RedEarth ENERGY STORAGE

BushChook

Installation and Operation Manual

- Single-phase (5 kW & 10 kW) and three-phase (12 kW)
- Suitable for on-grid and off-grid applications
- EV charger and energy trading ready
- Maximum capacity of 44.8kWh
- Australian made and owned
- Whole home backup

STC Approved
Rebate eligible!

Safety Instructions

⚠ WORKING ON THE INSIDE OF THE BUSHCHOOK SYSTEM IS RESTRICTED TO QUALIFIED PERSONNEL.

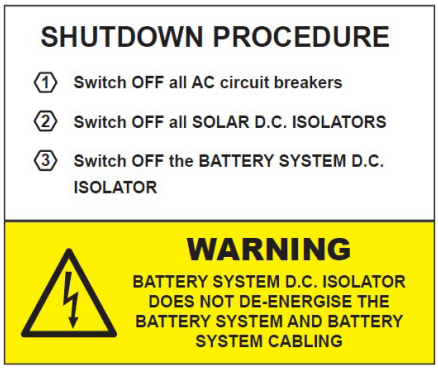
General Safety Notes

FIRE
The BushChook uses RedEarth's Troppo ULTRA batteries. This is a lithium-iron-phosphate based battery (LFP). It is the safest lithium chemistry.
However, in the unlikely event of a fire, or if the unit emits smoke, sparks, flames, or vapour, produces a burning smell, becomes excessively hot or swells, leaks, or makes unusual noises,
IMMEDIATELY:

- **Evacuate the area.** Move yourself and others to a safe distance.
- **Call Emergency Services (000).**
- **Do NOT attempt to extinguish the fire.**
- **Do NOT touch, move, or handle the system or the batteries.**
- **Do NOT use water or household extinguishers unless trained and safe to do so.**

Battery fires can reignite and may release toxic and flammable gases. Always prioritise personal safety.
Note: there must be Safety Data Sheet for the Troppo ULTRA battery left with the Main SwitchBoard for the fire brigade.
The Safety Data Sheet can also be found at www.redearth.energy

- The BushChook must only be installed by suitably qualified personnel who have read and are familiar with its operation and hazards. Working on the inside of the BushChook system is restricted to qualified personnel.
- The batteries provided with this system must only be charged by the inverter or the V2G (vehicle to grid) charger supplied by RedEarth. Do not attempt to charge the batteries with any other charging device or connect any devices directly to the DC battery bus unless approved by RedEarth.
- Do not use a damaged battery.
- Batteries should only be disposed of at an appropriate recycling centre. Contact RedEarth for advice.
- The shutdown procedure can be found on the label on the right-hand side of the BushChook. More details in Step 5 of the installation and customer handover.



Installation Safety Notes

- The wiring diagrams and installation instructions are given as a guide only and compliance to appropriate standards is the responsibility of the installer.
  Relevant standards are listed below:

AS/NZS 3000:2018	Wiring rules
AS/NZS 5033:2021	Installation and safety requirements for photovoltaic (PV) arrays
AS/NZS 4509.2:2012	Stand-alone power systems-Design
AS/NZS 1170.2:2021	Structural design actions-Wind actions
AS/NZS1768:2021	Lightning protection
AS/NZS 3008.1.2:2017	Electrical installations – Selection of cables
AS/NZS 5139:2019	Electrical installations-Safety of battery systems for use with power conversion equipment

- A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:
  - Remove watches, rings, and other metal objects.
  - Use tools with insulated handles.
  - Disconnect charging source prior to connecting or disconnecting battery terminals
- Lifting hazard
  The BushChook is heavy. Observe proper lifting techniques. To reduce the weight the Troppo ULTRA batteries can be removed.

In our efforts towards constant product enhancement, this document is subject to change at any time. Please visit www.redearth.energy and download the appropriate and latest version manual.

Table of Contents

Overview

RedEarth's BushChook home battery system is your complete solution for both on-grid and off-grid homes. There are models for single-phase (5 kW and10 kW)) and three-phase (12 kW) homes.

BushChook is an all-in-one battery system designed to be very easy to install. As an Australian-made product built in Brisbane, RedEarth provides best-in-class support for BushChook owners and installers.

The system, including solar panels, generates and stores electricity for use day and night, and includes a whole-home backup capability so that customer's loads remain powered during any blackout (load dependent).

For the homeowner it minimises electricity bills, optimises electricity usage (including electric vehicle charging) and reduces the homes carbon footprint.

For residential users, BushChook reduces electricity costs, optimises daily energy usage—including EV charging—and contributes to lowering the home's carbon footprint.

Monitoring and control of the system is provided through RedEarth's app, available for both Apple and Android devices.

The system is supplied with a **10-year manufacturer's warranty,** supported by RedEarth's onshore technical service team to ensure reliable long-term performance and a seamless installation and ownership experience.

BushChook is fully certified to AS4777.2:2020 & IEC62109.1&2 & AS60950.1 and conforms to the Australian Battery Safety Guide.

Installation features

- The BushChook system can easily be retrofitted to an existing PV solar system that may already be installed at the home.
- Solar panels: Up to 24 kW of panels can be connected to the 12 kW 3-phase BushChook and 20 kW of panels to the 10 kW 1-phase BushChook. This is usually enough to meet the needs of a typical home as well as charge an electric vehicle using only electricity generated at home.
- The BushChook is designed so that additional batteries can easily be added in the future, right up to eight batteries with a total of 44.8 kWh. Buy what is needed now, and add more later as demand grows, e.g., an electric vehicle is purchased.

RedEarth's Private Power Plant (PPP)

RedEarth offers its propriety Private Power Plant (PPP) to generate more value for BushChook battery system owners than is available from other battery systems.
With a BushChook installed, they not only gain access to a continuous source of renewable energy; by harnessing the untapped potential of their rooftop, they can generate more solar energy than needed to power their residence or business. The result? Their property can become their very own energy trader, creating an additional value stream by feeding surplus energy back into the grid or sharing it with family. This not only offsets energy costs but could even turn a profit.

Included PPP modules currently available are:

1. **PowerRanger**—The Power Ranger module gives you the ability to manually (or on an automated schedule) force charge or discharge the battery.
   This means power to:
   - choose to charge the batteries before a scheduled grid outage.
   - charge the batteries on a schedule if there are not enough solar panels on the roof.
   - manually charge on a one-off cloudy day
2. **Disaster Protection Mode**— When severe weather or other conditions are expected to cause grid outages, this mode ensures the batteries are fully charged to last as long as possible during the interruption.
3. **Scheduled EV charging**— View EV charging in real time through the RedEarth app, together with BushChook monitoring. Determine the best time to charge the EV and set the charge rate.
   With the addition of the Boomerang V2G, it can also discharge the vehicle. This can be especially valuable when off grid, either voluntarily or when storms bring down power lines, as it provides direct access to the large battery in the electric vehicle.
4. **Peer-to-peer electricity trading**—Trade excess electricity with other people at a price agreed on, for free to help out peers or family or for a second property, such as a rental property. This feature is available provided it is supported by the energy retailer.
5. **Manual Energy Trading**—Sell excess electricity at a profit at peak times.

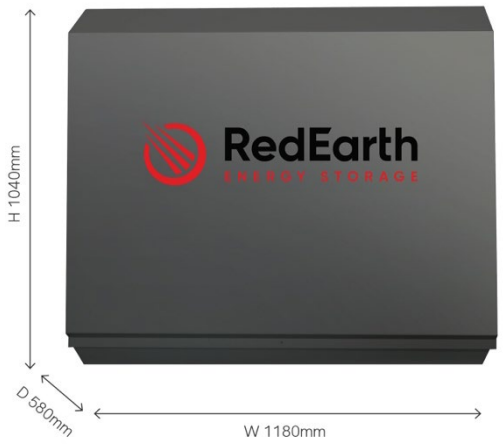
BushChook system owners can join RedEarth's Smart Energy Trading program, which uses our proprietary trading algorithms to maximise their returns. Customers can register directly through the RedEarth app—the same platform they already use to monitor their BushChook.
Smart Energy Trading requires a suitably sized BushChook system and a wholesale energy retailer. Our support team can confirm whether the system meets the requirements.

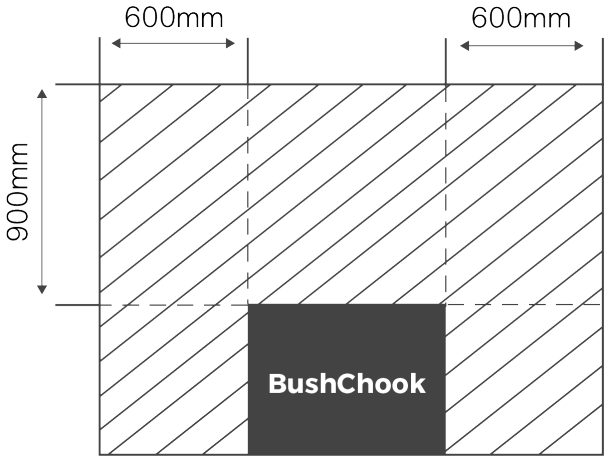
Smart Energy Trading PPP modules currently available include:

1. **Access to wholesale electricity pricing**— RedEarth can assist in transitioning from a standard electricity plan to wholesale pricing through a wholesale energy retailer. This shift can lower the average energy costs, when the BushChook system provides electricity during periods of high market prices.
2. **Automatic Energy Trading**— Sell excess electricity at peak times using RedEarth's proprietary automated trading algorithms. The system identifies the best moments to buy and sell, maximising the financial return.
6. **Smart EV charging**—RedEarth's algorithm determines the optimal time to charge.
   When paired with the Boomerang V2G (Vehicle-2-Grid), the system can also discharge the vehicle, providing an additional energy source from the large battery in an electric vehicle during off-grid operation or storm-related outages.

RedEarth continues to develop new PPP modules, each designed to deliver specific benefits depending on whether the system is on-grid or off-grid and on the size of the BushChook system.

Dimensions and Positioning





BushChook weight and size

- 495 kg with 8 x TROPPO ULTRA Lithium batteries (45 kg per battery)
- 135 kg complete without batteries.
- 1040 H x 1180 W x 580 D [mm]

Positioning information summary

Minimum clearance around BushChook where no windows doors etc are allowed. According to AS/NZS 5139.

Note: if the system is >300 mm off the wall then this does not apply. The BushChook system should be installed in a shaded area.

Overview of the installation tasks

A typical complete installation of the BushChook home battery will require the electrical connection of the following items. If the home is only off-grid then there is no need to connect the grid or the feed-in meter/CT, but a backup generator will very likely be required.
Note: Differences between 1-phase and 3-phase systems are highlighted where necessary.

1. **Grid:** AC cables run from the MSB (Main switchboard) directly to the grid terminals inside the BushChook system. In 3-phase system observe the correct phase rotation.
2. **Feed-in Meter/CT** (supplied) Required for on-grid systems that are not installed as whole home backup. It is installed in the MSB and connected to the BushChook system via a Cat5/6 cable or similar (not supplied). *The information from this meter affects the operation of the BushChook system, make sure both the wires and CT are connected the right way around.*
   - In addition to the Feed-in meter the MSB will also require a MCB to be installed to allow the BushChook system to be isolated, for example to work on the MSB.
3. **Load:** AC cables from the MSB directly to the Load terminals inside the BushChook system.
   - **Note:** The BushChook system is designed as a whole home backup system, however if the loads in a particular house are greater than the capacity of the BushChook system then the loads inside the MSB will need to be split to ensure that the backed-up circuits do not overload the BushChook system.
   - The BushChook 3-phase is rated at 12 kW and the 1-phase at either 10 kW or 5 kW, depending on which system was ordered. Loads such as pool pumps and under floor heating should probably not be backed up.
   - Putting too many loads on the backed-up circuit can also empty the battery quickly during an outage. In this case additional battery capacity may be required. Note that the BushChook has a multi-purpose SMART Port that can act as a Smart load which can be programmed to turn off at a pre-determined battery state-of-charge (SOC) leaving the remainder of the battery capacity for more critical loads. see details below under **Optional - SMART Port connection.**
4. **Solar:**

Specification	5 kW 1-Phase	10 kW 1-Phase	12 kW 3-Phase
Number of MPPTs	2	3	2
String Configuration	1 + 1	2 + 2 + 2	2 + 1
Total arrays accepted	Up to 2	Up to 6	Up to 3
Maximum String Voltage	500 Vdc	500 Vdc	600 Vdc

   For example, the 5 kW 1-phase accepts up to 4 arrays where each tracker accepts two strings in parallel with a maximum string voltage of 500 Vdc.

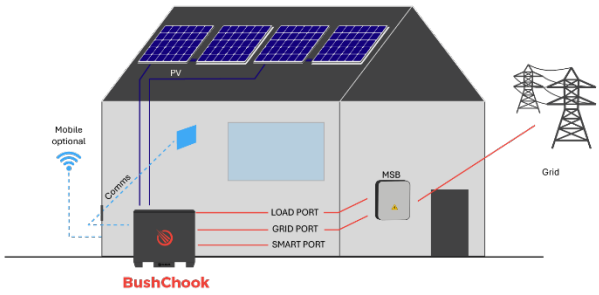
5. **Batteries:** The BushChook is pre-wired for up to eight Troppo ULTRA batteries. Each Troppo ULTRA battery has a nominal capacity of 5.6 kWh. The batteries need to be installed and plugged in.
6. **Remote monitoring:** The BushChook system needs to be connected to the internet to provide its full capabilities. Note this applies to both on-grid and off-grid Installations. If no internet connection is available, then no remote monitoring is available for the BushChook system. The BushChook battery system comes with an automatically three-months free remote monitoring via mobile internet. After this initial period, there is a charge to continue remote monitoring via mobile internet.
   - A cell phone booster option is also possible in areas with poor mobile phone coverage. Contact RedEarth for details.
   - Hard-wired internet cable from the home internet router to the BushChook system can be installed if available. This provides the most robust communication link versus a Wi-Fi or 4G signal.
7. **Optional - SMART Port connection:** The BushChook system has a third AC connection option, the SMART Port that can perform different functions depending on how it is configured. It can connect an auto-start generator, but it can alternatively be configured to either connect and manage a separate AC-coupled PV inverter OR it can power a "smart load" such as a pool heater or crypto miner. See notes below. ***By Default, the SMART port is configured to operate a Backup Generator, please notify RedEarth at the time of sale, or installation if you wish to adjust this***.

- Smart Load: If connecting a smart load, run your designated smart circuit into the ac breaker labelled Smart / Gen. This load will run when the batteries are above a programmed state of charge, and power down when the batteries fall below this SOC. For example, an air-conditioned could be powered via this SMART Port so that in a power outage it will continue running until the battery reaches a pre-programmed SOC. The SMART port can also be configured to always provide power to this circuit when the grid Is connected, independent of the battery SOC.
- AC Coupled Solar: An AC coupled solar Inverter, or micro-inverter can be connected into the terminal labelled ***Smart / Gen terminal***. This opens up the opportunity to redirect the output of an existing PV system to this port, allowing it to be controlled by the BushChook system. Note: It is important that the shutoff frequencies are set appropriately so that the BushChook system can correctly manage this extra AC-coupled PV system (consult RedEarth tech support), and it Is also essential that the AC coupled PV does not exceed a 1:1 relationship to the BushChook inverter size (5 kW or 10 kW for 1-phase or 12 kW for 3-phase).
- Generator: The SMART port is set to generator in the default configuration of the BushChook. This mode will automatically call your generator when the SOC reaches a lower SOC (battery voltage setting), this will then stop the generator when the SOC reaches the higher SOC (battery voltage setting), If you require assistance adjusting these two set points contact RedEarth tech support. The BushChook includes a 2-wire generator auto-start feature. See Section 4.6 for details.

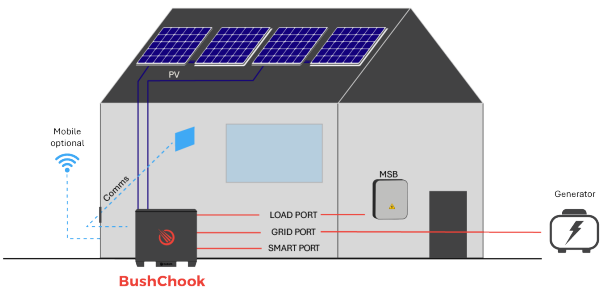
Key additional tasks to complete the installation include:

1. **Book the install with RedEarth:** When you know the installation date, book the time with RedEarth so that they are sure to be there to help you and also confirm that the system and the remote monitoring is properly setup.
2. **Optional - receive training on the BushChook system at RedEarth's facility In Brisbane.** It Is also possible for RedEarth to provide training at reseller/installer facilities.
3. **Adjusting the programming of the BushChook inverter** for the customer's specific requirements. (e.g. adjust the level of grid-feed allowed by the utility or modifying the SMART Port function). See STEP 6 - Commissioning the System

On-grid example



Off-grid example



4. **Handover to the customer:** this includes demonstrating what circuits are backed up during an electricity outage (by actually turning off the grid supply) as well as demonstrating how the backup generator works (if one is installed) and confirming that it charges the battery system.
5. **Customer to scan the QR code:** This is important for the customer to be able to monitor their system on RedEarth's app as well as access the benefits of RedEarth's Private Power Plant features. It also registers the warranty.

Note: *The BushChook is not designed to act as the customers MSB as it does not include space for additional main & customer circuit breakers or RCDs. RCD's must be installed in the MSB as required by AS4777.2:2020.*

Internal Components Description

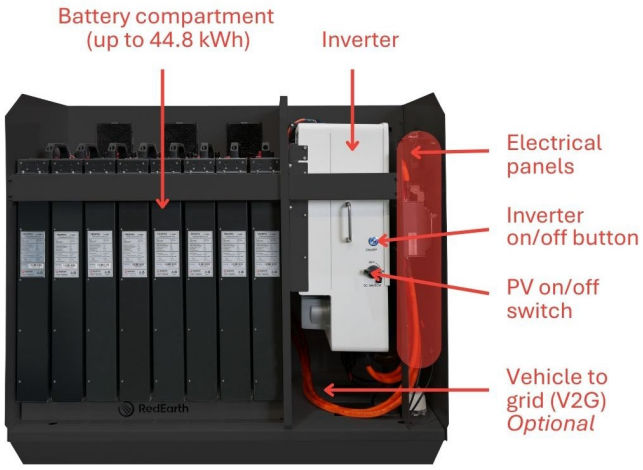
Opening the BushChook

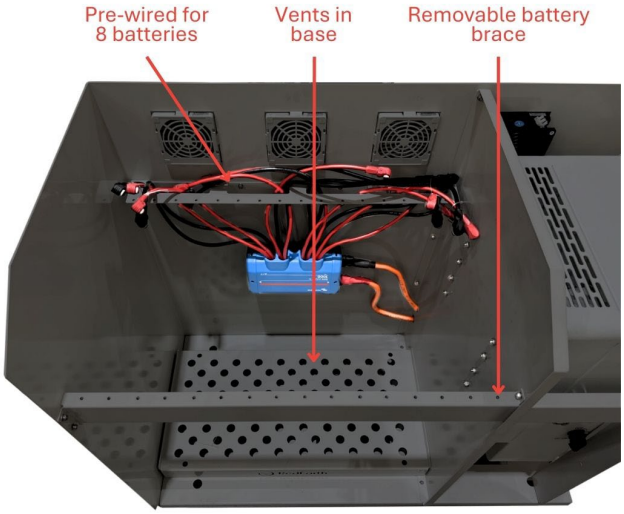
RedEarth's BushChook Home battery system can be accessed by removing the lid. To do this, remove the nine (9) screws with a Philips screwdriver (PH2), lift and pull the cover away from the unit and place in a safe location.

> ⚠ Removal of the cover must only be done by qualified personnel.

Inside Layout

The BushChook is divided into three main areas. On the left-hand side (LHS) are the batteries, in the middle is the Inverter and on the right-hand side (RHS) are the electrical components and cable connection points for installation. Prior to leaving the factory the system is tested. It leaves the factory with the inverter cabling fully connected and ready-to-run. The batteries are usually removed for transportation.





Battery area

Up to 8 x RedEarth Troppo ULTRA-5156 Lithium batteries can be installed in the BushChook.

All eight sets of battery cables are pre-wired into the system. This makes it very easy to add additional batteries in the future. Note that the battery modules are usually shipped separately and installed during installation.

Inverter area

Here you will find the Deye Inverter (5 kW, 10 kW or 12 kW). All the connections to it are already made to the inverter and the fans are pre-wired, so there is no installation wiring to be done in this area.

Electrical panel area

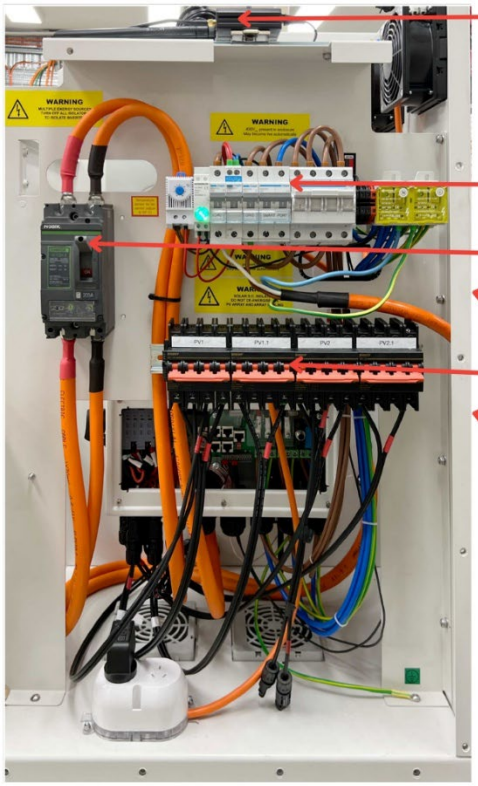
This area is designed for easy access to all the switchgear and wiring, like a typical switchboard.

To access this panel the right-side cover of the BushChook system is removed. Here you will find all the protection devices and the connection points needed to wire in the system during installation.

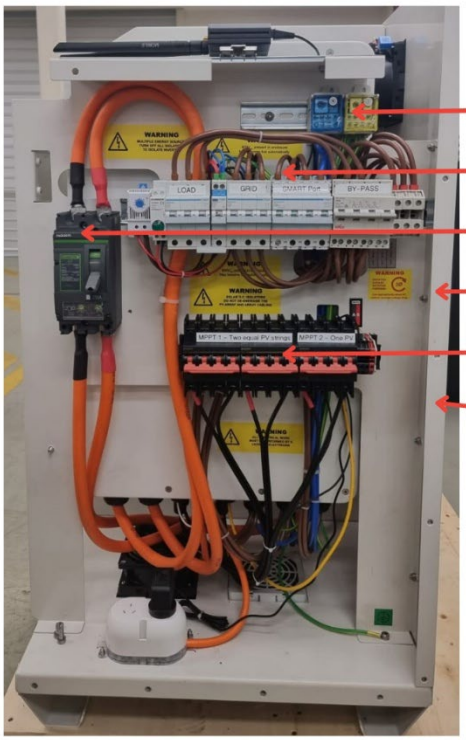
There are labels to clearly identify where cables are connected during installation.

Note that the wiring and switchgear for the three-phase and single-phase panels is different.

1-phase system



3-phase system



Parts kit and documentation

The BushChook is supplied with documentation and a parts kit box to complete the installation.

Documentation

- ❑ BushChook Installation Manual
- ❑ BushChook User Guide
- ❑ BushChook identification sheet (serial #s etc)
- ❑ Feed-in meter manual (Eastron)
- ❑ Inverter manual – Deye
- ❑ MSDS – Troppo ULTRA battery
  Note: This SDS must be left with the Main SwitchBoard for the fire brigade.
- ❑ Warranty terms

Parts Kit Box

- Documentation listed above.
- Feed-in meter (Eastron 1-ph or 3-ph version) for installation in the switch board plus CTs to connect to the meter (one for 1-ph and three for 3-ph). Note that a Cat5/6 cable or similar to connect the feed-In meter back to the BushChook system Is NOT supplied and needs to be provided by the installer.
- Stickers and Traffolytes required to complete the installation.
- 4 x Dynabolts for securing the BushChook system to the ground.
- 2x M16 gland for the comms antenna
- 6x M25 glands (suitable for sealing around 25 mm flexible conduit)
- Suitable circuit breakers for installation into the switchboard to isolate the BushChook when required. (1-phase 1 x 40 A or 50 A 2-pole, 3-phase 2 x 40 A 3-pole)

Installation and Customer Handover

The BushChook system is designed to be easy to install. It includes prewired connection points and comprehensive labelling and parts kit to simplify the installation. Technical support is available directly from RedEarth during installation if required. Contact details are included at the back of this manual.

8 steps to complete your BushChook installation:

1. Transporting – getting the BushChook to site.
2. Positioning – the BushChook in its final location
3. Solar Installation – including bringing the PV cabling to the BushChook system.
4. Electrical connections – at the BushChook system and the house switch board
5. Understanding turn on/shutdown procedures.
6. Commissioning the system – turning on and programming and confirming system operation
7. Activating remote Monitoring and Communications – contact RedEarth to confirm remote operation.
8. Customer Handover – including scanning the QR code and their access to the EMU app.

Step 1. Transporting

The BushChook system is usually supplied on a pallet, with the batteries in separate cardboard boxes. It has been factory tested; however, the batteries are usually subsequently removed for transportation. Without batteries but with all other components in place the 5 kW 1-phase system weighs 109 kg and the 12 kW 3-phase system weighs 135 kg.

The BushChook 5 kW 1-phase system weighs 469 kg when filled with 8 lithium batteries. The BushChook 12 kW 3-phase weighs 495 kg when filled with 8 Troppo ULTRA batteries. The image shows a BushChook with batteries packed separately as well as a second pallet of solar panels in a trailer.

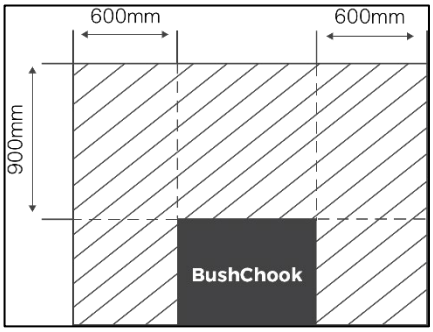
WARNING: Personal Injury
Use safe lifting techniques and standard safety equipment when transporting and installing the BushChook system.

Step 2. Positioning

The BushChook is designed as a freestanding weatherproof system (IP43).
It should be installed in a shaded area to minimise the chance of overheating. If the system overheats past 45°C the power output will start to derate until it reaches 60°C at which point It will shut down. (Once the system cools down again it will restart automatically).

The BushChook system should be located at least 100 mm off the wall to allow for proper ventilation through the rear vents. If possible, it should be placed closer to the solar panels and the main switchboard to minimise cable run length and voltage drop/power loss.

- If the system is installed within 300 mm of a wall then, to comply with Australian standards for a house, allow space around the system as shown in the image at right (no doors or windows within the shaded area).



BushChook Minimum Clearance
According to AS/NZS 5139

Issue date: 20/04/2026. Version: 4.0
For technical support: redearth.energy/raise-a-ticket/
1800 733 637 | 15 Fienta Place, Darra BRISBANE QLD 4076 | www.redearth.energy

- Note: the material that the wall is made of (its flammability) can influence the allowed positioning, however, if the BushChook system is installed >300 mm off the wall then the type of material is no longer relevant. This is a specific advantage of the BushChook system over some competitor's products which must be attached to the wall.

Cooling air flow passes up through vents in the base of the BushChook system and then out through fans at the rear. The fans are controlled by an adjustable temperature switch set to 25^{0}C in the factory. Do not block any vents or airflow access to the base as otherwise the system will overheat and shutdown.

Once the assembled BushChook enclosure is placed in position, and before installing batteries, it should be secured to the ground via the holes in the base using the supplied Dynabolts or material appropriate fixings.

Note: *BushChook can be installed indoors. however, proper additional ventilation must be installed according to AS/NZS 5139.*
Note: *Minimum distance between the wall and the back of the BushChook is 100 mm.*

Step 3. Solar Installation

PV Racking & Solar panels should be designed and installed in accordance with AS/NZS 5033 and the latest CEC Installation guidelines. Caution should be taken in selecting PV panels and the wiring method to ensure Open Circuit Voltage (V_{OC}) and Short Circuit Current (I_{SC}) ratings are not exceeded.

3.1 PV String configuration

String voltage overview:
Specifications of a typical 400 W Solar panel are listed below.
If the maximum string voltage is 500 V then the maximum number of panels that can be connected in series is nine, in an area where the temperature may drop to 0°C during the day.

This is because the VoC increases from 49.5 V to 52.8 Vdc at 0°C.

This is calculated as follows:

25° (difference from 25°C to lowest expected temp of 0°C) x -0.270%/°C = 6.75% voltage Increase from 49.5 V. Therefore, the maximum panel voltage that can be expected = 49.5 x 1.0675 = 52.8 Vdc. So only nine panels can be connected in series to stay under 500 Vdc maximum.

Electrical characteristics 400W panel	Mono-Crystalline Module (HiE-S_____UF)	
Maximum Rating Power (Pm)	W	400
Open Circuit Voltage (VoC)	V	49.5
Short Circuit Current (Isc)	A	10.12
Maximum Power Voltage (Vmp)	V	41
Maximum Power Current (Imp)	A	9.76
Module Efficiency	%	21.3
Maximum System Voltage	V	DC 1,500
Temperature Coefficient of Pmax	% / °C	-0.340
Temperature Coefficient of Voc	% / °C	-0.270
Temperature Coefficient of Isc	% / °C	+0.040

BushChook 5 kW 1-phase system

This 5 kW system Is offered if the customer already has an existing solar system and the DNSP only allows up to 10 kW of total inverter size to be connected at the premises.

A maximum of 10 kW of PV can be connected to the x2 MPPTs. Each MPPT can have only one string connected to it as shown in the table below. This could be two strings of 9 x 400 W panels, with each string going into one of the MPPTs.

Note also that the maximum PV voltage at the lowest expected temperature must be below 500 Vdc.

PV String Input Data for **5 kW BushChook 1-Phase**	
Max allowable PV (W)	10,000 W
Max usable PV (W)	7,500 W
PV input voltage (V)	370V (125 V~500 V)
MPPT range (V)	150~425 V
Full load DC voltage range	300~425 V
Start-up voltage (V)	125 V
PV input current (A)	13 A+13 A
Max. PV Isc(A)	19.5 A+19.5 A
No. of MPPT trackers	2
No. of strings per MPPT tracker	1+1

BushChook 10 kW 1-phase system

A maximum of 20 kW of PV can be connected to the x3 MPPTs. Each MPPT can have two strings connected in parallel as shown in the table below. These parallel strings must be the same length and be oriented in the same direction. These could be laid out as three instances of 2 strings of 8 panels in parallel with each instance going to a MPPT (giving 19.2 kW).

PV String Input Data for **10 kW BushChook 1-Phase**	
Max allowable PV (W)	20,000 W
Max. usable PV (W)	15,000 W
Max. DC input voltage (V)	500 V
Start-up voltage (V)	125 V
MPPT voltage range (V)	150-425 V
Max. operating PV input current (A)	26+26+26 A
Max. input short-circuit current (A)	44+44+44 A
No. of MPPT trackers/ No. of string per MPPT tracker	3/2+2+2

BushChook 12 kW 3-phase system

A maximum of 24 kW of PV can be connected to the x2 MPPTs, however this is configured with one string going to the first MPPT and two equal length and parallel strings going to the second MPPT. Note that with this Inverter the maximum PV voltage is 600 V. The installer needs to follow the current rules for residential homes.

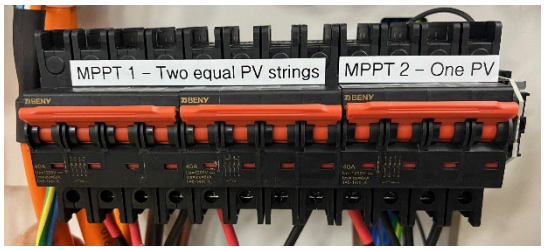
If the limit is 600Vdc then a typical PV string layout using the 400 W panels described above would allow a maximum of 45 panels to be connected and still claim the STCs. However, with a maximum PV string voltage of 600 V, only up to 11 panels could be connected in series.

PV String Input Data for **12 kW BushChook 3-Phase**	
Max allowable PV (W)	24,000 W
Max usable PV (W)	18,000 W
PV input voltage (V)	550V (160 V~600 V)
MPPT range (V)	200V-600 V
Start-up voltage (V)	160 V
PV input current (A)	26A+13 A
Max. PV Isc(A)	39A+19.5 A
No. of MPPT trackers	2
No. of strings per MPPT tracker	2+1

These could be laid out as 2 strings of 11 panels in parallel going to the higher rated MPPT, and 1 string of 11 panels going to the other MPPT. In this case a maximum of 33x400 W of this specification panels could be connected = 13.2 kW of PV panels.
Note that there are panels with other specifications that may be more suitable for a particular site.

3.2 PV Isolators

The PV isolation is provided by built-in MCBs. The number of MCBs depends on the size of the BushChook system. 5 kW (2 strings and 2 MCBs), 10 kW (6 strings and 3 MCBs) or 12 kW (3 strings and 3 MCBs). See image at right for the 12 kW 3-phase system. The individual PV cables are brought into the rear of the unit and connected to the MCBs. It is important to connect PV strings of equal length and orientation when 2 strings are going into one MPPT.



Note: *PV modules must have an IEC61730 Class A rating*

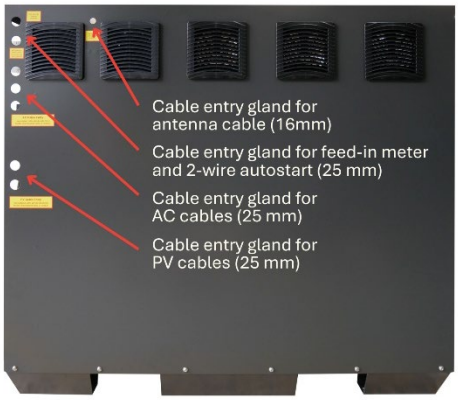
Note: *Ensure that the array is within the inverter specification and that the polarity of the array is correct*

Note: *PV array must be floating (must not be grounded)*

Step 4. Electrical Connections

Before any electrical connections are made, check all internal connections in the BushChook are secure and have not come loose during transport.

Ensure that all breakers and isolators, as well as those supplying power to the unit, ***are turned OFF.***



All cable entry points for the AC, PV and any communication cables are made via the 25 mm gland/entry points on the rear of the system, as shown at right. Use the 25 mm glands that are supplied in the parts kit. These glands are designed to accept flexible 25 mm conduit directly.
The 16 mm gland is for the antenna of the RedEarth monitoring device.

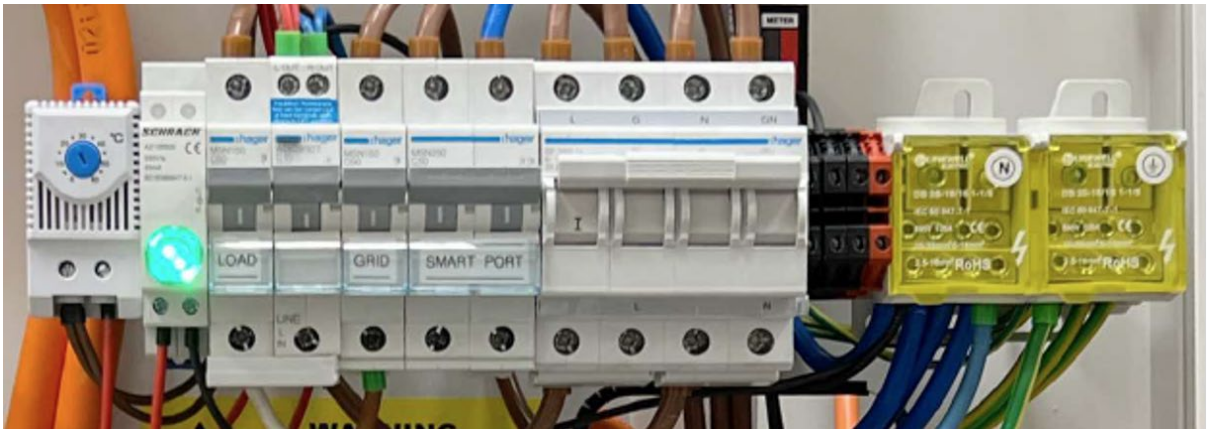
The BushChook system must be hardwired to a remote switchboard, which contains a MEN link and an earth stake.

To begin, remove the lid of the unit as explained in “Opening the BushChook” section. Next remove the right-side panel. This will provide direct access to all the switchgear and all the connection points needed for installation.

4.1 Grid, Load and Smart Port connection

MCBs and terminal blocks are installed and pre-wired on a single DIN rail to simplify making all the GRID, LOAD and SMART PORT connections during installation. They are labelled as shown below.

1-phase AC:



3-phase AC:

The Terminal Block labelled as GRID connects the BushChook directly to the Grid in the MSB.
Note: In off-grid installations this connection is not required.

The Terminal Block labelled as LOAD identifies the connection point that remains live during a Black-out. Do not overload the LOAD circuit with too many circuits in the MSB. Depending on the inverter size the BushChook can support 5 kW, 10 kW or 12 kW of power from the battery.

The terminal block labelled SMART Port has three different options. It can be used to connect either a generator, AC coupled solar or a smart load.

Generator Port: The generator setting is the default configuration of the BushChook. This mode will automatically call your generator when the SOC reaches a lower SOC (battery voltage setting), this will then stop the generator when the SOC reaches the higher SOC (battery voltage setting), If you require assistance adjusting these two set points contact RedEarth tech support. The BushChook includes a 2-wire generator auto-start feature. See Section 4.6 for details.

AC Coupled Solar: An AC coupled solar inverter, or micro-inverter can be connected into the MCB labelled SMART Port. This opens the opportunity to redirect the output of an existing PV system to this port, allowing it to be controlled by the BushChook system. Note: It is important that the shutoff frequencies are set appropriately so that the BushChook system can correctly manage this extra AC-coupled PV system (consult RedEarth tech support), and it Is also essential that the AC coupled PV does not exceed a 1:1 relationship to the BushChook Inverter size (5 kW or 10 kW for 1-phase or 12 kW for 3-phase).

Smart Load: If connecting a smart load, run your designated smart circuit into the ac breaker labelled SMART Port. This load will run when the batteries are above a programmed state of charge, and power down when the batteries fall below this SOC. For example, an air-conditioned could be powered via this SMART Port so that in a power outage it will continue running until the battery reaches a pre-programmed SOC. The SMART port can also be configured to always provide power to this circuit when the grid Is connected, independent of the battery SOC.

If you require assistance adjusting these set points, contact RedEarth tech support.
To connect the AC cables to the system, pass them through the upper 25 mm holes in the rear of the BushChook (the glands provided which are designed to seal around 25 mm flexible conduit). Secure the ends of the cable into the correct terminal blocks.

The cables for connecting the MSB to the Grid, SMART PORT and LOAD terminals must be sized to support the constant rating of the 5 kW or 12 kW inverter according to AS/NZS 3008.1.1:2017. All cables must be sized to appropriate Australian standards. 40 A or 50 A MCBs are installed in the BushChook.

Note: *Earth connection must be made to the same switchboard as the power cables.*

Note: *This system complies to IEC 62109-2 clause 13.9 for earth fault monitoring.*

4.2 Main Switchboard Wiring & Feed-in Meter Installation

4.2.1 Whole home backup (requires sufficient inverter size)

If the whole home is being backed up by the BushChook (all circuits - like what happens in an off-grid installation) then there is no need to separate the circuits in the switchboard. Also, the CT built into the BushChook inverter is used and there is no need for an external CT/Feed-in meter to be installed. There is also no need to separate the circuits in the switchboard.
Only one step is required:

- Installation of a double pole MCB breaker (1-phase) or 2 x 3-pole MCBs for the 3-phase installation, to isolate the BushChook system if work is being done in the switch board.

4.2.2 Partial home backup

Three tasks must be completed in the switch board for a complete BushChook installation when partial home backup is implemented:

Note: Refer to the SLD diagrams in Appendix A for additional information.

- Separation of the circuits in the main switchboard into
  - LOAD circuits that are backed up during an outage and,
  - Loads that are unsupported during an outage (e.g. pool heating, electric floor heating etc)
- Installation of the supplied double pole MCB breaker (1-phase) or 2 x 3-pole MCBs for the 3-phase installation, to isolate the BushChook system if work is being done in the switch board.
- Installation of the supplied Feed-in meter: (Eastron) and CT (1-phase has one CT, 3-phase has 3 CTs) and connection of an associated CAT5/6 cable from the feed-in meter back to the BushChook system (not supplied). The manual for the feed-in meter is included in the parts kit.

Meter connection: *Be sure to wire it into the side that turns off during a grid power outage and have the CTs clipped in between the Electricity Meter and the Main Circuit Breaker (with the ARROW pointing towards the BushChook system - see image).*

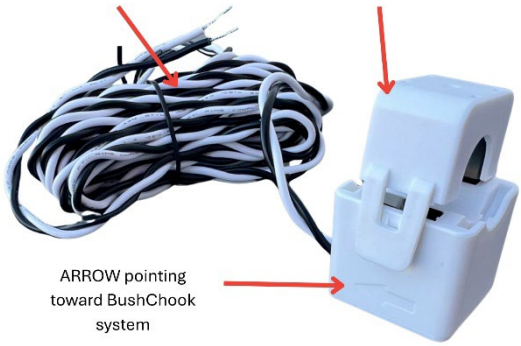
The meters supplied in the parts kit are shown below (3-phase and 1-phase meters and CT)

SDM630MCT 40mA

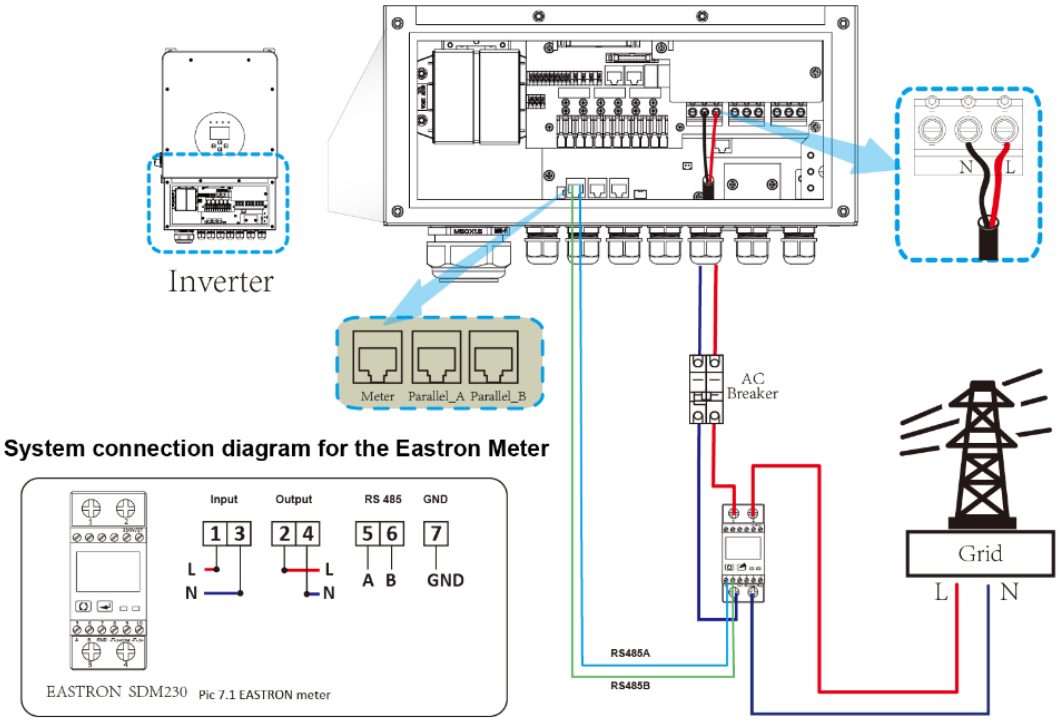
DIN Rail Energy Meter for Single and Three Phase Electrical Systems

SDM120CT-M(40mA)

Single-Phase Multifunction DIN Rail Meter



The communication cable from the feed-in meter to the BushChook system can be made using 2 wires of a CAT5 or CAT6 cable. Connect one strand to the terminal A on the Eastron meter and the second to terminal B. See the image overleaf. Inside the BushChook the terminals that the other end of this CAT cable will connect to are located on the end of the AC DIN rail. Strip the end of strands A and B and connect them to the correct terminals.



System connection diagram for the Eastron Meter

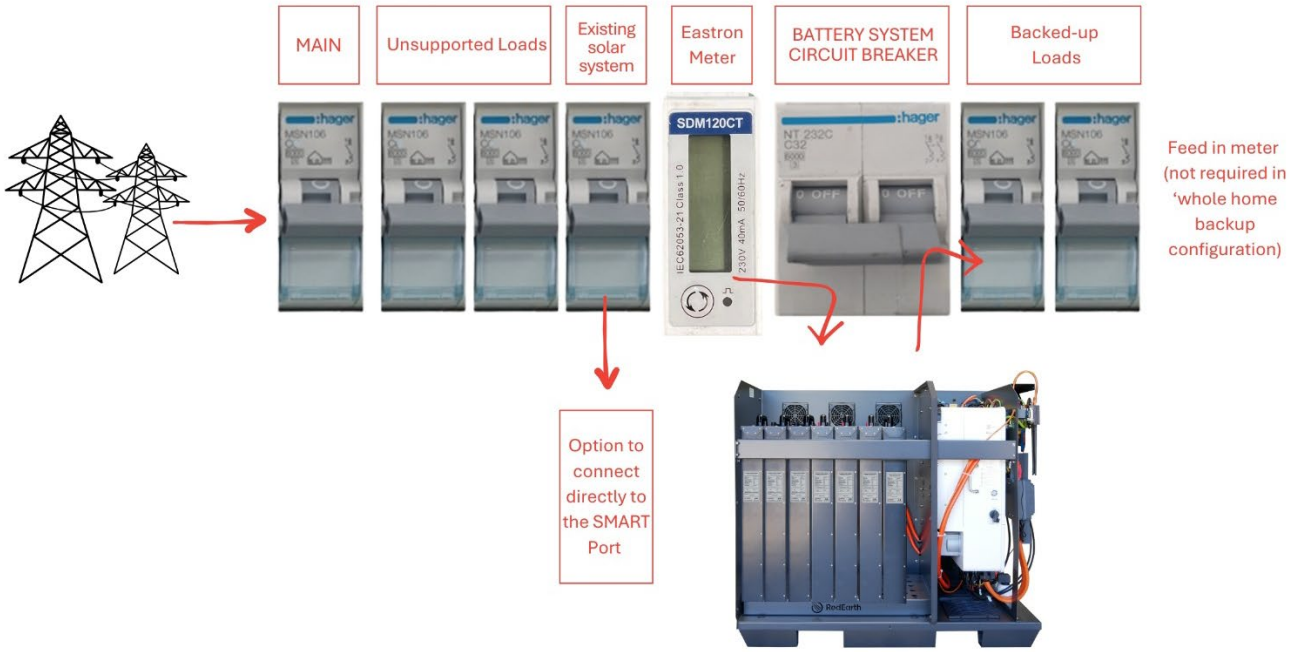
Pic 7.1 EASTRON meter

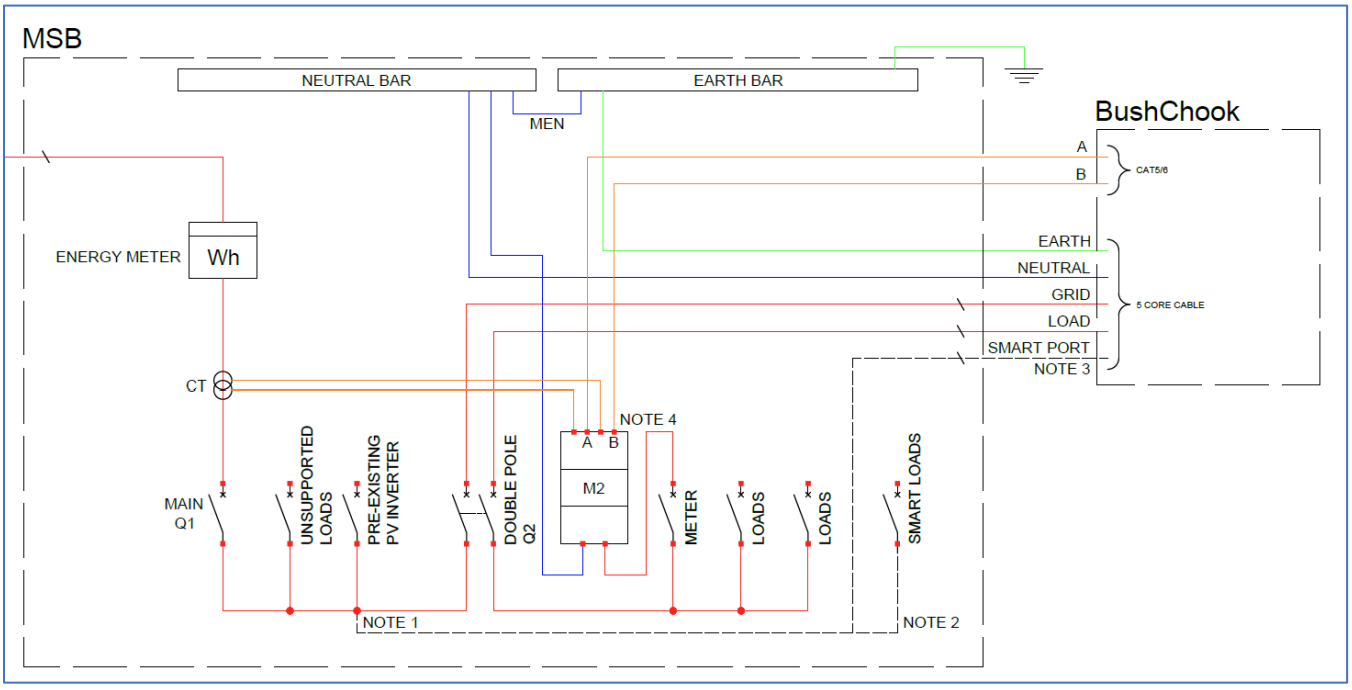
For ease of comprehension, install the BushChook system isolator (MCB) between the unsupported loads and the backed-up loads, as shown below. Then all the backed-up loads can be put on the right-side of the BushChook system isolator.

After the installation of the BushChook, the Main Switchboard of the property should look something like this (1-phase example shown). The two key components related to the BushChook system are identified below:

- "BATTERY SYSTEM CIRCUIT BREAKER": Isolates the BushChook from the Switchboard, which is required if for example work is to be done on the Switchboard. At all other times this switch remains on. In the 3-phase installation there are 2 x 3-pole switches required (included in the Parts kit).
- BushChook Feed-in Meter: The CT connected to this meter measures the amount of power exported to or imported from the grid. Note that the CT needs to be connected at the incoming grid connection. Note: If the installation is setup as whole home backup, then the CT is not required as the CT built into the BushChook inverter is used instead. Also, this meter is also not required in an off-grid installation.
- Optional SMART Port MCB - if used. Note, any existing PV Inverter can be connected to the Smart port of the BushChook to allow greater control of its operation and also to keep it operational during any grid outage. In this case it needs to be isolated from the unsupported load bus. (note that this option is not suitable for all existing PV inverters)

During a blackout the loads connected to the LOAD terminal of the BushChook system will keep functioning. The non-essential loads will turn off until grid power is restored. Note that if too many loads are on the LOAD circuit the battery could run flat quite quickly or the backup circuit could become overloaded and turn off temporarily.


MAIN
Unsupported Loads
Existing solar system
Eastron Meter
BATTERY SYSTEM CIRCUIT BREAKER
Backed-up Loads
SDM120CT
Feed in meter (not required in 'whole home backup configuration)
Option to connect directly to the SMART Port


MSB
NEUTRAL BAR
EARTH BAR
MEN
BushChook
A
B
CAT5/6
EARTH
NEUTRAL
GRID
LOAD
SMART PORT
NOTE 3
5 CORE CABLE
ENERGY METER
Wh
CT
NOTE 4
A B
M2
MAIN Q1
UNSUPPORTED LOADS
PRE-EXISTING PV INVERTER
DOUBLE POLE Q2
METER
LOADS
LOADS
SMART LOADS
NOTE 1
NOTE 2

4.3 Battery Connection & Setup

Troppo ULTRA with BMS

The Troppo ULTRA batteries used in the BushChook are controlled by a BMS (Battery Management System). The batteries need electrical, earthing and communication connections.
Follow the procedure below to correctly install the batteries.

Battery Connection

1. **Turn the Isolator off**
   Ensure the BATTERY SYSTEM D.C. ISOLATOR on the right-hand side of the BushChook is turned OFF (down).

Battery System D.C.Isolator

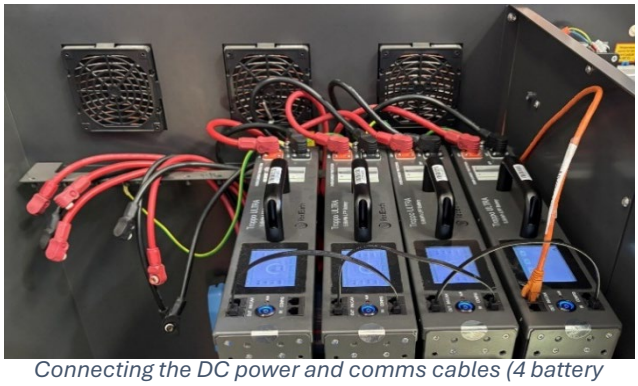
2. **Physical Installation**
   - Take the batteries out of the transport boxes and place them next to the BushChook.
   - Push button on the top of each battery to turn on the BMS displays of all batteries. Confirm that they are all at a similar voltage (within 0.5 V from each other).
     Note: all batteries will show Troppo-1 on the display. When the communication cables are wired, they will be allocated their battery number.
   - On the BushChook system remove the front cross bar by undoing the 4 x 6 mm nuts.
   - Start loading the Troppo ULTRA batteries from the **right-most** position first (closest to the inverter) with the battery displays towards the front.
   - Reinstall the cross bar and install screws in the side brackets of the batteries to hold the batteries in place.
3. **Earth connections**
   - Daisy-chain the battery earth link cables.
   - Connect the last battery in the earth link chain to the earth stud on the chassis indicated with an Earth symbol sticker.


Daisy chain the earth cables (4 battery example)

4. **Electrical connections**
   - Plug the DC power cables into the batteries, ensuring correct polarity (red to red, black to black). To attach DC power cables to the battery terminal, simply push the connector onto the terminal until you hear a click.
     (To remove the battery cables, press the button on the side of the terminal and pull it straight up with a slight wiggle.)
     If the system is not full of batteries, some of the DC power cables will remain unconnected. These are available for connecting additional batteries in the future.
5. **Communication connections**
   - Connect the pre-wired BMS Communications cable from the inverter into the INV CAN port in the Master battery, the **right-most** battery.
   - Connect the supplied BMS ethernet link cables in the order from **right to left**.
     Starting from the **IN** port of Master battery 1 (closest to inverter) into the **OUT** port of battery 2. (The OUT port of Master Battery 1 stays empty.)

- Continue connecting the **IN** port of battery 2 to the **OUT** port of battery 3 and so on to the **OUT** port of Battery 8. (The IN port of battery 8 stays empty.)

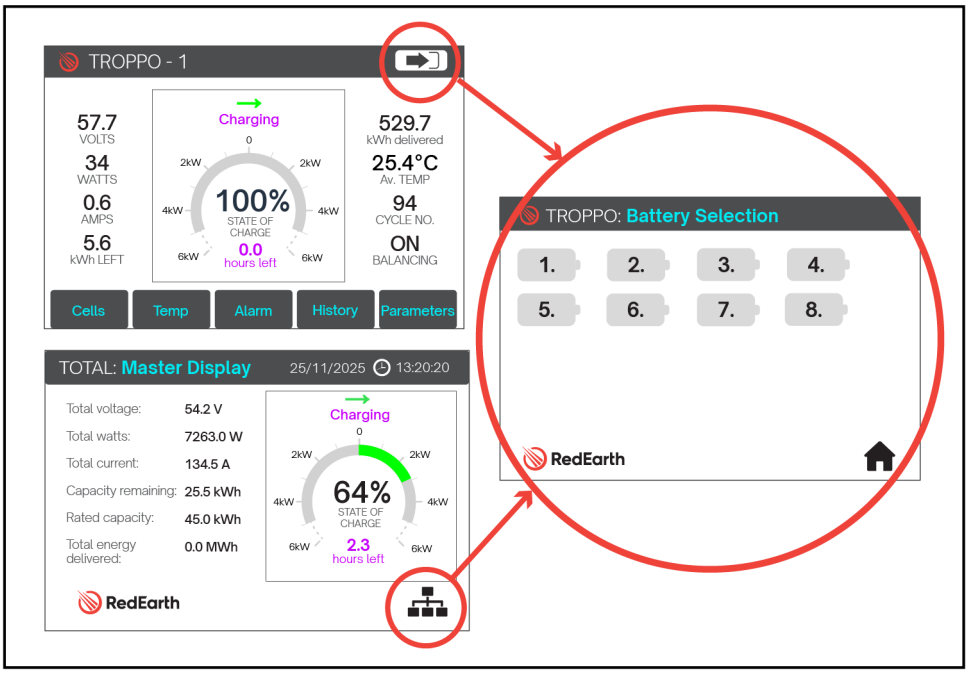
  The batteries will be allocated their battery number e.g. the display of battery 2 will show Troppo-2 (touch the display to wake if needed). This can take up to 5 minutes.



Connecting the DC power and comms cables (4 battery example)

6. Turning the batteries on

- Turn the OVER CURRENT PROTECTION breakers on top of each battery **ON**.
  You will notice some crossflow of electricity as the batteries balance with each other.
- From the master battery display navigate to the *Troppo: Battery Selection* screen.
  There are two options to do this:
  1 From the *Troppo-1* screen, click on the arrow in the right top corner.
  2 From the *Total: Master Display* screen, click on the network icon on the bottom right.



Navigate to Troppo: Battery Selection screen

- Ensure the Master battery **1** can 'see' all the Slave batteries, as per *TROPPO: Battery Selection* screen (see image).

  If the Master battery cannot see all the Slave batteries, or if the batteries are not numbered 1,2,3,....up to 8, check the BMS ethernet cables are securely connected to the right port and in the correct order.

4.4 Earth Fault Alarm

The Earth fault alarm is built into the system. If an earth fault is detected, then a loud audible alarm will sound. The end customer needs to contact the installer to investigate the PV installation. If the customer has signed up to RedEarth Optimum, then the alarm signal will also be sent to RedEarth.

4.5 Solar Connection

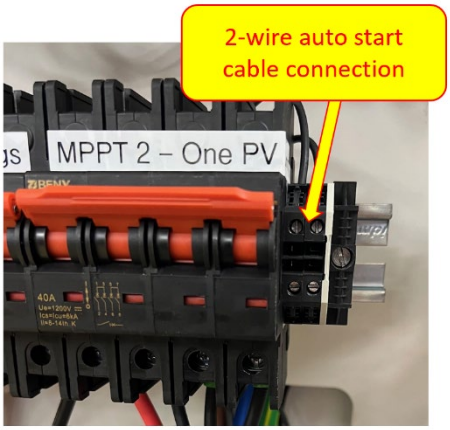
The BushChook systems each have two Maximum Power Point Trackers (MPPTs) The PV string configuration is explained previously in Step 3.

To connect the solar arrays, run the pairs of unterminated PV cables into the lower set of 25 mm holes in the rear of the BushChook (The glands provided in the parts kit are designed to seal around 25 mm flexible conduit). Next check for correct polarity and V_{OC}, then terminate the cables into the appropriate MCB (follow the labelling).

Note: finally ensure that the PV isolator built into the inverter is in the ON position. It is located on the left side of the inverter below the ON/OFF button, as shown here.

4.6 Connecting the BushChook in an Off-Grid Installation

When connecting the BushChook in an off-grid installation, the same process as above is followed, however there is no grid to connect to or feed-in meter to install.



This means simply connect the loads to the LOAD terminal and the generator to the SMART Port (Smart / Gen) terminal.

To benefit from the auto start feature the generator needs to be 2-wire auto-start capable. The two wires are then connected to the terminals inside the cabinet. These are located on the right side of the AC DIN rail. If the generator is not auto-start capable then it must be manually started and stopped when the batteries depleted. =

Step 5. Understanding the Turn ON/SHUTDOWN Procedure

Before starting up the BushChook confirm the following items have been completed:

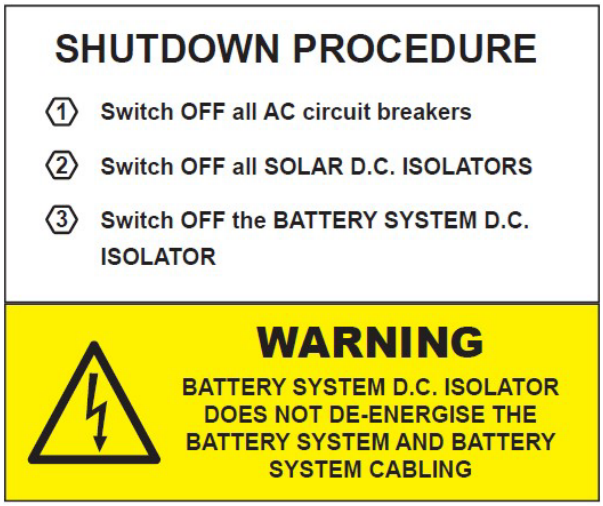
- The PV cables have the correct polarity and are correctly connected to the MCBs provided, particularly any parallel strings going into the same MPPT.
- GRID, LOAD and SMART Port cables are securely connected. The system is correctly earthed and a MEN link is in place in the switchboard.
- Proper weatherproof seals are installed on all cable entry glands of the BushChook System.
- The battery terminal connections on the BATTERY SYSTEM D.C. ISOLATOR are tight. (Check after transportation)
- The 4G antenna is positioned in a good reception area (if it is to be used)

To **Turn ON** the unit for the first time, follow the steps below:

1. Switch ON all battery breakers on top of each Troppo ULTRA battery
2. Switch ON the BATTERY SYSTEM D.C. ISOLATOR
3. Switch ON all the MCB SOLAR D.C. ISOLATORs. Also ensure the PV Isolator on the left-side of the inverter is in the ON position.
4. Ensure the on/off button on the left side of the inverter is ON (in)
5. Ensure the Bypass switch is in the Normal Operation position (upwards = (I))
6. Turn ON all AC circuit breakers and wait for the system to start up (approx. 5 minutes)

The **Shutdown Procedure** is the reverse of the “turn on” procedure and is shown below. This procedure can be found on the traffolyte label on the RHS of the unit.

1. Turn OFF all AC circuit breakers (#1). It is not necessary to turn off the inverter via the push button on the left side of the inverter (with the blue light).
2. Switch OFF the SOLAR D.C. ISOLATORS (#2). It is not necessary to turn off the PV Isolator on the left side of the inverter.
3. Switch OFF the BATTERY SYSTEM D.C. ISOLATOR (#3). It Is not necessary to turn off the individual battery breakers on each battery unless the system will be off for over three months.



Step 6. Commissioning the system

The BushChook is commissioned and tested in RedEarth's factory to confirm correct operation of the system prior to shipment.

The RedEarth settings can be accessed via the inverter screen.
The installer will need to confirm inverter settings and complete on-site parameter adjustments (e.g., Export limitation, connection to the customer's Wi-Fi or changing the Australia A to B or C setting depending on where the system is being installed in Australia).

This involves the following steps, which are detailed after this list.

1. **Power up the BushChook System.** Note that the inverter takes up to 5 minutes to fully start-up when the system is initially powered up. (You may hear a number of relays clicking during start-up).
2. **Access the BushChook inverter.** You can use the display panel on the front of the inverter to adjust all the settings (installer login). Refer to Chapter 5 of the Deye Hybrid Inverter manual for details on adjusting settings using the display panel on the inverter.
3. **Confirm the inverter initial configuration including regional settings** and make any adjustments required.
4. **Fault codes table.** Correct any faults that occur.
5. **Test and confirm the operation of the whole system** – including Backup mode (by turning off the main breaker of the house) also test the operation of the By-pass switch.

Commissioning steps details are explained below.

6.1 Power up the BushChook system

Follow the procedure outlined in Step 5 "Understanding the Turn ON/Shutdown procedure" above. Note: during powerup you may hear several relays clicking inside the system.

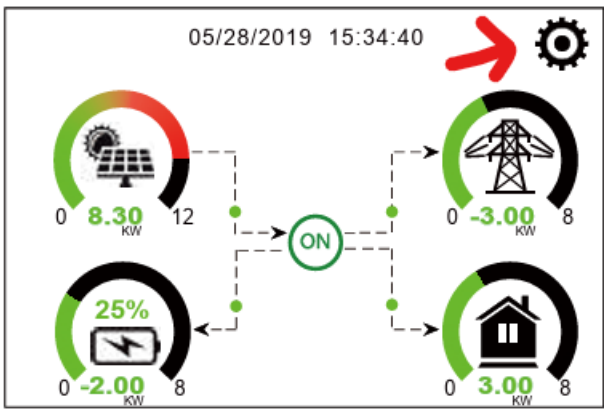
6.2 Access the Inverter via the Inverter Screen

The BushChook has been commissioned and tested in RedEarth's factory.
Only minor parameter adjustments may be required.

These changes can be made via the BushChook's inverter screen directly.

6.3 Confirm the Inverter Configuration (including regional settings)

Click the **System Setup** gear icon on the top right to enter the settings.

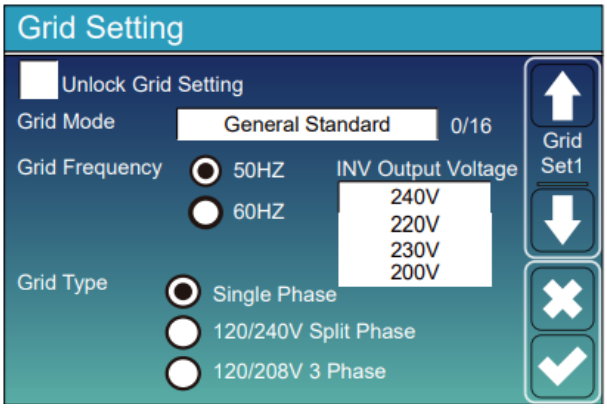


Issue date: 20/04/2026. Version: 4.0

System Setup -> Grid Setting

Confirm the settings are suitable for the installation site.

Select Australia A, B or C (for grid-connected systems). This will set the power quality response mode and grid protection settings to the default values for Australia Region A, B, C respectively.



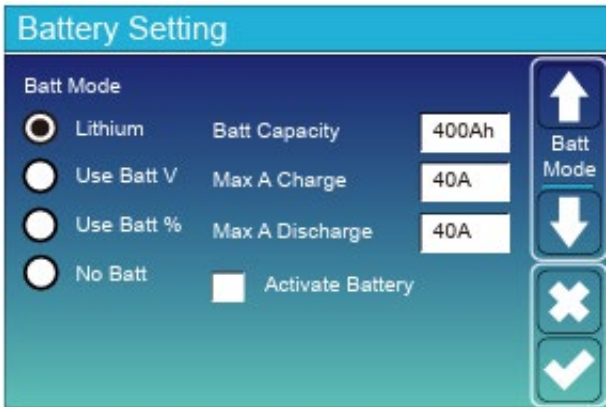
Battery Setting

Select **Lithium** as battery type.

Set **Battery Capacity** to number of Troppo ULTRA batteries x 110 Ah.

Set both **Max A Charge** and **Max A Discharge** to the following:

Batt	5 kW	10 kW	12 kW	15 kW
1	55	55	55	55
2	110	110	110	110
3	120	165	165	165
4	120	220	220	220
5	120	220	240	250
6	120	220	240	250
7	120	220	240	250
8	120	220	240	250



System Work Mode1

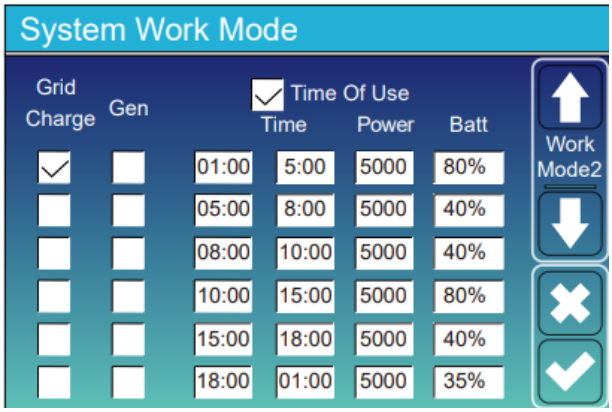
Set the following values:

- Set **Max Solar Power** to the inverter's capacity in Watts.
- If there is no meter, select **Zero Export to Load**.
- If there is a meter (Eastron or Chint) or external CTs connected to the inverter, select **Zero Export to CT**.
- Set **Max Sell Power** to the grid export limit allowed for the premise.
- Select **LoadFirst**
- Clear **Grid Peak Shaving**
- Select **Solar Sell**
- Set **Zero-export Power** to 0 (zero)

System Work Mode2

The default settings are:

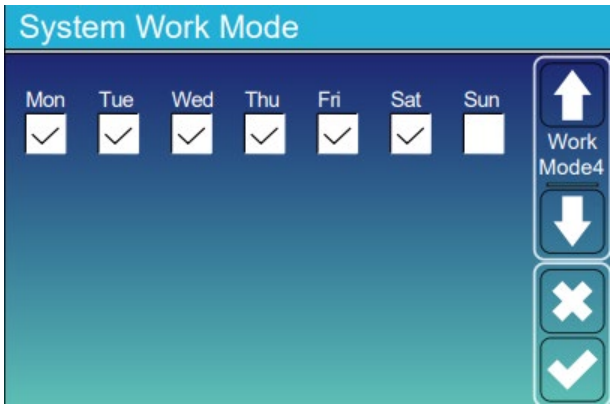
- Select **Time of Use** – this enables all other settings.
- Select **Grid Charge** – indicates to use the grid to charge the battery in this time period (select for all time periods).
- Optionally select **Gen Charge** – indicates the generator to charge the battery in this time period. Used for systems with generators connected in off-grid or hybrid systems (select for all time periods).



- Set **Time** – to set the start & stop time for which these settings are valid.
- Set **Power to** maximum discharge power from the battery allowed in that time period. Usually set to the battery capacity.
- Set **Batt** (V or SOC%) – usually set to 20%. It indicates the level to which the inverter will maintain the battery's voltage or SOC% when charging during the time period.

  E.g The first line in the above example says that in the time period between 1am and 5am, the inverter will keep the batteries at 80% SOC. If the SOC is below 80%, it will charge the batteries from the grid (on top of the solar) at 5000 W.

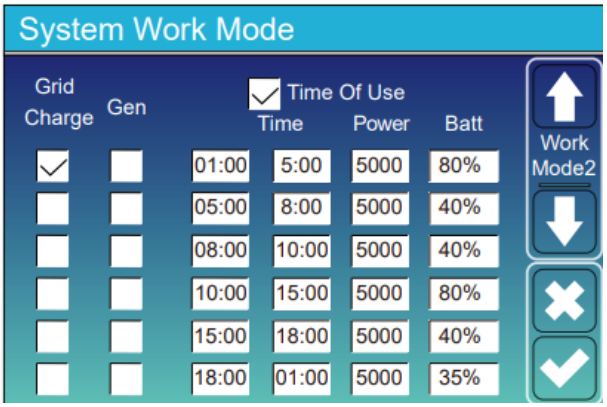
System Work Mode4
Select **Time of Use** for all days. This indicates the days on which the settings are enabled.

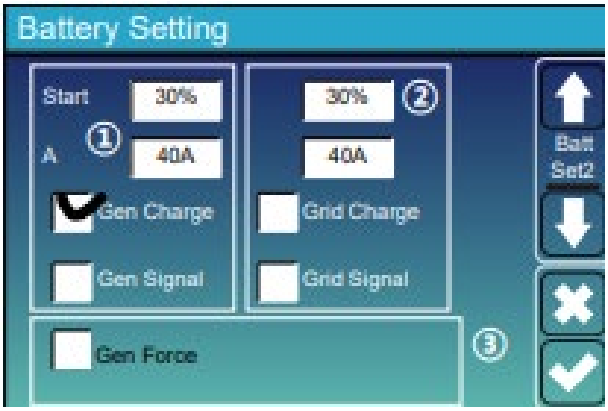


Adjusting Generator Charge Rate
This is usually only required if the BushChook is installed **off-grid.**
To adjust the generator limit you must adjust two parameters:

1.Navigate to **System Work Mode-2** and adjust **Power.** This will adjust how much the generator can be used to feed any loads if the battery is full.

2. Navigate to **System Setup** -> **Battery Setting2**, select **Gen Charge** and adjust A to the Amps in which the generator will be allowed to charge the battery.

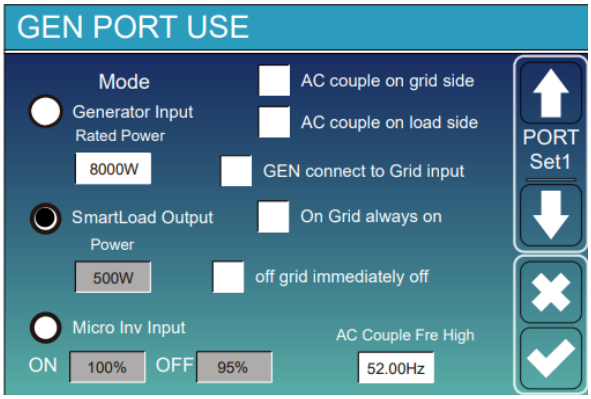




SMART PORT SETUP

The SMART PORT (GEN PORT) can be reconfigured as either a smart load output port or as an AC-coupled solar energy input port.

1. Navigate to **System Setup -> Gen Port Use**



Setting the Smart port to Smart Load Output
For example to connect an air-conditioner
To convert the generator port to a smart load output (disabling generator functionality), select **SmartLoad Output**

For the Smart Load Output, there are several simple parameters to tune it to the customers' requirements:

Smart Load OFF Batt:
This is the Battery SOC at which the Smart load switches off. (e.g. air-conditioner turns off)

Smart Load ON Batt:
This is the Battery SOC at which the Smart load switches on simultaneously, turning on the load. (e.g. air-conditioner turns on)

On Grid always on:
Select **on Grid always on** to activate the smart load when the grid is present.

For example, in the image above, Power = 500 W, ON= 100%, OFF= 95%, indicates that when the PV Power exceeds 500 W and battery bank SOC reaches 100%, the Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC < 95% or PV power falls below 500 W, the Smart Load Power will automatically switch off. The system does not need the grid to be present to supply the smart load with power.

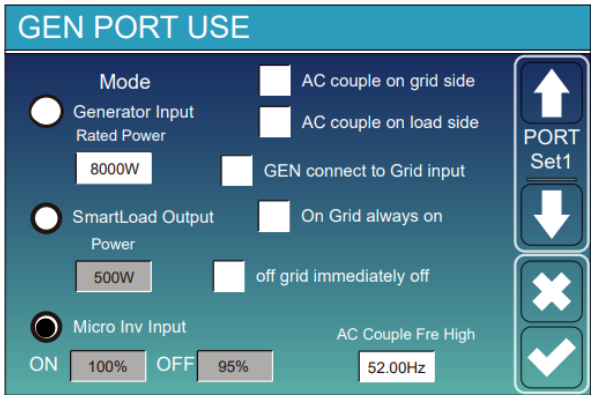
Setting the smart port to AC-coupled renewable input port
To connect an extra or existing PV solar inverter
To convert the generator port (SMART Port) to a smart load output (disabling generator functionality), select **Micro Inv Input**.

There are some simple parameters to tune the AC-coupled renewables input port to your customer's requirements:

Micro Inv Input OFF:
Microinverter or grid-tied inverter shuts down when battery SOC exceeds this set value.

Micro Inv Input ON:
Microinverter or grid-tied inverter starts working when battery SOC is lower than this set value.

AC Couple Fre High:
If **Micro Inv input** is selected, microinverter output power decreases linearly as battery SOC approaches this set value (OFF).
When battery SOC equals the set value (OFF), system frequency becomes the set value (AC couple Fre high), and the Microinverter stops working.
Stops exporting power produced by the microinverter to the grid.



***NOTE**: Changes to the BushChook settings must be done by a trained/qualified person. If in doubt, contact RedEarth Support*

6.4 BushChook Fault Codes

Error code	Description	*Solutions*
F08	GFDI _Relay Failure	1. When inverter is in Split phase(120/240Vac) or three-phase system (120/208Vac) system, the backup load port N line needs to connect ground; 2. If the fault still exists, please contact us for help.
F13	Working mode change	1. When the grid type and frequency changed it will report F13; 2. When the battery mode was changed to "No battery" mode, it will report F13; 3. For some old FW version, it will report F13 when the system work mode changed; 4. Generally, it will disappear automatically when shows F13; 5. If still same, and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch; 6. Seek help from us, if cannot go back to normal state.
F18	AC over current fault of hardware	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if cannot go back to normal state.
F20	DC over current fault of the hardware	DC side over current fault 1. Check PV module connect and battery connect; 2. When in the off-grid mode, the inverter startup with big power load, it may report F20. Please reduce the load power connected; 3. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 4. Seek help from us, if cannot go back to normal state.
F22	Tz_EmergStop_Fault	Please contact your installer for help.
F23	AC leakage current is transient over current	Leakage current fault 1. Check PV side cable ground connection. 2. Restart the system 2~3 times. 3. If the fault still exists, please contact us for help.
F24	DC insulation impedance failure	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and correctly; 2. Check whether the PE cable of inverter is connected to ground; 3. Seek help from us, if cannot go back to normal state.
F26	The DC busbar is unbalanced	1. Please wait for a while and check whether it is normal; 2. When the hybrid in split phase mode, and the load of L1 and load of L2 is big different, it will report the F26. 3. Restart the system 2~3 times. 4. Seek help from us, if cannot go back to normal state.
F29	Parallel CANBus fault	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. During the parallel system startup period, inverters will report F29. when all inverters are in ON status, it will disappear automatically; 3. If the fault still exists, please contact us for help.
F34	AC Overcurrent fault	1. Check the backup load connected, make sure it is in allowed power range; 2. If the fault still exists, please contact us for help.
F35	No AC grid	No Utility 1. Please confirm grid is lost or not; 2. Check the grid connection is good or not; 3. Check the switch between inverter and grid is on or not; 4. Seek help from us, if cannot go back to normal state.
F41	Parallel system stop	1. Check the hybrid inverter working status. If there's 1 pcs hybrid inverter is in OFF status, the other hybrid inverters may report F41 fault in parallel system. 2. If the fault still exists, please contact us for help.
F42	AC line low voltage	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage in specification; 2. Check whether grid AC cables are firmly and correctly connected; 3. Seek help from us, if cannot go back to normal state.
F47	AC over frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if cannot go back to normal state.
F48	AC lower frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if can not go back to normal state.
F56	DC busbar voltage is too low	Battery voltage low 1. Check whether battery voltage is too low; 2. If the battery voltage is too low, using PV or grid to charge the battery; 3. Seek help from us, if can not go back to normal state.

F58	BMS communication fault	1. It tells the communication between hybrid inverter and battery BMS disconnected when"BMS_Err-Stop" is active; 2. If don't want to see this happen, you can disable "BMS_Err-Stop" item on the LCD; 3. If the fault still exists, please contact us for help.
F63	ARC fault	1. ARC fault detection is only for US market; 2. Check PV module cable connection and clear the fault; 3. Seek help from us, if cannot go back to normal state.
F64	Heat sink high temperature failure	Heat sink temperature is too high 1. Check whether the work environment temperature is too high; 2. Turn off the inverter for 10mins and restart; 3. Seek help from us, if cannot go back to normal state.

6.5 Test the operation of the complete system prior to handover to the customer

This includes confirming that:

- The BushChook is generating PV, charging the batteries, and supplying the loads.
- also, that the Bypass switch works, by actually switching to Bypass mode and confirming the operation.
- also, confirm that the Backup function works as expected (for on-grid applications). This means that you MUST turn off the main house breaker and confirm the correct circuits are operating in Backup mode. (e.g., fridge & home Wi-Fi) .

6.5.1 Normal operation

In this operation mode the BushChook will use solar, battery and grid, depending on the situation.
All of the breakers and isolators should be in the ON position and the Bypass switch should be in the up position (I).

6.5.2 Bypass Operation

In the By-pass operation mode, the system will completely bypass the inverter and battery, and the grid will provide power directly to the LOAD.
For this to occur, all breakers and isolators should be turned OFF and then the By-pass Switch should be switched into the downwards position (II)

Note: *The breaker in the switchboard (labelled "BATTERY SYSTEM CIRCUIT BREAKER") must always remain tuned on during normal and Bypass operation.*

Note: *With the BYPASS SWITCH In the middle position, all Backup circuits will lose power. This is not a normal operating position for BYPASS switch*

6.5.3 Fan Control Adjustment

The thermostat is located inside the unit. This automatically starts the fans once the temperature rises above the set-point. This set-point can easily be adjusted with a small screwdriver. It is set to 25^{0}C in the factory. The fan operation can be tested by turning down the blue dial with a small screwdriver until the fans start. Return the setting to 25^{0}C after the test.

Step 7. Activating Remote Monitoring and Communications

For continuous monitoring, the BushChook needs a reliable internet connection. This applies to both on-grid and off-grid Installations. It can either be via mobile or connecting to the home internet. The best solution depends on the location. Generally, the home internet provides a more reliable solution. RedEarth recommends connecting to the home internet during installation either by wiring the BushChook to LAN or accessing the home WiFi.
However, if only mobile is possible, an optional cell phone booster can improve signal strength and increase reliability.

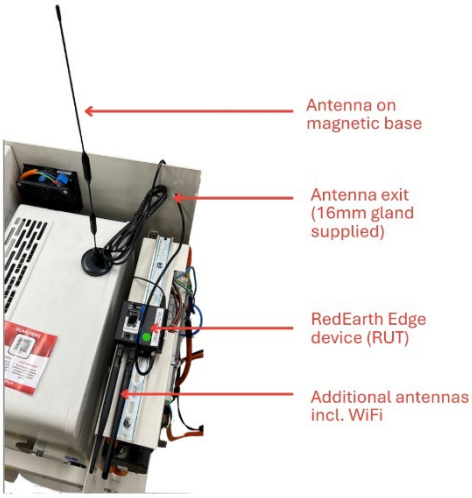
- The BushChook battery system comes with an automatically three-months free remote monitoring via mobile internet. After this initial period, there is a charge to continue remote monitoring via mobile internet.

- **Note**: When any issues with the system arise, it's invaluable to have a continuous monitoring history for troubleshooting. It's important to owner regularly checks the internet connection by accessing the RedEarth app.

Note: All options require the customer to first scan the QR code on the outside of the BushChook system and register their system for monitoring and warranty submission purposes.

The RUT with 4G option requires positioning the BushChook in a good 4G reception area. If installing in a closed area like a shed, remember to check the 4G signal with the shed doors closed as this will affect the strength of the signal. If needed replace the screw in pencil style 4G antenna with the supplied extension 4G antenna. This will allow for more flexible antenna locations. As shown in **"Step 6. Commissioning the system"**

Remote monitoring and control are available via RedEarth's app once the customer completes registration by scanning the QR code and filling in their details. This also registers their warranty.



BushChook Customer Handover Checklist

Your installer will go through the following steps to handover your BushChook system:

☐ **Provide the documentation that comes with the BushChook**

- BushChook Installation Manual
- BushChook User Guide (this document)
- BushChook Identification Sheet (serial #s etc.)
- SDS Troppo ULTRA Battery (Safety Data Sheet)
  This SDS must be left in the switchboard for the fire brigade
- Deye Inverter User Manual
- Eastron Feed-in Meter Manual
- Warranty terms

Installer's contact details:

☐ **Provide an overview of your BushChook installation**

Explain to you the switches on your BushChook and the isolation switches installed in your switchboard.

Your system includes a SMART port that can be configured for three different modes of operation:

☐ As generator input
☐ As input for a 3rd-party solar inverter
☐ As controlled load output

Confirm how your SMART port is configured. See **Overview of your BushChook installation** for more information.

☐ **Demonstrate operation including:**

On-Grid: Demonstrate what happens during a grid outage by turning off the Main grid breaker to the house and observing the Backup operation. Confirm that the correct circuits continue to operate.
Note: that there may be a short delay before the backup circuits activate after the grid is disconected from the home. See **Backup operation – On-Grid installation**

Off-Grid: Demonstrate the operation of the backup generator.

☐ **Demonstrate the operation and effect of the bypass switch**

If your BushChook system develops a fault, the BushChook will begin emitting a beeping sound. If this happens, bypass the whole system which isolates the battery from your home. The grid will provide power directly to all house loads, including the backup loads. All circuits in your home should continue to operate. See **Bypass Procedure.**

☐ **Show maintenance requirements**

To maintain optimal performance and ensure product longevity, all maintenance procedures outlined in the User Manual must be followed directly. *Non-compliance may limit or void your warranty coverage.*

☐ **Register your system with RedEarth**

1. Scan the QR code sticker attached to your BushChook with your mobile phone. It looks like this example, but will be specific to your BushChook. This will take you to the RedEarth customer portal
2. Click Register
3. Enter your contact information and click REGISTER
4. You can now download the **BushChook Warranty document** or view or change your details
   Note: *If it is not possible to register at the time of installation, you can contact RedEarth Customer Service to complete onboarding later.*

☐ **Activate Monitoring using the RedEarth App**

Monitoring your system is done via the RedEarth app

1. On the RedEarth customer portal, depending on your phone type, click either Google Play or App Store to download the RedEarth app
2. Open the app and create an account. It's recommended to use the same email as used to register your warranty
3. A confirmation email will be sent. Open it and verify your email address
4. You can now log into your account on your RedEarth app to instantly see your system

☐ **Ensure all documentation required for claiming STCs is signed by the customer**

RedEarth ENERGY STORAGE

Additional options available for your BushChook

RedEarth can provide several additional options for the BushChook system. The owner is advised to contact the installer for pricing and assistance with adding or expanding the system.

- Additional Troppo ULTRA batteries - up to a total of eight for the BushChook, adding 5.6 kWh extra per battery.
- Electric vehicle charger, that can be monitored on the RedEarth app (both 1-phase and 3-phase)
- Boomerang V2G (Vehicle to Grid) charger that can both charge the electric vehicle and discharge to the BushChook (coming soon).
- Cell phone booster to improve 4G connection.
- Starlink satellite internet connection if the location does not allow another reliable internet connection.
- RedEarth's PPP Smart Energy Trading program.

Support

Technical Support – for the Installer

RedEarth's technical support team are available to provide assistance and guidance during installation.

In order to receive onsite technical support, please contact our team **prior to the installation date** to ensure availability. Direct communication with us is possible from Monday to Friday, between **9am and 5pm across Australia.** Just call 1800 733 637.

Post installation, the customer will be directed to the installer as the first point of call, as per support process for the customer below.
When RedEarth's assistance is required for post installation issues, the quickest way to reach support is to go to our website http://www.redearth.energy and click on *Raise a Ticket*.
Please add the System ID and Installers details to the ticket for expedited assistance.

Customer Support – for the Owner

At RedEarth, we stand by the quality of our products. Supported by our dedicated Australian service team, we're committed to making sure your system delivers reliable performance – and that you always feel supported.

If you encounter any problem with your system, please follow the steps below:

1. **Contact your certified installer or authorised reseller**
   Your first point of call should be your installer or authorised reseller. They will know all the details of your specific installation and will be in the best position to offer you help.
2. **Contact RedEarth**
   If Step 1 is not available, contact RedEarth Customer Support. The quickest way to reach them is to go to our website http://www.redearth.energy and click on *Raise a Ticket*.
   Please add your System ID and Installers details to the ticket for expedited assistance.
3. **Next steps**
   Our Customer Support will contact you soon after with next steps and advice.

Appendices

Appendix A – Technical Specification BushChook

	Single phase		Three phase
BushChook Model	**Bushchook 5 kW** 2BC1-DY5-XUL	**Bushchook 10 kW** 2BC1-DY10-XUL	**Bushchook 12 kW** 2BC3-DY12-XUL
Battery capacity (Troppo ULTRA 5.6 kWh)	2 to 8	2 to 8	3 to 8
Battery capacity of BushChook system (kWh nominal)	11.2 – 44.8 kWh	11.2 – 44.8 kWh	16.8 – 44.8 kWh
Inverter model	5K-SG04LP1-AU	10K-SG02LP1-AU	12K-SG04LP3-AU
Battery data			
Battery type	Troppo ULTRA 5165 LFP		
Battery capacity (nominal)	5.6 kWh per Troppo ULTRA battery		
Battery operating voltage range (V)	40-57.6 V		
Maximum charging current (A)	120 A	220 A	240 A
Maximum discharging current (A)	120 A	220 A	240 A
PV string input data			
Maximum allowable PV (W)	10,000 W	20,000 W	24,000 W
Maximum usable PV (W)	7,500 W	15,000 W	18,000 W
Maximum PV input voltage (V)	500 V	500 V	600 V
MPPT range (V)	150 to 425 V	150 to 425 V	200 V to 600 V
Start-up voltage (V)	125 V	125 V	160 V
PV input current (A)	13 A+13 A	26 A+26 A+26 A	26 A+13 A
Maximum. PV Isc (A)	19.5 A+19.5 A	44 A+44 A+44 A	39 A+19.5 A
No. of MPPT trackers	2	3	2
No. of strings per MPPT tracker	1+1	2+2+2	2+1
AC output data			
Rated AC output and UPS power (W)	5,000	9999	12,000
Maximum. AC output power (VA)	5,000	9999	12,000
Peak power (off-grid)	2 times of rated power, 10 sec		
Rated AC output current (A)	21.7 A	43.5 A	17.4 A
Maximum AC output current (A)	21.7 A	43.5 A	17.4 A
Maximum continuous AC passthrough (A) * When installed in the BushChook system AC passthrough is current limited to 40 A	35 A*	50 A*	45 A*
Generator Total Harmonic Distortion (THDi)	<3% (of nominal power)		
Power factor	0.8 leading to 0.8 lagging		

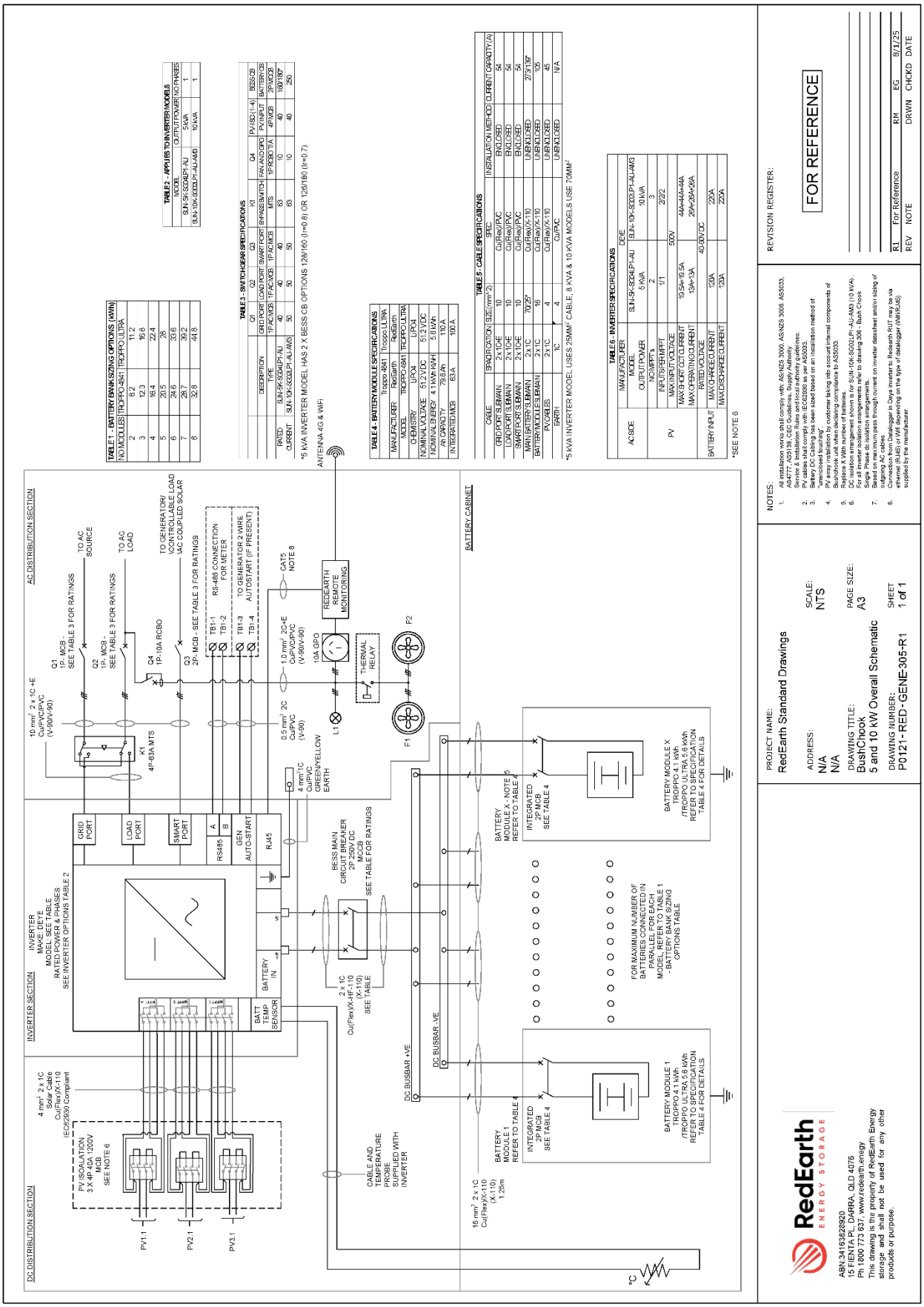
Issue date: 20/04/2026. Version: 4.0

	Single phase		Three phase
BushChook Model	**Bushchook 5 kW** 2BC1-DY5-XUL	**Bushchook 10 kW** 2BC1-DY10-XUL	**Bushchook 12 kW** 2BC3-DY12-XUL
Output frequency and voltage	50 Hz; 230 V/400 V, 240 V/415 V		
Grid connection type	Single phase L/N/E		Three phase 3L/N/E
Protection			
Integrated	DC Reverse Polarity Protection, AC Output Overcurrent Protection, Thermal Protection, AC Output Overvoltage Protection, AC Output Short Circuit Protection, DC Component Monitoring, Insulation Impedance Detection, Arc Fault Circuit Interrupter (optional), DC Switch, Anti-islanding Protection (Active Frequency shift), Residual Current Detection		
Over voltage category	DC Type II / AC Type III		
Certifications and standards			
Grid regulation	AS/NZS 4777.2		
EMC / Safety regulation	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2		
General data			
Operating temperature range (°C)	-40~60°C, >45°C derating		
Cooling	Smart cooling with temperature-controlled fans		
Weight of BushChook system (excl batteries) (kg)	109	130	135
Size of BushChook system (mm)	1180 W x 1040 H x 580 D		
Protection degree of BushChook system	IP43		
RedEarth Warranty	10 years (AU & NZ and South Pacific region)		

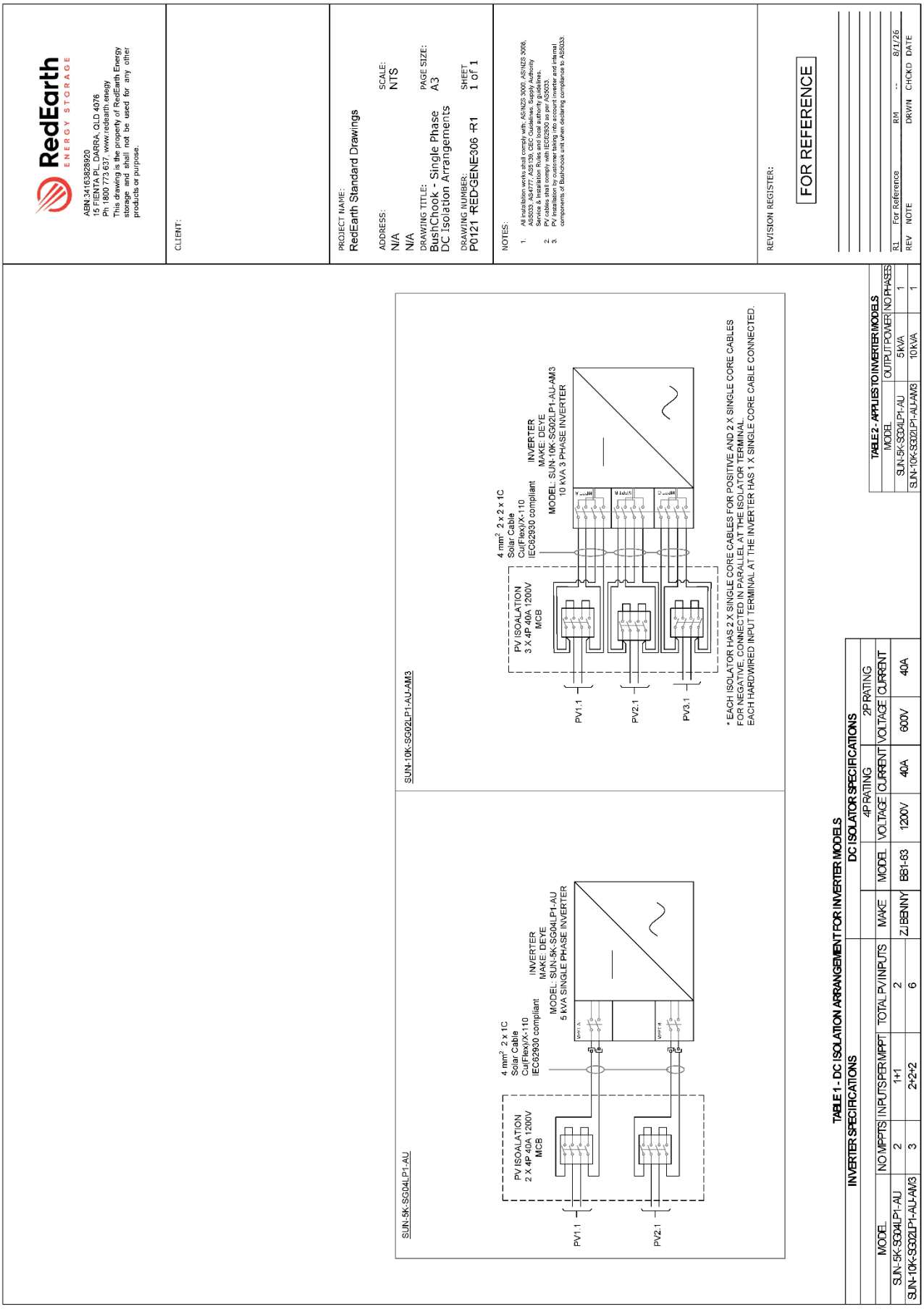
* The BushChook system is designed to only use the RedEarth Troppo ULTRA-5156 lithium-ion battery (LFP).
** The Nominal Energy Capacity depends on the number of Troppo ULTRA-5156 batteries installed in the BushChook system. The model numbers reflect the total battery capacity installed in the system.

Appendix B – Single Line Diagrams

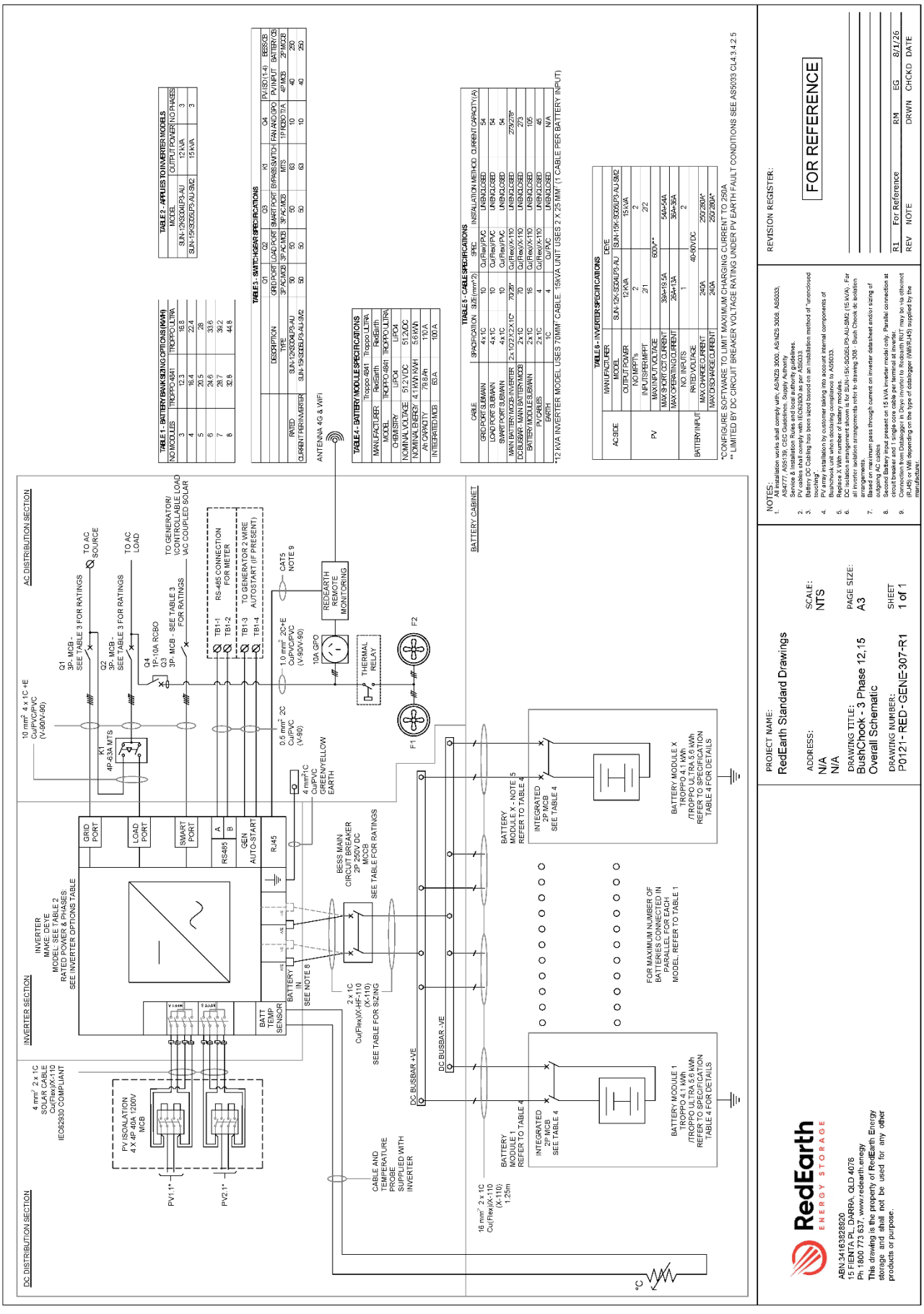
BushChook 5 kW and 10 kW Overall Schematic



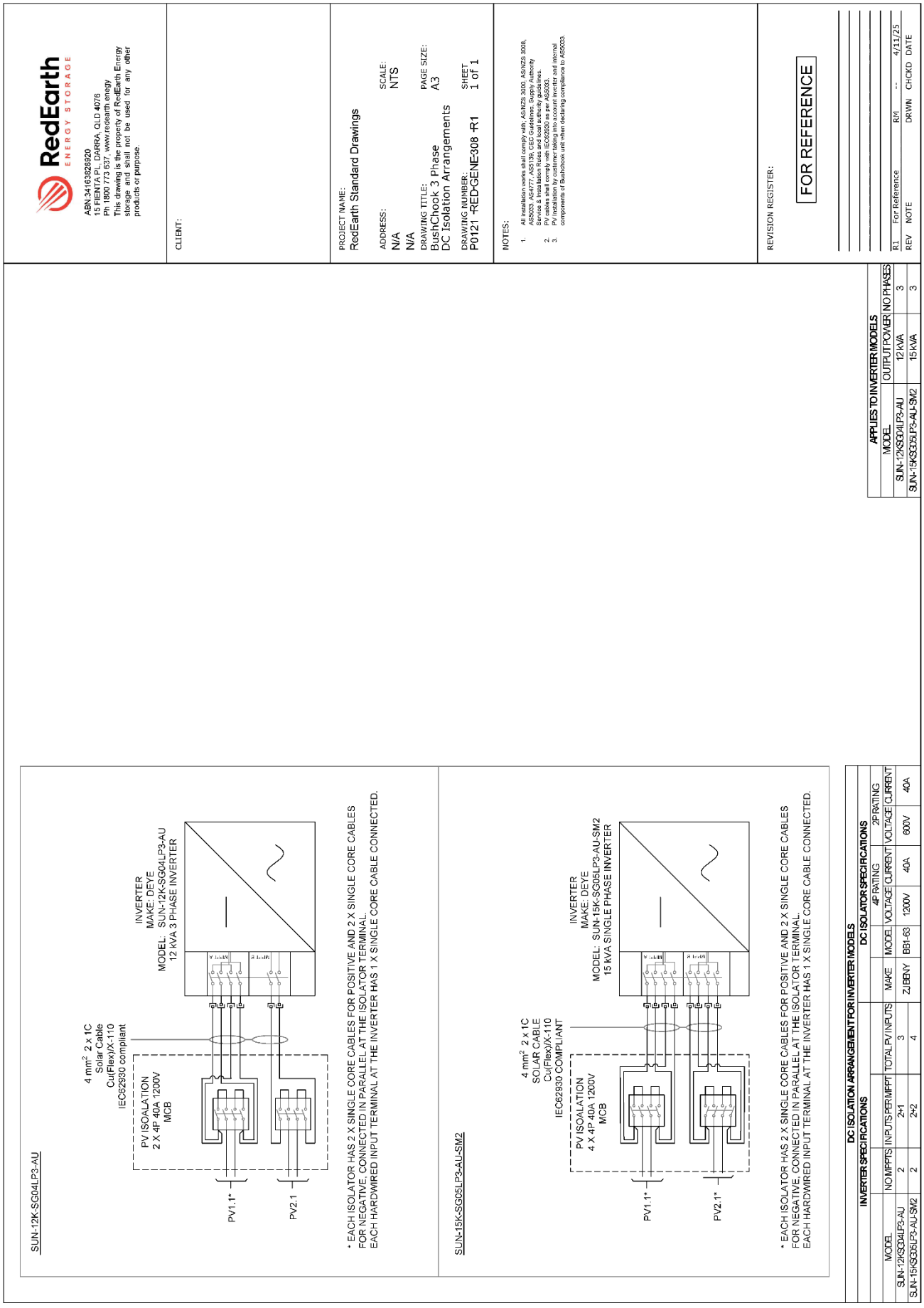
BushChook Single Phase DC Isolation Arrangements



BushChook - 3 Phase 12 kW Overall Schematic



BushChook 3 Phase DC Isolation Arrangements



BushChook AC Schematic

NOTES:
1. WIRING SHOWN IS FOR ILLUSTRATION PURPOSES ONLY AND SHOWS HOW THE EQUIPMENT MAY BE WIRED UNDER CERTAIN CIRCUMSTRANCES.
THE INSTALLER IS TO FOLLOW ALL APPLICABLE RULES AND STANDARDS AS THEY APPLY TO THE PARTICULAR INSTALLATION AS WELL AS ALL REDEARTH INSTALLATION DOCUMENTATION
2. CABLE SPECIFICATIONS WILL DIFFER DEPENDING ON APPLICATION AND SHALL BE SIZED BASED ON AS4777.1, AS3008.1 AND AS3000.
3. CONNECTING AN EXISTING PV INVERTER TO SMART PORT ALLOWS FREQUENCY CONTROL FROM DEYE INVERTER, CONSULT DEYE FOR MAXIMUM RATIO OF AC COUPLED INVERTER TO BATTERY INVERTER AND ANY OTHER SPECIFICATIONS REQUIRED.
4. SMART LOADS CAN BE CONNECTED TO THE SMART PORT TO ALLOW LOAD SHEDDING.
5. FEED-IN METER & CT'S ONLY REQUIRED WHEN THERE ARE UNSUPPORTED LOADS PRESENT.

BUSH CHOOK UNIT SINGLE PHASE MSB DETAIL

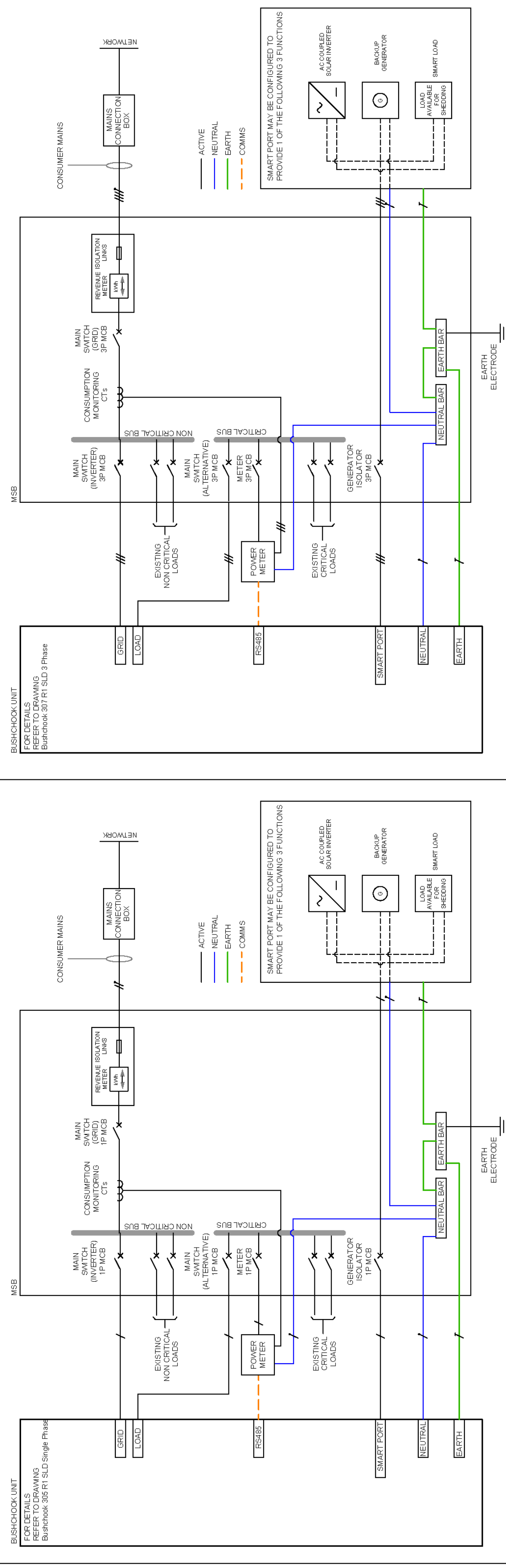
TABLE 1 - BUSH CHOOK SINGLE PHASE MODEL SPECIFICATIONS

	MCB RATINGS		CURRENT RATINGS	
BushChook Model	MAIN SWITCH (INVERTER) (A)	MAIN SWITCH (ALTERNATIVE) (A)	INVERTER RATED CURENT (A)	PASS THROUGH CURRENT (A)
Single Phase - 5kW	40	40	21.8	35
Single Phase - 10kW	50	50	43.5	50 - See Note 4

BUSH CHOOK UNIT THREE PHASE MSB DETAIL

TABLE 2 - BUSH CHOOK THREE PHASE MODEL SPECIFICATIONS

	MCB RATINGS		CURRENT RATINGS	
BushChook Model	MAIN SWITCH (INVERTER) (A)	MAIN SWITCH (ALTERNATIVE) (A)	INVERTER RATED CURENT (A)	PASS THROUGH CURRENT (A)
Three Phase - 12kW	50	50	17.4	45
Three Phase - 15kW	50	50	21.8	50 - See note 4



RedEarth ENERGY STORAGE

ABN:34163828920
15 FIENTA PL, DARRA, QLD 4076
Ph 1800 773 637, www.redearth.enegy

PROJECT NAME:
RedEarth Standard Drawings

ADDRESS:
N/A
N/A

SCALE:
NTS

DRAWING TITLE:
BushChook
AC SCHEMATIC

PAGE SIZE:
A3

DRAWING NUMBER:
P0121 - RED - GENE-309-R1

SHEET
1 of 1

NOTES:
1. All installation works shall comply with; AS/NZS 3000, AS/NZS 3008, AS5033, AS4777, AS5139, CEC Guidelines, Supply Authority Service & Installation Rules and local authority guidelines.
2. PV cables shall comply with IEC62930 as per AS5033.
3. PV Installation by customer taking into account inverter and internal components of Bush Chook unit when declaring compliance to AS5033.
4. Pass through current limited by 50 Amp grid side circuit breaker in Bush Chook unit.

REVISION REGISTER:

FOR REFERENCE

REV	NOTE	DRWN	CHCKD	DATE
R1	For Reference	RM	--	8/1/26

Power yourself.