth connection to the Smart Battery.

Note: if a local network is not available it is possible to temporarily connect the Smart Battery to a Wi-Fi hotspot, such as your phone. This is useful for configuration but is not an acceptable long-term solution.



This equipment is not compatible with 5Ghz Wi-Fi networks or hotspots. Use 2.4Ghz networks.

#	PROCEDURE	ILLUSTRATION
1.	Select the preferred method to connect to the local network and internet. Options are: - None - LAN (must be hardwired, will connect automatically) - Wi-Fi (usually requires network name and password)	
2.	Select the required network or swipe down to refresh the list.	
3.	Enter the password. Tap Connect to continue.	
4.	A Success message will appear. Tap Continue to go to the Smart Battery Configuration page.	

3.2 Notes on Regional Safety Settings

Regional Safety Setting is a mandatory selection when configuring the system—the system will not operate if it is not selected.

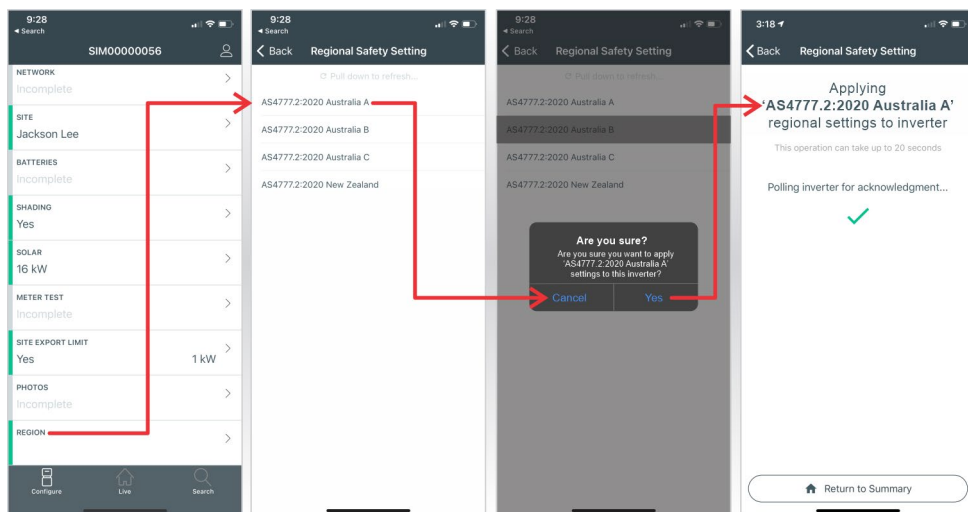
You may be prompted to update the inverter software. Do this if requested.

For convenience the Regional Safety Settings are set by selecting the Region from the list provided in the RedbackINSTALL app. The list is maintained with the latest settings required by AS4777.2:2020. Selection of a region automatically selects Power Quality Response Mode settings, including:

- Voltage balance mode (where available)
- Voltage and frequency limits
- Sustained operation for frequency variations
- Grid Protection
- Power Rate Limits
- Frequency Response Limits
- Voltage Disturbance Band Withstand
- Volt-Var response
- Volt-Watt response
- Fixed Power Factor Mode
- Reactive Power mode



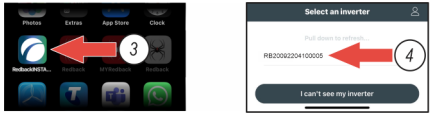
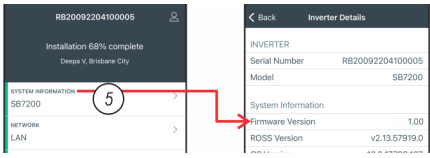
INFORMATION. The local grid operator may request a non-standard safety setting for an installation. If so, contact Redback Technical Support for assistance in changing settings.



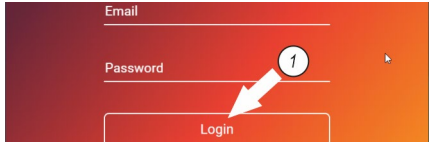
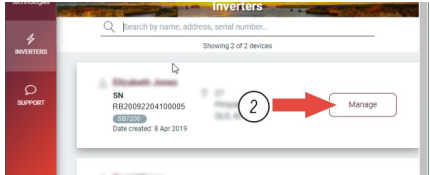
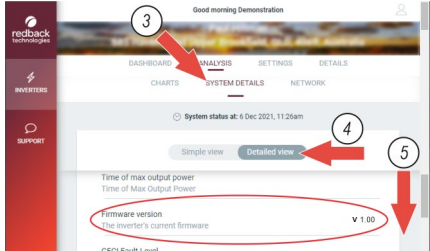
3.3 Redback product firmware version

Redback Smart Battery firmware version is v1.00.

3.3.1 IDENTIFY USING REDBACKINSTALL

#	PROCEDURE	ILLUSTRATION
1.	Press the hidden Reset button on the Smart Battery Status Panel.	
2.	Wait for the EMS icon to begin flashing: Bluetooth is now advertising.	
3.	If not already open, start RedbackINSTALL and sign in.	
4.	The app will display a list of nearby Redback products that are advertising Bluetooth. Select the required Redback product from the list. Settings page will open.	
5.	Touch SYSTEM INFORMATION to view the firmware version.	

3.3.2 IDENTIFY USING THE REDBACK PORTAL

#	PROCEDURE	ILLUSTRATION
1.	On the internet go to portal.redbacktech.com and login. The Inverters list will open (showing accessible inverters). Note: You will be unable to view the firmware of offline or unregistered inverters.	
2.	Find the target inverter and select MANAGE. The Analysis page will display.	
3.	Select SYSTEM DETAILS.	
4.	Select DETAILED VIEW as shown.	
5.	Scroll to the Firmware version or locate using your browser's search function.	

3.4 Compliance inspections

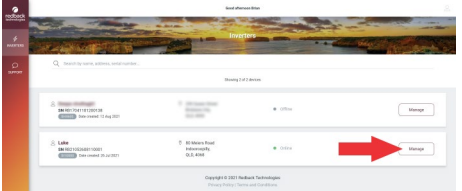
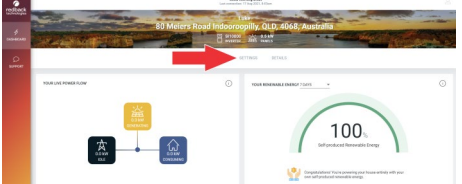
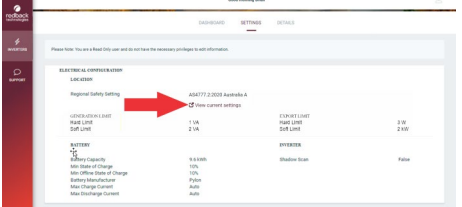
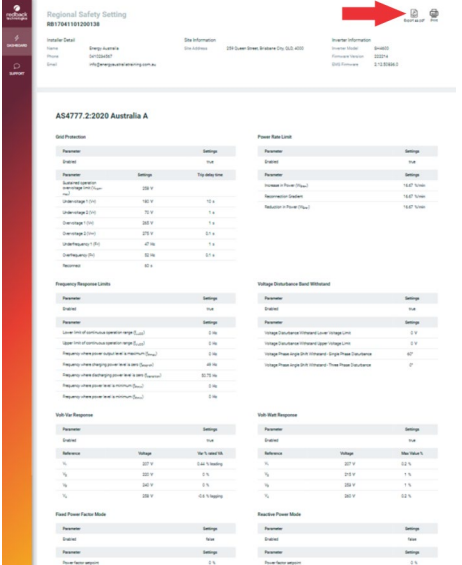
3.4.1 ASSIGNING AN INSPECTOR

Installers may assign a Compliance Inspector to each new product installation. Assignment is completed on the Redback Portal. Products must be registered in the installer's fleet prior to assigning an inspector.

#	PROCEDURE	ILLUSTRATION
1.	Login to the Redback portal at portal.redbacktech.com Search for the required product serial number from the list. Click the required product to open the product properties.	
2.	Click Dashboard .	
3.	Navigate to the Inverters tab and select User Access .	
4.	Add a new user. Enter Inspector's email and name. Select Inspector from the drop-down list. Select Invite to save. Notification emails will be sent to the email address provided.	
5.	The Inspector will now appear in the list of users of this inverter.	

3.4.2 COMPLIANCE INSPECTION

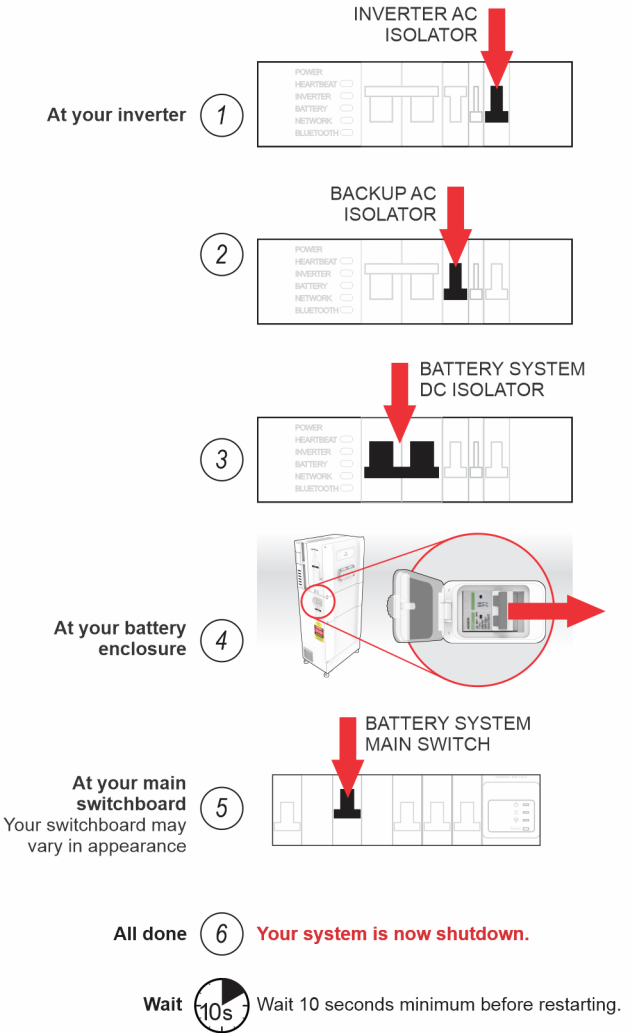
Nominated Compliance Inspectors receive notifications when added as a product user. Their first notification will provide a link to complete their user registration.

#	PROCEDURE	ILLUSTRATION
1.	Login to the Redback portal at portal.redbacktech.com If necessary, search for the required product serial number. Select Manage to open the product dashboard. Note: the first login will require acceptance of the Redback T&Cs.	
2.	Select SETTINGS to open the products general settings.	
3.	Select View current settings to see the Detailed Regional Safety Settings.	
4.	The Detailed Regional Safety Settings are read only. Scroll the page to see all settings. The settings may be Printed or Exported to PDF for record keeping.	

4. Troubleshooting

4.1 Shutdown procedure

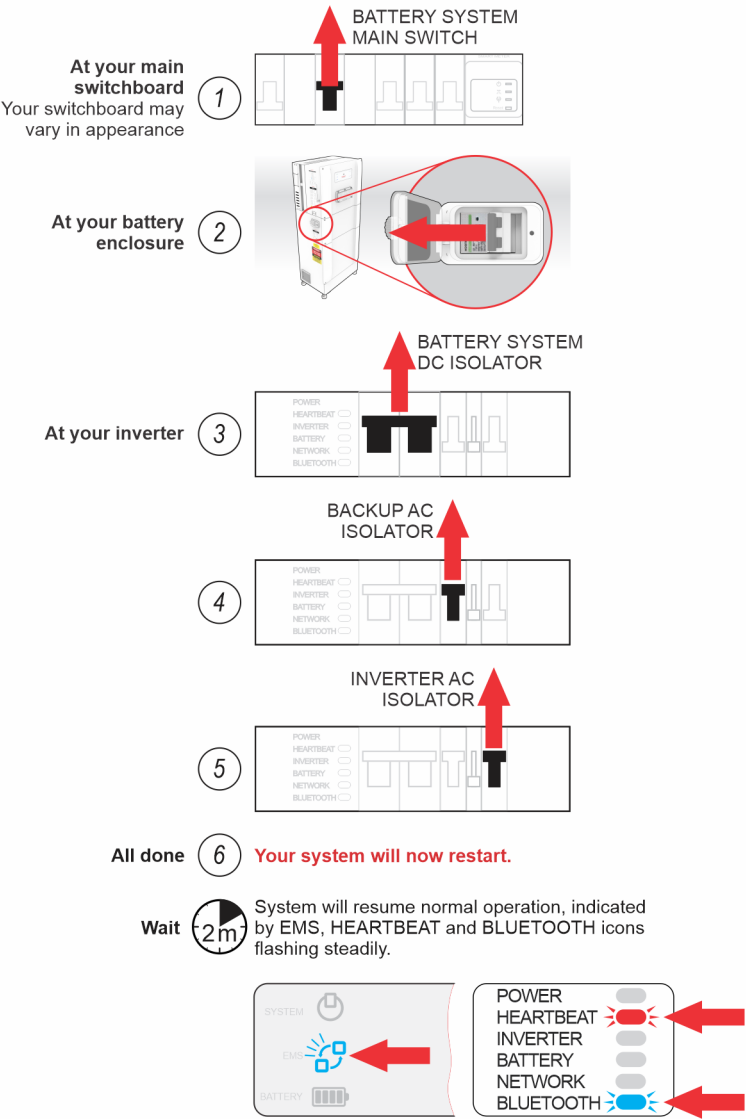
Occasionally, it may be necessary to shut down the Smart Battery interrupting all functions. Note: the battery and grid supplies remain energised to the isolators. Shut down using the following procedure:



WARNING: Grid supplies remain energised to the switchgear INVERTER AC Isolator.

4.2 Restart procedure

Restart the Smart Battery as shown below.



4.3 Earth fault alarm

If the Redback system detects an earth fault:

1. An audible alarm will sound in the inverter.
2. The Status Panel System icon will be solid red (see below).
3. An email will be sent to Redback customer service, the installer, and the system owner.

An email is also sent when the alarm is cleared.

4.4 Inverter Status LEDs

The Smart Battery is equipped with an Icon array to indicate system status and aid diagnosis. The table below lists Icon indications, probable cause, and rectification steps. If the problem is not solved contact Redback.

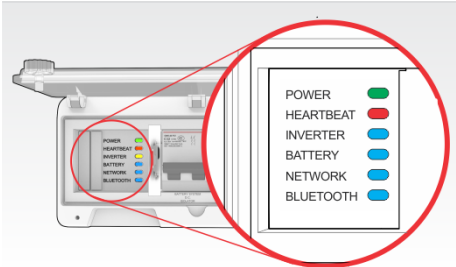


ICON	COLOUR & PATTERN	MEANING AND OR PROBABLE CAUSE	SOLUTION(S)
SYSTEM		System ready	OK
		System starting	Wait up to 10 minutes after a restart- this may be normal behaviour. The system may cycle several times during start-up. Completion of start-up process is indicated by the LED stabilising to ON.
		System is not operating	Restart system. If no response contact Redback.
		Grid voltage and frequency outside range	Report out-of-spec supply to the local DNSP. Ensure all grid and battery cabling is correct. Check the voltage and polarity of the batteries.
		Over temp. inside inverter	Investigate the incident. <i>Performance will be reduced above 45°C and shut down occurs above 60°C.</i>
		Ground fault alarm (audible also)	Investigate fault: this alarm indicates a ground fault on the battery side. Note: Persistent faults trigger email alerts to installer, owner, and the Redback Customer Service team.
		Inverter failure	Move the BYPASS switch to UP position to maintain grid supply to the Backup circuit.
		Backup circuit overload	Reduce simultaneous loads on the Backup circuits. Ensure plug-in devices on the Backup circuit are in accordance with section 1.4. Reduce permanent devices on the Backup circuit.
GRID			
GRID		Grid active and connected	OK. No action required.
		Syncing with Grid	Wait. No action required.
		Grid is disconnected or not active	Normal behaviour during a grid outage. Turn UTILITY GRID AC Isolator ON. Check cables

ICON	COLOUR & PATTERN	MEANING AND OR PROBABLE CAUSE	SOLUTION(S)
 EMS		EMS Comms OK	No action required.
		EMS Comms OK Bluetooth is advertising	The system can be accessed using RedbackINSTALL. Flashes for up to 30 minutes.
		EMS Comms failure	
 BATTERY		Battery SoC >75%	OK. No action required.
		Battery SoC is 50-75%	OK. No action required.
		Battery SoC is 25-50%	OK. No action required.
		Battery SoC <25%	OK. No action required.
		Batteries are disconnected or not active	Ensure BATTERY SYSTEM DC isolator is ON (up). Ensure BATTERY ENCLOSURE DC isolator in ON (to left). Reset EMS (press the Setting Sun on the Status Panel). Ensure all Battery and BMS cables are installed correctly. Reset EMS.
 NETWORK		Active Wi-Fi, LAN, or Bluetooth.	OK. No action required.
		In-active Wi-Fi, LAN, Bluetooth.	Internet connection lost. Ensure the local Wi-Fi or Ethernet network is operating correctly. The system is not onboarded. Onboard using RedbackINSTALL.
		EMS failure	If SYSTEM LED is ON check EMS LEDs for activity. Otherwise check INVERTER AC Isolator is ON.
LEGEND:  OFF  ON   Flashing			

4.5 EMS Status LEDs

The Energy Management System (EMS) is visible inside the switchgear hatch. The EMS controls the inverter functionality, and all internal and external communications.



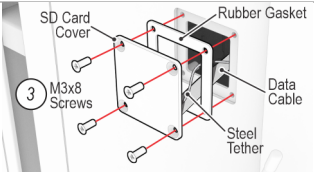
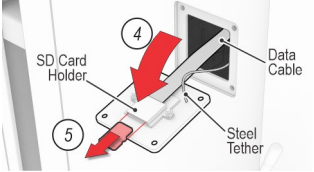
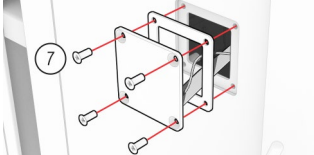
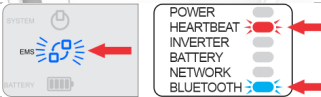
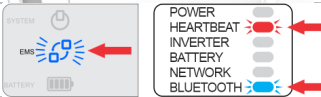
LED	COLOUR & PATTERN	MEANING AND OR PROBABLE CAUSE	SOLUTION(S)
ALL LEDs OFF 		No Power available	Inverter is Isolated from grid supply. Turn grid supply ON Grid outage is occurring, and backup power exists. Wait for grid to be restored. Bypass is incorrectly set. Try the BYPASS switch in the UP and DOWN positions- the EMS should power up from grid or battery, if available. EMS PSU problem (internal). Contact Redback for assistance.
ALL LEDs ON 		EMS is in start-up phase	Wait two minutes. EMS should stabilise to: Power ON ; Heartbeat flashing ; Inverter ON . If all EMS LEDs remain ON, restart the EMS—Press the switch concealed behind the Spider logo. If all LEDs remain ON, contact Redback for assistance.
POWER		EMS has power	OK. No action required.
		EMS does not have power	See ALL LEDs OFF, above. EMS Power Supply failure- Replacement required. EMS failure- Replacement required.
HEART BEAT		OK	No action required. EMS is running normally.
		EMS is frozen or updating	Wait 5 minutes. If no change, restart the EMS.
		No Power	See ALL LEDs OFF, above.
		Inverter is off	Start inverter in accordance with section 3.1.
INVERTER		OK	Wait 5 minutes. Settings are being applied.
		OK	No action required. EMS is connected to Inverter.
		EMS not connected to the Inverter	Check internal communications cables- contact Redback for information.

LED	COLOUR & PATTERN	MEANING AND OR PROBABLE CAUSE	SOLUTION(S)
BATTERY		Battery detection error, or detection does not match the Installer created configuration.	Restart the EMS. Check inverter settings. Check batteries and ensure internal cables are properly connected.
		OK	The EMS & BMS are communicating. No action required.
		Battery detection error	Turn all batteries OFF Ensure battery POWER and all BMS cables are correctly installed Restart batteries
		Batteries do not match saved configuration	See Battery Detection Error above. Note batteries present Review configuration in the Redback app or portal.
NETWORK		OK	Connected to the Redback Cloud. No action required.
		Connected to local network but Redback Cloud not found.	Ensure the local network is internet connected. Log in to portal.redbacktech.com Login success: Indicates the home network is preventing the inverter from connecting to the internet. Ask the homeowner to change their network and or firewall settings. Login failed: Indicates a Redback server issue. Contact Redback for advice.
		Inverter not connected to local network	Ensure the local network is operating correctly. Smart Battery requires onboarding.
BLUE TOOTH		Bluetooth is discoverable	If required, connect to the Smart Battery using your phone and RedbackINSTALL.
		Bluetooth is connected	Proceed with onboarding or setup.
		Bluetooth OFF	Bluetooth deactivates 30 minutes after EMS restart. Press the switch concealed behind the Redback icon: the EMS will restart and activate discoverable Bluetooth.
LEGEND:		 OFF	 ON  Flashing

4.6 SD Card Replacement

The SB series of Smart Batteries include an installer replaceable MicroSD Card. The MicroSD card holds the Smart Battery software and factory settings. Occasionally, replacement of the MicroSD card may be required.

The MicroSD card is installed in a holder located on the reverse side of a tethered panel on the left side of the inverter module.

#	PROCEDURE	ILLUSTRATION
1.	Shut down the Smart Battery as described in section 4.1 .	
2.	Locate the MicroSD Card panel on the left side of the inverter module.	
3.	Remove the four retainer screws from the panel and set aside.	
4.	Carefully loosen and tilt the panel to expose the card holder, noting: - The panel is tethered on the reverse side - Do not pull on the data cable - There may be some resistance due to adhesion to the concealed rubber seal: if necessary, pry one edge of the panel taking care not to damage the paint.	
5.	Remove the MicroSD card from the holder.	
6.	Insert the new MicroSD card (label -side up)	
7.	Replace the panel and retaining screws.	
8.	Restart the Smart Battery as described in section 4.2 . Wait for the system to begin advertising Bluetooth (up to 10 minutes), indicated by EMS, Heartbeat and Bluetooth icons flashing steadily.	
9.	Reconnect RedbackInstall to the Smart Battery as described in section 3.1 .	
10.	Reconfigure the system (site settings are retrieved from Redback).	

5. Maintenance


WARNING: ELECTROCUTION HAZARD.

Lethal voltages may be present. Isolate all sources of power and test before removing covers.



CAUTION: Do not lay tools or metal parts on top of batteries.

CAUTION: Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

The Redback Smart Battery is a low maintenance product. Annual maintenance is required.

Note: Filters, fans and heatsink fins may require more frequent cleaning in dusty conditions.

ITEM	NAME	REASON	PROCEDURE	BY SERVICE PERSON	BY OWNER
1.	Battery Enclosure vents and filter	Airflow is reduced when dust accumulates on the vents, or the filter is clogged. The lower intake vents are more likely to be affected.	- Use a small pry tool to release the vent covers - gently pry next to the notches at top or bottom of cover. - Blow or brush the vents clean. - Wash the filter pads in soapy water and squeeze dry. - Refit all parts ensuring the vents face downward.	✓	✓
2.	Battery Enclosure Fan blades	Fan efficiency is reduced when dust accumulates on the fan blades.	Remove the Upper Vent Cover and filter pad. Gently blow, brush, or wipe off fan blades. Do not overspeed the fan. Replace all parts.	✓	✓
3.	Cabinet	Cabinet may become soiled	Wipe down outside of cabinet with a just-damp cloth. Immediately wipe dry with a microfibre cloth. Do not use cleaning agents as they may damage the finish.	✓	✓
4.	Inverter heatsink fins	Cooling efficiency is reduced when dust, dirt or debris accumulate on the heatsink.	Clean the heatsink fins using a small brush or compressed air.	✓	✗
5.	Battery connections	Battery efficiency may reduce if connections or terminals become dirty or corroded.	Unplug and inspect battery cable connections. Remove corrosion or debris. Spray with contact cleaner.	✓	✗
6.	Cabinet seals	Concealed seals ensure cabinet water resistance	Remove covers and inspect seals for hardening, tears, or other damage. Look for signs of water in cabinets.	✓	✗
7.	Cable seals and caps	Seals and caps prevent water and insects entering the inverter or connections.	Remove BoS front cover and tighten all cable glands and waterproof caps.	✓	✗

6. Specifications

PRODUCT MODEL	SB7200	SB9600	SB14200
GRID INTERACTIVE PORT			
Nominal Output Voltage	230V	230V	230V
Nominal Output Frequency	50 Hz	50 Hz	50 Hz
Rated Output Current	AC 14.3A	AC 19.6A	AC 19.6A
Max. Output Current	AC 14.3A	AC 19.6A	AC 19.6A
Rated Output Active Power	AC 3300W	AC 4500W	AC 4500W
Rated Output Apparent Power	3300VA	4500VA	4500VA
Rated Input Current	AC 30.4A	AC 39.1A	AC 39.1A
Input Voltage	230V	230V	230V
Input Frequency	50 Hz	50 Hz	50 Hz
Rated Input Apparent Power	7000VA	9000VA	9000VA
Power Factor (range)	0.8 lagging to 0.8 leading	0.8 lagging to 0.8 leading	0.8 lagging to 0.8 leading
Output Voltage THD	<3%	<3%	<3%
Inrush Current	AC 65A 5μs	AC 65A 5μs	AC 65A 5μs
Maximum Output Fault Current	30A 0.2s	40A 0.2s	40A 0.2s
Maximum Output Overcurrent Protection	AC 65A 5μs	AC 65A 5μs	AC 65A 5μs
Decisive Voltage Class (DVC)	DVC-C	DVC-C	DVC-C
BACKUP PORT			
Nominal Output Voltage	AC 230V	AC 230V	AC 230V
Nominal Output Frequency	50 Hz	50 Hz	50 Hz
Rated Current	AC 14.3A	AC 19.6A	AC 19.6A
Rated Active Power	AC 3300W	AC 4500W	AC 4500W
Rated Apparent Power	3300VA	4500VA	4500VA
Power Factor (range)	0.8 lagging to 0.8 leading	0.8 lagging to 0.8 leading	0.8 lagging to 0.8 leading
Output Voltage THD	< 3%	< 3%	< 3%
Inrush Current	AC 65A 5μs	AC 65A 5μs	AC 65A 5μs
Maximum Output Fault Current	33A 10μs	44A 10μs	44A 10μs
Maximum Output Overcurrent Protection	AC 65A 5μs	AC 65A 5μs	AC 65A 5μs
Decisive Voltage Class (DVC)	DVC-C	DVC-C	DVC-C
EFFICIENCY			
Maximum Efficiency	96.6%	96.6%	96.6%
PHYSICAL DATA			
Installed weight	130kg	165kg	203kg
Dimensions (W x D x H) (mm)	566 x 370 x 1238	566 x 370 x 1655	566 x 370 x 1655
Material	Aluminium	Aluminium	Aluminium
Finish	Powdercoat & seal	Powdercoat & seal	Powdercoat & seal
BATTERY ENCLOSURE DATA			
Number of Battery Units	3	4	4
Storage Capacity	3 x 2.4kWh	4 x 2.4kWh	4 x 3.55kWh
Battery System Model	RB-HVS-144-50-AC	RB-HVS-192-50-AC	RB-HVS-192-74-AC
Maximum Capacity	7.2kWh	9.6kWh	14.2kWh
Nominal Voltage	DC 144V	DC 192V	DC 192V

Rated Current	DC 25A	DC 25A	DC 25A
Fan Specification	DC 12V / 0.3A	DC 12V / 0.3A x2	DC 12V / 0.3A x2
Protective Class	Class I	Class I	Class I
Ingress Protection Rating	IP54	IP54	IP54
Noise Emission	<42dBA*	<42dBA*	<42dBA*
Material	Steel	Steel	Steel
Finish	Powdercoat & seal	Powdercoat & seal	Powdercoat & seal
ISOLATORS	GRID INTERACTIVE PORT	BACKUP PORT	BATTERY PORT
Manufacturer Part Number	S201M-C50	S201M-C32	GM5-40P/2 C32
Rated Insulation Voltage	440V	440V	DC 1000V
Rated Impulse Withstand Voltage	4kV	4kV	8kV
Suitability for Isolation	C	C	C
Rated Operational Current	50A	32A	32A
Utilisation Category	A	A	A
Rated Breaking Capacity	15kA	10kA	1.5kA

COMMUNICATION PORTS AND PROTOCOLS

ETHERNET	RJ45; straight thru	RS485	RJ45; Factory use only
DRED	RJ45; DRED	Wi-Fi	802.11b/g/n/ac; 2.4GHz
RELAYS	RJ45; 3x Digital I/O; +DC5V & GND	LTE	NA
KWHR METER	RJ45; RS485 MODBUS	Interlock	NA

USER INTERFACE

Front panel display	Coded, coloured LEDs
Communications	Bluetooth for commissioning; Wi-Fi or ethernet for remote access
Remote access	Web Portal; MYRedback app
Remote firmware updates	Supported
Power/energy monitoring	Includes 1 x utility grade energy meter (class 1)

GENERAL INFORMATION

Operating Temperature	-20 to 60°C	Active Anti-islanding Method	Active Frequency Drift
Unconditioned without solar effects		Moisture Location Category	4K4H
Operating Temperature Derated Output	Below 10°C and over 45°C	External Environment Pollution Degree	Grade 1, 2 and 3
Operating Relative Humidity	0 – 100%	Inverter Topology	Non-isolated
Operating Altitude	0-4000m	Country of origin	China
Protective Class	Class I	Demand Response Modes	DRM 0
Ingress Protection Rating	IP54	Standby Self-Consumption	<15W
AC Overvoltage Category	OVC III	Noise emissions	<42 dBA
DC Overvoltage Category	OVC II	Warranty	10 years
		Recommended Application	Household

CERTIFICATIONS, STANDARDS AND APPROVALS

AS/NZS 4777.2:2020	IEC 62040-1:2017	IEC 60529	RCM Approval
IEC 62109-1: 2010	IEC 62116:2014	EN 61000	
IEC 62109-2: 2011	IEC 62477-1:2012	CE Mark (LVD, EMC, RoHS directives)	

DESIGNED WITH INSTALLATION STANDARDS CONSIDERED

AS/NZS3000:2018	AS/NZS 5139:2019	AS/NZS 5033:2021
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*Measured in Redback laboratory at 1m in front of system.

Notes

7. Close-up and handover

7.1 Close up

After the Smart Battery is commissioned:

ITEM	PROCEDURE	COMPLETED
1.	Fit enclosure front covers.	
2.	Ensure all front covers are secure.	
3.	Ensure all top and side covers are secure.	
4.	Ensure all Inverter side retainer screws are tight.	
5.	Clean worksite and dispose of rubbish appropriately.	

7.2 Handover

With the homeowner:

ITEM	DESCRIPTION	COMPLETED
1.	Walk through the installation, ensuring the homeowner understands what has been installed (and where), including any Backup circuits.	
2.	Explain the limitations of the system, including the possibility of overloading the backup circuit by using too many devices simultaneously, even when the grid is connected.	
3.	Demonstrate how to recover after a BACKUP circuit overload.	
4.	Demonstrate how and when to use the BYPASS switch.	
5.	Assist owner to complete their Redback Account setup, if not already done.	
6.	Assist owner to download the app, demonstrate features and answer questions.	
7.	Assist owner to log on to portal and demonstrate including how to: - Review performance - Setup battery charge/discharge schedules - Setup relay schedules - Raise an on-line support request	
8.	Handover documentation to the homeowner, including: - Homeowner's Guide - Warranty Booklet - Installation Manual (optional)	

