

INSTALLATION, OPERATION & MAINTENANCE MANUAL OF BW-INV-SPH5K,BW-INV-SPH3.6K,BW-INV-SPB5K



DISCLAIMER

Copyright © Bytewatt Co., Ltd. 2022. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Bytewatt Co., Ltd.

The material furnished in this document is believed to be accurate and reliable. The information and recommendations in this document do not constitute commitments or warranties in the form of assignments. The information in this document is subject to change without notice. You may refer to the NEOVOLT Cloud Platform (<https://monitor.byte-watt.com>) for the most updated version.

All company and brand products and service names are trademarks or registered trademarks of their respective holders.

COPYRIGHT STATEMENT

This manual is under the copyright of Bytewatt Co., Ltd. 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 product before reading through the manual.

1. INTRODUCTION

1.1. Content and Structure of this Document

This document is valid for:

BW-INV-SPH5K, BW-INV-SPH3.6K, BW-INV-SPB5K inverter.

This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the product as well as the operation of the product user interface.

Read this document through, understand the safety information, and get familiar with the functions and features of the device before installing and operating it.

Illustrations in this document are reduced to the essential information and may deviate from the real product.

You will find the latest version of this document and further information on the product in PDF format at www.byte-watt.com.




1.2. Target Group

This document is intended for qualified persons and end users. Only qualified persons are allowed to perform the operations marked with a warning symbol in this document. Tasks that do not require any specific qualifications will not be marked and can be performed by the end user. Qualified persons must have.

- Knowledge of working principle of inverters.
- Knowledge of how to deal with the dangers and risks associated with installing and using electrical devices, batteries and systems.
- Knowledge of the installation and commissioning of electrical devices and systems.
- Knowledge of the applicable standards and directives.
- Understood and complied with this document, including all safety precautions.
- Understood and complied with the documents of the battery manufacturer, including all safety precautions.

1.3. Levels of Warning Messages

The following levels of warning messages may occur when handling the product

| |
|--|
|  DANGER |
| DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury. |
|  WARNING |
| WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
|  CAUTION |
| CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| NOTICE |
| NOTICE indicates a situation which, if not avoided, can result in property damage. |
| INFORMATION provides tips which are valuable for the optimal installation and operation of the product. |

1.4. Definition of Abbreviations and Nouns**A**

AC alternating current

APP application

AUX auxiliary

B

BAT battery

BMS battery management system

D

DC direct current

E

EMS energy management system

I

INV inverter

P

PV photovoltaic

M

MPPT maximum power point tracking

2. Safety

2.1. Intended Use

The inverter, battery packs and the electricity meters make up a system for optimization of self-consumption for a household. The inverter can achieve bidirectional transfer between AC current and DC current. The battery is used for energy storage.

The inverter can achieve bidirectional transfer between AC current and DC current. This inverter is suitable for indoor and outdoor installation.

Inverter must only be operated with PV arrays of protection class II in accordance with IEC 61730, application class A. The PV modules must be compatible with this product. PV modules with a high capacity to ground must only be used if their coupling capacity does not exceed 1.0 μF .

The inverters can operate with a battery system but if a battery system is installed, the inverters are intended to be installed with the Bytewatt battery systems BW-BAT-10.1P, BW-BAT-10.1P II, BW-BAT-10.1P III, BW-BAT-10.1P IV, BW-BAT-10.1P V, BW-BAT-10.1P VI only.

All components must operate in a scenario suitable for their operation.

Be sure to use this product in accordance with the information provided in the accompanying documents and local applicable standards and directives. Any other operation may cause personal injury or property damage.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of Bytewatt. Unauthorized alterations will void guarantee and warranty claims. Bytewatt shall not be held liable for any damage caused by such changes.

Any use of the product other than that described in the Intended use section does not qualify as appropriate.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and comply with all instructions contained therein.

The type label must remain permanently attached to the product.

2.2. Safety Instructions

2.2.1. General Safety Precautions

- Over voltage or wrong wiring can damage the battery pack and cause deflagration, which can be extremely dangerous.
- All types of breakdown of the battery may lead to a leakage of electrolyte or flammable gas.
- Battery pack is not user-serviceable. There is high voltage in the device.
- Read the label with Warning Symbols and Precautions, which is on the right side of the battery pack.
- Do not connect any AC conductors or PV conductors directly to the battery pack which should be only connected to the inverter.
- Do not charge or discharge damaged battery.
- Do not damage the battery pack in such ways as dropping, deforming, impacting, cutting or penetrating with a sharp object. It may cause a leakage of electrolyte or fire.
- Do not expose battery to open flame.

2.2.2. Response to Emergency Situations

The battery pack is composed of multiple batteries and designed to prevent the danger caused by malfunction.

- If the user touches the inner material of the battery cells due to damage to the shell, the following actions are recommended.
 1. Inhalation: Leave the contaminated area immediately and seek medical attention.
 2. Eye injuries: Rinse eyes with running water for 15 minutes and seek medical attention.
 3. Skin injuries: Wash the contacted area with soap thoroughly and seek medical attention.
 4. Ingestion: Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery pack is installed, perform the following countermeasures:

- Fire extinguishing media
 1. Respirator is not required during normal operations.
 2. Use FM-200 or CO² extinguisher for battery fire.
 3. Use an ABC fire extinguisher, if the fire is not from battery and not spread to it yet.

- Firefighting instructions
 1. If fire occurs when charging batteries, if it is safe to do so, disconnect the battery pack circuit breaker to shut off the power to charge.
 2. If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire.
 3. If the battery pack is on fire, do not try to extinguish but evacuate people immediately.

 **WARNING**

There may be a possible explosion when batteries are heated above 150°C. When the battery pack is burning, it leaks poisonous gases. Do not approach.

- Effective ways to deal with accidents
 1. On land: Place damaged battery into a segregated place and call local fire department or service engineer.
 2. In water: Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.
 3. Do not use submerged battery again and contact the service engineer.

2.3. Important Safety Instructions

 **DANGER**

Danger to life due to electric shock when live components or cables are touched.

There is high voltage in the conductive components or cables of the product. Touching live parts and cables can result in death or lethal injuries due to electric shock.

- Do not touch non-insulated parts or cables.
- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery pack.
- After disconnection, wait for 5 minutes until the capacitors have discharged.
- Do not open the product.
- Wear suitable personal protective equipment for all operations on the product.

 **DANGER****Danger to life due to danger voltages on the battery pack.**


There is danger voltage at the pin connector for the power cable. Reaching into the pin connector for the power cable can result in lethal electric shock.

- Do not open the battery pack.
- Do not wipe over the battery pack with a damp cloth.
- Leave the protective caps on the pin connectors for the batteries power connection until the inverter cables are connected to the battery pack.
- Disconnect the system from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery pack.

 **WARNING****Risk of chemical burns from electrolyte or toxic gases.**

During normal operation, no electrolyte would leak from the battery pack and no toxic gases would form. Despite careful construction, if the battery pack is damaged or a fault occurs, it is possible that electrolyte may be leaked or toxic gases may form.

- Store the battery pack in a cool and dry place.
- Do not drop the battery pack or damage it with sharp objects.
- Only set the battery pack down on its back or its bottom.
- Do not open the battery pack.
- Do not install or operate the battery pack in potentially explosive atmosphere or areas of high humidity.
- If moisture has penetrated the battery pack (e.g. due to a damaged housing), do not install or operate the battery pack.
- In case of contact with electrolyte, rinse the affected areas immediately with water and consult a doctor without delay.

 **CAUTION****Risk of burns due to hot heatsink and housing.**

The heatsink and housing can get hot during operation. During operation, do not touch any parts other than the cover of the inverter.

NOTICE**Damage to the inverter due to electrostatic discharge.**

- Touching electronic components can cause damage to or destroy the inverter through electrostatic discharge.
- Ground yourself before touching any component.

NOTICE**Damage due to cleaning agents.**

- The use of cleaning agents may cause damage to the product and its components.
- Clean the product and all its components only with a cloth moistened with clear water.

 **DANGER****Danger to life due to electric shock when live components or PV cables are touched.**

When PV panels exposed to sunlight, the PV array generates high DC voltage which presents in the DC conductors. Touching the live DC cables can result in death or lethal injuries due to electric shock.

- Disconnect the inverter from voltage sources and make sure it cannot be reconnected before working on the device.
- Do not touch non-insulated parts or cables.
- Do not disconnect the DC connectors under load.
- Wear suitable personal protective equipment for all work on the inverter.

 **DANGER****Danger to life due to electric shock from touching an ungrounded PV module or array frame.**

- Touching ungrounded PV modules or array frames can result in death or lethal injuries due to electric shock.
- Connect and ground the frame of the PV modules, the array frame and the electrically conductive surfaces so that there is continuous conduction.
- Observe the applicable local regulations.












 **DANGER****Danger to life due to electric shock when touching live system components in case of a ground fault.**

When a ground fault occurs, parts of the system may still be live. Touching live parts and cables can result in death or lethal injuries due to electric shock.

- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the device.
- Touch the cables of the PV array on the insulation only.
- Do not touch any parts of the substructure or frame of the PV array.
- Do not connect PV strings with ground faults to the inverter.

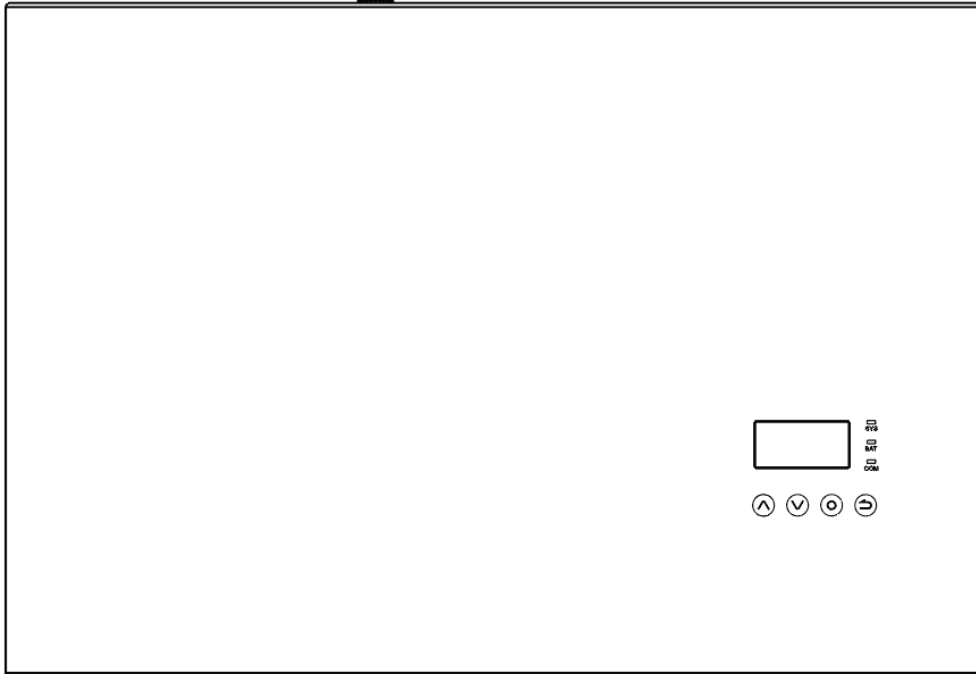
2.4. Symbols explanation

Symbols on the type label and warning label of the inverter.

| Symbol | Explanation |
|---|--|
|  | Beware of a danger zone This symbol indicates that the product must be additionally grounded if additional grounding or equipotential bonding is required at the installation site. |
|  | Beware of electrical voltage The product operates at high voltages. |
|  | Beware of hot surface The product can get hot during operation. |
|  | Danger to life due to high voltages in the inverter, observe a waiting time of 5 minutes. Prior to performing any work on the inverter, dis-connect it from all voltage sources as described in this document. |
|  | WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site. |
|  | Observe the documentation |
|  | CE marking |
|  | Certified safety |
|  | RCM (Regulatory Compliance Mark) |
|  | UKCA marking |
|  | RoHS labeling |

3. Product Introduction and Application Scenarios

3.1. Nomenclature introduction

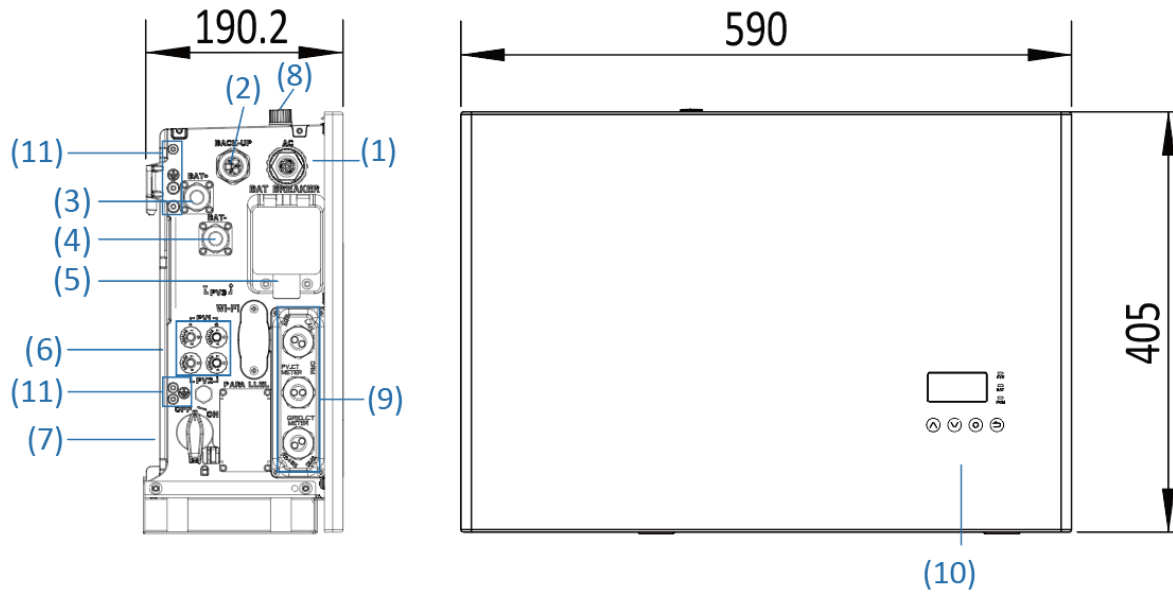


Dimension(W×H×D): 590*405*205 mm

| Name | Designation in this document |
|----------------|------------------------------------|
| BW-INV-SPH5K | 5kW Single-phase hybrid inverter |
| BW-INV-SPH3.6K | 3.6kW Single-phase hybrid inverter |
| BW-INV-SPB5K | 5kW Single-phase battery inverter |

3.2. Product Description

3.2.1. Inverter Electrical Interface Introduction



| Position | Designation |
|----------|--|
| 1 | Grid Connector |
| 2 | Backup Connector |
| 3 | Battery+ Power Connector |
| 4 | Battery- Power Connector |
| 5 | Battery Circuit Breaker* of the Inverter |
| 6 | Positive and Negative PV connectors, PV 1/ PV2 *** |
| 7 | PV Switch*** |
| 8 | Wi-Fi Port |
| 9 | Communication Ports (CAN/RS485,BMS, LAN, Meter/Grid-CT, DRM**, PV-CT, AUX) |
| 10 | Inverter LED |
| 11 | Grounding |

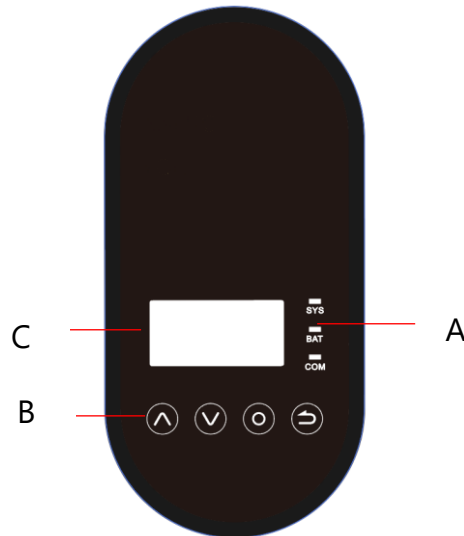
*All breakers of the product are switched off when shipped.

**The DRM is only for regions with AS/NZS 4777.2 safety regulations.

***For product B5, there are no PV switch and PV inputs.

3.2.2. Inverter Display Interface Introduction

LC Display



| Object | Name | Description |
|--------|-----------------|---|
| A | Indicator LED | Red: The inverter is in fault. |
| | | Green: The battery is in charging or discharging. |
| | | Green: The inverter is in normal state. |
| | | Green: The inverter is in communication. |
| B | Button Function | Return Button: Escape from current interface or function. |
| | | Up button: Move cursor to upside or increase value. |
| | | Down Button: Move cursor to downside or decrease value. |
| | | ENT Button: Confirm the selection. |
| C | LC Display | Display the information of the energy storage system |



3.2.2.1 Main interface of the Inverter LCD

| | |
|---------|---------|
| Power | 0W |
| Total | 00.0kWh |
| Battery | % |
| Normal | |

| |
|-----------------|
| >>>> MENU <<<<< |
| >Status |
| History |
| Setting |

Main displays the inverter working status and information, including:

1. Power: Current PV power
2. Total: Total power generation.
3. Battery: Current remaining battery power (SOC).
4. Normal: Current working state of the equipment, including Standby.

In the Main interface, press ENT key to enter the menu's main interface.

Use the up and down key to select a sub-menu, press the ENT key to enter the selected sub-menu, press Return key to return to the previous layer.

3.2.2.2 Display Content of Sub-Menu Status Item

| |
|-------------------|
| >>>> Status <<<<< |
| >Grid |
| Solar |
| Battery |

Status menu contains five sub-menus: Solar, Battery, Grid, UPS and Comm. These display the relevant information about the current operation or communication interface respectively.

| | |
|-------------------|---------|
| >>>>> Grid <<<<<< | |
| > U | 230.2V |
| I | 2.0A |
| F | 49.99Hz |

Grid interface displays the real-time information on the utility grid side: voltage U, current I, frequency F, PInv, PMeter AC, PMeter DC.

| | |
|--------------------|--------|
| >>>>> Solar <<<<<< | |
| > U1 | 360.0V |
| I1 | 1.0A |
| P1 | 360W |

Solar interface displays the real-time information of PV side: voltage U1, current I1, power P1, voltage U2, current I2 and power P2.

| | |
|------------------|-------|
| >>> Battery <<<< | |
| > U | 48.0V |
| I | 10.0A |
| P | 480W |

Battery interface displays the real-time information of battery side: voltage U, current I, power P, residual capacity of Battery (SOC), the internal environmental temperature Temp

```
>>>>  UPS  <<<<<
> U                230.2V
  I                2.0A
  P                460W
```

UPS interface displays the real-time information in this mode: voltage U, current I, power P, frequency F

```
>>>>  Comm  <<<<<
> BMS                Yes
  Net                Yes
  MeterGrid          Yes
```

Communication interface displays the real-time communication situation of BMS, Net, Meter Grid and Meter DC.

3.2.2.3 Display Content of Sub-Menu History Item

```
>>>>  History  <<<
> Grid Consump
  INV Gen.
  BAT Gen.
```

History menu contains seven sub-menus: Grid Consumption, INV Gen., BAT Gen., PV Gen., Grid Charge, PV Charge, Error Logs

```
>  Grid CONSUMP  <
>  Total:
                                0.0kWh
```

Grid Consumption interface displays today's or total load consumption from grid

```
>>>  INV Gen.  <<<
> Today:
                                29.1kWh
```

INV Gen. interface displays today's or total electricity quantity generated from this inverter.

```
>>>  Bat Gen.  <<<
> Today:
                                13.8kWh
```

Bat Gen. interface displays today's or total energy discharged from the battery.

```
>>>  PV Gen.  <<<
> Today:
                                19.0kWh
```

PV Gen. interface displays today's or total energy generated from the PV-panels.

```

>>>  Grid Charge  <<
> Today:
                                     1.9kWh

```

Grid Charge interface displays today's or total battery energy charging from the grid.

```

>>>  PV Charge  <<
> Today:
                                     13.1kWh

```

PV Charge interface displays today's or total battery energy charging from the PV-panels.

```

>>>  Error Logs  <<<
1:
2018-02-02          16:48
    Chg SPI Fault

```

Error Logs interface displays the 10 latest fault records of this system, including the name and time of the error.

```

>> Information <
> SN:
    2500xxxxxxxxxxx

```

Make sure all numbers in the information menu are correct.

```

>> Information <
> Inverter Ver.:

```

Check the inverter software version.

3.2.2.4 Display Content of General Setting Item

```

>  New Password  <
>
    0  0  0  0

```

Step1: Click setting and enter the password.

The installation's password is a four-digits password: 1111, after four-digits password was correctly input, you can enter into the main Setting interface (administrator permissions).

```

>>> Setting <<<

> Function
  Safety
    
```

Step2: Click Function to enter function setting.

```

>>> Function <<<
> Solar
  Battery
  Grid
    
```

Step3: Click Solar to set the Solar relevant information.

```

>>> Solar <<<
> On Grid Cap.
      000000W
    
```

Step4: Set on-grid capacity, storage capacity and number of PV strings (MPPT number).

```

>>>> Battery <<<<
> Bat Model
      BW-BAT-XXX
    
```

Step5: Click the Battery Function and check battery type.

```

>>>>Battery <<<<
> SOC Calibration
      No
    
```

Step 6
Check SOC Calibration function set No.

```

>>>> Battery <<<<
> Battery Ready
      No
    
```

Step 7
Check the Battery Ready function set No. If you only use this inverter without battery, please set it Yes.

```
>>>>> Grid <<<<<
> FeedIN Control
  Power Limit
  Power Factor
```

Step 8

Click the Grid Function to set up relevant parameters of the grid

```
>> System Mode <<
> DC
  AC
  Hybrid
```

Step 10

Click System Mode Function to set system mode: DC, AC, Hybrid.

```
Max. Feed in rate
> User Value:
  50%
```

Step 9

Set the Max. Feed in rate value.

```
>>> Work Mode <<
> Force Charge

  Enable
```

Step 11

Click the mode then set up work mode: self-use or force time charge.

```
>>> Work Mode <<
> Force Charge

Enable
```

Step 12

If you want to use Force Charge, set Enable here.

```
>>> Work Mode <<
> Charge
Start Time 1
01 :00
```

Step 13

Set the charge and discharge time.

```
>>> Work Mode <<
> UPS Reserve SOC
11 %
```

Step 14

Set the UPS Reserve SOC, it means how much battery energy to reserve for UPS function.

```
>>>> Safety <<<<
> Country

As4777
```

Step 15

Click Safety in the setting menu. Set safety standard AS4777 for Australia, VDE AR-N 4105 for Germany, CEI 0_21 for Italy, NRS097_2_1 for South Africa, RD1699 for Spain.

```
>>> CT Meter <<<
> Enable          OFF
Ratio            1
```

Step 16

If you use CT meter, please set CT meter enable and the relevant ratio.

```
>> UPS System <<
> Mute           YES
Frequency:       50Hz
```

Step 17

If you use UPS function, please set the mute as YES in UPS System interface and the relevant Frequency.


```
> > Date&Time <<
> 2018 - 02 - 02
    09 : 46
```

Step 18

Click System in the setting menu. Click Date &Time and set up the date and time.

```
> > > Ethernet <<<
IP method

> DHCP
```

Step 19

Click Ethernet to set the IP address. DHCP mode means that IP address is set up automatically.

If you want to set up the IP address manually, please choose manual mode.

Information

It need to set the following 3 parameters for manual mode:

IP Address: IP address;

Subnet Mask: Subnet mask;

Default Gateway: Default gateway;

Automatic display one parameter: MAC Address.

```
>>> Language <<<
> English
  Deutsch
```

Step 20

Click Language to set Language
Date & Time Setting Interface

```
>> Information <
> SN:
  2500xxxxxxxxxxx
```

Step 21

Make sure all the following number
is correct in Date & Time Setting In-
terface

3.2.2.5 Display Content of Additional Function Setting

If you use Backup box, please set as below:

```
>> Backupbox <<
> Enable
   No
```

```
>> Backupbox <<
> L1    1 SOC    10
   L1    2 SOC    10
   L1    3 SOC    10
```

Step 1

Click Enable to set YES.

Step2:

Set the priority of the load, L1>L2>L3.

If external device will dispatch the system, please set as following steps:

```
>>> Function <<<
> Parallel
   ModBus
```

```
>>> ModBus <<<
> Enable      OFF
   Mode       Slave
```

Step 1

Please go to the function menu, choose “ModBus” and press enter.

Step 2

Please set Modbus enable as YES.

3.2.2.6 Overload reminder

When overloaded, the display show "over load" and scrolls to prompt the customer to reduce some electrical appliances like this 'please turn off some electrical appliances'.

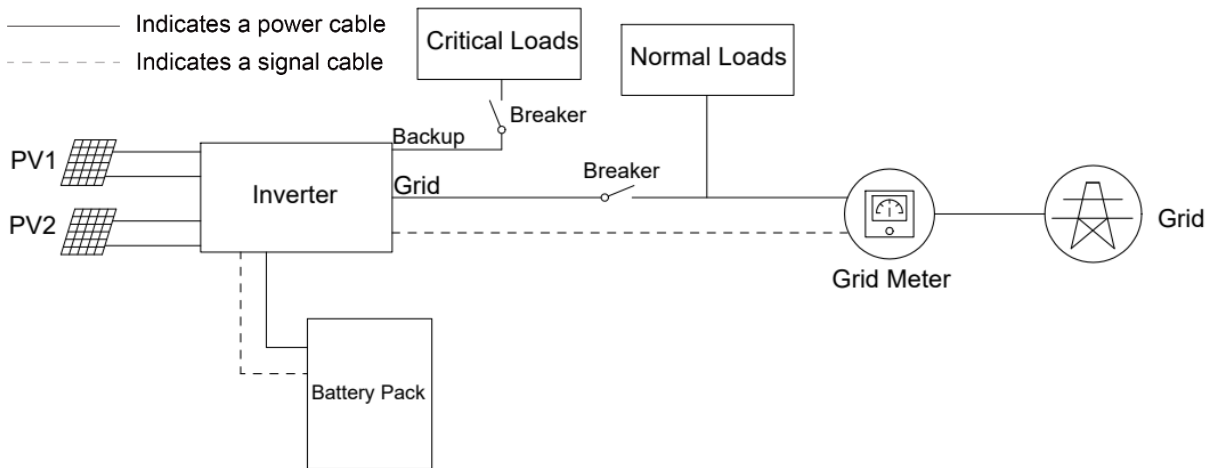
```
>>> Main <<<

please turn off some
electrical appliances
```

3.3. Application Scenarios

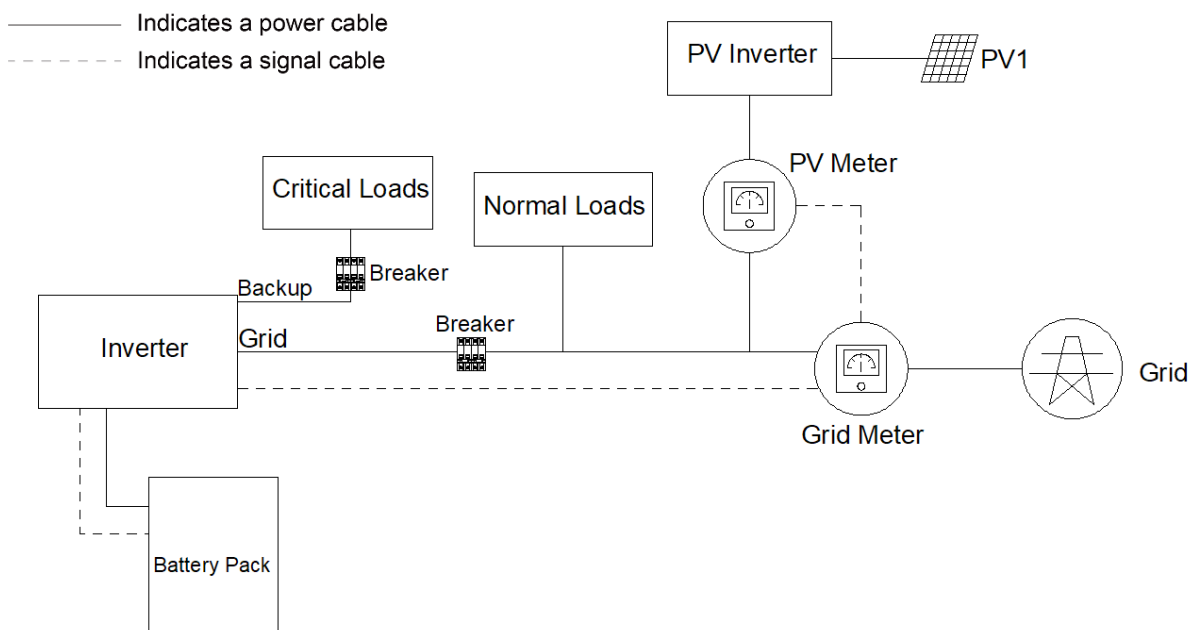
Bytewatt inverter and battery system (includes inverter BW-INV-SPH5K/BW-INV-SPH3.6K/BW-INV-SPB5K and battery BW-BAT-10.1P) can be applied in DC-coupled systems (mostly new installation), AC-coupled systems (mostly retrofit), Hybrid-coupled systems (mostly retrofit, and increase the PV capacity), and Off-grid (with Generator) systems as the following schemes:

DC-coupled Storage System



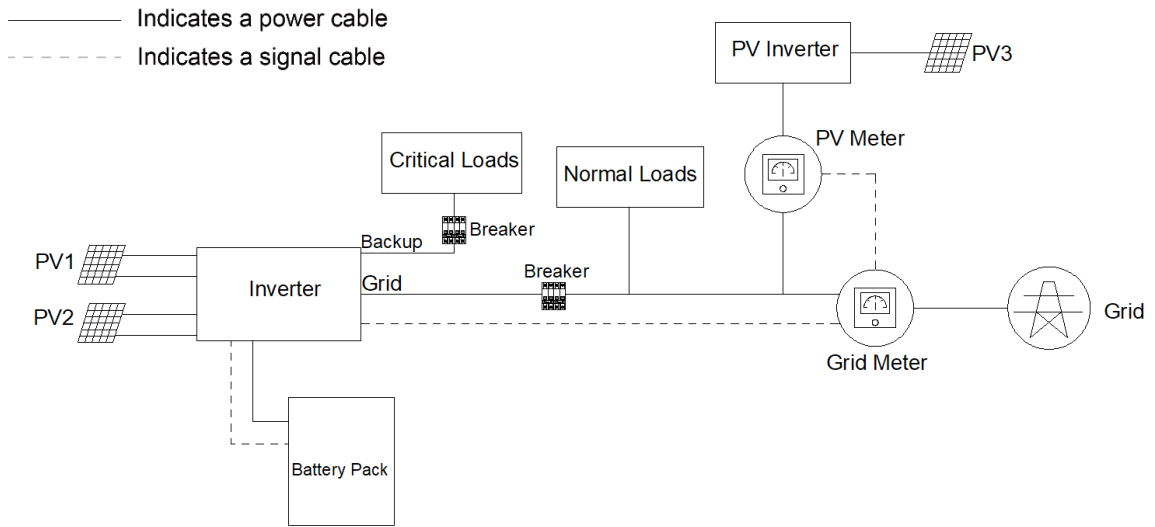
DC-coupled Storage System - Scheme

AC-coupled Storage System



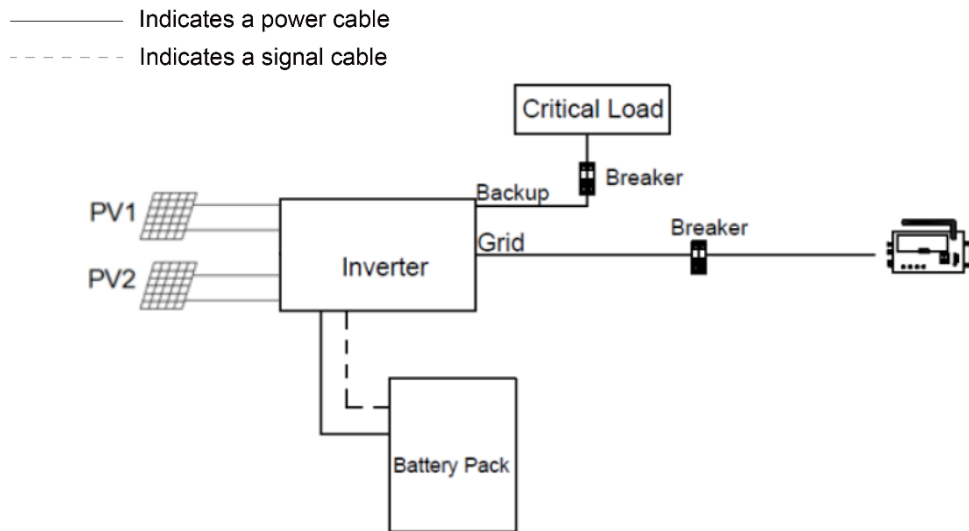
AC-coupled Storage System - Scheme

Hybrid-coupled Storage System



Hybrid-coupled Storage System - Scheme

Off grid Storage System



Off-grid (with Generator) Storage System - Scheme

4. Storage and Transport

4.1. Storage

The following requirements should be met if the inverter is not put into use directly:

1. Do not unpack the inverter.
2. Keep the storage temperature at $-40\sim 60^{\circ}\text{C}$ and the humidity at $5\%\sim 95\%$ RH.
3. The inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
4. A maximum of six inverters can be stacked. To avoid personal injury or device damage, stack inverters with caution to prevent them from falling over.
5. During the storage period, check the inverter periodically. Replace the packing materials which are damaged by insects or rodents in a timely manner.
6. If the inverters have been stored for more than two years, it must be checked and tested by professionals before being put into use.

4.2. Transport

During transportation, please follow these guidelines:

1. Priority to use the original packaging for transportation. If the original packaging is not available, put the product inside a suitable cardboard box and seal it properly.
2. Handle with care, choose the corresponding handling method according to the weight, and pay attention to safety;
3. During transportation, please keep the packaging away from dangerous sources and take waterproof measures;
4. Please fix the packaging during transportation to prevent falling or mechanical impact;


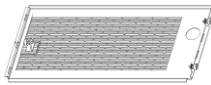


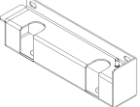
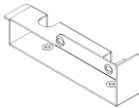
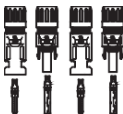
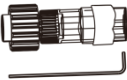


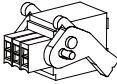

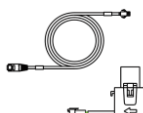
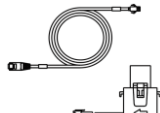

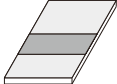
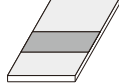
5. Mounting

5.1. Checking the Outer Packing

Before unpacking the product, check the outer packing for damage, such as holes and cracks. If any damage is found, do not unpack the product and contact your dealer as soon as possible.

5.2. Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact your distributor if the scope of delivery is incomplete or damaged.

| INVERTER | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| BW-INV - SPH5K/SPH3.6K/ SPB5K -INV (X1) | TOP Cover (X1) | Right plate (X1) | Left plate (X1) | Left Support Foot (X1) |
|  |  |  |  |  |
| Right Support Foot (X1) | PV+&PV- Connectors (X2)* | Grid Connector(X1) | Backup Connector(X1) | WiFi Module (X1) |
|  |  |  |  |  |
| 6 Pin AUX Ter- minal Block (X1) | M4*10 Screw(X2) M5*12 Screw(X8) | Grid CT and Cable (X1)** | PV CT and Cable (X1)** | Grounding Cable (X1) |
|  |  | | | |
| Quick Installation Guide (X1) | System Wiring Diagram sheets (X1) | | | |

*Only for product BW-INV-SPH5K/BW-INV-SPH3.6K

**Optional

5.3. Requirements for Mounting

WARNING

Danger to life due to fire or explosion

Despite careful construction, electrical devices can cause fires.

- Do not mount the energy storage system in areas containing highly flammable materials or gases.
- Do not mount the energy storage system in potentially explosive atmospheres.

5.3.1. Basic Requirements

- The Inverter and Battery system is suitable for indoor and outdoor use.
- Do not install the inverter in a place where a person can easily touch it because its housing and heatsink are hot during operation.
- Do not mount the system in areas with flammable or explosive materials.
- Do not mount the inverter at a place within children's reach.
- Do not mount the system outdoors in salt areas because it will be corroded there and may cause fire. A salt area refers to the region within 500m from the coast or prone to sea breeze. The regions prone to sea breeze vary depending on weather conditions (such as typhoons and monsoons) or terrains (such as dams and hills).

5.3.2. Mounting Environment Requirements

- The system must be mounted in a well-ventilated environment to ensure good heat dissipation.
- When mounted under direct sunlight, the power of the system may be derated due to additional temperature rise.
- Mount the system in a sheltered place or mount an awning over the product.
- The optimal temperature range for the battery pack to operate is from 15 to 30°C.
- Do not expose or place near water sources like downspouts or sprinklers.
- If the battery pack is mounted in the garage, then ensure that it is above the height of the vehicle bumper or door.

5.3.3. Mounting Structure Requirements

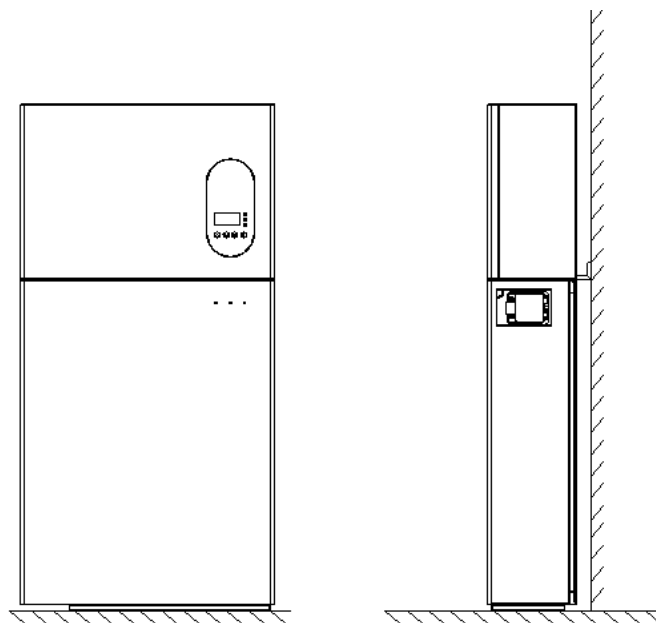
- The mounting structure where the system is mounted must be fireproof.
- Do not mount the system on flammable building materials.
- Ensure that the mounting surface is solid enough to bear the weight load.
- In residential areas, do not mount the inverter on dry walls or walls made of similar materials which have a weak sound insulation performance because the noise generated by the inverter is noticeable.

5.3.4. Mounting Angle and Stack Requirement

The inverter should be mounted on the battery (Model: BW-BAT-10.1P、 BW-BAT-10.1P II、 BW-BAT-10.1P III、 BW-BAT-10.1P IV、 BW-BAT-10.1P V、 BW-BAT-10.1P VI).

The installation angle requirement is as follow:

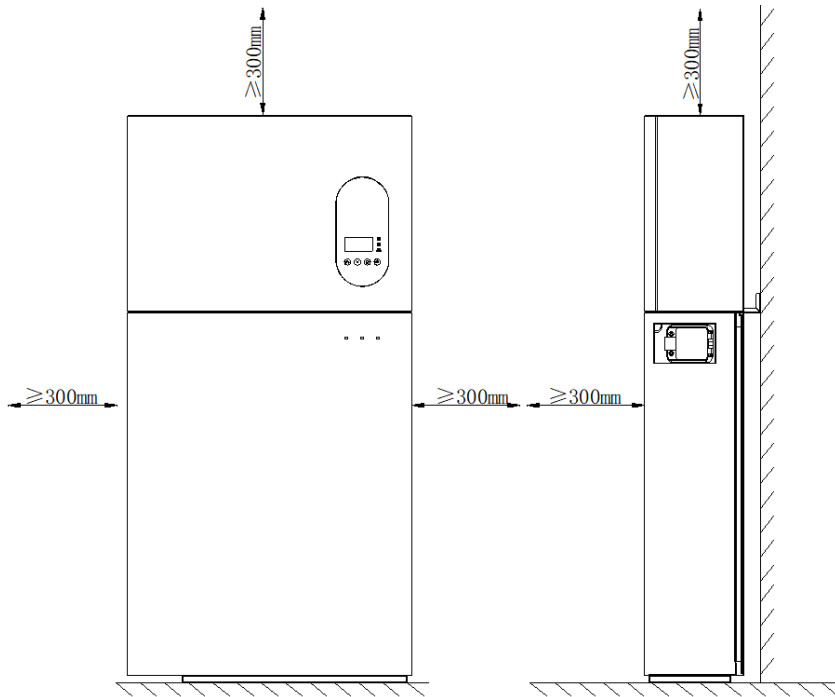
- Do not mount the inverter at forward tilted, side tilted, horizontal, or upside down positions.







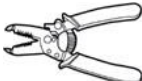










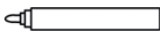






5.3.5. Mounting Space Requirements

- Reserve sufficient clearance around the product to ensure sufficient space for installation, maintenance and heat dissipation.
- The side clearance is a recommendation. Keep the clearance as short as you can if there is no influence to the operation and maintenance.

Recommended clearances



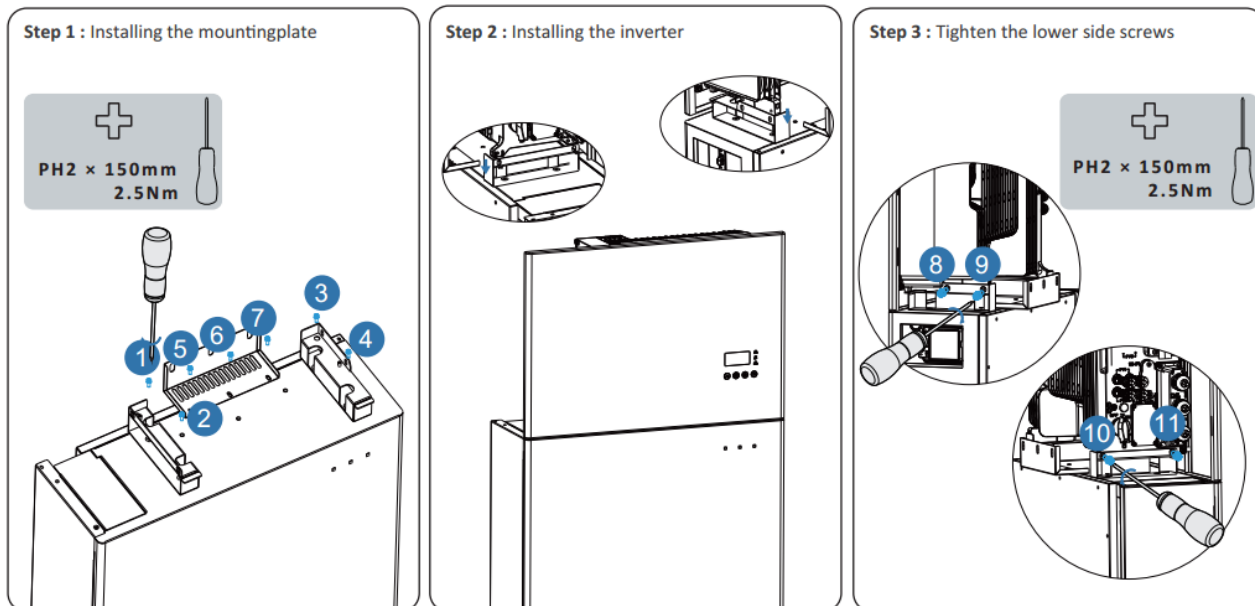
5.4. Preparing Tools and Instruments

| Category | Tools and Instruments | | |
|-------------------------------|---|---|---|
| Installation |  |  |  |
| | Hammer drill (with a $\Phi 10$ mm drill bit) | Torque socket wrench SW10 | Multimeter (DC voltage range ≥ 1000 V DC) |
| |  |  |  |
| | Diagonal pliers | Wire stripper | T20 screwdriver (torque range: 0-5 N m) L < 200mm |
| |  |  |  |
| | Rubber mallet | Utility knife | Cable cutter |
| |  |  |  |
| | Crimping tool (model: PV-CZM-22100) | Cord end terminal crimper | Disassembly and Assembly Tool of PV connector |
| |  |  |  |
| | Vacuum cleaner | Heat shrink tubing | Heat gun |
| |  |  |  |
| Marker | Measuring tape | Bubble or digital level | |
| Personal Protective Equipment |  |  |  |
| | Safety gloves | Safety goggles | Anti-dust respirator |
| |  | | |
| Safety shoes | | | |

5.5. Mounting the Product

5.5.1. Mounting the Inverter

- a. Fit the left and right side brackets onto the top of the battery
- b. Attach the inverter to the mounting bracket. Mount the supporting bracket at the bottom of the inverter(M5*12 2.5N.m PH2).



6. Electrical Connection

Precautions

DANGER

Before connecting cables, ensure that all breakers of the inverter and the battery packs and all the switches connected to inverters and the battery packs are set to OFF. Otherwise, the danger voltage of the energy storage system may result in electric shocks.

WARNING

- The energy storage system damage caused by incorrect cable connections is not covered under any warranty.
- Only certified electricians are allowed to connect cables.

Operation personnel must wear proper PPE when connecting cables

NOTICE

The cable colors shown in the electrical connection diagrams provided in this chapter are for reference only.

Select cables in accordance with local cable specifications (green-and-yellow cables are only used for PE).

6.1. Cable Requirements for Connection

| No. | Cable | Type | Conductor Cross Section Area Range | Outer Diameter | Source |
|-----------------|-----------------------------|---|--|----------------|-----------------------------|
| 1 | Battery power cable | Standard PV cable in the industry (recommended type: PV1-F) | 16mm ² | N/A | Delivered with the battery |
| 2 | Battery communication cable | Standard network cable in the industry (recommended type: Cat5e, UTP, UV-resistant for outdoor use) | 0.12 ~ 0.2 mm ² (AWG26~AWG24) | N/A | Delivered with the battery |
| 3※ ¹ | Signal cable | Standard network cable in the industry (recommended type: Cat5e, FTP, UV-resistant for outdoor use) | 0.12 ~ 0.2 mm ² (AWG26~AWG24) | N/A | Delivered with the inverter |
| 4 | PV Power cable | Standard PV cable in the industry (recommended type: PV1-F) | 4~6 mm ² | 5.5 ~ 9 mm | Purchased by the installer |
| 5※ ² | Signal cable | Standard network cable in the industry (recommended type: Cat5e, FTP, UV-resistant for outdoor use) | 0.12 ~ 0.2 mm ² (AWG26~AWG24) | 4~6 mm | Purchased by the installer |
| 6※ ³ | Signal cable | Multiple-core outdoor shielded twisted pair cable | 0.1 ~ 1.3 mm ² | 4~6 mm | Purchased by the installer |
| 7 | AC power cable for backup | Three-core (L, N and PE) outdoor copper cable | 4 ~ 6 mm ² | 10 ~ 14 mm | Purchased by the installer |
| 8 | AC power cable for grid | Three-core (L, N and PE) outdoor copper cable | 6 ~ 10mm ² | 12 ~ 18 mm | Purchased by the installer |
| 9 | PE cable | Single-core outdoor copper cable | 6 ~ 10 mm ² | N/A | Purchased by the installer |

※¹ For CT communication connection with inverter.

※² For CAN/RS485, LAN, Meter, DRM communication connection with inverter.

※³ For AUX communication connection with inverter.

6.2. Connecting Additional Grounding

NOTICE

Electric Shock Hazard

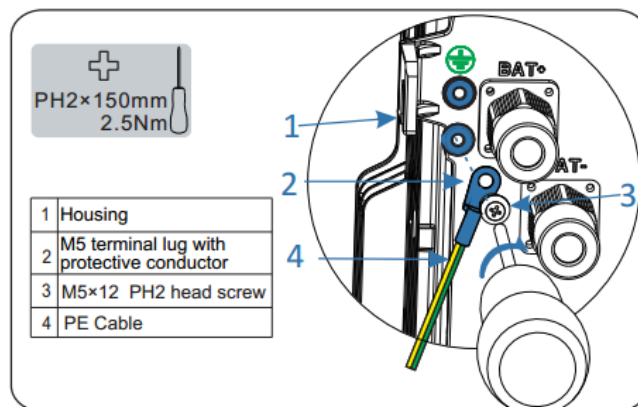
Before doing electrical connection, please ensure the PV switch & all AC and BAT circuit breakers in the energy storage system are switched OFF and cannot be re-activated.

External grounding points are provided at the left side of the inverter.

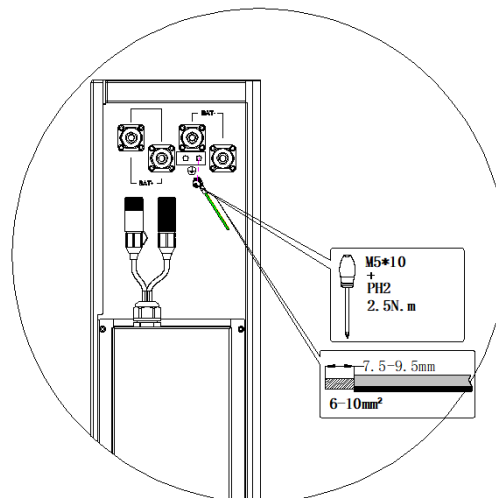
Prepare M5 OT terminals, strip the grounding cable insulation, insert the stripped part of the grounding cable into the ring terminal lug and crimp using a crimping tool.

Connect the OT terminal to grounding point using the torque 2.5 N.m with TX20 screwdriver.

Additional grounding connection for inverter.



Grounding connection between inverter and Battery.



6.3. AC Connection

6.3.1. Requirements for the AC Connection

AC cable requirements as follows:

- Conductor type: copper wire
- External diameter: 12 mm to 18 mm for grid connector, 10 mm to 14 mm for backup connector
- Grid conductor cross-section recommendation: 10 mm²
Backup conductor cross-section recommendation: 6 mm²
- Insulation stripping length: 10 mm
- Sheath stripping length: 50 mm

NOTICE

Residual-current monitoring unit:

If local regulations require the use of a residual-current device, or Hybrid-coupled storage system with big coupling capacity from the PV array and PV inverter, the following must be observed:

The inverter is compatible with type B residual-current devices with a rated residual current of 30mA or less. Each inverter in the system must be connected to the utility grid via a separate residual-current device.

DANGER

You must protect each inverter with an individual grid/backup circuit breaker in order to ensure that the inverter can be disconnected safely.

NOTICE

For Australia and New Zealand installation site, the neutral cable of the grid side and the backup side must be connected to the neutral bar at the mains switchboard, otherwise the backup output function will not work. Please refer to wiring diagram in Appendix

Testing to multiple inverter combinations as per AS/NZS 4777.2:2020 has not been conducted

| Description | Max. Current | Breaker Type for BW-S5/B5-INV |
|-------------|--------------|-------------------------------|
| Grid Side | 43.5A | 50A |
| Backup Side | 21.7A | 32A |

| Description | Max. Current | Breaker Type for BW-B5-INV |
|-------------|--------------|----------------------------|
| Grid Side | 32A | 40A |
| Backup Side | 16A | 20A |

 **WARNING**

Selecting a circuit breaker and copper conductor cross section

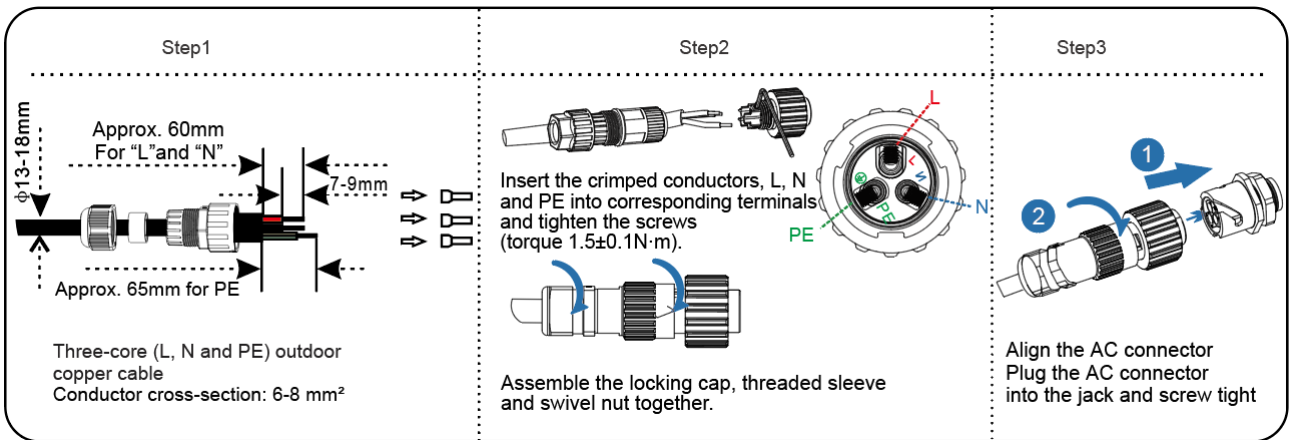
For BW-INV-SPH5K/SPB5K, the maximum allowable grid circuit breaker specification is 50A at the same time the copper conductor cross section for grid connection must be 10mm². You should use APP or cloud to do the right setting for example when selecting grid circuit breaker specification 32A or 40A and suitable copper conductor cross section, otherwise it increases the danger of the circuit breaker tripping under normal operating conditions.

NOTICE

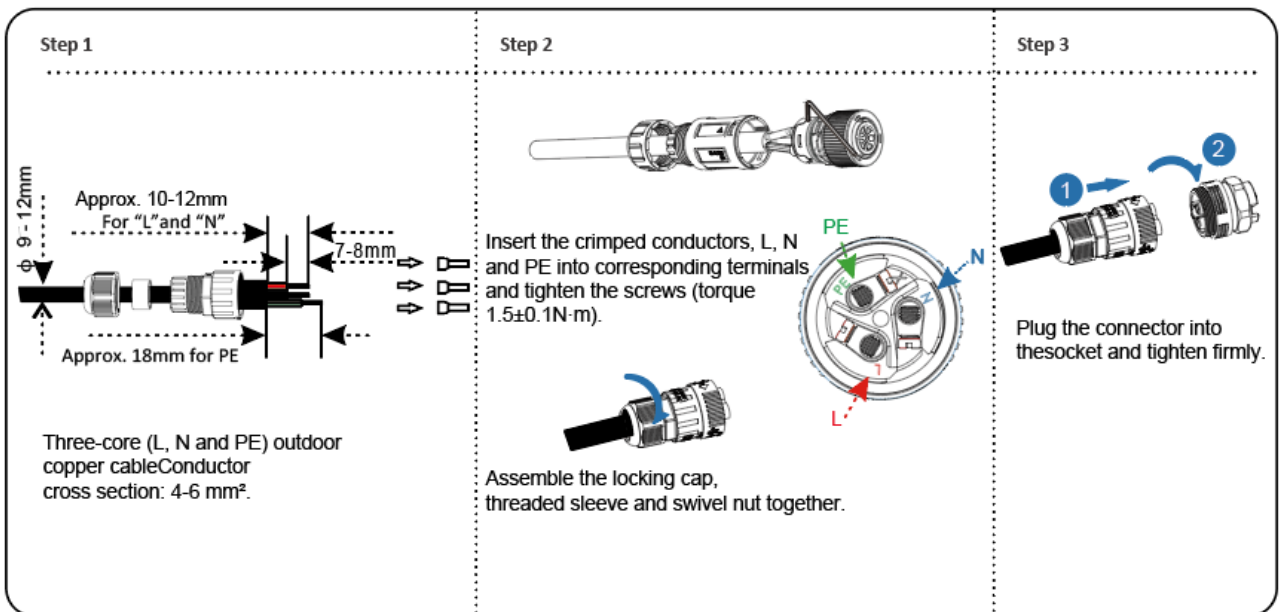
The user should make sure the neutral and ground connection maintain neutral continuity in the home electrical distribution box according AS/NZS 4777.2

6.3.2. Grid and Backup Connection

The steps for connecting the grid connector as follows:



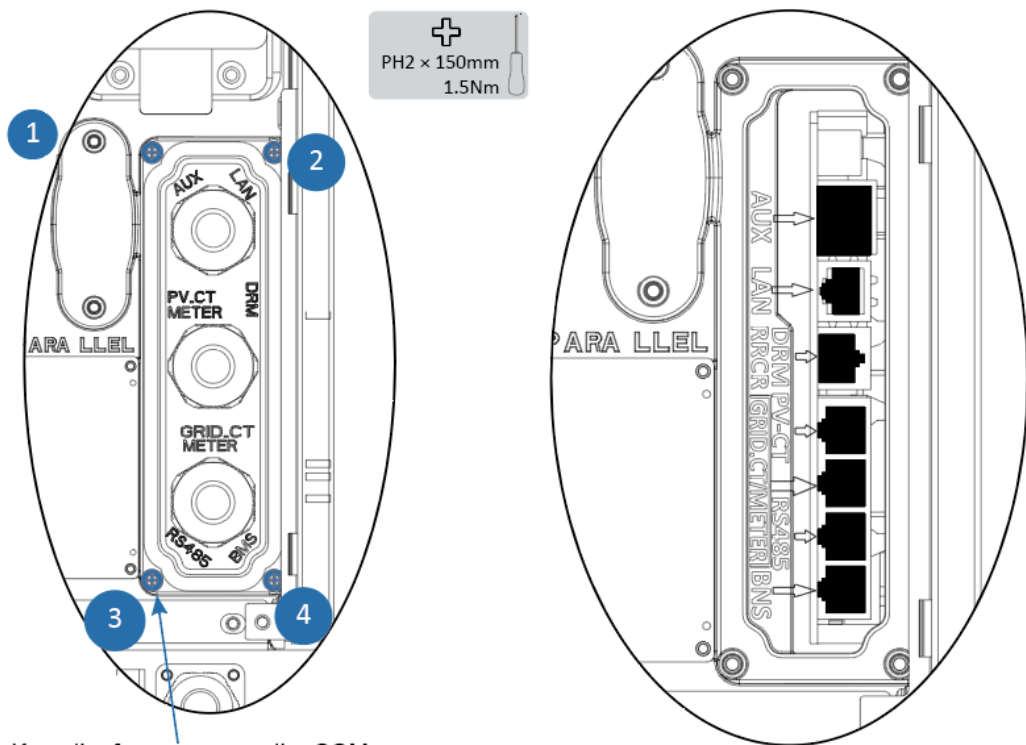
The steps for connecting the backup connector as follows:



6.3.3. CT Connection & Electricity Meter Connection

| Item | Current | Scenarios |
|--------------------------|---------|--------------------------------|
| CT | 100A | CT |
| DTSU666-3*230V 5(80)A | 80A | Three phase meter (without CT) |
| DTSU666-3*230V 100A/40mA | 100A | Three phase meter (with CT) |
| DTSU666-3*230V 250A/50mA | 250A | Three phase meter (with CT) |

Loosen the swivel nuts of the cable glands on the COM connection cover of BW-Inverter, and unscrew the 4 screws on the corners, then you will see the grid CT, PV CT and meter communication ports.



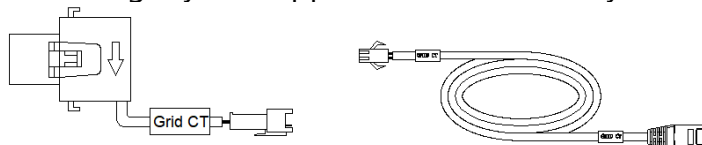
PH2 × 150mm
1.5Nm

6.3.4. CT Connection

The Grid CT & cable and PV CT & cable are standard accessories, which are provided by inverter.

For hybrid-coupled or AC-coupled storage system application, installer needs to use Grid CT & cable and PV CT & cable.

For DC-coupled storage system application, installer only needs to use Grid CT & cable.



Please take out CT(s) from the package.

For DC-coupled storage system application

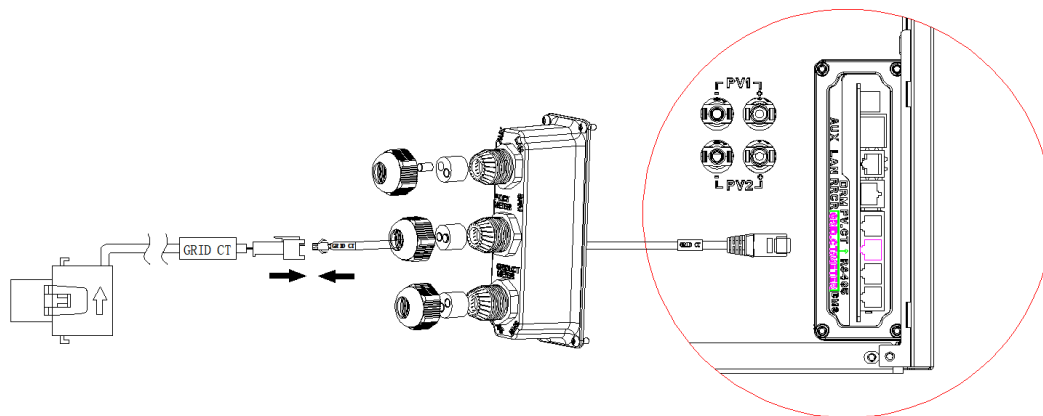
Step 1: Please take out Grid CT & cable from the package.

Step 2: Lead the grid CT cable through the cable gland of the COM connection cover, don't tighten the swivel nut of the cable gland.

Insert the RJ45 plug to the relative RJ45 socket with symbol "Grid CT".

Step 3: Buckle the magnetic buckle of the Grid CT on the house-service live cable.

The arrow on the magnetic buckle of the Grid CT should point to the Grid port of BW-INV-SPH5K/SPB3.6K. Plug the two connectors of Grid CT and its cable.



For AC-coupled storage system BW-INV-SPB5K application

Step 1: Please take out Grid CT & cable and PV CT & cable from the package.

Step 2: For Grid CT connection, please do it as above steps.

Step 3: For PV CT connection, please do it as follows.

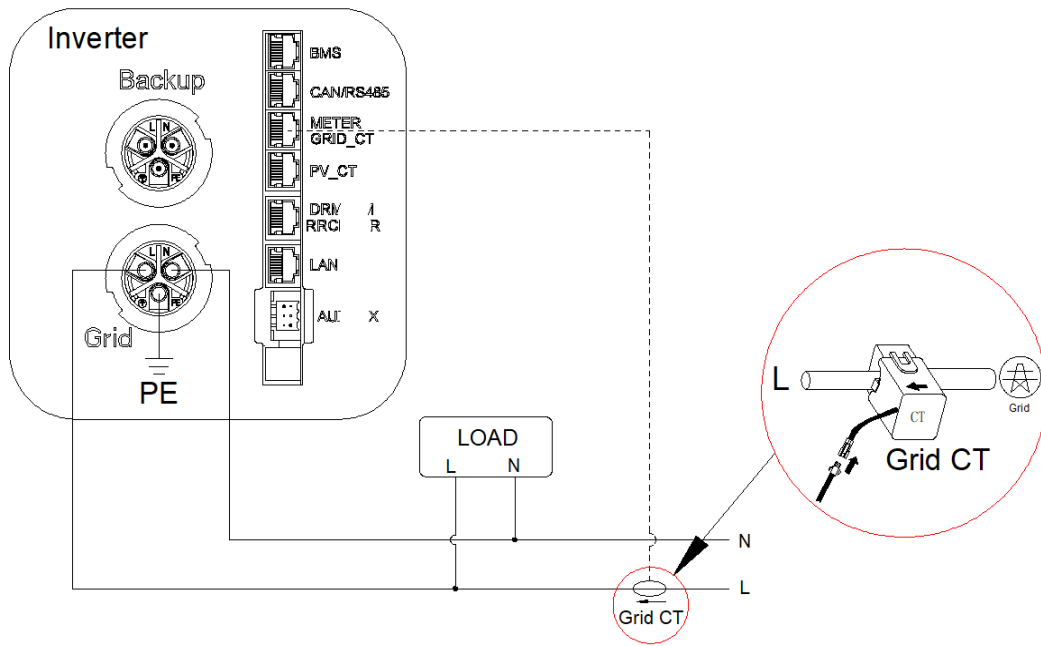
Lead the PV CT cable through the cable gland of the COM connection cover, don't tighten the swivel nut of the cable gland.

Insert the RJ45 plug to the relative RJ45 socket with symbol "PV CT".

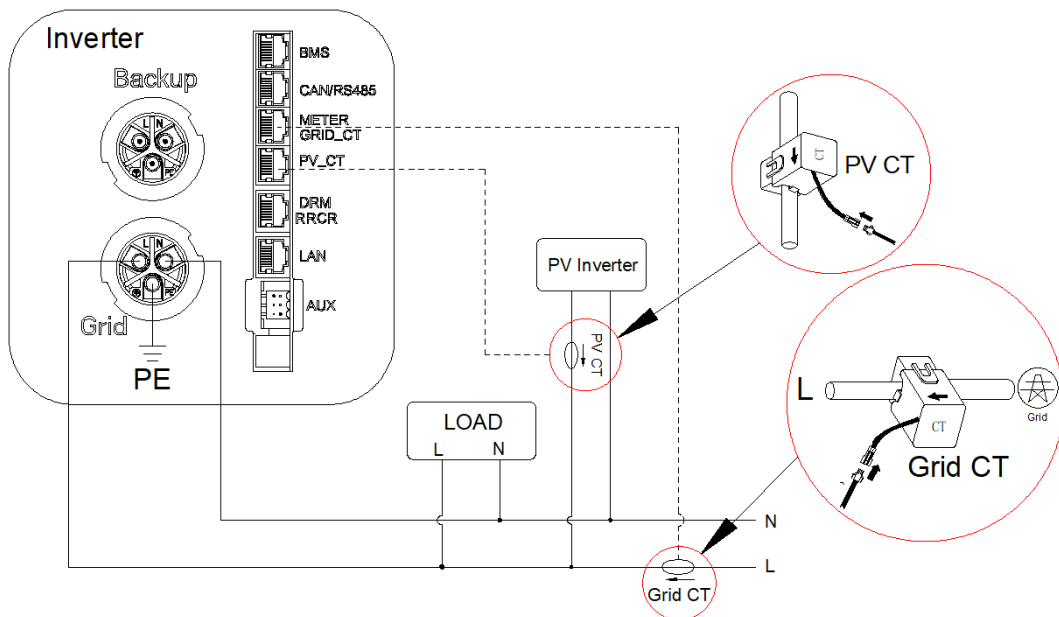
Step 4: Buckle the magnetic buckle of the PV CT on the live cable of the installed PV inverter. The arrow on the magnetic buckle of the PV CT should point to the mains grid. Plug the two connectors of PV CT and its cable.

NOTICE

The CT cable marked Grid CT should be connected to the Grid CT, and the CT cable marked PV CT should be connected to the PV CT.



DC-coupled Storage System



AC-coupled Storage System and Hybrid-coupled Storage System

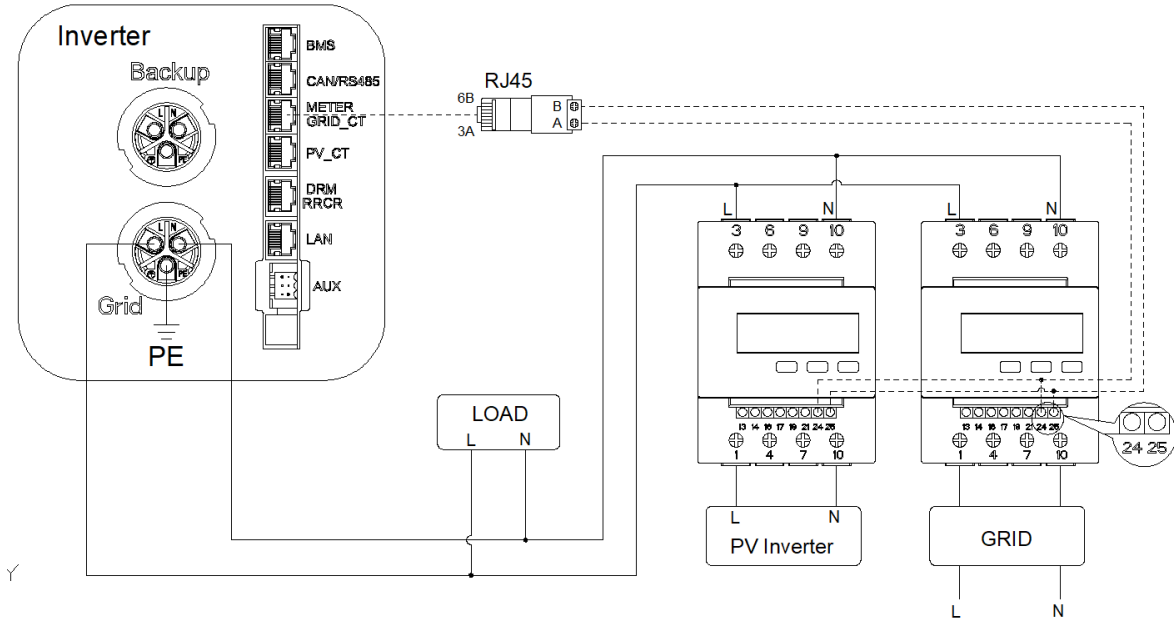
6.3.5. Meter Connection

Lead the meter cable through the cable gland of the COM connection cover, don't tighten the swivel nuts of the cable glands.

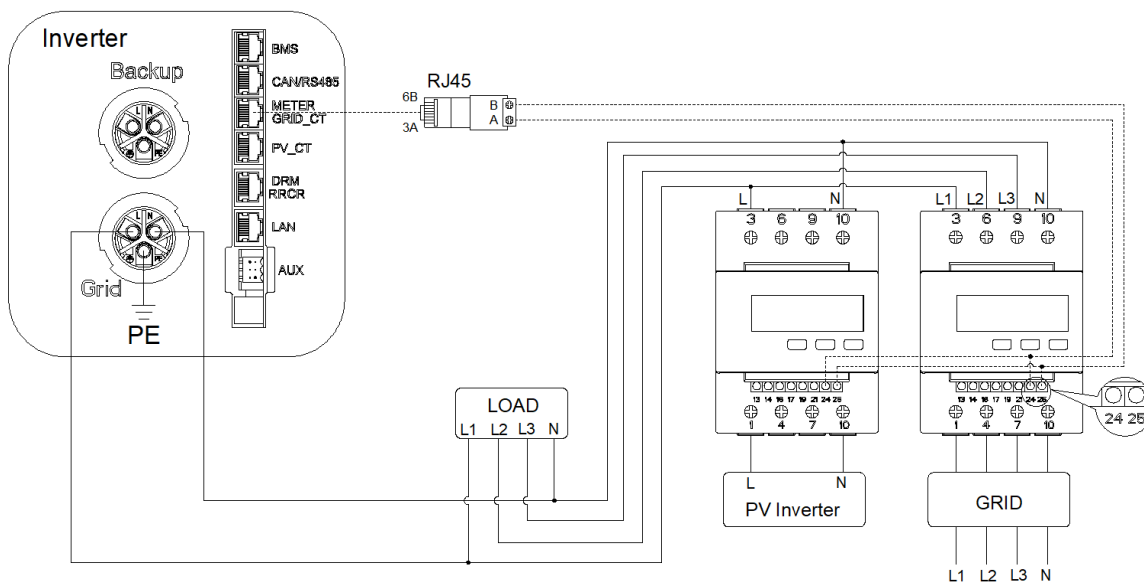
Insert the RJ45 plugs to the meter communication port.

The other steps for meter connection as follows:

1. DSTU666-3*230V 5(80)A: Three phase meter (without CT) connection



Wiring at single-phase feed in



Wiring at three-phase feed in

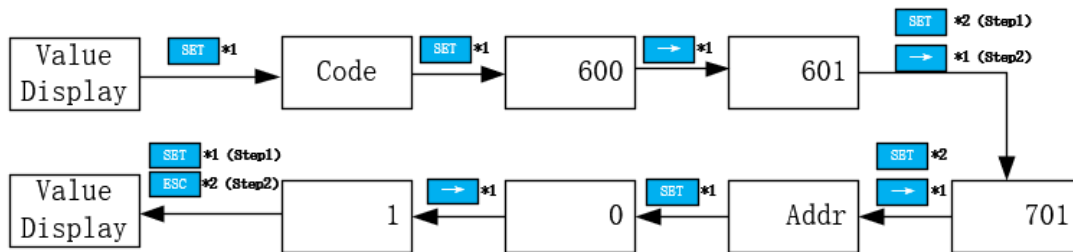
2. DSTU666-3*230V 100A/40mA, DTSU666-3*230V 250A/50mA: Three phase meter (with CT) connection

6.3.6. Configuring the Chint Meter

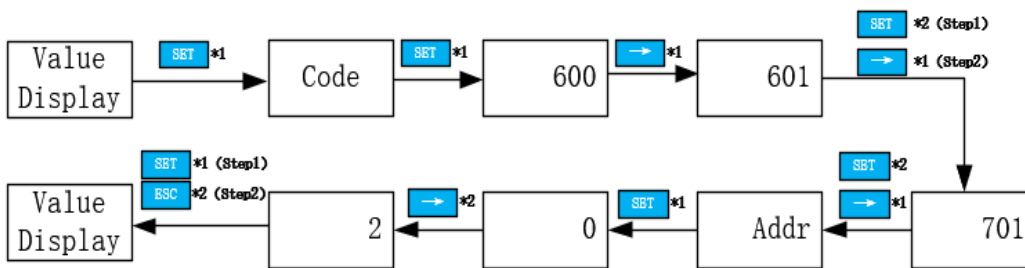
| Model | Grid Meter Address | PV Meter Address |
|------------------------------------|--------------------|------------------|
| DTSU666-3*230V 5(80)A (without CT) | 1 | 2 |
| DTSU666-3*230V 100A/40mA (with CT) | 1 | N/A |
| DTSU666-3*230V 250A/50mA (with CT) | 1 | N/A |

1. DTSU666-3*230V 5(80)A: Three-phase meter (without CT)

When the meter is used as Grid meter, please follow the steps below to complete the address setting.

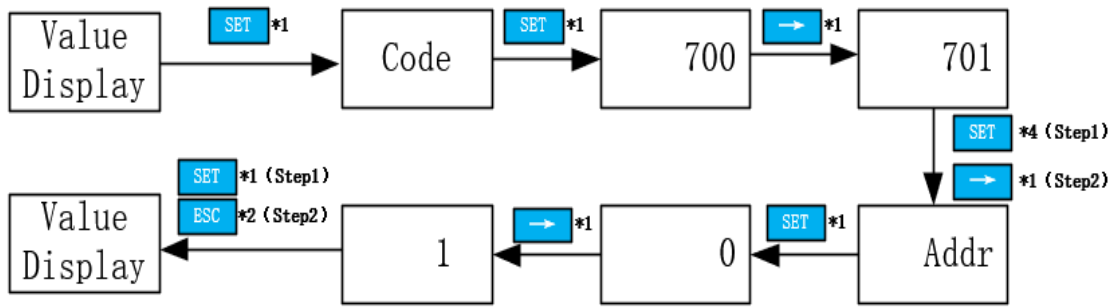


When the meter is used as PV meter, please follow the steps below to complete the address setting.



2. DTSU666-3*230V 100A/40mA, DTSU666-3*230V 250A/50mA: Three-phase meter (with CT)

When the meter is used as Grid meter, please follow the steps below to complete the address setting.



Meter Setting on Bytewatt Cloud

Step 1:

When the system work mode is selected as DC, click the button under the “Grid Meter” to turn the “Meter” icon green.

When the system work mode is selected as AC or Hybrid, click the buttons under the “Grid Meter” and “PV side meter” to turn the “Meter” icon green.

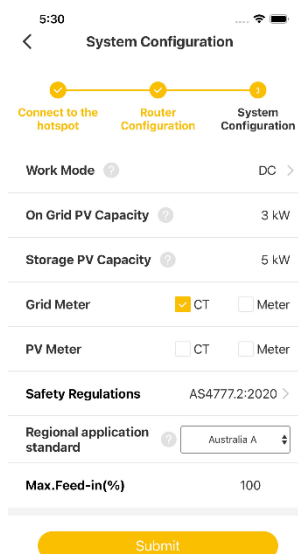
Step 2:

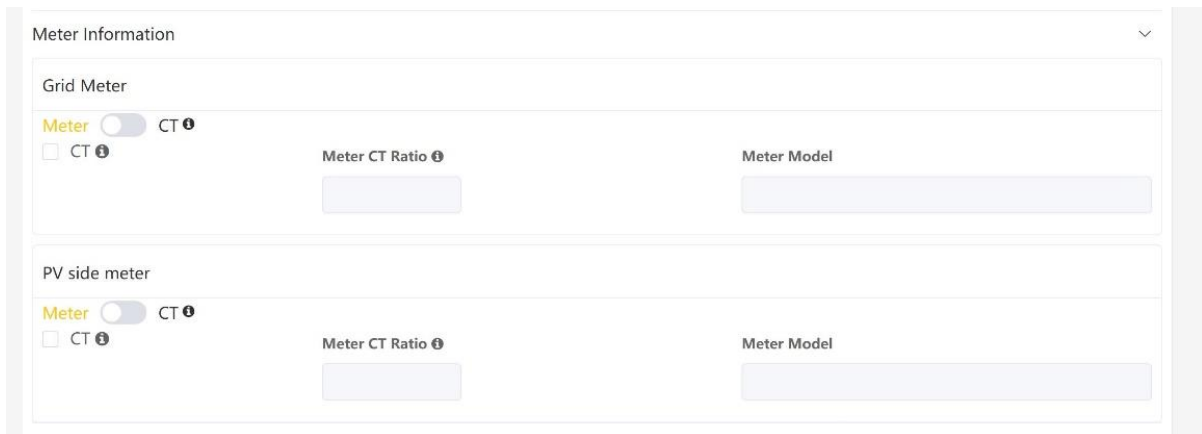
Click "Save" and wait a few minutes to refresh the page.

When the “Meter Model” displays DTSU666 model, the setting is successful.

NOTICE

It is forbidden to tick CT to modify the CT ratio.





Meter Information

Grid Meter

Meter CT

Meter CT Ratio

Meter Model

PV side meter

Meter CT

Meter CT Ratio

Meter Model

Meter Setting on Bytewatt APP

Step 1:

When the system work mode is selected as DC, only tick "Meter" icon on the right of the "Grid Meter".

When the system work mode is selected as AC or Hybrid, both tick "Meter" icon on the right of the "Grid Meter" and "PV side meter".

Step 2:

Click "Submit" and enter the "System information" page to check the meter model. When the "Meter Model" displays DTSU666 model, the setting is successful.



NOTE

It is forbidden to tick CT to modify the CT ratio.

6.4. PV Connection

Please ensure the follows before connecting PV strings to the BW-INV:

Make sure the open voltage of the PV strings will not exceed the max. DC input voltage (580Vdc). Violating this condition will void the warranty.

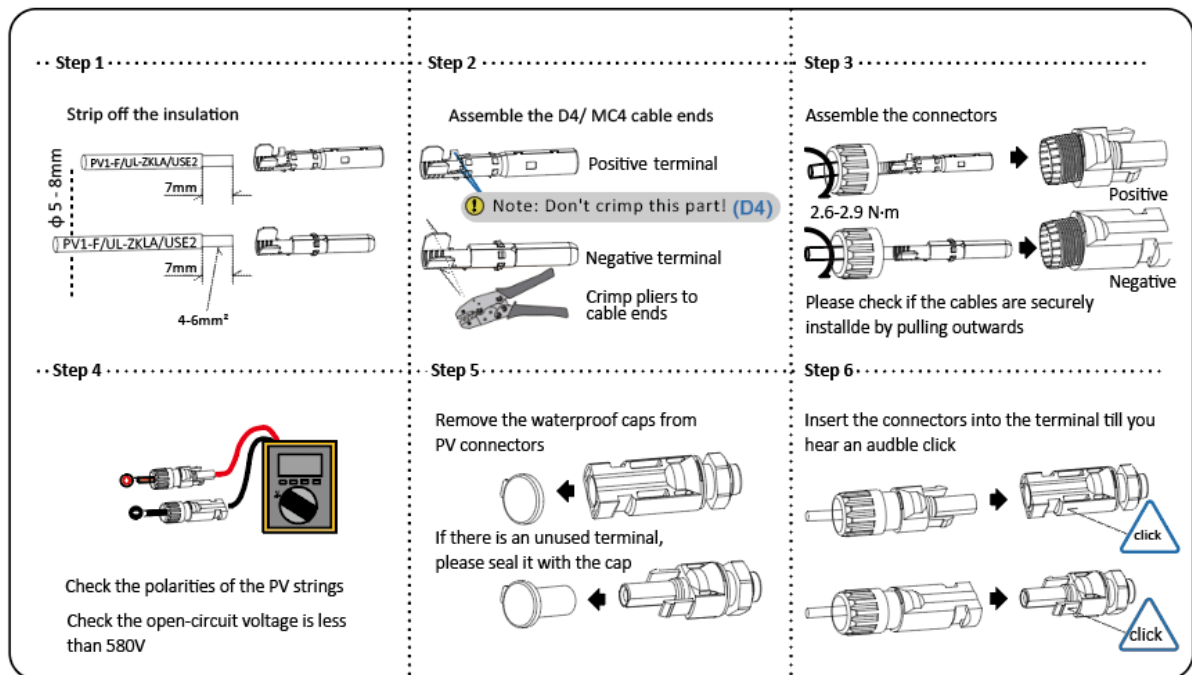
Make sure the polarity of the PV connectors is correct.

Make sure the PV-switch, breakers of battery, AC-BACKUP and AC-Grid are all in their off-states.

- Make sure the PV resistance to ground is higher than 200KOhms.

The inverter uses the Vaconn D4/MC4(optional) PV connectors. Please follow the picture below to assemble the PV connectors.

PV conductor cross section requirements: 4~6 mm²

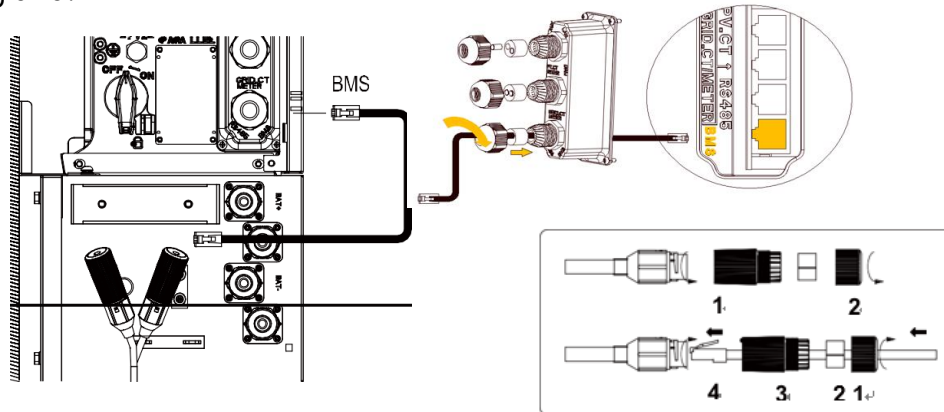


6.5. Electrical Connection Between the Inverter and Battery Packs

6.5.1. Electrical Connection Between the Inverter and Battery

Communication cable connection:

- a. Take out the battery communication cable from the battery package
- b. Lead the battery communication cable through the cable gland of the COM connection cover of inverter, don't tighten the swivel nuts of the cable glands, insert the RJ45 plugs to the BMS communication port.
- c. The battery communication ports of Battery series are at the top right of the battery, unscrew the 4 screws of the communication panel and remove it.
- d. Loosen the swivel nut of the cable gland on the battery communication panel, lead the battery communication cable through the cable gland, insert the RJ45 plugs to the BMS communication port of Battery series.
- e. Tighten the 4 screws of the communication panel, then tighten swivel nut of the cable gland.



⚠ DANGER

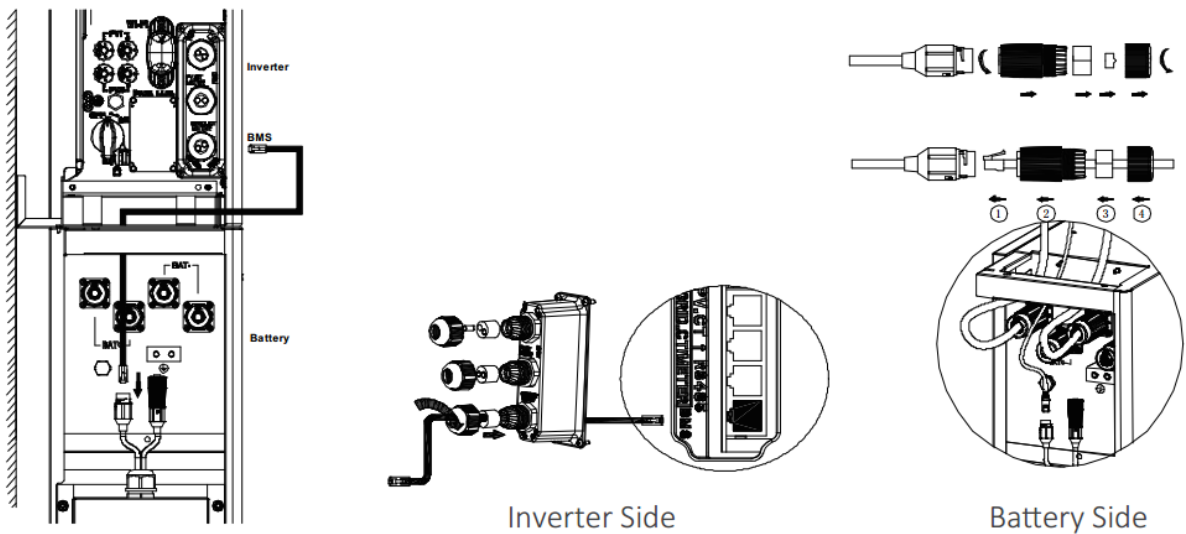
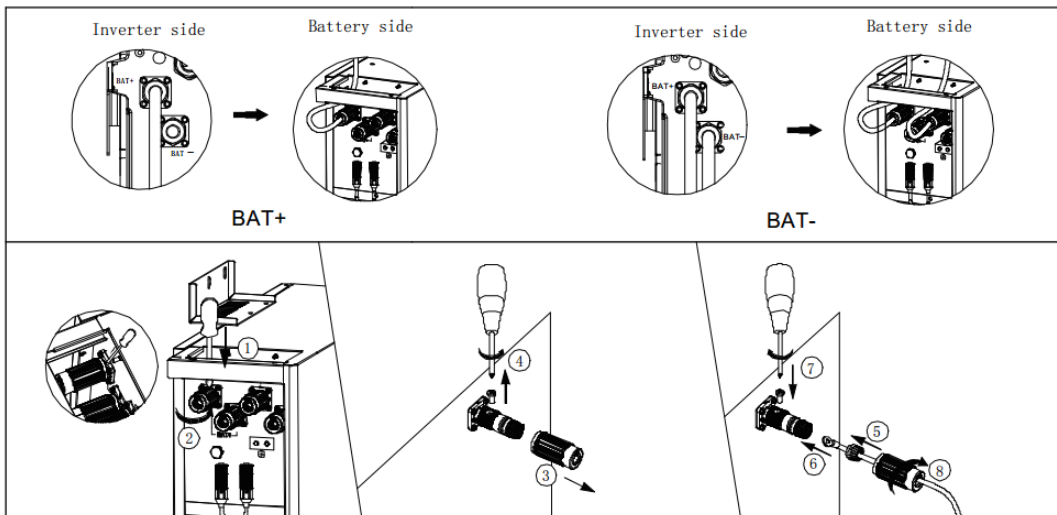
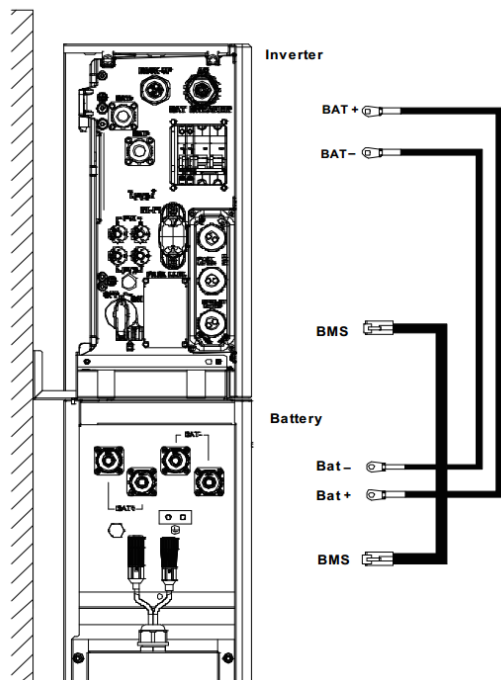
Danger to life due to short-circuiting of the battery

Touching the short-circuit connection of the battery results in death or lethal injuries due to electric shock and massive energy release.

- Switch off the battery breaker which is located on the right side of the battery.
- Please connect both ends of one battery power cable completely before connecting the next power cable to avoid short-circuiting of the positive and negative battery power cables.

Power cable connection:

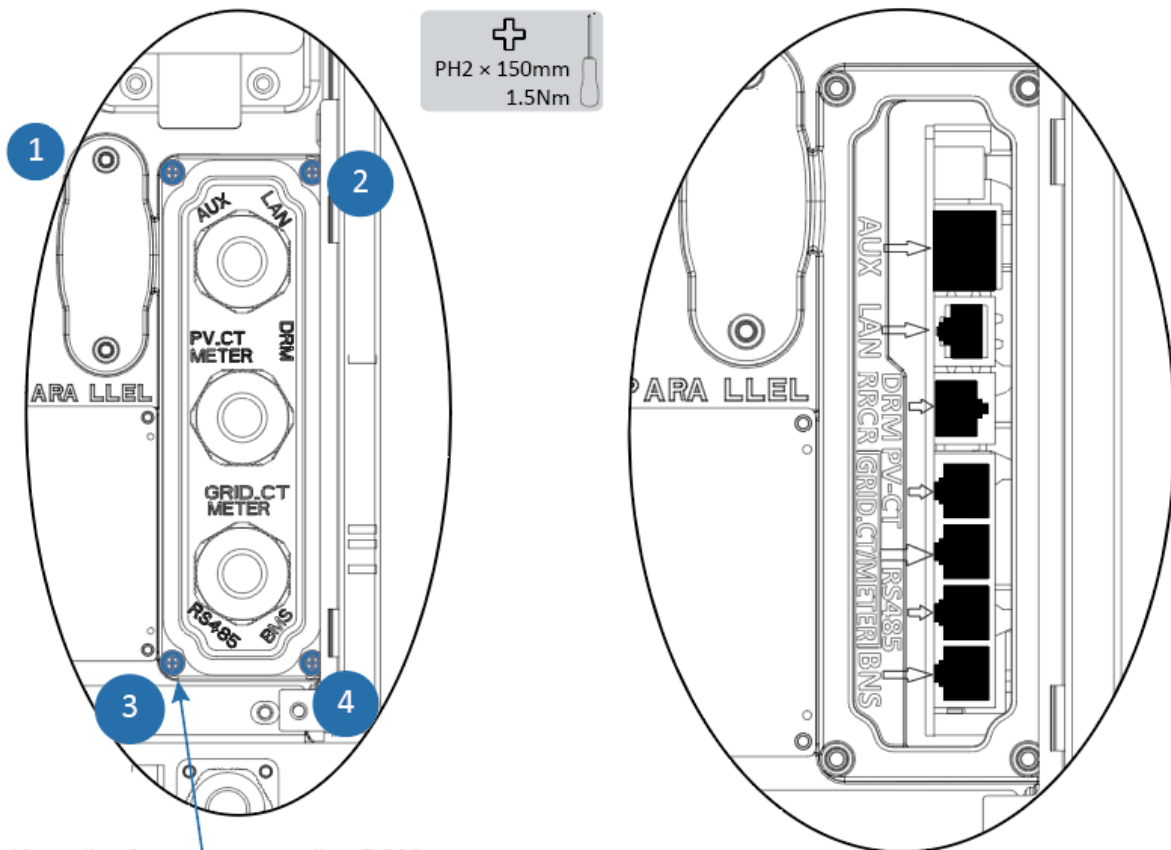
- a. Take out the battery power cables from the battery package.
- b. Remove the protective caps from the battery power connectors.
- c. Connect the battery power cables to the inverter and battery packs.
Please pay attention to the cable polarity, red cable is for battery positive.



6.5.2. AUX/LAN/PV-CT/DRM、RRCR/GRID-CT、Meter/RS485/BMS Connection

For other communication (AUX, LAN, RRCR, DRM, Meter, RS485) connection, please follow the below steps.

1. Loosen the cable glands on the COM connection cover, and then unscrew the 4 screws on the COM connection cover.

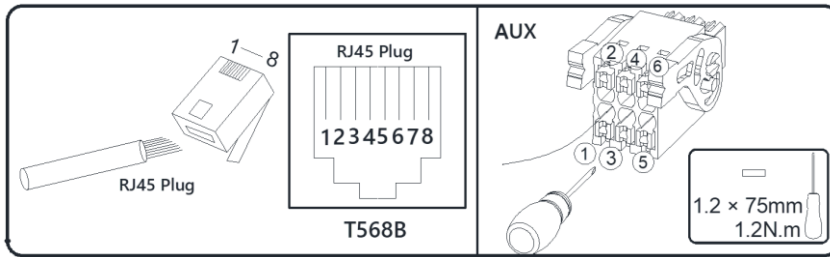


Keep the four screws on the COM cover during disassembling them.

2. Lead the communication cables through the cable glands of the COM connection cover, don't tighten the swivel nuts of the cable glands.

Insert the RJ45 plugs to the relative RJ45 sockets.

- 1) For meter wiring, refer to Chapter 6.4.2 and 6.4.3 for Chint or Acrel Meter Connection.
- 2) If DRM support is specified, the system may only be used in conjunction with a Demand Response Enabling Device (DRED). This ensures that the system implements the commands from the grid operator for active power limitation at all times. The system and the Demand Response Enabling Device (DRED) must be connected in the same network. Only DRM0 is available for Inverter.
- 3) Take out 6 pin terminal block for AUX connection. To do wiring connection, insert a screwdriver (blade width: 1.2 mm) into the relative connection position side. For AUX position definition, please see the AUX wiring documentation.



3. Place the COM connection cover against the inverter housing and tighten the 4 screws, at last secure the swivel nut of the cable glands.

The pin definition of the communication ports:

| | | | | | | | | |
|------------------|----------|----------|----------|-------------|-------------|------------|----------|---|
| AUX | 1 | 2 | 3 | 4 | 5 | 6 | | |
| | DO1_NO | DO1_COM | DO1_NC | DI_negative | DI_positive | GND | | |
| DRM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| RRCR | DRED 1/5 | DRED 2/6 | DRED 3/7 | DRED 4/8 | REF GEN/0 | COM LOAD/0 | / | / |
| PV_CT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | / | / | RS485_A7 | / | / | RS485_B7 | | / |
| GRID_CT METER | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | / | / | RS485_A7 | / | / | RS485_B7 | / | / |
| RS485 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | / | / | / | RS485_B5 | RS485_A5 | / | / | / |
| BMS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | / | RS485_A4 | / | CAN1_H | CAN1_L | / | RS485_B4 | / |

7. Installer Account Register and Install New System

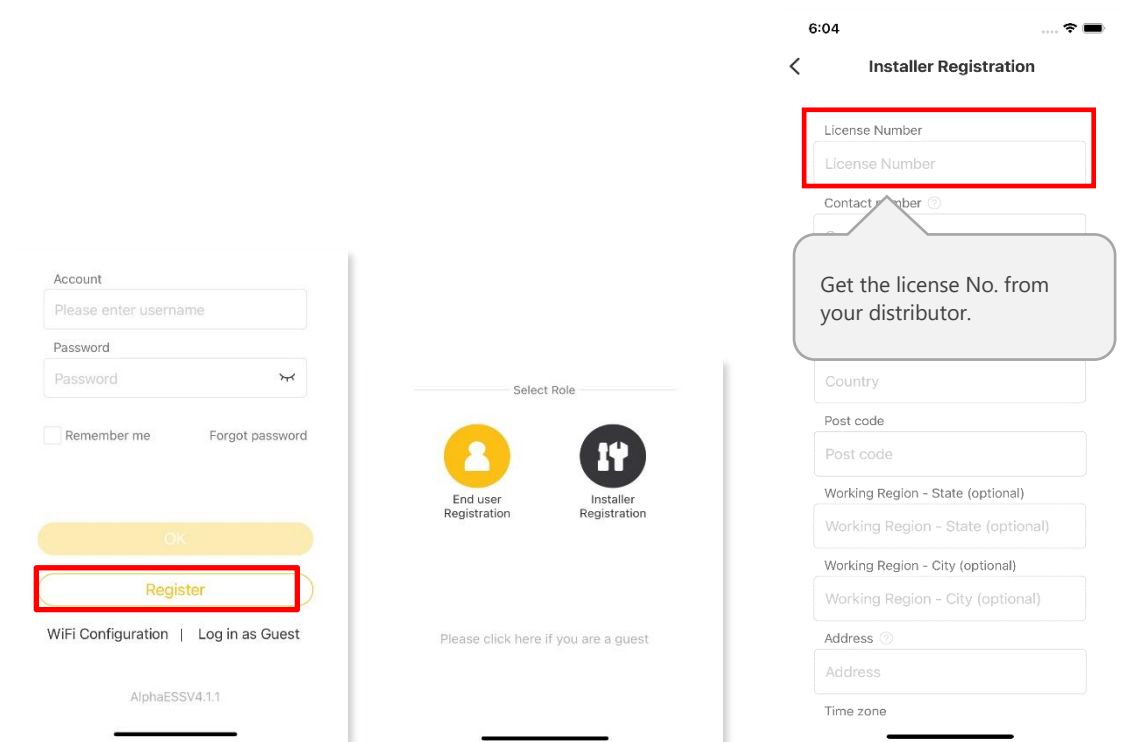
7.1. Register on APP

7.1.1. Download and Install APP

1. Android device users can download the Bytewatt App through major Android application markets such as Google Play.
2. IOS device users can search for "Cloud" in App Store and download the App.

7.1.2. Register as Installer Account

If you don't have an installer account, please register firstly.



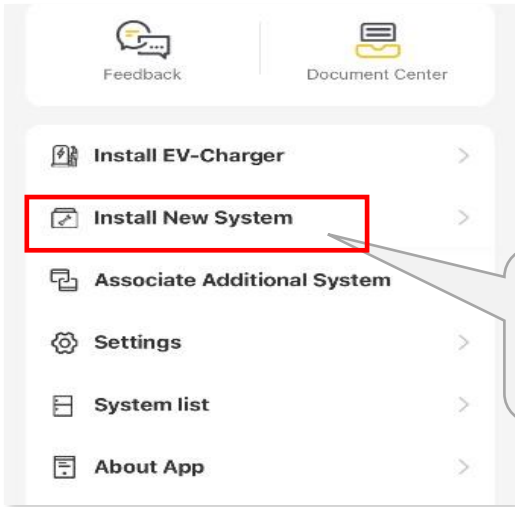
If you already have an installer account, please log in directly.

7.1.3. Overview of Functions for Installer Account

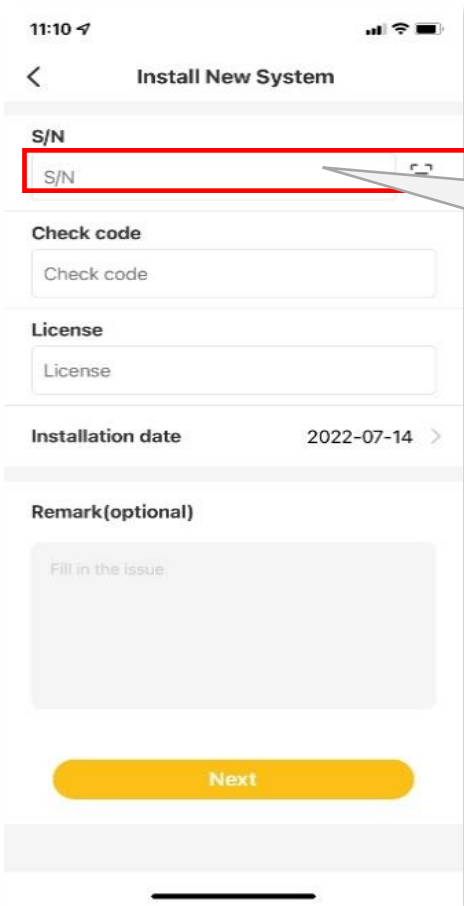




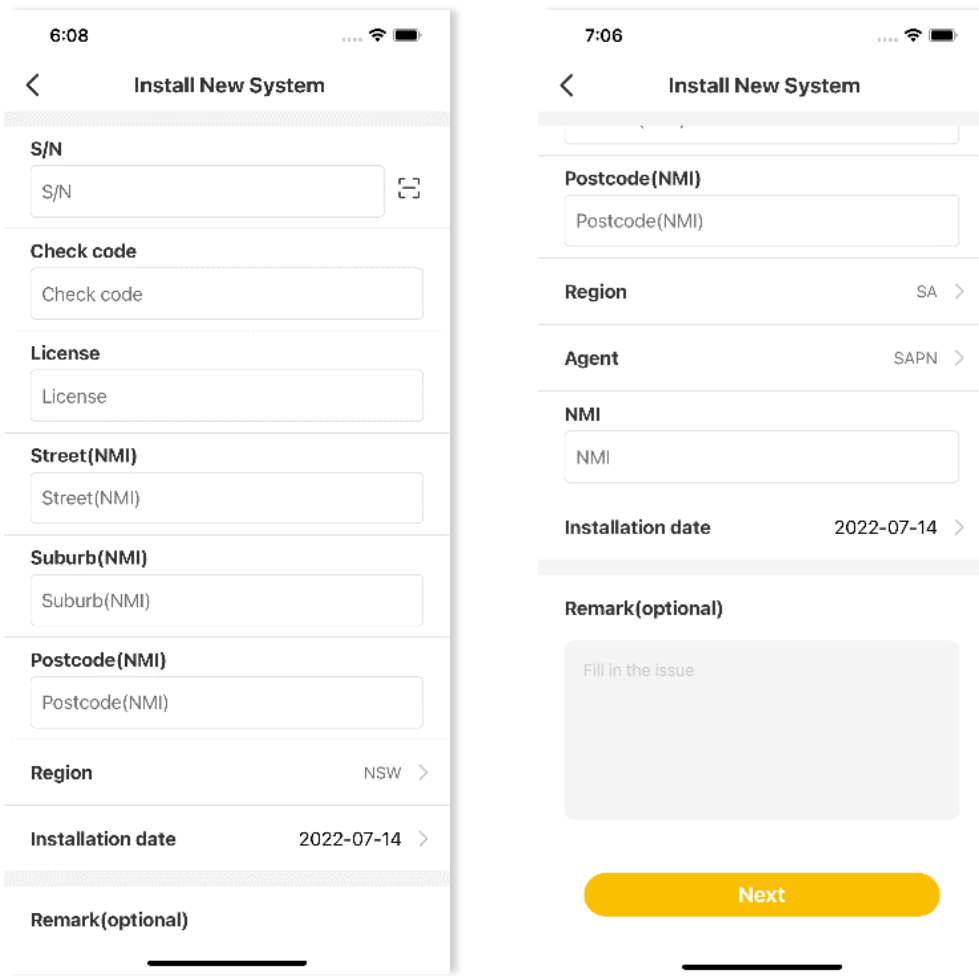
7.1.4. Install New System



After login, click "Install new system"



You can find the SN and check code on the label of the Battery with EMS. Scan or type in.



Australian Installer

Please enter your installer account and click install new system to bind the system to your account and set the system.
 Enter S/N, check code, license, create time, customer full name, contact number, address, and click the save button. If you are an Australian installer, you will need to fill in the Street (NMI), Suburb (NMI) and Postcode (NMI) fields and add a new Region field, which has six fixed options (NSW, QLD, VIC, SA, TAS, WA). If SA is selected for Region, two more fields are added which are Agent and NMI.
 Fields that are not marked "optional" need to be filled in.
 Click "Next" to go to the installation steps interface.

Battery Model

Including WiFi Module?

If there is no WiFi module, please choose "Including WiFi Module" as "No", some parameters need to be set in Step 8 to ensure the normal operation of the system.

6:10

Install New System

System Configuration

Work Mode

Storage Cap(kWp)

On Grid Cap(kWp)

Max.Feed-in(%)

Time zone

Safety Regulations

Regional application standard

Meter on the grid side Meter CT

Meter on the PV side Meter CT

AC:SPB5K should be AC coupled for PV selfconsumption application

PV capacity on the PV-inverter (on-grid) side

You can set the allowable feed-in ratio from 0%-100%.

Note: When the safety standard is set as AS4777.2 (Australia and New Zealand), the secondary sub-options can be selected according to the region or local grid company.

On the grid side, if only a CT is installed, please select CT for grid side. If the grid meter is installed, please select Meter for grid side. If this meter is a CT meter and the CT ratio is not 1, please select CT below and input the Meter CT Ratio. If this meter is not a CT meter or the CT ratio is 1, please do not select CT below.

Click "Submit" when the settings are complete.

 NOTICE

The safety standard must be set correctly

If you select a safety standard which is not valid for your country and purpose, it can cause a disturbance in the energy storage system and lead to problems with the grid operator. When selecting the safety standard, you must always observe the locally applicable standards and directives as well as the properties of the PV system (e.g. PV system size, grid-connection point).

- If you are not sure which safety standard is valid for your country or purpose, contact your grid operator for information on which safety standard is to be configured.

If there is a WiFi module, please choose "Including WiFi Module" as "Yes", the APP will jump to the WiFi configuration page, and please refer to section 9.3.

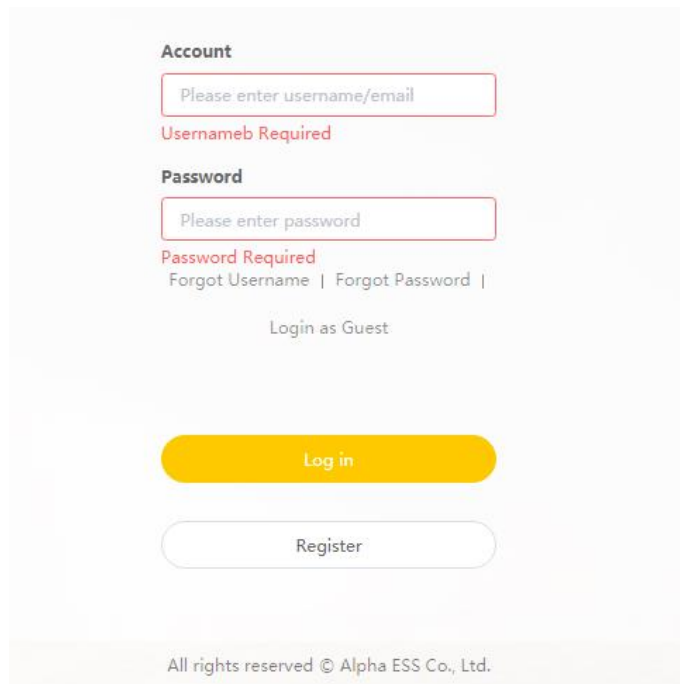
7.2. Register on Bytewatt Cloud

7.2.1. Register as Installer Account

You can create a new account on our webserver for the normal monitoring. In addition, a part of our warranty is based on this connection to our webserver. The data produced prior to registration can be synchronized to the webserver.

Step1: Please use the following steps: Open the portal: www.Bytewatt.com.

Step2: Please fill in "Username", "Password" and click "Login" if you have already registered.



Account

Please enter username/email

Username Required

Password

Please enter password

Password Required

[Forgot Username](#) | [Forgot Password](#) |

[Login as Guest](#)

Log in

Register

All rights reserved © Alpha ESS Co., Ltd.

If not, please register by filling in the following web form;

User registration

| | | |
|--|--|---|
| <p>* User Type</p> <input type="text" value="End user"/> | <p>* SN</p> <input type="text" value="Please enter system SN"/> | <p>* SN check code</p> <input type="text" value="Please enter the SN che"/> |
| <p>* Username</p> <input type="text" value="someone@example.com"/> | <p>* Zip Code</p> <input type="text" value="Please enter your zip code"/> | |
| <p>* Password</p> <input type="text" value="Please enter the password"/> | <p>* Confirm Password</p> <input type="text" value="Please confirm the password"/> | |
| <p>Language</p> <input type="text" value="English"/> | <p>* Contact Person</p> <input type="text" value="Please enter a contact"/> | |
| <p>* Country / Region</p> <input type="text" value="Please select your coun"/> | <p>Province/State</p> <input type="text" value="Please select your provin"/> | <p>City/Town</p> <input type="text" value="Please select your city"/> |
| <p>Address</p> <input type="text" value="Please enter your address"/> | <p>Contact Number </p> <input type="text" value="Please enter your phone number"/> | |
| <p>* Time Zone</p> <input type="text" value="Please select a time zone"/> | <p>* Installation Time</p> <input type="text" value="Please select an installation date"/> | |

Whether to allow automatic update (the automatic upgrade function is to actively update the latest push program to improve the use of the device when the system is online.)

Agree to the above terms [《Terms and Conditions》](#) and [《Privacy Policy》](#)

Back
Submit

In this form, all fields with a red star are compulsory, and you can select the finally users or installation procedures.

***Serial number:** EMS serial number (please see the nameplate of the inverter)

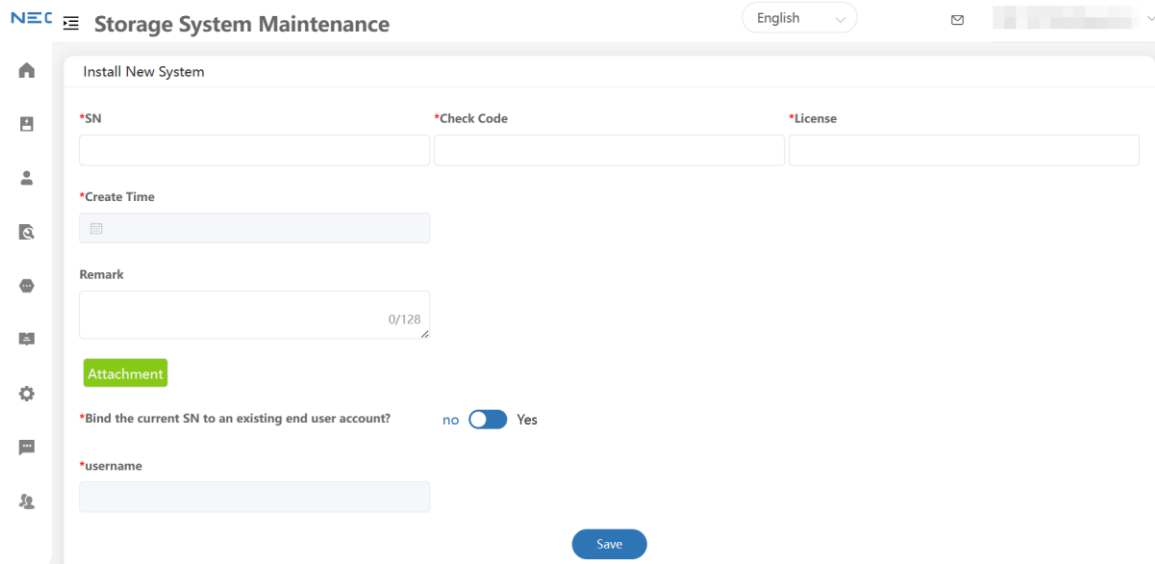
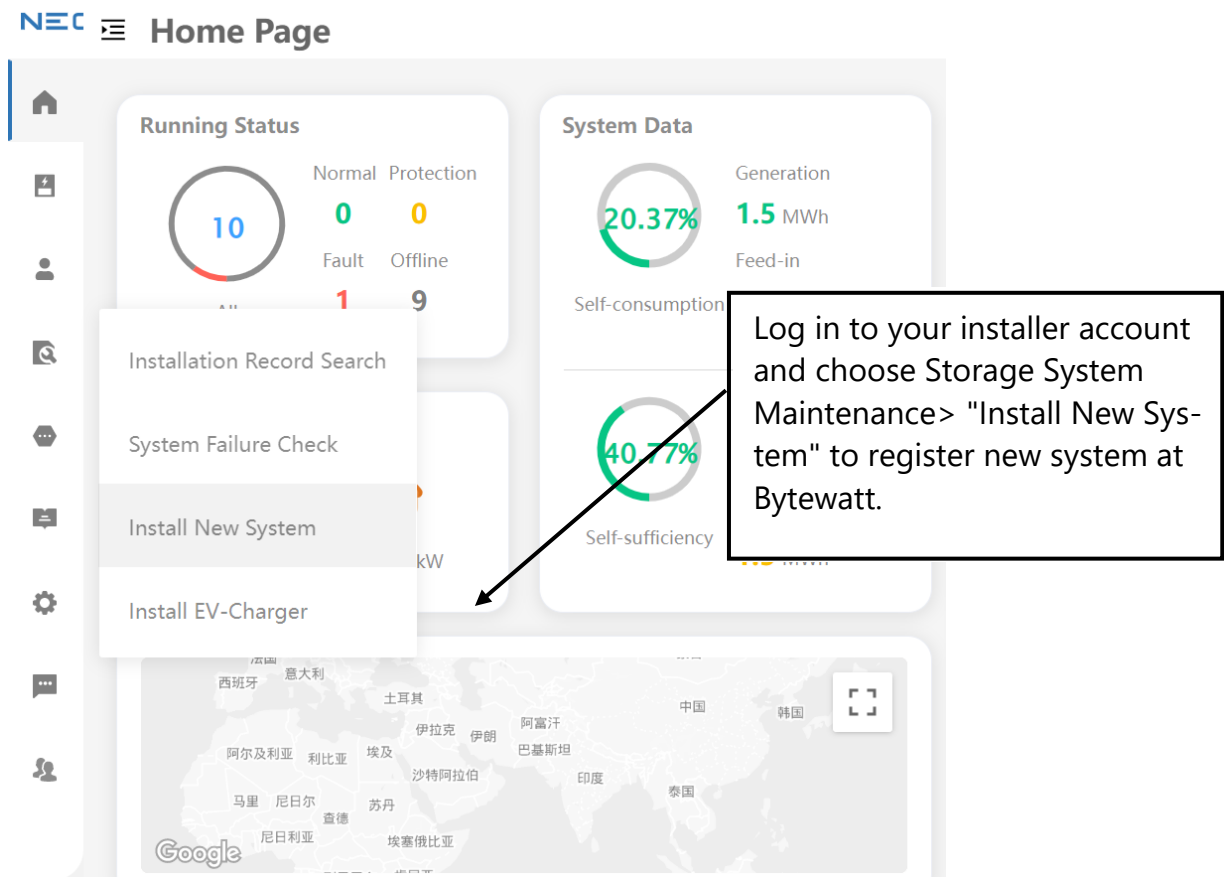
***Username:** 5-15 letters / numbers

***Password:** 5-15 letters / numbers / characters

More details are available in the Online Monitoring Web Server Installers User Manual, which can be downloaded from Bytewatt homepage.

7.2.2. Install New System

Installers who haven't yet registered need to click "Register" to visit the registration page. Please refer to "Bytewatt Cloud Online Monitoring Webserver Installers User Manual", which you can get from Bytewatt sales and get license number from relevant sales from Bytewatt.

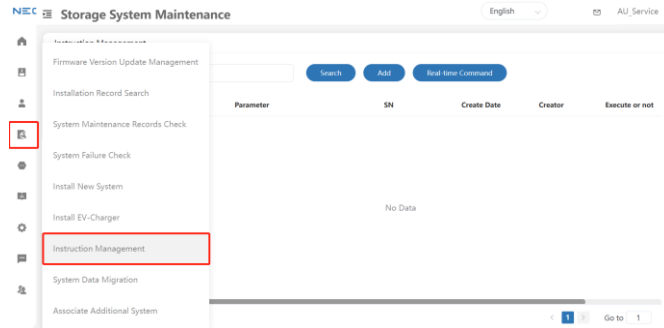


Enter the system S/N, check code, license, installation date and click the save button. The red * in front of it is required. Click the Browse button to select the attachment you want to add.

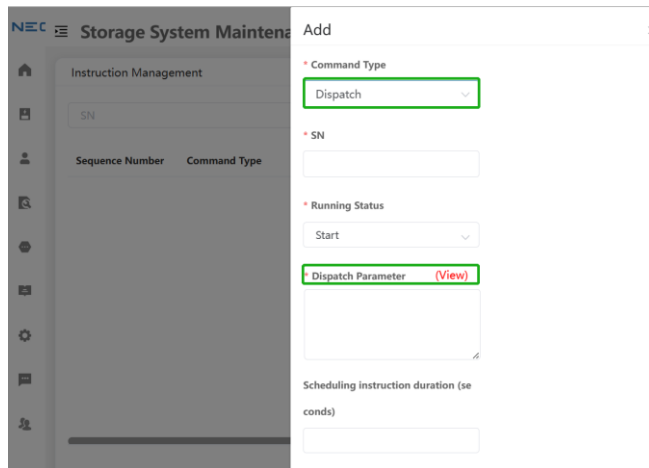
7.2.3. Power quality response:

The quality response function can be adjusted by the Bytewatt Cloud system.

Step 1: Select <instruction management >, begin with the instrument setting.



Step 2: Select <Add>, to Determine the number of the instrument and the Management command.



Step 3: Select <dispatch> item for response setting.

Note: designed response mode as following:

- Active power - Frequency response.
- Active power - Voltage response.
- Reactive power - Voltage response.
- Reactive power - Power response.
- Power factor - Power response.

8. Powering On and Off the System

8.1. Powering on the System

- 1) Switch on the battery breaker of the batteries.
- 2) Switch on the DC breaker which is at the bottom of the inverter
- 3) Press the battery button, if there are more than one battery, the button for each battery should be pressed within 5s of the previous one.
- 4) Switch on the AC breaker between the grid port of the inverter and the grid.
- 5) Switch on the AC breaker between the backup port of the inverter and the loads.
- 6) Switch on the PV switch at the bottom of the inverter if there is any.
- 7) Switch on the AC breaker (if there is any) between the PV-inverter and the grid.

8.2. Powering off the System



WARNING

After the energy storage system is powered off, the remaining electricity and heat may still cause electric shocks and body burns. Therefore, put on protective gloves and operate the product 5 minutes after the power-off.

Procedure

- 1) Switch off the AC breaker between the inverter and the load.
- 2) Switch off the AC breaker between the inverter and the grid.
- 3) Switch off the PV switch at the bottom of the inverter if there is any.
- 4) Switch off the PV switch between the PV string and the inverter if there is any.
- 5) Switch off the DC breaker which is at the bottom of the inverter.
- 6) Long press 5s the power button of the battery.
- 7) Switch off the battery breaker of the battery.

9. COMMISSIONING

9.1. Checking Before Power-On

| No. | Check Item | Acceptance Criteria |
|-----|------------------------------------|---|
| 1 | Mounting environment | The mounting space is proper, and the mounting environment is clean and tidy, without foreign objects. |
| 2 | Battery pack and inverter mounting | The battery pack and inverter are mounted correctly, securely, and reliably. |
| 3 | WiFi mounting | The WiFi module is mounted correctly, securely, and reliably. |
| 4 | Cable layout | Cables are routed properly as required by the customer. |
| 5 | Cable tie | Cable ties are secured evenly and no burr exists. |
| 6 | Grounding | The ground cable is connected correctly, securely, and reliably. |
| 7 | Switch and breakers status | The PV switch (if there is any) and battery breakers and all the breakers connecting to the product are OFF. |
| 8 | Cable connections | The AC cables, PV cables (if there is any), battery power cables, and communication cables are connected correctly, securely, and reliably. |
| 9 | Unused power terminals | Unused power ports and communication ports are blocked by watertight caps. |

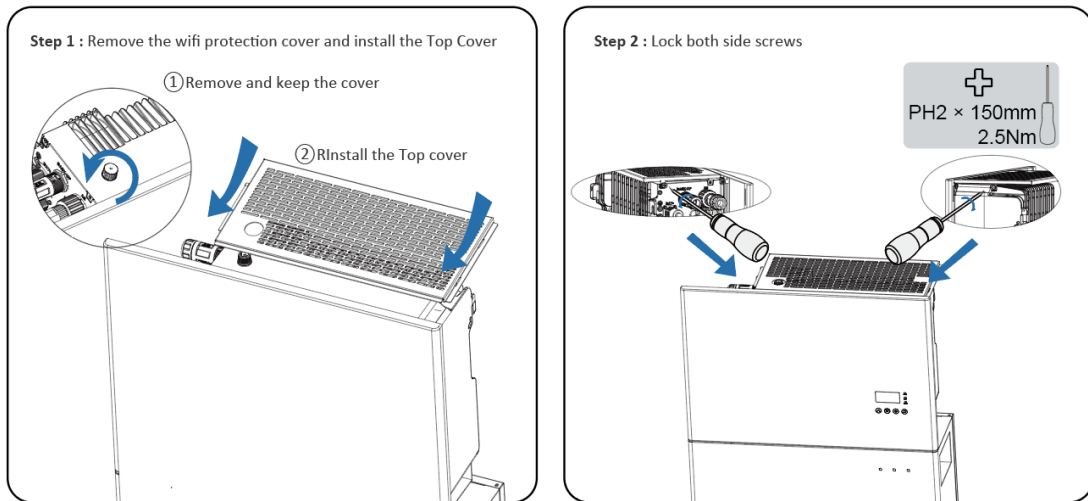
9.2. Powering on the System and Install the Battery and inverter plastic decorative

Powering on the System

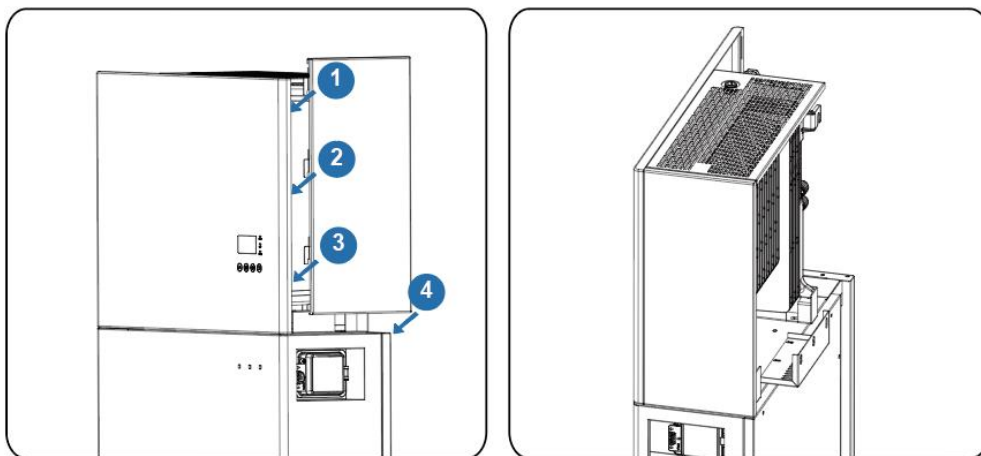
- Check the voltage range and frequency range of the grid and the installation of CT(s) or meter(s).
- Switch on the battery breaker of the battery.
- Switch on the battery breaker located on the energy storage inverter.
- Switch on the external AC breaker between the grid and the energy storage inverter.

- Firstly, don't press the battery button, don't switch on the PV switch on the energy storage inverter and don't switch on the AC breaker on the PV inverter if there is any.
After finishing electrical connection of energy storage system, do the following operations.

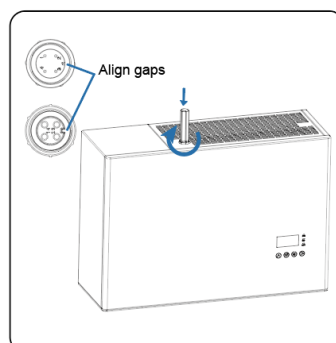
Install the top and right decorative cover of the inverter.



Install the left decorative cover of the inverter.



9.3. Installing the WI-FI MODEL



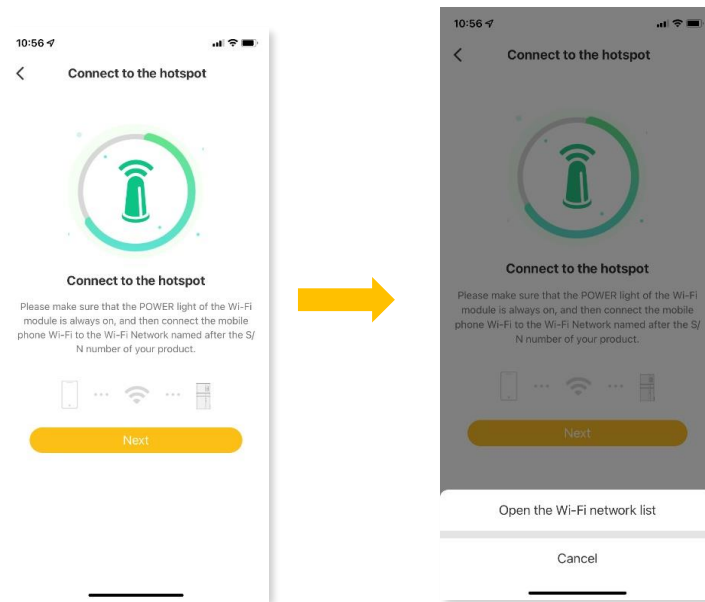
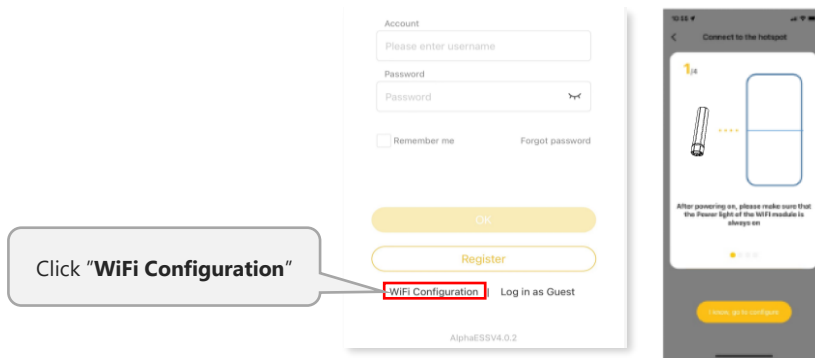
9.4. WiFi Module Configuration and Parameter Settings

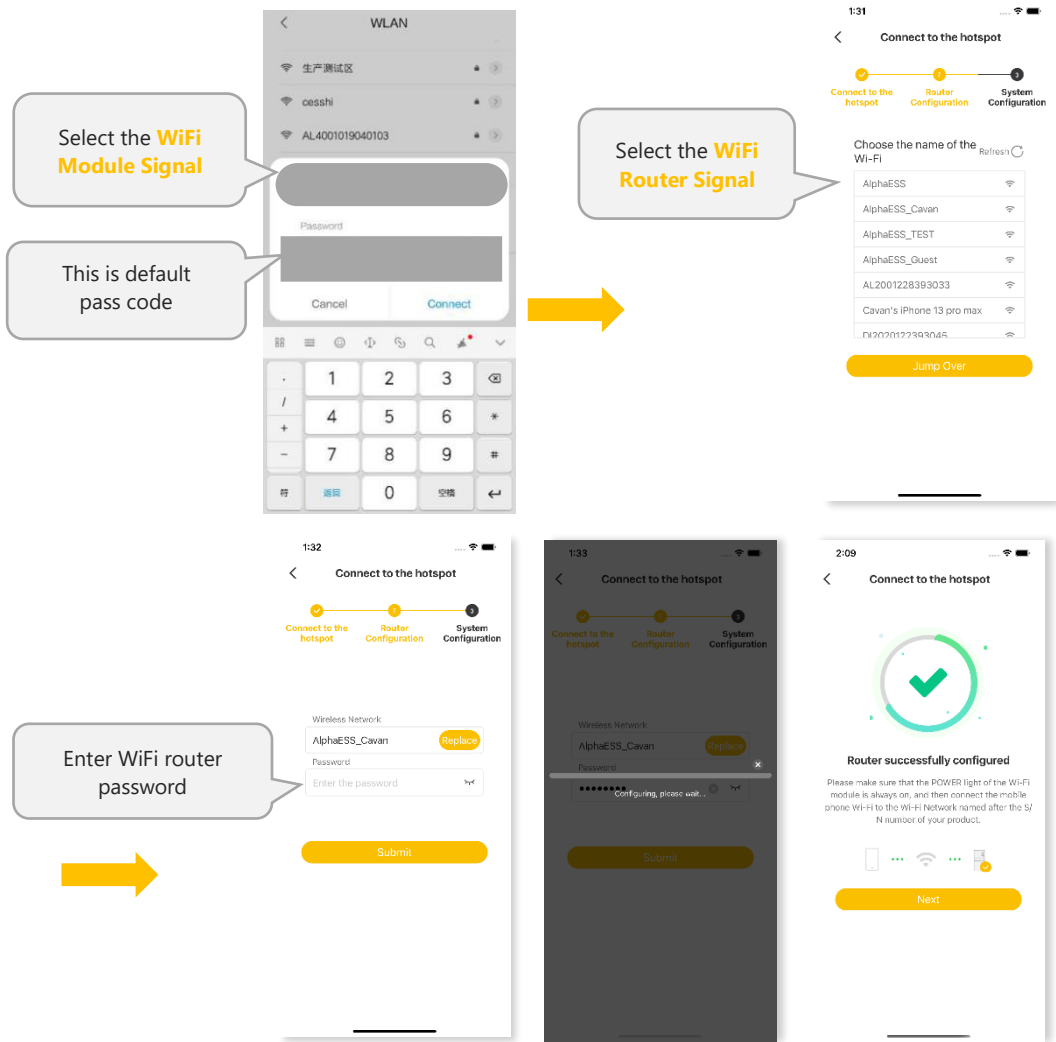
9.4.1. WiFi Configuration

The inverter shall be combined with battery module to form energy storage system for data monitoring

This section is for users who have an energy storage system with a WiFi module.

Bytewatt App is able to configure the network, set system basic parameter, monitor system operation status and check configuration information.



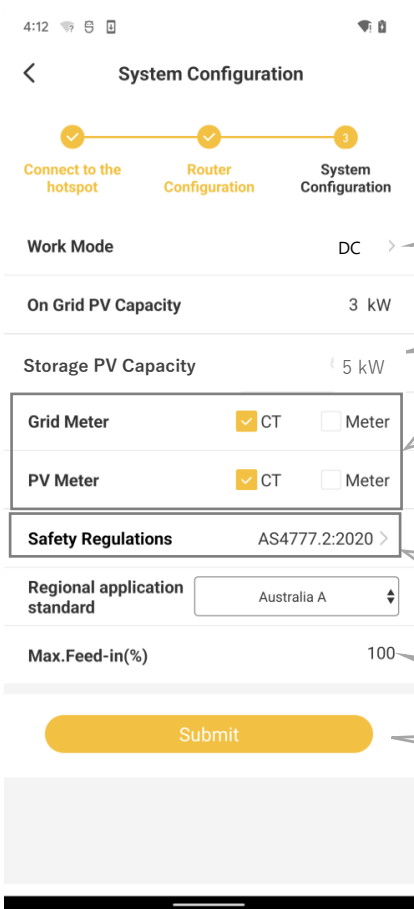
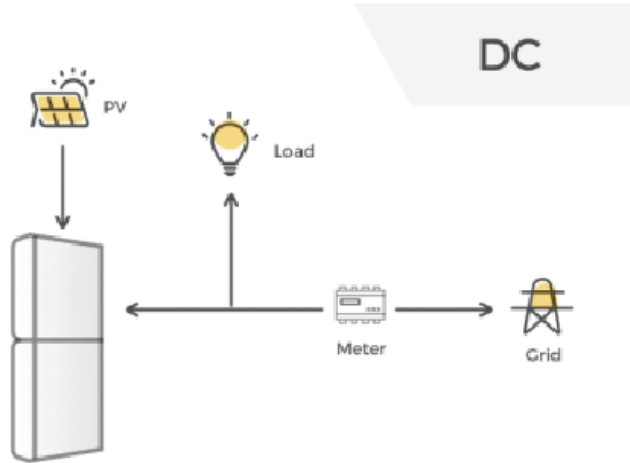


NOTE

The system will not be able to connect to the internet without WiFi configuration.

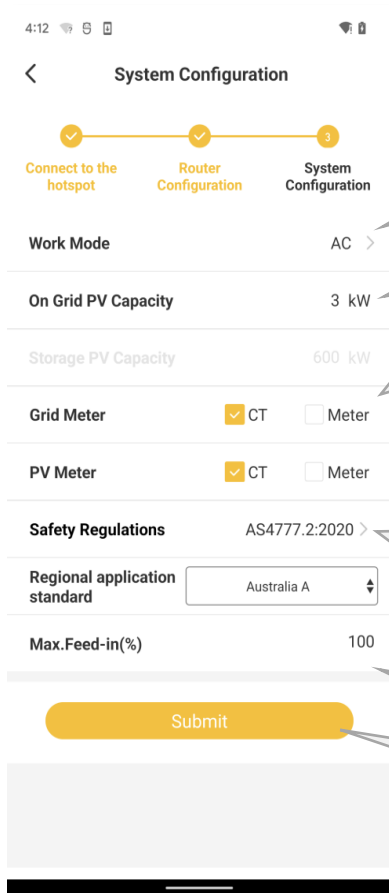
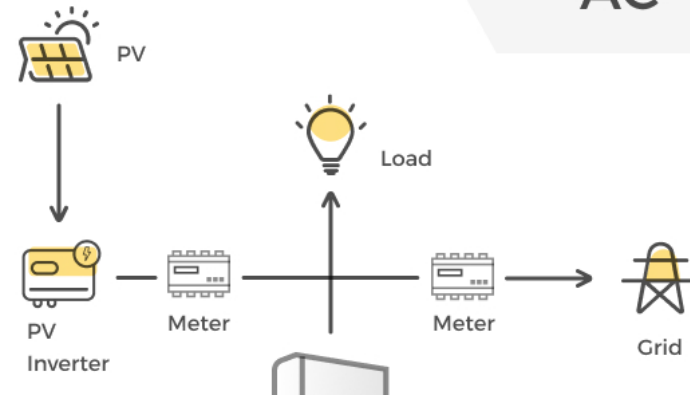
9.4.1.1 Basic Parameters Settings

DC Mode



- Three mode options: **DC**/AC/Hybrid
- Storage PV capacity: PV capacity on the energy storage inverter side
- 1. Only CT installed, select CT for Grid Meter.
2. Only Meter installed, select Meter for Grid Meter,
- If this meter is CT meter and CT ratio is not 1, select CT below and input the Meter CT Ratio.
- If this meter is not a CT meter or the CT ratio is 1, do not select CT below.
- Note:** When safety regulation is set as AS4777.2 (Australia and New Zealand), the secondary sub-options can be selected according to the region or local grid company.
- You can set the allowable feed-in ratio from 0%-100%.
- Click "Submit" when the settings are complete.

AC Mode



Three mode options: DC/AC/Hybrid

PV capacity on the PV-inverter (on-grid) side

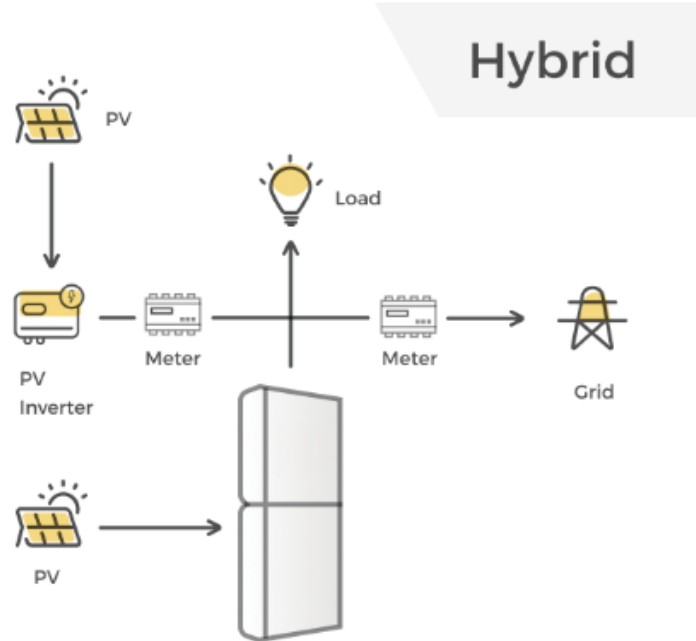
1. Only CT installed, select CT for Grid Meter.
 2. Only Meter installed, select Meter for Grid Meter,
 -If this meter is CT meter and CT ratio is not 1, select CT below and input the Meter CT Ratio.
 -If this meter is not a CT meter or the CT ratio is 1. do not select CT below.

Note:
 When the safety standard is set as AS4777.2 (Australia and New Zealand), the secondary sub-options can be selected according to the region or local grid company.

You can set the allowable feed-in ratio from 0%-100%.

Click "Submit" when the settings are complete.

Hybrid Mode



Hybrid

4:12 [signal icons]

System Configuration

Progress: 1. Connect to the hotspot, 2. Router Configuration, 3. System Configuration

Work Mode AC >

On Grid PV Capacity 3 kW

Storage PV Capacity 5 kW

Grid Meter CT Meter

PV Meter CT Meter

Safety Regulations AS4777.2:2020 >

Regional application standard Australia A

Max.Feed-in(%) 100

Submit

Three mode options: DC/AC/**Hybrid**

PV capacity on the PV-inverter (on-grid) side

Storage PV capacity: PV capacity on the energy storage inverter side

1. Only CT installed, select CT for Grid Meter.
 2. Only Meter installed, select Meter for Grid Meter,
 - If this meter is CT meter and CT ratio is not 1, select CT below and input the Meter CT Ratio.
 - If this meter is not a CT meter or the CT ratio is 1, do not select CT below.

Note: When the safety regulation is set as AS4777.2 (Australia and New Zealand), the secondary sub-options can be selected according to the region or local grid company.

You can set the allowable feed-in ratio from 0%-100%.

Click "Submit" when the settings are complete.

 NOTICE

The safety standard must be set correctly

If you select a safety standard which is not valid for your country and purpose, it will cause a disturbance in the energy storage system and lead to problems with the grid operator. When selecting the safety standard, you must always observe the locally applicable standards and directives as well as the properties of the PV system (e.g. PV system size, grid-connection point).

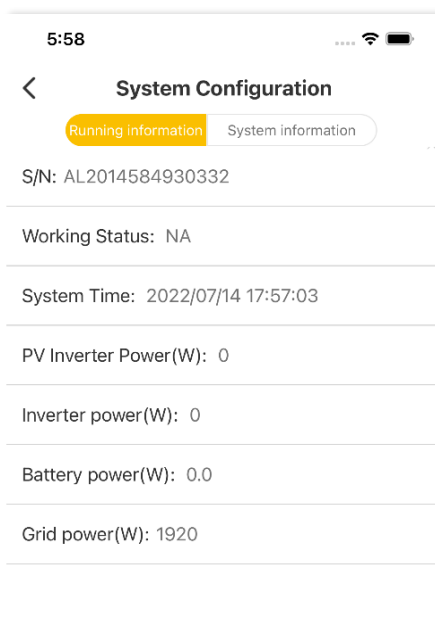
- If you are not sure which safety standard is valid for your country or purpose, please contact your grid operator for information on which safety standard is to be configured.

9.4.2. Direct Commissioning on WiFi configuration

You can commission the system during the WiFi configuration process directly.

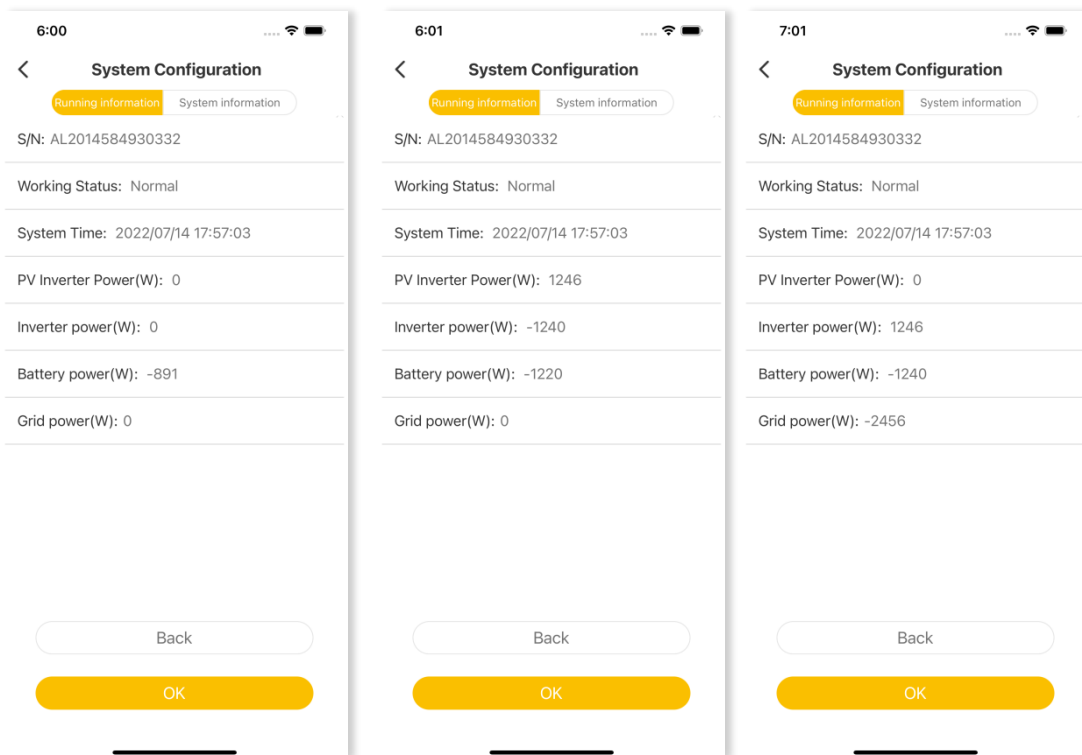
9.4.2.1 Check the Running State without PV and Battery

- Keep the PV switch of the energy storage inverter and AC breaker of the PV-inverter off. Don't power on the batteries.
- Turn on some larger loads directly connected on the grid to check the grid status, the inverter LED ("Fault or SYS") will be red, don't worry, because the battery is not communicated. The grid power should be positive. Otherwise please check the direction of grid CT or grid meter installation.



9.4.2.2 Check the Running State of PV and Battery

- Switch off the AC breaker between the grid port on the energy storage inverter and the grid, and switch off the AC breaker between the backup port on the energy storage inverter and the loads.
- Press the battery button. If there are more than one battery, press the button of each battery and the interval time of powering on any two batteries should be less than 5s.
- Switch on the AC breaker between the grid port of the energy storage inverter and the grid.
- Switch on the PV switch on the energy storage inverter if there is any and AC breaker on the PV-inverter if there is any.
- Switch off all the loads to see the battery charging status and the inverter LED ("Normal" or "SYS") will be solid on Green or White. Battery power value should be negative. If the system is in AC or hybrid mode, the PV inverter power value should be positive. If it is not normal, please check the direction of PV CT or PV meter installed.



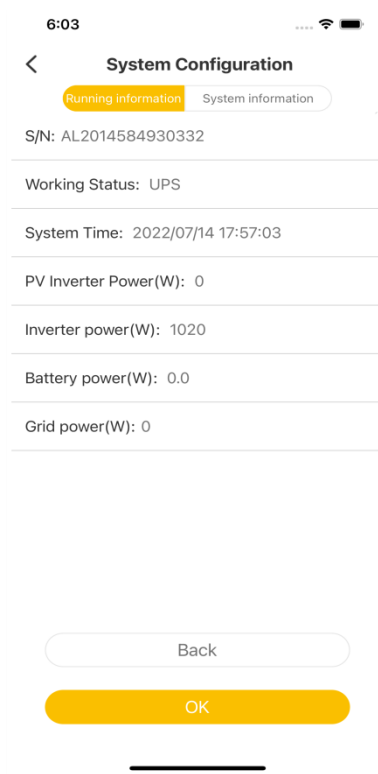
DC Mode

AC Mode

Hybrid Mode

9.4.2.3 Check the UPS State

- Please connect an essential electrical appliance to the socket of backup load. Or switch on an essential electrical appliance already connected on the backup load port of the inverter.
- Switch on the AC breaker on the backup port of the energy storage inverter.
- Switch off the external AC breaker between the grid and the energy storage inverter.
- The inverter will enter the UPS mode at once.
- If the electrical appliance on backup side can work normally, it means that the wiring of the backup has been connected correctly.



NOTICE

During commissioning, if the LED indicators on the display panel of the inverter or the battery pack show red, please refer to chapter troubleshooting.

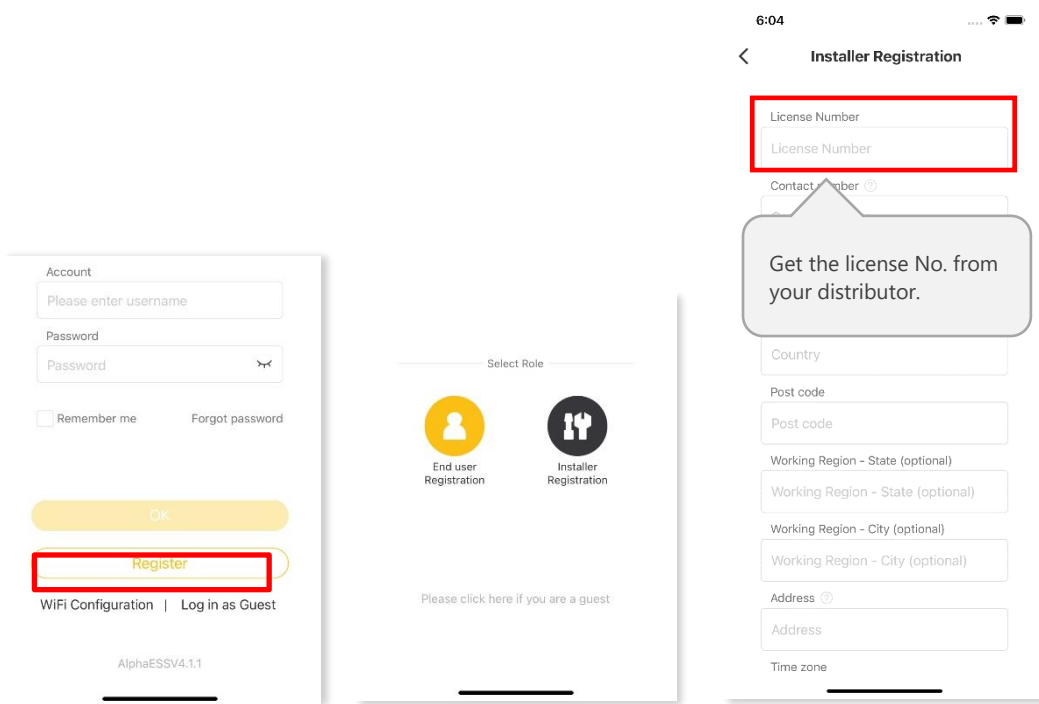


9.5. Installing New System and Settings on the APP

9.5.1. Download and Install the APP

9.5.2. Register as an Installer

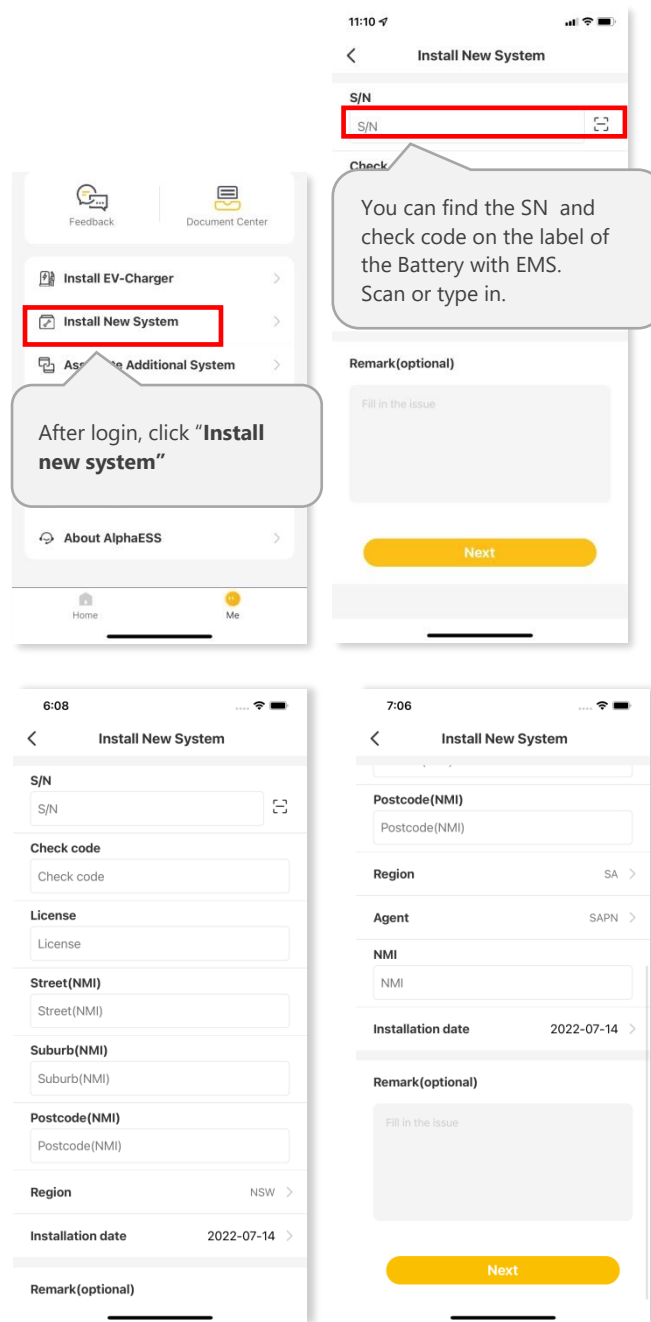
If you don't have an installer account, please register first.



If you already have an installer account, please log in directly.

9.5.3. Install New System

If you have "installed" the new system already or want to install it later, please directly to the Section 9.4 WiFi Module Configuration and Parameter Settings. If not, you can "Install New System" first.



Australian Installer

Please enter your installer account and click "Install New System" to bind the system to your account and set the system.

Enter S/N, check code, license, create time, customer full name, contact number, address, and click the save button. If you are an Australian installer, you will need to fill in the Street (NMI), Suburb (NMI) and Postcode (NMI) fields and add a new Region field, which has six fixed options (NSW, QLD, VIC, SA, TAS, WA). If SA is selected for Region, two more fields are added which are Agent and NMI.

Fields that are not marked "optional" need to be filled in.

Click "Next" and go to Section 10.3 if the WiFi has not been configured.

9.6. Check the Running State On-line

If you have completed commissioning as described in section 10.3.2, please ignore this section.

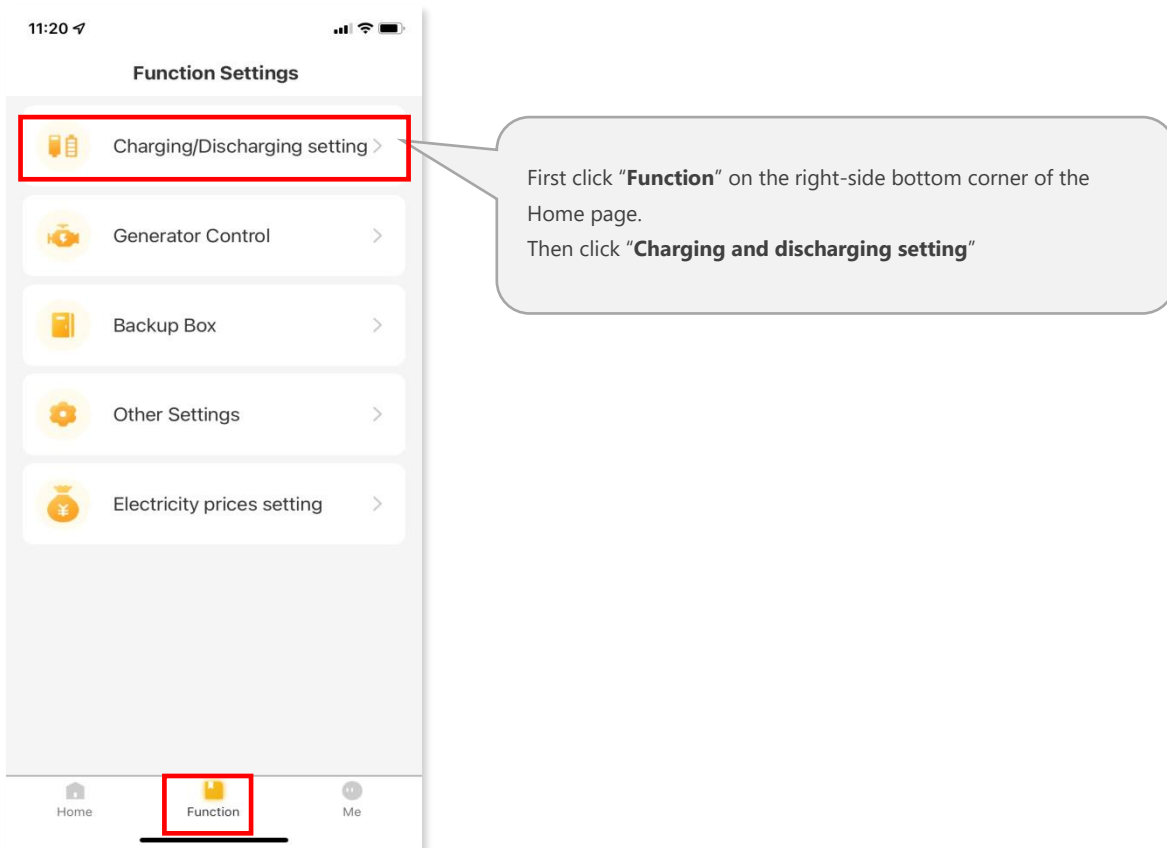
You can also commission the system after WiFi configuration.

Please make sure the PV switch and battery breakers and all the breakers connecting to the product are ON.

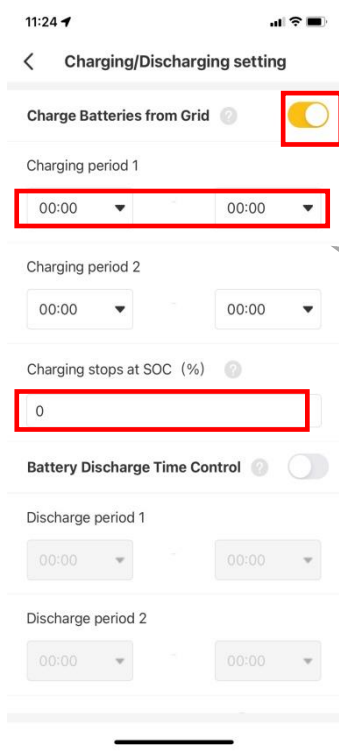
9.6.1. Check the Charging Function of the Product

- To make sure the system is installed and operating correctly, please set the system to "Charging/Discharging Setting" by following the instructions below.

Step1



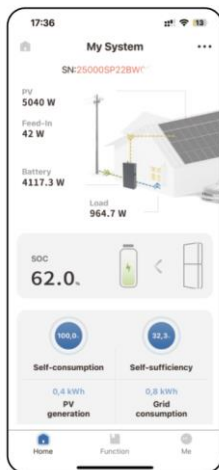
Step2



Select "ON" to Charge Batteries from Grid"

please set the "Charging period 1" for the time and the SOC would be 100 under this operation.

Step3



TIPS :

The relative value should be like this :

Load = PV ± GRID-Battery.

Battery should be in charging status.

PV arrow should be as the picture shows.

± :

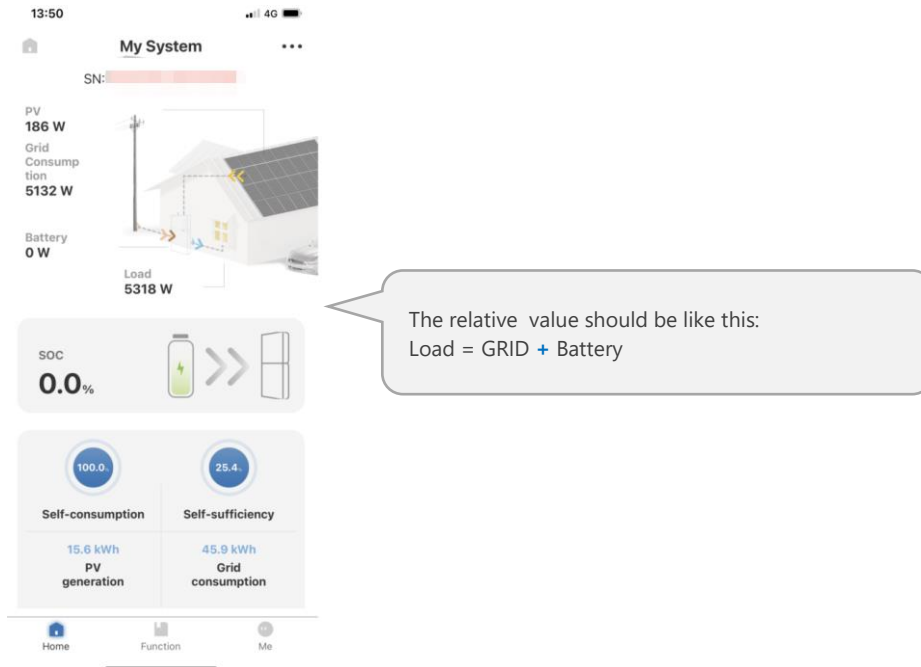
>> absorbing for grid: +;

<< feed-in to grid - .

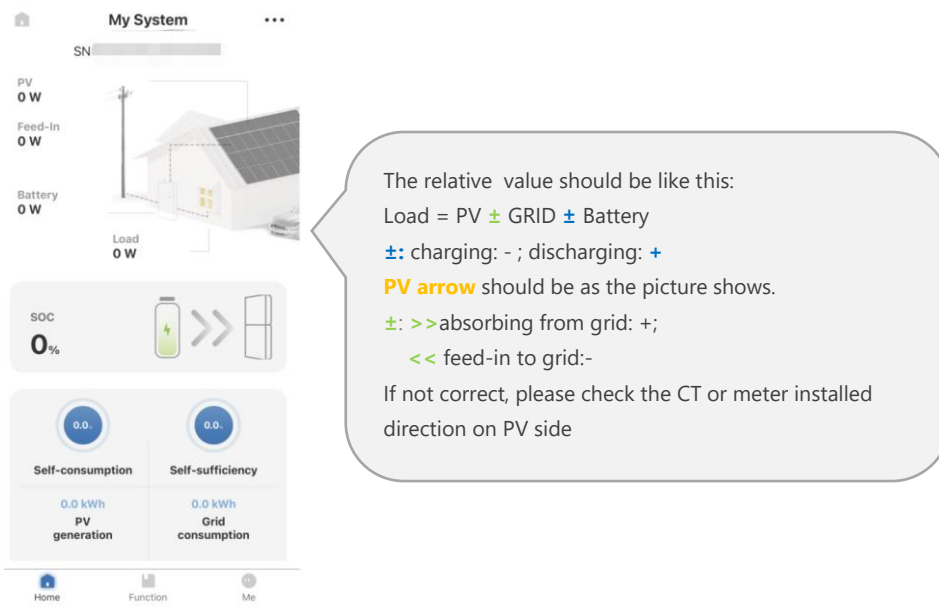
- Check the running status of the system in "Step 3".
- If the operation is normal as described in "Step3", please remember to deactivate the "Charging/Discharging Setting" by clicking "OFF" and save the changes.

9.6.2. Check the PV Generation and Discharging Function of the Product

Step 1: Please switch off the PV switch on the energy storage inverter and the AC breaker on the PV inverter if there is any. Switch on some larger loads to see the battery discharging status.



Step 2: Please switch on the PV switch on the energy storage inverter and the AC breaker on the PV inverter if there is any. Check the running status of the system.



9.6.3. Check the UPS State of the Product

- Please connect an essential electrical appliance to the socket of backup load. Or switch on an essential electrical appliance already connected on the backup load port of the energy storage inverter.
- Switch on the AC breaker on the backup port of the energy storage inverter.
- Switch off the external AC breaker between the grid and the energy storage inverter.
- The product will enter the UPS mode at once.
- If the electrical appliance on backup side can work normally, it means that the wiring of the backup has been connected correctly.

 **NOTICE**

During commissioning, if the LED indicators on the display panel of the inverter or the battery pack show red, please refer to chapter troubleshooting.

9.6.3.1 Switch on all of the Breakers

Please don't forget to switch on all of the breakers.

9.7. Instruct the End User to Install the APP

Please make sure that your end user has downloaded the APP and registered the account correctly, and added the system SN.

10. Maintenance and Troubleshooting

10.1. Routine Maintenance

Normally, the energy storage system need no maintenance or calibration.

However, in order to maintain the accuracy of the SOC, it is recommended to perform a full charge calibration for SOC (charging battery until the charging power is 0) on the battery at regular intervals (such as two weeks).

Disconnect the system from all power sources before cleaning. Clean the housing, cover and display with a soft cloth.

To ensure that the energy storage system can operate properly in the long term, you are advised to perform routine maintenance on it as described in this chapter.

Maintenance checklist

| Check Item | Acceptance Criteria | Maintenance Interval |
|------------------------|---|--|
| Product cleanliness | The heatsink at the back of the product are free from obstacles or dust. | Once every 6 to 12 months |
| Product visible damage | The product are not damaged or deformed. | Once every 6 months |
| Product running status | <ol style="list-style-type: none"> The product operate with no abnormal sound. All parameters of the product are correctly set. Perform this check when the product is running. | Once every 6 months |
| Electrical connections | <ol style="list-style-type: none"> Cables are securely connected. Cables are intact, and in particular, the cable jackets touching the metallic surface are not scratched. Unused cable glands are blocked by rubber sealing which are secured by pressure caps. | <p>Perform the first maintenance 6 months after the initial commissioning.</p> <p>From then on, perform the maintenance once every 6 to 12 months.</p> |

 **CAUTION**

Risk of burns due to hot heatsink and housing

The heatsink and housing of the inverter can get hot during operation.

- During operation, do not touch any parts other than the cover.
- Wait approx. 30 minutes before cleaning until the heatsink has cooled down.

10.2. Troubleshooting

Inverter Error Troubleshooting

| Error No. | Error description | Solution |
|------------------|--------------------------|---|
| 100000 | Grid_OVP | 1. Check whether Grid is abnormal. 2. Confirm whether the grid cable connection is normal. 3. Restart inverter and check whether the fault is existing. |
| 100001 | Grid_UVP | |
| 100002 | Grid_OFP | |
| 100003 | Grid_UFP | |
| 100005 | BUS_OVP1 | 1. Check whether the input voltage of PV1 and PV2 exceeds 580V. 2. If the first one does not exist, restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 100007 | Insulation_fault | 1. Check whether PV cable connection is reliable. 2. Check whether PV cable is damaged. |

| | | |
|--------|------------------------------|--|
| 100008 | GFCI_fault | 1. Restart inverter and check whether the fault is existing. |
| 100009 | Leakage current test failure | |
| 100010 | Grid_relay_fault | |
| 100011 | Over_Temperature | <ol style="list-style-type: none"> 1. Check whether the environment around inverter is with poor heat dissipation. 2. Confirm whether inverter installation meet the installation requirements. |
| 100014 | M_S_com_fault | Restart the inverter and check whether the fault is existing. |
| 100017 | MPPT1_OVP | Check the PV1 voltage. If it exceeds 585VDC, reduce the number of PV modules. |
| 100018 | MPPT1_SW_OCP | <ol style="list-style-type: none"> 1. Try to reduce the PV power. 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 100019 | MPPT1_HW_OCP | |
| 100020 | MPPT1_OTP | <ol style="list-style-type: none"> 1. Try to lower the ambient temperature. 2. Make sure that the inverter is installed according to the manual and there is no shelter around the inverter. 3. After the inverter is powered off and waiting for 30 minutes, then restart it. If the fault still exists, please call the service center. |
| 100021 | MPPT2_OVP | Check the PV2 voltage. If it exceeds 585V, reduce the number of PV modules |

| | | |
|--------|--------------|--|
| 100022 | MPPT2_SW_OCP | 1. Try to reduce the PV power. |
| 100023 | MPPT2_HW_OCP | 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 100024 | MPPT2_OTP | 1. Try to lower the ambient temperature. 2. Make sure that the inverter is installed according to the manual and there is no shelter around the inverter. 3. After the inverter is powered off and waiting for 30 minutes, then restart it. If the fault still exists, please call the service center. |
| 100025 | BAT_OVP | Check whether the actual battery voltage exceeds the battery charging cut-off voltage by more than 20V. |
| 100026 | BAT_UVP | Check whether the actual battery voltage is lower than the battery discharge cut-off voltage. |
| 100027 | Battery_lose | Confirm that the wiring is normal, and check whether the battery voltage sampling value is less than 75V. |
| 100028 | BAT_OTP | 1. Try to lower the ambient temperature. 2. Make sure that the inverter is installed according to the manual and there is no shelter around the inverter. 3. After the inverter is powered off and waiting for 30 minutes, then restart it. If the fault still exists, please call the service center. |

| | | |
|--------|----------------------------|--|
| 100029 | BAT1_charge_OCP | <ol style="list-style-type: none"> 1. Try to reduce battery power. 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 100030 | BAT1_discharge_OCP | |
| 100031 | BAT2_charge_OCP | |
| 100032 | BAT2_discharge_OCP | |
| 100033 | BAT1_HW_OCP | |
| 100034 | BAT2_HW_OCP | |
| 100035 | INV_OTP | <ol style="list-style-type: none"> 1. Try to lower the ambient temperature. 2. Make sure that the inverter is installed according to the manual and there is no shelter around the inverter. 3. After the inverter is powered off and waiting for 30 minutes, then restart it. If the fault still exists, please call the service center. |
| 100036 | NV_OVP | The effective value of grid voltage exceeds the maximum protection value of national standard voltage. |
| 100037 | INV_UVP | <ol style="list-style-type: none"> 1. Whether the off grid output terminal is short circuited or has impact load. 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 100038 | Output_DC_ over_current | Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |

| | | |
|--------|-------------------------|--|
| 100039 | INV_OCP | <p>1. Check whether the off grid output terminal is overloaded, short circuited or has impact load.</p> <p>2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center.</p> |
| 100040 | INV_HW_OCP | Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 100041 | Output_DC_over_voltage | |
| 100042 | Output_short | <p>1. Use a multimeter to test the impedance of the off grid output. If it is small, check whether the wiring is correct.</p> <p>2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center.</p> |
| 100043 | Output_overload | <p>1. Check whether the load exceeds the rated power.</p> <p>2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center.</p> |
| 110000 | Bat over-voltage alarm | Check that the actual battery voltage is 10V higher than the battery charging cut-off voltage |
| 110001 | Bat under-voltage alarm | Check that the actual battery voltage is 10V higher than the battery discharging cut-off voltage |
| 110002 | output_overload_alarm | Check whether the load exceeds 0.95 of the rated power |

| | | |
|--------|-----------------------------|---|
| 110003 | abnormal_temperature_sensor | Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 110004 | dc_power_alarm | <ol style="list-style-type: none"> 1. Check whether the total power of the battery and PV is less than the load power. 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 110005 | battery_stops_running_alarm | <ol style="list-style-type: none"> 1. If the battery is not connected, use a multimeter to measure whether there is voltage at the battery terminal. 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center. |
| 110006 | overtemperature_alarm | <ol style="list-style-type: none"> 1. Try to lower the ambient temperature. 2. Make sure that the inverter is installed according to the manual and there is no shelter around the machine. 3. After the inverter is powered off and waiting for 30 minutes, then restart it. If the fault still exists, please call the service center. |

10.2.1. Inverter Protection Description

| LED Indicator | Error Code | LED Display Description | Troubleshooting |
|--|------------|---------------------------------|--|
| Inverter is faulty, SYS red light is on, BAT is off, METER is off, COM is on | 1 | DC-Group: Bus soft start failed | Wait for automatic recovery. If the problem is not solved yet, please call the service center. |
| | 2 | BUS_OVP1 | |

| | | | |
|--|----|------------------------------|---|
| | 2 | Dc_bus_undervolt | |
| | 3 | Bus Short | |
| | 4 | INV Soft Timeout | |
| | 5 | INV_OVP | |
| | 6 | Output_short | |
| | 7 | Output_overload | |
| | 8 | Grid Load Reverse | |
| | 8 | LPE Reverse | |
| | 9 | EMSSCI | |
| | 10 | 12V auxiliary power Fault | |
| | 10 | 1.5V auxiliary power Fault | |
| | 10 | 0.5V auxiliary power Fault | |
| Inverter is faulty, SYS red light is on, BAT is off, METER is off, COM is on | 11 | NTC Loss | Wait for automatic recovery. If the problem is not solved yet, please call the service center. |
| | 12 | BAT_UVP | |
| | 12 | BAT_OVP | |
| | 13 | Leakage current test failure | |
| | 14 | GFCI_fault | |
| Inverter is faulty, SYS red light is on, BAT | 15 | INV HCT Fault | |
| | 15 | Load CT Fault | |

| | | | |
|--|----|-------------------------|---|
| is off, METER is off, COM is on | 15 | PV1 CT Fault | Wait for automatic recovery. If the problem is not solved yet, please call the service center. |
| | 15 | PV2 CT Fault | |
| | 15 | Bat1 CT Fault | |
| | 15 | Bat2 CT Fault | |
| | 16 | Grid_relay_fault | |
| | 16 | Bypass Relay Fault | |
| | 16 | Load Relay Fault | |
| | 16 | NPE Relay Fault | |
| Inverter is faulty, SYS red light is on, BAT is off, METER is off, COM is on | 14 | Insulation_fault | Wait for automatic recovery. If the problem is not solved yet, please call the service center. |
| | 14 | DCI Consistency Failure | |
| | 17 | WatchDog | |
| | 18 | INV Open Loop | |

 **NOTE**

1. the four LEDs in the first row are system (SYS), battery (BAT), meter (METER), and communication (COM);
2. The five LEDs in the second row are divided into two functions:
 - 1) Battery SOC power display;
 - 2) When a fault occurs, the corresponding fault code will be displayed. From right to left, the numbers represented by each light are 1, 2, 4, 8, 16.
 - 3) In the event of an earth fault, the following error codes are displayed <100007> or <10008> on the inverter LED display or via the monitoring app.

11. Uninstallation & Return

11.1. Removing the Product

Procedure

- Step 1: Power off the energy storage system by following instructions in Chapter 8.2 Powering Off the System.
- Step 2: Disconnect all cables from the product, including communication cables, PV power cables, battery power cables, AC cables, and PE cables.
- Step 3: Remove the WiFi module.
- Step 4: Remove the product from the wall bracket. Remove the expansion battery from the wall bracket.
- Step 5: Remove the wall brackets.

11.2. Packing the Product

If the original packaging is available, put the product inside it and then seal it using adhesive tape.

If the original packaging is not available, put the product inside a suitable cardboard box and seal it properly.

11.3. Disposing of the Product

- If the product service life expires, dispose of it according to the local disposal rules for electrical equipment and electronic component waste.
- Dispose of the packaging and replaced parts according to the rules at the installation site where the device is installed.
- Do not dispose the product with normal domestic waste.



12. Specification

12.1. Datasheet of Inverter

| Item | BW-INV-SPH5K | BW-INV-SPH3.6K | BW-INV-SPB5K |
|--|-------------------|----------------|--------------|
| Input DC (PV side) | | | |
| Recommended max. PV power | 10000 | 7200 | NA |
| Max. PV input voltage | 580 V | | NA |
| Rated voltage | 360 V | | NA |
| Start-up voltage | 90 V | | NA |
| MPPT voltage range | 100 ~ 550 V | | NA |
| Max. Input Current Per MPPT | 15 A / 15 A | | NA |
| Max. Short Circuit Current Per MPPT | 18.75 A / 18.75 A | | NA |
| MPPT Number | 2 | | NA |
| Max Input Strings Number Per MPPT | 1 | | NA |
| Battery | | | |
| Battery Type | Li-ion | | |
| Battery Voltage Range | 80 ~ 450 V | | |
| Maximum Charging Power | 5 kW | | |

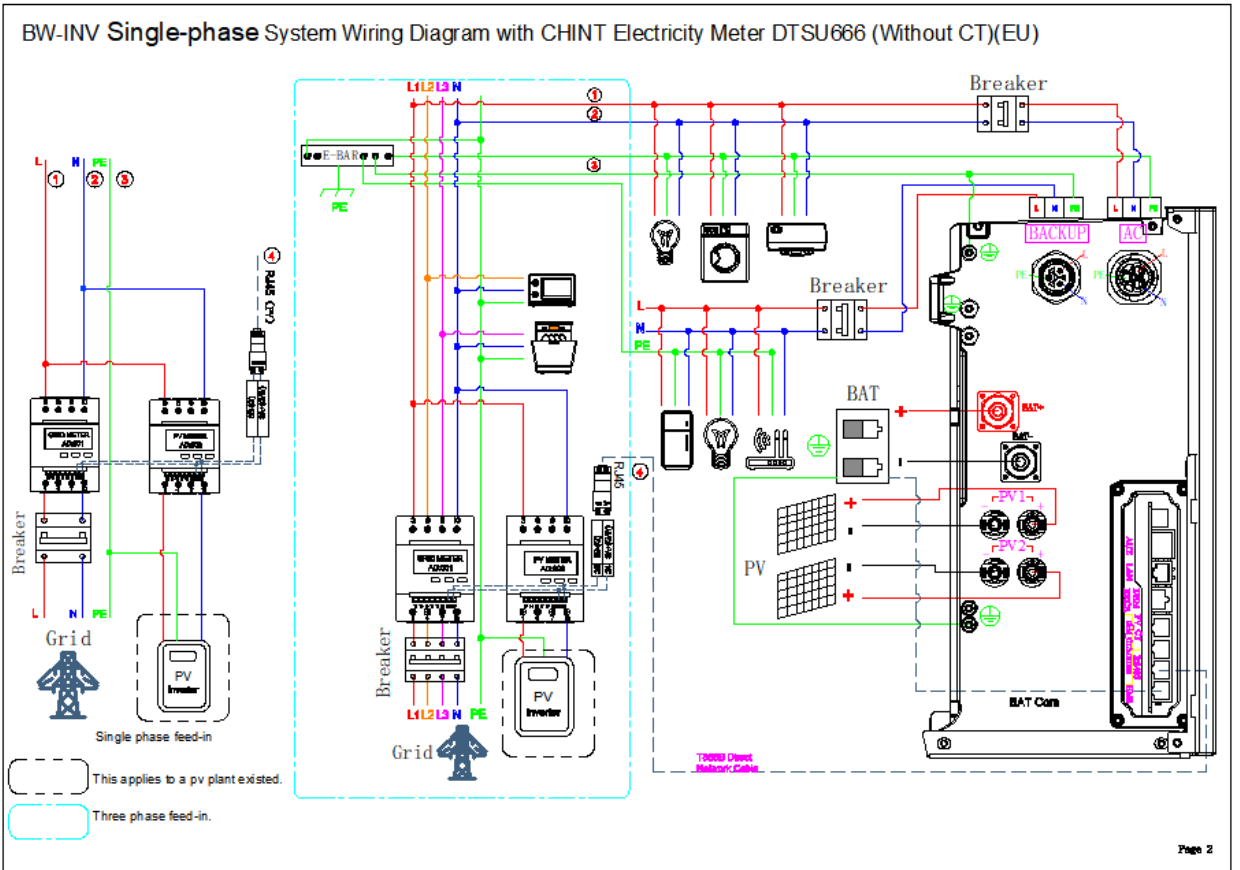
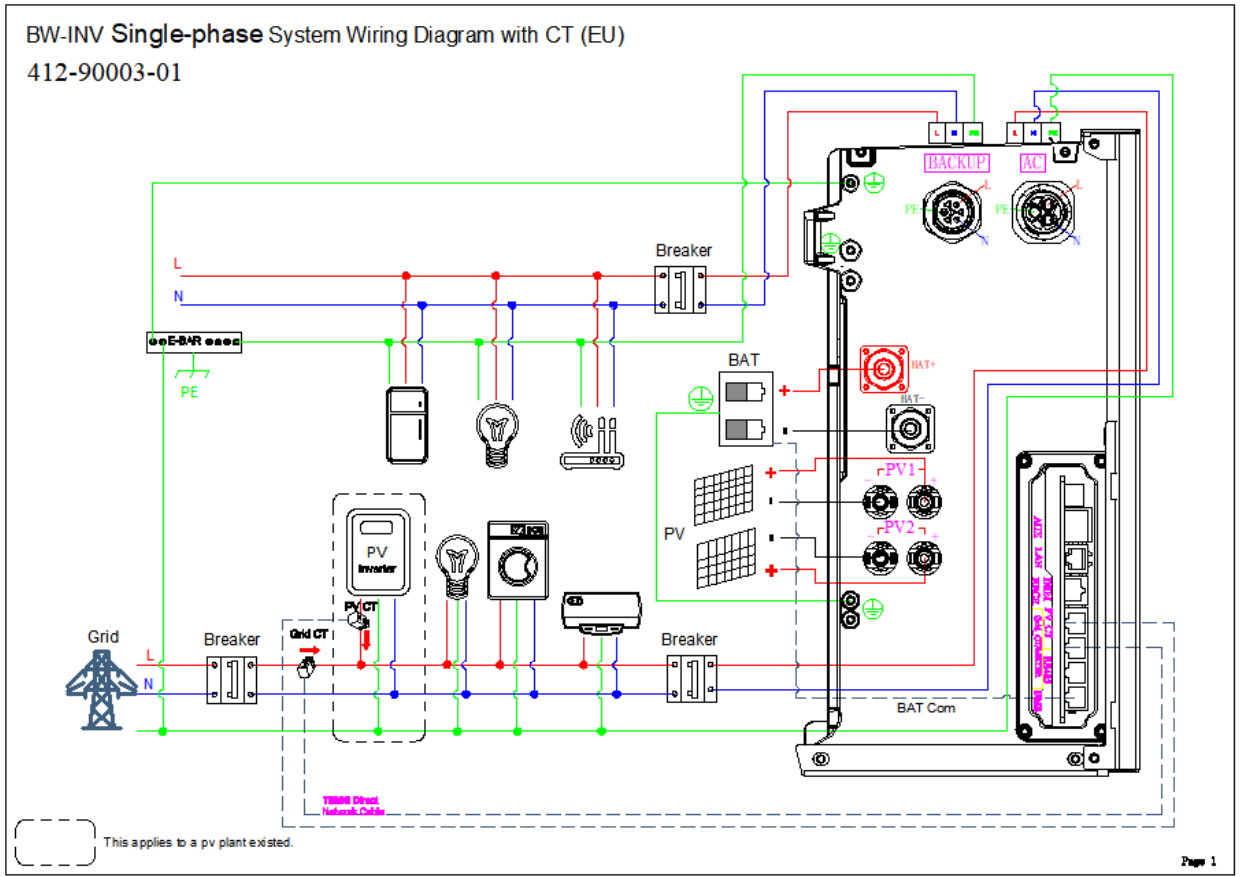
| | | | |
|--|---------------|----------|--------|
| Maximum Charge/ discharge current | 60 A / 60 A | | |
| Communication | CAN | | |
| Output AC (Back-up) | | | |
| Rated output power | 5 kW | 3.68 kW | 5 kW |
| Max Apparent Output Power | 5 kVA | 3.68 kVA | 5 kVA |
| Back-up switch time | <20 ms | | |
| Rated output voltage | L/N/PE, 230 V | | |
| Rated Frequency | 50/60 Hz | | |
| Rated output current | 21.7 A | 15.7 A | 21.7 A |
| THDv(@linear load) | 3% | | |
| Input AC (Grid side) | | | |
| Rated Output Current | L/N/PE, 230 V | | |
| Rated Frequency | 50/60 Hz | | |
| Rated Input Power | 10 kW | 7.2kW | 10 kW |
| Max. input current | 43.5 A | 31.3A | 43.5 A |
| Output AC(Grid side) | | | |

| | | | |
|--------------------------------------|---|----------|--------|
| Rated output power | 5 kW | 3.68 kW | 5 kW |
| Max. Apparent Output Power | 5 kVA | 3.68 kVA | 5 kVA |
| Operation Phase | Single phase | | |
| Rated Grid Voltage | L/N/PE, 230 V | | |
| Grid Voltage Range | 180 ~ 270 V | | |
| Rated Grid Frequency | 50 / 60 Hz | | |
| Rating Grid Output Current | 21.7 A | 15.7 A | 21.7 A |
| Power Factor | 0.8 leading - 0.8 lagging | | |
| Thdi | < 3% | | |
| Protection Class | I | | |
| Overvoltage Category | III | | |
| Efficiency | | | |
| Max Efficiency | >97% | | |
| EU Efficiency | >96.2% | | |
| Protection | | | |
| Anti-Islanding Protection | Integrated Active: AFD and SMS; Passive: ROCOF | | |
| Insulation Resistor Detection | Integrated | | |

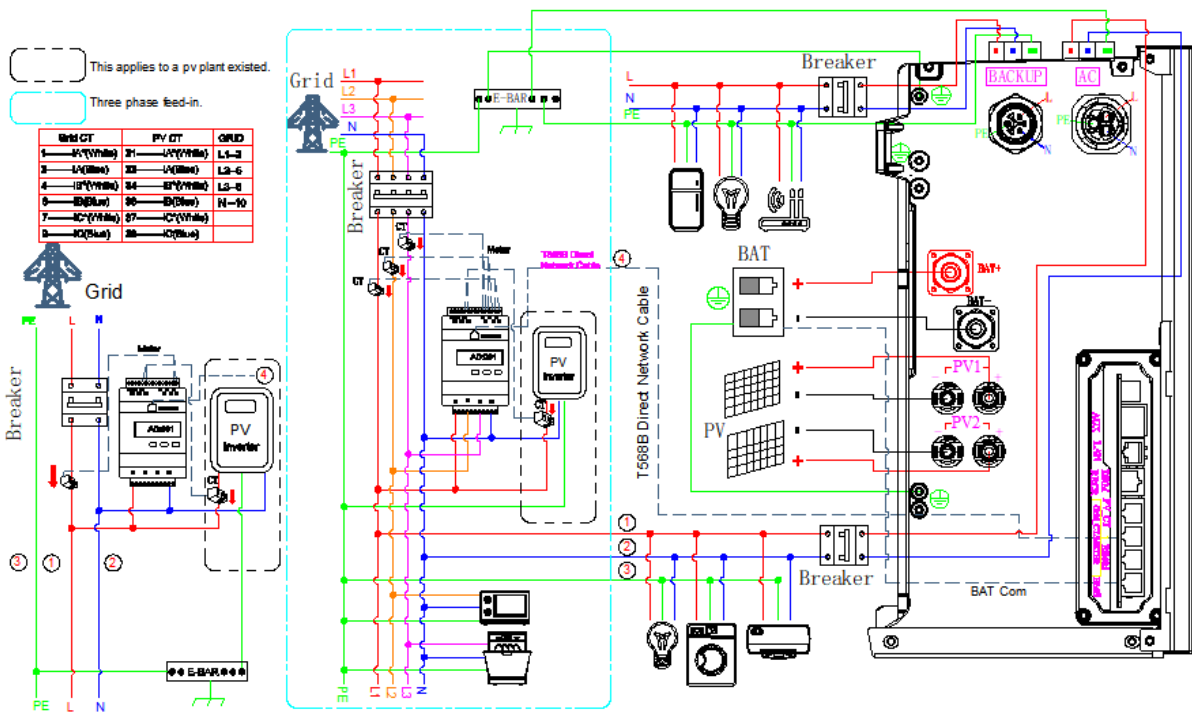
| | | | |
|---|-----------------|--------|--------|
| Residual Current Monitoring Unit | Integrated | | |
| Output Over Current Protection | Integrated | | |
| Output Short Protection | Integrated | | |
| Output Overvoltage Protection | Integrated | | |
| DC Reverse Polarity Protection | Integrated | | |
| PV Overvoltage Protection | Integrated | | |
| PV Switch | Integrated | | |
| Battery Breaker | Integrated | | |
| General data | | | |
| Dimensions (W*H*D) | 590*405*205 mm | | |
| Weight | 19.5kg | 19.5kg | 17.5kg |
| Topology | Transformerless | | |
| Operation Temperature Range | -25 ~ +60 °C | | |
| Ingress Protection | IP65 | | |
| Noise Emission | <30 dB | | |

| | |
|---------------------------------|---|
| Cooling Concept | Natural convection |
| Max. Operation Altitude | 3000 m |
| Grid Connection Standard | G98/G99, VDE-AR-N 4105, EN 50549-1, VDE 0126, RD 1699, CEI 0-21, C10/11, NRS 097-2-1, TOR Erzeuger, MEA, PEA, AS/NZS 4777.2, IEEE1547 |
| Safety/ EMC Standard | IEC62040-1, IEC62109-1/-2, AS3100, NB/T 32004, IEC/EN61000-6-1/2/3/4 |
| Features | |
| PV Connection | Vaconn H4 connectors/MC4 (optional) |
| Grid Connection | Vaconn |
| Back-up Connection | connectors |
| BAT Connection | connectors |
| Communication | LAN, WiFi (optional) |
| Warranty | 5 years standard |

Appendix 1: System Overview



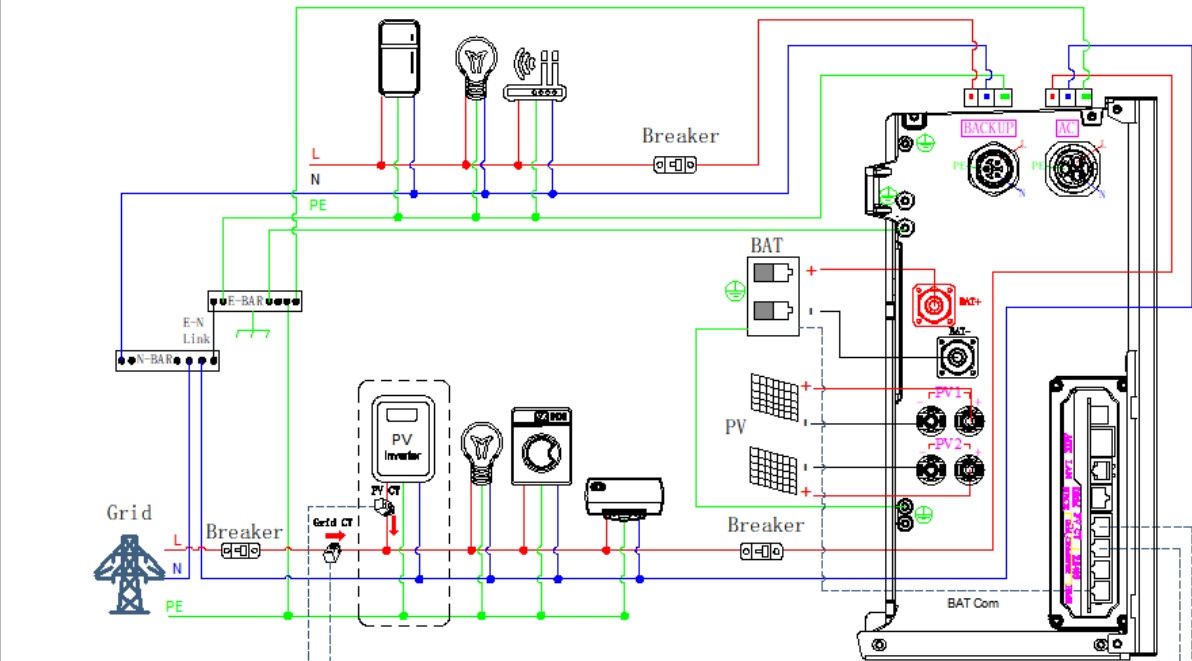
BW-INV Single-phase System Wiring Diagram with CHINT Electricity Meter DTSU666 (With 3CT or 6CT)(EU)

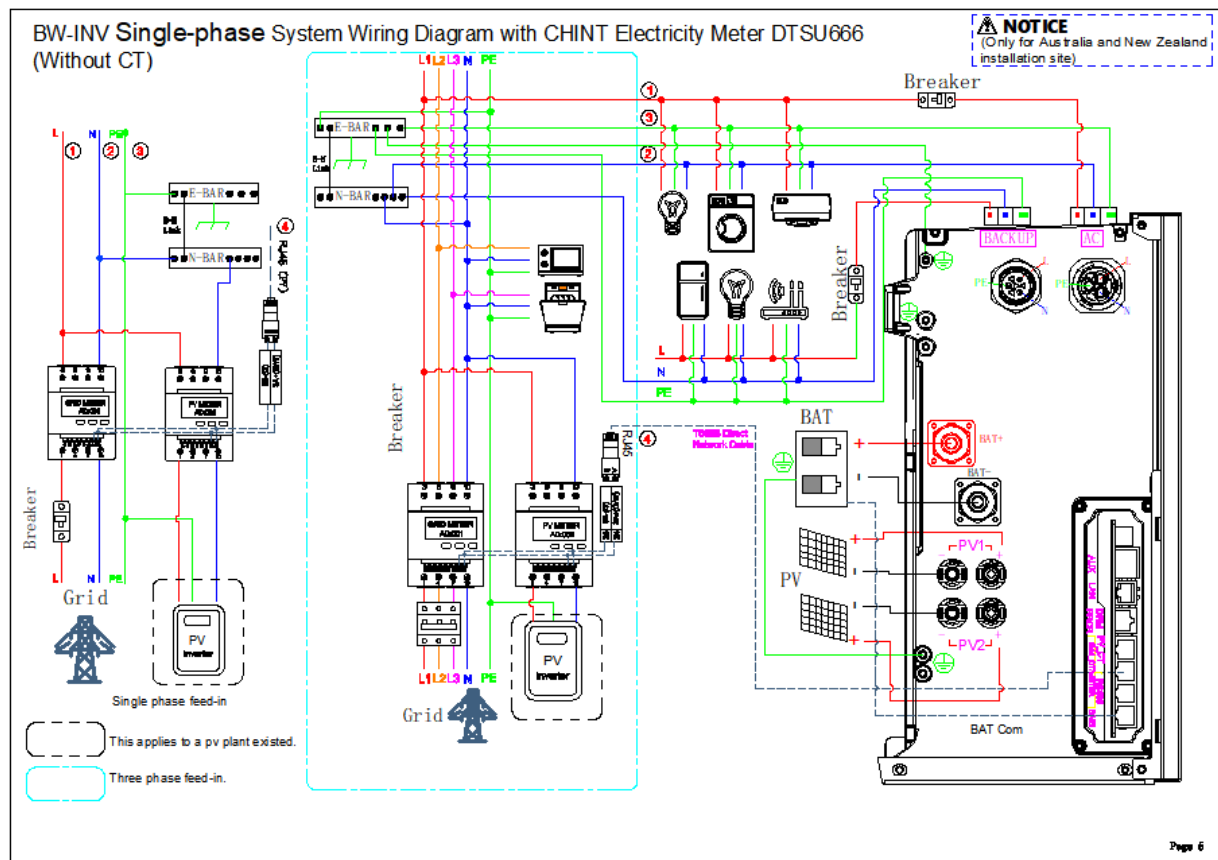
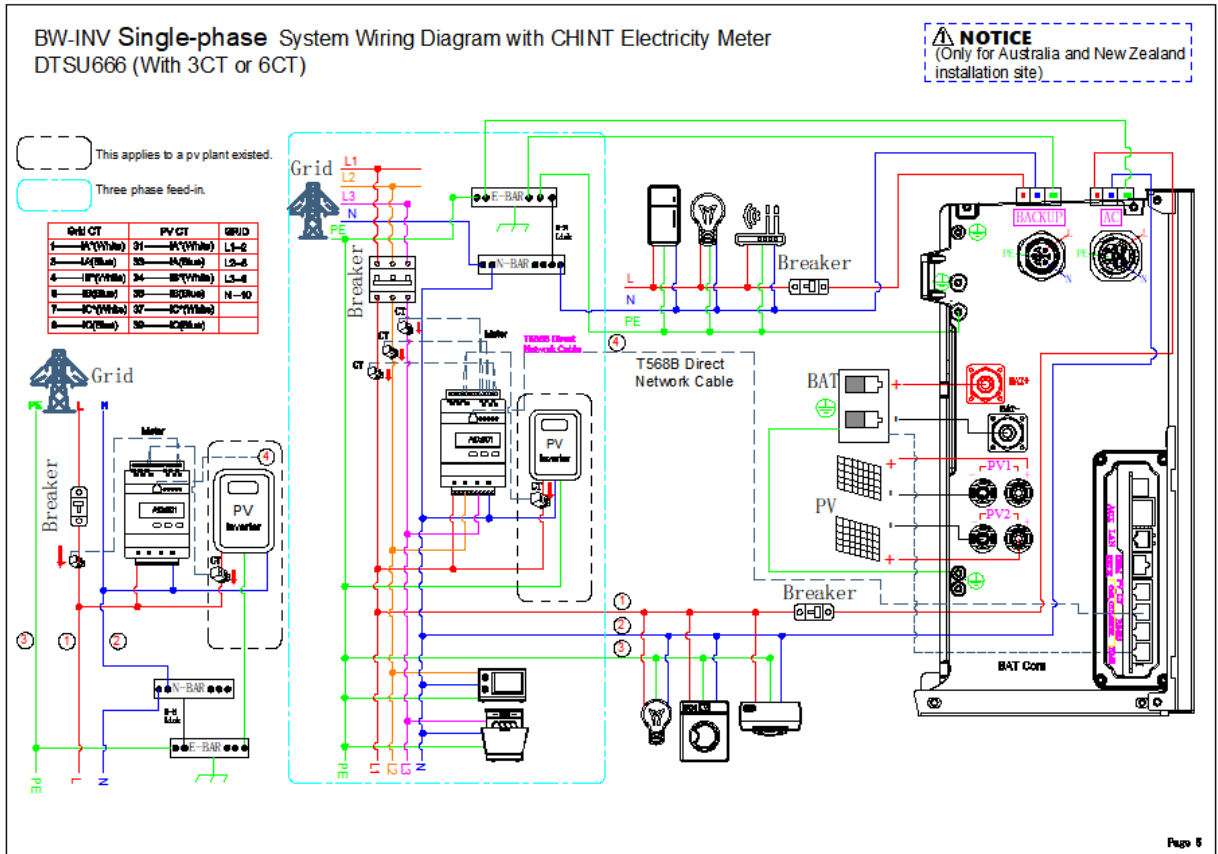


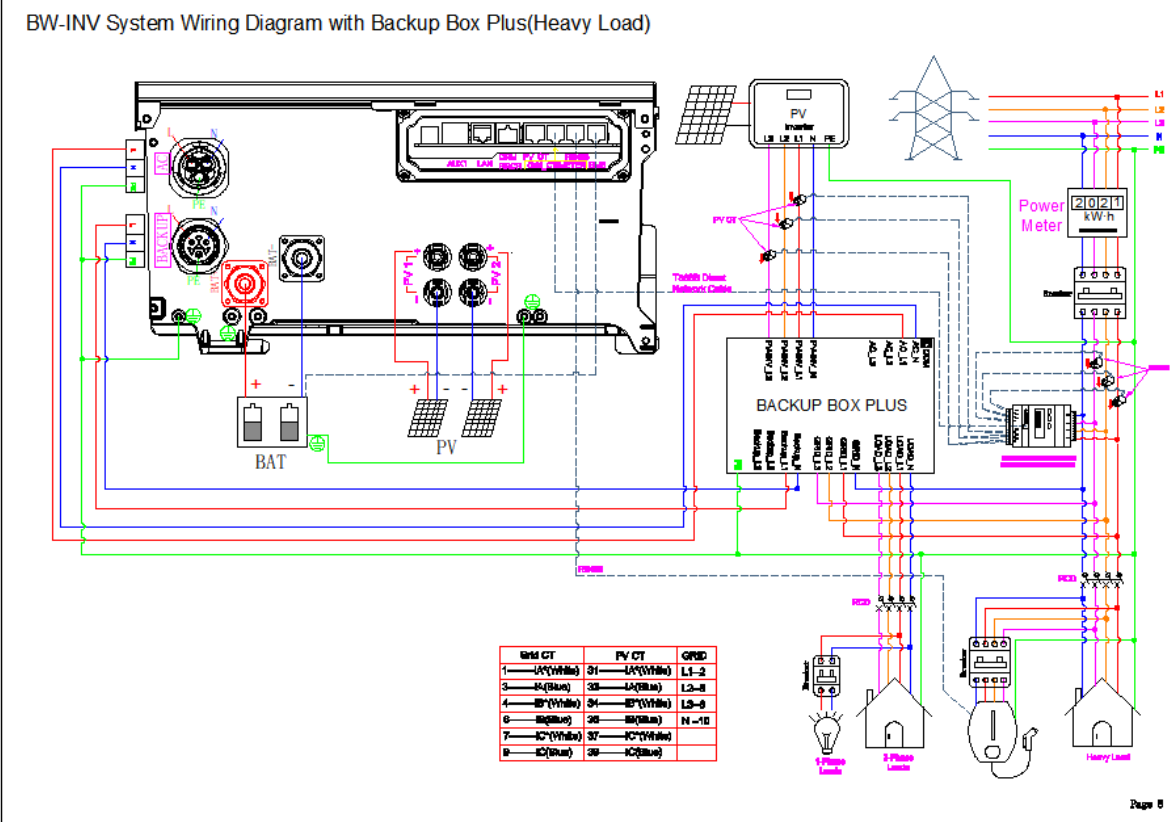
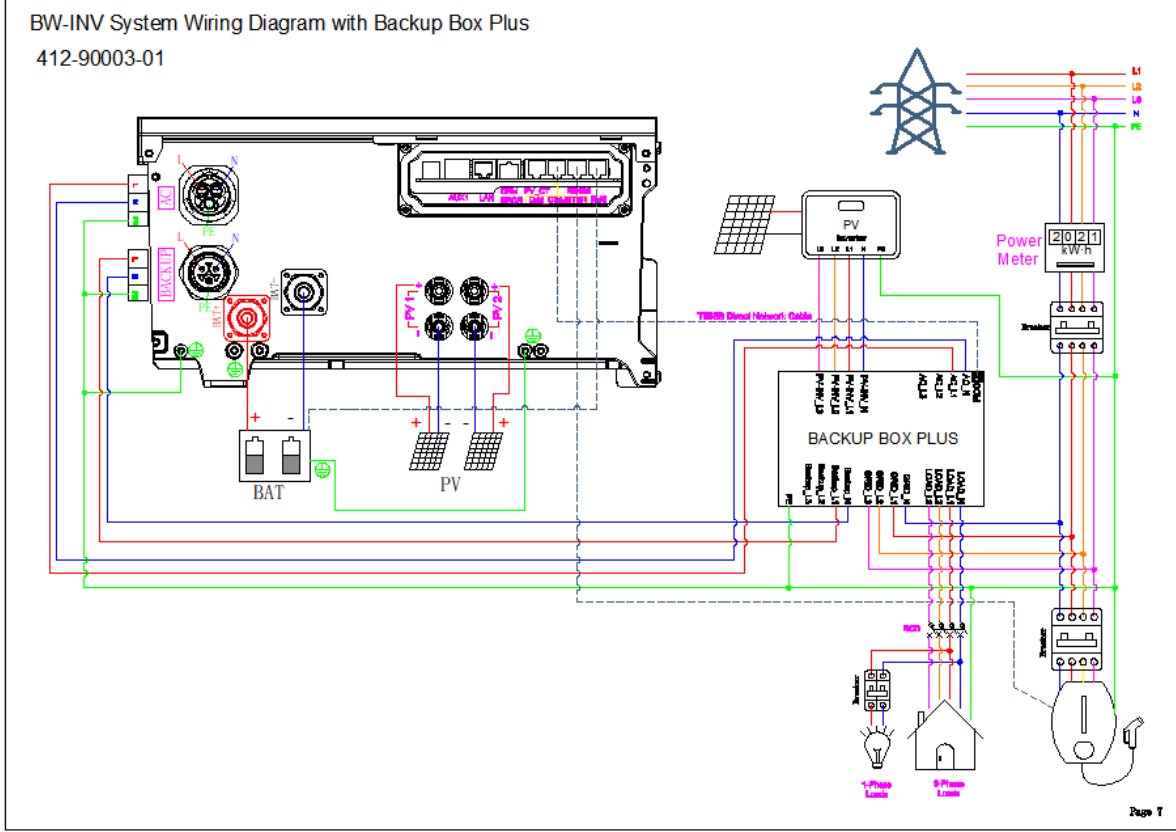
BW-INV Single-phase System Wiring Diagram with CT

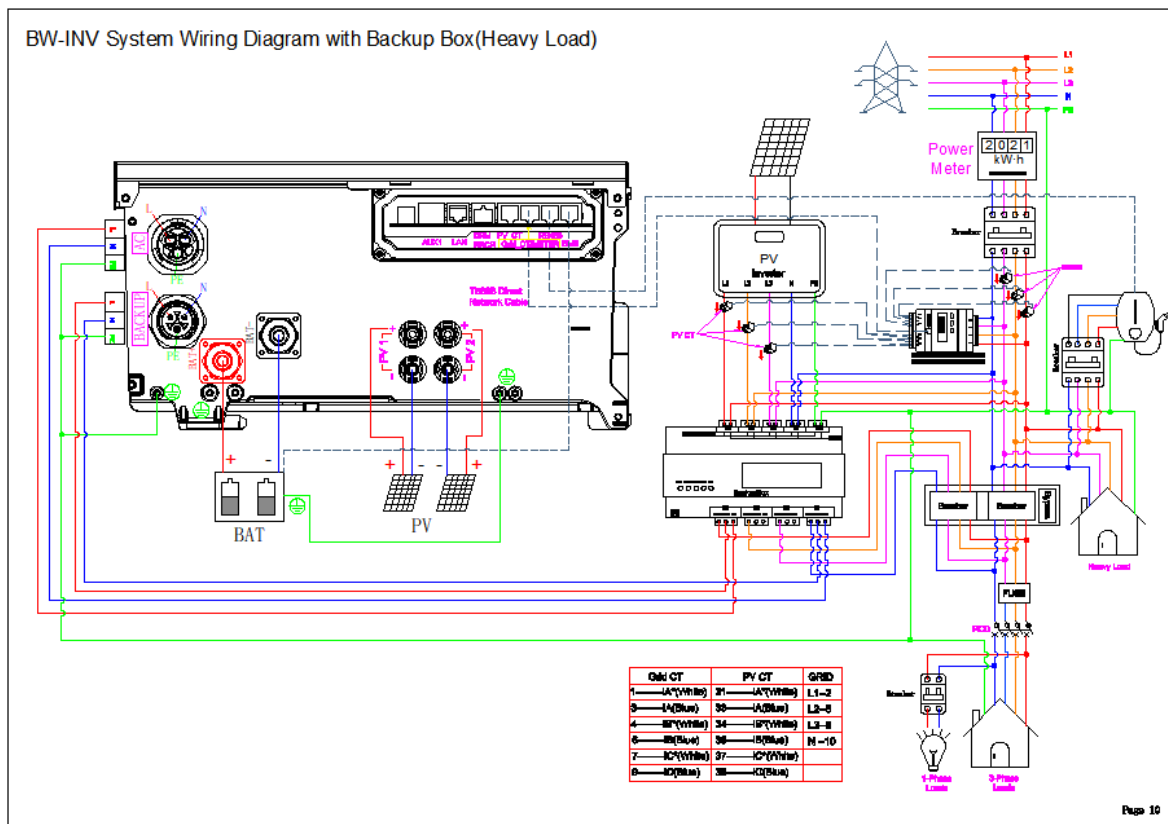
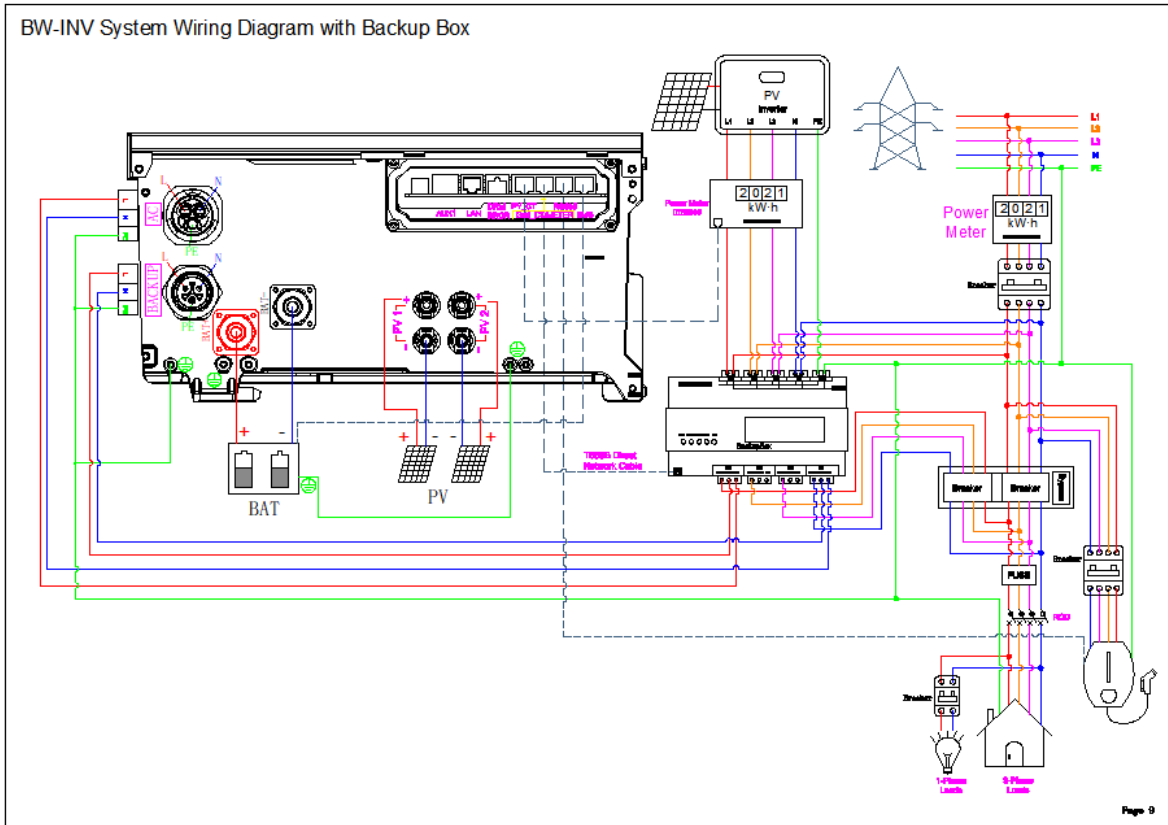
412-90003-01

NOTICE
(Only for Australia and New Zealand installation site)









Note: Backup box/Backup Box Plus is used for switching the power supply of battery charging, the charging power supply can be the grid or other(for example:the diesel engine).

Appendix 2: Regional Application Standard

Please check with your local grid company and choose the correspond Regional Application Standard, the power quality modes Volt-var and Volt-Watt will be running automatically. (Only for regions with AS/NZS 4777.2 safety regulations).

| Regional application Standard | Electric Company |
|-------------------------------|--------------------|
| Australia A | N/A |
| Australia B | N/A |
| Australia C | N/A |
| New Zealand | N/A |
| Vector | New Zealand Vector |

13. CONTACT US

Name: Suzhou Bytewatt Technology Co.,Ltd.

Tel: +86 180 1268 7058

Address: Room 1004-1, Tantaihu Building, No.9 East Taihu Road, Wuzhong District,
Suzhou City Jiangsu, China

Postcode: 215000

