

EVANTRA



WH-SPHA3.6H-5.12kWh

WH-SPHA3.6H-10.24kWh

WH-SPHA4.6H-5.12kWh

WH-SPHA4.6H-10.24kWh

WH-SPHA5.0H-5.12kWh

WH-SPHA5.0H-10.24kWh

WH-SPHA6.0H-5.12kWh

WH-SPHA6.0H-10.24kWh

USER MANUAL

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Copyright Statement

This manual is under the copyright of JIANGSU WEIHENG INTELLIGENT TECHNOLOGY CO., LTD.(hereinafter referred to as WIFO PRO), with all rights reserved. Please keep the manual properly and operate in strict accordance with all safety and operating instructions in this manual. Please do not operate the system before reading through the manual.

Version Information

Version	Date	Content
V1.0	2021-8-12	
V2.0	2022-5-26	

1. GENERAL INTRODUCTION

1.1 System Introduction

WH-SPHA series hybrid all-in-one battery energy storage system (BESS) is designed for both indoor and outdoor use. BESS can store the DC power generated by the PV array into the battery, or convert it into AC power to loads. This user manual applies to the following products : WH-SPHA3.6H-5.12kWh/WH-SPHA3.6H-10.24kWh/WH-SPHA4.6H-5.12kWh/WH-SPHA4.6H-10.24kWh/WH-SPHA5.0H-5.12kWh/WH-SPHA5.0H-10.24kWh/WH-SPHA6.0H-5.12kWh/WH-SPHA6.0H-10.24kWh.

1.2 Safety Introduction

1.2.1 Protection of Warning Sign

● SYMBOLS EXPLANATION

	Caution ! Failing to observe a warning indicated in this manual may result in injury.
	Danger of high voltage and electric shock !
	Danger of hot surface!
	Components of the product can be recycled.
	This side up! The package must always be transported, handled and stored in such a way that the arrows always point upwards.
	No more than six (6) identical packages being stacked on each other.
	Product should not be disposed as household waste.
	The package/product should be handled carefully and never be tipped over or slung.
	Refer to the operating instructions.
	Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.
 	Inverter will be touchable or operable after minimum 5 minutes of being turned off or totally disconnected, in case of any electrical shock or injury.
	CE Mark

● SAFETY WARNING

Any installation and operation on BESS must be performed by qualified electricians, in compliance with standards, wiring rules or requirements of local grid authorities or companies (like AS 4777 and AS/ NZS 3000 in Australia).

Before any wiring connection or electrical operation on BESS, all battery and AC power must be disconnected from BESS for at least 5 minutes to make sure BESS is totally isolated to avoid electric shock.

The temperature of BESS surface might exceed 60°C during working, so please make sure it is cooled down before touching it, and make sure the BESS is untouchable for children.

Usage and operation of the BESS must follow instructions in this user manual, otherwise the protection design might be useless and warranty for the BESS will be invalid.

Do not open BESS cover or change any component without WIFO PRO 's authorization, otherwise the warranty commitment for the BESS will be invalid.

Appropriate methods must be adopted to protect BESS from static damage. Any damage caused by static is not warranted by WIFO PRO.

The neutral continuity is NOT maintained internally, it must be achieved by external connection arrangements like in the system connection diagram for Australia on page 31 section 2.3.3.

This BESS includes an integrated residual current device (RCD).

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

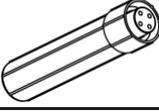
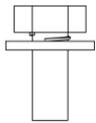
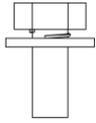
This BESS uses active anti-islanding protection, the method is shifting the frequency of the inverter away from nominal conditions in the absence of a reference frequency (frequency shift).

This BESS is a multiple mode inverter, it is used for outdoor unconditioned without solar effects. The maximum operating ambient temperature is 55 °C.

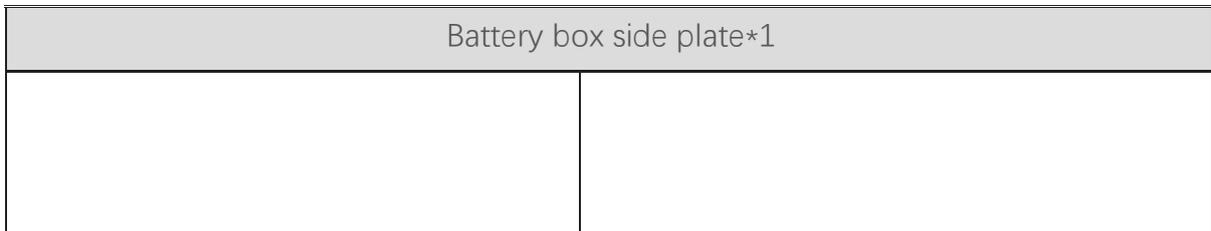
Product should not be used in multiple phase combinations.

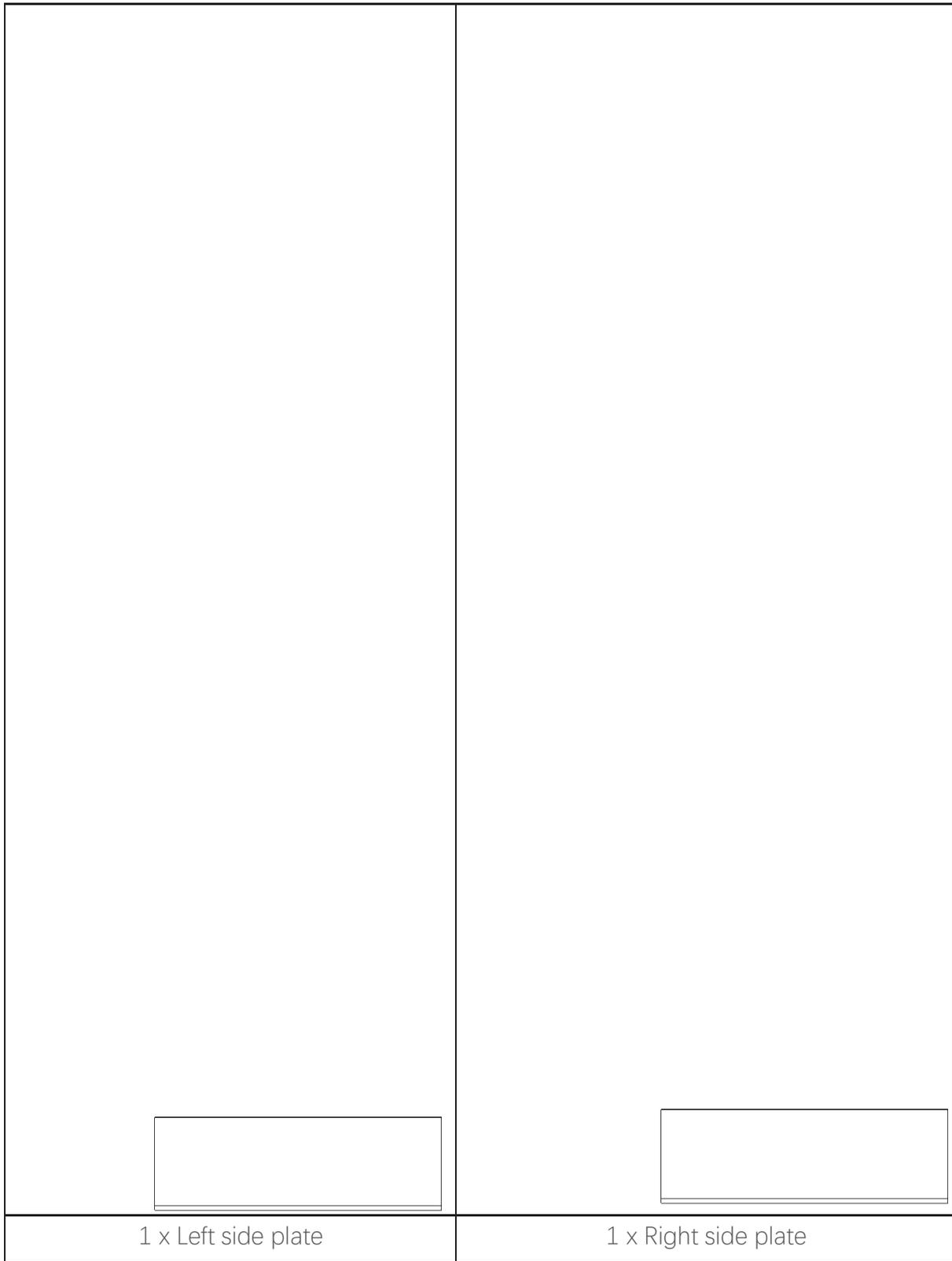
In the event of an earth fault, an error message will be sent to eCactus App and the status lamp on our product will turn into red.

1.3 Packing List

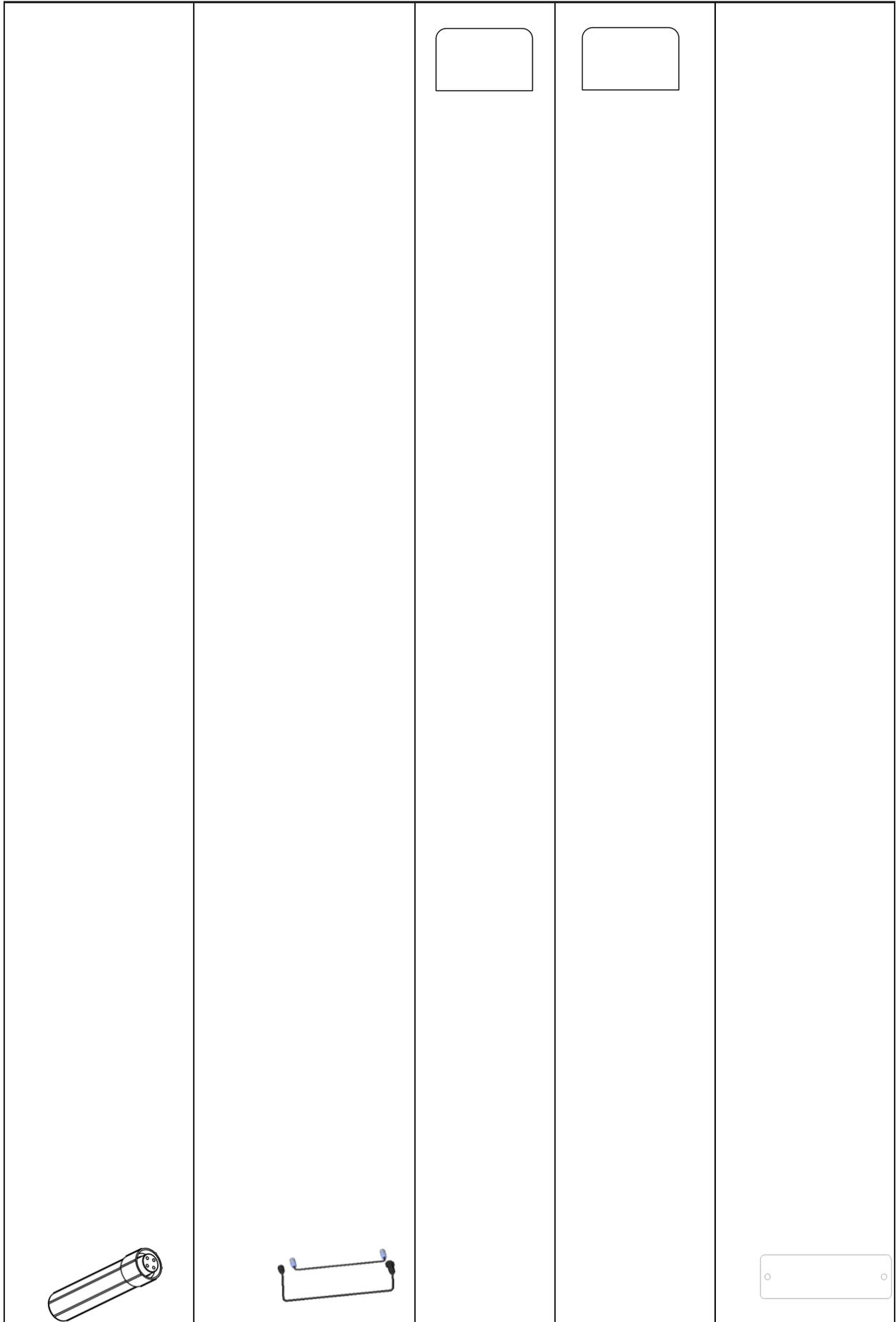
WH-SPHA-3.6H/4.6H/5.0H/6.0H-5.12kWh				
				
1xWifi module	Terminal accessory	Document accessory	2 x upper and lower connection plate	
				
1x Meter (Three Phase Meter/ Single Phase Meter)	1xQuick Installation Manual	Label accessory	8xM4*10	1xM4*10(PE)

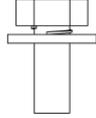
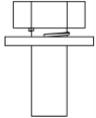
				
<p>1x Back plate</p>	<p>4xCushions</p>	<p>10xCable ties</p>	<p>2xφ10*60</p>	<p>Disassemble tool</p>





WH-SPHA-3.6H/4.6H/5.0H/6.0H-10.24kWh

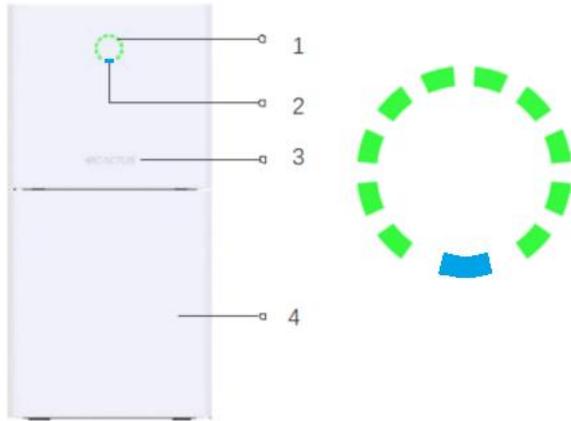


1xWifi module	2xcables	Terminal accessory	Document accessory	4x upper and lower connection board
				
1x Meter (Three Phase Meter/ Single Phase Meter)	1xQuick Installation	Label accessory	16xM4*10	1xM4*10(PE)
				
2x Back plate	4xCushions	15xCable ties	4xφ10*60	Disassemble tool
				
1 x Left side plate	1 x Right side plate			
Battery box side plate*2				



1.4 System Appearance

LED INDICATORS:



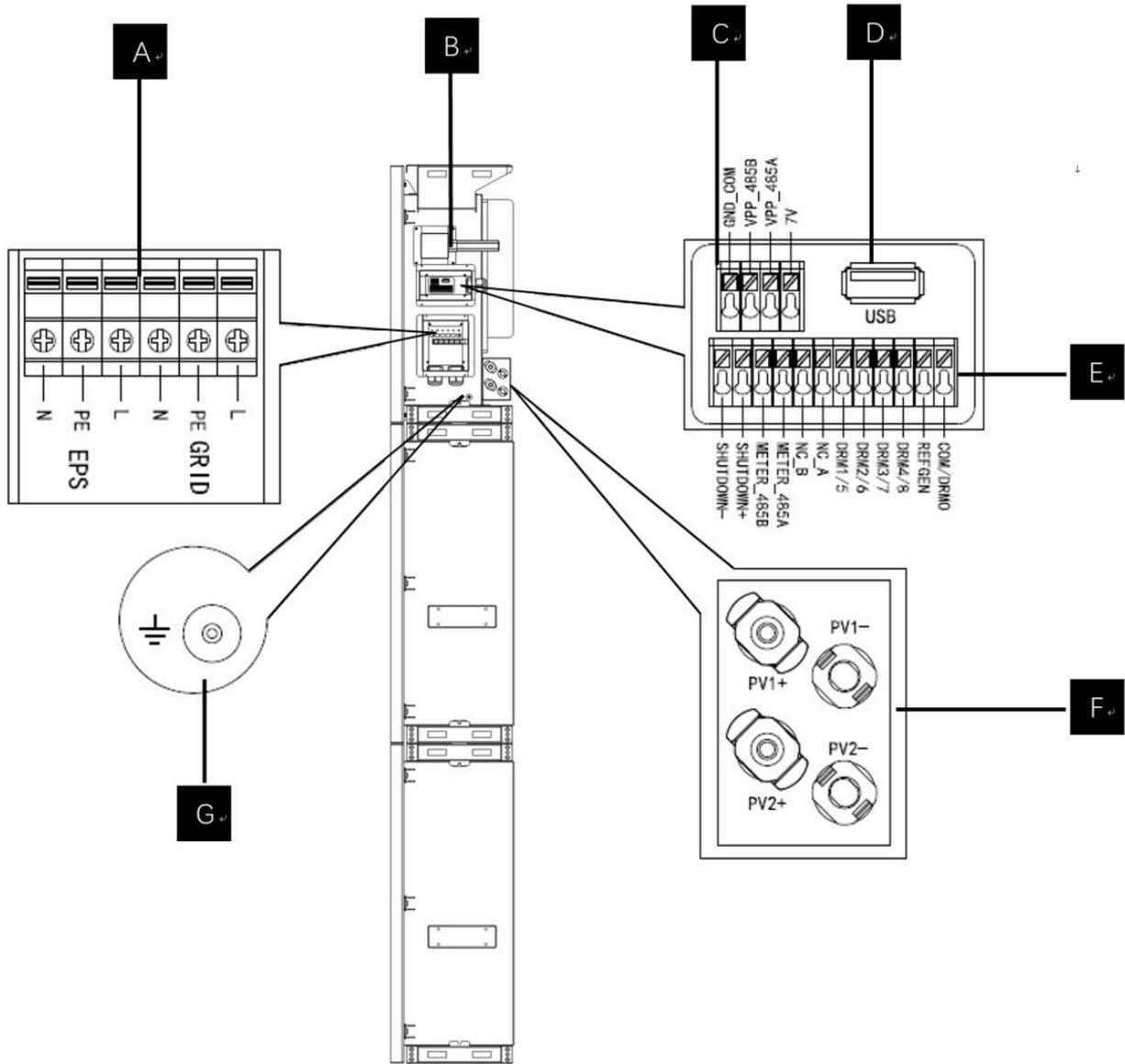
Object	Description
1	Energy indicator lamp
2	Status indicator lamp
3	logo
4	battery box *1

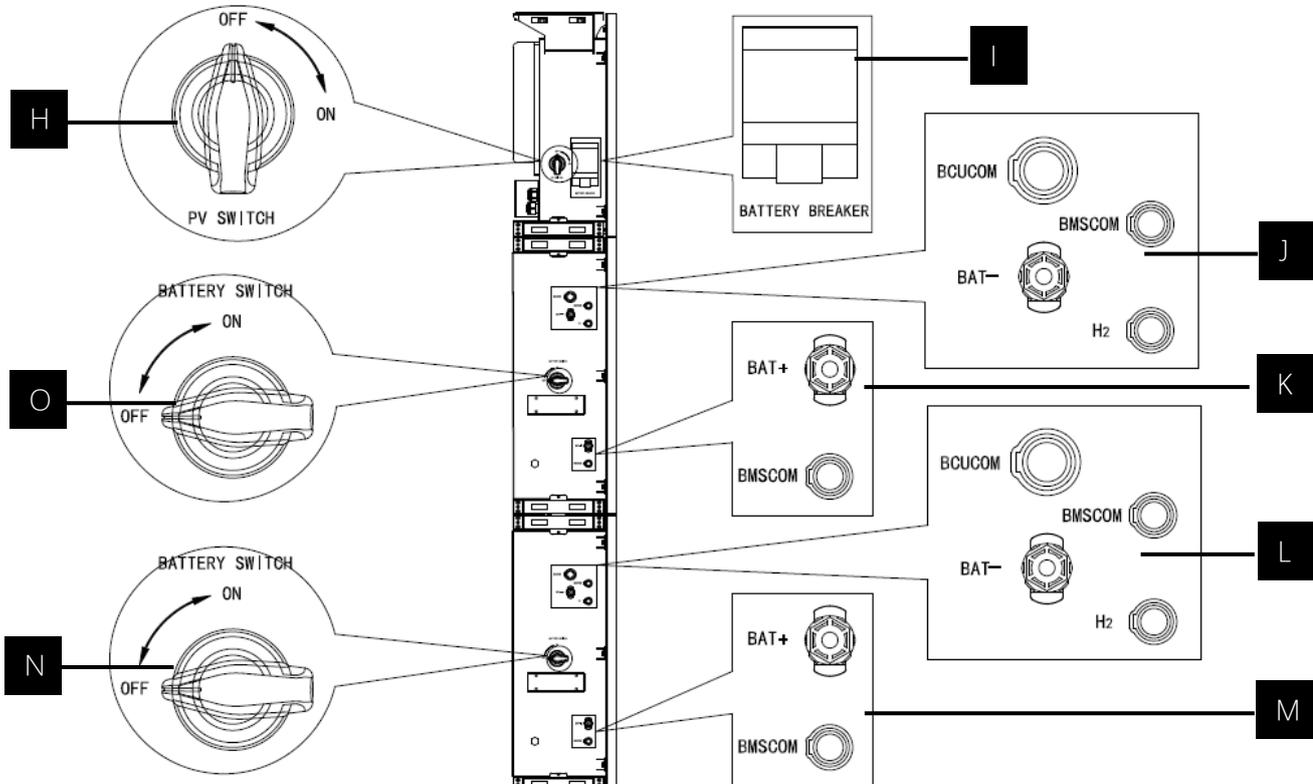
Note: *1 Two battery boxes can be placed.

STATUS	LED INDICATORS
Waiting	Blue LED blinking, with an interval of 1sec
Checking	Blue LED blinking, with an interval of 0.5sec
Normal	Blue LED on
DSP fault	Red LED on
Battery com. fault	Red LED blinking, with an interval of 1sec
Meter com. fault	Red LED blinking, with an interval of 0.5sec
Energy indicators	



Terminals of BESS:





Object	Description	Tool requirements and torque
A	Grid output & EPS output	Cross screwdriver 2.5 N·m
B	Wifi port	Plug and play terminals no tool required
C	VPP communication port	Flat head screwdriver
D	USB port for upgrading	Plug and play terminals no tool required
E	Meter communication port & DRM port	Flat head screwdriver
F	PV connection area	Plug and play terminals no tool required
G	Earthing screw	Cross screwdriver 2.5 N·m
H	PV switch(optional) For Australia and New Zealand the PV switch is not integrated	---
I	Battery breaker	Rated voltage [d.c.V] 500 Rated current [d.c.A] 40 Rated insulation voltage [d.c.V] 1000 Rated impulse voltage [d.c.V] 6000 Icu [kA] 6 Ics [kA] 6 Operating temperature -30°C...70°C
J/K/L/M	Battery internal communication &	Plug and play terminals no tool required

	power connected area	
NVO	Battery switch	The battery switch isolates the internal battery modules which are connected in series, the battery switch should not be used to disconnect the batteries under load. Isolation of battery under load is achieved via battery breaker.

1.5 Liability Limitation

WIFO PRO does not assume any direct or indirect liability for any product damage or property loss caused by the following conditions.

- ◆ Product modified, design changed or parts replaced without Wifo Pro's authorization;
- ◆ Changes, or attempted repairs and erasing of series number or seals by non Wifo Pro technician;
- ◆ System design and installation are not in compliance with standards or regulations;
- ◆ Failure to comply with the local safety regulations (VDE for DE, SAA for AU, MEA PEA for Thailand);
- ◆ Transport damage (including painting scratch caused by rubbing inside packaging during shipping). A claim should be made directly to shipping or insurance company in this case as soon as the container/ packaging is unloaded and such damage is identified;
- ◆ Failure to follow any/all of the user manual, the installation guide and the maintenance regulations;
 - ◆ Improper use or misuse of the device;
- ◆ Insufficient ventilation of the device;
- ◆ The maintenance procedures related to the product that have not been followed to an acceptable standard;
- ◆ Force majeure(violent or stormy weather, lightning, fire etc.);

2.INSTALLATION

It is required to be installed on a flat ground or platform which can bear at least 300Kg. The back of the battery box requires a wall or bracket that can fix expansion bolts, bearing at least 300Kg. The installation site is required to be free from and has no flammable and explosive items and maintains air circulation.

2.1 Installation Site and Environment

2.1.1 General

BESS is outdoor version and can be installed in an outdoor or an indoor location.

The BESS is naturally ventilated. The location should therefore be clean, dry and adequately ventilated. The mounting location must allow free access to the unit for installation and maintenance purposes, and the system panels must not be blocked.

The following locations are not allowed for installation:

- ◆ habitable rooms;
- ◆ ceiling cavities or wall cavities;
- ◆ on roofs that are not specifically considered suitable;
- ◆ access / exit areas or under stairs / access walkways;
- ◆ Places where the freezing point can be reached, such as garages, carports or other places as well as wet rooms;
- ◆ places where salty and humid air can penetrate;
- ◆ seismic areas - additional security measures are required;
- ◆ sites higher than 3000 meters above sea level;
- ◆ places with an explosive atmosphere;
- ◆ locations with direct sunlight or a large change in the ambient temperature;

2.1.2 Restricted Locations

The BESS shall not be installed:

- (1) within 600 mm of any heat source, such as hot water unit, gas heater, air conditioning unit or any other appliance.
- (2) within 600 mm of any exit;
- (3) within 600 mm of any window or ventilation opening;
- (4) within 900 mm of access to 220/230/240 Vac connections;
- (5) within 600 mm of side of other device.

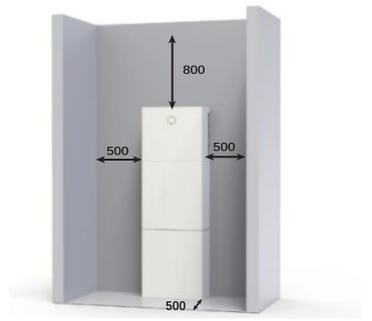
BESS installed in any corridor, hallway, lobby or the like and leading to an emergency exit shall ensure sufficient clearance for safe egress of at least 1 meter.

2.1.3 Barrier to Habitable Rooms

To protect against the spread of fire in living spaces where the BESS is mounted or on surfaces of a wall or structure in living spaces with a BESS on the other side, the wall or structure shall have a suitable non-combustible barrier. If the mounting surface itself is not made of a suitable non-combustible material, a non-combustible barrier should be placed between the BESS and the surface of a wall or structure. If the BESS is mounted at a wall or at least distance of 30 mm from the wall or the structure separating it from the habitable space, the distances to other structures or objects must be increased.

The following distances must remain empty:

- (1) 500 mm beside the BESS;
- (2) 800 mm above the BESS;
- (3) 500 mm before the BESS.



2.1.4 SELECT MOUNTING LOCATION

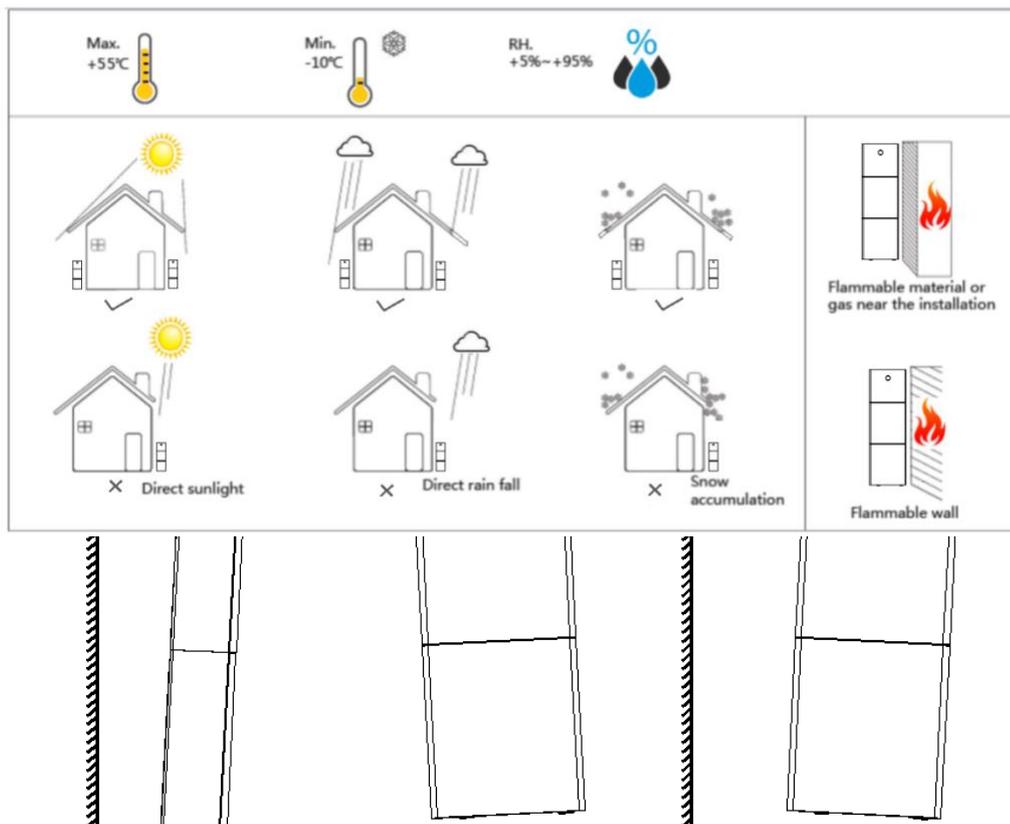
For The BESS's protection and convenient maintenance, mounting location for The BESS should be selected carefully based on the following rules:

Rule 1. The BESS should be installed on a solid surface, where is suitable for inverter's dimensions and weight.

Rule 2. The BESS installation should stand vertically or lie on a slop by max 2° (Pic 1).

Rule 3. Ambient temperature should be lower than 45°C.

Rule 4. The installation of The BESS should be protected under shelter from direct sunlight or bad weather like snow, rain, lightning etc.

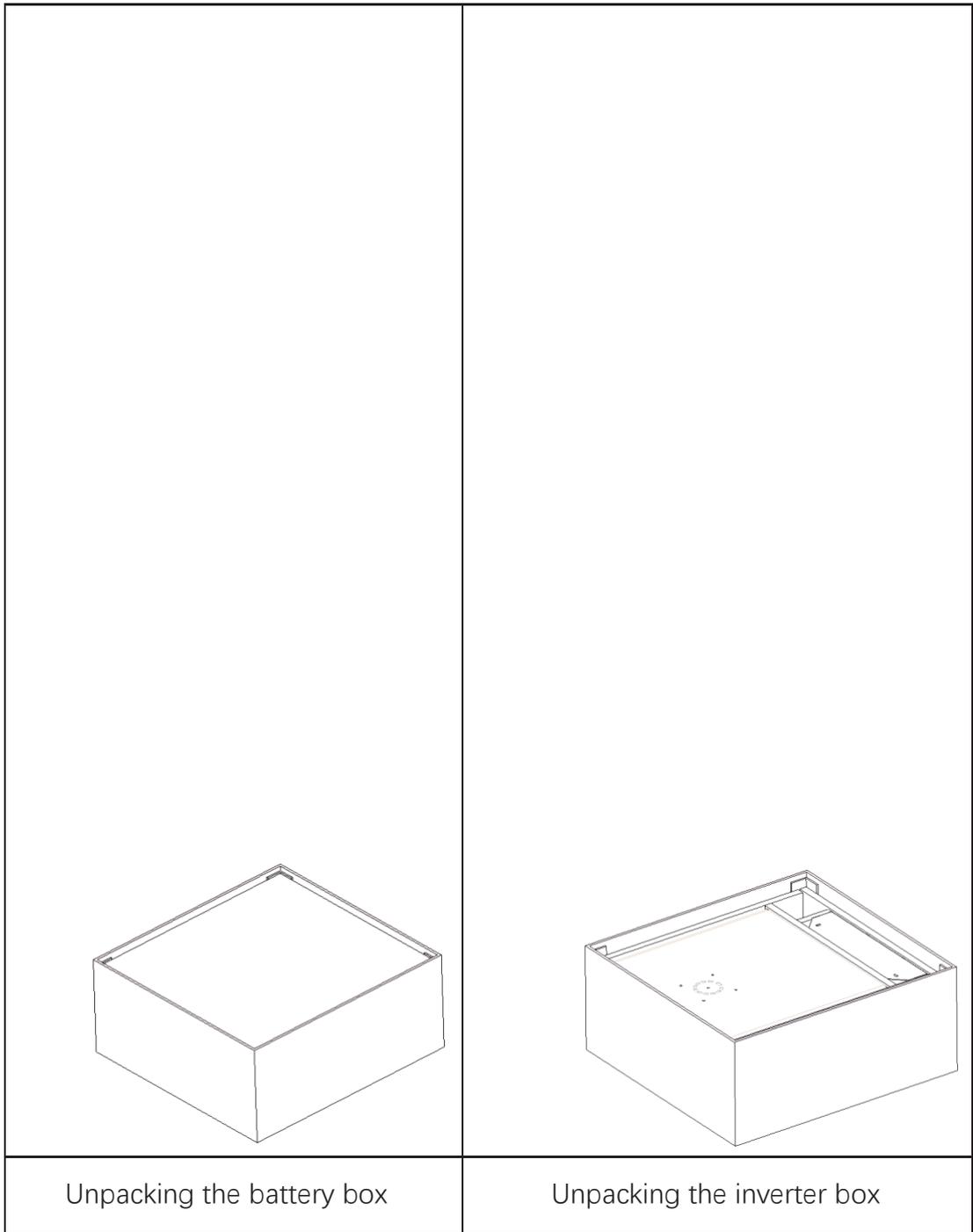


Rule 5. The BESS should be installed at eye level for convenient maintenance.

Rule 6. Product label on The BESS should be clearly visible after installation.

2.2 Installation Steps

Unpacking the battery box and inverter box.



2.2.1 Battery Box Installation

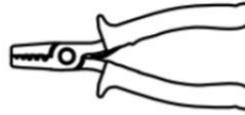
Installation Tools: ↴



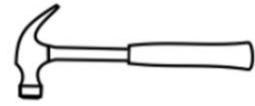
screwdriver



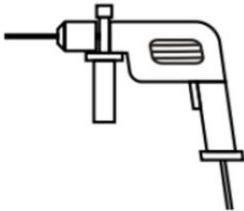
Multimeter



Wire stripper



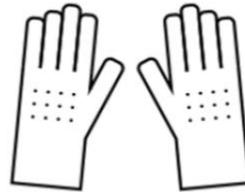
Claw hammer



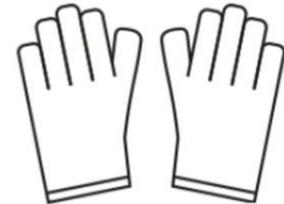
Percussion drill



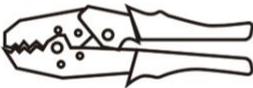
Diagonal pliers



Insulating gloves



Protective gloves

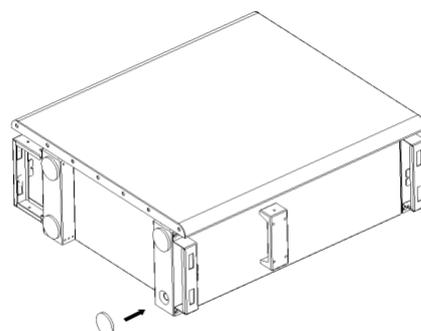


Crimping pliers ↴

For 10kWh BESS:

Step 1 : Paste the cushions of the battery box
Find four cushions from the inverter packaging accessory and paste them at the four corners of the bottom of the battery box.

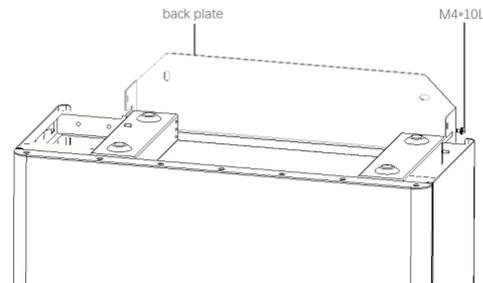
Step 2 : Back plate pre-tightening
Remove the installation back plate from the inverter attachment package and



pre-tighten the back plate to the top of the battery box with two M4*10 screws, as shown in the figure below:

Step 3 : Drilling holes

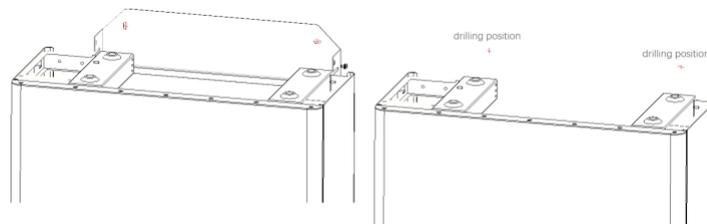
Put the pre-installed battery box in a specified position, so that it is close to



the fixture, mark it according to the hole position on the back plate, then rotate the back plate at an angle (or take the backboard away), and drill holes at the fixture with $\varnothing 10\text{mm}$.

Step 4 : Fix expansion tube

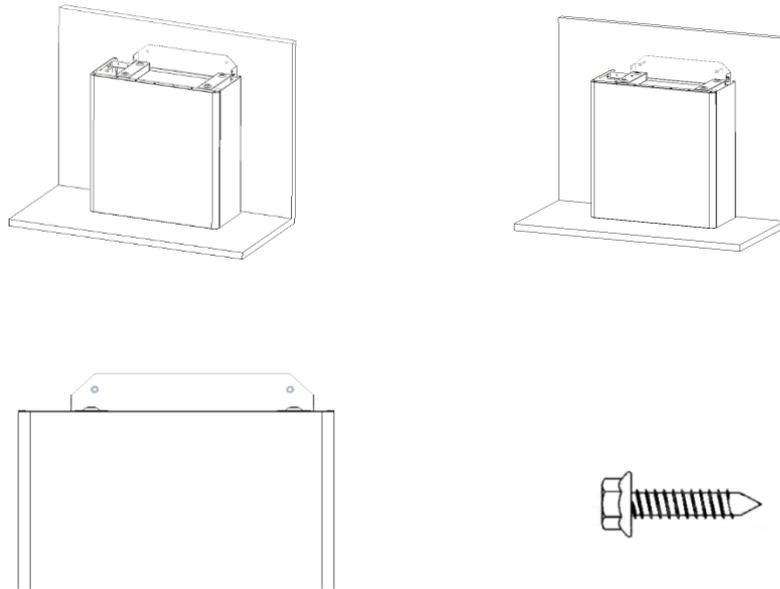
Find the expansion screw from the inverter box accessory package and hammer it into the pre-drilled hole so that its surface is flush with the wall.



Step 5 : Fix battery box and back plate

Rotate the back plate in place and spin the expansion pipe into the locking back plate with self-tapping screws (note that the battery box is fixed with the back plate). Replace the battery box and align the expansion pipe with the backboard hole, and then spin the self-tapping screws into it until the screw plane is pressed on the back plate.





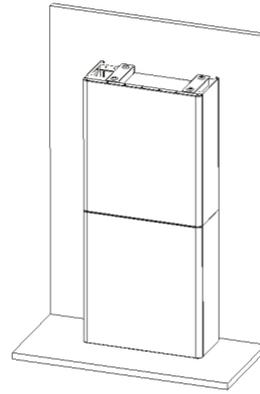
Step 6 : Back plate pre-tightening

Remove the installation back plate from the inverter attachment package and pre-tight the back plate to the top of the battery box with two M4*10 screws, as shown in the figure below.

Step 7 : Install the second battery box

Put the second battery box smoothly on the top of the first battery box, and be careful not to hit the Back plate.





Step 8 : drilling holes

Put the pre-installed battery box in a specified position, so that it is close to the fixture, mark it according to the hole position on the back plate, then rotate the back plate at an angle (or take the backboard away), and drill holes at the fixture with $\varnothing 10\text{mm}$.



Step 9 : Fix expansion tube

Find the expansion screw from the inverter box accessory package and hammer it into the pre- drilled hole so that its surface is flush with the wall.

Step 10 : Fix battery box and back plate

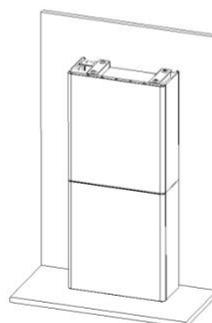
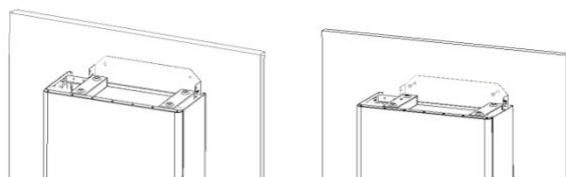
Rotate the back plate in place and spin the expansion pipe into the locking back plate with self- tapping screws (note that the battery box is fixed with the back plate). Replace the battery box and align the



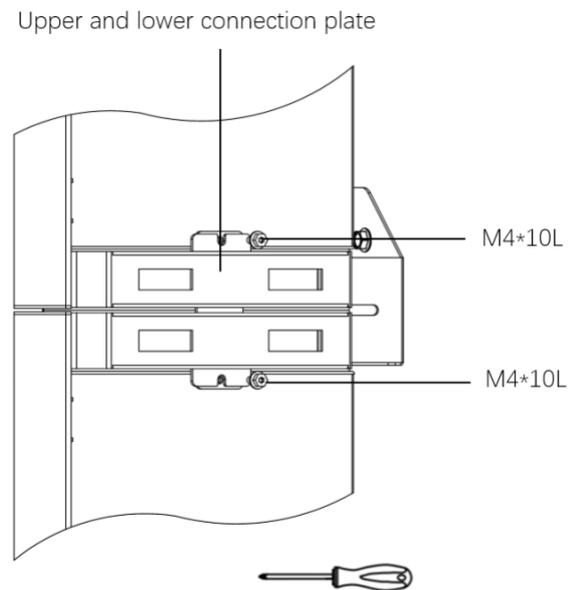
expansion pipe with the backboard hole, and then spin the self- tapping screws into it until the screw plane is pressed on the back plate.

How to fine-tune the battery box:

Item	Name	Torque	Note
1	Expansion screws	4 N·m	Tune up and down
2	Tune screws	3 N·m	Tune left and right
3	Fix screws	3 N·m	Tune front and back

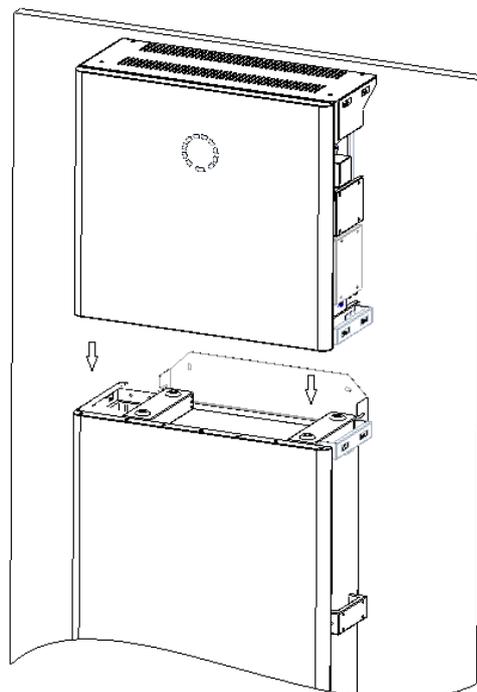


Step 1 1 : Fix the upper and lower connection plate. (Torque 2.5N.m)



2.2.2 Inverter Box Installation

Step 1 : Take the inverter out of the box and place it smoothly on the battery box.
Be careful not to damage the cables of the inverter when moving it.

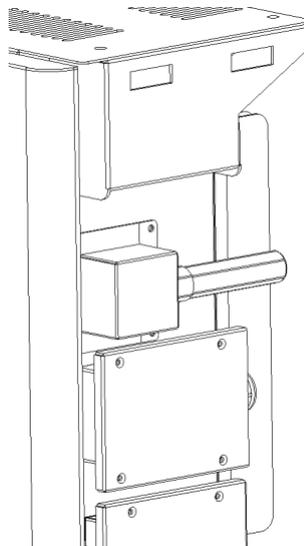
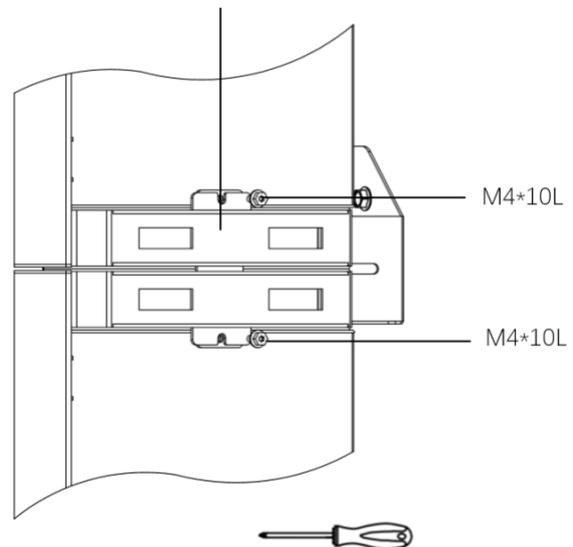


Step 2 : Fix the upper and lower connection board to the inverter box
 Pre-lock the back plate and inverter with M4*10L stainless steel screws,
 then lock the battery box and inverter with a upper and lower connection
 plate, and finally lock the back plate with the screws of the inverter.
 (Torque 2.5N.m)

Step 3 : Install Wifi module

Find the Wifi module in the accessory package and insert it into the base, then
 tighten the Plastic nut. Torque: 2.5N.m

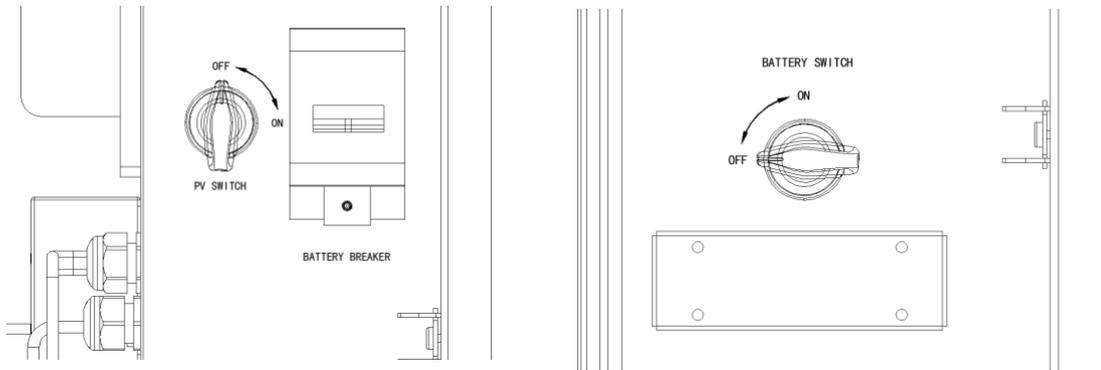
Upper and lower connection plate



2.3 Cable Connection

2.3.1 General

Make sure all the switches and breakers on the BESS are turned off.



Note: For Australia and New Zealand the PV SWITCH is not integrated.

Note: The external isolation devices for PV array ports shall include the requirement of an additional external break switching device that conforms to the requirements AS/NZS 4777.1

2.3.2 Connect the Inverter Box and Battery Box

Recommended cables and terminals:

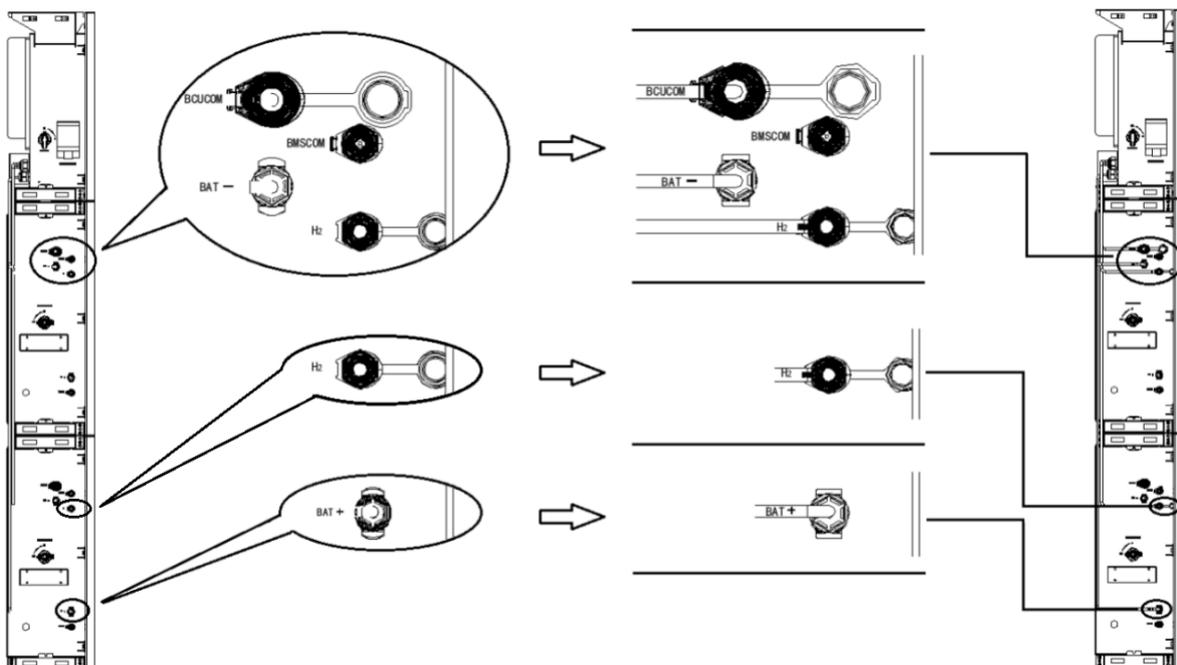
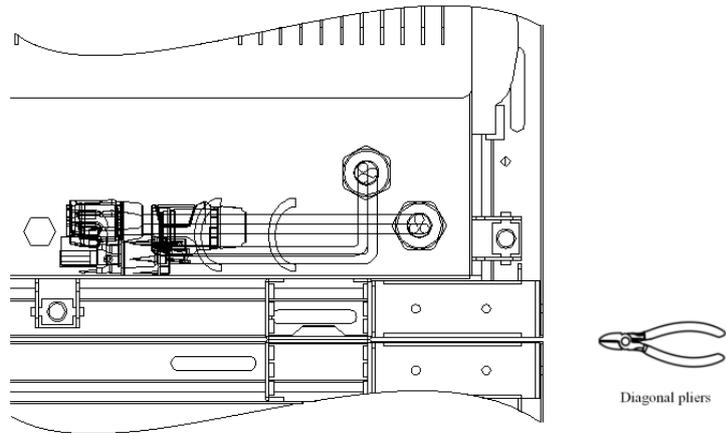
Cable Type	Cable Specification	Terminal Model
PE cable	10AWG	OT5-4 (In accessory)
PV+ cable	10AWG(REDF)	Positive DC Plug (In accessory)
PV- cable	10AWG(BLACK)	Negative DC Plug (In accessory)
Grid cable	8AWG	E10-12-XL (In accessory)
EPS cable	10AWG	E6012-XL (In accessory)

For 10kWh BESS:

Make sure all the switches and breakers on the BESS are turned off.

Step 1: Untie the cable ties.

Step 2: First open the waterproof cover of the corresponding terminal, and insert the corresponding terminal in turn according to the cable label.

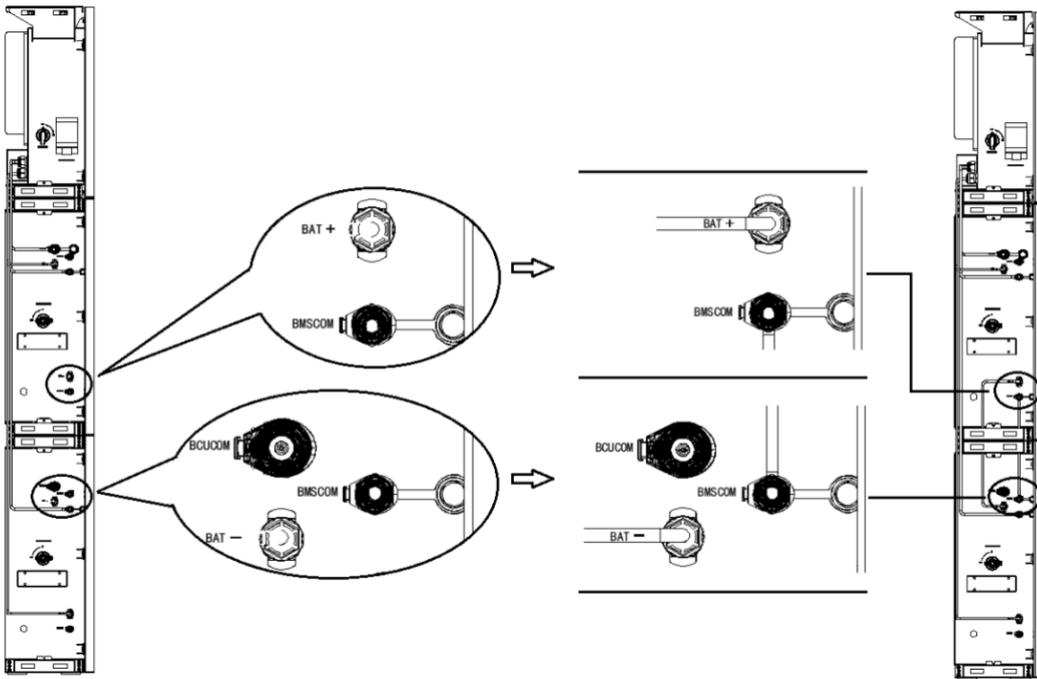


Step 3: Connect the cables between two battery boxes

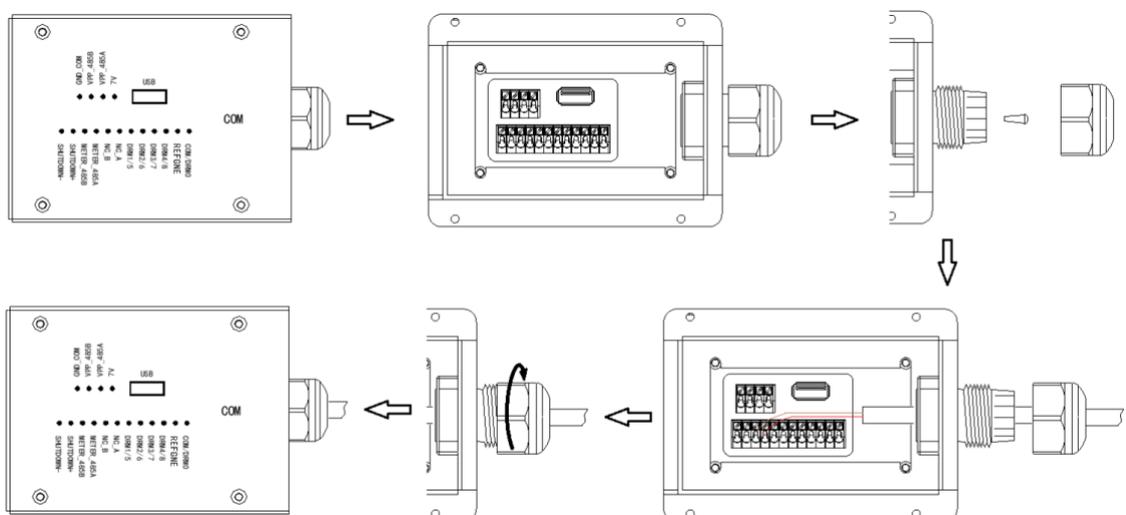
Find two wires from the inverter box and insert the corresponding port according to the wire number.

Step 4: Connect the communication cables

Open the communication cover plate and wiring according to the print instructions on



the communication cover board. Open the press nut of the waterproof connector, pull out the seal race, then penetrate the conductor into the hole, connect the corresponding label in turn, then tighten the forced nut, and finally lock the waterproof cover plate.



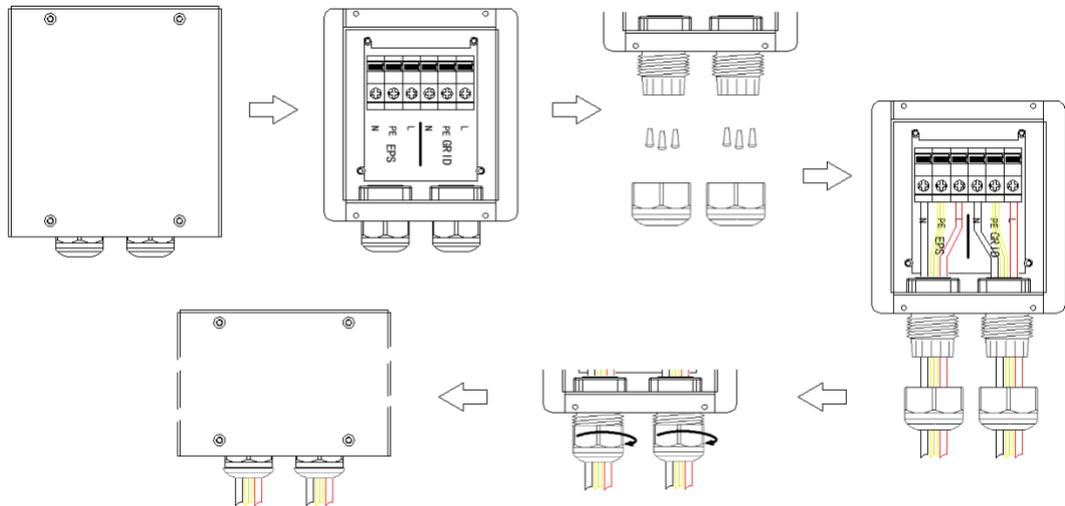
Step 5: GRID and EPS cables

Open the waterproof cover plate and connect according to the type description on the box. Open the press nut of the waterproof joint and pull out the seal race. Then penetrate the wire into the hole.

Note: The length of the cable shall be less than 30 meters.

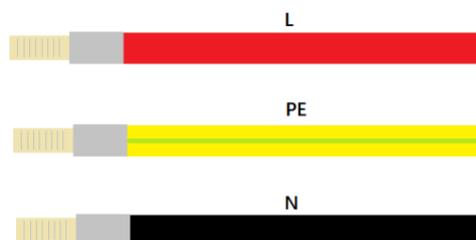
Pressed cable :

1. Peel off the L/N/PE cable end of 7mm length.

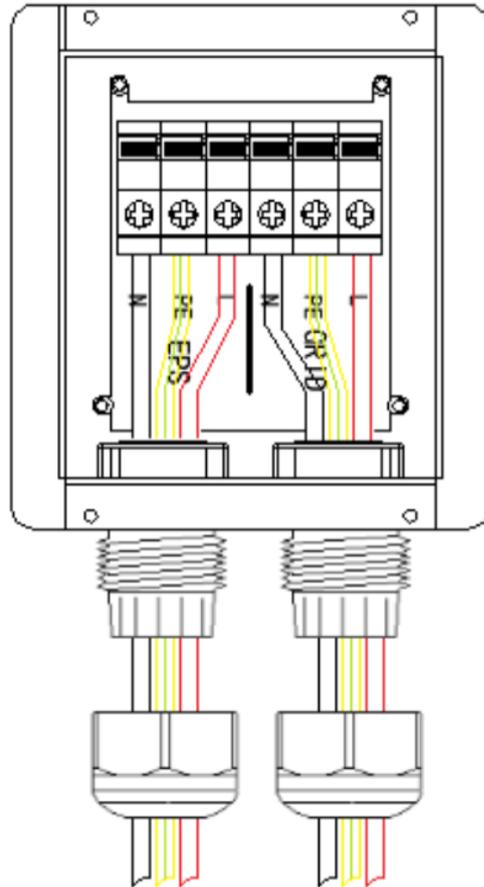


2. Put the "I" terminal into the cable and press it tightly with pressure line clamps.

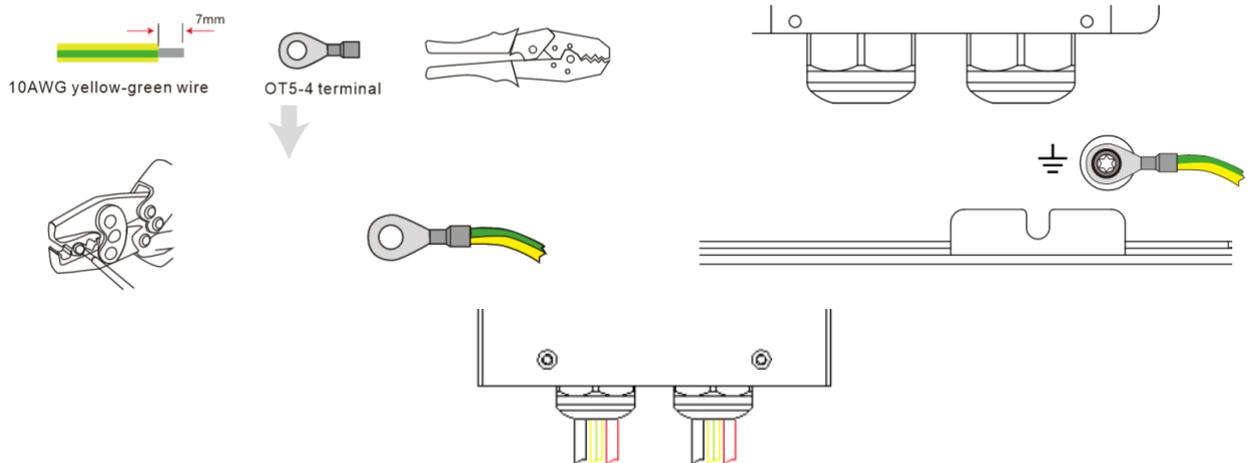
3. Insert the terminal into the wiring seat, use a cross screwdriver to lock the screws (2.5N.m), and tighten the nut.



4. Fix the waterproof cover and lock it.



Step 6 : Connect PE cable.



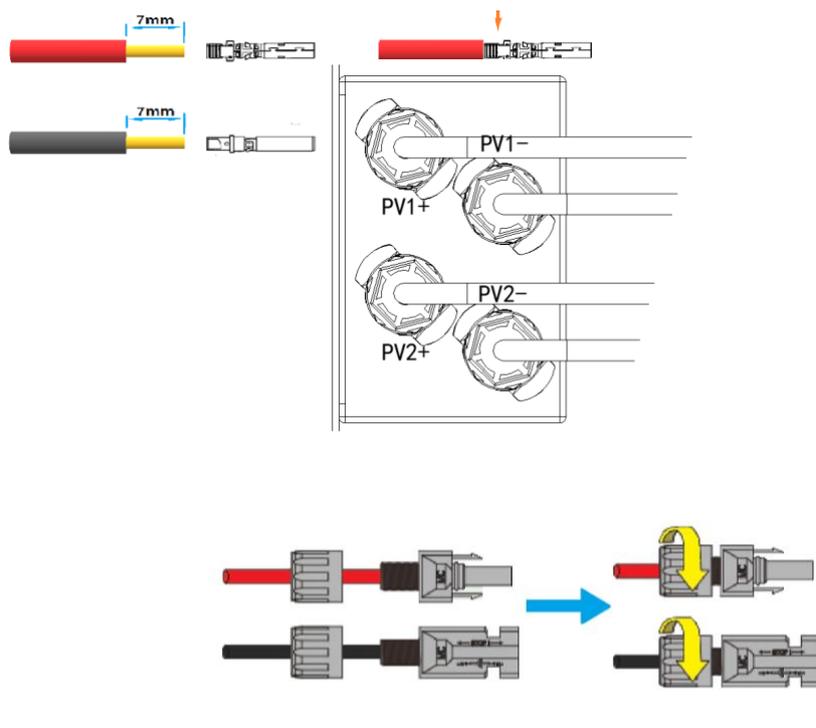
Step 7: Connect PV cables

1. Press the terminal;

2. Plug through the terminal and lock the nut;

Grade	Description	Value
A	Outside Diameter	5.5-8.0mm
B	Conduct Wire Length	7mm
C	Conduct Core Section	4-6mm ²

3. Finish the interpolation.



Model	①	②	③ ④
WH-SPHA3.6H- 5.12kWh/10.24kWh	50A/230V AC breaker	32A/230V AC breaker	Depends on household loads (usually already placed in the grid distribution box)
WH-SPHA4.6H- 5.12kWh/10.24kWh	63A/230V AC breaker	32A/230V AC breaker	
WH-SPHA5.0H- 5.12kWh/10.24kWh	63A/230V AC breaker	32A/230V AC breaker	
WH-SPHA6.0H- 5.12kWh/10.24kWh	63A/230V AC breaker	40A/230V AC breaker	

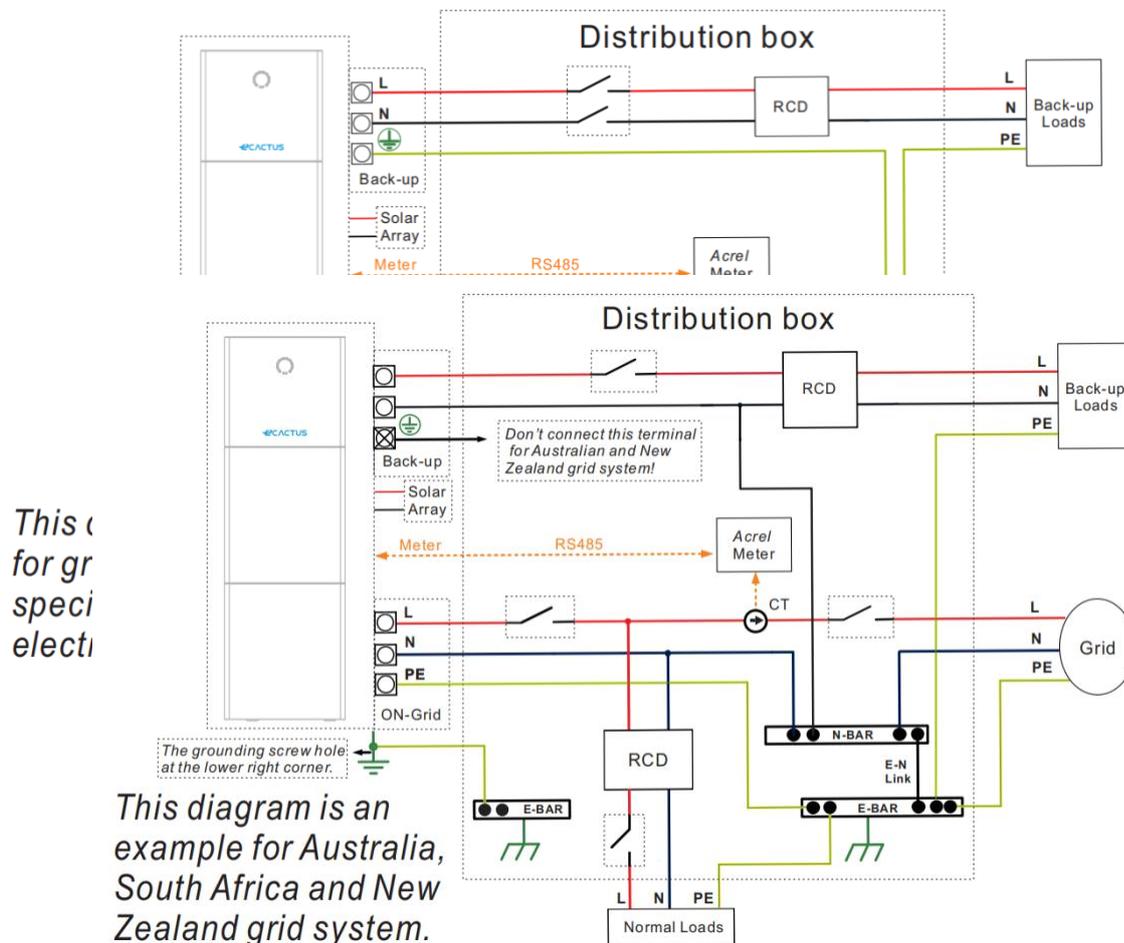
**Choose
the
proper**

breaker:

● System Connection Diagrams

Note: For Australia safety country, the neutral cable of On-Grid side and Back-Up side must be connected together, otherwise Back-Up function will not work.

Note: The back-up PE line and rack earth must be grounded properly and effectively. Otherwise the back-up function may be abnormal when the grid fail.



This is for specific electrical

This diagram is an example for Australia, South Africa and New Zealand grid system.

2.3.4 Power Meter

The electricity meter should be mounted and connected at the grid transition point

so that it can measure the grid reference and feed-in power.

CT meter ratio and accuracy table

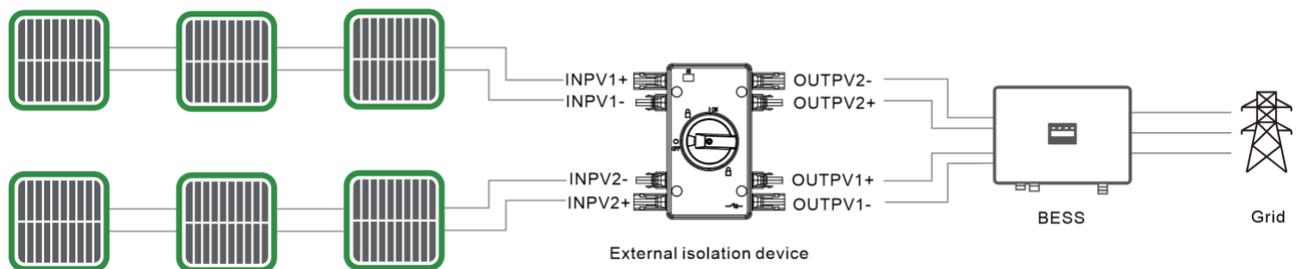
Manufacturer	Model	CT ratio	Accuracy
Acrel Co., Ltd	ACR10R-D16TE	3000	0.5 level

2.3.5 External isolation devices for PV array

For Australia and New Zealand the PV SWITCH is not integrated. An external isolation device for PV array ports is needed. The external isolation device shall conform to the requirements AS/NZS 4777.1

External isolation device for PV array table

Manufacturer	Model
PROJOY Electric Co., Ltd	PEDS100-EL40R-4(4MC4)



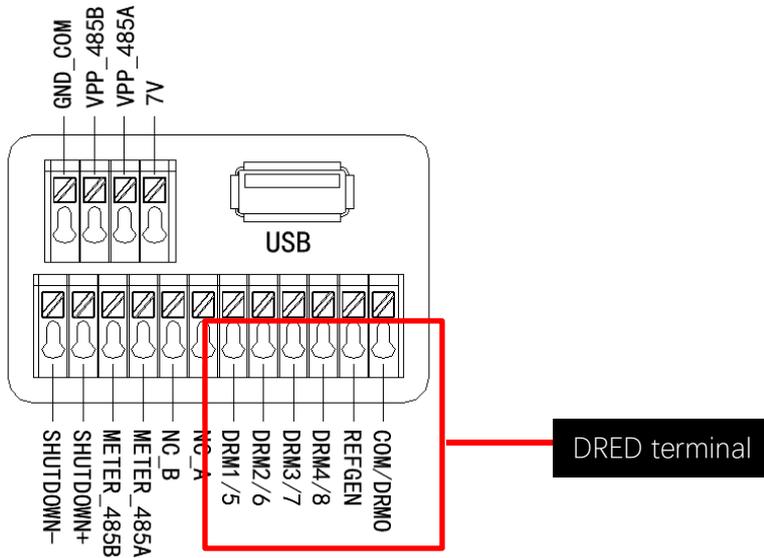
2.4 DERD Connection

DRED is used for Australia and New Zealand installation to support several demand response modes.

Demand response mode	Requirement
DRM0	Disconnected Import power = 0 & Generate power = 0
DRM1	Import power = 0
DRM2	Import power < 50%
DRM3	Import power < 75%
DRM4	Import power = Not limited
DRM5	Generate power = 0
DRM6	Generate power < 50%

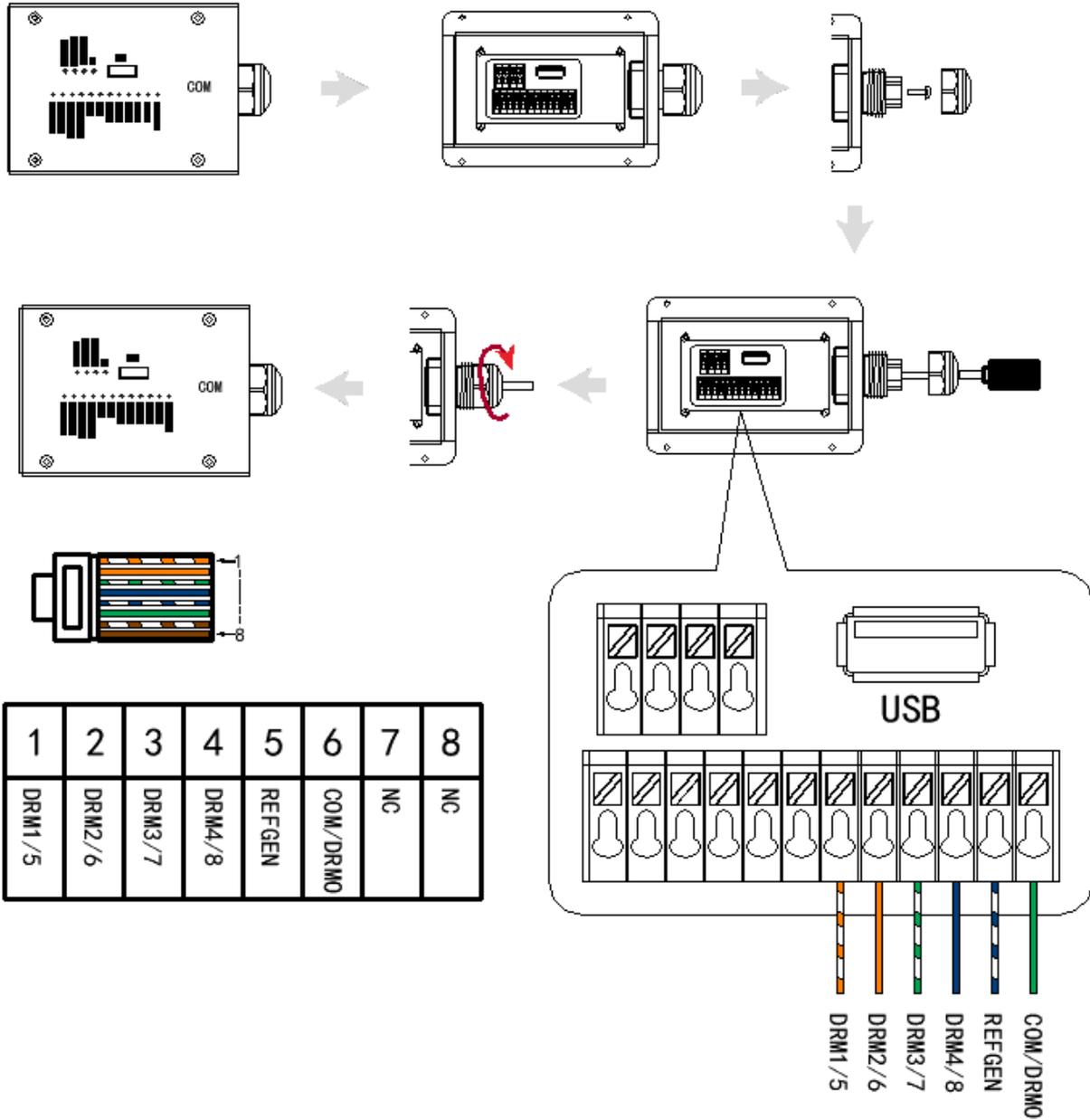
DRM7	Generate power < 75%
DRM8	Generate power = Not limited

● DRED terminal:



● DRED Wire connection

Open the communication cover plate and wiring according to the print instructions on the communication cover board. Open the press nut of the waterproof connector, pull out the seal race, then penetrate the conductor into the hole, connect the corresponding label in turn, then tighten the forced nut, and finally lock the waterproof cover plate.



3.SYSTEM OPERATION

3.1 Switch On

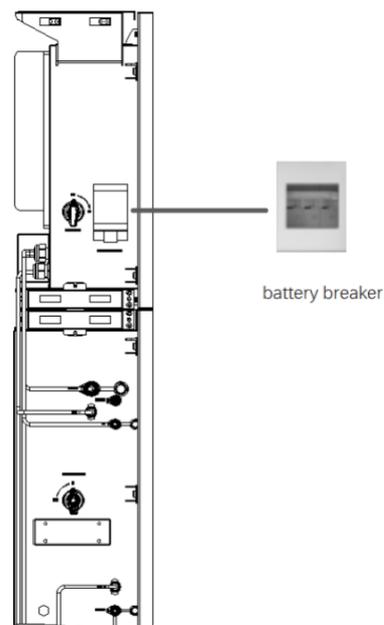
Warning: Please check the installation again before turning on the system.

Step 1: Turn on the battery switch on every battery module

Note:

The battery switch isolates the internal battery modules which are connected in series, the battery switch should not be used to disconnect the batteries under load. Isolation of battery under load is achieved via battery breaker.

Step 2 : Open the battery breaker cover and turn on the battery breaker.



Step 3: Turn on the PV switch.

Note: For Australia and New Zealand the PV SWITCH is not integrated.

Note: The external isolation devices for PV array ports shall include the requirement of an additional external break switching device that conforms to the requirements AS/NZS 4777.1

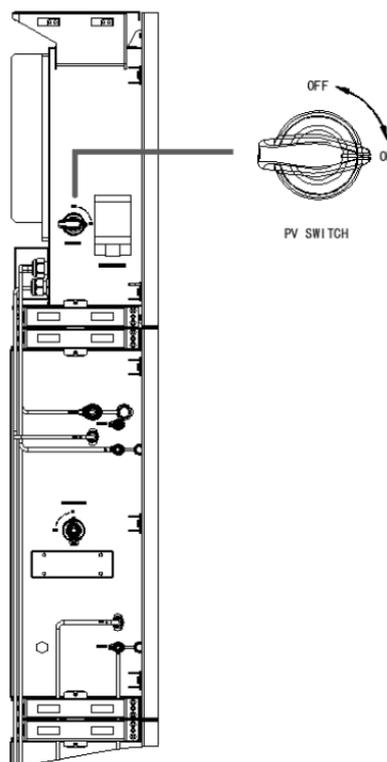
Step 4: Turn on the grid breaker.

Step 5: If backup load is applied, switch on the backup breaker.

Step 6: Close the battery breaker cover.

Step 7: Configure the WIFI stick (Only if this is the first time turning on the system).

Please follow the instructions in section 4 to section 5.



3.2 Switch Off

Step 1: If backup load is applied, turn off the backup load first, and then turn off the backup breaker.

Step 2: Turn off the grid breaker.

Step 3: Turn off the PV switch.

Step 4: Open the battery breaker cover and turn off the battery breaker.

Step 5: Turn off the battery switch on every battery module.

Step 6: Close the battery breaker cover.

3.3 Emergency Situations

3.3.1 Emergency Procedure

When the WH-SPHA battery energy storage system (BESS) appears to be running abnormally, you can turn off the main grid breaker that directly feeding the BESS, and turn off all switches within the BESS. Then please contact Wifo Pro and we will provide detailed instructions.

WARNING: Please do not open the upper cover plate of the BESS by yourself.

3.3.2 First Aid Measures

If battery module leaks electrolyte, avoid contacting with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below:

Skin contact: Remove contaminated clothes and rinse skin with plenty of water or shower for at least 15 minutes. Take a medical treatment immediately.

Eye contact: Immediately flush eyes with plenty of water continuously for at least 15 minutes, occasionally lifting the upper and lower eyelids. Take a medical treatment immediately.

Inhalation: Cover the victim in a blanket, move to the place of fresh air and keep quiet. Take a medical treatment immediately. When dyspnea (breathing difficulty) or asphyxia (breath-hold), give artificial respiration immediately.

Ingestion: Give at least 2 glasses of milk or water. Induce vomiting unless patient is

unconscious. Take a medical treatment immediately.

3.3.3 Firefighting Measures

Extinguishing media: Dry power, sand, carbon dioxide (CO₂), water spray
Fire precautions and protective measures:

Flammable properties: Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks When subjected to high temperature (> 150°C) , When damaged or abused (e.g., mechanical damage or electrical overcharge). Burning cells can ignite other batteries in close proximity.

Explosion data: Extreme mechanical abuse will result in rupture of the batteries. Throw into the fire will result in burning.

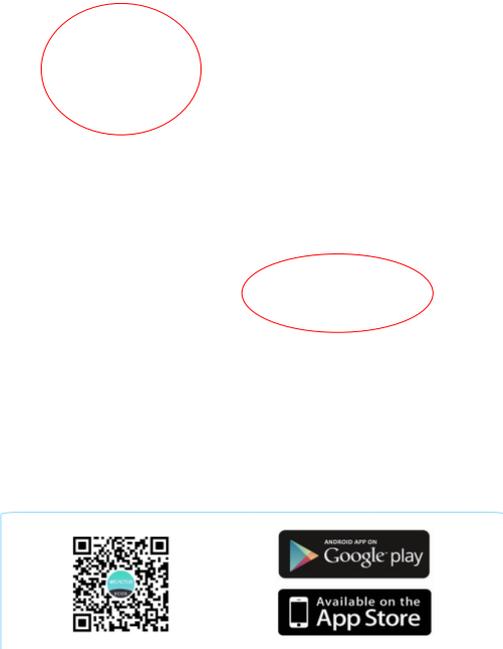
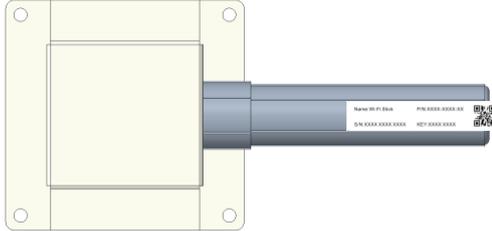
Special protective equipment for firefighters: In the event of a fire, wear full protective clothing and self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

4. ECACTUS CONFIGURATION & WIFI RELOAD

- This part shows eCactus configuration step by step.

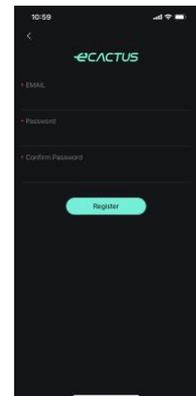
4.1 Preparation

1. Inverter must be powered up with only PV power.
2. Need a router with available Internet access to the eCactus application center.
3. An Android or iOS smart phone

<p>STEP1</p> <p>1. Scan the QR code on the front of the device to install Android or iOS version eCactus App which depends on the operating system.</p>	 <div data-bbox="901 1243 1404 1377" style="border: 1px solid black; padding: 5px;">    </div> 
--	--

STEP2

1. Open ECOS APP and click the sign up button to register a new user account.
2. Following all the instructions during the sign up process to successfully connect the device with ECOS.
3. The QR code for the product connection ID is on the Wi-Fi stick within the right side of the device.

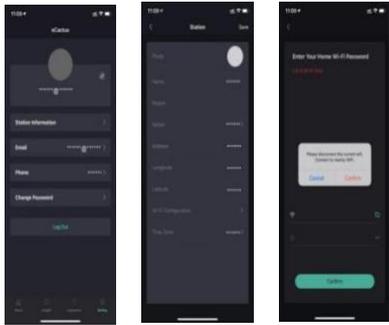


NOTE:

1. Please make sure the password is right the same with the router's.
2. If everything is right well, the Wi-Fi LED on inverter will change from double blink to quartic blink then to solid status, Which means Wi-Fi is connected to eCactus successfully.

4.2 Wi-Fi Reset & Reload

Wi-Fi Reset means restarting Wi-Fi module, Wi-Fi settings will be reprocessed and saved. Wi-Fi Reload means setting Wi-Fi module settings back to default factory setting.

<p>Wi-Fi Reset: Please use your eCactus App to reset Wi-Fi configuration. Navigate to Setting and Station information and then Wi-Fi Configuration and follow the instructions to finish Wi-Fi reset procedure.</p>	
---	---

4.3 Install Side Plate

Confirm that the left and right side plates are installed respectively after the BESS is working properly.:



5.EMS CONFIGURATIONS

Energy management system(EMS) configurations can be done via eCactus App or online website.

Three working modes can be set:

1.Self - Powered:

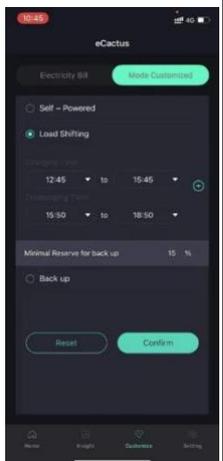
eCactus will manage your family power to reduce buying power from power grid.

2.Load Shifting

Power from battery will be charge and discharged as you configured.

3.Backup:

eCactus will not discharge battery unless power grid is off. At that time, eCactus can support your family power usage by discharging battery.

<p>Working Modes:</p> <p>Navigate to Customize tab and you can one of three operation modes from eCactus App.</p>	
--	---

6. Wifo Monitor CONFIGURATION

You can change and check the country code and power quality response modes via our configuration software “Wifo Monitor”. Please contact our technical support for more information.

For AS/NZS 4777.2:2020, you can change the Region requirements: Australia A, Australia B, Australia C, New Zealand. When you selected from Australia Region A/B/C, our configuration software “Wifo Monitor” would then load the default values. Including default power quality response modes (i.e. volt-watt, volt-var) and grid protection settings (i.e. overfrequency, overvoltage, etc) according to the regions you have selected. Also you can adjust the setpoints (within the permitted/allowed range).

Note: “Wifo Monitor” is provided to authorized persons only.

(1) Select country code

open the Wifo Monitor, click the “Saf” button and open the setting page to change the country code and select region from Australia Region A/B/C(Only for AS/NZS 4777.2:2020).

“AUS” means Australia, “AS4777_2_A” means Australia Region A.

The default protection settings points(under/over frequency, under/over voltage) are automatically loaded according to AS/NZS 4777.2:2020 Table 4.1 & 4.2.

Table 4.1 — Passive anti-islanding voltage limit values

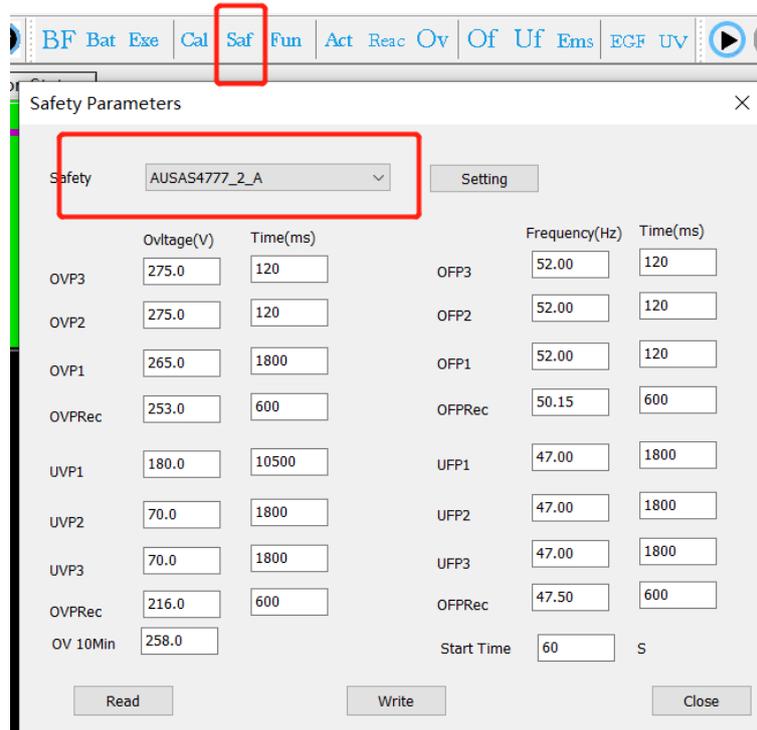
Protective function	Protective function limit	Trip delay time	Maximum disconnection time
Undervoltage 2 ($V < <$)	70 V	1 s	2 s
Undervoltage 1 ($V <$)	180 V	10 s	11 s
Overvoltage 1 ($V >$)	265 V	1 s	2 s
Overvoltage 2 ($V > >$)	275 V	—	0.2 s

NOTE Refer to [Table 2.5](#) for the measurement specifications.

Table 4.2 — Passive anti-islanding frequency limit values

	Region	Australia A	Australia B	Australia C	New Zealand
Under-frequency 1 ($F <$)	Protective function limit value	47 Hz	47 Hz	45 Hz	45 Hz
	Trip delay time	1 s	1 s	5 s	1 s
	Maximum disconnection time	2 s	2 s	6 s	2 s
Over-frequency 1 ($F >$)	Protective function limit value	52 Hz	52 Hz	55 Hz	55 Hz
	Trip delay time	—	—	—	—
	Maximum disconnection time	0.2 s	0.2 s	0.2 s	0.2 s

NOTE Refer to [Table 2.5](#) for the measurement specifications.



(2) Volt-Watt mode

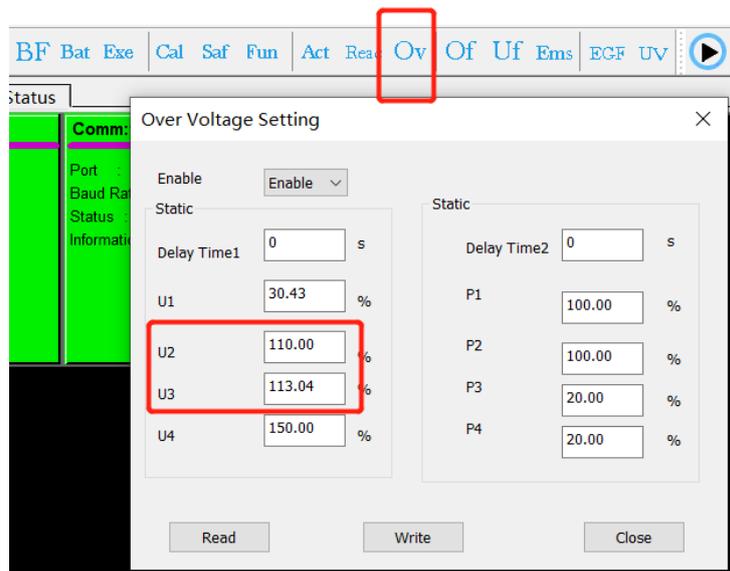
click the “Ov” button and open the setting page.

The default protection settings points are loaded according to AS/NZS 4777.2:2020 Table 3.6.

Table 3.6 — Volt-watt response default set-point values

Region	Default value	V _{w1}	V _{w2}
Australia A	Voltage	253 V	260 V
	Inverter maximum active power output level (P) % of S _{rated}	100 %	20 %
Australia B	Voltage	250 V	260 V
	Inverter maximum active power output level (P) % of S _{rated}	100 %	20 %
Australia C	Voltage	253 V	260 V
	Inverter maximum active power output level (P) % of S _{rated}	100 %	20 %
New Zealand	Voltage	242 V	250 V
	Inverter maximum active power output level (P) % of S _{rated}	100 %	20 %
Allowed range	Voltage	235 to 255 V	240 to 265 V
	Inverter maximum active power output level (P) % of S _{rated}	100 %	0 % to 20 %

NOTE Australia C parameter set is intended for application in isolated or remote power systems.



U2=110% means $V_{w1} = 110\% \times 230 = 253V$

U3=113.04% means $V_{w2} = 113.04\% \times 230 = 260V$

(3) Volt-Var mode

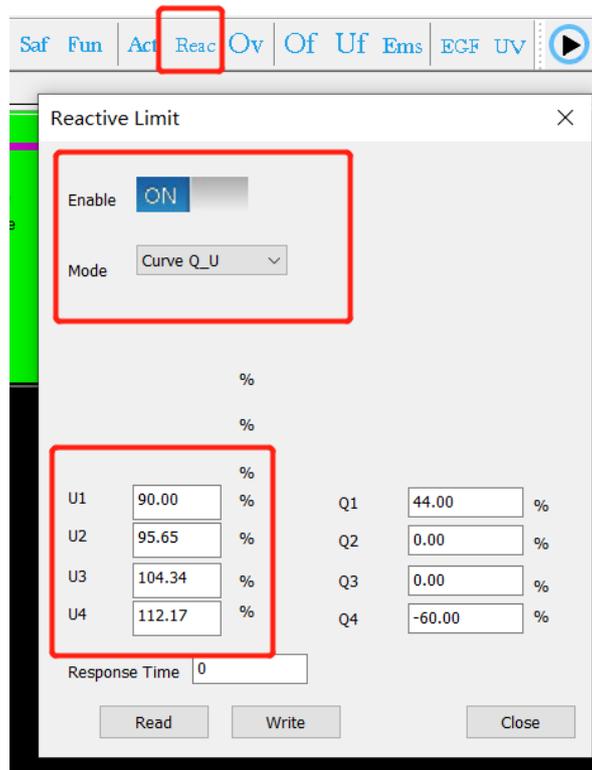
click the “Reac” button and open the setting page.

The default protection settings points are loaded according to AS/NZS 4777.2:2020 Table 3.7.

Table 3.7 — Volt-var response set-point values

Region	Default value	V _{V1}	V _{V2}	V _{V3}	V _{V4}
Australia A	Voltage	207 V	220 V	240 V	258 V
	Inverter reactive power level (Q) % of S _{rated}	44 % supplying	0 %	0 %	60 % absorbing
Australia B	Voltage	205 V	220 V	235 V	255 V
	Inverter reactive power level (Q) % of S _{rated}	30 % supplying	0 %	0 %	40 % absorbing
Australia C	Voltage	215 V	230 V	240 V	255 V
	Inverter reactive power level (Q) % of S _{rated}	44 % supplying	0 %	0 %	60 % absorbing
New Zealand	Voltage	207 V	220 V	235 V	244 V
	Inverter reactive power level (Q) % of S _{rated}	60 % supplying	0 %	0 %	60 % absorbing
Allowed Range	Voltage	180 to 230 V	180 to 230 V	230 to 265 V	230 to 265 V
	Inverter reactive power level (Q) % of S _{rated}	30 to 60 % supplying	0 %	0 %	30 to 60 % absorbing

NOTE 1 Inverters may operate at a reactive power level with a range up to 100 % supplying or absorbing.
NOTE 2 Australia C parameter set is intended for application in isolated or remote power systems.



- U1 means Vv1
- U2 means Vv2
- U3 means Vv3
- U4 means Vv4

(4) Volt-watt set-point when charging(Under Voltage)

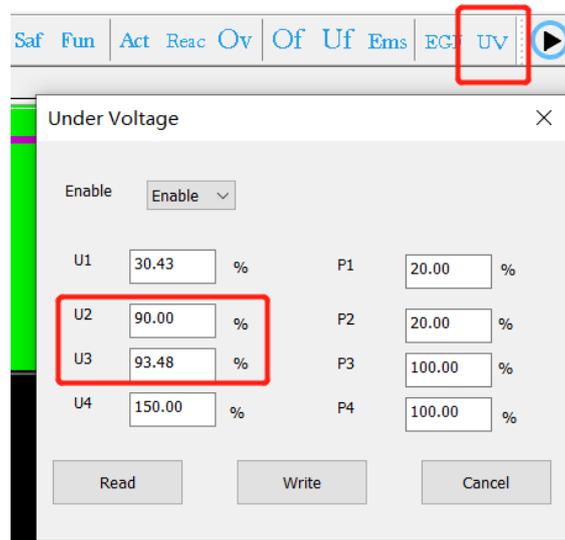
click the “UV” button and open the setting page.

The default protection settings points are loaded according to AS/NZS 4777.2:2020 Table 3.8.

Table 3.8 — Volt-watt response set-point values for multiple mode inverters with energy storage when charging

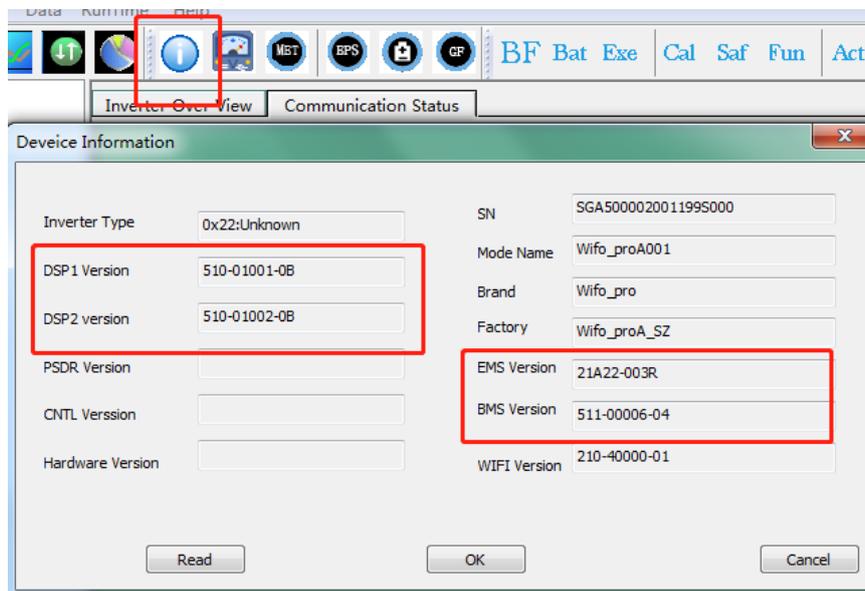
Region	Default value	V _{w1-ch}	V _{w2-ch}
Australia A	Voltage	207 V	215 V
	P _{charge} /P _{rated-ch}	20 %	100 %
Australia B	Voltage	195 V	215 V
	P _{charge} /P _{rated-ch}	0 %	100 %
Australia C	Voltage	207 V	215 V
	P _{charge} /P _{rated-ch}	20 %	100 %
New Zealand	Voltage	216 V	224 V
	P _{charge} /P _{rated-ch}	20 %	100 %
Allowed Range	Voltage	180 to 230 V	180 to 230 V
	P _{charge} /P _{rated-ch}	0 to 20 %	100 %

NOTE 1 P_{charge} refers to power input level through the grid-interactive port.
 NOTE 2 P_{rated-ch} refers to the rated active power input through the grid-interactive port used for charging the energy storage.



U2 means V_{w1-ch}
 U3 means V_{w2-ch}

(5) View the inverter firmware version(in read-only mode)

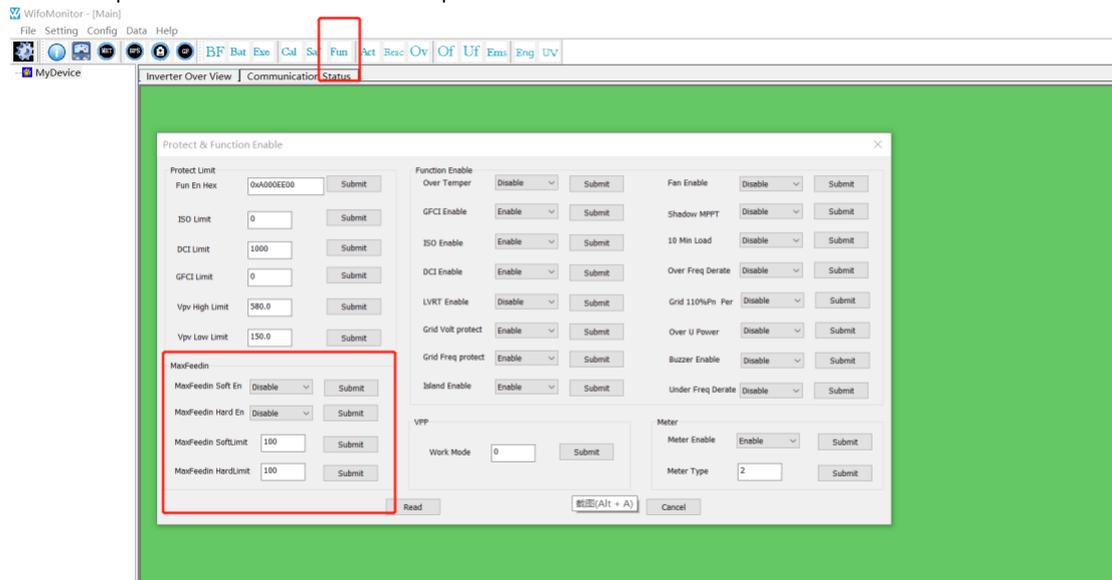


Inverter firmware version includes DSP1 Version, DSP2 Version, BMS Version and BMS Version.

(6) Generation Limit and Export limit control function

Inverter system and one meter used as external device for generation control function.

open the Wifo Monitor, click the “Fun” button, open the setting page and find the “MaxFeedin” part to enable and setup Generation Limit and Export Limit control.



7. Cleaning and Maintenance

Power off the system first.

● Shut down procedure :

Step 1: If backup load is applied, turn off the backup load first, and then turn off the backup breaker.

Step 2: Turn off the grid breaker.

Step 3: Turn off the PV switch.

Step 4: Open the battery breaker cover and turn off the battery breaker.

Step 5: Turn off the battery switch on every battery module.

Step 6: Close the battery breaker cover.

7.1 Cleaning

When the BESS needs to be cleaned, please power off the system first. If you want to clean the battery case, use a soft dry brush or vacuum cleaner to remove the dirt. Do not use solvents, abrasives, corrosive liquids, etc. to clean the case.

7.2 Storage and Maintenance

Since the battery capacity is 30% before transportation, the module needs maintenance after long-term storage. During maintenance, fully discharge the battery with 0.1C current, and then charge the battery to 30% with 0.1C current. Please refer to the table below for details. Maintenance cycle at different

temperatures:

Temperature	Charging interval (Months)
25°C	18
35°C	12
45°C	6

CAUTION:

- Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- When replacing batteries, replace with the same type and number of batteries or battery packs.
- General instructions regarding removal and installation of batteries.
- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- 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, or other metal objects.
 - ▶ Use tools with insulated handles.
 - ▶ Wear rubber gloves and boots.
 - ▶ Do not lay tools or metal parts on top of batteries.
 - ▶ Disconnect charging source prior to connecting or disconnecting battery terminals.
 - ▶ Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

8.ANNEX

8.1 Datasheet

All-In-One Spec.

Series name: Agave

Model	WH-SPHA3.6H- 5.12kWh WH-SPHA3.6H- 10.24kWh	WH-SPHA4.6H- 5.12kWh WH-SPHA4.6H- 10.24kWh	WH-SPHA5.0H- 5.12kWh WH-SPHA5.0H- 10.24kWh	WH-SPHA6.0H- 5.12kWh WH-SPHA6.0H- 10.24kWh
PV Input				
Absolute max Voltage [d.c.V]	600			
MPPT Voltage Range [d.c.V]	100...550			
Max. DC Input Power [W]	4800	6200	6650	8000
Start-up Voltage [d.c.V]	90			
Rated Operating Voltage [d.c.V]	360			
Max. Input Current [d.c.A]	12.5/12.5			
Max. inverter backfeed current to array[d.c.A]	0			
Isc PV[d.c.A]	18/18			
NO. of MPP Trackers	2			
NO. of Strings per MPP Tracker	1			
Battery Model	WH-BXB5.12 (For models: WH-SPHA3.6H-5.12kWh WH-SPHA4.6H-5.12kWh WH-SPHA5.0H-5.12kWh WH-SPHA6.0H-5.12kWh)		WH-BXB10.24 (For models: WH-SPHA3.6H-10.24kWh WH-SPHA4.6H-10.24kWh WH-SPHA5.0H-10.24kWh WH-SPHA6.0H-10.24kWh)	
Battery Capacity	LiFePO4 5.12kWh		LiFePO4 10.24kWh	
Nominal Battery Voltage [d.c.V]	204.8		409.6	
Battery Voltage Range [d.c.V]	160...227.2		320...454.4	
Max. Charge/Discharge Current [d.c.A]	25/25			
Depth of Discharge [%]	90			
AC Input/Output				
Rated output Power [W]	3600	4600	5000	6000

Rated Apparent Power to Grid [VA]	3600	4600	5000	6000
Max. Apparent Power to Grid [VA]	3600	4600	5000	6000
Max. Apparent Power from Grid [VA]	7200	9200	10000	12000
Rated Voltage [a.c.V]	220/230/240			
Rated Frequency [Hz]	50/60			
Rated AC Current to Grid[a.c.A]	15.6	20	21.7	26.1
Rated AC Current from Grid[a.c.A]	31.2	40	43.4	52.2
Inrush current[a.c.A]	16 a.c.A (peak), 11.3 us (duration)			
Max. output fault current[a.c.A]	57 (peak), 40 (rms)			
AC output Maximum output overcurrent protection[a.c.A]	40			
AC input power factor	-0.8...+0.8			
AC output power factor	1(-0.8...+0.8 adjustable)			
THDi	< 3%			
EPS Output (With Battery)				
Max. Output Power [W]	3600	4600	5000	6000
Rated Apparent Power [VA]	4320	5520	6000	7200
Max. Apparent Power [VA]	4320	5520	6000	7200
Rated Voltage [a.c.V]	230 (±2%)			
Norminal Frequency [Hz]	50/60 (±0.2%)			
Rated Output Current [a.c.A]	18.8	24	26.1	31.3
Inrush current[a.c.A]	16 a.c.A (peak), 11.3 us (duration)			
Max. output fault current[a.c.A]	57 (peak), 40 (rms)			
EPS output Maximum output overcurrent protection[a.c.A]	40			
Switch time [ms]	< 10			
THDv @ Linear Load [%]	< 2			
Power Factor	-0.8...+0.8			
Efficiency				
PV Max. Efficiency[%]	97.6			
PV Europe Efficiency[%]	97			
PV Max. MPPT Efficiency[%]	99.9			
Battery Charge by PV Max. Efficiency[%]	98			
Battery Discharge Efficiency[%]	96.7			
Protection				
Over/Under voltage protection	Yes			
DC isolation protection	Yes			
DC injection monitoring	Yes			

Residual current detection	Yes	
Anti-islanding protection	Yes	
Over load protection	Yes	
Battery Input reverse polarity protection	Yes	
PV reverse polarity protection	Yes	
Surge protection	Yes	
Over heat protection	Yes	
General Data	WH-BXB5.12	WH-BXB10.24
Dimension (W/D/H)[mm]	550*233*1125	550*233*1750
Dimension of Packing (W/D/H)[mm]	645*302*1370	655*302*2055
Net weight [kg]	68	115
Gross weight [kg]	78	130
Operation Temp [°C]	-10...+55	
Relative Humidity[%]	0...95	
Altitude [m]	<= 3000	
Ingress Protection	IP65	
Cooling	Natural	
Inverter Topology	Non-isolated	
Over voltage category	III(AC), II(DC)	
Protective class	Class I	
Active anti-islanding method	frequency shift	
Human Interface	LED/APP	
BMS Communication Interface	RS485/CAN	
Meter Communication Interface	RS485	
Noise Emission [dB]	< 25	
Standby Power Consumption [W]	< 5	
Safety and Approvals		
Safety	IEC62040.1:2019 AS/NZS 4777.2:2020 IEC 62109-1&-2 IEC62619 UN38.3 IEC60730-1	
EMC	EN IEC 61000-6-2:2019 EN IEC 61000-6-3:2021	

S_{max}=S_{rated} for AS/NZS 4777.2

Made in China

9.LABELS

9.1 Inverter label



Storage System:

Type	WH-SPHA6.0H-10.24kWh	
PV INPUT	Max.DC input power	8000W
	Absolute max. voltage	DC 600V
	MPPT voltage range	DC 100...550V
	Rated operating voltage	DC 360V
	Max. input current	DC 12.5/12.5A
	Isc PV	DC 18/18A
AC INPUT	Rated voltage	AC 220/230/240V
	Rated current	AC 52.2A
	Rated frequency	50/60Hz
	Max.apparent power	12000VA
	Power factor	-0.8...+0.8
AC OUTPUT	Rated power	6000W
	Rated apparent power	6000VA
	Max. apparent power	6000VA
	Rated frequency	50/60Hz
	Rated voltage	AC 220/230/240V
	Rated output current	AC 26.1A
	Power factor	1(-0.8...+0.8 adjustable)
EPS OUTPUT	Rated voltage	AC 230V
	Rated output current	AC 31.3A
	Rated frequency	50/60Hz
	Rated apparent power	7200VA
	Max. apparent power	7200VA
Power factor	-0.8...+0.8	
Battery capacity	10.24kWh	
Ingress protection	IP65	
Operation temperature range	-10°C...+55°C	
Inverter topology	Non-isolated	
Over voltage category	III (AC) ,II (DC)	
Protective class	Class I	

Smax=Srated for AS/NZS 4777.2

DRM0 DRM1 DRM2 DRM3 DRM4 DRM5 DRM6 DRM7 DRM8



Jiangsu Weiheng intelligent technology Co.,Ltd.

Address: 888 ChunLiuBei Road, Yangzhong City, JiangSu Province

www.weiheng-tech.com

Made in China

9.2 Battery label



Rechargeable Li-ion Battery System

IFpP10/134/203[(16S)4S]M/0+40/90
 Rated Capacity:25Ah
 Model No./Nominal Voltage/Rated Energy
 WH-BXB5.12/204.8Vd.c./5.12kWh
 Max.Charge/Discharge Current: 25A
 Nominal Charge/Discharge Current:8.25A
 Operating voltage range:160V...227.2V
 Operating temperature range:
 0°C...+45°C(Charge), -10°C...+55°C(Discharge)
 Available SOC Range:10%...100%
 Protection Class: I
 IP Class IP65

The battery should be disposed by qualified recycling agent



- Do not disassemble the battery pack.
- Do not immerse the battery pack in water.
- Do not short-circuit the battery.
- Do not leave the battery near by fire.

Emergency Situations

- * If leaking ,fire, wet or damaged ,switch off the breaker and go away from the battery.
- * Do not touch the leaking liquid. Do not use water ,sand or dry powder extinguisher is usable.



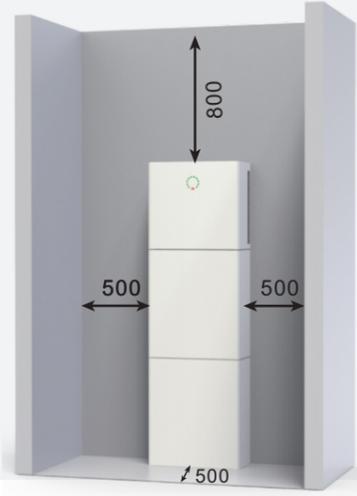
Manufacturer:Jiangsu Weiheng Intelligent Technology Co., Ltd.

Made in China

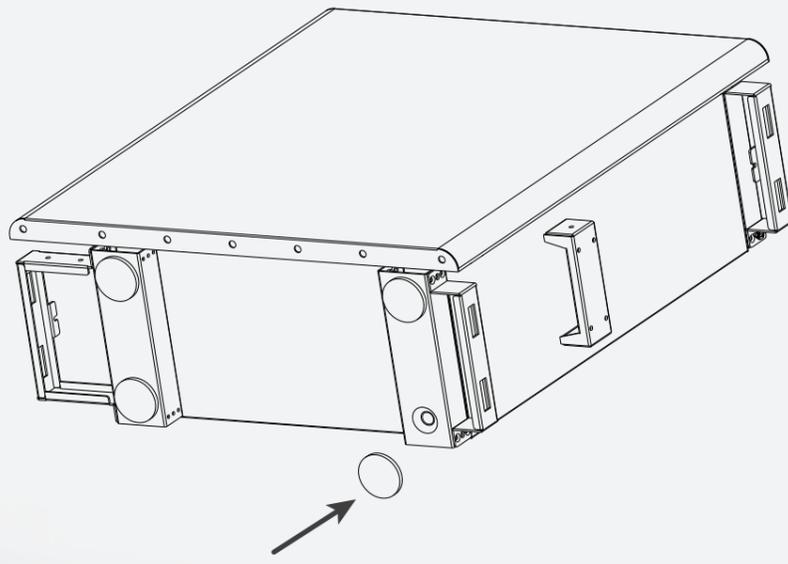
Quick Installation

A Installation Space

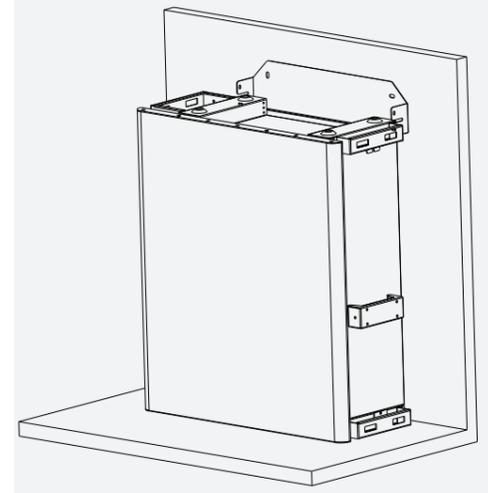
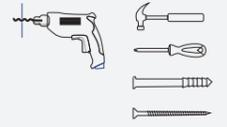
- (1) 500mm beside the SPHA
- (2) 800mm beside the SPHA
- (3) 500mm beside the SPHA



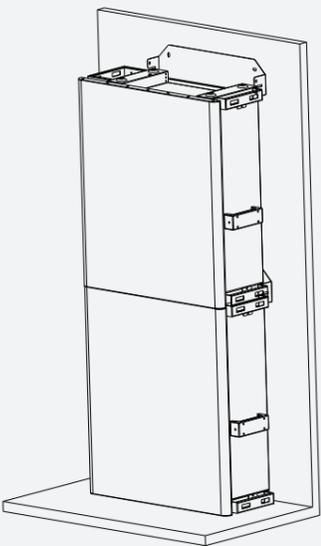
STEP 1



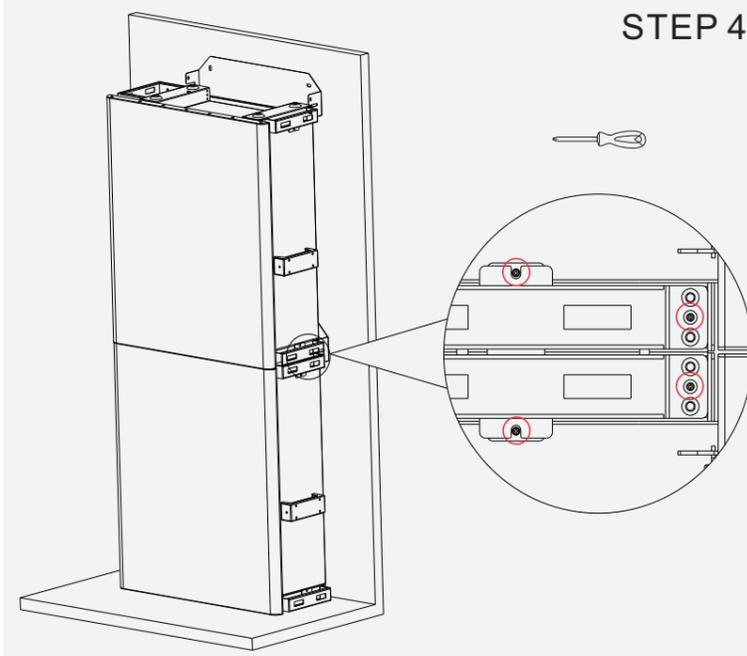
STEP 2



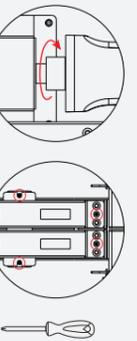
STEP 3



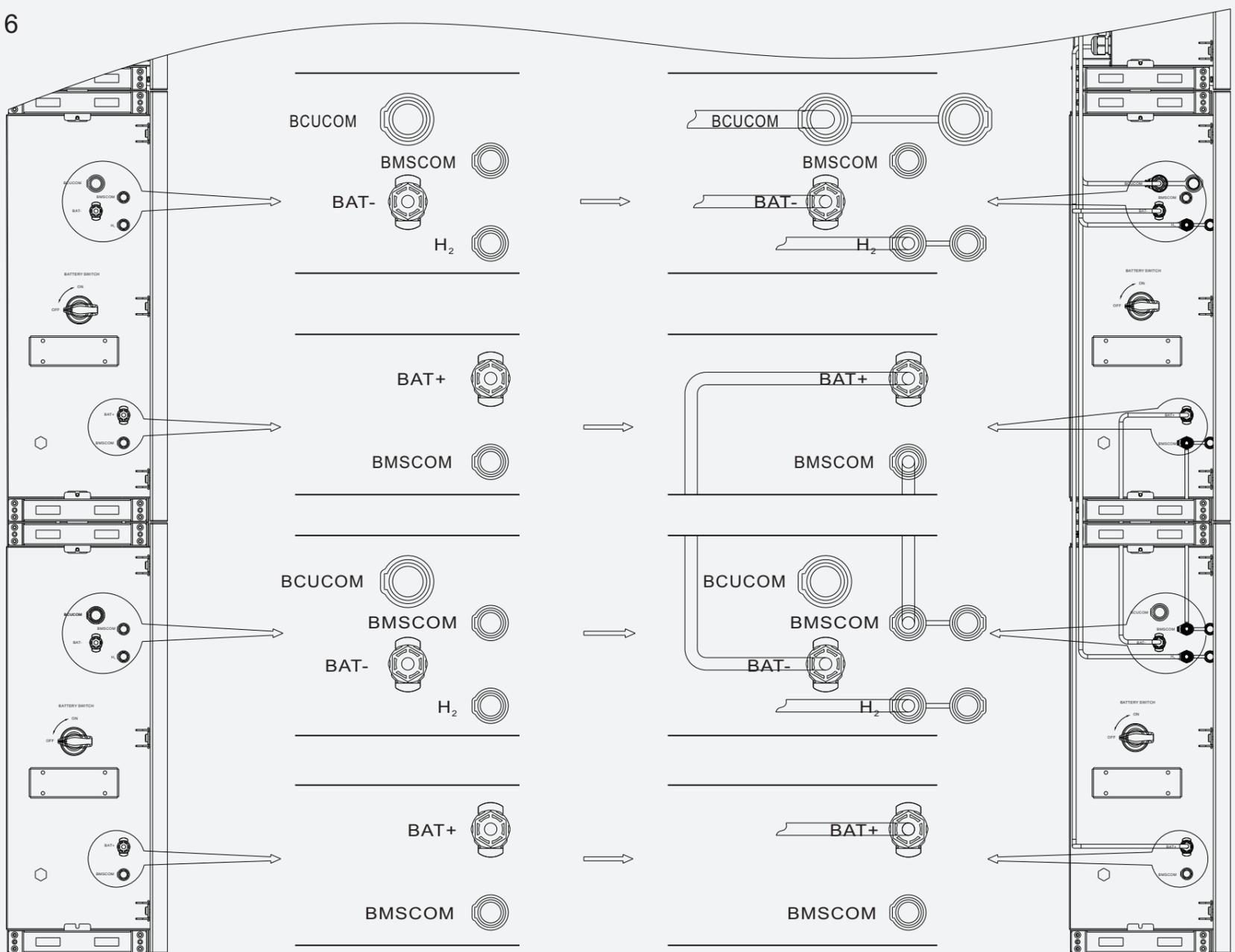
STEP 4



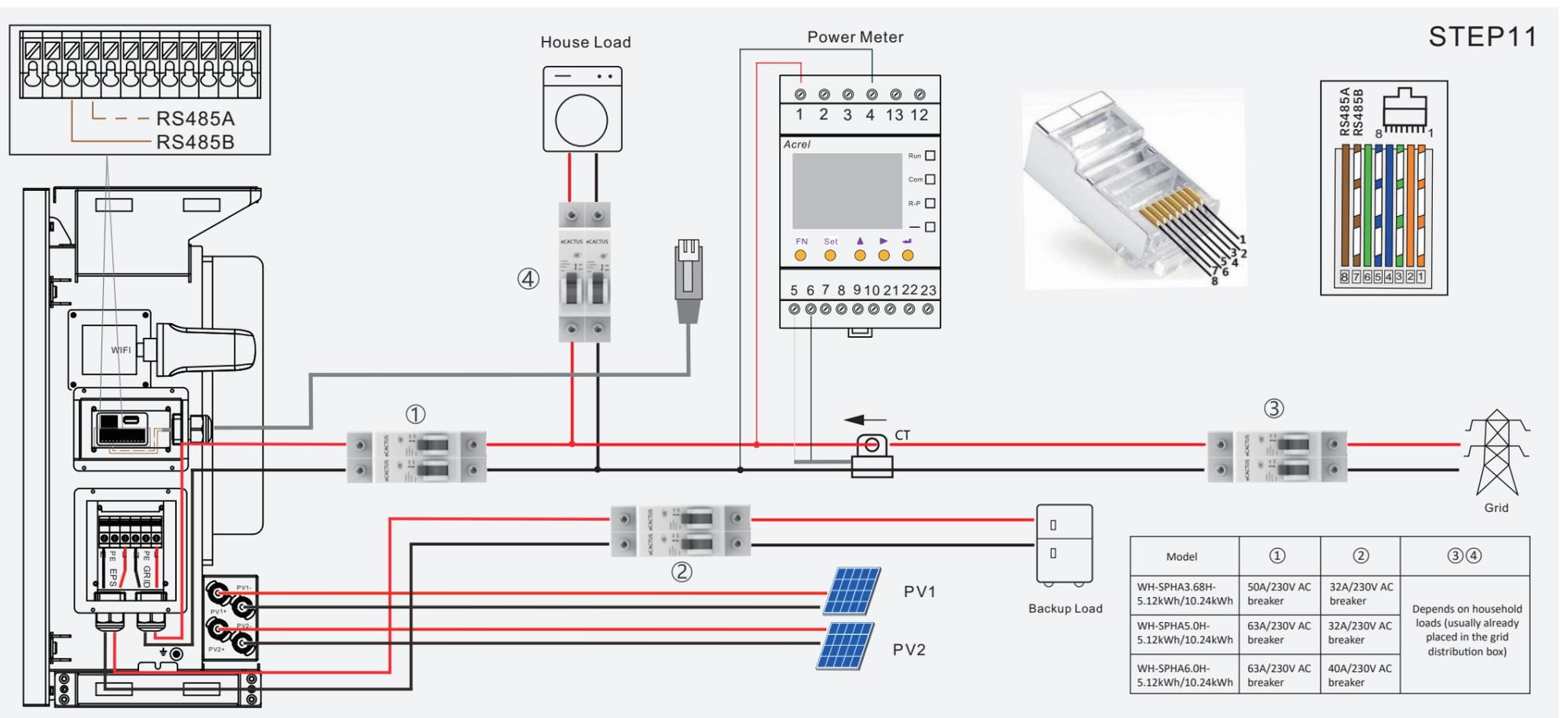
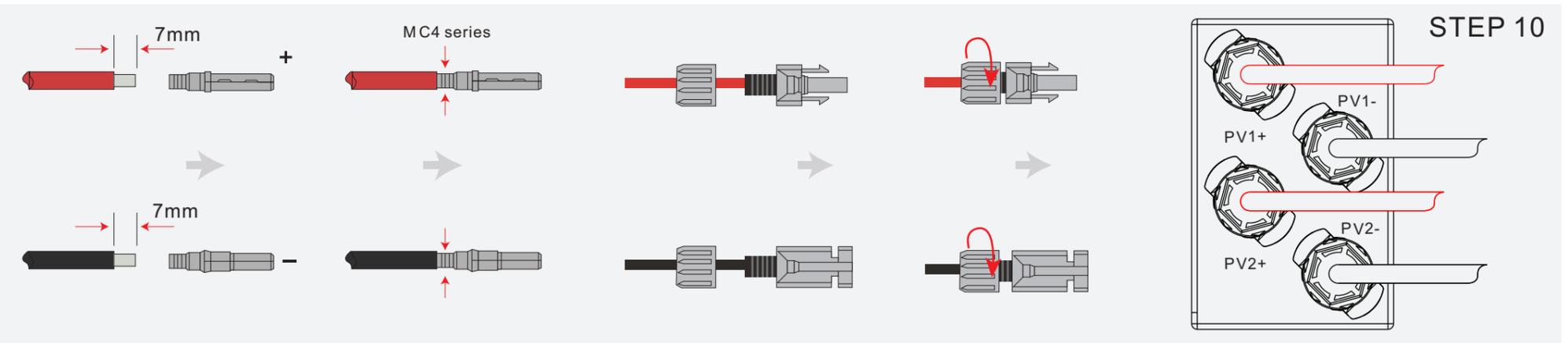
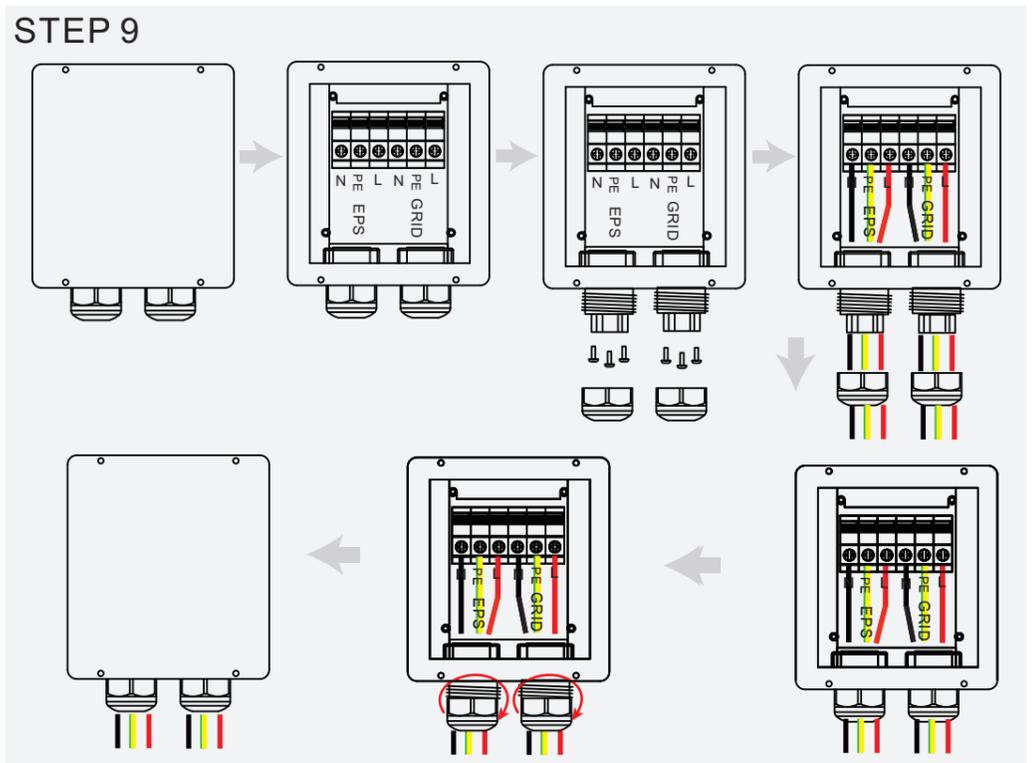
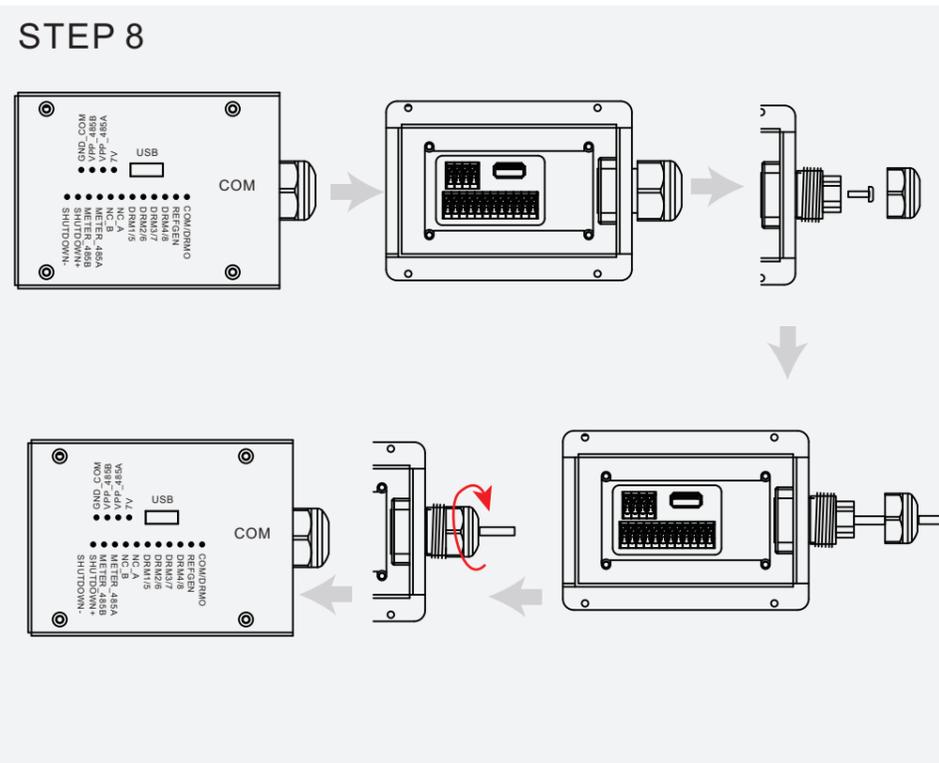
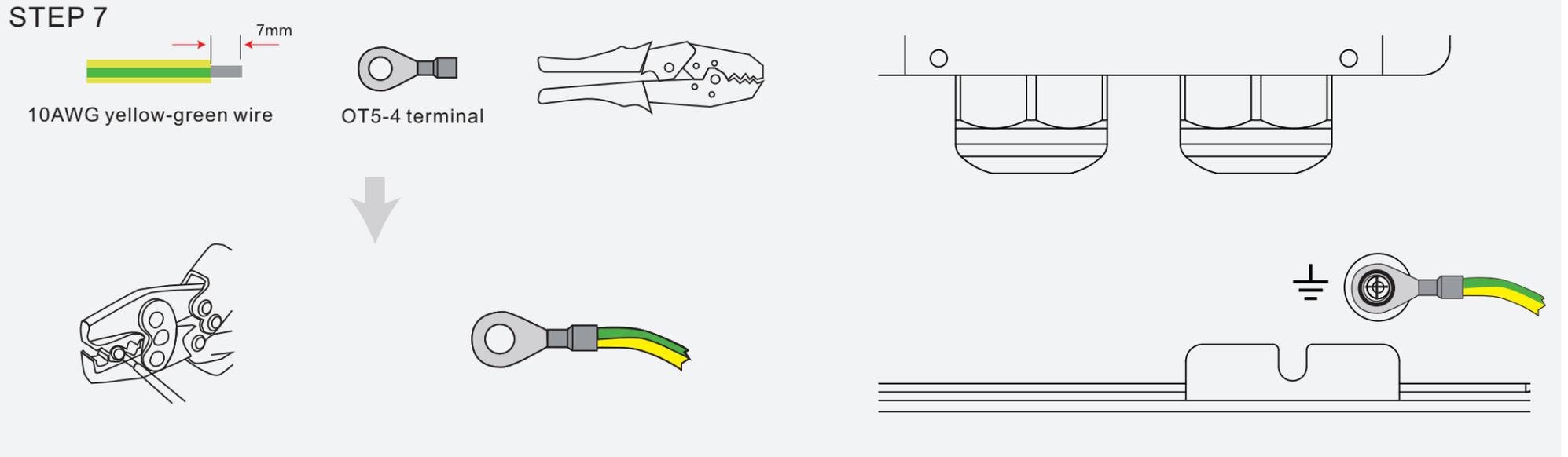
STEP 5



STEP 6



Quick Installation



EVANTRA

Installation Guide CT200i

Smart Gateway

V1.0

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Introduction

Welcome!

The CT200i Smart Gateway is a carbonTRACK product that aims to provide homeowners and business owners with insights about their energy usage patterns and create smart and efficient energy management strategies to generate a positive impact on their energy bill.

In addition, the CT200i Smart Gateway includes load controlling features through hardwire and wireless devices offered by carbonTRACK.

The information can be accessed through a user dashboard (software) for home/building owners. The dashboard gives customers insights into their energy consumption and energy costs, as well as provides the user with the ability to control or automate their energy use remotely.

This manual describes the installation of the CT200i Smart Gateway hardware.

Need help? For installation assistance please contact carbonTRACK by e-mail at support@carbontrack.com.au or by phone at 1300-288-648 (Australia).

Read Before Use

The CT200i Smart Gateway must be installed in close proximity to the Main Service Panel (MSP). If wireless smart devices are to be used, consider wall material and surroundings when deciding the installation location for reliable wireless communication.

WARNINGS

The CT200i Smart Gateway connects to dangerous voltages. The improper use or installation of the device can lead to serious or fatal injuries. Please observe the following safety precautions when installing the CT200i Smart Gateway:



- The product must be installed by a licensed electrician
- Review all the instructions before you start the installation
- Personal protective equipment should be worn when installing this product
- Do not use the product in any way other than its intended use
- Do not install or operate the product in extreme temperatures
- Do not open, attempt to access or touch any internal product parts
- Do not use the product if it is damaged or appears to be damaged
- Do not power the product with circuit breakers higher than 10 amps
- Adhere to all local and national safety regulations for installation and use

Installation Guidelines & Usage

- Product must be installed by a licensed professional who has undergone appropriate training for the relay.
- The CT200i Smart Gateway requires 110/240 V power supply. DO NOT exceed this voltage level.
- Examples of monitoring capabilities:
 - Single phase power systems
 - Three (3) phase power systems
 - Single phase solar generation systems
 - Three (3) phase solar generation systems
 - Single incoming phase + single phase solar generation
 - Three (3) incoming phases + single phase solar generation
 - Three (3) incoming phases + three (3) phase solar generation
 - Sub circuit monitoring
- Examples of controlling capabilities:
 - Circuit level ON/OFF switching (hot water systems, pool-pumps)
 - HVAC centralized and split systems
 - Solar Inverters and Storage Solutions (Batteries)
 - Energy Meters

REGULATIONS

In Australia, all installations, maintenance or modifications of any sub circuit MUST adhere to the AS/NZS-3000 wiring rules, as well as all other relevant regulations.

All cable insulator colours should correspond with their correct use.

- **RED, WHITE OR BLUE** for ACTIVE
- **BLACK OR BLUE** for NEUTRAL
- **GREEN / YELLOW** for EARTH
- **RED + WHITE** for SWITCHING SERVICES

All conductors and sub-circuits must be suitably rated and protected against overcurrent by use of circuit breakers or fuses.

AUDITING

The safety of all installers and clients is carbonTRACK's top priority. Accuracy and reliability of our products is also critically important.

In the interest of quality control and safety, carbonTRACK may audit installations completed by third parties.

This will consist of two components:

- **Live audit** – carbonTRACK employee will oversee a full installation by third party installers and generate a report based on install quality and safety.
- **Post Audit** – carbonTRACK employee will inspect a ratio of completed jobs by each installer and check for correct installation and safety hazards.

There are three categories for an Audit fail, CAT 1, CAT 2 and CAT 3:

Category 1

A CAT 1 non-compliance is a failure to meet NEC wiring rules which presents an immediate safety risk. This must be remedied immediately by the carbonTRACK auditor making it safe and rectifying the issue.

One CAT I non-compliance will require further investigation of previous installs by carbonTRACK. The installer will not be permitted to undertake further installations until advised by carbonTRACK.

Category 2

A CAT 2 non-compliance is an issue that renders the carbonTRACK unit inoperable or not able to function correctly but is not an immediate safety risk. This must be rectified as soon as possible by the third party and carbonTRACK must be notified via email with pictures once the issue is rectified.

Category 3

A CAT 3 non-compliance is a minor issue that does not impose an immediate safety risk or stops the carbonTRACK unit from functioning as normal. This consists of incorrect labelling, housekeeping, not informing customer, etc.

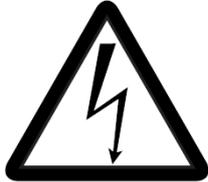
carbonTRACK reserves the right to immediately blacklist any installer from further installing any carbonTRACK product if an installation has been found to have an immediate CAT 1 safety risk, the installer fails a live audit with a CAT 1 non-compliance, or the installer has had a number of CAT 2 or CAT 3 non-compliances or audit fails against them. This is entirely at carbonTRACK's discretion.

SAFETY INFORMATION

This section contains information that must be observed at all times when working on or with the product. To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

Use of warnings

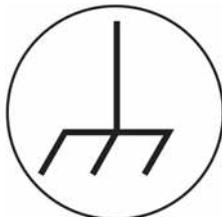
Warning symbols are used as follows:



The electrical warning informs you about electrical hazards which can cause injury, death and/or damage to the equipment.



The general warning informs you about conditions, excluding those caused by electricity, which can result in injury, death and/or damage to the equipment.



The earth symbol informs you about specific terminals and components that must be connected to a grounding network, which can result in injury, death and/or damage to the equipment if not properly utilised.

Notes draw attention to important details concerning the product or installation

DANGER

Danger to life due to electric shock

- Disconnect the connection point from voltage sources during installation and make sure it cannot be reconnected.
- Before performing any electrical connection in the distribution board disconnect the grid side from all voltage sources using the installed disconnect switch.
- Ensure that the conductors to be connected are de-energized.
- Only install the carbonTRACK Smart Gateway in a dry environment and keep it away from moisture.
- In case of requiring an outdoor installation, you must use a certified carbonTRACK outside enclosure.
- Disconnect the CT200i Smart Gateway from voltage sources before cleaning. The CT200i Smart Gateway must be cleaned with a dry cloth only.

WARNING

Danger to life due to electric shock

Overvoltages (e. g. in the case of a flash of lightning) can be further conducted into the building and to other connected devices in the same network via the network cable if there is no overvoltage protection.

- Ensure that all devices in the same network are integrated in the existing overvoltage protection.

WARNING

Risk of fire due to dirty or oxidized contact surfaces of live aluminium conductors

Connecting dirty or oxidized contact surfaces with aluminium conductors reduces the ampacity of the live terminals, thereby increasing the transition resistances. This can cause components to overheat and catch fire.

- The contact surfaces are to be cleaned, brushed, and treated with acidic and alkaline substances (e.g. petroleum jelly or special thermal grease).

WARNING

Fire risk

If a fuse is missing or incorrect and a fault occurs, a fire may be caused. This can result in death or serious injury.

- Protect the line conductors of the CT 200i smart Gateway with a dedicated circuit breaker, maximum. 10-Amps.

Pre-Installation Checklist

In order to warrantee the correct and successful installation of carbonTRACK's CT200i smart gateway a pre-installation check has been developed. Find bellow the elements included in the pre-installation check.

What You Get

	
CT200i Smart Gateway	Current Clamps

What You Need

					
Isolation Gloves	Safety Glasses	10A Circuit Breaker	Conduit Glands	Wire Puller	Conduit
					
Multi-Meter	Drill	Step Drill Bit	Wire (6 to 14 AWG)	Screw Drivers	Wire Cutters
					
Hole Saw (Ø25mm and Ø20mm)	Masonry Drills Bits	Phase Rotation Meter	Load Tester	Wall Plugs	M5 Self-Tapping Screws

Note: Specific projects may require additional equipment.

Safety Inspection

Complete a site safety inspection.

- Stop and think about the potential dangers associated with the job.
- Look and identify any hazards.
- Assess the risk. Consider any possible threats of damage or injury.
- Manage controls. Implement suitable control measures to reduce risk.
- Safely complete the task.

Scope of work

It is important to understand which monitoring and controlling configuration that will be implemented at site.

carbonTRACK requires its partner distributors to provide installers with single line diagrams that detail the clamping points and the controlling connections relevant for the site installation.

Installation Overview

STEP 1	Remove the enclosure cover
STEP 2	Identify gateway mounting location
STEP 3	Prepare gateway cable entry points
STEP 4	Mount the gateway
STEP 5	Install current clamps
STEP 6	Install the circuit breaker
STEP 7	Install and connect AC power to the gateway
STEP 8	Connect the current clamps to the gateway
STEP 9	Connect and enable the battery
STEP 10	Power ON the gateway
STEP 11	Install the enclosure cover

Remove the enclosure cover of the gateway by removing the securing screws.



Figure 1. Remove cover securing screws

Identify an appropriate location to mount the gateway and where to access the distribution board for AC power and clamp setup.

Note: The length of the corrugated conduit may vary for each install. The corrugated conduit needs to be fixed on the mounting surface using fastening clips.

Use a 25 mm hole saw to drill two access points into the base of the gateway enclosure. Install the glands in each hole. These two entry points will be used to feed AC cables and current clamps through.



Figure 2. Cable entry points

Mark the surface where the gateway is going to be mounted. It is suggested to hold the gateway at the desired mounting location and mark the drilling points with a pencil and then pre-drill the holes.

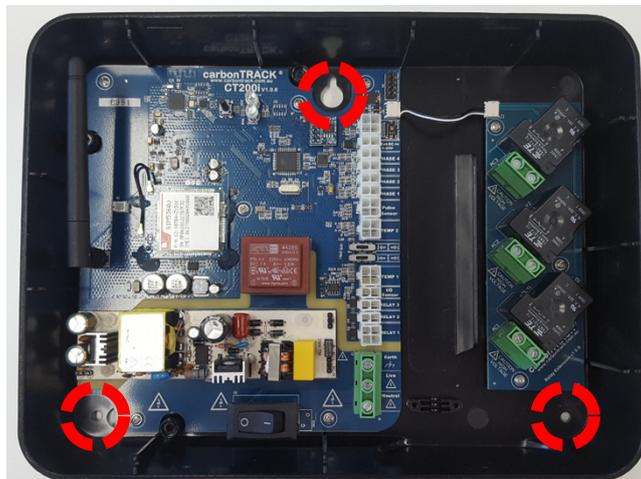


Figure 3. Gateway mounting holes

Drill the mounting holes on the selected position. Install wall plugs and fix the gateway to the mounting location using M5 screws.

Identify the correct size of current clamps to be installed based on the size of the cable that the clamp is to be applied to. The size of the current clamp is defined by the overall diameter of the cable to be clamped.

Conductor Diameter	Current Clamp Size

Figure 4. Current clamp size selection

Identify the cables where the current clamps are to be installed. Typical installations locate clamps around:

- Grid incomer(s)
- Solar feeder(s)
- Sub-circuit feeder(s)

Identify the correct the orientation for the current clamps.

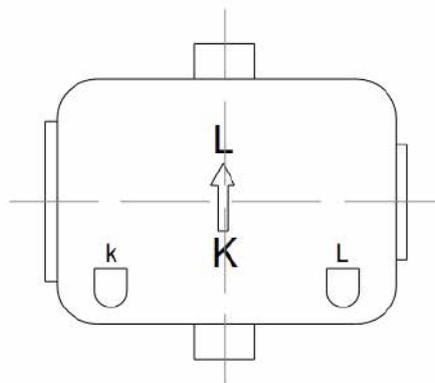


Figure 5. Current clamp orientation label.

Note: Take into account that the current clamps must be installed in the correct orientation in order to ensure correct measurements are received. The energy flow is marked on the current clamp and must correspond with the cable energy flow.

The current clamp cables will be run in conduit to the gateway in a future step.

STEP 6. Install the circuit breaker

Identify where to install the new circuit breaker or identify a pre-installed circuit breaker from which the gateway will be powered from.



Figure 6. Circuit breaker install

Note: The circuit breaker (new or pre-installed) must be rated at 10A.

STEP 7. Install and connect AC power to the gateway

Locate the power supply connection point inside the gateway and connect the AC cable from the circuit breaker described in the step above using 3 x 1.5 mm² multicore cable.

Take note the orientation of live, neutral and earth on the gateway connector.



Figure 7. AC connection

Note:

For a 1-phase solar generation system:

- The gateway **MUST** be powered from the same phase that the solar generation is connected to.

For a 3-phase solar generation system:

- The gateway can be powered from any of the three available phases.

Use a multimeter to confirm the gateway is connected to the correct phase.

Connect the Molex terminals from each of the current clamps into the gateway according to the following criteria:

PHASE 1

- Connect the current clamp monitoring the phase powering the gateway to this port (hereinafter referred to as Reference Phase).

PHASE 2

- If monitoring a 3-phase grid incoer, connect the current clamp that is monitoring the second of the three phases to this port.

PHASE 3

- If monitoring a 3-phase grid incoer, connect the current clamp that is monitoring the third of the three phases to this port.

PHASE 4

- If monitoring a 3-phase solar system, connect the current clamp to the same solar phase that is powering the gateway (Reference Phase).

Note: The sequence in which the current clamps are connected into the PHASE ports must respect the phase rotation.

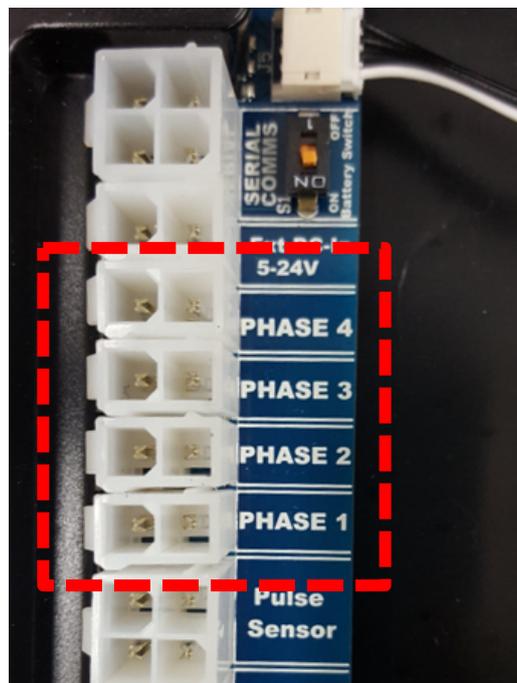


Figure 8. Current clamp install

Connect the battery to the battery port.

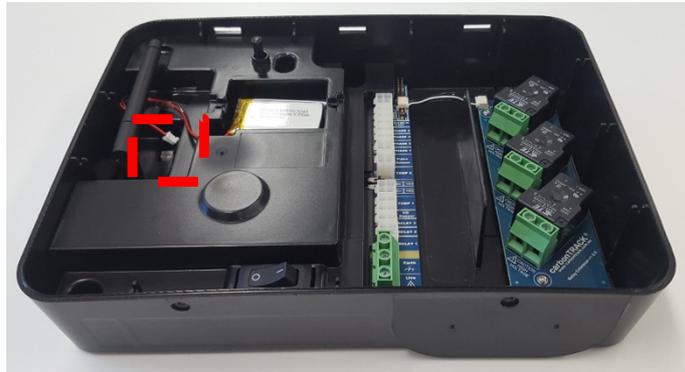


Figure 9. Battery connection

Turn the battery switch in the gateway to the ON position.



Figure 10. Battery switch location



Figure 11. Battery switch ON position

Switch the gateway power switch to the ON (I) position.

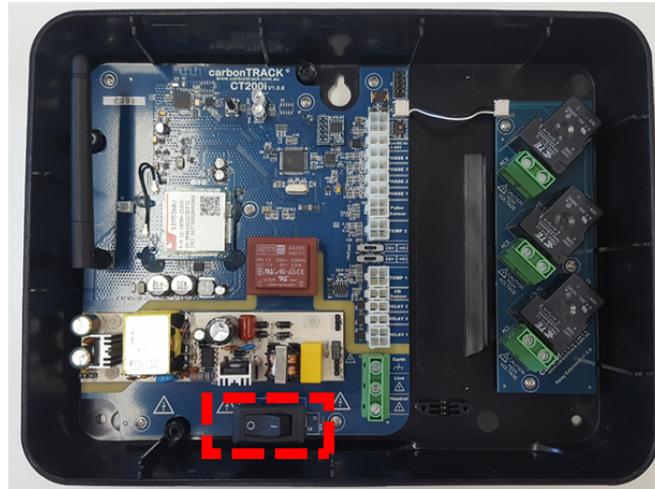


Figure 12. Gateway Power On

Install the gateway enclosure cover on the gateway. Use the provided screws to secure it.



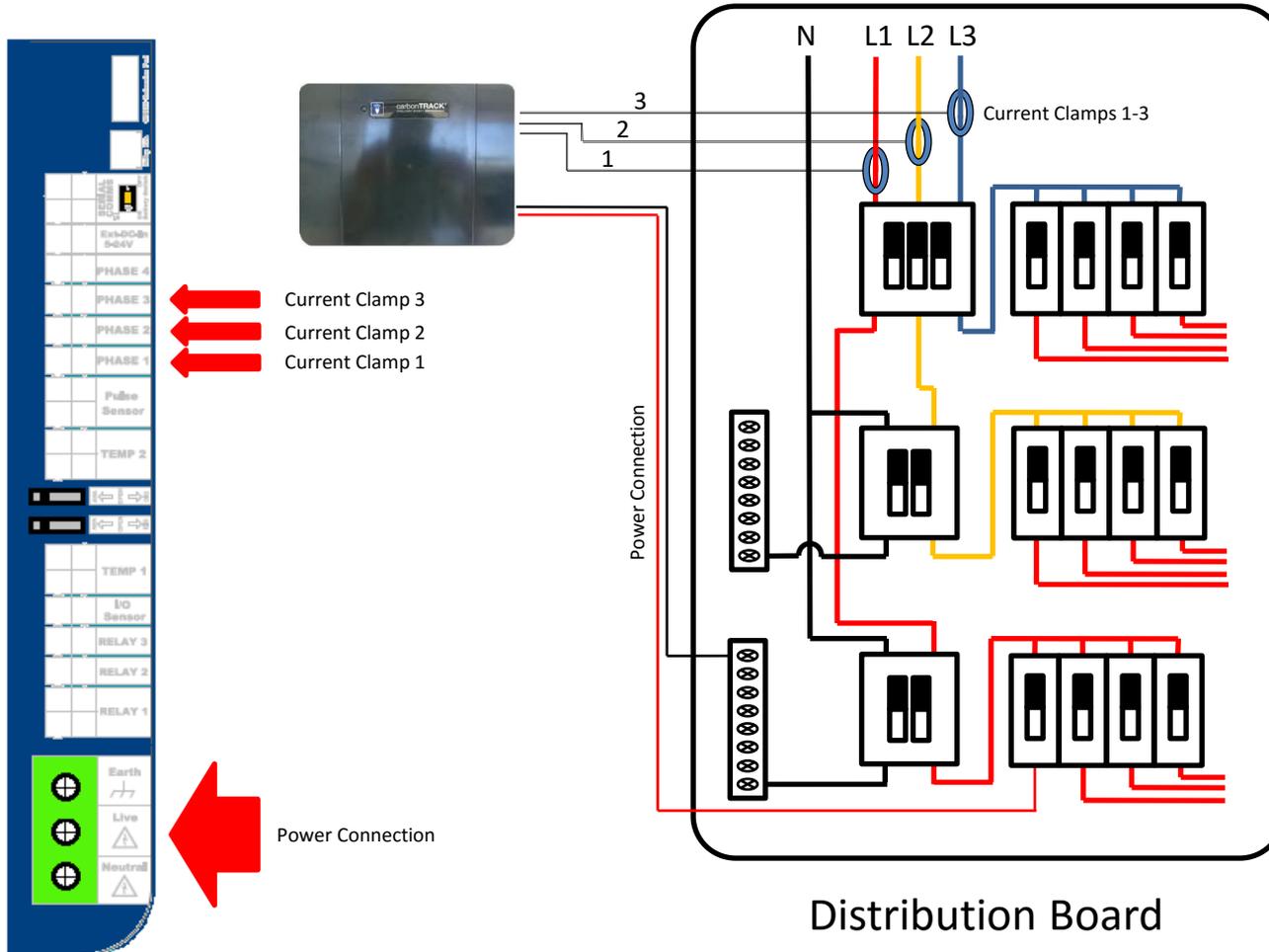
Figure 13. Enclosure cover installation

Limited Manufacturer Warranty

The manufacturer undertakes a 2-year manufacturer's warranty from the date of supply and purchase of the products.

For further details on warranty terms, please visit: <http://www.carbontrack.com.au/legal/warranty>

CT200i – Three Phase Consumption

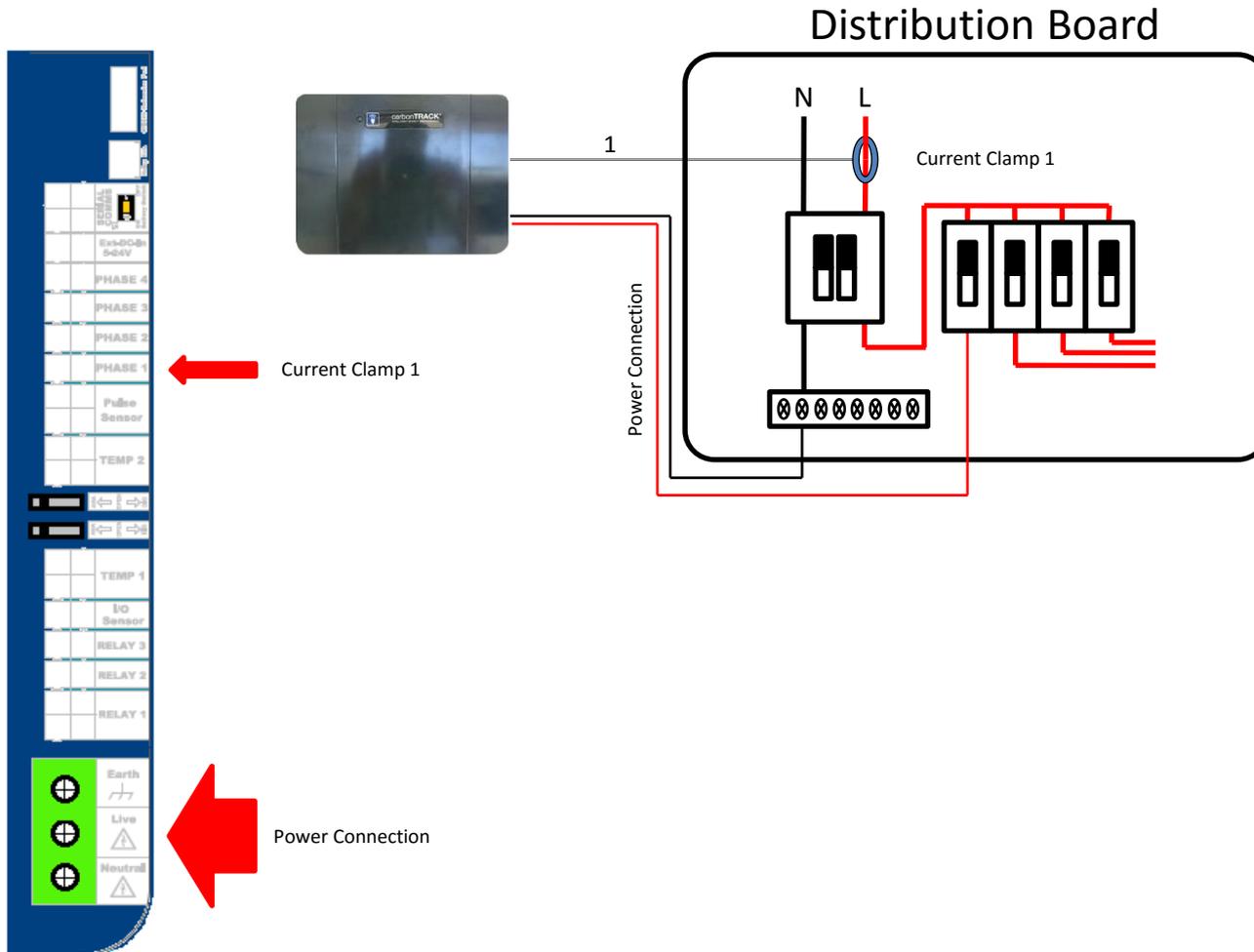


Notes:

1. Ensure that Current Clamp 1 is always clamped around the same phase as the unit is powered from.
2. Ensure the direction of current flow through each current clamp is correct for each phase.
[\(See Current Clamp Slide\)](#)

In this example power is connected to the RED phase, thus current sensor 1 is clamped around the RED phase.

CT200i – Single Phase Consumption



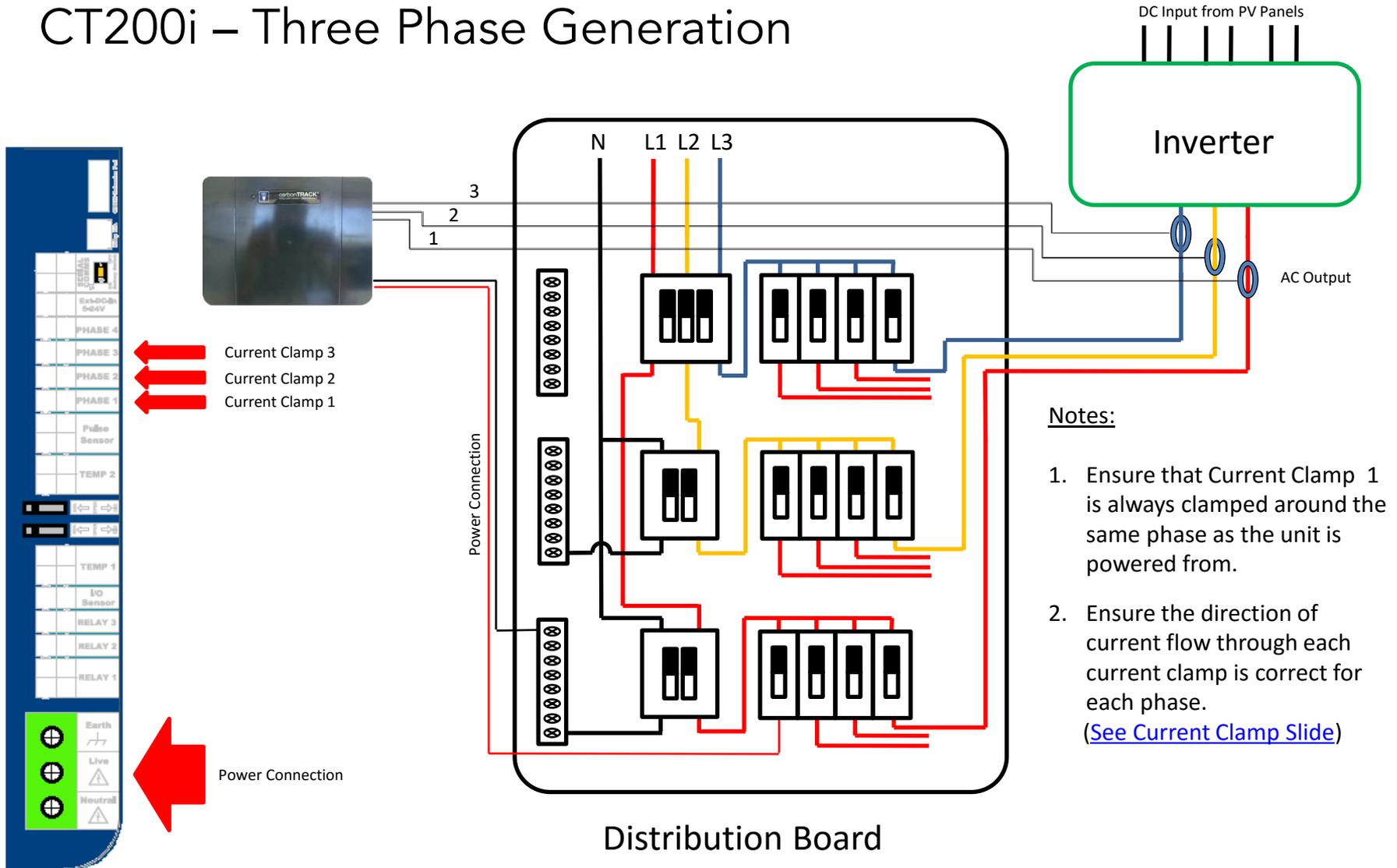
Notes:

1. Ensure that the Current Clamp is always clamped around the Live wire.
2. Ensure the direction of current flow through each current clamp is correct for each phase.

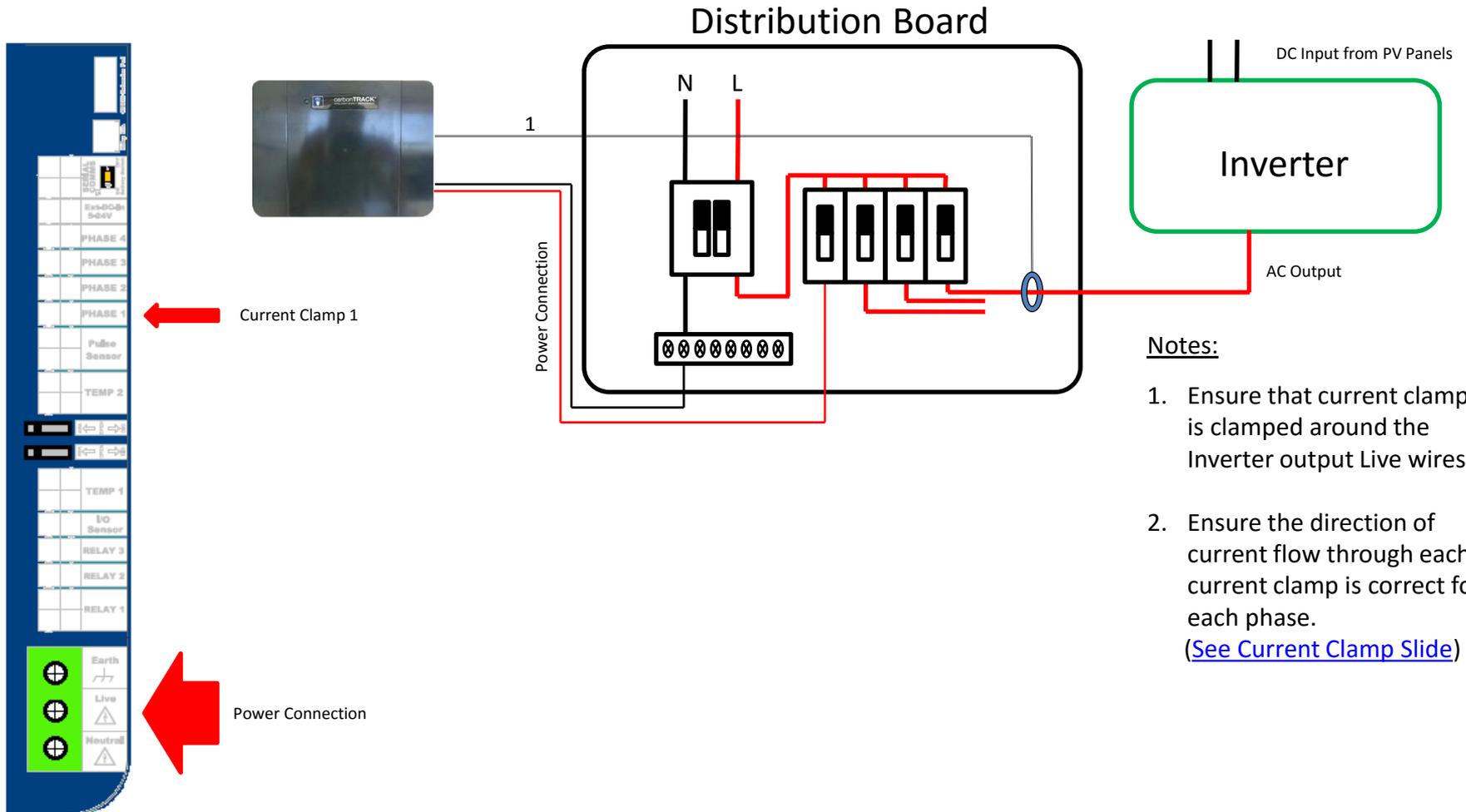
[\(See Current Clamp Slide\)](#)

Evantra Energy Measurement

CT200i – Three Phase Generation



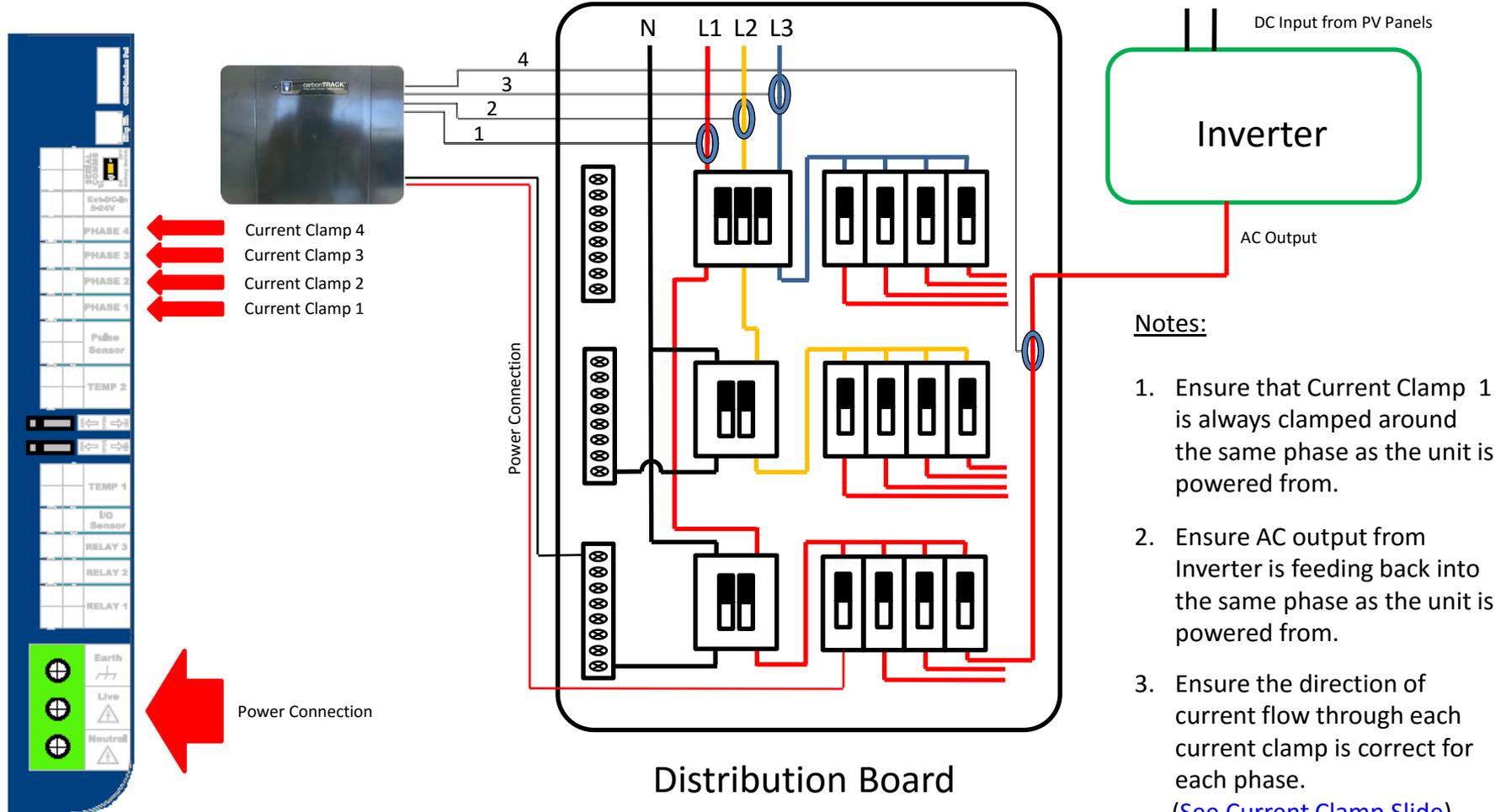
CT200i –Single Phase Generation



Notes:

1. Ensure that current clamp 1 is clamped around the Inverter output Live wires.
2. Ensure the direction of current flow through each current clamp is correct for each phase.
([See Current Clamp Slide](#))

CT200i – Three Phase Consumption & Single Phase Generation



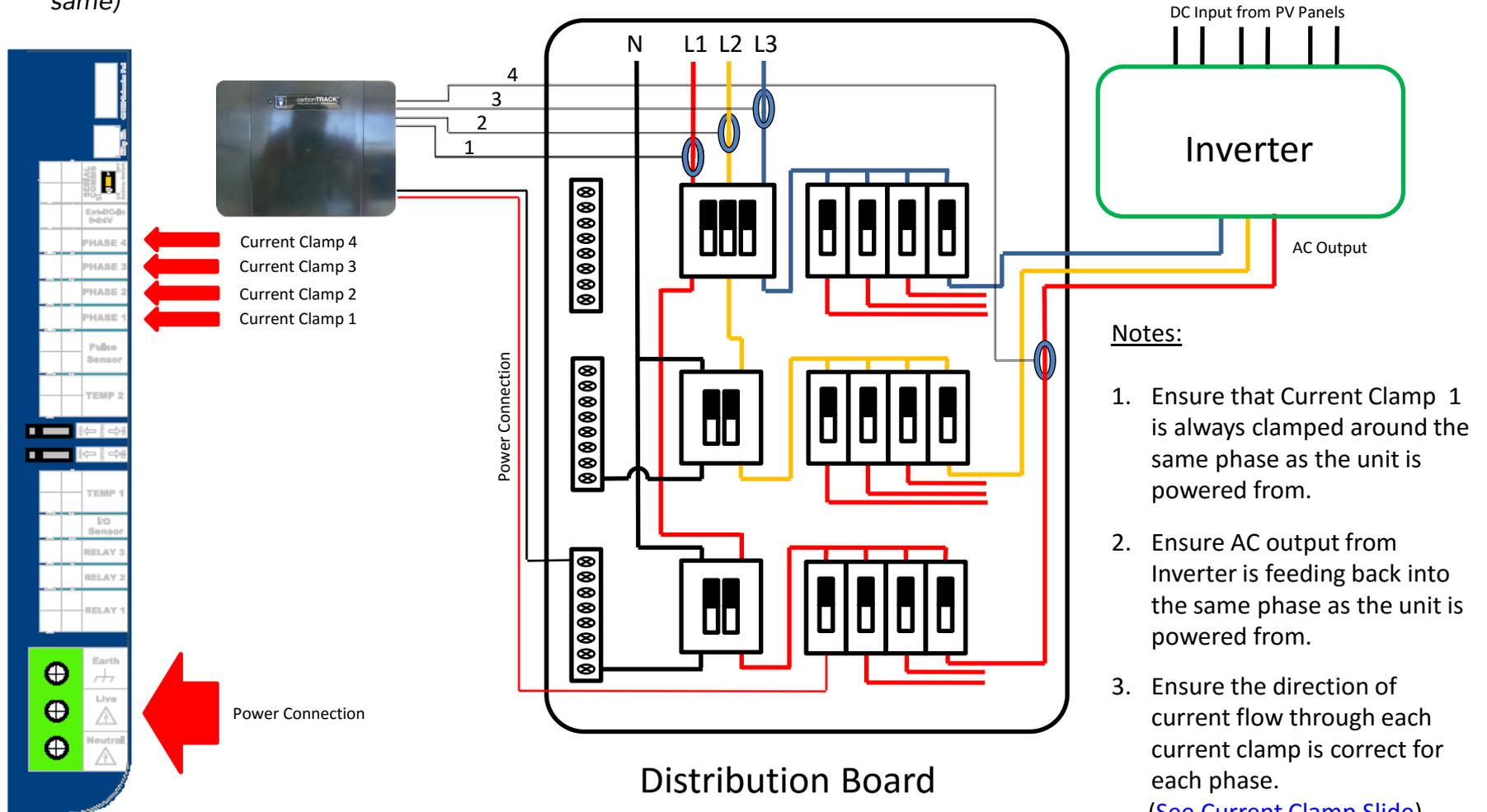
Notes:

1. Ensure that Current Clamp 1 is always clamped around the same phase as the unit is powered from.
2. Ensure AC output from Inverter is feeding back into the same phase as the unit is powered from.
3. Ensure the direction of current flow through each current clamp is correct for each phase.

(See [Current Clamp Slide](#))

CT200i – Three Phase Consumption & Three Phase Generation

This kind of measurement can only be done when inverter output is balanced (AC output on each phase is the same)

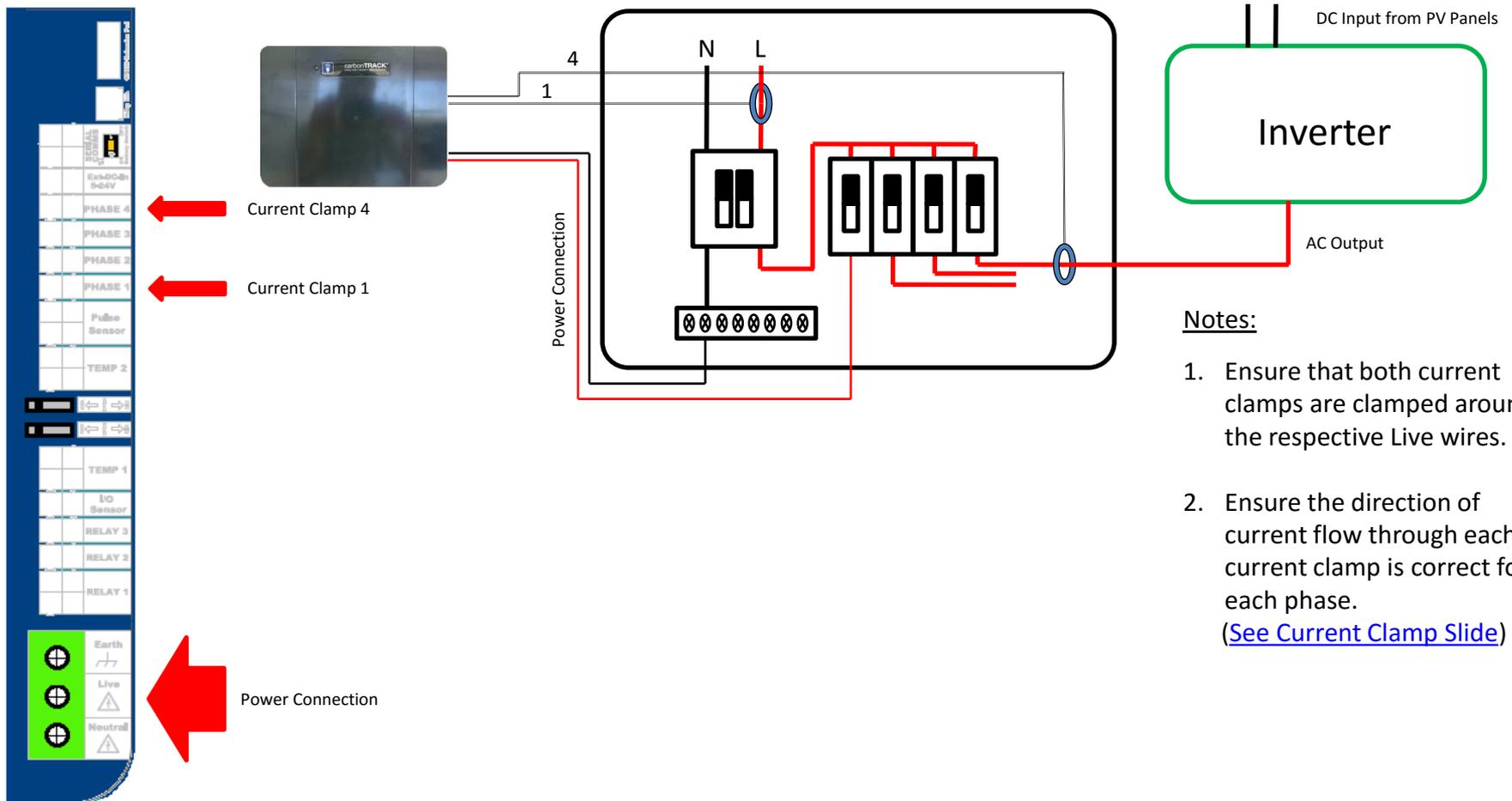


Notes:

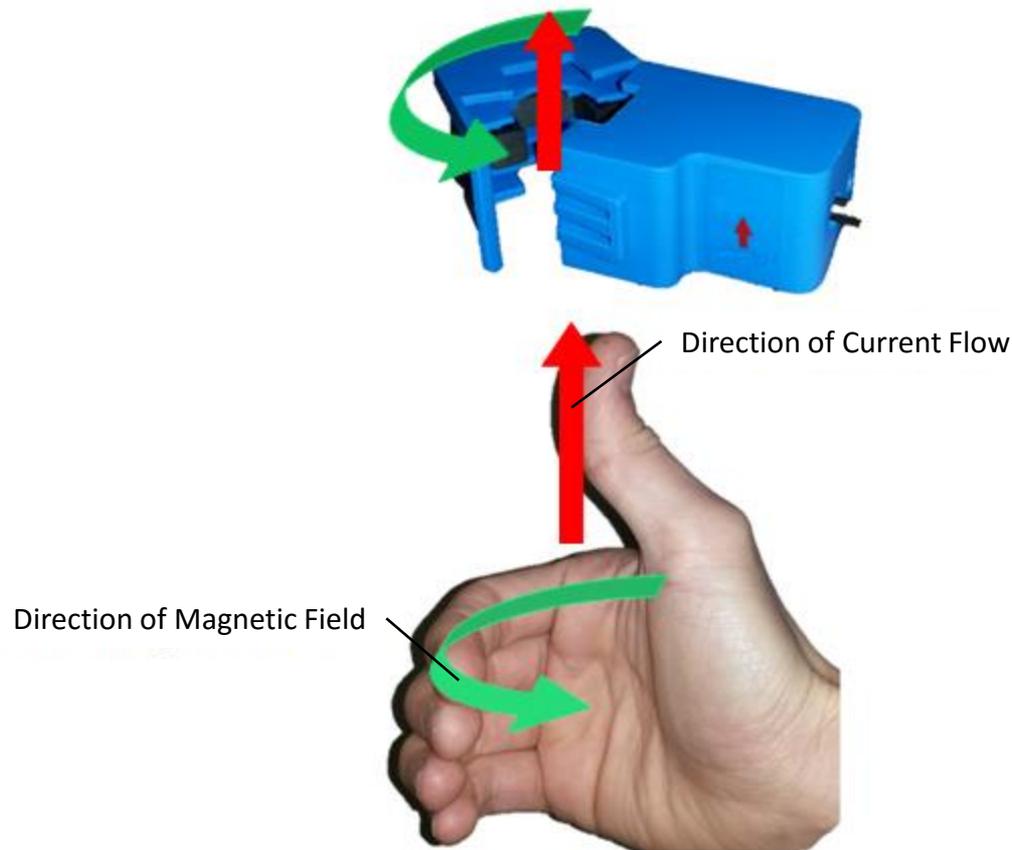
1. Ensure that Current Clamp 1 is always clamped around the same phase as the unit is powered from.
2. Ensure AC output from Inverter is feeding back into the same phase as the unit is powered from.
3. Ensure the direction of current flow through each current clamp is correct for each phase.

(See [Current Clamp Slide](#))

CT200i – Single Phase Consumption & Single Phase Generation



Evantra – Current Clamp Installation



Notes:

1. Ensure that Current Clamp is always connected correctly.
2. Ensure the hinged clamp part is closed properly after clamping around the relevant wire.
3. Ensure the direction of current flow through each current clamp is correct for each phase. (Red Arrow = Current Direction)
4. Ensure the clamping direction of each current clamp is correct. (Green Arrow = Clamping Direction) (Green Arrow = Magnetic Field Direction)
5. If arrow is missing follow right hand rule example on the left.