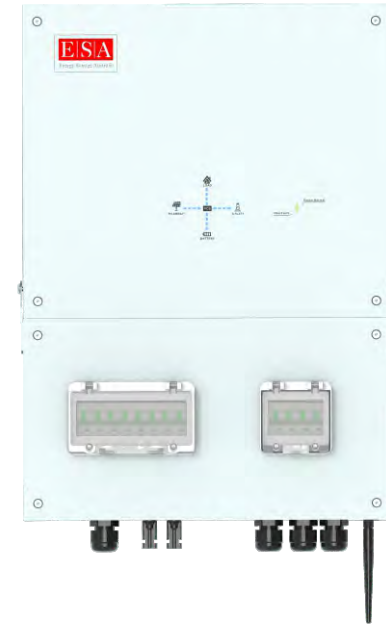
Energy Storage Australia

HYBRID INVERTER USER MANUAL

(V1.0)



ADD: 99 Coventry Street, Southbank, VIC 3004, Australia
Tel: +61 133 765

Contents

1 Notes On This Manual 1
- 1.1 Validity 1
- 1.2 Target Group 1
- 1.3 Additional Information 1
- 1.4 Storage Of The Manuals 1
- 1.5 Symbols Used 2
- 1.6 Markings On This Product 2

2 Safety And Conformity 3
- 2.1 Safety Instructions 3

3 Product Description 5
- 3.2 Information Of The Unit 5
- 3.3 Storage Of Inverter 6

4 Unpacking 7

5 Installation And Electrical Connection 8
- 5.1 Safety 8
- 5.2 Selecting The Installation Location 9-10
- 5.3 Mounting The Inverter With Bracket 11
- 5.4 Fixed The Inverter On The Wall 12
- 5.5 Check Inverter Installation Status 13
- 5.6 Electrical Connection 13
- 5.6.1 Safety 13
- 5.6.2 System Diagram With Inverter Electrical 13
- 5.6.3 Connect To The Grid(AC Utility) 14
- 5.6.4 Connect To The Back-up 15
- 5.6.5 Connect To PV Panel 16
- 5.6.6 Connect To The Battery 17-18
- 5.6.7 Load Monitor Connect To The Inverter 19
- 5.6.8 Grounding Connection 20
- 5.6.9 Communication wiring diagram of lithium battery....21
- 5.7 Earth Fault Alarm Connection 22

6 Communications 23
- 6.1 Wi-Fi/GPRS 23
- 6.2 The DRMO Function for SAA Certification 23
- 6.3 Set Inverter Regulations 24
- 6.4 WiFi Dongle setting using Laptop 24
- 6.4.1 Connecting WiFi Dongle to the Internet 25-26
- 6.5 Monitoring your Inverter System 27

7 The Inverter Parameter setting 28
- 7.1 Setting Interface 28
- 7.2 Volt-Watt Function 28
- 7.3 Set volt-var function 29

8 Start-Up And Shut Down Of The Inverter 30
- 8.1 Start-Up The Inverter 30
- 8.2 Disconnecting The Inverter 30
- 8.3 Commissioning of the Hybrid Inverter 30
- 8.4 Country Code Settings 30

9 Maintenance And Cleaning 31
- 9.1 Checking Heat Dissipation 31
- 9.2 Cleaning The Inverter 31
- 9.3 Checking The DC Switch 31

10 Decommissioning 31
- 10.1 Dismantling The Inverter 31
- 10.2 Packing The Inverter 31
- 10.3 Storing The Inverter 31

11 Work Modes 32

12 Manufacturer Warranty 32

13 Technical Data 33-34

1 Notes On This Manual

1.1 Validity

This manual describes the assembly, installation, commissioning and maintenance of the ESA hybrid inverter.

This manual does not cover any details concerning equipment connected to the unit (e.g. PV modules). Information concerning the connected equipment is available from the manufacturer's instructions.

1.2 Target Group

CAUTION	This manual is for qualified personnel that have received training and have demonstrated skills and knowledge in construction and operation of this device. Qualified personnel are trained to deal with the dangers and hazards involved in installing electric devices.

1.3 Additional Information

Find further information on special topics on our website.

1.4 Storage of the manuals

The manual and other documents must be stored in a convenient place and be available at all times. We assume no liability for any damage caused by failure to observe these instructions.

1.5 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

	**Manual** – Read the Manual!
	**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	**WARNING** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	**CAUTION** indicates a hazardous situation which, if not avoided, could result in a minor or moderate injury.
	NOTE Failure to observe this warning may lead to damage to property.

1.6 Markings On This Product

Symbol	Description
	**Warning regarding dangerous voltage** The product works with high voltage. All work on the product must only be performed as described in its documentation and by qualified trades people.
	**Beware of hot surface** The product can become hot during operation. Do not touch the product during operation.
	**Observe the operating instructions** Read the product's documentation before working on it. Follow all safety precautions and instructions as described in the documentation.
	**Point of connection for grounding protection.**
	**Direct Current (DC)**
	**Alternating Current (AC)**
	**Signals danger** due to electrical shock and indicates the times (5 minutes) to allow after the inverter has been turned off and disconnected to ensure safety in any installation operation.

2 Safety And Conformity

2.1 Safety Instructions

DANGER

Danger To Life Due To Lethal Voltages!

Lethal voltages are present within the unit and on the power supply lines. Therefore, only authorized electricians may install and open the unit. Even when the unit is disconnected, high contact voltages may still be present within the unit.

DANGER

Danger Of Burn Injuries Due To Hot Enclosure Parts!

During operation, the four sides of the enclosure lid and the heat sink may become hot. Only touch the front enclosure lid during operation.

NOTE

Grounding The PV Generator

Comply with the local requirements for grounding the PV modules and the PV generator. We recommend connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction with ground in order to have optimal protection of the system and personnel.

NOTE

Capacitive Discharge Currents

PV modules with large capacities relative to earth, such as thin-film PV modules with cells on a metallic substrate, may only be used if their coupling capacity does not exceed 470nF. During feed-in operation, a leakage current flows from the cells to earth, the size of which depends on the manner in which the PV modules are installed (e.g. foil on metal roof) and on the weather (rain, snow). This "normal" leakage current may not exceed 30mA due to the fact that the inverter would otherwise automatically disconnect from the electricity grid as a protective measure.

NOTE

No one should be opening the unit

DC and AC Breaker

Disconnecting the unit securely from the grid and the PV generators, battery using DC and AC breaker. DC and AC breaker shall be able to disconnect all non- ground conductors after installation.

Grounding The PV Modules

This unit is a transformer-less inverter. It has no galvanic separation. Do not earth the DC circuits of the PV modules to the inverter. Only Earth the mounting frame. If you bond the PV modules to the inverter you will receive an error message "PV ISO Low".

Qualification Of Skilled Workers

- Knowledge of how an inverter works and is operated
- Instruction in how to deal with the dangers and risks associated with installing and using electrical devices and plants
- Training in the installation and commissioning of electrical devices and plants
- Knowledge of all applicable standards and guidelines
- Knowledge and observance of this manual and all safety instructions

3 Product Description

3.1 Inverter Overview

Figure 1

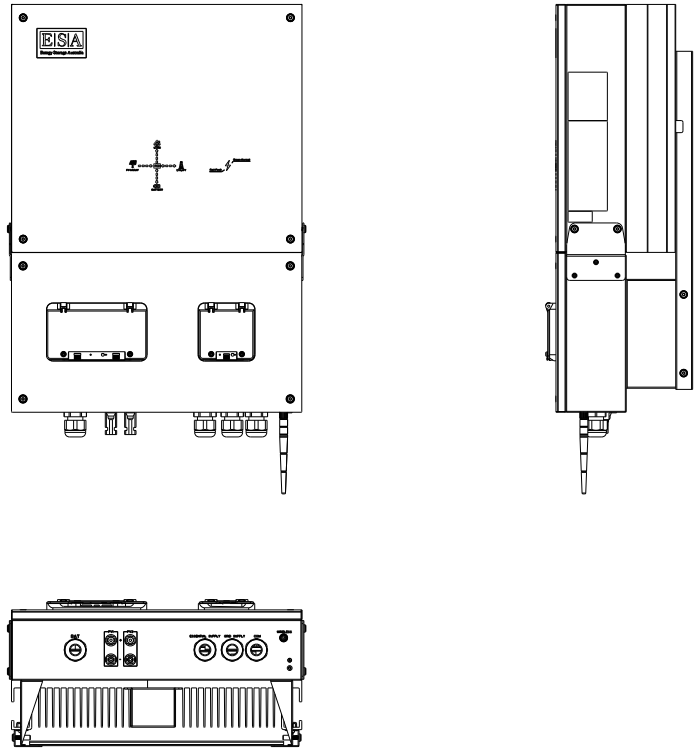
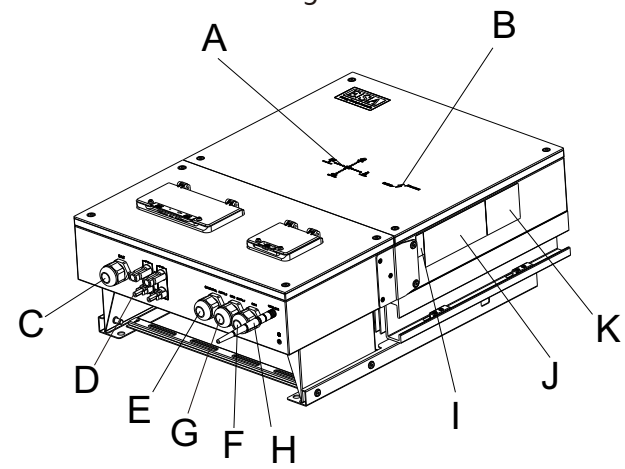


Figure 2



A	The Inverter Power Flow Direction Indicator
B	The Inverter Operation Status Indicator
C	Battery Input
D	PV Input Terminals
E	Essential Supply (AC OUT)
F	Grid Supply (AC IN)
G	COM
H	Wireless
I	Inverter Serial No.
J	Spec Label
K	Warning Signals Label

3.2 Information of the Unit

The unit is bidirectional which applies to the PV system with battery storage. Energy produced by the PV system is used to optimize self-consumption. Excess energy is used to charge the batteries, and then fed into the public grid when the PV energy is adequate.

When PV energy output is insufficient to support connected loads, the system automatically draws energy from the batteries if battery capacity is sufficient. If the battery capacity is insufficient to meet own consumption requirements, electricity will be drawn from the public grid.

3.3 Storage of Inverter

If you want to storage the unit in your warehouse, you should choose an appropriate location to store the inverter.

- The unit must be stored in original packaging.
- The storage temperature should be always between -25℃ and +60℃.
- The storage relative humidity should be always between 0 and 95%.
- If there are a batch of unit need to be stored, the maximum layers for original carton is four.

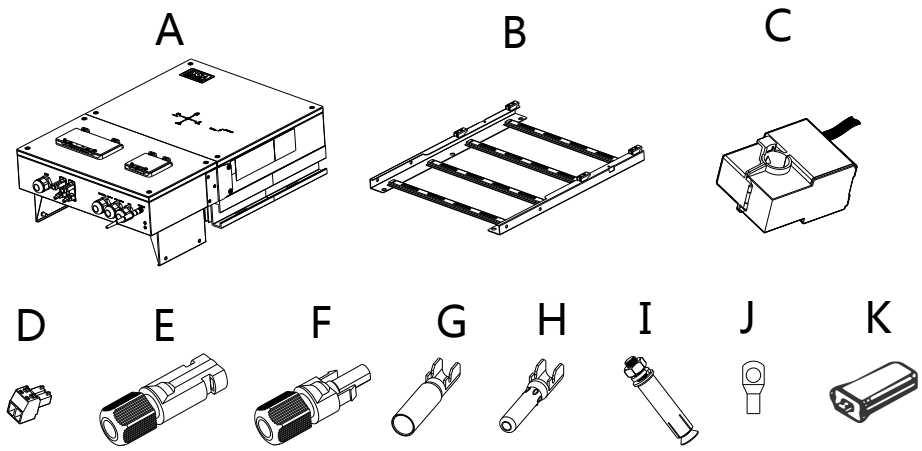
  Note; The battery storage much be according with the battery manufacturers specifications.

4 Unpacking

Thoroughly inspect the packaging upon receipt. If any damage to the packaging is visible, or if you find that the unit is damaged after unpacking, please notify the distributor immediately.
If there is anything damaged or missing, please contact your supplier. Do not dispose of the original packaging. If you want to transport the unit, it is better stored in the original packaging.

Complete Delivery Should Contain As Follows:

Figure 3



Item	Name	Quantity
A	Inverter	1
B	Mounting Frame	1
C	CT Clamp	1
D	Communication Connector	3
E	PV Connector Female	2
F	PV Connector Male	2
G	PV Connector Pin Female	2
H	PV Connector Pin Male	2
I	Mounting Frame Fixings	6
J	Battery Input Terminations	2
K	WIFI or GPRS	1

5 Installation and Electrical Connection

5.1 Safety

DANGER

Danger to life due to fire or explosion
Despite careful construction, electrical devices can cause fires. Do not install the inverter on easily flammable materials and where flammable materials are stored.

DANGER

Risk of burns due to hot enclosure parts
Mount the inverter in such a way that it cannot be touched inadvertently.

DANGER

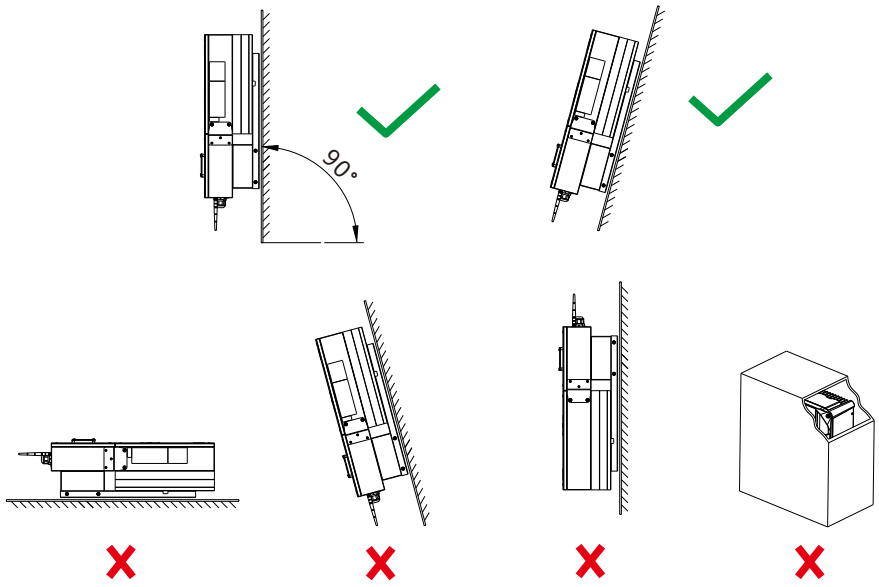
- All electrical installations shall be done in accordance with the IEE Wiring Regulations. Do not remove the casing. The inverter contains no user serviceable parts. Please refer servicing to qualified service personnel.
- All wiring and electrical installation should only be conducted by a qualified electrician.
- Carefully remove the unit from its packaging and inspect for external damage. If you find any imperfections, please contact your local supplier.
- The inverter must only be operated with PV generation. Do not connect any other source of renewable energy to it.
- Both AC and DC voltage sources are terminated inside the PV Inverter. Please disconnect these circuits before servicing.
- This unit is designed to feed power to the public power grid (utility) only. Do not connect this unit to a generator. Connecting the inverter to external devices could result in serious damage to your equipment.
- When a photo-voltaic panel is exposed to light, it generates a DC voltage. When connected to this equipment, a photo-voltaic panel will charge the DC capacitors.
- Energy stored in this equipment's DC capacitors presents a risk of electric shock. Even after the unit is disconnected from the grid and photo-voltaic panels, high voltages may still exist inside the PV-Inverter.
- Although designed to meet all safety requirements, some parts and surfaces of the Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating.

5.2 Selecting The Installation Location

This is guidance for the installer to choose a suitable installation location, to avoid potential damages to the device and operators.

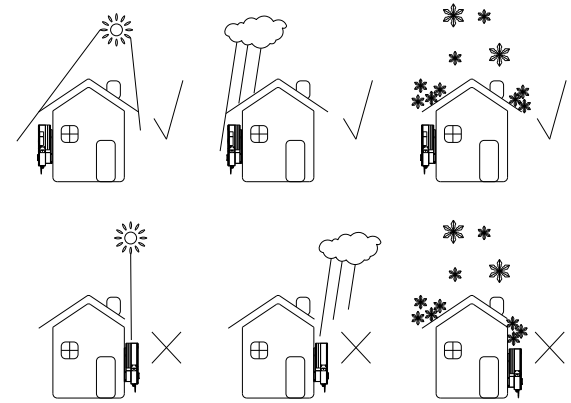
- The inverter shall not be installed where in direct contact with water or in direct sunlight.
- The unit shall be mounted at least 914 mm (3 feet) above the ground.
- The installation location must be suitable for the inverter's weight and dimensions for a long period of time.
- Select the installation location so that the status display can be easily viewed.
- Do not install the inverter on structures constructed of flammable materials.
- The humidity of the installation location should be 0 - 95%, without condensation.
- The installation location must be safely accessible to get to at all times.
- Vertical installation or tilted backwards by max. 15° and make sure the connections of inverter are at the bottom. Never install horizontally and avoid forward and sideways tilt.
- Be sure that the inverter is out of the children's reach.
- Do not put anything on the inverter. **Do not cover the inverter.**
- Do not install the inverter near television antenna or any other antennas, antenna cables.
- The Inverter requires adequate cooling space. Provide the best ventilation for the Inverter to ensure the heat escapes adequately. The ambient temperature should be below 40° C to ensure optimum operation.

Figure 4



- The inverter should not be installed in direct sunlight, direct heavy water sources or unstable locations. We recommend that the inverters be installed at a location with some cover or protection.

Figure 5



- Observe the minimum clearances to walls, other inverters or objects as shown in the diagram below in order to guarantee sufficient heat dissipation.

Figure 6

Direction	Min. clearance(cm)
above	60
below	60
sides	40
front	30

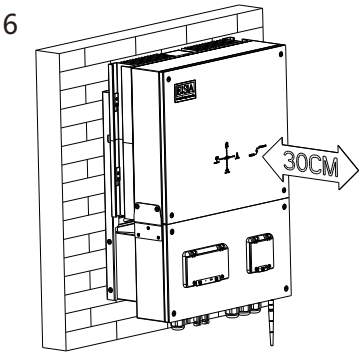
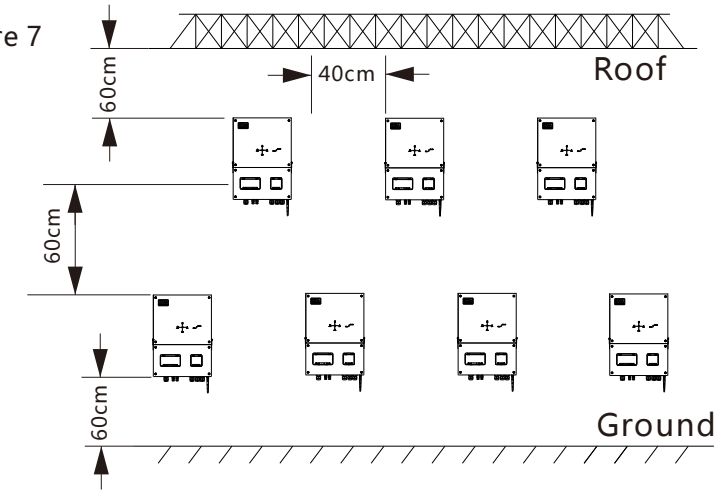


Figure 7



Ambient Dimensions Using Inverters In Series

- There must be sufficient clearance between the individual inverters to ensure that the ambient air from the adjacent inverter is not taken in.
- If necessary, increase the clearance spaces and make sure there is enough fresh air supply to ensure sufficient cooling of the inverters, and heat dissipation.

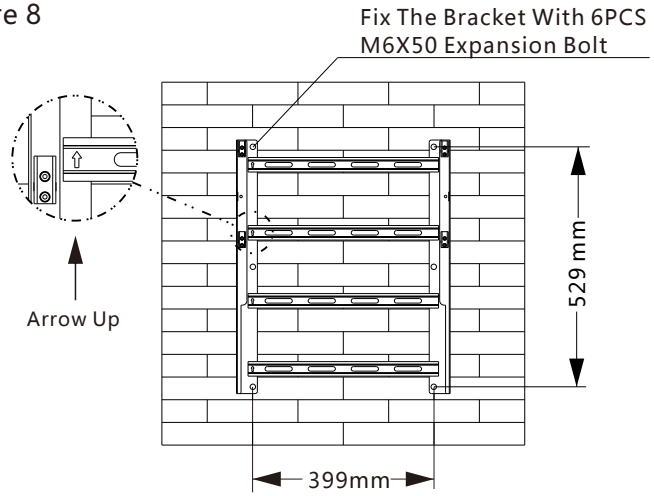
5.3 Mounting The Inverter With Bracket

WARNING

In order to avoid electrical shock or other injury, inspect existing electrical wiring systems or plumbing installations before drilling holes for bracket fixings

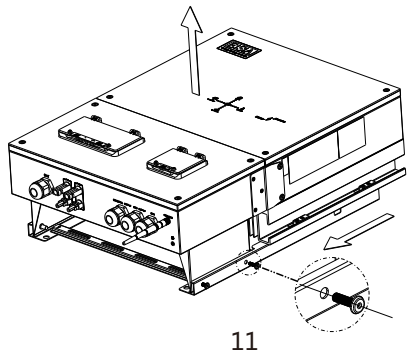
- The dimension of bracket as in [Figure 8]:
- Using the mounting frame as a template, drill holes as illustrated in the image below.

Figure 8



- Remove the four screws on both sides of the wall bracket .
  Move the wall bracket in the direction of the arrow ; Take away the wall bracket

Figure 9



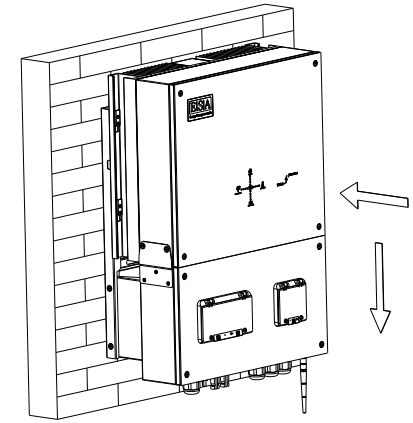
5.4 Fixed The Inverter On The Wall

WARNING

Falling equipment can cause serious or even fatal injury. Never mount the inverter on the bracket unless you are sure that the mounting frame is securely mounted on the wall.

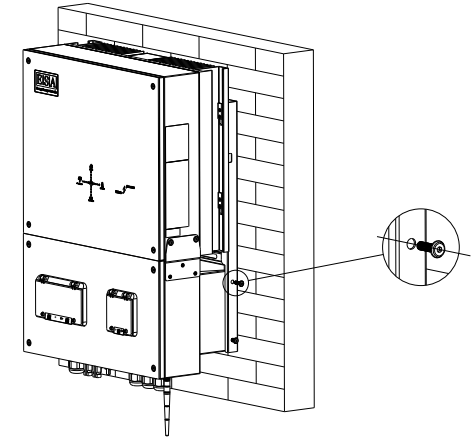
- Raise the inverter a little higher than the bracket. Consider the weight during the process to maintain the balance of the inverter. Hang the inverter on the bracket through the hooks on bracket.

Figure 10



- After confirming the inverter is fixed securely.
  Lock the four screws on both sides of the wall bracket.

Figure 11



5.5 Check Inverter Installation Status

- Check the mounting of the inverter by trying to raise it from the bracket. The inverter should remain firmly attached.
- Please ensure that the correct mounting surface is selected to allow for vibration of the inverter during normal operation.

5.6 Electrical Connection

5.6.1 Safety

DANGER

Danger To Life Due To Lethal Voltages!

High voltages which may cause electric shocks are present in the conductive parts of the inverter. Prior to performing any work on the inverter, disconnect the inverter on the AC side, PV side and battery side.

Do not reverse the polarity of the battery! It will damage the inverter and void any warranty.

WARNING

Danger of damage to electronic components due to electrostatic discharge. Take appropriate ESD precautions when replacing and installing the inverter.

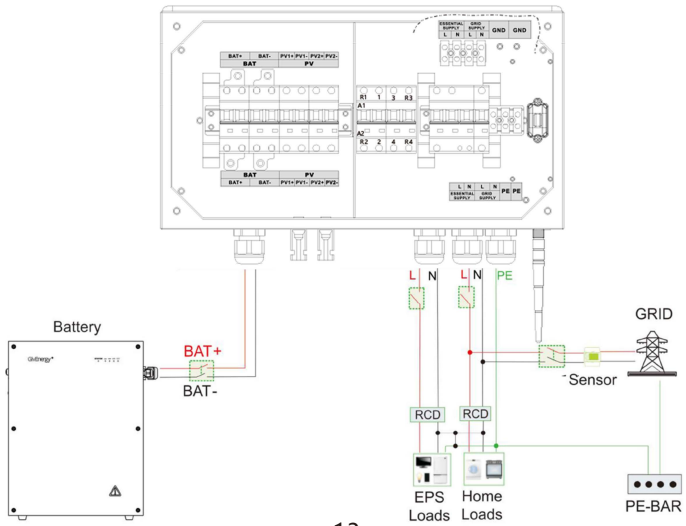
DANGER

Earthing.

Before connecting the DC power cables, the AC supply must be earthed.

5.6.2 System Diagram With Inverter Electrical

Figure 12



This inverter includes an integrated residual current device (RCD)

If an external residual current device (RCD) is used, a device of type B should be used, with a tripping current of 30mA or higher.

1. If you want to use on gird only, please connect with AC grid (right terminal) and float EPS OUTPUT.
2. If you want to use both on gird power and backup power ,please connect with AC grid and EPS OUTPUT like the chart show. If backup is used, make sure that the N line of the backup port and the N line of the AC input are connected to the ground line in the distribution box
3. On grid terminal and off grid terminal can't directly connect together, if directly connected together, it will cause damage to inverter!
4. Off Grid terminal can't connect to grid. If there is grid power, it will cause damage to inverter!
5. The first start of system needs Grid power.

NOTE

The neutral of the EPS and the main load should be connected externally to maintain the neutrality

Ensure all wiring is correctly selected and erected in accordance with BS7671:2015, IEE wiring regulations.

5.6.3 Connect To The Grid (AC Utility)

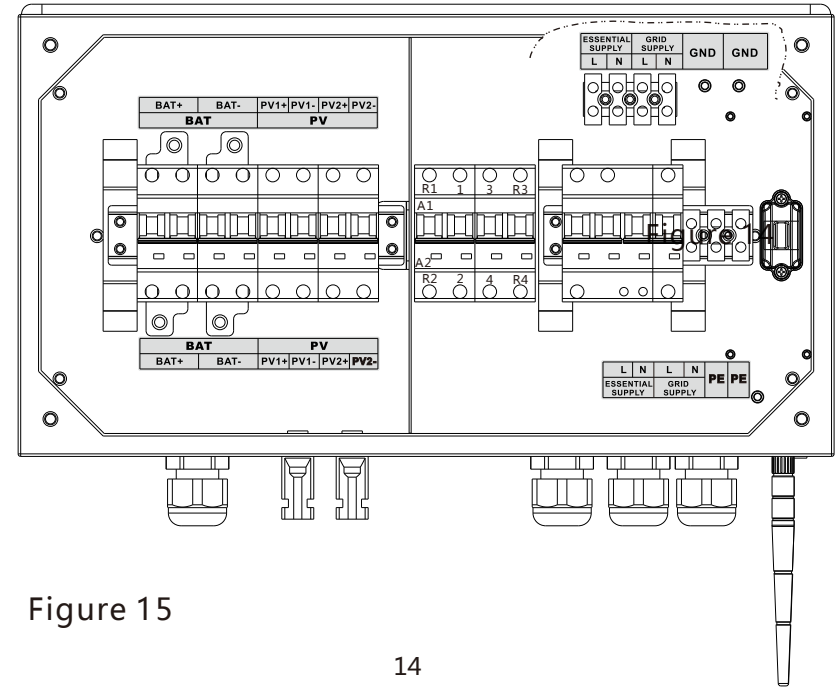


Figure 15

We suggest the AC separate unit spec as follow,

Output cable requirements

Product Model	Current	Area CSA (mm^2)
ESA-3600	20A	2.5 4.0
ESA-5000	32A	4.0 6.0

NOTE

The cable length should not exceed 50 m as the resistance of the cable will consume inverter output power and reduce the inverter efficiency.

WARNING

You must install a separate AC circuit-breaker or other load disconnection unit between the inverter and utility, in order to ensure that the inverter can be safely disconnected under load.

A Conductor Cross-section:

See the conductor cross section in the following chart above

B Bare Length: 8mm around

5.6.4 Connect To The Back-Up

The back-up can provide a maximum output power of 2500w. You can connect the essential load to the back-up terminals.

You must install an AC Isolator or other load disconnection unit between the inverter back-up output and the essential load, in order to ensure that the inverter can be safely disconnected under load. We suggest the separate unit spec is **20A**.

WARNING

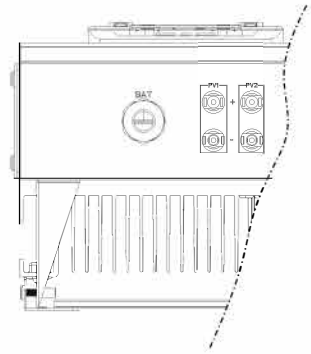
The back-up MAX output power is 2500w. If the load is greater than 2500w, the inverter will stop outputting and draw from the grid. The output power of back-up depends on the battery capacity.

5.6.5 Connect To PV Panel

DANGER

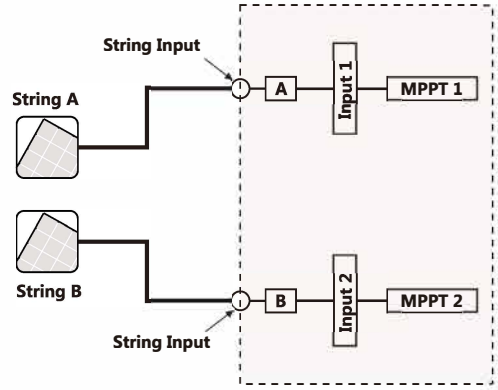
- Risk of electric shock and fire, use only with PV modules, and with a maximum system voltage of 600Vdc per string.
- Electric shock hazard, the DC conductors of this photovoltaic system are normally ungrounded but will become intermittently grounded without indication when the inverter measures the PV array isolation.Because of the transformerless design, the DC positive pole and DC negative pole of PV arrays are not permitted to be grounded.
- Do not disconnect the DC connectors under load!

Figure 16



PV Input Connection Terminal

Figure 17



There are two MPPT's on the unit, so you can connect two independent MPPT channels.

- Suggestions for the PV modules of the connected strings:
  - Same type of modules
  - Same quantity of PV modules connected in series

- **Under all conditions !** Make sure the maximum open circuit voltage (Voc) of each PV string is less than **600Vdc**.

  - Do not connect strings with an open circuit voltage greater than the maximum input voltage of the inverter. If the strings voltage exceeds the maximum input voltage of the inverter, the inverter can be destroyed due to overvoltage. All warranty claims become void.
  - Check the design of the PV plant. The max. open circuit voltage, which can occur at solar panels ambient temperature of -10℃, must not exceed the max. input voltage of the inverter.

- Before connecting PV panels to the DC terminals, please make sure the polarity is correct. Incorrect polarity connection could damage the inverter.
- Check short-circuit current of the PV string. The total short-circuit current of the PV string should be less than the inverter's maximum DC current.
- Connect the positive and negative terminals from the PV panel to positive(+) terminals and negative(-) terminals on the PV-Inverter. Each DC terminal on Inverter can withstand 11A.
  - For instance, if the positive pole of a string is connected at MPP tracker A and the string's negative pole at MPP tracker B, this is called a mixed connection, the inverter no longer fulfils the requirements of the EMC Directive.
  - Only connect strings at one input zone and never mix the input zones A and B.
  - High voltages exist when the PV panel is exposed to the sun. To reduce risk of electric shock, avoid touching live components and treat connection terminals carefully.

Cable requirements

Product Model	Current	Area CSA (mm^2)
ESA-3600	20A	2.5 4.0
ESA-5000	32A	4.0 6.0

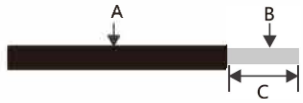
5.6.6 Connect To The Battery

- **Before connecting to the battery, you must install a separate DC breaker(not less than 120A) between the inverter and battery. That will ensure the inverter can be securely disconnected during maintenance.**

DANGER **Reversed polarity will damage the inverter!!!**

- **It is very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, you much use the proper recommended cable size, refer to the following;**

Figure 18



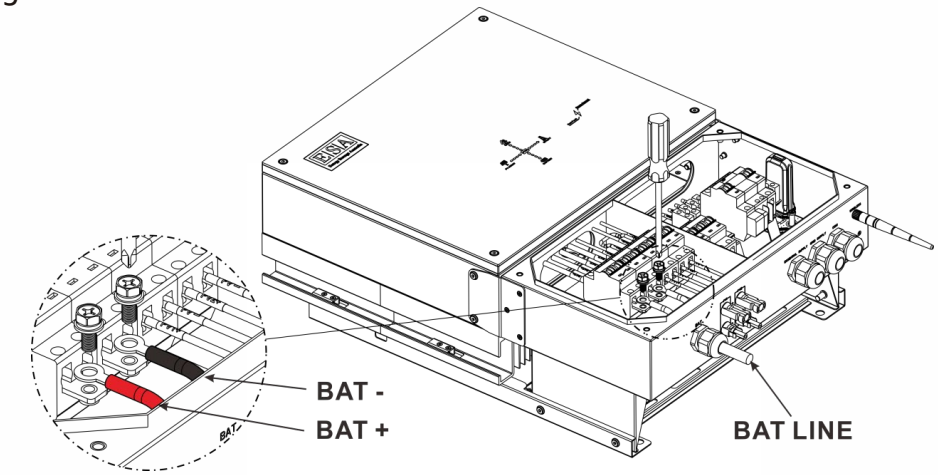
Grade	Description	Value
A	O.D.	10-12mm
B	C.S.A.	10-25mm ^{2}
C	Bare Wire Length	10mm

- The battery must be installed in accordance with the manufacturer's instructions.
- The MAX charge/ discharge current of the inverter is 50A.
- The inverter's battery rated voltage is 48V. The battery series connection voltage must not exceed 48V or it will damage the inverter and void any warranty.

Follow the below steps to implement the battery connection:

(1) Check the battery nominal voltage meets the inverter spec.
(2) Disconnect the breaker between inverter and battery.
(3) Check out the polarity of the battery and the inverter.
(4) Terminate battery DC cables by means of the lugs provided.
(5) Screw the DC cable to the inverter's battery input terminal.
(6) The correct battery technology must be selected upon commission, so that it can be controlled via the BMS

Figure 19



⚠ **Shut Down And Turn Off The Isolator Before Operating In This Housing!**

NOTE

we recommend using the Solarshop appointed lithium battery, because the battery BMS communication has been designed to be compatible with the Solarshop Hybrid Inverter.

DANGER

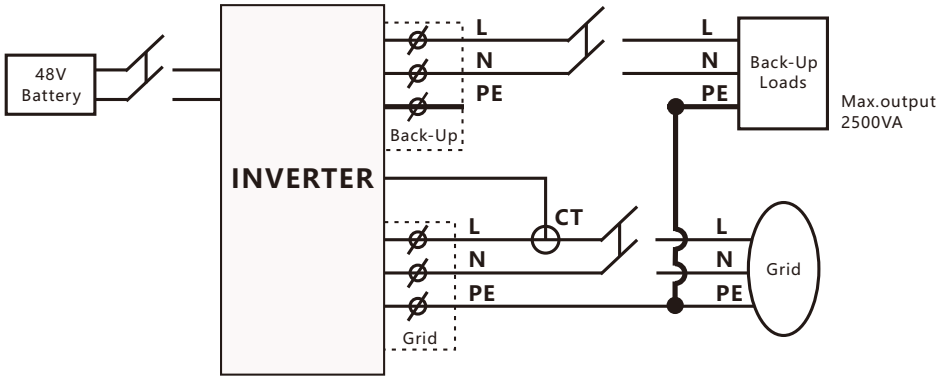
Danger to life due to voltages!
Before you install the BAT.NTC, you must turn off the inverter, check all the separate breakers are off, and the inverter's LED is off. Then you can safely install the BAT.NTC terminal to the inverter.

5.6.7 Connect CT Clamp Or Mid Approved Meter To Inverter

In the system, a CT or mid approved meter must be installed to monitor the power of the house to decide the inverter status: charge or discharge.

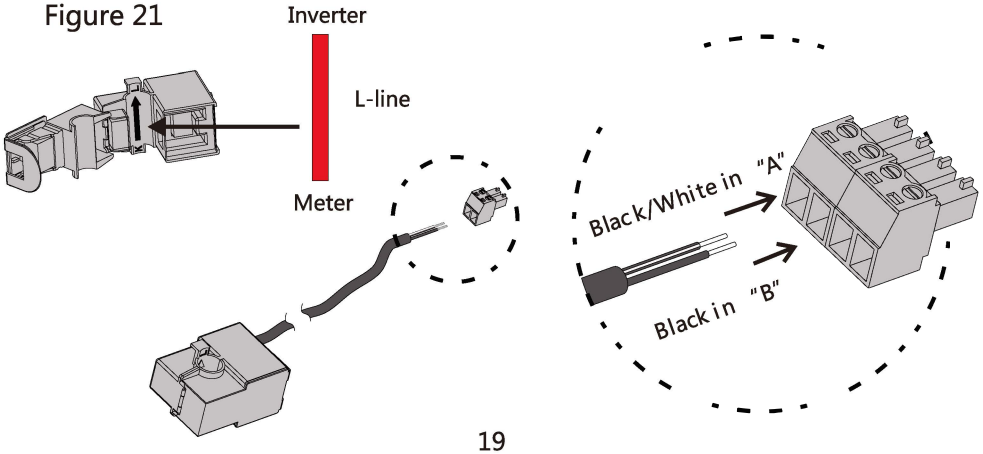
CT or meter must be installed at the origin of supply. In this case, the inverter can monitor all household consumption of power. According to the sensor, the inverter will control the PV power feeding to the grid to balance the level of household power use.

Figure 20



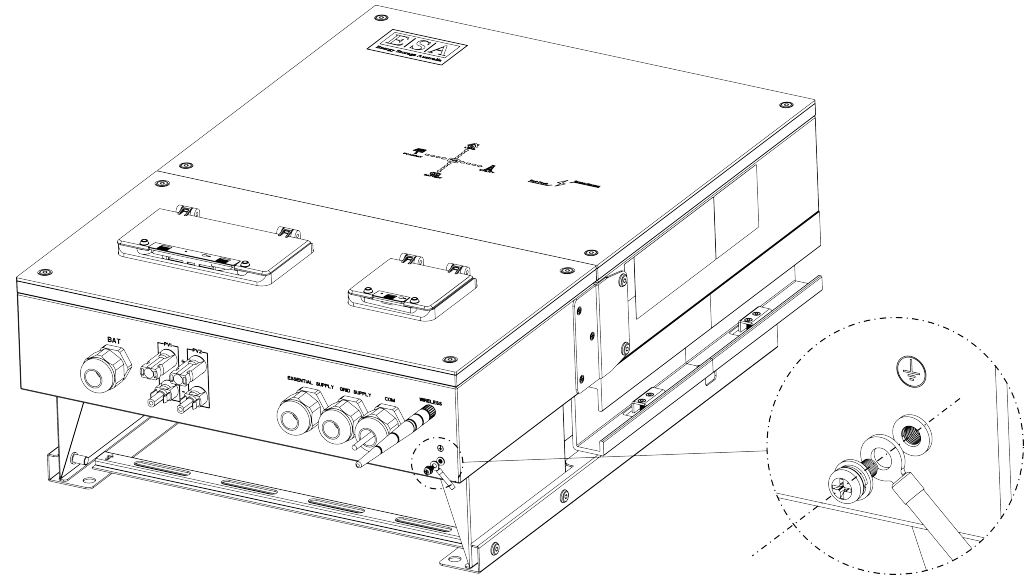
Place the CT reader inbetween the meter and the inverter. This must be positioned in front of local load and around the LIVE wire only with the arrow pointing TOWARDS the inverter.

Figure 21

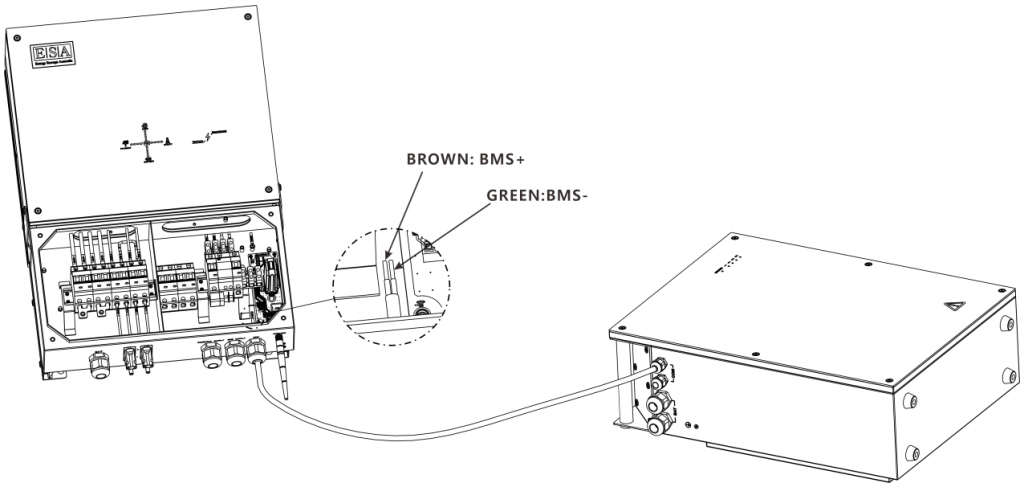


5.6.8 Grounding connection

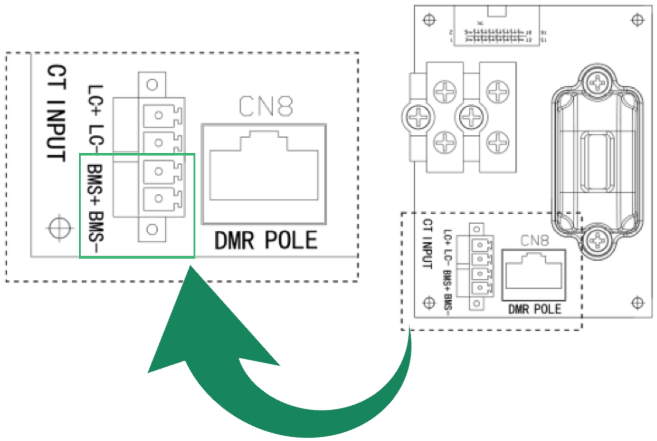
ESA Hybrid Inverter must be grounded by cable, the grounding point is showed as follow, and the minimum grounding cable wire diameter is 10.0mm.



5.6.9 Communication wiring diagram of lithium battery



the BMS + / BMS – cables will connect into the inverter.



When installing lithium batteries, the batteries' BMS need to connected to the BMS terminals in the inverter. (the terminal locations within the inverter are illustrated above) . The steps for wiring the BMS are as follows:

1. Unscrew the rubber nut on the waterproof cover of the energy storage machine;
2. Unscrew the six battery cover screws and remove the cover. Feed the 485 wire through the rubber nut, seal ring, threaded sleeve and waterproof cover in turn. Once fed through, connect the RS485 wire supplied to one of the green coloured (plugs) cable termination point. Connect to the corresponding port within the battery labelled as BMS+/BMS-.
3. Lock the waterproof cover with the screws provided and tighten the rubber nut to the waterproof cover.
4. Pass the other end of the RS485 wire through the COMM port at the base of the inverter and connect to the BMS terminals using the green coloured (plug) cable termination point.

we recommend using the Solar Shop appointed lithium battery because the battery BMS communication has been designed to be compatible with the GivEnergy Hybrid Inverter.

5.7 Earth Fault Alarm Connection

If this occurs the inverter will disconnect from the grid stopping power supply. The Inverter will detect a low insulation resistance level during the preliminary stage of a ground leakage on the DC side during operation with the grid. It will be visible with the red LED status on the front of the inverter as well as an error and fault notification on the monitoring portal. Usually this fault derives from a PV string, array or another DC connection point..

To remedy this issue, first ensure the inverter is fully and safely disconnected. The PV strings could to be checked for earth faults in the first instance of trouble shooting. To determine and locate where any earth fault exists, carry out the appropriate measurement tests of the voltages between the positive / negative poles of each string and the earth potential (individually and together).

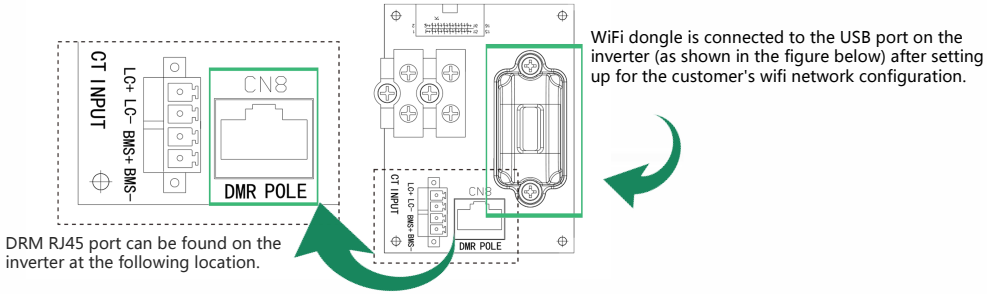
6 Communications

6.1 Wi-Fi/GPRS

Hybrid inverter uses Wi-Fi/GPRS as standard wireless communication.

6.2 The DRM0 Function for SAA Certification

The DMR0 function of hybrid inverter is provided for SAA.
The DRM0 connection CNS in the front plate, as the picture:

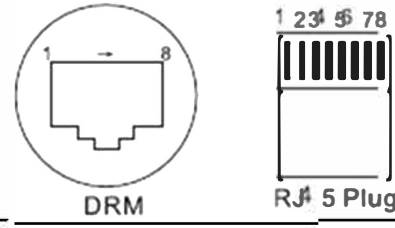


When it receives the order from DRM0 connection, the inverter will act responding to the order, the inverter must POWER OFF or POWER ON

6.2.1 DRM pin assignment

PIN	Assignment for inverters capable of both charging and discharging
1	DRM5
2	DRM6
3	DRM7
4	DRM8
5	REFGEN
6	COM/DRM0
7	/
8	/

Pin Assignments Front View



6.2.2 Method of asserting demand response modes (for Australia)

MODE	Rj45 socket Asserted by shorting pins		Requirments:
DRM0	6	5	Operate the disconnection device
DRM5	1	5	Do not generate power
DRM6	2	5	Do not generate at more than 50% of rated power
DRM7	3	5	Do not generate at more than 75% of rated power AND Sink reactive power if capable
DRM8	4	5	Increase power generation (subject to constraints from other active DRMs)

6.3 Set inverter regulations

Go to http://www.givenergy.cloud and enter your username and password Enter the setting interface, enter the machine serial number, you can set the regulations.
The values for regulations and Settings correspond to the following table

Type	Safety standard	Value	Remarks
Hybrid Inverter (3600W - 5000W)	cS_ VDE0126	30	European countries
	cS_ AS4777	798	Australia
	cS_ G83/G98	2078	UK

6.4 WiFi Dongle settings using Laptop

Step 1

The units WiFi dongle has been pre loaded in the USB port in the unit and is accessible by removing the front cover. Search and select the dongle on the WiFi options on your android or laptop device. Once connected to it proceed to Step 2. Alternatively, remove the WiFi dongle and plug it into a laptop like you would any other USB device. Once the dongle receives power, it will start to flash slowly. Select the WiFi Signal 'WDxxxxxx' and type the default password '12345678'

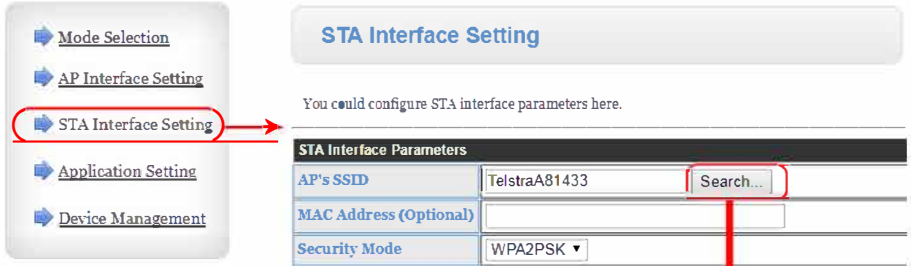
6.4.1 Connecting the WiFi Dongle to the Internet

Step 2

Open up a web browser (we recommend Google Chrome) and type in **10.10.100.254.** You should be prompted to enter credentials to access this page. By default, the username and password are both 'admin'. This can be reconfigured later for security, if you or the end user wishes for this to be changed.

Step 3

Click 'STA Interface Setting'

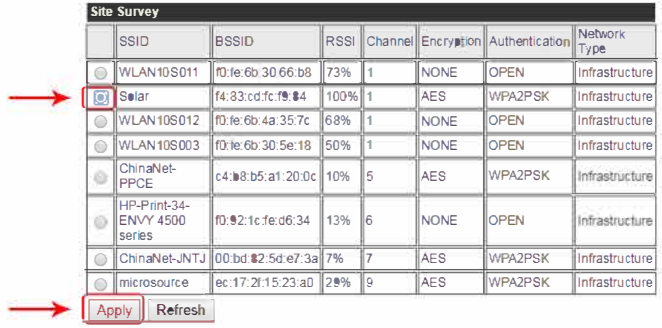


Step 4

Click 'Search'

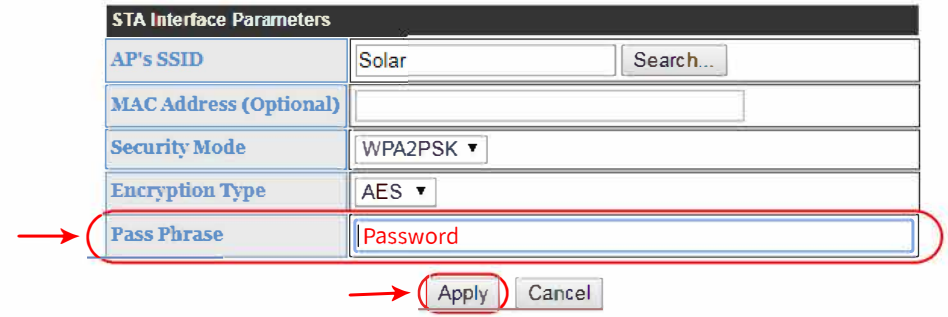
Step 5

Select SSID of the home router and click 'Apply'



Step 6

Enter password of the home router in 'Pass Phrase' and click 'Apply'

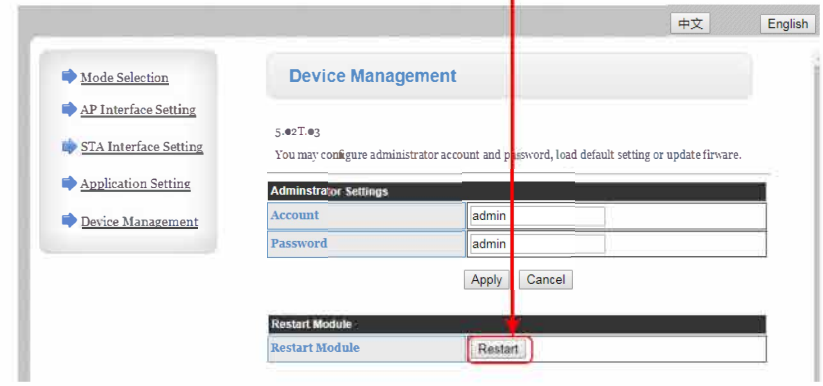


Step 7

Click 'Device Management'

Step 8

Click 'Restart' in 'Restart Module'



Then the setting is finished.

6.5 Monitoring your Inverter System

Once you system inverter had been connected to your the Internet, you can monitor the performance of your system. By following the below instructions:

1. Go to your web browser and enter the following URL: www.energystorageaustralia.com<http://www.energystorageaustralia.com>

2. On the homepage, select "Monitoring portal" on the top menu tab.

3. As issued by ESA or your retailer, enter your User name and Password (default password also issued)

4. We recommend that once you are in the Portal you change your password – which can be completed at any time once you are first logged in.

5. The monitoring Portal will enable you to monitor in real time (5 minute reading intervals) your PV generation, load (consumption), export/import with the grid and if you have battery storage, your state of Charge

6. Many other features of the Monitoring portal are available such as accessing historical data, report generation, grid charging etc. A member of the ESA team can further assist with the portal features.

From the menu list on top left hand side you would be able to select Overview and see Generation, Import, Export, consumption, you will see the same info in the graph below if you place the mouse over the column.

You are able to view by month which shows everyday during that month.

The second thing to look at is My Hybrid, which shows what the system performance is at any moment, on top of the page you will Graphs which shows the Generation and demanded Power.

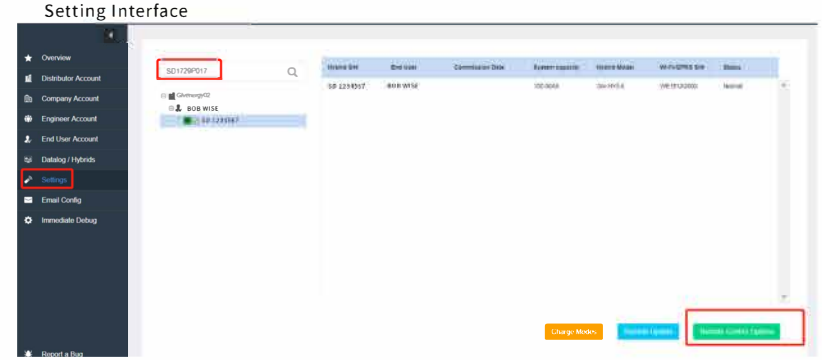
7 The Inverter Parameter Setting

After setting the wifi connection, enter the setting interface of the website to set inverter parameters

7.1 Click the Settings option in the menu bar, as shown in Figure 1 below

Enter the serial number of the machine in the search box. Select this machine Click Remote Control Option in the lower right corner to enter the setting interface

Setting Interface



7.2 Volt-watt function

7.2.1 Query Volt - Watt Function

Select the Volt Watt Enable (128,0,1) option, and the Volt - Watt function shown in the option box
0- Disable
1 - Enable

7.2.2 Set the Volt - Watt function

In the option Volt Watt Enable (128,0,1), set the value to Enable or prohibit the Volt - Watt function

0-Disable
1- Enable

Australia Setting

7.3 Set volt-var function

7.3.1 Query and set the Volt-var function and volt-var voltage threshold

7.3.1.1 Click Volt-var function enable to select the type for query

7.3.1.2 In the Volt-var function enable selection, set 6 to enable and 0 to disable

0-Disable

6 –Enable

7.3.2 Query and set the Volt-VAR voltage threshold

7.3.2.1 Click the options Volt-VAR Vl, Volt-VAR V2, Volt-VAR V3 and Volt-VAR V4 respectively to query the threshold voltage of the Volt-VAR function

7.3.2.2 Select Volt-var Vl, Volt-VAR V2, Volt-var V3 and Volt-VAR V4 to input the voltage value to be modified and set

8 Start-Up And Shut Down Of The Inverter

8.1 Start-Up The Inverter

(1) Connect the AC circuit breaker;
(2) Turn on the DC switch;
(3) Turn on the battery breaker;
(4) The inverter will start automatically when the PVvoltage is higher than 150V and the battery voltage is higher than 46.4V.

8.2 Disconnecting The Inverter

(1) Disconnect the AC circuit breaker to prevent it from being reactivated;
(2) Disconnect the Battery breaker to prevent it from being reactivated;
(3) Turn off the PVswitch;
(4) Check the inverter operating status;
(5) Wait until LED display has gone out, the inverter is shut down.

8.3 Commissioning of hybrid inverter

1. Start up the inverter by turning on the AC circuit breaker. GRID and LOAD LEDs on the hybrid inverter front panel should light up and status led should be solid green. Check with ESA team to make sure that CT has been placed correctly. Checks can be done on the portal to make sure that correct load is reflected in the portal.

2. Turn on the DC circuit breakers for PV strings. PV LED indicator should light up once hybrid inverter detects power generation from PV panels (if there is sun). Wait for 65 seconds and check the portal for PV generation.

- Check that LOAD does not increase with PV generation. If so check the CT placement again ensuring energy flow on the portal matches to that on site.

3. For systems with batteries connected, turn on the battery DC circuit breaker. The battery LED indicator should light up once the hybrid inverter can establish communication with battery.

4. In regards to confirming the effective installation and commissioning of the system, further verification can be undertaken by monitoring the system through the portal. Refer to section 6.5 – Monitoring the System for instructions on this.

8.4 Country Code Setting

The ESA inverter has been pre-set only for use in Australia – so there is no requirement to set or change this coding.

9 Maintenance and Cleaning

9.1 Checking Heat Dissipation

If the inverter regularly reduces its output power due to high temperatures, please improve the heat dissipation conditions. You need to clean the heat sink, or look for other obstructions.

9.2 Cleaning The Inverter

If the inverter is dirty, please shut down the inverter and clean the enclosure lid.

9.3 Checking The DC Switch

Check for externally visible damage and discoloration of the breaker, and the cables at regular intervals. If there are any signs of visible damage to the breaker, or visible discoloration or damage to the cables, contact the installer.

WARNING

Once a year, turn the rotary switch of the DC switch from the On position to the Off position 5 times in succession. This cleans the contacts of the rotary switch and prolongs the electrical endurance of the DC Disconnect.

10 Decommissioning

10.1 Dismantling The Inverter

(1) Disconnect the inverter as described;
(2) Remove all connection cables from the inverter;
(3) Screw off all projecting cable glands;
(4) Lift the inverter off the bracket and unscrew the bracket screws;

DANGER

Danger of burn injuries due to hot enclosure parts!
Wait 20 minutes before disassembling until the housing has cooled down.

10.2 Packing The Inverter

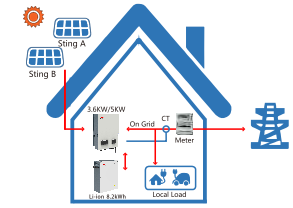
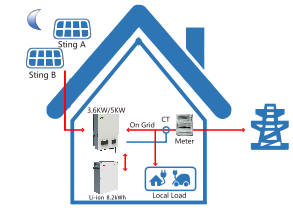
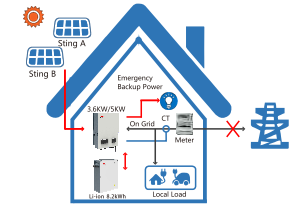
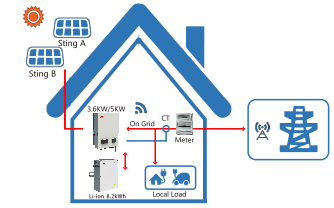
If possible, always pack the inverter in its original packaging and secure it with tension belts. If this is no longer available, you may also use an equivalent sized carton. The box must be capable of being closed completely and made to support both the weight and the size of the inverter.

10.3 Storing The Inverter

Store the inverter in a dry place where ambient temperatures are always between -25°C and +60°C.

11 Work Modes

The ESA Series Hybrid Inverter has the following main work modes:

DAYTIME MODE The system optimizes the delivery of generated PV power, prioritizing LOCAL loads then BATTERY if necessary and finally ending excess generated power to the GRID.	
NIGHT TIME MODE / ON PEAK EVENING This is prioritized to discharge the battery ready for the OFF PEAK time to refill if necessary at the cheapest rate. When the battery is depleted automatic switching will occur and GRID power will be used.	
EMERGENCY BACK UP AND ISLAND MODE The system has the ability to be a stand alone system in ISLAND MODE. There is also an essential backup power system available for use when there is a power cut.	
DEMAND SIDE RESPONSE There is an option in our software to allow remote data collection/analytics. This gives vital information to utility providers and can allow a high level of indication to when demand will occur.	

12 Manufacturer Warranty

This inverter is covered by a 5(five) year warranty. Completion of the on-line registration certificate validates a standard factory warranty of 5(five) years from the date of commission. A warranty extension can be purchased within a 12 month period of original installation. Please contact your supplier for further details. The warranty statement is available as a separate document and it can also be downloaded from the www.energystorageaustralia.com website.

13 Technical Data

SPEC	ESA-3600	ESA-5000
Input Date (DC)		
Max. DC Power	4000W	6500W
Max. DC Voltage	600V	
Start Voltage	150V	
DC Nominal Voltage	360V	
PV Voltage Range	100V ~ 600V	
MPP Voltage Range	120V ~ 550V	
Max. input Current per string of tracker A/tracker B	11A/11A	
Number Of Independent MPP Input	2	
Backfeed current to the array appears	0A	
Output Date (AC)		
Nominal AC output power (at 230V 50Hz)	3600W	5000W
Max.AC Apparent Power	3600VA	5000VA
Max. output current (at 230V 50Hz)	16A	22.8A
AC Nominal Voltage; Range	220V/230V/240V; 180Vac 280Vac	
AC Grid Frequency; Range	50,60Hz; ±5Hz	
Power factor at rate power	1	
Power Factor	0.8leading 0.8lagging	
THDi	<3%	
AC connection	Single phase	
Battery		
Battery Type	LiFeP04	
Norminal voltage	48V	
Battery Capacity	100Ah(depending requirement)	
Energy	4.88kWh(depending requirement)	
Max. discharging /Charging Power	2500W / 2500W	
Charging Curve	3-stage adaptive with maintenance	
Operating Voltage Range	46.4-57.6V	
Max. Charging/Discharging Current	50A / 50A	
Back-Up Output		
Outpu Rate Power	2500VA	
Peak Power	3450VA,10s	
Output Voltage	230Vac ±2%, 50Hz(60Hz Optional)±0.2%, THDV<3%(linear load)	
Efficiency		
Max. efficiency	97%	97.10%
Euro - eta	96.50%	96.50%
MPPT efficiency	99.50%	99.50%

SPEC	ESA-3600	ESA-5000
Protection Devices		
DC reverse polarity protection	Yes	
DC switch rating for each MPPT	Yes	
Output over current protection	Yes	
Output overvoltage protection-varistor	Yes	
Ground fault monitoring	Yes	
Grid monitoring	Yes	
Max. inrush current	30A peak	
Max. output fault current	40A peak	
Max. output overcurrent protection	25A rms	
Integrated all - pole sensitive leakage current monitoring unit	Yes	
General Date		
Dimensions (W / H / D)	480 X 410 X 220mm	
Weight	30KG	30KG
Operating temperature range	-25...+60℃ (-13...+ 140F) ° With derating above 45C1 13₣	
Noise emission (typical)	≤ 25 dB(A)	
Altitude	Up to 2000m6 560ft Without power derating	
Relative humidity	95%	
Consumption: operating (standby) / night	<5W / < 0.5 W	
Topology	Transformerless	
Cooling concept	Natural	
Environmental Protection Rating	IP65	
Features		
PV connection	H4/MC4	
Battery connection	Screw terminal	
AC connection	Screw terminal	
Display	LED	
Interfaces: Wi-Fi/USB/GPRS/RS485	Yes/Yes/Opt/Opt	
Warranty:	10 Years	
Certificates and approvals	CE,IEC 62109-1 2, VDE 0126-1-1 G83/2, AS4777 N S 3100	

Note:

(1) Back-Up output power depends on the battery.

(2) Specifications are subject to change without further notice.