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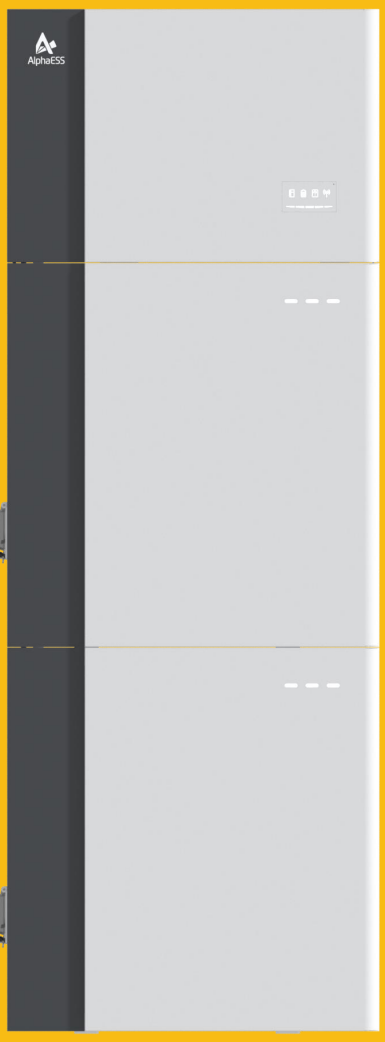
V01

INSTALLATION, OPERATION & MAINTENANCE MANUAL OF SMILE - G3 - T5 / T10 & SMILE-G3-BAT-9.3S Ⅱ Ⅲ Ⅳ Ⅴ Ⅵ



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1. Introduction

1.1. Content and Structure of this Document

This document is valid for SMILE-G3 three-phase energy storage system, which includes inverter SMILE-G3-T5/T10-INV and battery SMILE-G3-BAT-9.3S.

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

Please read all documentation that accompanies the product. Keep them in a convenient place and available at all times.

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

1.2. Target Group

This document is intended for qualified personnel. Only qualified personnel are allowed to perform the operations marked with a warning symbol in this document.

Qualified personnel 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 energy storage system.
- Knowledge of the installation and commissioning of electrical devices and energy storage system.
- Knowledge of the applicable standards and directives relevant to the product and its installation.
- Understood and complied with this document, including all safety precautions.
- Understood and complied with the documents of the battery manufacturer and inverter 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 that will result in serious injury or even death if not avoided.
WARNING

WARNING indicates a hazardous situation that could result in serious injury or even death if not avoided.
CAUTION CAUTION indicates a hazardous situation that could result in minor or moderate injury if not avoided.
NOTICE NOTICE indicates a situation that could result in property damage if not avoided.
INFORMATION provides tips 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

S

SOC	the State of Charge

2. Safety

2.1. Intended Use

The inverter, batteries and electricity meters together form a system designed to optimise the self-consumption of electrical energy in a household. The inverter transfers energy between AC current and DC current while the battery is used for the storage of energy (typically storing surplus energy produced by solar arrays).

SMILE-G3-T5/T10-INV and SMILE-G3-BAT-9.3S are suitable for indoor and outdoor installation.

The SMILE-G3-T5/T10-INV 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.

The product is not equipped with an integrated transformer and therefore has no galvanic isolation.

The product must not be operated with PV modules whose outputs are grounded. This can cause the product to be destroyed. The product may be operated with PV modules whose frame is grounded.

PV modules with a high capacity to ground can be used only when their coupling capacity does not exceed 1.0 µF.

All components must be used in a manner and environment in compliance with the requirements of this manual and in compliance with all relevant local 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 Alpha. Unauthorized alterations will void the product warranty(s). Alpha 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 for Battery

2.2.1. General Safety Precautions

- Before installing any part of the SMILE-G3, please read the Installation Manual completely. If additional hardware is being installed at the same time as the SMILE-G3 unit (e.g. a Backup device or a separate AC-coupled PV system), please read the Installation Manual for each component/system before commencing installation of any hardware. The installation of one piece of hardware may create hazards for the installation of another piece of hardware – be sure to read all Manuals to understand the interaction and safety implications of the combined systems.
- Overvoltage or incorrect wiring can damage the battery and cause deflagration, which can be extremely dangerous.
- All types of battery breakdown may lead to electrolyte or flammable gas leakage.
- The battery is not user-serviceable because there is high voltage in the device.
- Read the label with Warning Symbols and Precautions on the right side of the battery.
- Do not connect any AC conductors or PV conductors directly to the battery which should be connected only to the inverter.
- Do not charge or discharge a damaged battery.
- Do not damage the battery by dropping, deforming, impacting, cutting or penetrating it with a sharp object. Battery damage may cause a leakage of electrolyte or fire.
- Do not expose the battery to an open flame.

2.2.2. Response to Emergency Situations

The battery is designed to prevent the danger caused by malfunction.

In the case of user exposure to the electrolyte or other internal materials of the battery cells, the list below details recommended actions dependent on the type of exposure:

- Inhalation: Leave the contaminated area immediately and seek medical attention.
- Eye injuries: Rinse eyes with running water for 15 minutes and seek medical attention.
- Skin injuries: Wash the affected area thoroughly with soap and seek medical attention.
- Ingestion: Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery is installed, please follow these measures:

Fire extinguishing methods

- A Respirator is not required during normal operations.
- Use an FM-200 or CO2 extinguisher for battery fire.
- In the case of a fire in the property but where the fire has not yet reached the battery, if it is safe to do so, use an ABC fire extinguisher and prevent the fire from reaching the battery.

Firefighting instructions

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

WARNING

There may be a possible explosion when batteries are heated above 150 °C.

The battery leaks poisonous gases when it is burning. Do not approach.

Effective ways to deal with accidents

- On land: Place damaged battery in a segregated place and call local fire department or technical service engineer.
- In water: Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.
- Do not use submerged battery again and contact an Alpha-Accredited or Battery-Accredited technical service engineer.

2.3. Important Safety Instructions

DANGER

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

The DC cables connected to a battery or a PV module may be live. Touching live DC cables can result in serious injury or even death due to electric shock. To avoid this danger:

- Disconnect the inverter and battery 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 product.
- Observe all safety information of this document.

DANGER

Danger to life due to electric shock if live system components in backup mode are touched

Even if the grid circuit breaker and the PV switch of the inverter are disconnected, parts of the system may still be live when the battery is switched on due to backup mode. To avoid this danger:

- Before performing any work on the inverter, disconnect it from all voltage sources as described in this document.

DANGER

Danger to life due to electric shock if touching live components or DC cables when working on the battery

The DC cables connected to the battery may be live. Touching live DC cables can result in serious injury or even death due to electric shock. To avoid this danger:

- Before performing any work on the battery, disconnect the inverter from all voltage sources as described in this document.

DANGER

Danger to life due to electric shock if touching live components when the inverter or battery cover is open

High voltages are present in the live parts and cables inside the system during operation. Touching live parts and cables can result in significant injuries or even death due to electric shock. To avoid this danger:

- Do not open the system cover.

DANGER

Danger to life due to electric shock if live components are touched during a ground fault

When a ground fault occurs, parts of the energy storage system may still be live. Touching live parts and cables can result in significant injuries or even death due to electric shock. To avoid this danger:

- 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.

DANGER

Danger to life due to electric shock if an ungrounded PV module or array frame is touched

Touching ungrounded PV modules or array frames can result in significant injuries or even death due to electric shock. To avoid this danger:

- Connect and ground the frame of the PV modules, the array mounting frame and the electrically conductive surfaces to ensure continuous conduction.
- Observe the applicable local regulations.

DANGER

Danger to life due to dangerous voltages on the battery.

There is dangerous voltage at the terminal of the battery power cable. Touching the terminal of the battery power cable can result in a lethal electric shock. To avoid this danger:

- Do not open the battery cover.
- Leave the protective caps on the connectors for the battery's power connection until the inverter cables are connected to the battery.
- Disconnect the system from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery.

WARNING

Risk of chemical burns from electrolyte or toxic gases

During normal operation, no electrolyte would leak from the battery and no toxic gases

would form. Despite careful construction, if the battery is damaged or a fault occurs, it is possible that electrolyte may leak or toxic gases may form. To avoid this danger:

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

WARNING

Danger to life due to burns caused by electric arcs through short-circuit currents

Short-circuit currents in the battery can cause heat build-up and electric arcs. Heat build-up and electric arcs may result in lethal injuries due to burns. To avoid this danger:

- Disconnect the battery from all voltage sources before performing any work on it.
- Observe all safety information of this document.

CAUTION

Risk of burns from the inverter's hot surface

The surface of the inverter can get extremely hot during operation, and touching it can result in burns. To avoid this danger:

- Correctly mount the inverter so that it cannot be inadvertently touched.
- Do not touch hot surfaces.
- Wait for 30 minutes for surfaces to cool down after switching the system off.
- Observe the safety messages on the inverter.
- During operation, don't touch any parts other than the display panel of the inverter.

CAUTION

Risk of injury due to weight of the inverter and battery

Injuries may be caused if the product is lifted incorrectly or dropped while being transported or mounted. To avoid this danger:

- Transport and lift the product carefully. Take the weight of the product into account. Use lifting and conveyance aids such as lifting trolleys wherever possible.
- Wear suitable personal protective equipment for all work on the product.

NOTICE

Damage to the inverter and battery due to electrostatic discharge

Touching electronic components can result in electrostatic discharge, which can damage or destroy the inverter and battery. To avoid this:

- Ground yourself before touching any component.

NOTICE

Damage due to cleaning agents or inappropriate cleaning methods

The use of cleaning agents may cause damage to the product and its components. To avoid this:

- Clean the product and all its components only with a cloth moistened with clear water.
- Never clean the unit with a hose or with the use of a water jet.

2.4. Symbols Explanation

Symbols on the type label of the energy storage 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 inverter can get hot during operation.
	**Danger to life due to high voltages in the inverter, observe a waiting time of 5 minutes** High voltages within the live components of the inverter that can cause lethal electric shocks.Prior to performing any work on the inverter, disconnect 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 documentations**

	Observe all documentations supplied with the product.
CE	**CE marking** The product complies with the requirements of the applicable EU directives.
	**RCM (Regulatory Compliance Mark)** The product complies with the requirements of the applicable Australian standards.
UK CA	**UKCA marking** The product complies with the regulations of the applicable laws of England,Wales and Scotland.

Symbols on the type label and warning label of the battery

Symbol	Explanation
	**Beware of a danger zone** This symbol indicates that the battery 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.
	**Corrosive substances warning** The product contains corrosive substances that can cause severe injury if they come into direct contact with the skin.
	**Potentially explosive substances warning** Improper handling or fire can cause the product to ignite or explode.
	**Warning of hazards from batteries** This symbol indicates the danger of handling batteries.
	**Observe the documentations**

	Observe all documentations supplied with the product.
	**Refer to the instruction for operation** Observe all documentations supplied with the product.
	**Use eye protection** Wear eye protection for all work on the device.
	**No open flame** Handling an open flame and sources of ignition is forbidden in the immediate vicinity of the product.
	**Access is prohibited for all children** Children must be kept at a safe distance from the product.
	**Do not short circuit** Touching the short-circuit connection of the battery can result in serious injuries or even death due to electric shock and massive energy release.
	**WEEE designation** Do not dispose of the battery together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	**CE marking** The product complies with the requirements of the applicable EU directives.
	**RCM (Regulatory Compliance Mark)** The product complies with the requirements of the applicable Australian standards.
	**UKCA marking** The product complies with the regulations of the applicable laws of England,Wales and Scotland.
UN38.3	**Marking for transport of dangerous goods**

	The product passes the certifications of the UN38.3.

3. Product Introduction and Application Scenarios

3.1. Naming Convention

SMILE-G3-T10

1 **2** **3**

Position	Name	Explanation
1	SMILE	Residential energy storage system
2	G3	3rd Generation of SMILE series
3	T5	**5** kW Inverter with Solar Connections – Three-phase Hybrid energy storage system
	T10	**10** kW Inverter with Solar Connections – Three-phase Hybrid energy storage system

Complete Designation	Designation in This Document
SMILE-G3-T5-INV SMILE-G3-T10-INV	Energy storage inverter
SMILE-G3-BAT-9.3S	Series battery / Battery
SMILE-G3-T5 SMILE-G3-T10	Energy storage system / System

3.2. System Introduction

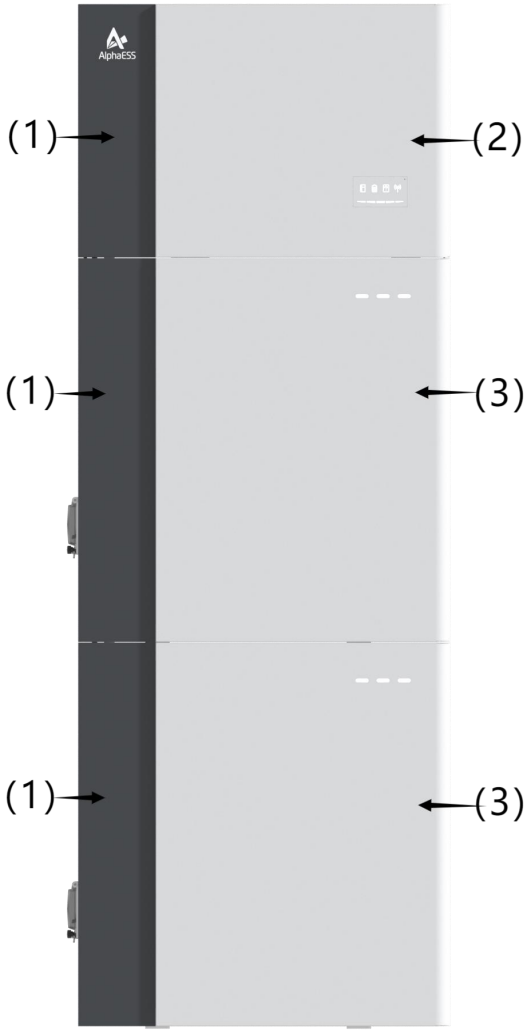


Figure 3-1 System product diagram

Position	Name	Explanation
1	Cable Cover	Covers for the left wiring area (There are two types of covers, one for the Battery Module(s) wiring and a second for the Inverter connections.)
2	SMILE-G3-T5-INV SMILE-G3-T10-INV	Product ontology of energy storage inverter
3	SMILE-G3-BAT-9.3S	Product ontology of series battery

3.3. Product Description

3.3.1. Inverter Electrical Interface & Connections Introduction

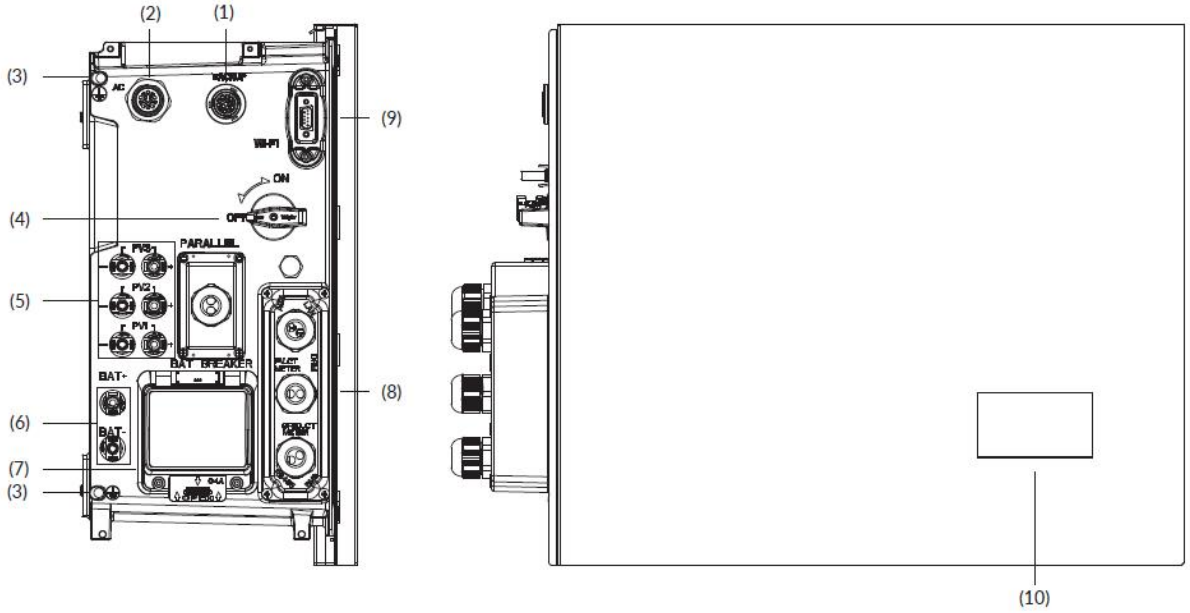


Figure 3-2 Inverter electrical interface diagram

Position	Designation
1	Backup Connector
2	Grid Connector (AC Supply)
3	Grounding Point
4	PV Switch*
5	Positive and Negative PV Connectors, PV1 / PV2 / PV3
6	Battery Positive Connector Battery Negative Connector
7	Battery Circuit Breaker*
8	Communication Ports (BMS, RS485, Meter, DRM**&RRCR, LAN, AUX1, AUX2), Refer to Chapter 6.6
9	Wi-Fi Port
10	LED Display

* Battery circuit breaker and PV switch of the inverter are switched off when shipped.

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

***The RRCR performs the corresponding maximum feed net percentage according to different signals.

3.3.2. Inverter Display Interface Introduction

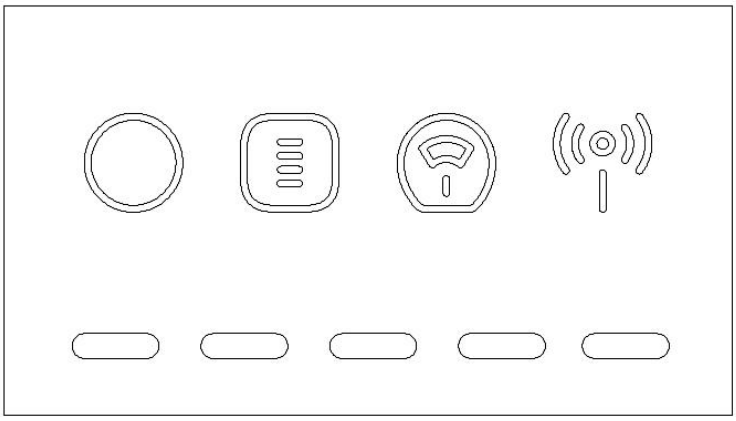


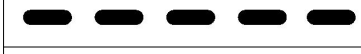
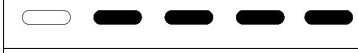
Figure 3-3 LED display

These LED indicators provide information about the operation status of the energy storage system.

Status	Explanation	Status	Explanation
SYS	**White light** The system works normally	BAT	**White light** The battery works normally
SYS	**Red light** The system is in fault	BAT	**No light** The battery is in fault
METER	**White light** Meter communication works normally	COM	**White light** Connected to the server
METER	**No light** Meter lost	COM	**No light** Disconnected to the server

The lower five LED indicators provide information about the State of Charge (SOC) of the batteries connected to this energy storage system.

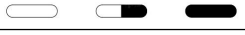
Status	Explanation
	White LED is off
	White LED is flashing
	White LED is glowing

LED Indicator	SOC	Description
LEDs show the SOC of batteries		SOC＜5%
		5%≤SOC＜20%
		20%≤SOC＜40%
		40%≤SOC＜60%
		60%≤SOC＜80%
		80%≤SOC≤100%

Note that the LED lights provide an approximation of the State of Charge and should be read as an indication and not as a set value.

3.3.3. Battery Display Interface Introduction

During normal operation of battery, three LED indicators on the front cover provide information the State of Charge (SOC) of the battery with white lights glowing and off or flashing (0.5s on, 1.5s off).

LED Indicator	No.	SOC	Description
LEDs show the SOC status	1		SOC≤10%
	2		10%＜SOC≤30%
	3		30%＜SOC≤50%
	4		50%＜SOC≤60%
	5		60%＜SOC≤90%
	6		90%＜SOC≤100%

State Display
The LEDs indicate the operating state of the product.
Standby: All white LEDs are flashing (0.5s on and 0.5s off).
Normal: White LEDs are glowing or flashing (0.5s on and 1.5s off).
Protection: Yellow LEDs are glowing or flashing (0.5s on and 0.5s off).
Error: Yellow LEDs are glowing or flashing (0.5s on and 0.5s off).
Shutdown: All LEDs are off.

3.3.4. Battery Introduction of SMILE-G3-BAT-9.3S

Battery appearance and dimensions

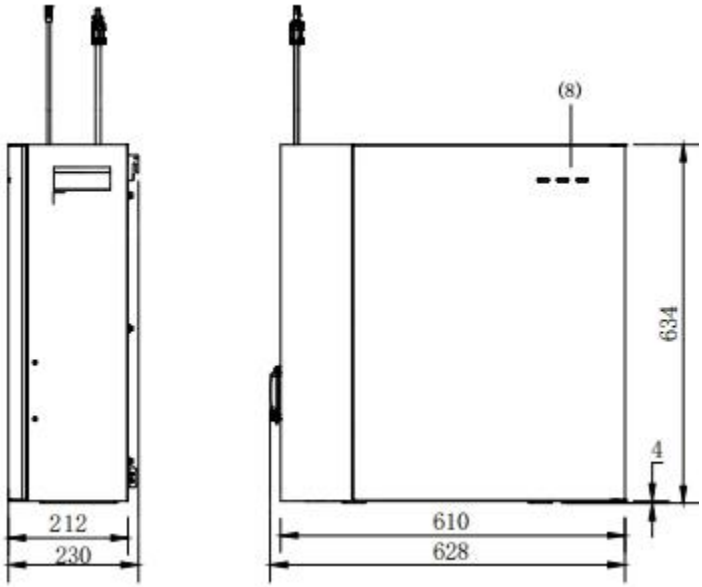


Figure 3-4 Battery appearance and size diagram

Connection area overview

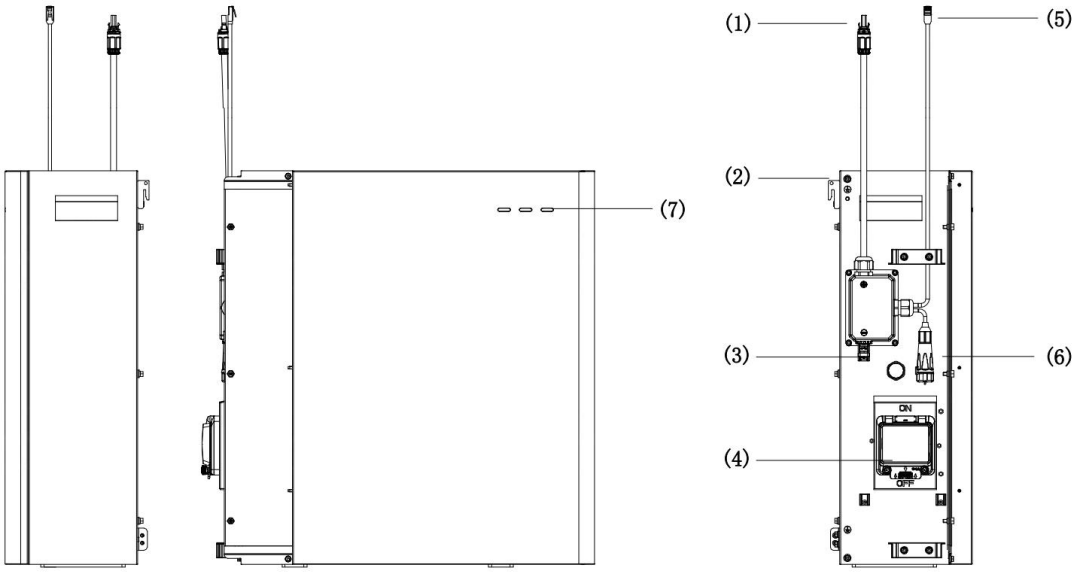


Figure 3-5 Battery connection area diagram

Position	Designation
1	Battery Positive Cable Connector
2	Grounding Point
3	Battery Negative Cable Connector
4	Battery Circuit Breaker
5	BMS COM1

6	BMS COM2 (with Termination Resistor)
7	LED Display

3.4. Application Scenarios

SMILE-G3 three phase system (includes inverter SMILE-G3-T5/T10-INV, battery SMILE-G3-BAT-9.3S) can be connected as a DC-Coupled systems (mostly new installation), AC-Coupled systems (mostly retrofit), Hybrid-Coupled systems (mostly retrofit, and increase the PV capacity), and Off-Grid (under development) systems as shown in the following diagrams:

3.4.1. DC-Coupled Energy Storage System

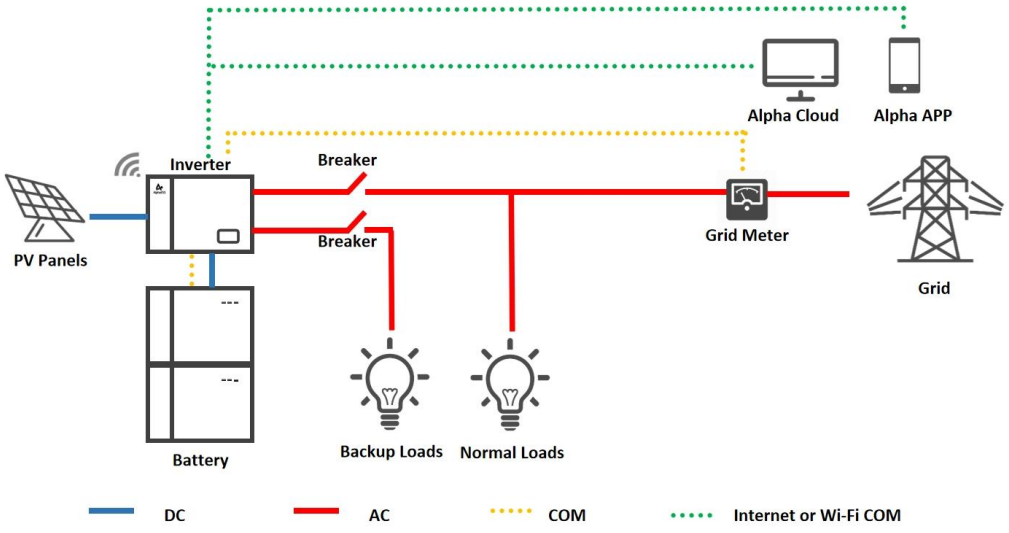


Figure 3-6 DC-Coupled Storage System – Scheme

3.4.2. AC-Coupled Energy Storage System

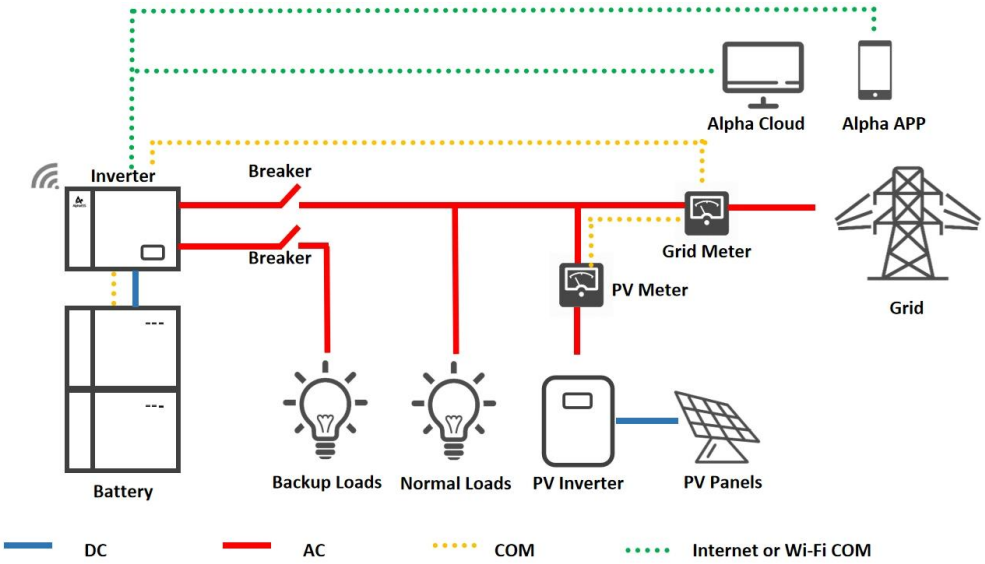


Figure 3-7 AC-Coupled Storage System – Scheme

3.4.3. Hybrid-Coupled Energy Storage System

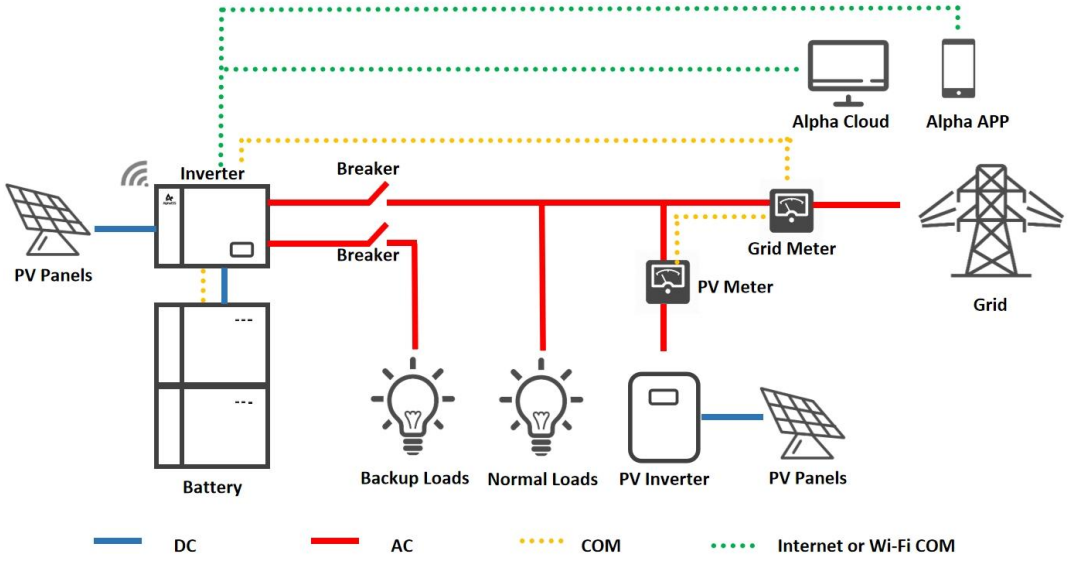


Figure 3-8 Hybrid-Coupled Storage System – Scheme

3.4.4. Off-Grid Energy Storage System

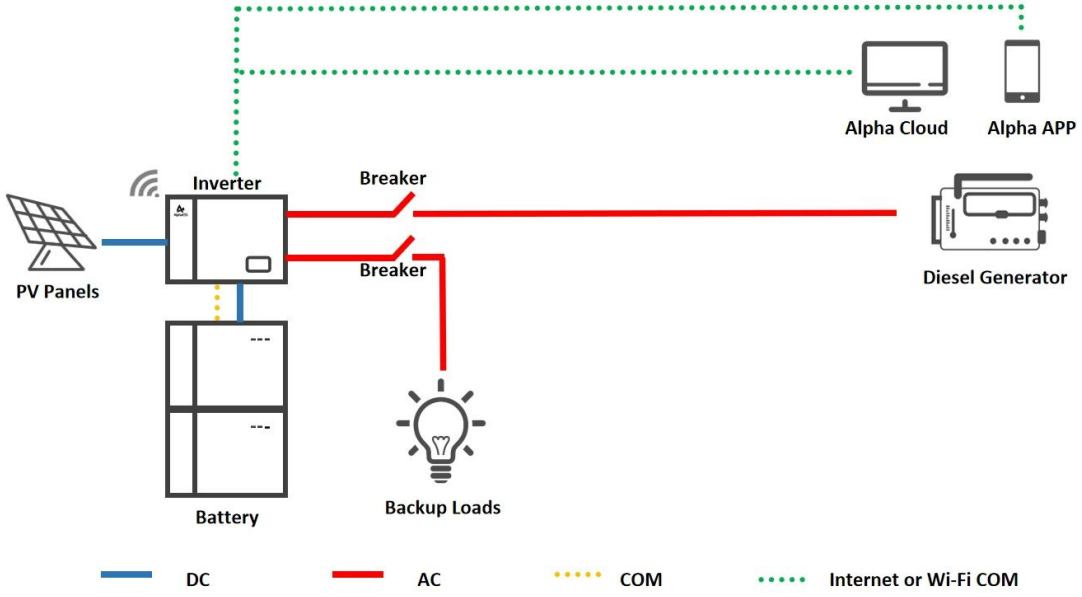


Figure 3-9 Off-Grid (with Generator) Storage System – Scheme

NOTES:

1. In all cases, Normal Loads and Essential Loads must be appropriately protected by earth fault protection devices (e.g. Type A or Type B RCDs, RCBOs) in accordance with appropriate Standards.
2. Backup/Essential Loads should not exceed the rated capacity of the inverter, even during on-grid operation.

4. Storage and Transport

4.1. Storage

4.1.1. Inverter Storage

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

1. Do not unpack the inverter.
2. Keep the storage temperature at -40~60°C and the humidity at 5%~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 any damaged packaging promptly.
6. The inverters stored for more than 2 years should be inspected and tested before being put into service.

4.1.2. Battery Storage

The following requirements should be met if the battery is not put into immediate use:

1. Place batteries according to the signs on the carton during storage.
2. Stack battery cartons in accordance with the stacking requirements printed on the external carton.
3. Store the battery out of reach of children and animals.
4. Store the battery in an area where there is minimal dust and dirt.
5. Handle batteries with care to avoid damage.
6. The requirements for the storage environment are as follows:

- Ambient temperature: -10~55°C, recommended storage temperature: 15~30°C
- Relative humidity: 15%~85%
- Place batteries in a dry, clean, ventilated location free from dust.
- Store batteries in a place that is away from corrosive organic solvents and gases.
- Keep batteries away from direct sunlight.
- Keep batteries at least 2 meters away from heat sources.

7. The batteries in storage must be disconnected from external devices and the indicators (if any) on the batteries should be off.
8. Warehoused batteries should be delivered based on the "first in, first out" stock control.

9. The warehouse keeper should collect battery storage information every month and report to the planning department. Batteries stored for more than 6 months should be assessed and charged periodically.
10. Capacity loss may occur if a lithium battery is stored for a long time. After a lithium battery is stored for 12 months in the recommended storage temperature, the irreversible capacity loss rate is 3%~10%. It is recommended that batteries not be stored for a long period. If the batteries need to be stored for more than 6 months, it is recommended to recharge the batteries to 65~75% of the SOC.

4.2. Transport

During transportation, please follow these guidelines:

1. Use the original packaging for transportation. If the original packaging is not available, place the product inside a suitable cardboard box with adequate protection and seal the carton.
2. Handle with care, choose the corresponding handling method according to the weight, and pay attention to safety. Mechanical aids should always be used in preference to lifting by hand.

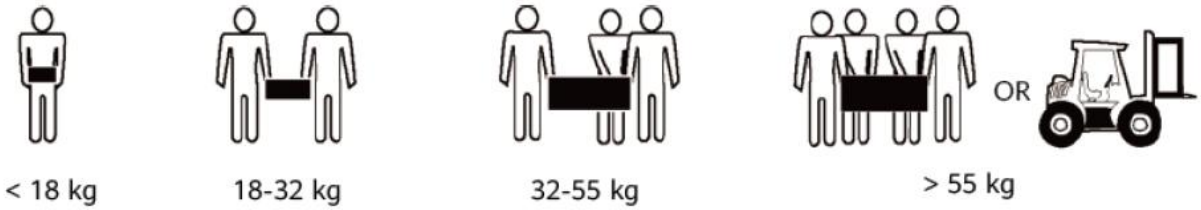


Figure 4-1 Handling methods for batteries of different weights

3. Keep the packaging dry and away from potential sources of damage during transportation.
4. Secure the Product during transportation to prevent falling or mechanical impact.

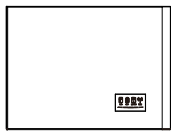
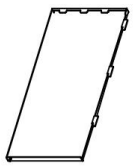
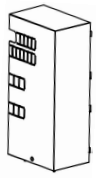
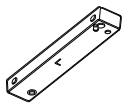
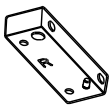
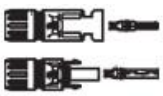
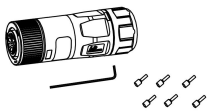
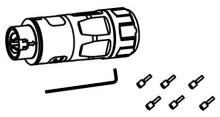
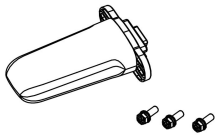
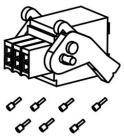
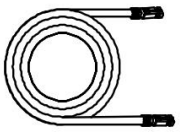
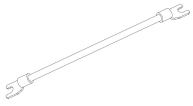
5. Mounting

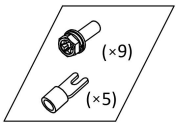
5.1. Checking the Outer Packaging

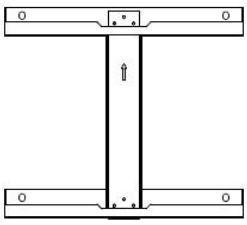
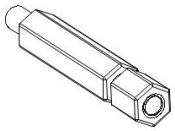
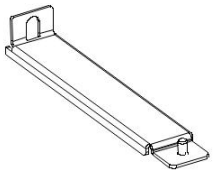
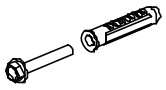
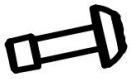
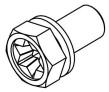
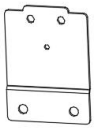
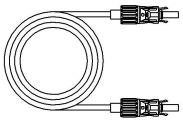
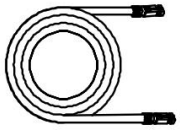
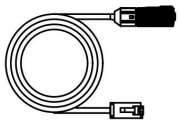
Before unpacking the product, check the outer packaging for damage, such as holes, signs of mechanical damage or water damage. If any damage is found, do not unpack the product and contact your dealer as soon as possible.

5.2. Scope of Delivery

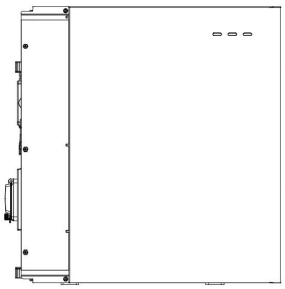
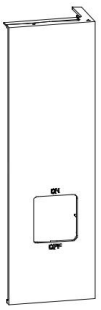
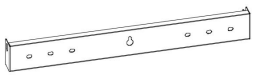
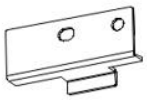
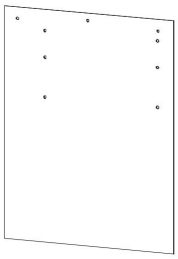
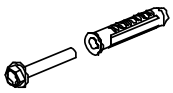
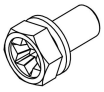
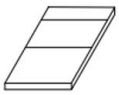
Check the scope of delivery and inspect components to ensure they are present and undamaged.
Contact your distributor if the packed components are incomplete or damaged.

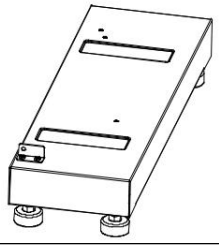
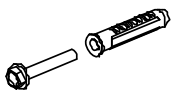
SMILE-G3 Three Phase Inverter				
				
Inverter (×1)	TOP Cover (×1)	Right Cover (×1)	Cable Cover (×1)	Left Support Foot (×1)
				
Right Support Foot (×1)	PV+ & PV- Connectors (×3)	Grid Plug Connector (×1)	Backup Plug Connector (×1)	Wi-Fi Dongle (×1)
				
6 Pin AUX Terminal Block (×2)	Series Battery Main Positive Power Cable (×1)	Series Battery Main Negative Power Cable (×1)	Grounding Cable Between INV and 1st Battery (×1)	Connector removal wrench (×1)

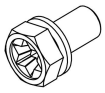
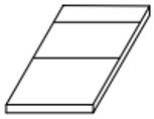
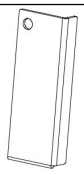
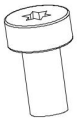
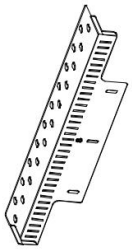
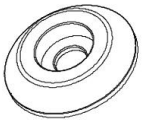
				
Hexagon Head Screws M5*12 and Terminals OT16-5 Set (×1)	Documentation (×3)			

(Optional) Wall Bracket of SMILE-G3 Three Phase Inverter			
			
Wall Bracket (×1)	Support Stud for Right Cover (×1)	Support Plate for Cable Cover (×1)	Support plate for cable cover (×1)
			
Hooks for Wall Bracket (×4)	Wall Anchor ST6*55 (×4)	Screw M4*10 (×2)	Hexagon Head Screw M5*12 (×8)
			
Connector for Wall Brackets (×2)	Series Battery Main Positive Power Cable (×1)	Series Battery Main Negative Power Cable (×1)	Communication Cable between Inverter and 1st Series Batteries (×1)

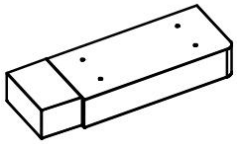
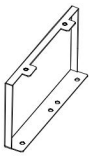
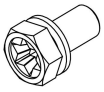
SMILE-G3-BAT-9.3S

			
Battery (×1)	Battery Cable Cover (×1)	Limit Bracket (×1)	Grounding Bar (×1)
			
Positioning Cardboard (×1)	Wall Anchor ST6*55 (×4)	Hexagon Head Large Washer Screw M5*12 (×4)	Ring Removal Wrench (×1)
			
Quick Installation Guide (×1)			

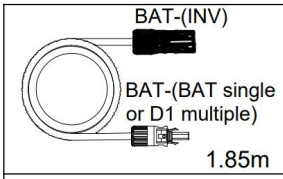
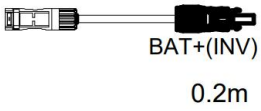
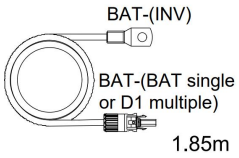
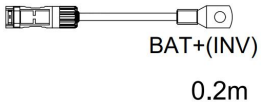
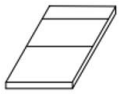
Base Unit of SMILE-G3-BAT-9.3S			
			
Base Unit (×1)	Fixing Bracket (×2)	Right Connection Block (×1)	Wall Anchor ST6*55 (×4)

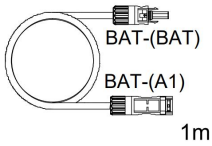
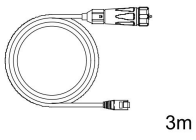
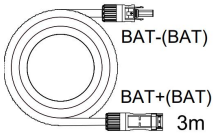
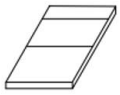
		a 	b 
Hexagon Head Screw M5*12 (×10)	Quick Installation Guide (×1)	Right Connection Plate (indoor) (×4)	Hexagon Head Limit Screw M5*10 (×9)
c 	d 	e 	f 
Top Wall Bracket (×1)	Limit block (×8)	Pan Head Screw M5*10* (×9)	Right Connection Plate (outdoor) (×4)

* a,b,c,d, and e are suitable for series battery installations in other models.
* f is for the installation of SMILE-G3-BAT-9.3S

(Optional) Top Cover Unit of SMILE-G3-BAT-9.3S			
			
Top Cover (×1)	Top Cover Bracket (×2)	Hexagon Head Screw M5*12 (×5)	Countersunk Head Screw M4*8 (×5)

Cable Sets for Battery side Connection between SMILE-G3 Inverters and the first Column Batteries of SMILE-G3-BAT-9.3S

			
Series Battery Main Negative Cable between SMILE-G3-T10 Series Inverter and the first Column Batteries of SMILE-G3-BAT-4.5S/9.3S (×1)	Series Battery Main Positive Cable between SMILE-G3-T10 Series Inverter and the first Column Batteries of SMILE-G3-BAT-4.5S/9.3S (×1)	Series Battery Main Negative Cable between SMILE-G3-T20/S5 Series Inverter and the first Column Batteries of SMILE-G3-BAT-4.5S/9.3S (×1)	Series Battery Main Positive Cable between SMILE-G3-T20/S5 Series Inverter and the first Column Batteries of SMILE-G3-BAT-4.5S/9.3S (×1)
			
M5 Y Type Terminal (×3)	BAT Connector Disassembling Tool (×1)	Quick Installation Guide (×1)	

Cable Sets for Distanced Horizontal Battery Expansion of SMILE-G3-BAT-9.3S			
			
Main Negative Power Extension Cable (×1)	Communication Cable between two Column Series Batteries (×1)	Power Cable between two Column Series Batteries (×1)	M5 Y Type Terminal (×3)
			
Connector removal wrench (×1)	Quick Installation Guide (×1)		

5.3. Requirements for Mounting

DANGER

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

1. Inverter SMILE-G3-T5/T10-INV is suitable for indoor and outdoor installation.
2. Battery SMILE-G3-BAT-9.3S is suitable for indoor and outdoor installation.
3. Do not install the inverter in a place where people can easily touch it because the inverter's surface will get extremely hot during operation.
4. Do not engage screws into the threaded holes using a Hammer Driver, Impact Driver or "Rattle gun". Do not damage screws or threaded holes by tightening with too much torque.

5.3.2. Mounting Environment Requirements

1. Do not mount the ESS outdoors in areas of high salt mist likelihood where corrosion may cause damage. An area of high salt mist likelihood refers to a region within 500m from the coast or prone to the sea breeze.
2. The system must be mounted in a well-ventilated environment to ensure adequate heat dissipation.
3. Do not mount in a location that will be exposed to direct sunlight. Mount the system in a sheltered place or mount an awning over it. When mounted under direct sunlight, the power of the system may be derated due to additional temperature rise and the longevity of the product will be reduced.
4. Favour locations that are indoors, under cover, or generally protected from the elements and extreme temperatures (e.g. in a garage). If the battery is mounted in the garage, ensure the product is adequately protected from potential mechanical impact.
5. The optimal temperature range for the battery to operate is 15 to 30 ℃.
6. Do not place the system near water sources such as downpipes or sprinklers.

5.3.3. Mounting Structure Requirements

1. The surface to which the batteries is to be mounted shall be fire-rated where required by local regulations.
2. Out of an abundance of caution, it is recommended that the system be mounted on non-flammable building materials, even when not required by local regulations.
3. Ensure that the mounting surface is sufficiently sturdy to bear the weight of the product.
4. In residential installation, do not mount the system on drywalls or walls made of gyprock or similar materials with poor sound insulation. The noises generated by the

inverter can be noticeable and may be exacerbated by locations with poor insulation or where echoing may occur.

5. The mounting location must be suitable for the weight and dimensions of the product (see Section 5.3.5).

5.3.4. Mounting Angle and Stack Requirement

The battery should be mounted on the base unit or hanged on the wall bracket and secured to the wall.

The inverter should be placed on the top of the battery and secured to the battery.

The installation angle requirement is as follows:

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

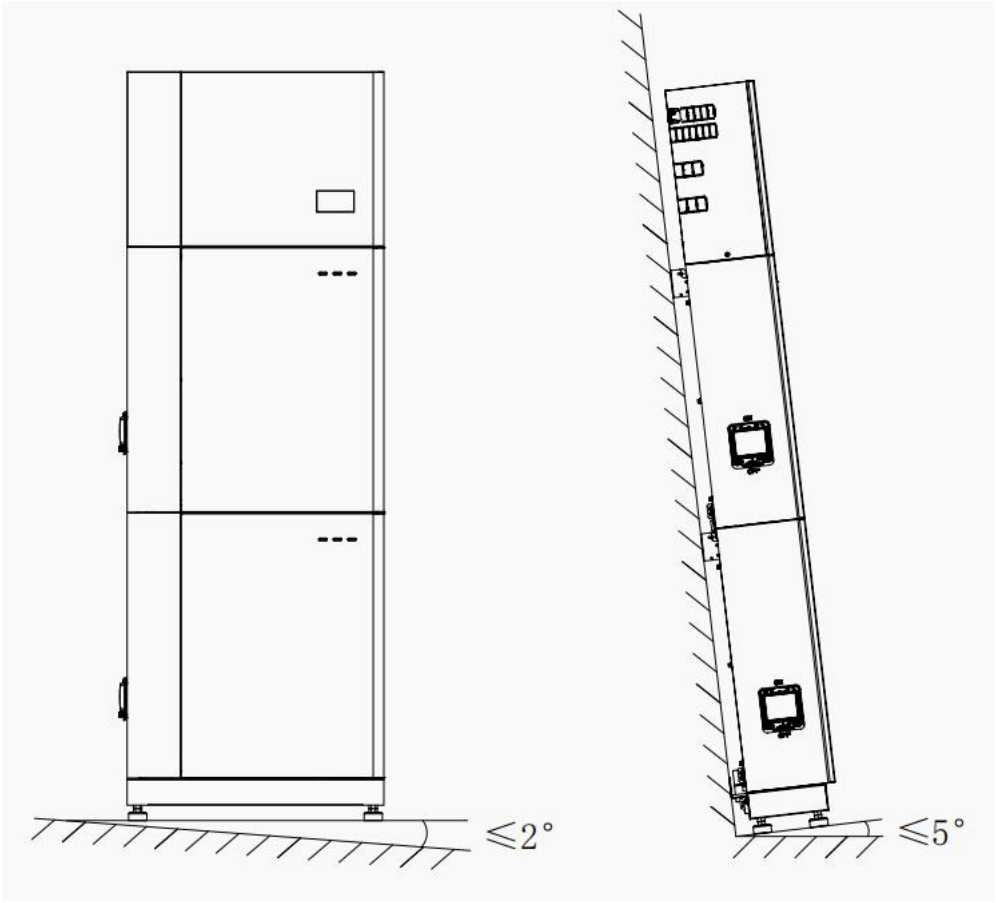


Figure 5-1 Product installation diagram

5.3.5. Mounting Space Requirements

1. Reserve sufficient space around the energy storage system to ensure sufficient space for installation, maintenance and heat dissipation.
2. Recommend a minimum of 100 mm off the ground was advisable to protect from submergence, so the series batteries should be mounted by wall brackets or base unit.
3. The side clearance is a recommendation which can be adjusted according to the end-users requirements. Clearances may be up to 100mm less than noted if ventilation is

adequate and no restrictions or objects will limit access to the labelling or switches of the Product or to the use of tools to remove covers or service/remove the Product.

For Australia, according to ASNZ5139-2019-4.2.2.2, the non-combustible material needs to be placed between the wall and the battery unit and must extend 600 mm to the left and right of the battery and 900 mm above it.

Recommended clearances for SMILE-G3-T5/T10 system with SMILE-G3-BAT-9.3S

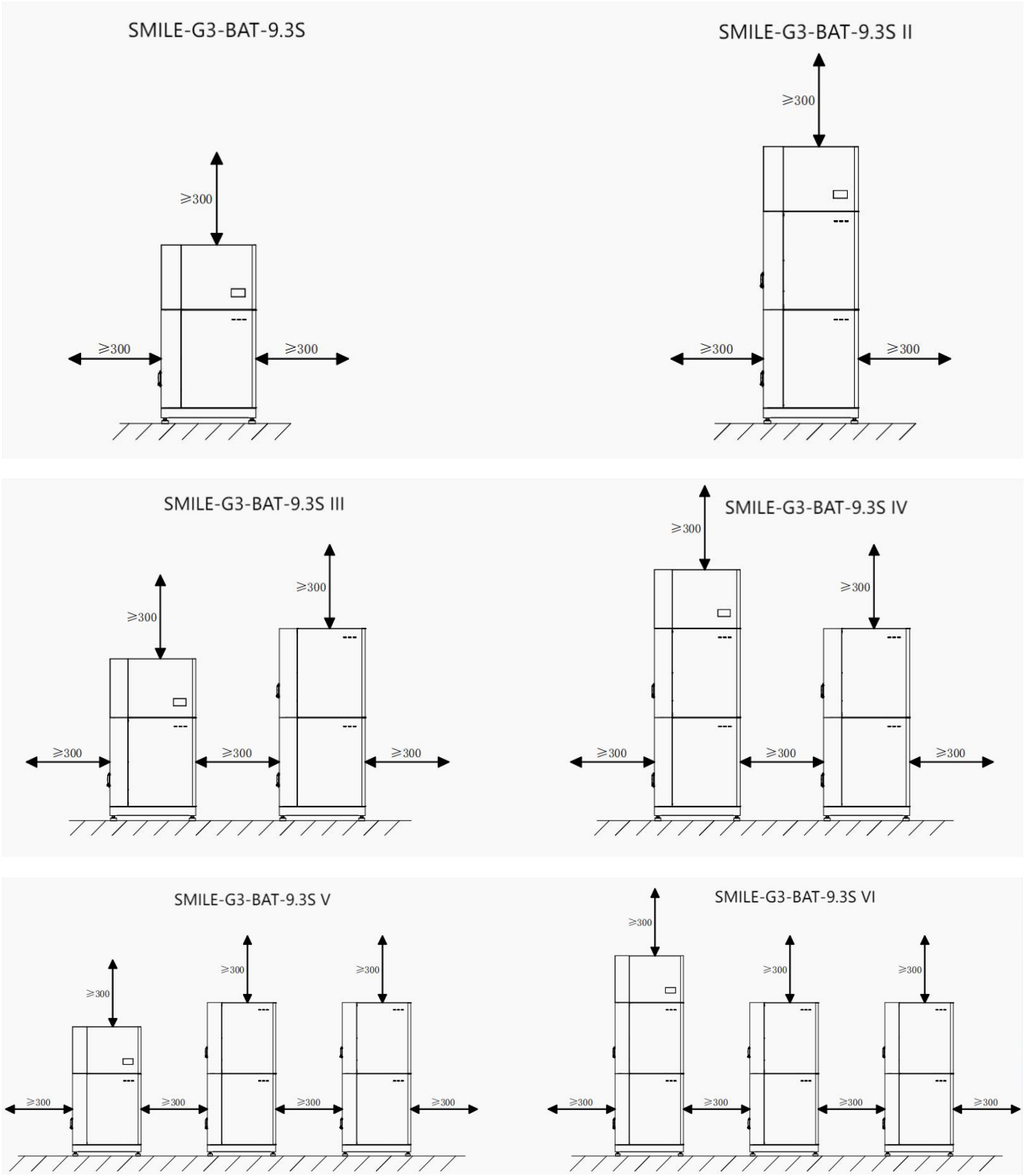
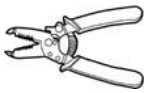
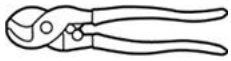
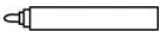


Figure 5-2 Installation space requirements

5.4. Preparing Tools and Instruments

Category	Tools and Instruments		
Installation			
	Hammer drill (with a Φ10 mm drill bit)	Socket wrench SW8&SW10	Multimeter (DC voltage range ≥ 1000 V DC)
			
	Diagonal pliers	Wire strippers	T20/PH2 screwdriver (torque range: 0~5 Nm), L=150mm
			
	Rubber mallet	Utility knife	Cable cutters
			
	Crimping tool (model: PV-CZM-22100)	Bootlace/Ferrule terminal crimper	Connector removal wrench
			
	Vacuum cleaner	Heat shrink tubing	Heat gun
			
	Marker	Measuring tape	Spirit level
Personal Protective Equipment			
	Safety gloves	Safety goggles	Anti-dust respirator

			
	Safety shoes		

5.5. Mounting the System

5.5.1. Mounting the Series Battery

5.5.1.1 Base Unit Installation for Battery SMILE-G3-BAT-9.3S

When mounting multiple series batteries SMILE-G3-BAT-9.3S with base unit, please follow the below steps.

1. Take out the right connection block from the package and tighten it to the rear right side of the battery base (tool: T20 screwdriver, torque: 2.5 Nm).

1. Take out two fixing brackets and place them against the rear side of the battery base, secure the two fixing brackets using the M5*12 screws (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 1-2 in Figure 5-3.

2. Place the battery base unit against the wall, place the spirit level on the battery base, check the bubbles and adjust the feet to level the battery base unit, then mark the position of the drill holes. Refer to 3 in Figure 5-3.

3. Take out the positioning cardboard, fold 90 degrees according to the markings, place the bottom surface of the positioning cardboard on the base unit and let the right edges flush, then mark the position of the drill holes. Refer to 4 in Figure 5-3.

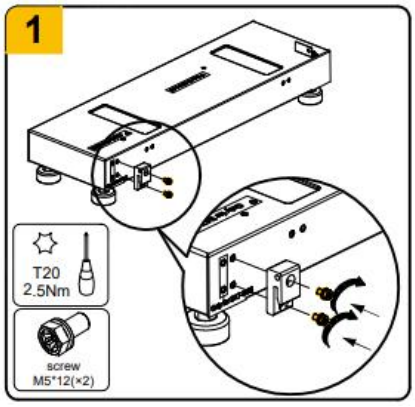
4. Remove the base unit, drill 5 holes in the wall with a Φ10 drill to a depth of about 70mm and clean the holes and insert screw anchors into the drill holes. Refer to 5 in Figure 5-3.

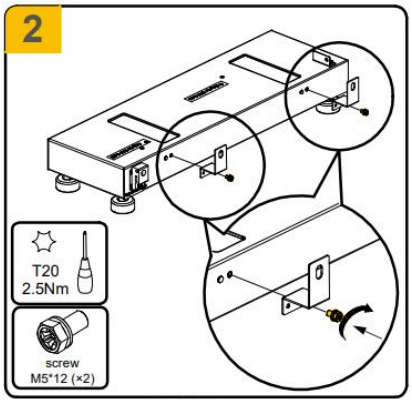
5. Secure the two fixing brackets to the wall using the provided screws (tool: Socket wrench SW8, torque: 6 Nm). Secure the limit bracket to the wall using the provided screws (tool: Socket wrench SW8, torque: 6 Nm). Refer to 6 in Figure 5-3.

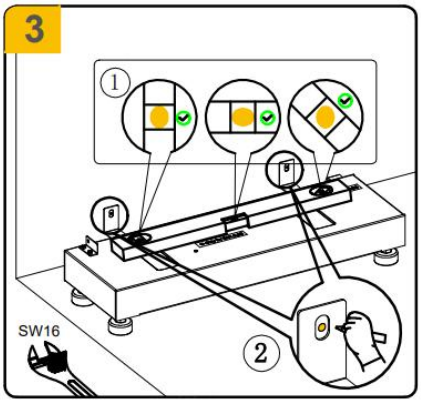
6. Unscrew the screw at the lower left of the first battery. Lift the battery by using the handles at two sides, place the battery on the top of the battery base unit, align their contours and ensure that the battery is securely in place. Refer to 7 in Figure 5-3.

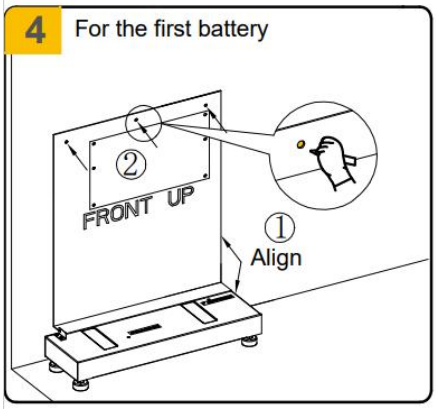
7. Secure the battery to the battery base unit, tighten them with one screw M5*12 from the lower left of the battery (tool: T20 screwdriver, torque: 2.5 Nm). Take out one right connection plate (outdoor) from the battery base package, use it to connect the lower right corner of the first battery and the upper right corner of the base unit (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 8 in Figure 5-3.

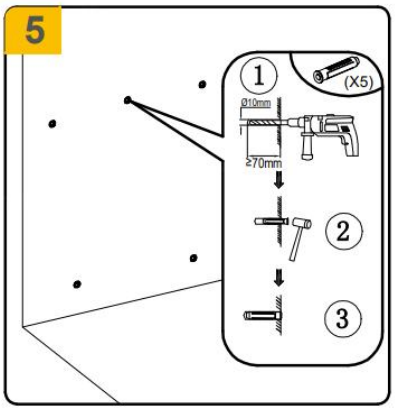
8. Secure the battery to the limit bracket on both sides with a screw M5*12 provided. Use a magnetized screwdriver to insert a screw into the upper screw hole of the limit bracket and tighten it (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 9 in Figure 5-3.
9. Take out the positioning cardboard, fold 90 degrees according to the markings, place the bottom surface of the positioning cardboard on the top of the first battery and let the right edges flush, then mark the position of the drill holes. Refer to 10 in Figure 5-3.
10. Cover the top of the battery with the initial packaging bag. Drill 3 holes in the wall with a Φ10 drill to a depth of about 70mm and clean the holes and insert screw anchors provided into the drill holes. Refer to 11 in Figure 5-3.
11. Secure the limit bracket to the wall using the provided screws (tool: Socket wrench SW8, torque: 6 Nm). Refer to 12 in Figure 5-3.
12. Take out the second battery from the package. Lift the second battery by using the handles at two sides, place the second battery on the top of the bottom battery, align their contours and ensure that the second battery is securely in place. Refer to 13 in Figure 5-3.
13. Secure the battery to the limit bracket on both sides with a screw M5*12 provided. Use a magnetized screwdriver to insert a screw into the upper screw hole of the limit bracket and tighten it (tool: T20 screwdriver, torque: 2.5 Nm).
14. Up to 3 batteries can be installed in a single column. Please repeat steps j to n if you want to install the third battery.
15. Take out the grounding bars from the battery package, and use it to connect the lower left corner of the upper battery and the upper left corner of the lower battery (tool: T20 screwdriver, torque: 2.5 Nm). When doing so, unscrew the two screws before connecting the grounding bar. Refer to 14 in Figure 5-3.
16. If you want to mount more batteries, please repeat the above mounting steps to mount the second column batteries. Refer to 15 in Figure 5-3.

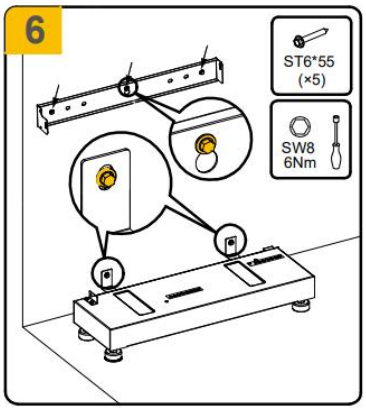

1
T20
2.5Nm
screw
M5*12(×2)

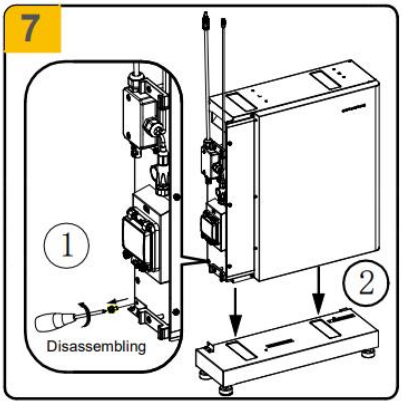

2
T20
2.5Nm
screw
M5*12 (×2)

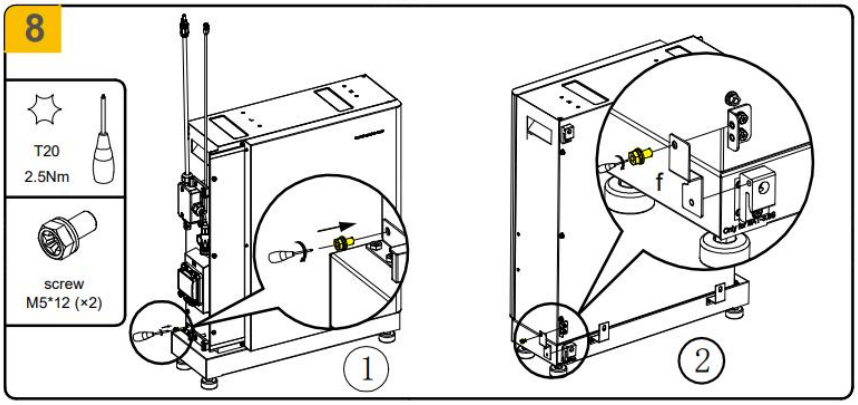

3
SW16
2

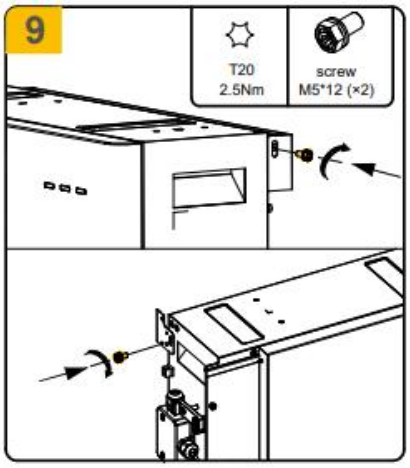

4
For the first battery
FRONT UP
Align

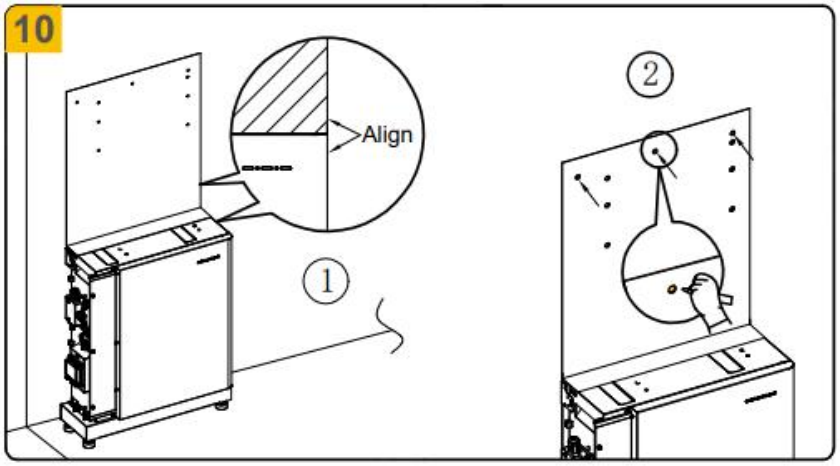

5
(X5)
Ø10mm
≥70mm


6
ST6*55
(×5)
SW8
6Nm


7
Disassembling


8
T20
2.5Nm
screw
M5*12 (×2)
f


9
T20
2.5Nm
screw
M5*12 (×2)


10
Align

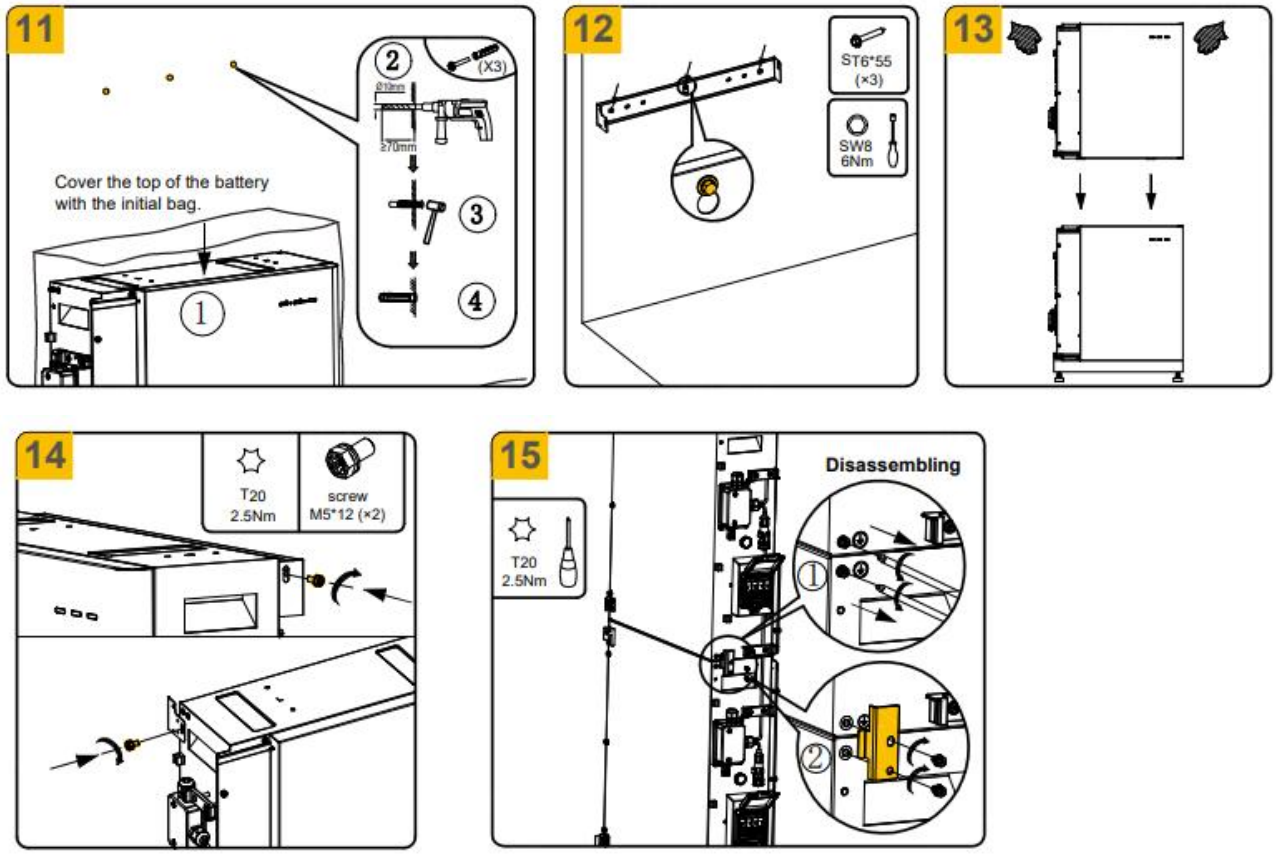


Figure 5-3 Battery Base Installation Steps Diagram

5.5.1.2 Mounting the top Cover of the Battery

Mount the top cover on the battery top, detailed steps as follows:

17. Take out the top cover support from the package.

Mount two top cover supports onto the top of the second column battery with four hexagon head screws M5*12 (tool: T20 screwdriver, torque: 2.5 Nm).

18. Take out the top cover from the package.

Mount the top cover onto the top of two top cover supports with four countersunk head screws M4*8 (tool: T20 screwdriver, torque: 1.6 Nm).

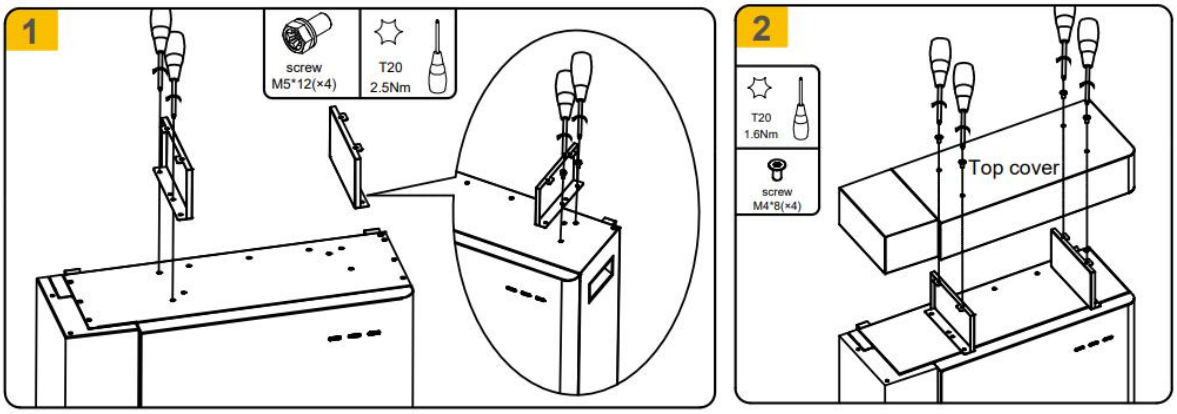


Figure 5-4 Battery top cover installation

5.5.2. Mounting the Inverter

Mount the inverter standing on the battery

19. Take out the left support foot and right support foot from the inverter package.
20. Mount the left support foot and right support foot onto the top of the upper battery. Refer to 1 in Figure 5-5.
21. Place the inverter onto the two support feet.
    Ensure the lower right and left holes on the bottom of the inverter align to and insert into the respective guides in the support feet. Refer to 2 in Figure 5-5.
22. Attach the inverter to the side support feet. The inverter mounting holes should align to the horizontal holes of the side support feet. Note that the inverter sits inside (between) the two feet and is secured with two screws on the left and right sides. Refer to 3 in Figure 5-5.

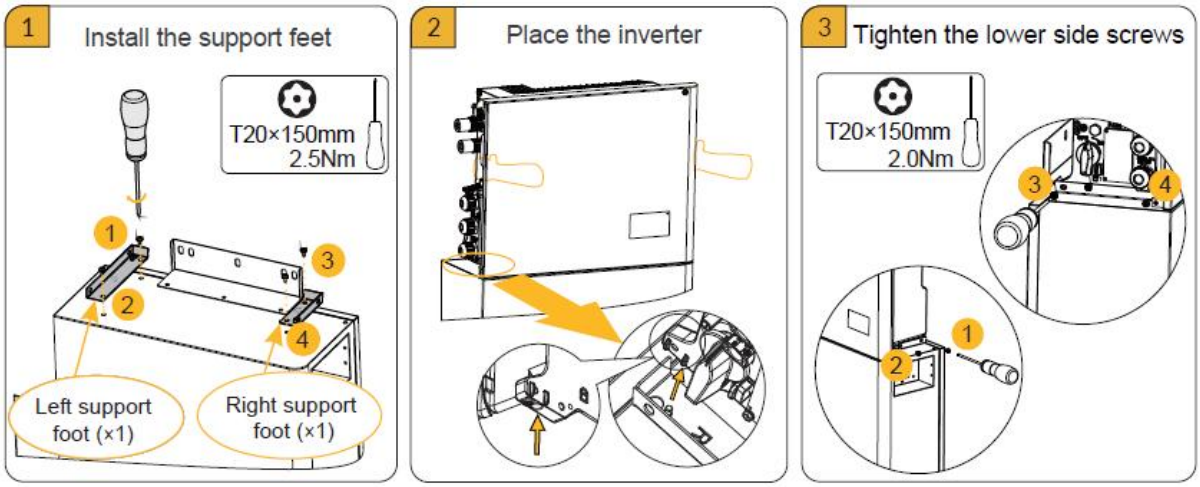


Figure 5-5 Inverter installation diagram

Mount the inverter on the wall using the bracket.

1. Take out the wall bracket of the energy storage inverter from the package.
2. Select a suitable height to mount batteries below later.
3. Please reserve enough height if you want to add more batteries later.
4. Mark the four drilling positions of the wall bracket, and drill the marked hole with drill Φ10. Insert screw anchors into the drilling holes.
5. Ensure that the wall bracket is placed horizontally using a spirit level before securing it. Secure the wall bracket to the wall using the provided screws (tool: Socket wrench SW8, torque: 6 Nm).Refer to Figure 5-6 below.

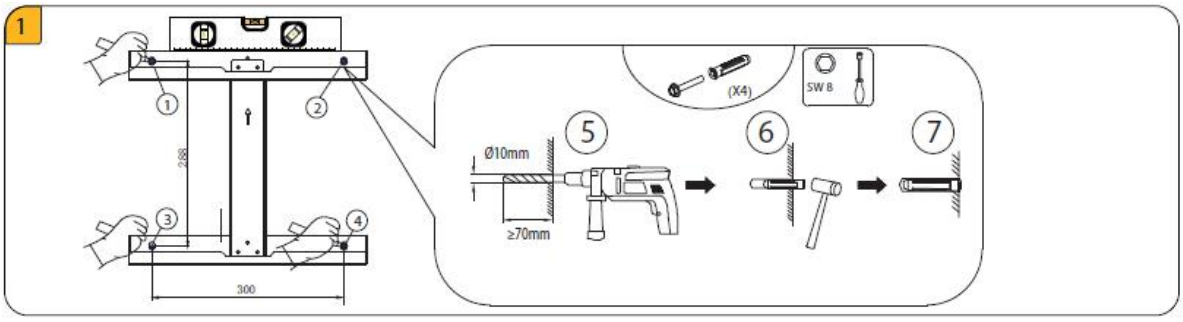


Figure 5-6 Inverter bracket fixation diagram

6. Take out the left support foot and right support foot, mount them to the lower right and left edges on the bottom of the inverter with screws M5*12 (tool: T20 screwdriver, torque: 2.0 Nm).

7. Take out the four hooks for wall bracket from the package, assemble them with screws M5*12 (tool: T20 screwdriver, torque: 2.5 Nm). Refer to Figure 5-7 below.

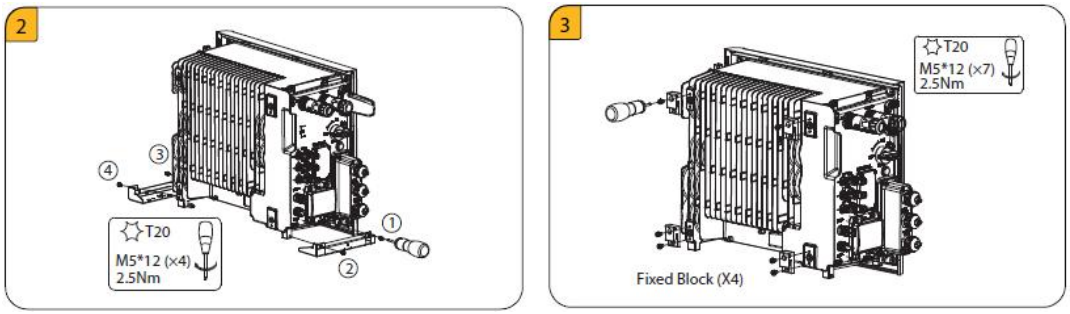


Figure 5-7 Four hooks fixation diagram

8. Hook the inverter onto the wall bracket.

9. Secure the inverter to the wall bracket. Insert the hexagon head screws M5*12 into the lower and upper threaded holes on both sides of the inverter hanging hooks respectively and tighten them. Ensure that the inverter is securely in place. Refer to 3 in Figure 5-8.

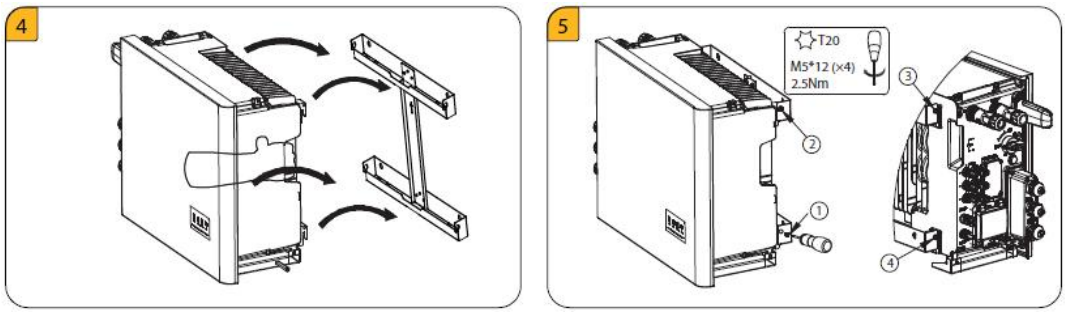


Figure 5-8 The inverter is connected to the bracket diagram

5.5.3. Battery Installation for Battery-Ready Application

Battery Ready scenario is that end users initially only installed hybrid inverter as PV inverter but did not install batteries, later the users decide to install the batteries. At this section we will introduce how to mount the first series battery, please follow these steps.

1. Take out the wall bracket from battery package and two connectors for wall brackets from inverter wall bracket package, assemble them with M5 nuts (tool: Socket wrench SW8, torque: 2.5 Nm). Refer to 1 in Figure 5-9.
2. Align the upper holes of the two connectors for battery wall bracket to the lower rivets of the wall bracket of the hybrid inverter, mark the drilling position of the newly wall bracket of the series battery. Refer to 2-3 in Figure 5-9.
3. Remove the newly assembled battery wall bracket, drill the marked hole with drill Φ10. Insert screw anchors into the drilling holes, tighten the screws with the SW8 socket wrench to secure the wall bracket to the wall. Refer to 4-6 in Figure 5-9.

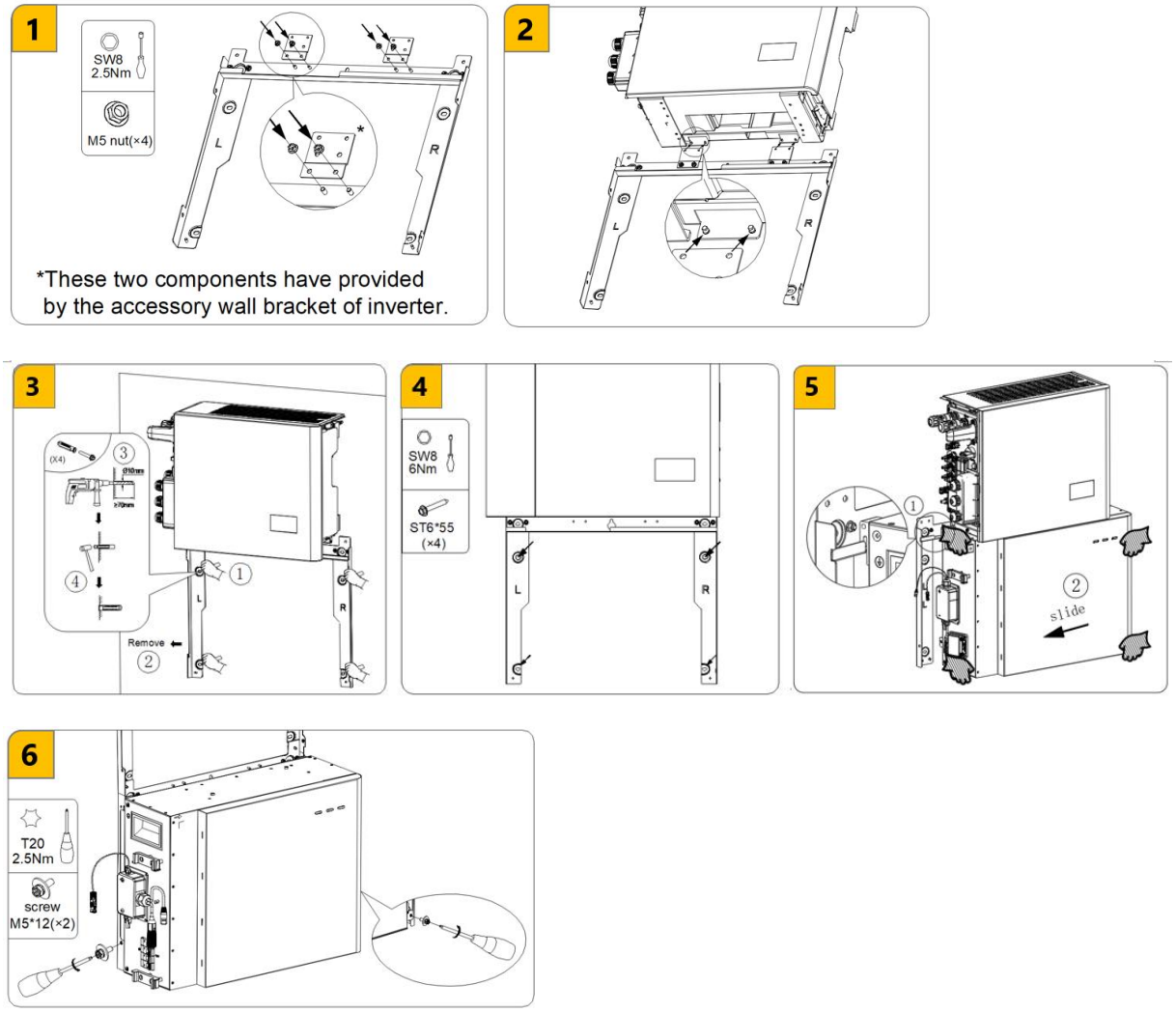


Figure 5-9 the first series battery installation

5.5.4. Mounting the Wi-Fi Module

Mount the Wi-Fi module at the left of the inverter, detailed steps as follows:

1. Remove the protective cover of Wi-Fi port at the left of the inverter.

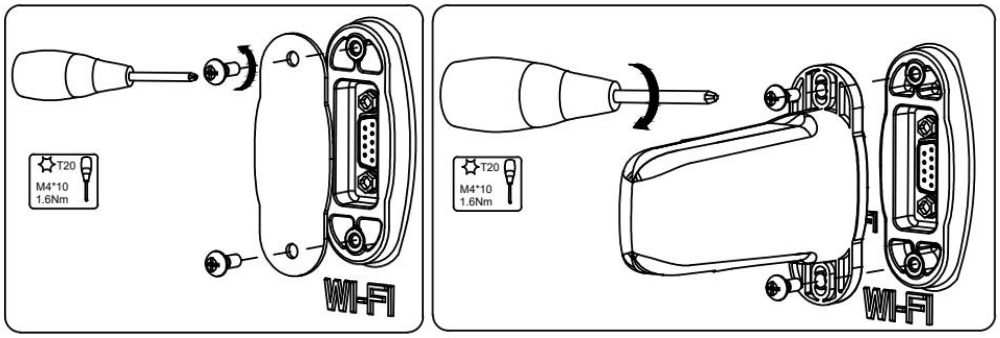


Figure 5-10 Installation diagram of Wi-Fi adapter

2. Tighten the Wi-Fi module onto the inverter with two M4*12 screws provided (Tool: T20 screwdriver, torque: 1.6Nm). DO NOT OVERTIGHTEN – do not damage the plastic housing of the Wi-Fi module. Note that Alpha always recommends a LAN cable connection over the use of a Wi-Fi module.

6. Electrical Connection

Precautions

DANGER

Electric Shock Hazard - Before connecting cables, switch off all circuit breakers and switches connected to the inverter and batteries.

CAUTION

- Damage to the energy storage system caused by incorrect cable connections is not covered under warranty.
- Only certified electricians accredited by Alpha are allowed to connect cables.
- Appropriate PPE must be worn when installing or connecting the product.

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	PV Power cable	Standard PV cable (recommended type: H1Z2Z2-K)	4~6 mm2	5.5~9 mm	Prepared by the installer
2*	Signal cable	Standard network cable (recommended type: Cat5e, SFTP, UV-resistant for outdoor use)	0.12~0.2 mm2 (AWG26~AWG24)	4~6 mm	Prepared by the installer
3**	Signal cable	Two-core outdoor shielded twisted pair copper cable	0.5~1.5 mm2	4~6 mm	Prepared by the installer
4***	Signal cable	Outdoor shielded twisted pair copper cable	0.5~1.3 mm2	4~6 mm	Prepared by the installer

5	AC power cable	Five-core (L1, L3, L3, N and PE) outdoor copper cable	4~6 mm2	13 ~17.5 mm	Prepared by the installer
6	PE cable	Single-core outdoor copper cable	2.5~6 mm2	N/A	Prepared by the installer

* For RS485, LAN, three-phase meter (with CT), DRM&RRCR communication connection with inverter.

** For three-phase meter (without CT) communication connection with inverter.

*** For AUX communication connection with inverter.

6.2. Grounding Connection

CAUTION

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 accidentally or unintentionally reactivated.

A grounding point is provided near the grid connector of the energy storage inverter.

Take out M5 Y terminals, strip the grounding cable insulation, insert the stripped conductor into the ring terminal lug and crimp with a crimping tool.

Connect the grounding terminal to the inverter (tool: T20 screwdriver, torque: 2.5 Nm).

Grounding connection for the energy storage inverter.

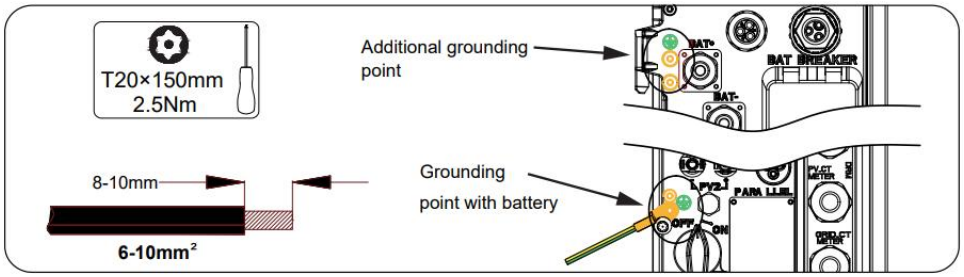
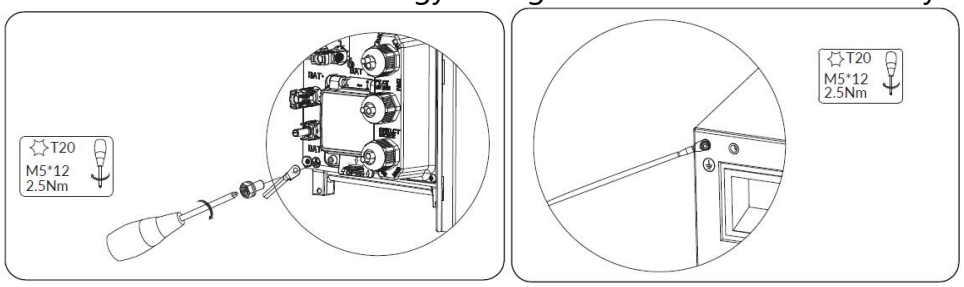


Figure 6-1 Grounding connection of the energy storage inverter

Grounding connection between the energy storage inverter and series battery.



Inverter side Battery side

Figure 6-2 Grounding connection and series battery

6.3. AC Connection

6.3.1. Requirements for the AC Connection

- AC cable requirements as follows:Conductor type: copper conductor (tinned copper preferred).
- Grid cable current carrying capacity depends on the inverter model selected and max. full current from grid, example for 10kW inverter model, max. current: 21.7 A.
- Backup cable current carrying capacity depends on the inverter model selected and loads connected when the mains grid is available, example for 10kW inverter model, max. current: 21.7 A.

Note: Account for temperature derating and voltage drop/rise when selecting wire diameters. 110 °C or higher rated cable derates slower as temperatures increase.

Description	External diameter	Conductor cross-section	Insulation stripping length	Sheath stripping length
Grid connector Backup connector	13~17.5 mm	4~6 mm^2	10 mm	43 mm

DANGER

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

CAUTION

Residual-current monitoring unit

The inverter is equipped with an all-pole sensitive residual-current monitoring unit in accordance with IEC/EN 62109-2 and VDE 0126-1-1. The all-pole sensitive residual-current monitoring unit monitors AC and DC residual currents.

It disconnects the inverter redundantly from the utility grid in the event of residual current jumps of > 30 mA. If the residual current monitoring unit malfunctions, the inverter is immediately disconnected from the utility grid at all poles. If the protection by automatic disconnection of supply according to DIN VDE 0100-410 is fulfilled by an appropriate overcurrent protective device, the inverter does not require an external residual-current device for safe operation. If local regulations require the use of a residual-current device, the following must be observed:

- The inverter is compatible with type A and B residual-current devices. The rated residual current of the residual-current device must be 30 mA or higher. Each inverter in the system must be connected to the utility grid via a separate residual-current device.
- When using residual-current device with a lower rated residual current, there is a risk

of false tripping of the residual-current device, depending on the system design.

6.3.2. Selecting Suitable AC Circuit Breaker

The general requirements for the selection of circuit breakers are determined by standards and country-specific provisions. The following factors should be considered when selecting a suitable circuit breaker.
Factors influencing the current-carrying capacity of the cable: type of cable used, ambient temperature around the cable, type of cable routing, bundling of cables.
Other influencing factors: loop impedance, mutual heating of circuit breakers, ambient temperature at the circuit breaker, selectivity, type of connected device.
If these factors are ignored, it will increase the risk of the circuit breaker tripping under normal operating conditions.
Selecting Circuit Breakers for the AC supply and Backup output is dependent on the maximum current of the backup circuit and the inverter (if it is force-charged), the model of MCBs used and their derating current rating considering their maximum temperatures. Supplier Datasheets detail temperature derating for their MCBs. Ensure the MCBs used are appropriate for the current and the operating temperature. Otherwise, the risk of the circuit breaker tripping will increase under normal operating conditions.

AC connection recommendation for SMILE-G3-T10-INV

Description	Max. Current	Breaker Type	Recommended Cable Cross Section
Grid Side	21.7 A	32 A	4~6 mm2
Backup Side	21.7 A	32 A	4~6 mm2

6.3.3. Grid and Backup Connection

Where the wire diameter used for the AC connection to or from the battery inverter exceeds the maximum wire diameter for the grid connector plug below (e. g. if a long cable run is required and Voltage Rise Calculations require a wire of greater than 10 mm^2), use an intermediary connection point close to the battery to downsize the wire. Ensure that the short-run wire type is appropriate for the current and temperature (e. g. 180 °C Silicone flex will carry much greater current than vs 90 °C PVC) and use an intermediate MCB at the intermediary connection point if required.

The steps for connecting the grid connector are as follows:

1. Disconnect the PV switch, grid, backup and battery circuit breaker and secure them to prevent reconnection.
2. Strip the AC cable outer insulation by 43 mm.

3. Shorten L1, L2, L3 and N by 3 mm each, so that the grounding conductor is 3 mm longer. This ensures that the grounding conductor is the last to be pulled from the screw terminal in the event of tensile strain.
4. Strip the insulation of L1, L2, L3, N and the grounding conductor 10 mm.
5. If using fine stranded wire, fit L1, L2, L3, N and PE with bootlace ferrules.
6. Disassemble the grid connector plug, pass the swivel nut and threaded sleeve over the AC cable.
7. Insert the five conductors into the screw terminals on the bush insert and tighten the screws using the torque 1.2 Nm with provided tool. Ensure that all conductors are securely fastened in the screw terminals on the bush insert.
8. Insert the threaded sleeve into the bush insert and hear the "click" sound. Screw the swivel nut onto the threaded sleeve.
9. Insert the grid plug connector into the grid connection socket for the grid connection until it audibly snaps into place. When doing so, align the grid plug connector so that the convex rib on the bush insert of the grid plug connector should point to the groove on the grid connection socket first, and then insert the grid plug connector to the grid connection socket.

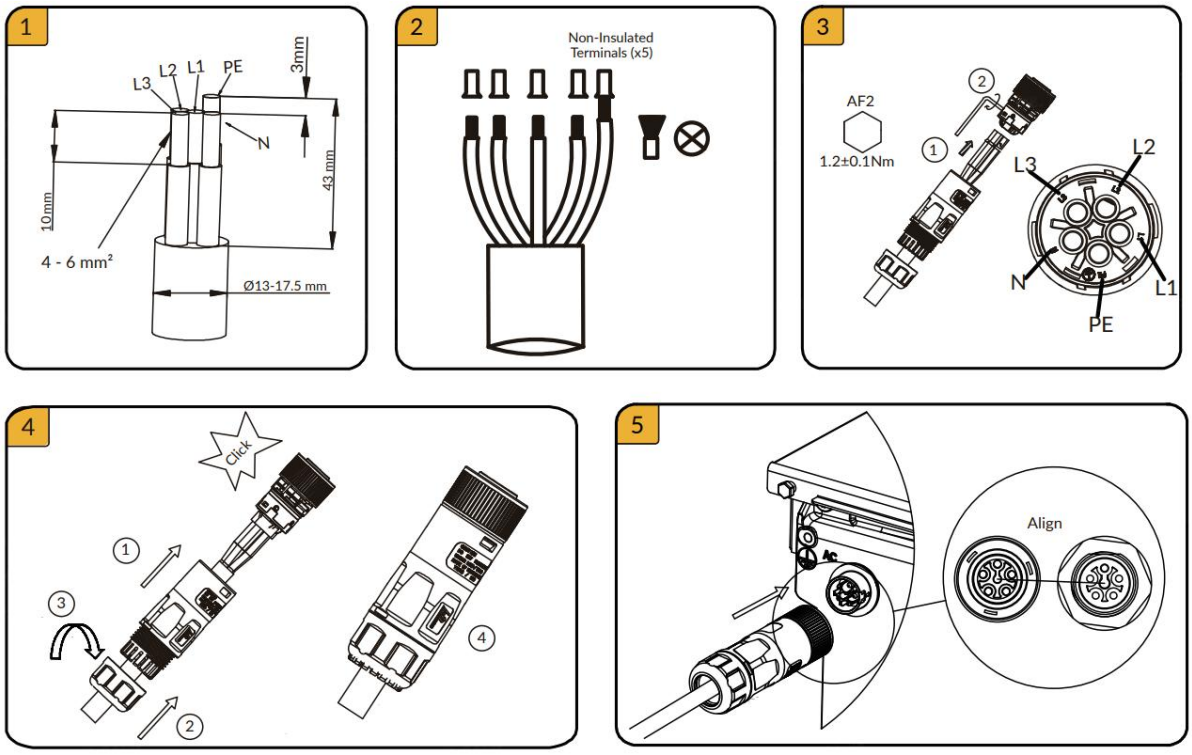


Figure 6-3 Grid connector installation Diagram

The steps for connecting the backup connector as follows:

1. Disconnect the PV switch, grid, backup and battery circuit breaker and secure against reconnection.
2. Dismantle the AC cable by 43 mm.
3. Shorten L1, L2, L3 and N by 3mm each, so that the grounding conductor is 3 mm longer. This ensures that the grounding conductor is the last to be pulled from the screw terminal in the event of tensile strain.
4. Strip the insulation of L1, L2, L3, N and the grounding conductor 10 mm.
5. If using fine stranded wire, fit L1, L2, L3, N and PE with bootlace ferrules.
6. Unscrew the swivel nut from the threaded sleeve and pass the swivel nut and threaded sleeve over the AC cable.
7. Insert the five conductors into the screw terminals on the bush insert and tighten the screws using the torque 1.2 Nm with provided tool. Ensure that all conductors are securely in place in the screw terminals on the bush insert.
8. Insert the threaded sleeve into the bush insert and hear the "click" sound. Screw the swivel nut onto the threaded sleeve.
9. Unplug the backup connector cover. Use a flat-blade screwdriver (blade width: 2.5 mm) to push the orange latch forwards to unlock the connector coupling structure, rotate the backup connector cover anticlockwise, then pull the backup connector cover apart from the backup connection socket.
10. Insert the backup plug connector into the backup connection socket for the backup connection until it audibly snaps into place. When doing so, align the backup plug connector so that the groove on the bush insert of the backup plug connector should point to the convex rib on the backup connection socket first, and then insert the backup plug connector to the backup connection socket.

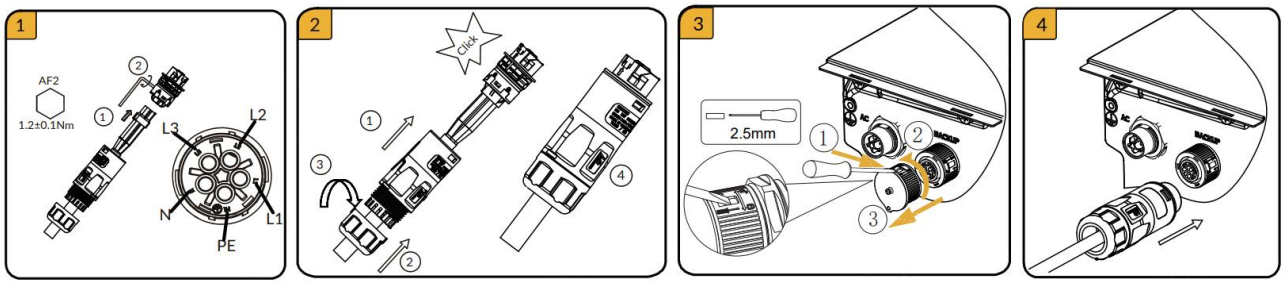


Figure 6-4 Backup connector installation Diagram

6.3.4. Disassembling Grid and Backup Connectors

Disassemble the grid plug connector (e.g. due to faulty assembly), proceed as follows.

1. Unplug the grid plug connector. Detailed steps: use a flat-blade screwdriver (blade width: 2.5 mm) to push the orange latch forwards to unlock the connector coupling structure, rotate the bush insert of the grid plug connector anticlockwise, then pull the grid plug connector apart from the grid connection socket. Do not pull on the cable.
2. Unlock the grid plug connector. To do this, unscrew the swivel nut from the threaded sleeve, then insert a flat-blade screwdriver (blade width: 2.5 mm) into the side catch mechanism and pry the catch mechanism open. Carefully pull the bush insert apart.

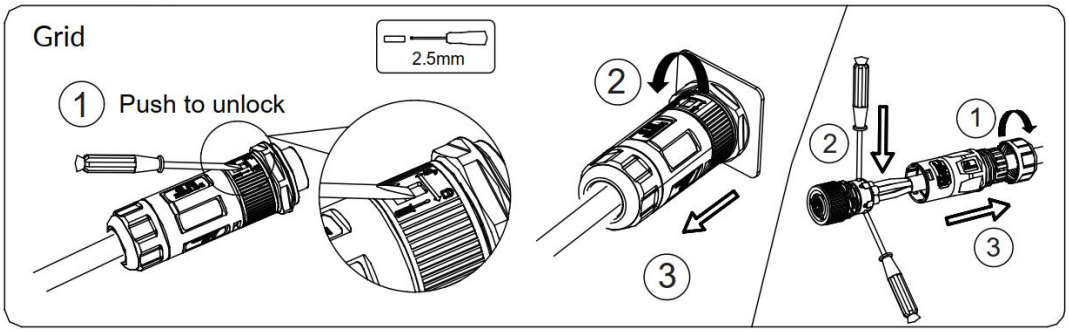


Figure 6-5 Disassembly of Grid connectors

Disassemble the backup plug connector (e.g. due to faulty assembly), proceed as follows.
1. Unplug the backup plug connector. Detailed steps: use a flat-blade screwdriver (blade width: 2.5 mm) to push the orange latch forwards to unlock the connector coupling structure, rotate the bush insert of the backup plug connector clockwise, then pull the backup plug connector apart from the backup connection socket. Do not pull on the cable.
2. Unlock the backup plug connector. To do this, unscrew the swivel nut from the threaded sleeve, then insert a flat-blade screwdriver (blade width: 2.5 mm) into the side catch mechanism and pry the catch mechanism open. Carefully pull the bush insert apart.

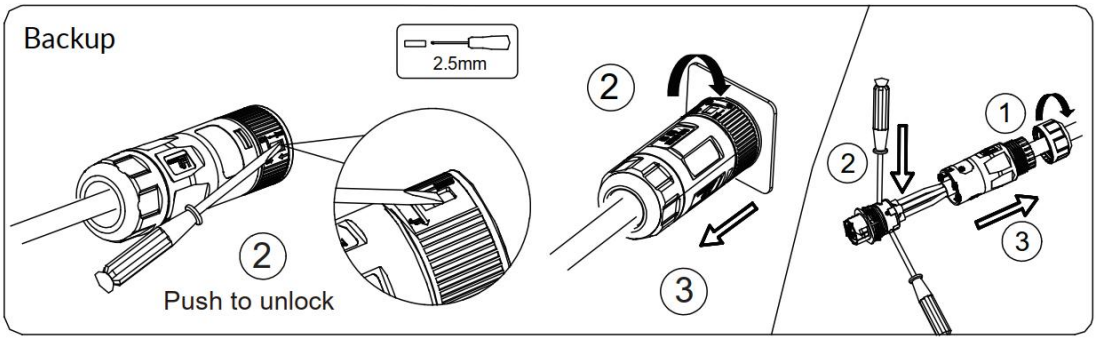


Figure 6-6 Disassembly of Backup connectors

6.3.5. Meter Connection

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

Loosen the strain relief nuts of the cable glands on the COM connection cover of inverter, and unscrew the 4 screws on the corners, then you will see meter communication ports. Any of the meter communication ports can be used.

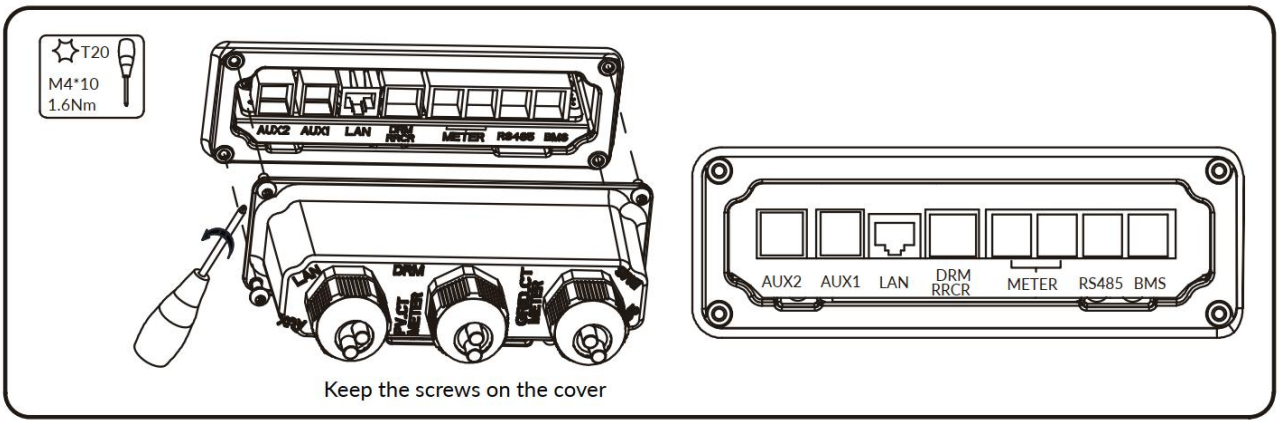


Figure 6-7 Meter connection diagram

6.3.5.1 Meter Wiring

Pass the meter communication cable through the cable gland of the COM connection cover but don't tighten the strain relief nut of the cable gland.
Insert the RJ45 plug of the meter communication cable into the METER communication port labelled "METER" of the inverter.

The other steps for meter connection as follow:
1. DTSU666-3*230V 5(80)A: Three phase meter (without CT) connection

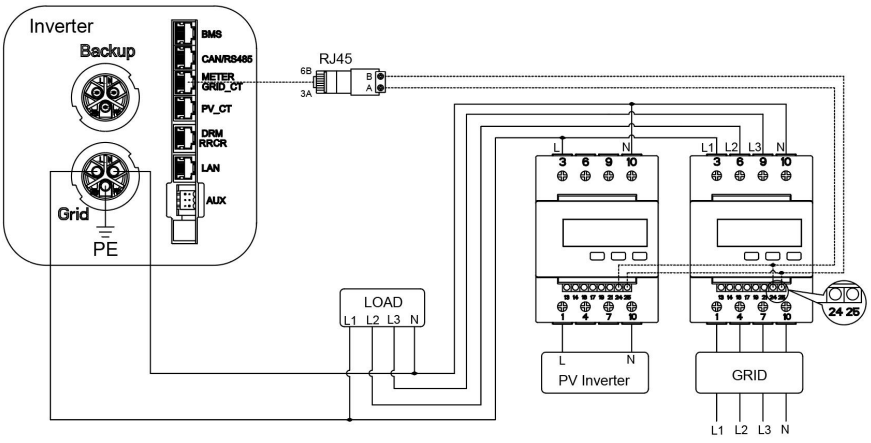


Figure 6-8 Wiring at three-phase feed in

Meter communication cable requirements: two-core outdoor shielded twisted pair copper cable (flexible), conductor cross-section 0.5~1.5 mm^2, wires terminal should be fitted with bootlace ferrules.

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

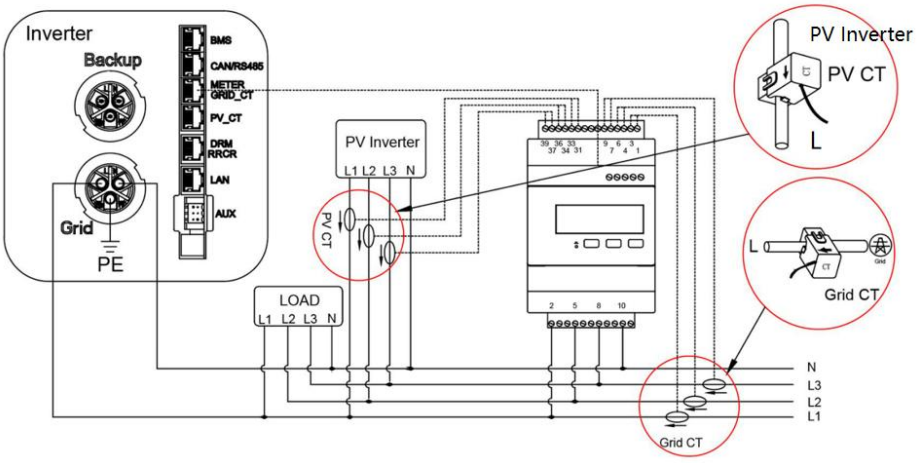


Figure 6-9 Wiring at three-phase feed in

Meter communication cable requirements: standard network cable (recommended type: Cat5e, SFTP, UV-resistant for outdoor use).

The connections are marked clearly on the meter.

Wiring location description of Chint three phase meter (with CT)

Grid CT	PV CT	GRID
1--------IA* (White)	31--------IA* (White)	2----------L1
3--------IA (Blue)	33--------IA (Blue)	5----------L2
4--------IB* (White)	34--------IB* (White)	8----------L3
6--------IB (Blue)	36--------IB (Blue)	10-------- N
7--------IC* (White)	37--------IC* (White)	
9--------IC (Blue)	39--------IC (Blue)	

CT Group	Grid-> Load								PV->Load					
CT Phase	IA*	IA	IB*	IB	IC*	IC			IA*	IA	IB*	IB	IC*	IC
Terminal	1	3	4	6	7	9	X	X	31	33	34	36	37	39
Colour	White	Blue	White	Blue	White	Blue			White	Blue	White	Blue	White	Blue

NOTICE

Be VERY careful when wiring or checking these connections because the connections appear reversed when the meter is secured in place on the Din Rail.

Always physically check the label on the meter when wiring any CTs or grid reference wires.

6.3.5.2 Meter Configuration

Meter Setting on the Meter's Display

If connecting DTSU666 meter without CTs, two meters are required if there is any AC-coupled PV inverter, one for the Grid Import/Export and one for the AC-coupled PV inverter measurements.

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

1. Meter setting for type DTSU666-3*230V 5(80)A, which is three-phase meter (without CT)

When the meter is used as grid meter, the default address is 1. The installer doesn't need to make any other settings.

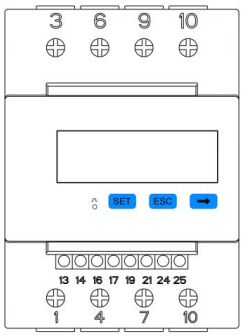


Figure 6-10 DTSU666-3*230V 5 (80) A type three-phase electricity meter (without CT) setting

If installer wants to have a check, please follow the steps below:

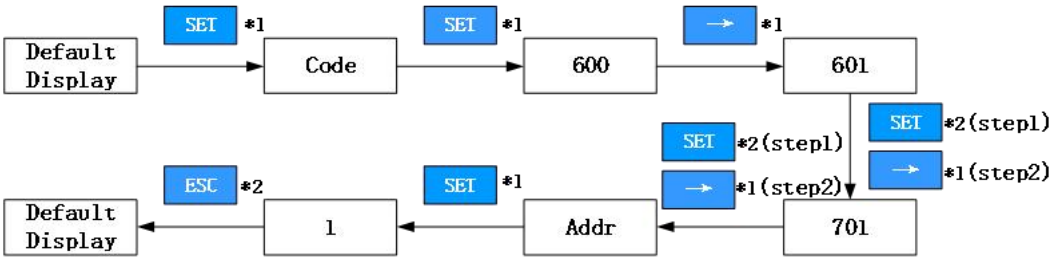


Figure 6-11 Installer check steps

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

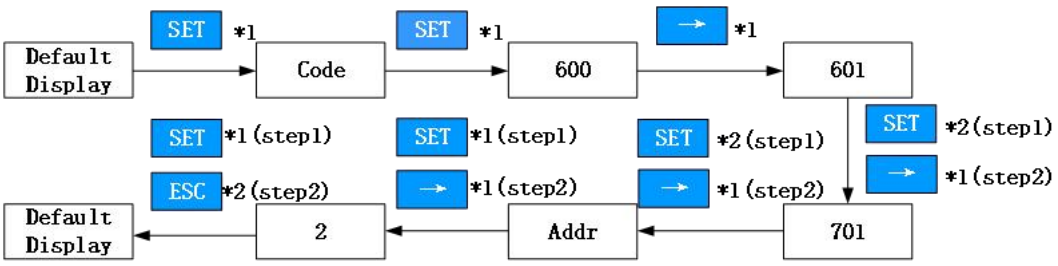


Figure 6-12 Address setting for photovoltaic electricity meters

2. Meter setting for type DTSU666-3*230V 100A/40mA, three-phase meter (with CT)

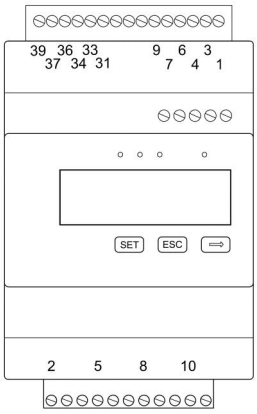


Figure 6-13 Range setting of DTSU666-3*230V 100A/40mA three-phase electricity meter (with CT)

The default address is 1. The installer doesn't need to make any other settings.

If installer wants to have a check, please follow the steps below:

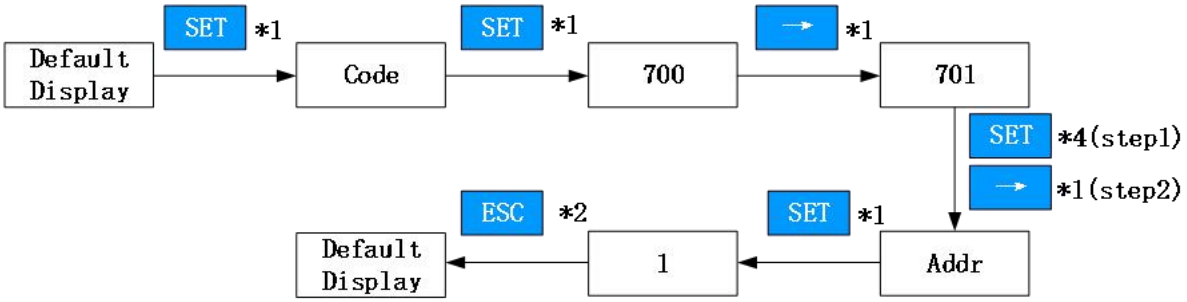


Figure 6-14 Installer check steps

The display order of parameters:

The following images show the information read and displayed by the meter in real time.

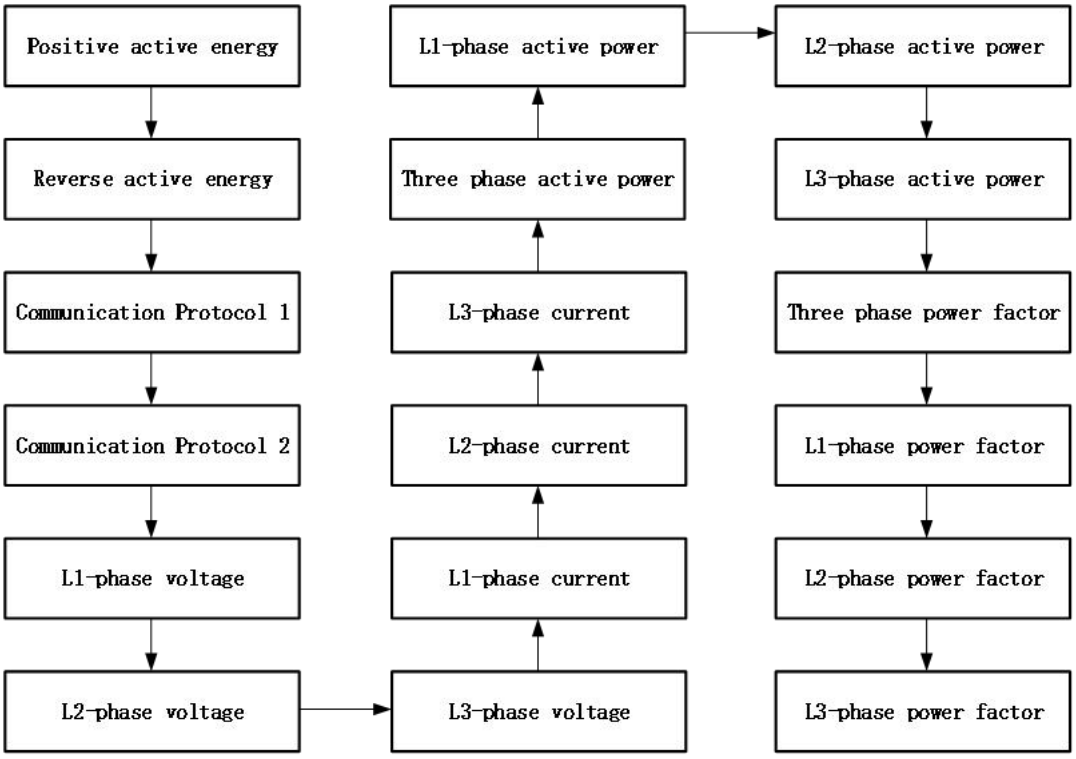


Figure 6-15 Parameter display sequence

6.4. PV Connection

6.4.1. Connecting the PV Array

DANGER

Danger to life due to electric shock if live components or DC cables are touched

The DC cables connected to a battery or a PV module may be live. Touching live DC cables can result in serious injury or even death due to electric shock. To avoid this danger:

- Disconnect the inverter and battery 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 product.
- Observe all safety information in this document.

NOTICE

Risk of the inverter due to overvoltage

The inverter can be destroyed if the open-circuit voltage of the PV modules exceeds the maximum input voltage of the inverter.

- If the open-circuit voltage of the PV modules exceeds the maximum input voltage of the inverter, do not connect any strings to the inverter and check the design of the PV system.

NOTICE

Risk of product damage due to ground fault on DC side during operation

Due to the transformerless topology of the inverter, ground faults on DC side during operation can lead to irreparable damage. Damages to the inverter due to a faulty or damaged DC installation are not covered by warranty. Although the inverter is equipped with a protective device that checks whether a ground fault is present during the starting sequence, the inverter is not protected during operation.

- Ensure that the DC installation is carried out correctly and no ground fault occurs during operation.

NOTICE

Risk of the inverter damage due to sand, dust and moisture ingress if the PV inputs are not closed

The inverter is properly sealed only when all unused PV inputs are closed with sealing plugs. Sand, dust and moisture penetration can damage the inverter and impair its functionality.

- Seal all unused PV inputs with sealing plugs.

Please ensure the follows before connecting PV strings to the inverter:

- Make sure the open voltage of the PV strings will not exceed the max. DC input voltage (1000Vdc). Violating this condition will void the warranty.
- Make sure the polarity of the PV connectors is correct.
- Make sure the PV-switch, circuit breakers of battery, AC-BACKUP and AC-Grid are all isolated/in their "off" states.
- Make sure the PV resistor to ground is higher than 200K Ohms.

The inverter uses the Vaconn D4 PV connectors. Please follow the picture below to assemble the PV connectors. PV conductor cross section requirements: 4~6 mm^2.

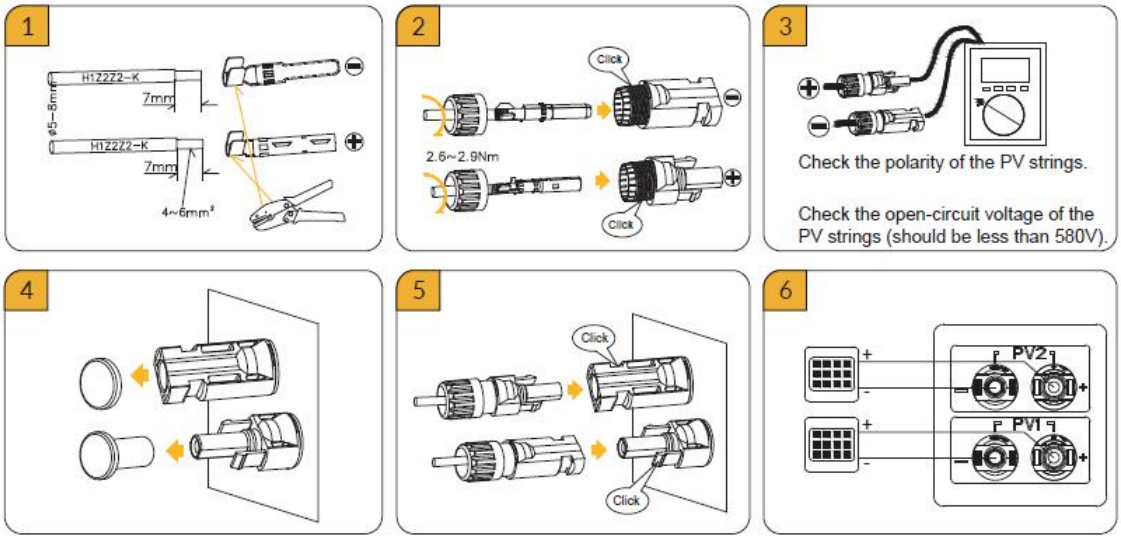


Figure 6-16 Assembly of photovoltaic connectors

6.4.2. Disassembling the PV Connector

DANGER

Danger to life due to electric shock if live components or DC cables are touched

The DC cables connected to a PV module may be live. Touching live DC cables can result in serious injury or even death due to electric shock. To avoid this danger:

- Disconnect the inverter and battery 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 product.
- Observe all safety information in this document.

Ensure that the PV connector can only be removed via using the removal wrench. Removing the PV connector without the removal wrench isn't allowed and dangerous.

Procedure:

1. Release and remove the PV connectors. To do so, insert the removal wrench into the bayonet, press the wrench with an appropriate strength to release the locking mechanism, then pull the PV connectors out. Please do not pull on the cable.

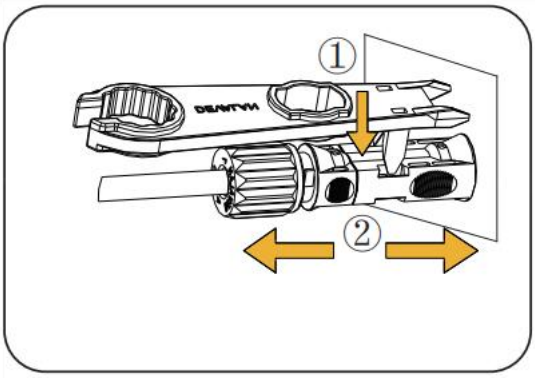


Figure 6-17 Disassembly of PV connector PV

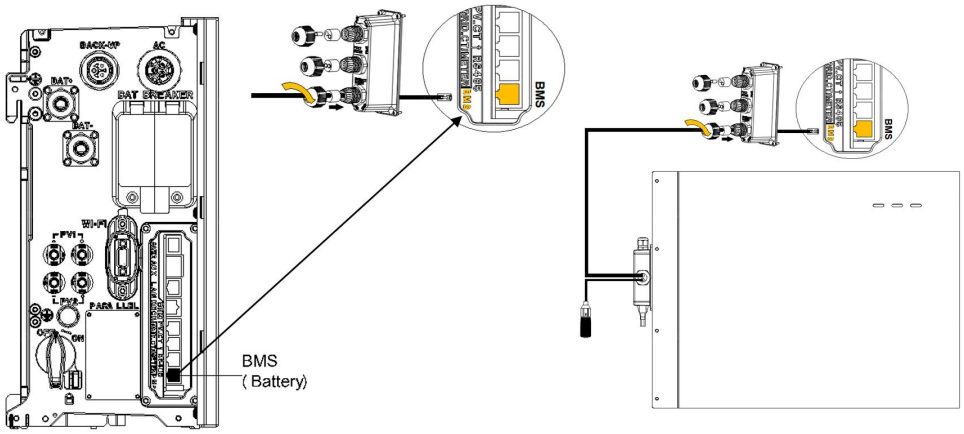
6.5. Electrical Connection between the Inverter and Battery

6.5.1. Communication Connection between INV and BAT

Communication cable connection between the inverter and series battery, proceed as follows.

1. Pass the battery communication cable of the upper battery (directly below the inverter) through the cable gland of the COM connection cover of inverter. Do not tighten the strain relief nuts of the cable glands yet.
2. Insert the RJ45 plug to the BMS communication port on the inverter communication board labelled "BMS".

3. Only secure the COM connection cover in place after the meter communication cable, the BMS cable and the LAN cable (if used) have been clipped into their respective ports.
4. When securing the COM connection cover over the communication ports, tighten the cover in place and then lightly push the communication cables into the cover as you tighten the strain relief nuts onto the cables. This will ensure the communication cables are well-seated in the RJ45 ports.



Inverter side

Battery Communication
Connection between INV and 1st BAT

Figure 6-18 The electrical connection between the inverter and the battery

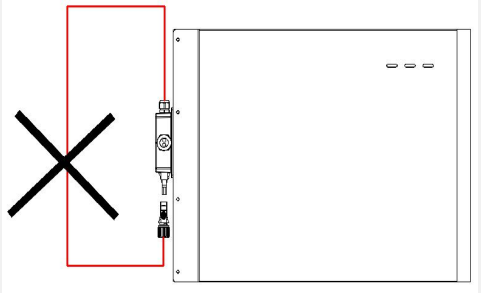
6.5.2. System Connection between INV and BAT

DANGER

Danger to life due to burns caused by electric arcs through short-circuit currents

Short-circuit currents in the battery can cause heat build-up and electric arcs. Heat build-up and electric arcs may result in lethal injuries due to burns.

- Disconnect the battery from all voltages sources prior to performing any work on the battery.
- The upper power connector of the lower battery must connect to the lower power connector of the upper battery, otherwise the short-circuiting of the battery will occur.



- Please connect both ends of one battery power cable completely before starting to connect the next power cable.
- Observe battery safety information provided in the manual.

NOTICE

The original cable sets (Amphenol connector) provided by the inverter SMILE-G3-T5/T10-INV are not suitable for connecting with Battery SMILE-G3-BAT-9.3S.

When SMILE-G3-T5/T10 series inverter installs with batteries SMILE-G3-BAT-9.3S, please purchase cable sets (HD connector) accessory 93600409 and 93600408.

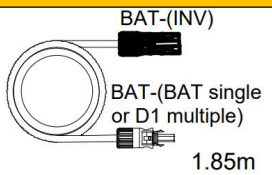
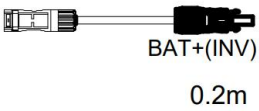
- Cable sets product number 93600409 is for single column battery side wiring.
- Cable sets product number 93600408 is for the second column battery side wiring.

You can install up to 6 series batteries in the SMILE-G3-T10 energy storage system.

Max. 4 series batteries can be installed in the first column of SMILE-G3-T10 energy storage system.

Cables connection between the inverter and series batteries of single column as follows:

Please pay attention to the cable type. There are 3 kinds of cables:

No.	Picture	Description
1		**The main negative power cable, length 2 m, 10 mm², black** Connect BAT main negative connector of series battery (the last series battery) and the BAT negative connector of inverter.
2		**The main positive power cable between inverter and the first series battery, length 0.18 m, 10 mm², red** Connect BAT main positive connector of series battery (directly below the inverter) and the BAT positive connector of inverter.
3		**The grounding cable between inverter and the first series battery, 6 mm², yellow-green** Connect the grounding point of series battery (directly below the inverter) and the grounding point of the inverter.

Detailed electrical connection between the inverter and single column of series batteries as follows:

1. Take out all cables from the inverter packaging.
2. Use the provided grounding cable to connect the grounding point of the first series battery (directly below the inverter) and the grounding point of the inverter.
3. Remove the protective caps from the battery power connectors of the inverter.
4. Complete the grounding, power and communication connection between the upper and lower series batteries.

Connect the upper power connector of the lower series battery to the lower power connector of the upper series battery.
Connect the upper communication cable of the lower series battery to the lower communication connector of the upper series battery. Disassemble the battery communication connector components, remove the termination resistor, unscrew the swivel nut and push the cable support sleeve out of the threaded sleeve.
Thread the swivel nut and threaded sleeve over the battery communication cable. At the same time, thread the cable through the opening in the cable support sleeve. Insert the RJ45 plug of the lower battery into the BMS communication port of the upper battery and screw the threaded sleeve. Press the cable support sleeve into the threaded sleeve. Screw the swivel nut onto the threaded sleeve.
Retain the termination resistor of last battery.

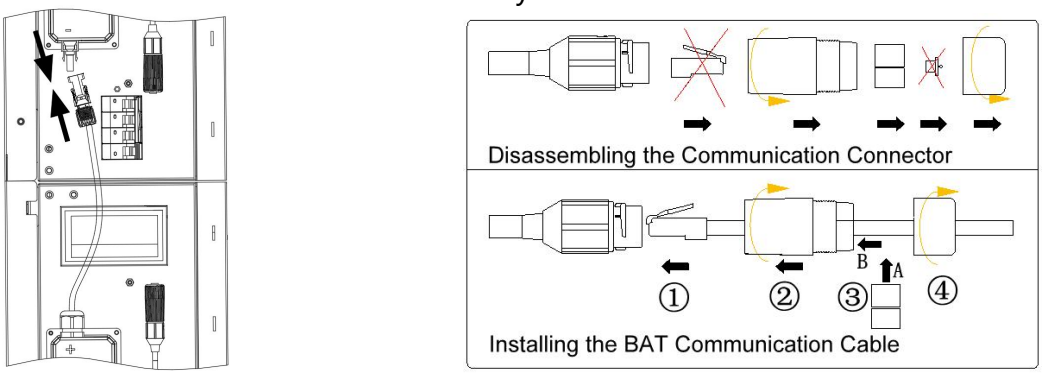
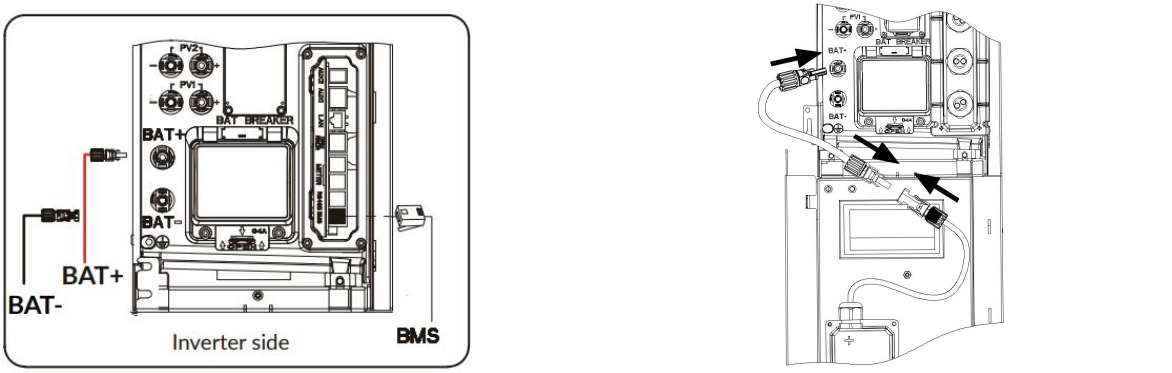


Figure 6-19 Installation of battery connection cables

5. Pick up the red power cable, connect BAT main positive connector of series batteries (directly below the inverter) to the BAT positive connector of inverter.
6. Pick up the black power cable, connect BAT main negative connector of series batteries (the last series battery) to the BAT negative connector of inverter.



Inverter side Positive connection between BAT and INV

Figure 6-20 Single-column battery side wiring diagram

Battery Side Wiring Diagram of Single Column as follows:

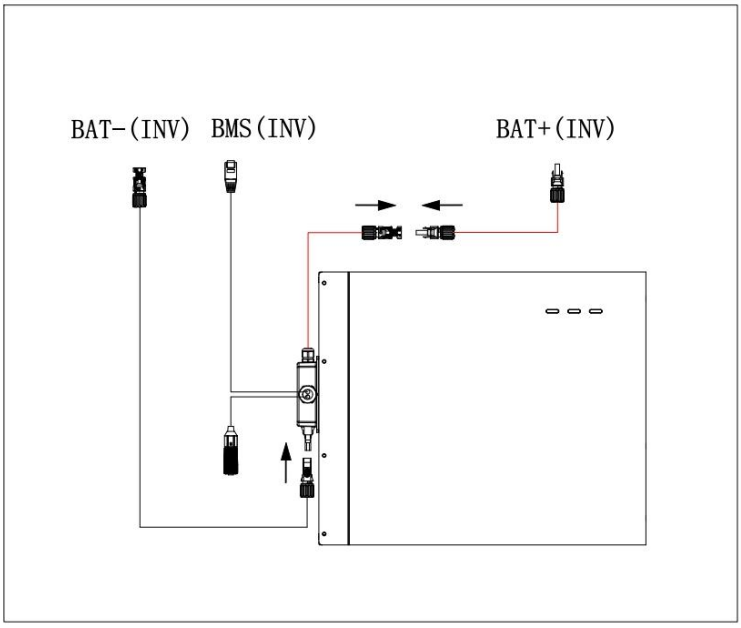


Figure 6-21 Wiring diagram of one battery

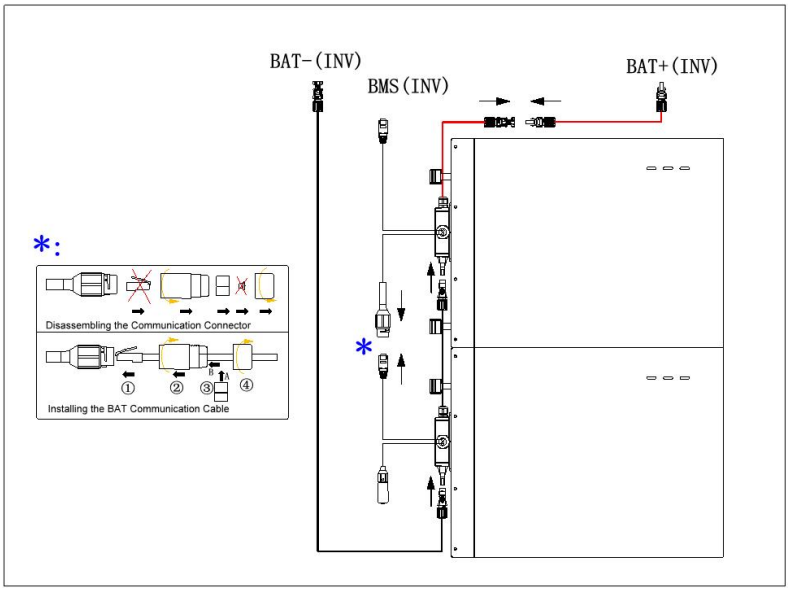


Figure 6-22 Wiring diagram of two batteries

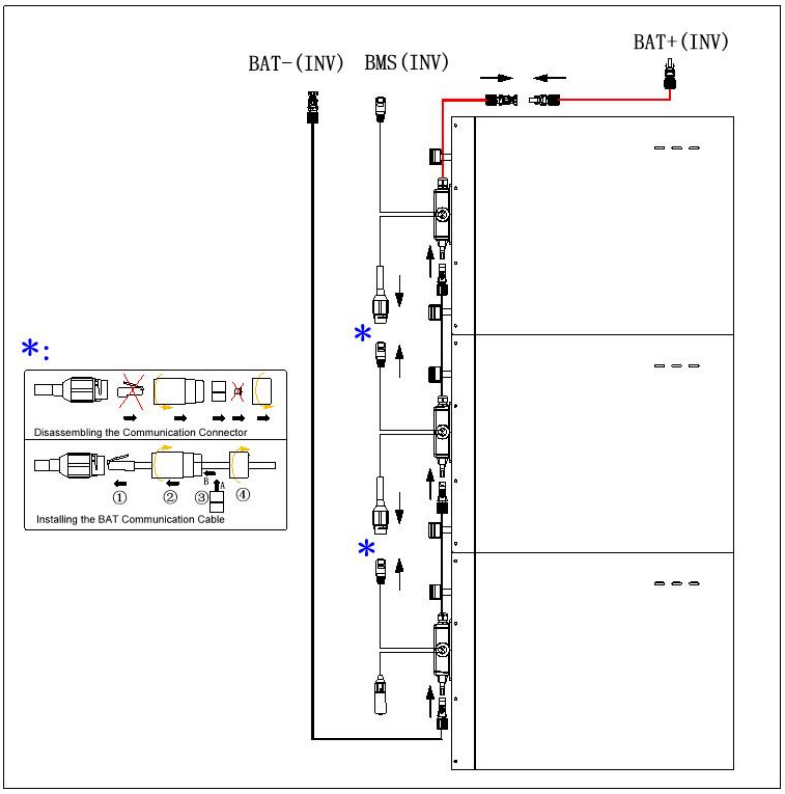
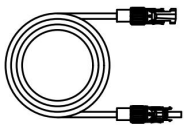
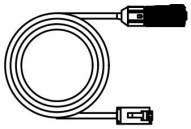


Figure 6-23 Wiring diagram of three batteries

Cables connection between the Inverter and two columns of series batteries as follows.

Cables for distanced horizontal series batteries expansion should be purchased additionally. Please pay attention to the cable type. There are three kinds of cables:

No.	Picture	Description
1		The main negative power extension cable of the system, length 1 m, 10 mm2, black Connect BAT main negative connector of series battery (the last series battery) and the existing BAT negative power cable (connecting with the BAT negative connector of inverter).
2		The power cable between two column series battery, length 3 m, 10 mm2, black Connect BAT negative connector of the bottom battery of the first column series battery and BAT positive connector of the top battery of the second column series battery.
3		The battery communication cable, length 3 m, AWG24, black Connect the lower communication connector of the bottom battery of the first column series battery and the upper communication cable of the top battery of the second column series battery.

Detailed electrical connection between the inverter and the second column of series batteries as follows:

1. Disconnect the energy storage system from all voltages sources prior to performing any work on the system.
2. Installer should prepare the grounding cable. Take out M5 Y terminals and grounding conductor, strip the insulation of the grounding conductor, insert the stripped conductor into the terminal lug and crimp with a crimping tool. Use the prepared grounding cable to connect the grounding points between the two columns of series battery.
3. Complete the electrical connection between the second column of series batteries. Retain the termination resistor of the last battery of the second column series batteries.
4. Complete the rest electrical connection. Take out three cables from the package of Cables for Distanced Horizontal Battery Expansion.
   Remove the termination resistor of the bottom battery of the first column series batteries.
   Use the provided communication cable to connect the lower communication connector of the bottom battery of the first column series batteries and the upper communication cable of the top battery of the second column series batteries.
   Use the provided power cable to connect BAT negative connector of the bottom battery of the first column series batteries and BAT positive connector of the top battery of the second column series batteries.
   Take out the main negative power extension cable, connect BAT main negative connector of series battery (the last series battery) and the existing BAT negative power cable (connecting with the BAT negative connector of inverter).

Battery side wiring diagram of two columns as follows:

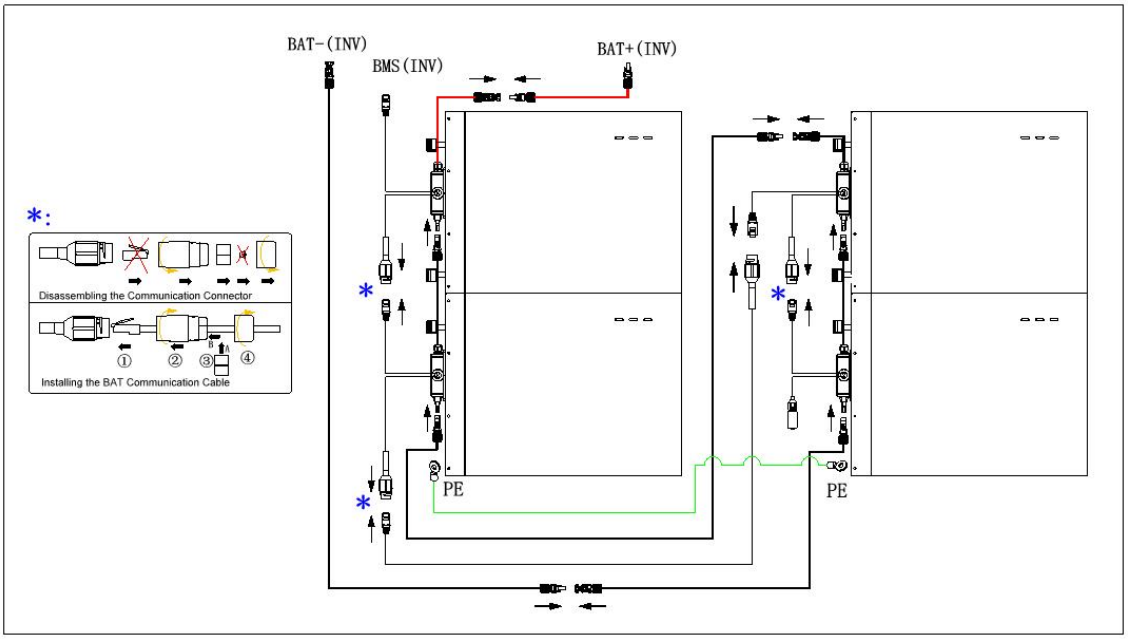


Figure 6-24 Two columns of battery side wiring diagrams

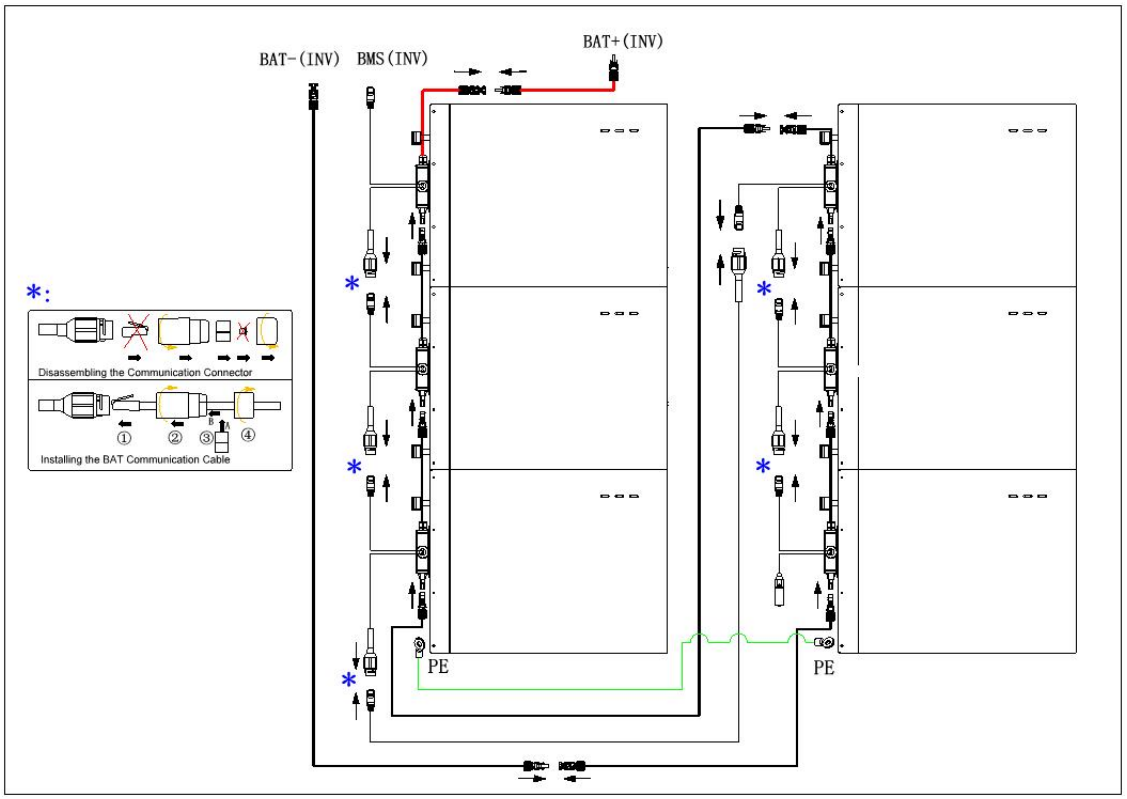


Figure 6-25 Two columns of battery side wiring diagrams

6.5.3. Disassembling BAT Connectors

To disassemble the BAT connectors (e.g. due to faulty installation), proceed as follows.

DANGER

Danger to life due to electric shock when touching exposed DC conductors or BAT plug contacts if the BAT connectors are damaged or loose

The BAT connectors can break or become damaged, become free of the DC cables, or no longer be connected correctly if the BAT connectors are released and disconnected incorrectly. This can result in the DC conductors or BAT plug contacts being exposed. Touching live DC conductors or BAT plug connectors will result in serious injury or even death due to electric shock.

- Do not disconnect the BAT connectors under load.
- Before removing the BAT connectors, ensure that the BAT circuit breakers of the batteries and inverter are OFF.
- Wear insulated gloves and use insulated tools when working on the BAT connectors.
- Ensure that the BAT connectors are in perfect condition and that none of the DC conductors or BAT plug contacts are exposed.
- Carefully release and remove the BAT connectors as described in the following.

Ensure that the BAT connector can only be removed via using the removal wrench. Removing the BAT connector without the removal wrench isn't allowed and dangerous.

Procedure:
Release and remove the BAT connectors. To do so, insert the removal wrench into the bayonet, press the wrench with an appropriate strength to release the locking mechanism, then pull the BAT connectors out. Please do not pull on the cable.

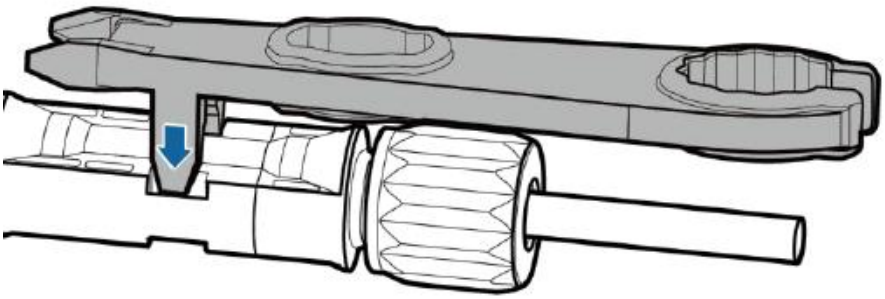


Figure 6-26 Disassemble the BAT connector

6.6. Communication Connection with Inverter

For other communication (AUX2, AUX1, LAN, RRCR, DRM, Meter, RS485) connection, please follow the steps below.

1. Unscrew the 4 screws on the COM connection cover of the inverter, then loosen the strain relief nuts of the cable glands on the COM connection cover.

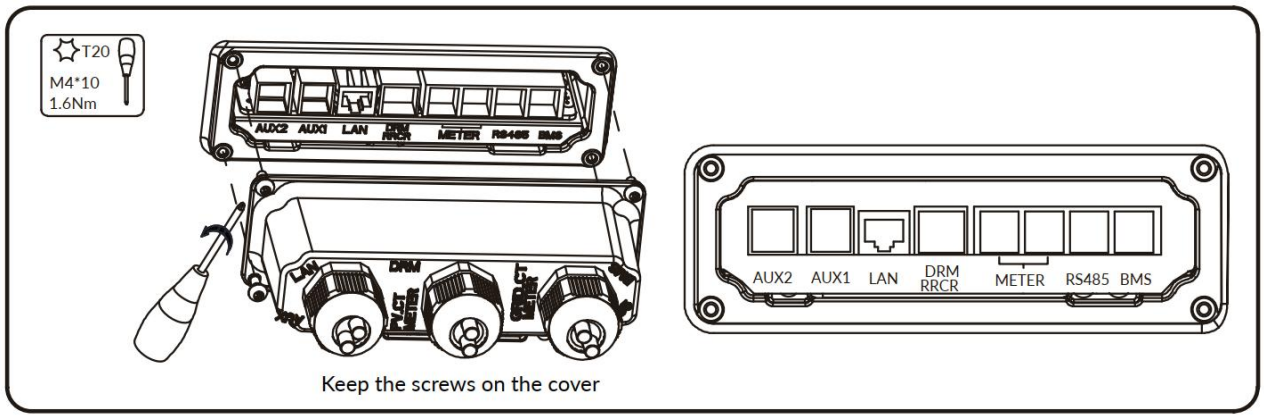


Figure 6-27 COM connection cover

2. Pass the communication cables through the cable glands of the COM connection cover. Do not tighten the strain relief nuts of the cable glands yet.

Insert the RJ45 plugs to the relative RJ45 sockets.

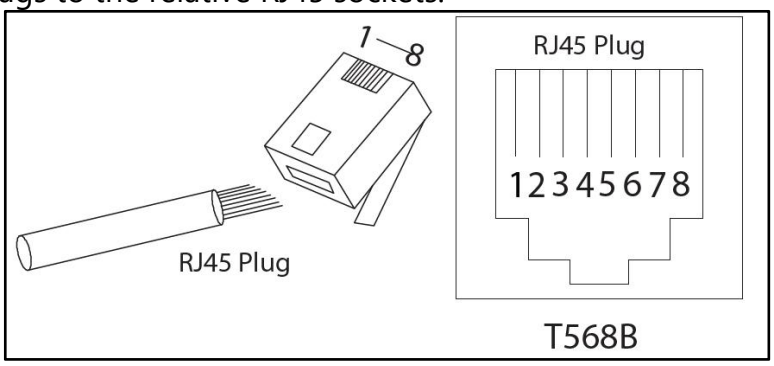


Figure 6-28 RJ45 plug connection

a. For meter wiring, please refer to Chapter 6.3.5 Meter Connection.
b. 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 SMILE-G3-T10-INV.
c. Take out 2 pieces of 6 pin terminal blocks for AUX connection.

For AUX position definition, please refer to the AUX wiring documentation.

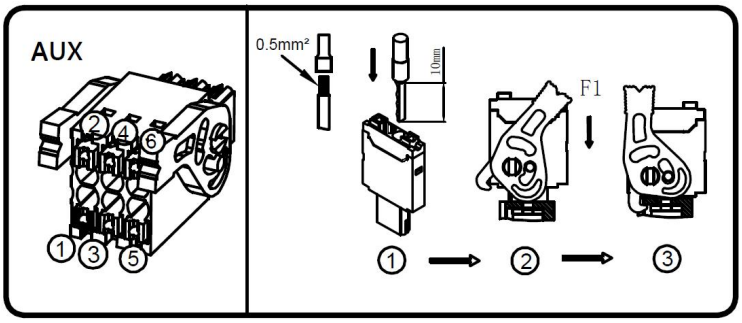


Figure 6-29 A 6-pin terminal block with AUX connection

In emergency situations, such as fire, the end user can manually press the EPO (Emergency Power Off) button to shut down the inverter and switch off the battery (except for the PV array). End users or installer should prepare the external EPO.

AUX cable requirements: outdoor shielded copper cable (flexible), recommended conductor cross-section 0.5 mm^2. Conductor ends should be fitted with bootlace ferrules.

To disconnect the AUX connection, rotate the handles on both sides clockwise, unplug the AUX connector, insert a screwdriver (blade width: 1.2 mm) into the relative connection position side and unplug the conductor.

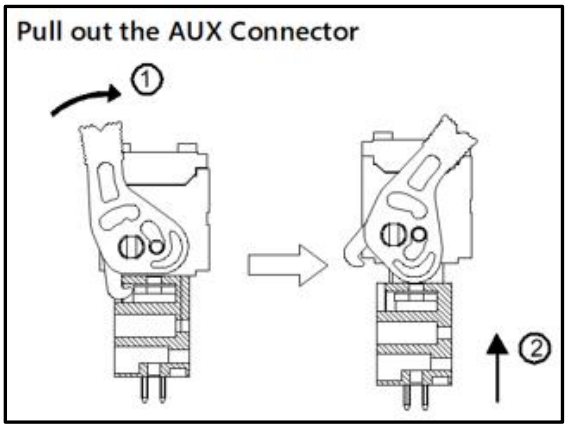


Figure 6-30 Disconnect the AUX connection

3. Place the COM connection cover against the inverter enclosure and tighten the 4 screws. When securing the cover over the communication ports, tighten the cover in place and then lightly push the communication cables into the cover as you tighten the strain relief nuts onto the cables. This will ensure the communication cables are well-seated in the RJ45 ports.

The pin definition of the communication ports:

NO / ITIM	1	2	3	4	5	6	7	8
BMS	NC	RS485_A4	NC	CAN1_H	CAN1_L	NC	RS485_B4	NC
RS485	12V	NC	GND	RS485_B5	RS485_A5	NC	NC	NC
GRID_CT/METER	GRID_CT-	GRID_CT+	RS485_A7	NC	NC	RS485_B7	NC	NC
PV_CT	Pv_CT-	PV_CT+	RS485_A7	NC	NC	RS485_B7	NC	NC
RRCR	K1	K2	K3	K4	5V	NC		
DRM	DRED1/5	DRED2/6	DRED3/7	DRED4/8	REFGEN/O	COMLOAD/O	GND	
AUX	DO1_NO	DO1_COM	DO1_NC	DI_NEGATIVE	DLPOSITIVE	GND		
	2A 24VDC	2A 24VDC	2A 24VDC	1A 24VDC	1A 24VDC	1A		
	2A 230VAC	2A 230VAC	2A230VAC					

The electrical parameters of two AUX ports:

AUX	1	2	3	4	5	6
	DO1_NO	DO1_COM	DO1_NC	DI_negative	DI_positive	GND
Electrical Parameters	2A 24VDC	2A 24VDC	2A 24VDC	1A 24VDC	1A 24VDC	1A
	2A 230VAC	2A 230VAC	2A 230VAC			

6.7. Mount the Covers of the Inverter and Battery

After finishing electrical connection of energy storage system, please follow the steps below to mount the covers.

4. Mount the cable cover of the battery, Refer to 1-2 in Figure 6-31.

a. Cut a cable hole based on the cabling routing and route the cables through the cable hole.
b. Align the top surface of the cable cover to the top surface of the battery housing.
c. Align the protrusions on the right side of the cable cover to the slots on the left side of the battery's front cover, then push the cable cover right to the battery housing till hearing the "click" sound.

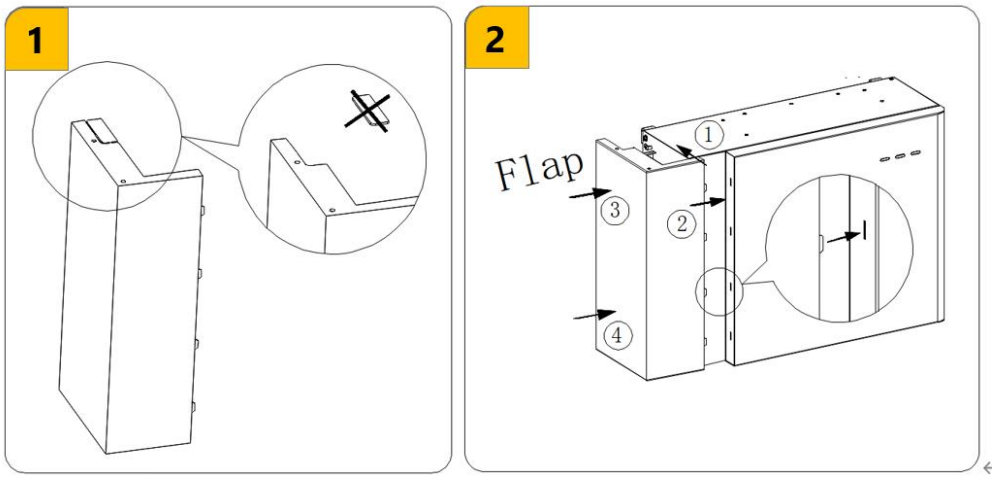


Figure 6-31 Install the cable cover for the battery

Disassemble the cable cover of the battery

5. Grasp the cable cover, then move it to the left, Refer to 1 in Figure 6-32.

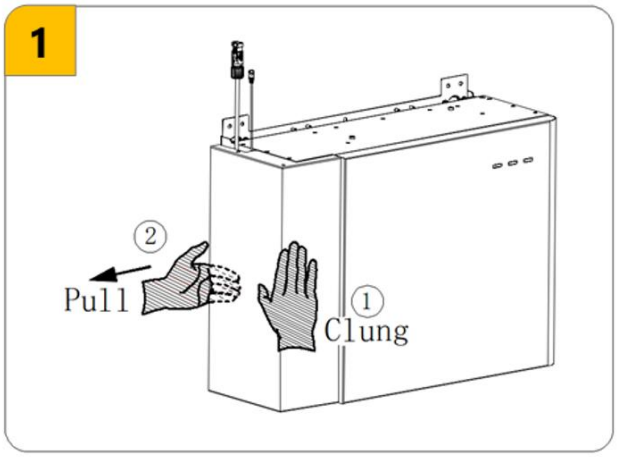


Figure 6-32 Remove the c wire of the battery

1. Mount the covers of the inverter

Attach the top cover to the inverter.

Place the top cover on top of the inverter and slide it forward. The three side screws of the top cover should align to the inverter mounting threaded holes. Secure the top cover to the inverter (tool: T20 screwdriver, torque: 1.6 Nm).

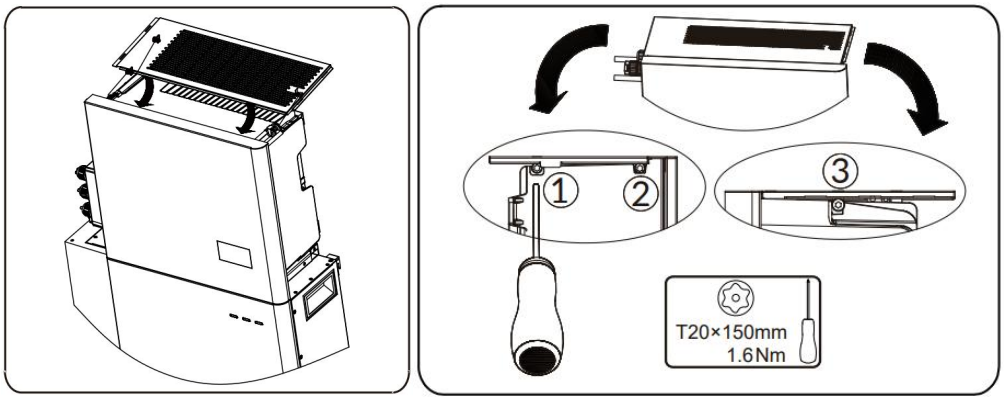
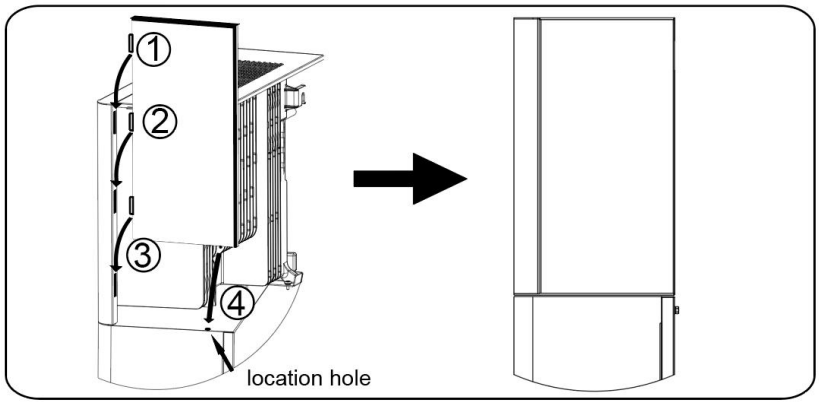


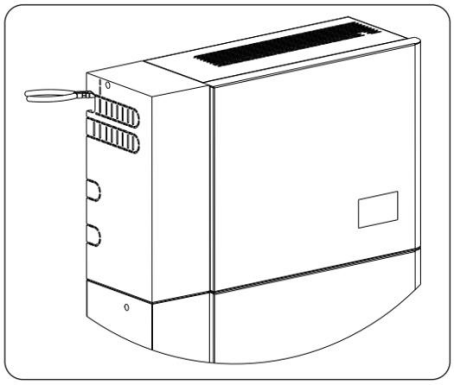
Figure 6-33 Remove the c wire of the battery

Mount left cable cover and right cover of the inverter when inverter standing on the battery, please follow the steps below.

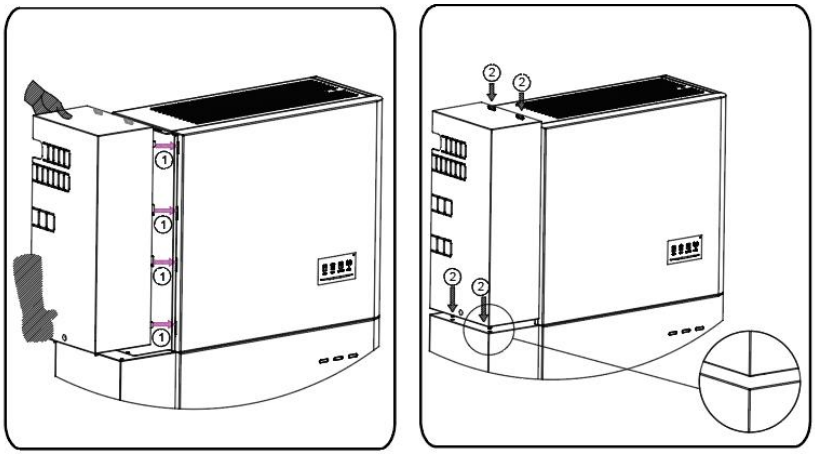
a. Take out the right cover and cable cover from the inverter packaging.
b. Align the hooks on the front side of the right cover to the slots on the right side of the front cover, downwards insert the right cover along the right edge of the inverter front cover till the protruding pin in the lower right corner falls into the hole located at the right rear of the battery housing.



c. Cut a cable hole based on the AC cabling routing and route the cables through the cable hole.



d. Align the hooks on the right side of the cable cover to the slots on the left side of the front cover, downwards insert the cable cover along the left edge of the inverter front cover till the top surfaces of the top cover and cable cover are flush.



Disassemble the cable cover of the inverter

a. Insert a screwdriver (blade width: 1.2 mm) into the gap between the cable covers of the inverter and the first battery, then pry the cable cover up lightly.
b. Grasp the cable cover and lift it up by about 20mm, then move it to the left.

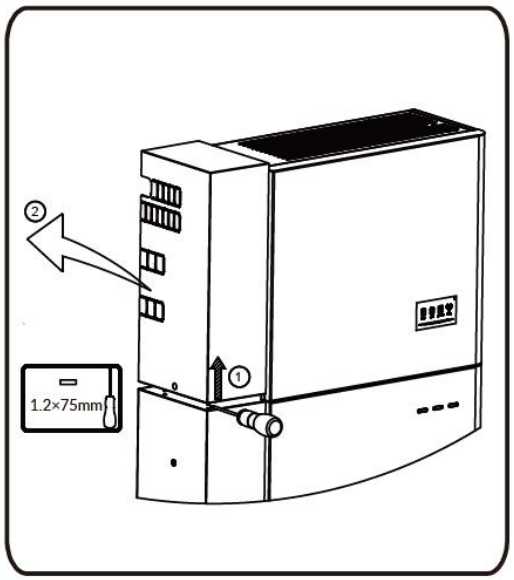


Figure 6-34 Disassemble the cable cover of the inverter

Mount left cable cover and right cover of the inverter when inverter mounting with wall bracket, please follow the steps below.

a. Take out the following material supplied from the wall bracket packaging:
   Support plate for left cable cover, hexagon head screw M5*12, support stud for right cover, support stud for cable cover, pan head screw M4*10;

b. Tighten the support plate for left cable cover to the bottom left edge of the inverter enclosure using one screw M5*12 (tool: T20 screwdriver, torque: 2.5 Nm).

Tighten the support stud for right cover to the bottom right edge of the inverter enclosure (tool: Socket wrench SW8, torque: 2.5 Nm).

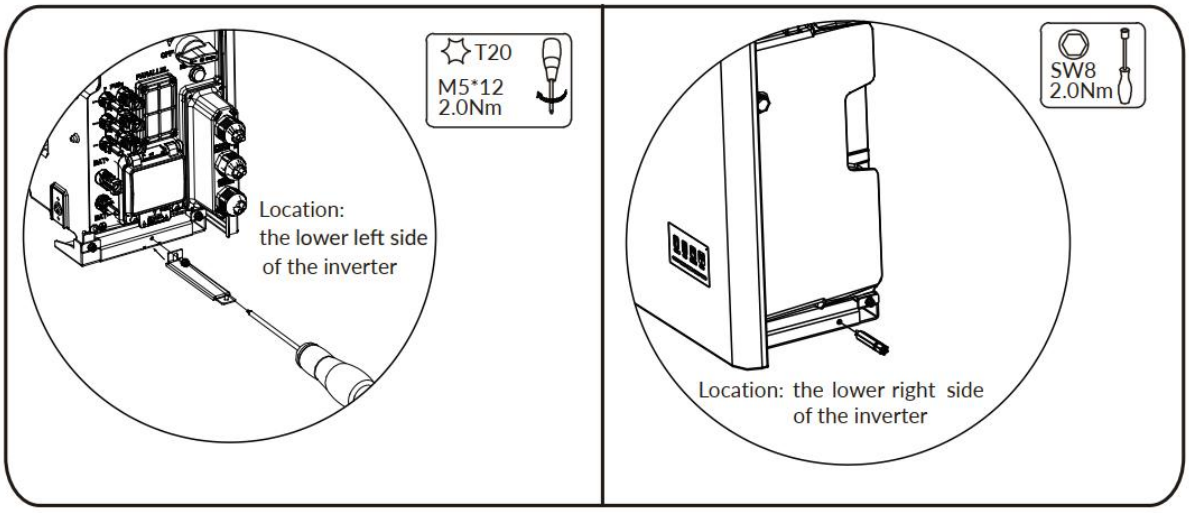


Figure 6-35 Mount left cable cover and right cover of the inverter

Mounting the left cable cover and right cover:

a. Tighten the support plate for left cable cover to the inner side of the cable cover using pan head screw M4*10 (tool: T20 screwdriver, torque: 1.6 Nm).
b. Align the hooks on the right side of the cable cover to the slots on the left side of the front cover, downwards insert the cable cover along the left edge of the inverter front cover till the top surfaces of the top cover and cable cover are flush.
c. Align the hooks on the front side of the right cover to the slots on the right side of the front cover, downwards insert the right cover along the right edge of the inverter front cover.

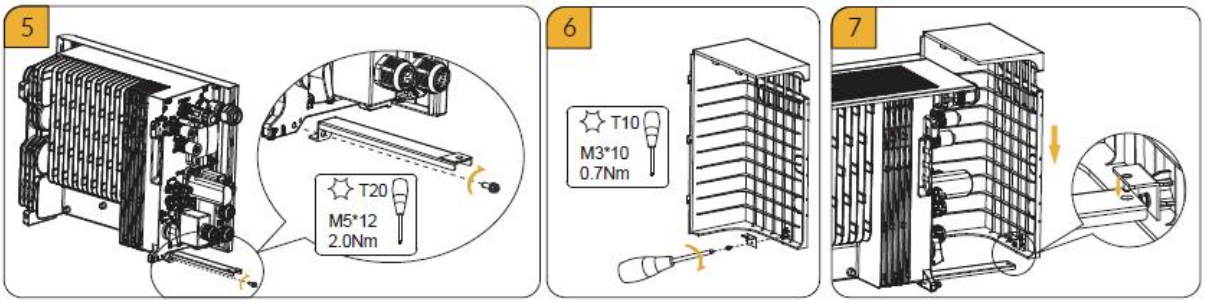


Figure 6-36 Cable cover installation

7. Operation

7.1. Power On the System

WARNING

- Before power on the energy storage system, please ensure the PV switch & all AC and BAT circuit breakers in the system are switched OFF and cannot be reactivated.
- Never power on the energy storage system without the correct and reliable installation and electrical connection.

1. Switch on the battery circuit breaker which is at the lower left of the inverter.
2. Switch on the battery circuit breakers of all batteries (located on the left-hand side of the battery).
3. Switch on the AC circuit breaker between the grid port of the energy storage inverter and the mains grid (this AC circuit breaker should be labelled Main Switch Battery ESS Supply or similar).
4. Switch on the AC circuit breaker between the backup port of the energy storage inverter and the loads (this AC circuit breaker should be labelled Main Switch Battery ESS Backup or similar).
5. Switch on the PV switch at the left middle of the inverter if there are PV strings directly connected to the energy storage inverter.
6. Switch on the AC circuit breaker (if there is any) between any separate PV inverter and the mains grid. These separate PV inverters are also referred to as “AC-coupled PV inverters”.

7.2. Power 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. Please put on protective gloves and operate the product 5 minutes after the system is powered off.

1. Switch off the AC circuit breaker between the energy storage inverter and the backed-up loads.
2. Switch off the AC circuit breaker between the energy storage inverter and the mains grid.

3. Switch off the PV DC Isolator(s) between the PV strings and the energy storage inverter if there are any.
4. Switch off the PV switch on the left-hand side of the energy storage inverter (if there are PV strings directly connected the energy storage inverter).
5. Switch off the battery circuit breakers of all batteries (located on the left-hand side of the battery).
6. Switch off the battery circuit breaker which is at the lower left of the inverter.

8. Commissioning

8.1. Checks Before Power-On

No.	Check Item	Acceptance Criteria
1	Installation/Mounting environment	The installation environment is safe and the unit has adequate clearance as per the instruction in this manual as well as in compliance with local standards. The area around the installation should be free from clutter and should not be flood-prone.
2	Battery and inverter mounting	The battery and inverter should be mounted correctly, securely, and reliably.
3	Wi-Fi mounting	The Wi-Fi module should be mounted correctly, securely, and reliably.
4	Cable layout	Cables should be routed neatly and protected adequately where exposed, in accordance with standards.
5	Cable tie	Cable ties should be secured and trimmed evenly and no burr exists.
6	Grounding	The grounding cables should be connected correctly, securely, and reliably. Impedance/resistance checks should be conducted to confirm reliable Earth connections.
7	Switches and breakers status	The PV switch (if there is any) and battery circuit breakers and any AC circuit breakers connecting to the energy storage system should be OFF.
8	Cable connections	The AC cables, PV cables (if there are any), battery power cables, and communication cables should be connected correctly, securely, and reliably.
9	Unused ports	Unused power ports and communication ports should be sealed from water or dust ingress by watertight caps.

8.2. Power on the Product before Commissioning

WARNING

- Before commissioning, please ensure the PV switch & all AC and BAT circuit breakers in the system are switched OFF and cannot be reactivated.
- Never power on the energy storage system without the correct and reliable installation and electrical connection.
- Don't switch on the PV switch on the energy storage inverter.
- Don't switch on the AC circuit breaker on the PV inverter (if there is any).

1. Switch on the battery circuit breaker at the left middle of the energy storage inverter.
2. Switch on the battery circuit breakers of all batteries.
3. Switch on the external AC circuit breaker between the grid and the energy storage inverter.
4. Please strictly follow the aforementioned steps to power on the system.

8.3. Wi-Fi Module Configuration and Basic Parameters Settings

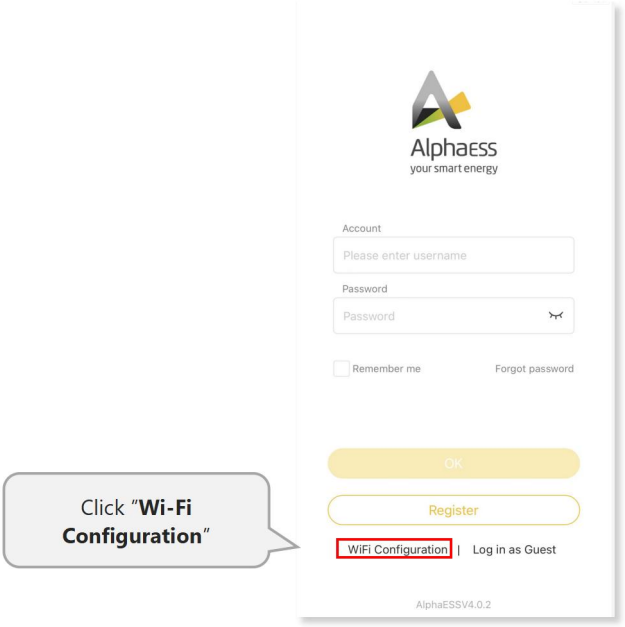
8.3.1. Download and Install the App

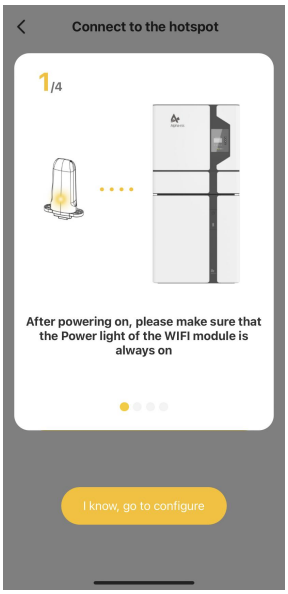
1. Android device users can download the App through major Android App stores such as Google Play. You can also scan the following two-dimensional code to install.
2. IOS device users can search for "AlphaESS" in the App Store and download the App. You can also scan the following two-dimensional code to install.

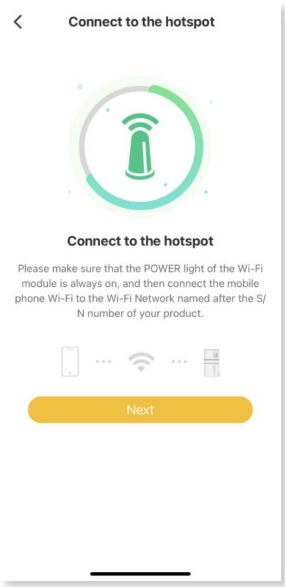
Figure 8-1 AlphaESS App

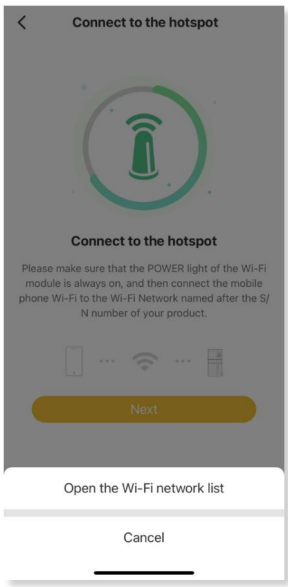
8.3.2. Wi-Fi Configuration

This section is for user who has an energy storage system with a Wi-Fi dongle.
The AlphaESS App is used to configure the network, set system basic parameters, monitor system operating status and check configuration information.

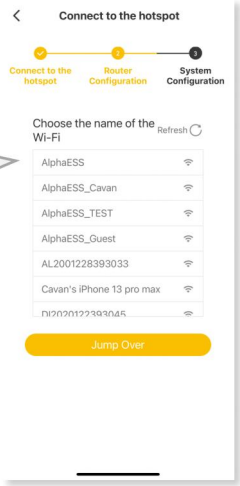

Alphaess
your smart energy
Account
Please enter username
Password
Password
Remember me
Forgot password
OK
Register
WiFi Configuration | Log in as Guest
AlphaESSV4.0.2
Click "Wi-Fi Configuration"


Connect to the hotspot
1/4
After powering on, please make sure that the Power light of the WIFI module is always on
I know, go to configure


Connect to the hotspot
Connect to the hotspot
Please make sure that the POWER light of the Wi-Fi module is always on, and then connect the mobile phone Wi-Fi to the Wi-Fi Network named after the S/N number of your product.
Next


Connect to the hotspot
Connect to the hotspot
Please make sure that the POWER light of the Wi-Fi module is always on, and then connect the mobile phone Wi-Fi to the Wi-Fi Network named after the S/N number of your product.
Next
Open the Wi-Fi network list
Cancel


WLAN
生产测试区
cesshi
AL4001019040103
Password
Cancel
Connect
Select the Wi-Fi Module Signal
This is default Password (12345678)


Connect to the hotspot
Connect to the hotspot
Router Configuration
System Configuration
Choose the name of the Wi-Fi
Refresh
AlphaESS
AlphaESS_Cavan
AlphaESS_TEST
AlphaESS_Guest
AL2001228393033
Cavan's iPhone 13 pro max
Jump Over
Select the Wi-Fi Router Signal

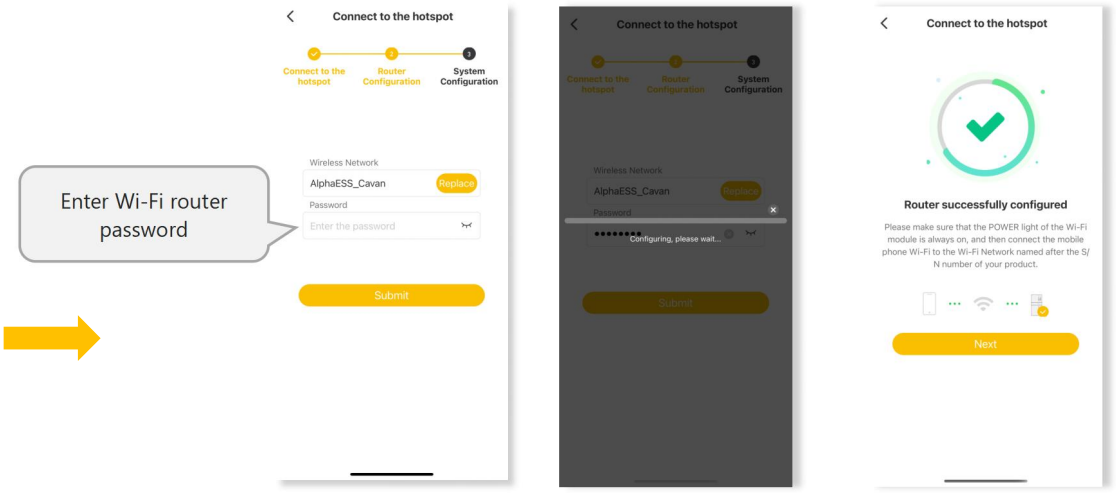


Figure 8-2 APP Wi-Fi connection and configuration

NOTICE

- The system will not be able to connect to the internet without either a physical LAN cable connection or configured Wi-Fi if the Wi-Fi module is used.
- To ensure account security, change the Wi-Fi password periodically and keep the new password in mind. Not changing the initial password may cause password disclosure. A password left unchanged for a long period of time may be stolen or cracked. If a password is lost, devices cannot be accessed.

8.3.3. Basic Parameters Settings

DC Mode

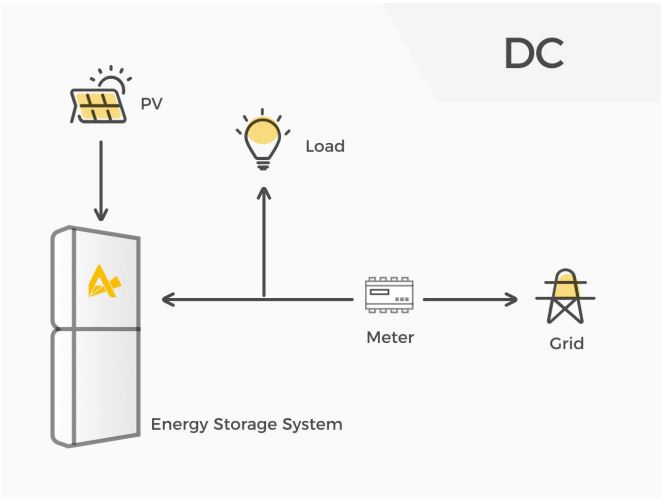


Figure 8-3 DC Model

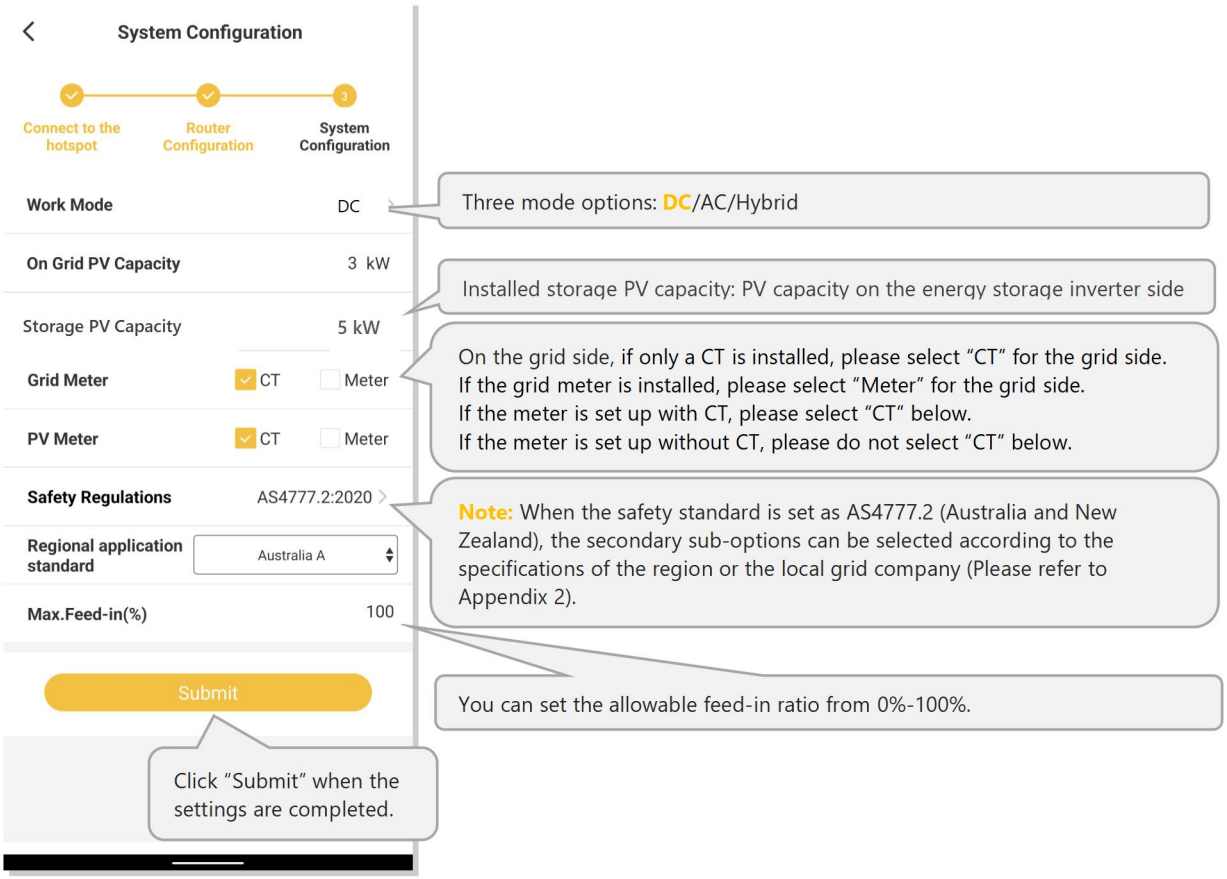


Figure 8-4 APP DC mode Settings

AC Mode

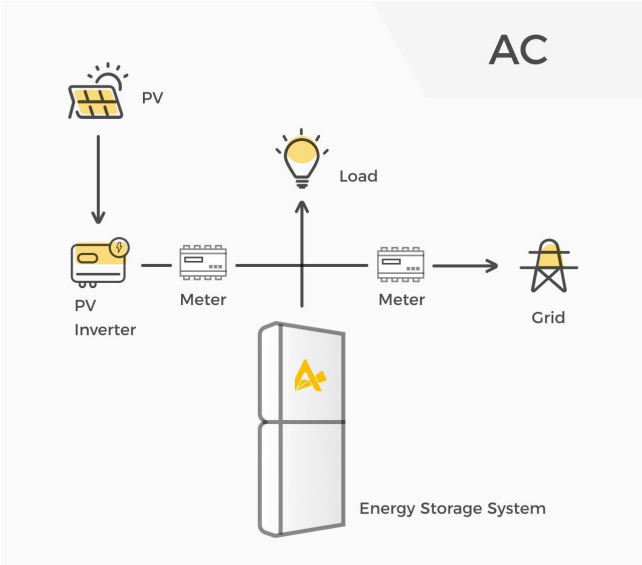


Figure 8-5 AC Mode

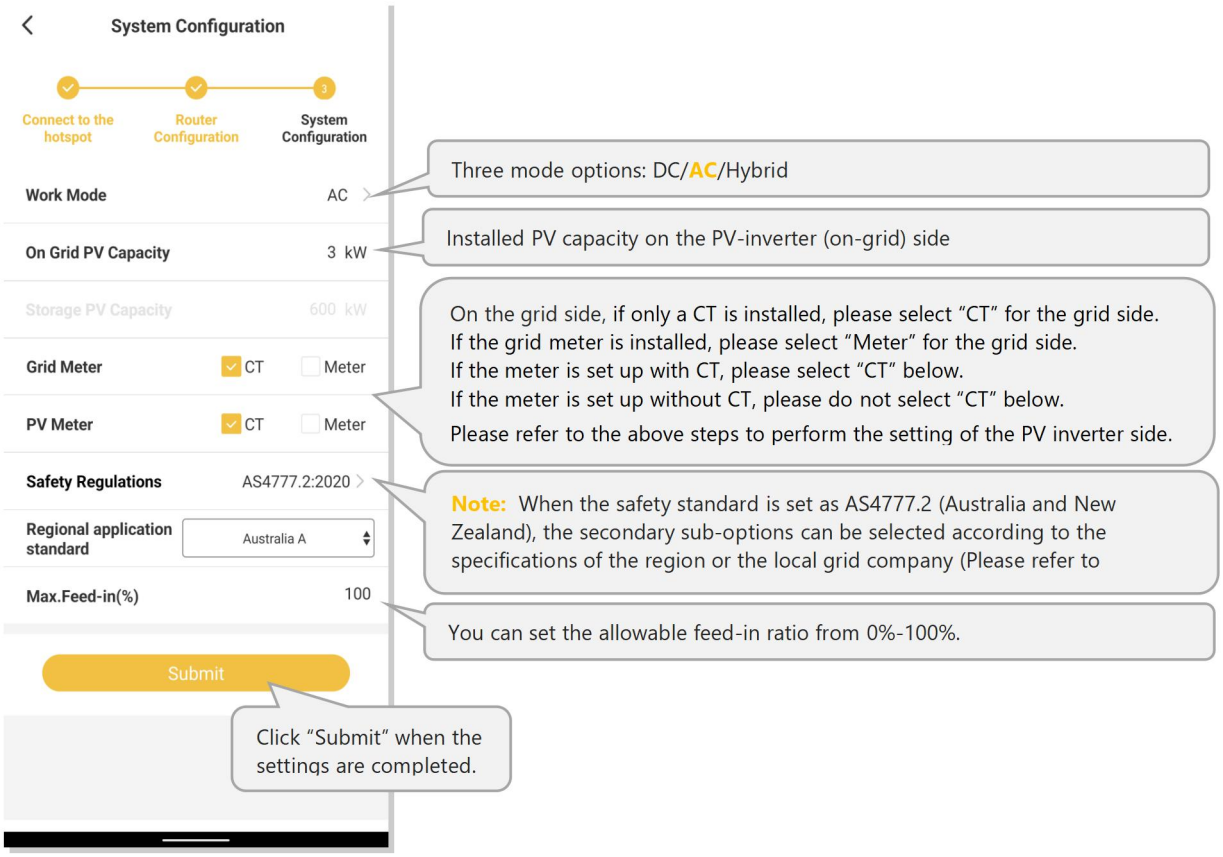


Figure 8-6 APP AC mode Settings

Hybrid Mode

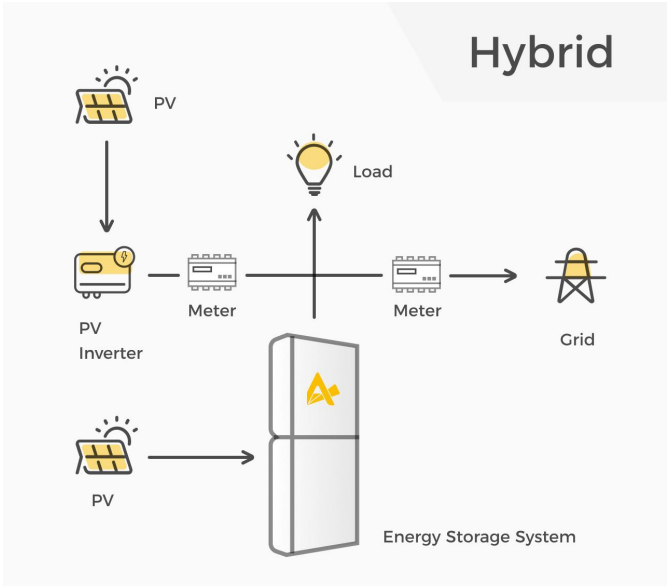


Figure 8-7 Hybrid Mode

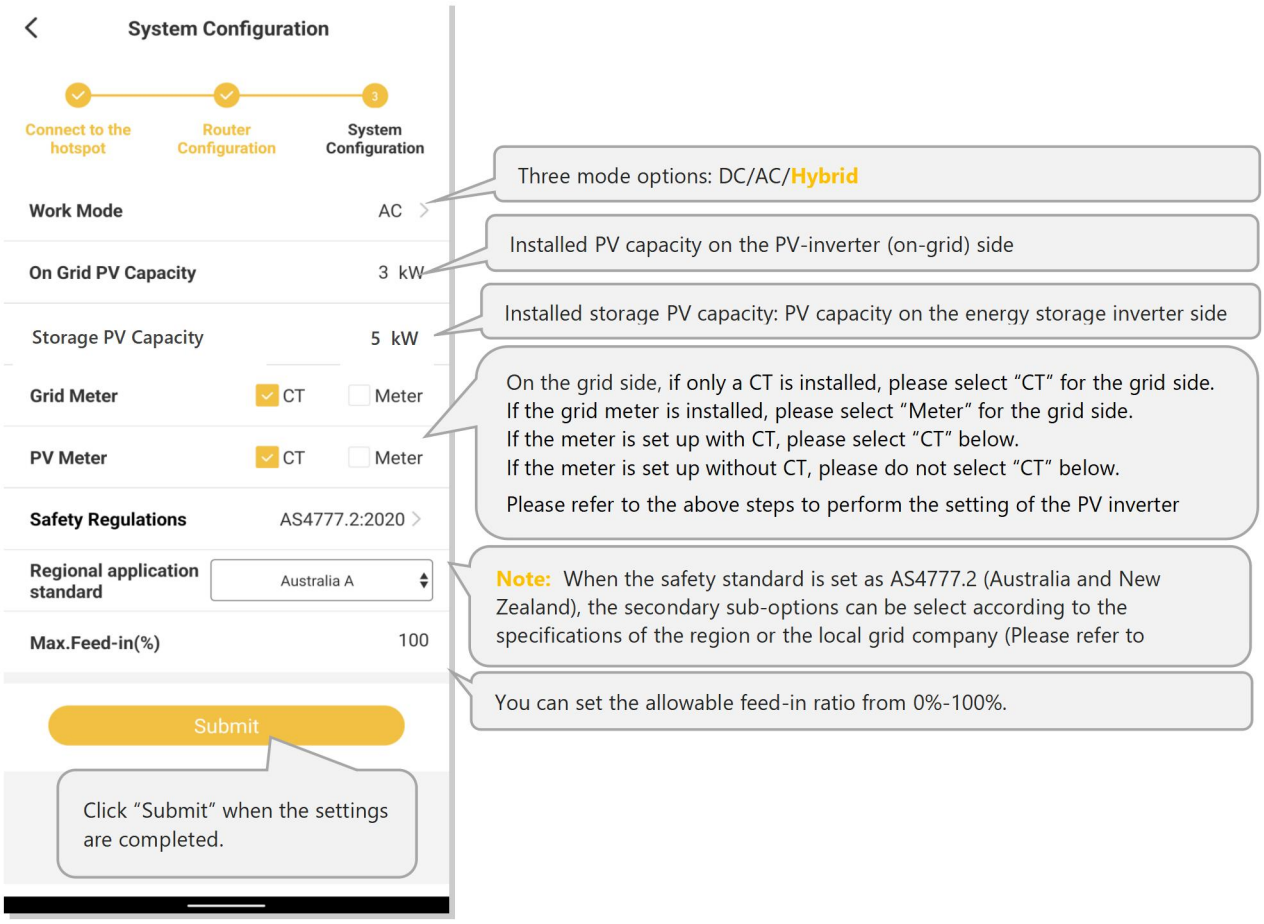
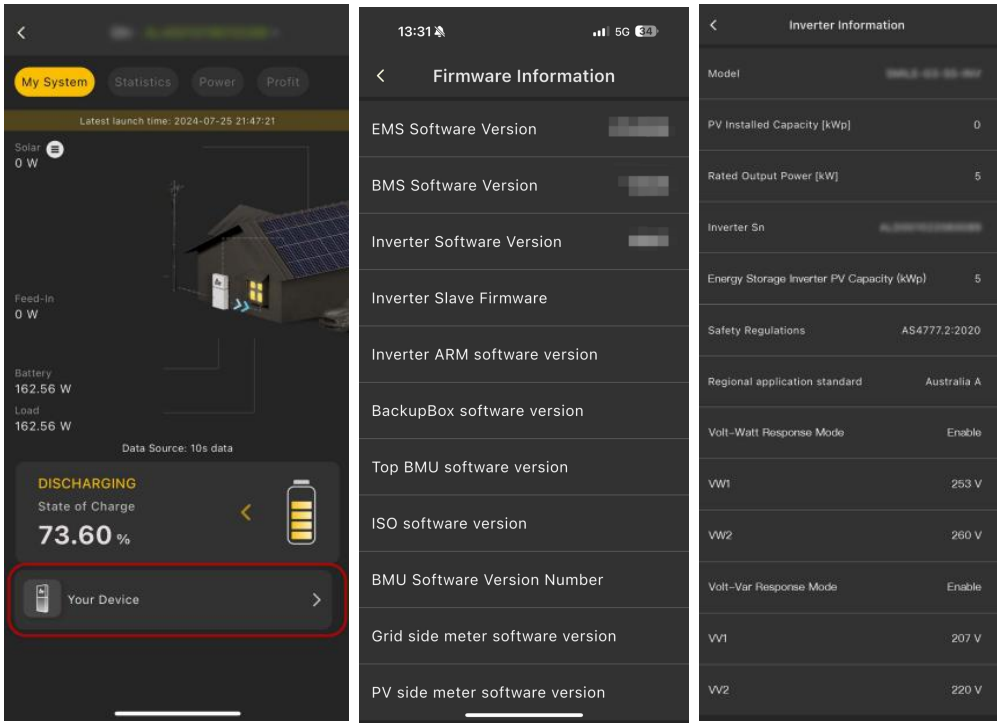


Figure 8-8 APP Hybrid mode Settings

8.3.4. Information on the main page

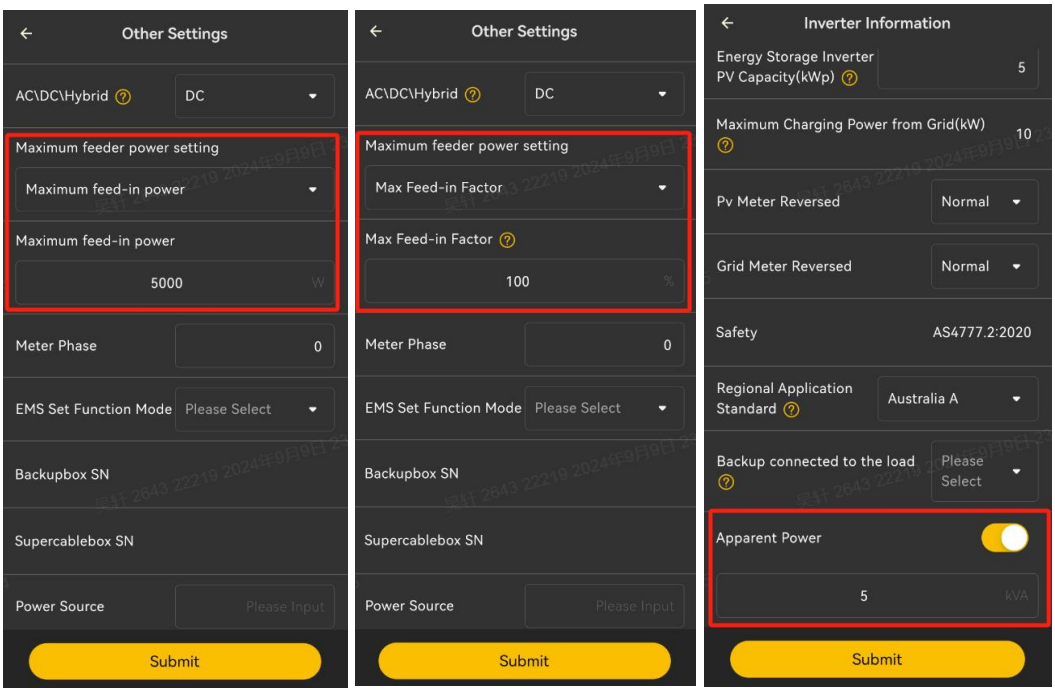
After finishing the basic parameters setting, all the stauts can be found via the main page. On the main page, tap "your device" to view the information for the system. The firmware version can be checked in the "Firmware information", and the safety regulations, the power quality modes and setpoints can be viewed through the "inverter information". Once the safety regulation is chosen during the basic parameters setting, only the Alpha service engineer can change the safety regulation and the setpoints for the power quality response modes. Please contact AlphaESS to change settings when necessary.



8.3.5. Function settings

8.3.5.1 Generation and export limitation

Specifically, if you are an installer who wants to set the soft export limit, you can set the allowable max feed-in factoe from 0-100%, the output to the grid will be reduced based on the inverter maximum output power multiplied by the factor. Or you can set the allowable max feed-in power from 0 W to the rated power of inverter. To switch to the hard export limit and keep the same value, please contact Alpha ESS. To set up the generation limit (for both hard and soft limit), go to your device after the configuration and choose "Inverter Information", where you can set the number of the apparent power for generation limit.



CAUTION

The safety standard field must be set correctly

If you select a safety standard that is not valid for your country, region and purpose, it can cause a disturbance in the energy storage system and lead to problems with the Network 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, region or purpose, contact your Network Operator for information on which safety standard should be used.

NOTICE

A Note on setting Feed-In limits with multiple PV systems

If the product is installed with DC-connected Solar Panels as well as with an existing AC-coupled PV system, Installers may need to set a Feed-In limit to comply with Local Regulations.

The Feed-in limit should be set to the total Phase feed-in limit set by the Network Operator, regardless of the size of the existing AC-coupled PV system. Only set the feed-in limit to *zero* if the Network Operator has dictated *zero feed-in* from the house.

8.4. Installing New System and Settings on the App

8.4.1. Register as an Installer

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

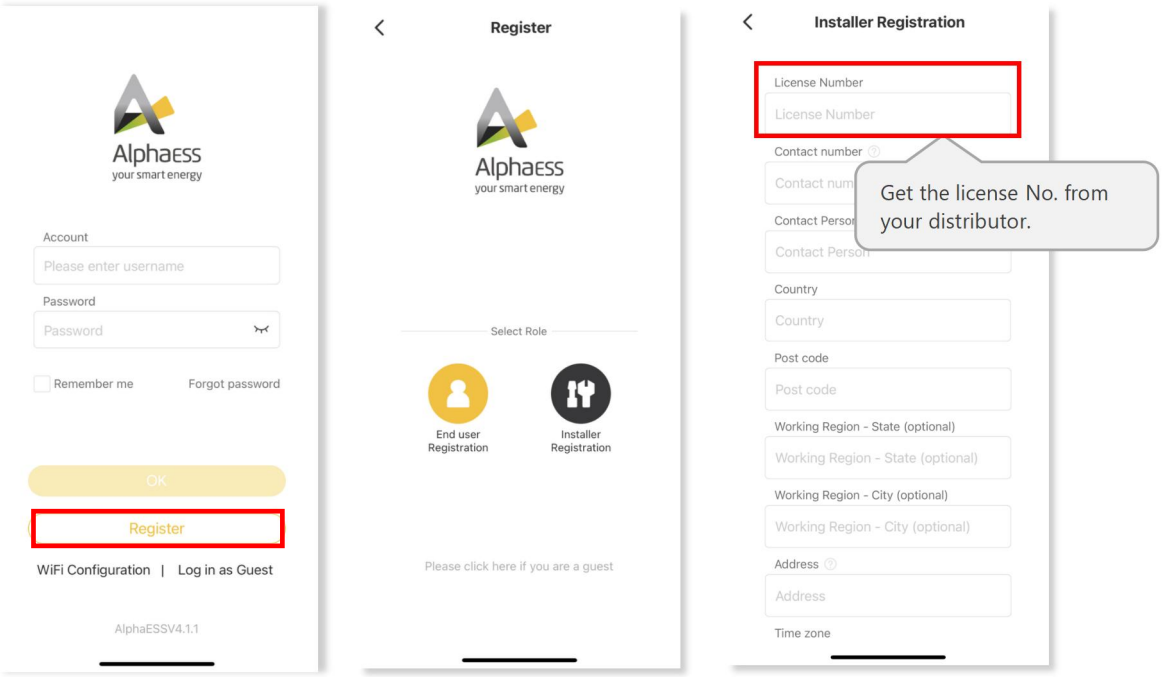


Figure 8-9 APP register and login

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

8.4.2. Overview of Functions for Installer Account

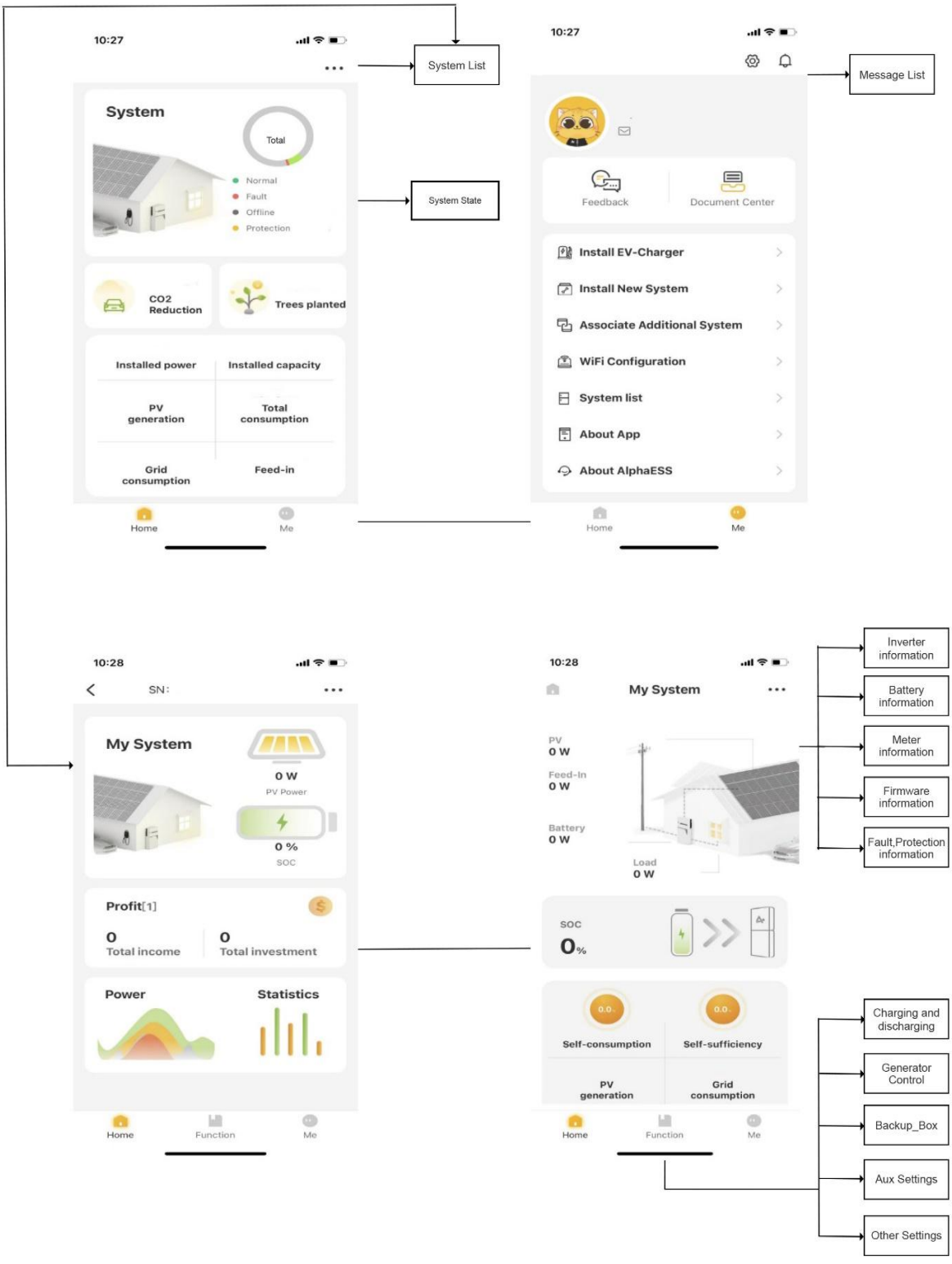


Figure 8-10 Account Functions

8.4.3. Install New System on the App

You can carry out “Install New System” as follows:

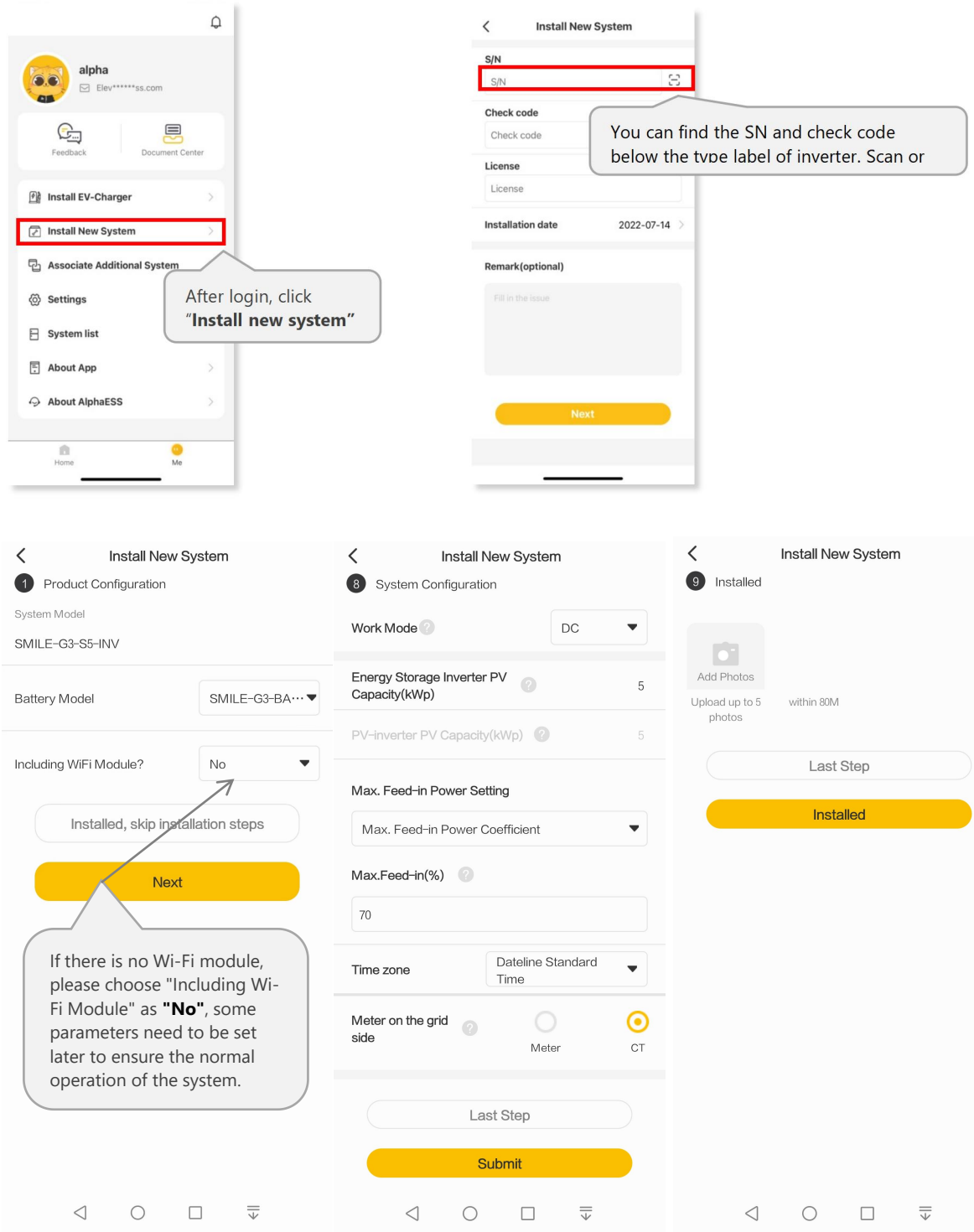


Figure 8-11 Install the new system in APP

For regular installers, please click “Install New System”, enter your installer account ID in the “license” field to bind the system to your account and “activate” the system. Enter S/N, check code, license, installation time and click the “save” button.

8.4.4. Instruct the End User to Install the App

Please make sure that end user has downloaded the App, registered the account correctly, and bound the system SN.

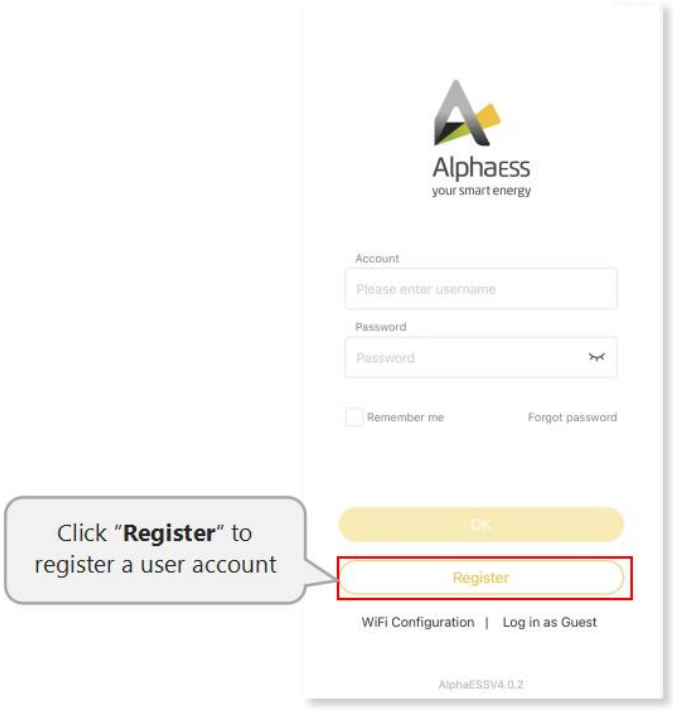


Figure 8-12 User account registration

8.5. Register on AlphaCloud

8.5.1. Register an Installer Account on AlphaCloud

If you do not already have an Installer account, you can create a new account on our web server for system monitoring purposes. In addition, Alpha Warranty is predicated on this connection to our web server.

The data produced prior to registration can be synchronized to the web server.

Step 1: Please open the portal: www.alphaess.com.

Step 2: Please fill in "Username", "Password" and click "Login" if you have already registered.

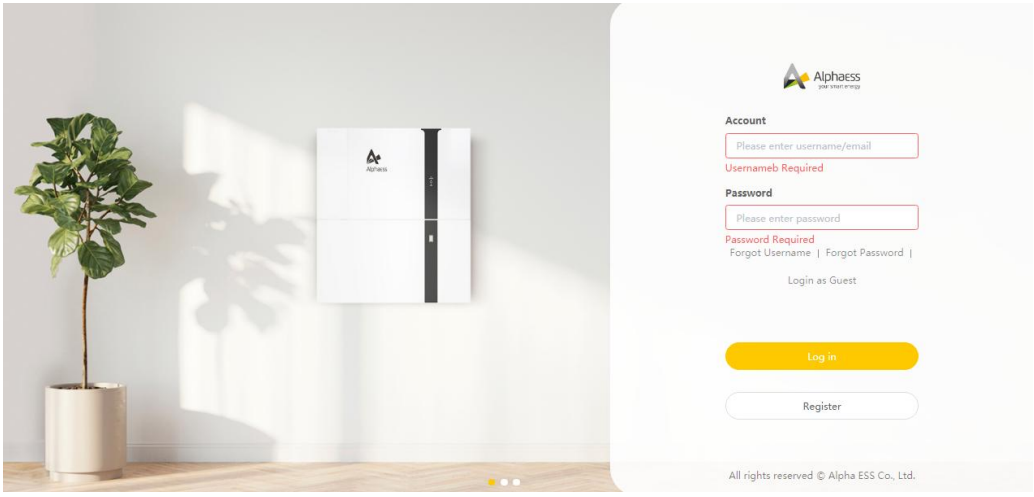


Figure 8-13 Alpha Cloud platform login page

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

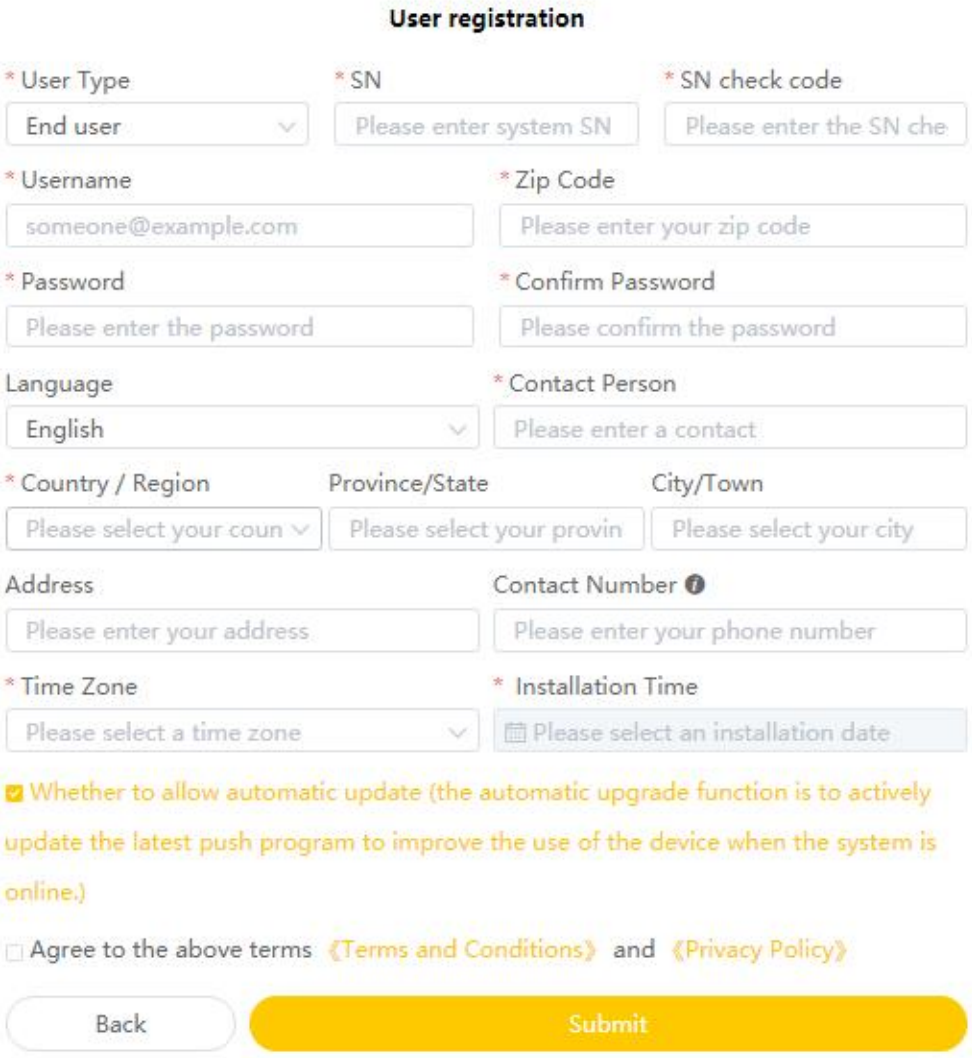


Figure 8-14 User registration

In this form, all fields with a red star are required.
***Serial Number:** SN (please see the type label 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 the AlphaESS homepage.

8.5.2. Install New System on AlphaCloud

Installers who haven't yet registered need to click “Register” to visit the registration page. Please refer to the “AlphaCloud Online Monitoring Web Server Installers User Manual”, which you can get from the Alpha sales team and get a Alpha Installer license number.

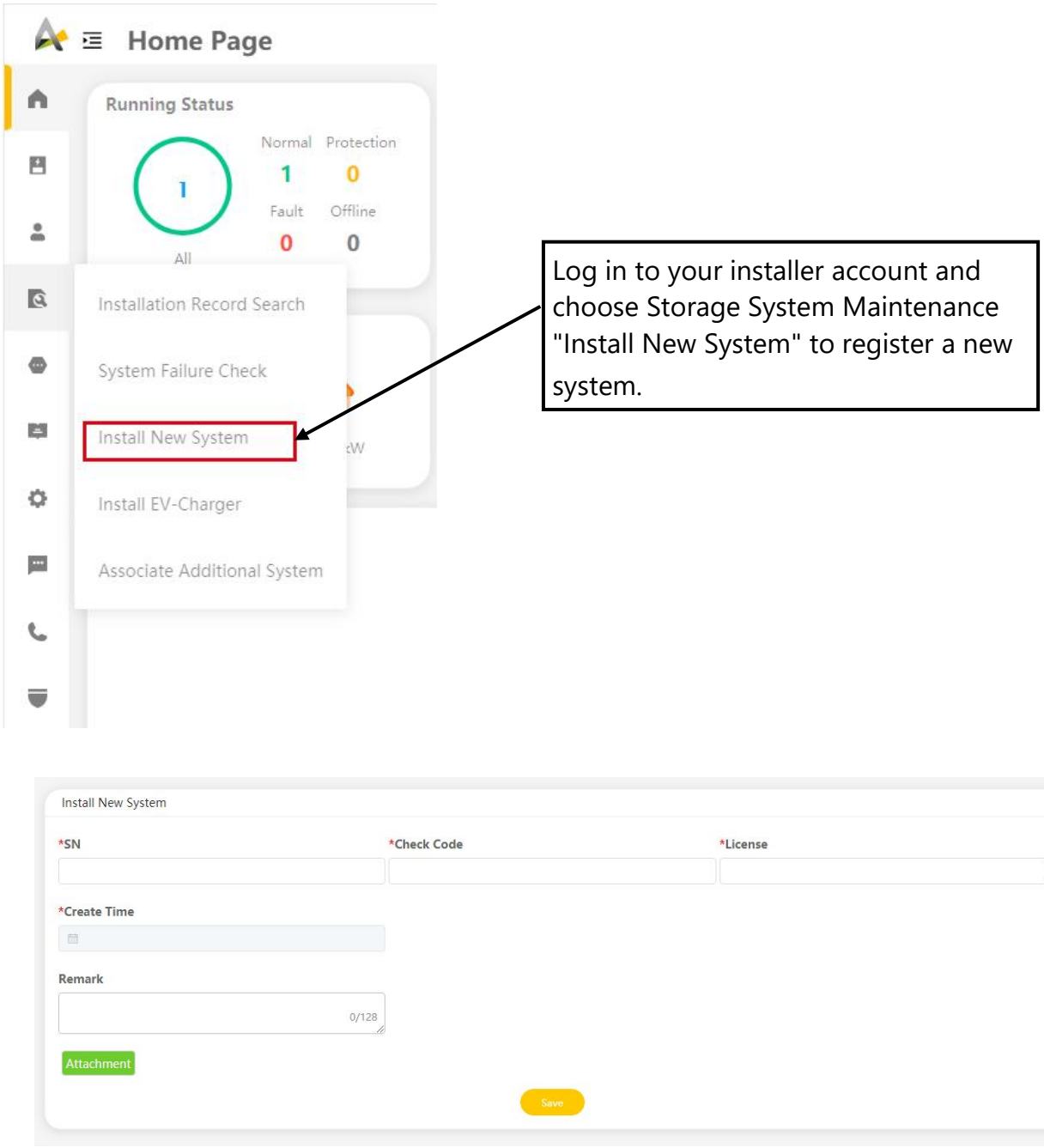


Figure 8-15 Install the new system on the Alpha Cloud platform

Enter the system S/N, check the code, license, and installation date, then click the “Save” button. The red * indicated a required field. Click the “Browse” button to select any attachment you want to add.

8.6. Check System Wiring and Meter Installation

Check the grid's voltage range and frequency range and the installation (including location, direction and phase sequence) of all CT(s) and/or meter(s).

You can directly commission the system after the system configuration process.

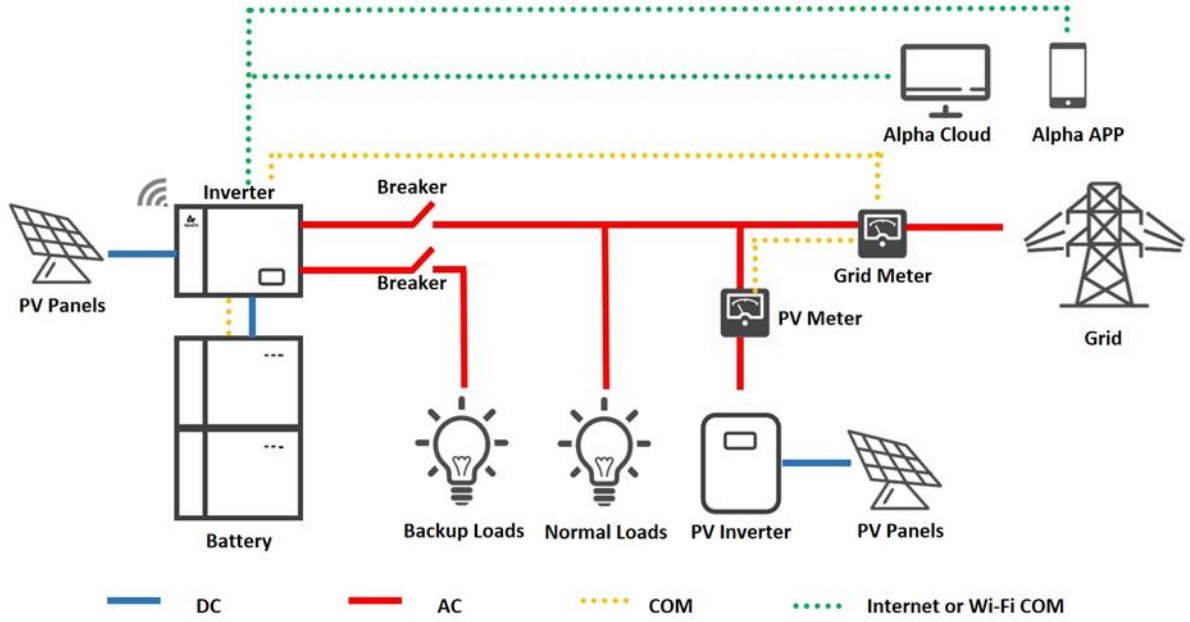


Figure 8-16 Brief wiring diagram of the hybrid-coupled system

1. Detailed operating steps to check system wiring and meter installation as follows:

Please perform the steps below for the circuit breakers and PV switch in the system.

a. Switch on the battery circuit breaker of the energy storage inverter.
b. Switch on the battery circuit breakers of all batteries.
c. Switch on the AC circuit breaker between the grid port of the energy storage inverter and the grid.
d. Switch on the AC circuit breaker between the backup port of the energy storage inverter and the loads.
e. Switch off the PV switch of the energy storage inverter.
f. Switch off the AC circuit breaker (if there is any) between the PV inverter and the grid.
g. At this moment, the energy storage inverter will enter NORMAL state.
h. Please turn off all loads. If you can't, please ensure that there aren't loads of large power fluctuations connected in the system.
i. Log on to the App and click to page "My System" and note the current "**Load**".

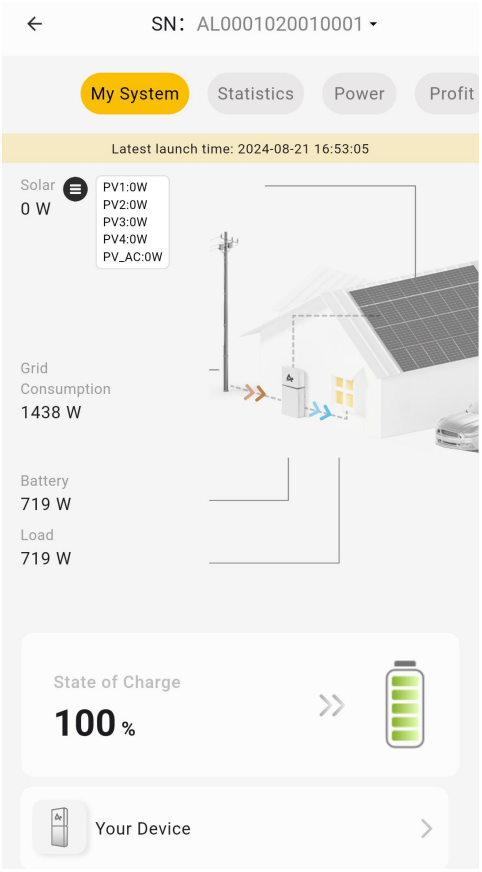


Figure 8-17 My system page on the APP

2. Operate the App and follow the instructions below to enable "Charge Batteries from the Grid".

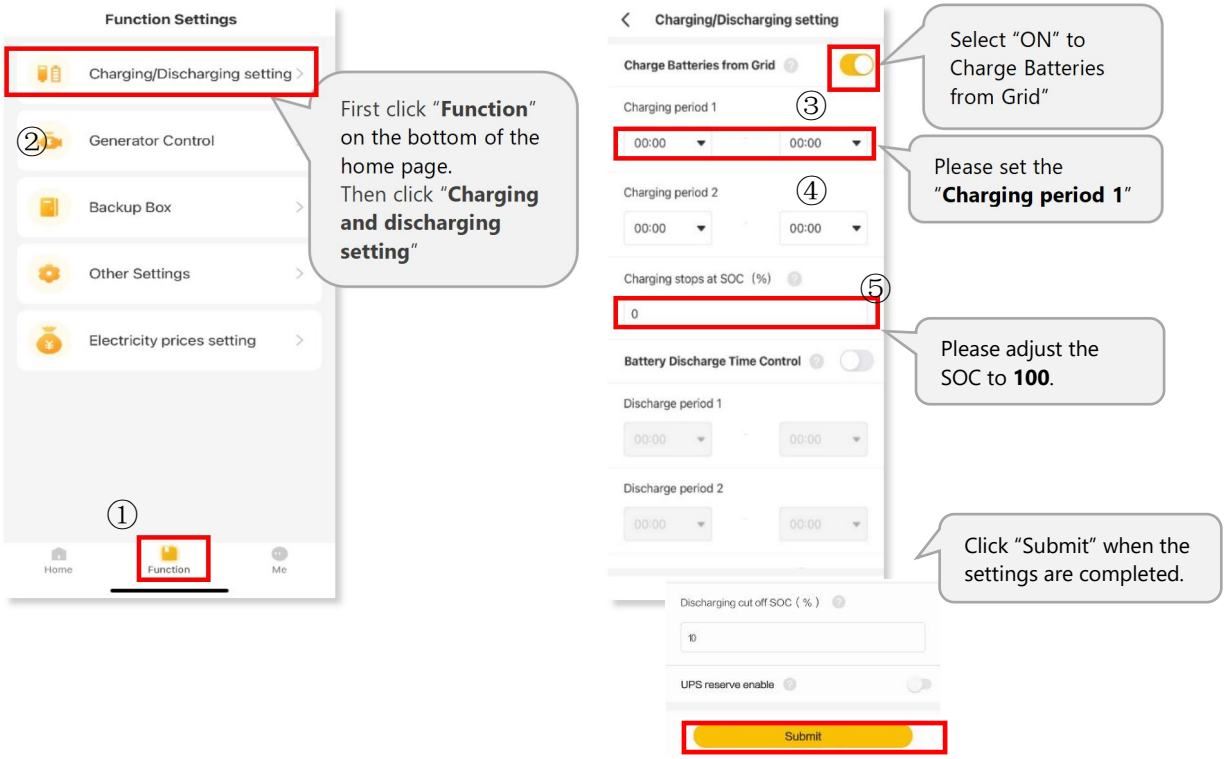


Figure 8-18 Settings for charging the battery from the power grid

If the formula “Grid Power≈ **Load** + Battery Charging Power” fits well, the grid meter installation of the energy storage inverter is correct. Please remember to deactivate the “Charge Batteries from Grid” by clicking “OFF” and save the changes.

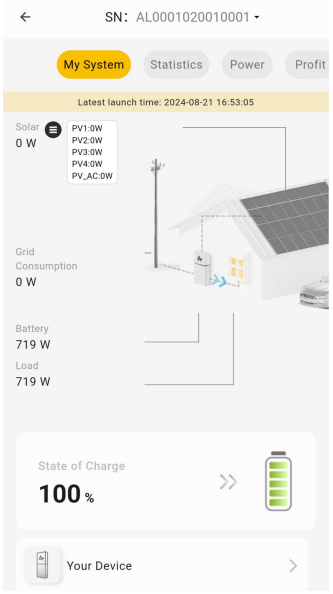


Figure 8-19 Confirmation of installation of power grid electricity meters

If the data doesn’t fit well, please perform the troubleshooting below.

Meter Type	Solution
Meter (without CT)	Check the wiring and location of the grid meter.
Meter (with CT)	Check the location, direction, phase sequence and cable connection of the grid CT.

3. If there isn’t PV inverter in the system, please skip this step.

If PV inverter exists in the system, switch on the AC breaker between the PV inverter and the grid.

Click the App, turn to page “Running Information” and check the power value of “PV Inverter Power”. If the power value is positive, the meter installation of PV inverter is correct.

Figure 8-20 Check the power of the photovoltaic inverter

If the power value of "PV Inverter Power" is negative, please perform the troubleshooting below.

Meter Type	Solution
Meter (without CT)	Check the wiring and location of the PV meter.
Meter (with CT)	Check the location, direction, phase sequence and cable connection of the PV CT.

4. If there are PV modules connected directly to the energy storage inverter, switch on the PV switch of the energy storage inverter.
5. Switch off the AC breaker between the grid port of the energy storage inverter and the grid. At this moment, please check whether the electrical appliance connected to backup side of the energy storage inverter runs normally. Otherwise, please contact Alpha service for further check.

CAUTION

During commissioning, if the LEDs on the display panel of the inverter or the battery show red or yellow, please refer to the troubleshooting chapter of the Installation, Operation & Maintenance Manual.

6. Congratulation. The whole check of system wiring and meter installation has finished successfully.

9. Maintenance and Troubleshooting

9.1. Routine Maintenance

In order to maintain the accuracy of the SOC, it is recommended to perform a full charge calibration for SOC (charge the battery until the charge power is 0W) on the battery at regular intervals (such as two weeks).
Before cleaning, ensure that the system is disconnected from all power sources. Clean the housing, cover and display panel with a soft cloth.
To ensure that the energy storage system can operate properly in the long term, it is advised to perform routine maintenance as described in this chapter.

Maintenance Checklist

Check Item	Acceptance Criteria	Maintenance Interval
Product cleanliness	The enclosure of the inverter should be free from obstacles or dust.	Once every 6 to 12 months
Product visible damage	The product should be not damaged or deformed.	Once every 6 months
Product running status	1. The product should operate without any abnormal sound. 2. All parameters of the product should be set correctly. Perform this check when the product is running.	Once every 6 months
Electrical connections	1. Cables should be securely connected. 2. Cables should be intact, and in particular, the cable jackets touching the metallic surface should not be scratched. 3. Unused cable glands should be blocked by rubber sealing which are secured by pressure caps.	Perform the first maintenance 6 months after the initial commissioning. Thereafter, perform the maintenance once every 6 to 12 months.

CAUTION

Risk of burns due to hot enclosure of the inverter

The enclosure of the inverter can get hot during operation.

Do not touch any parts other than the display panel during operation.

Wait approximately 30 minutes for the inverter to cool down before cleaning.

9.2. Troubleshooting

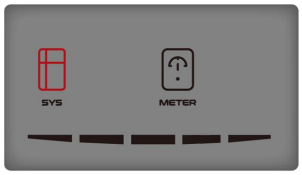
9.2.1. Common Errors

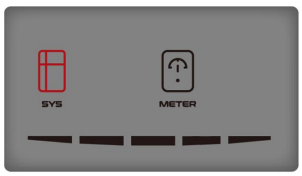
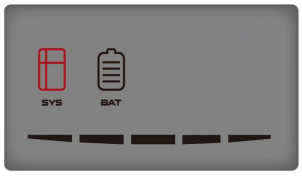
NOTICE

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 serve two functions:

- During normal system operation, they indicate the SOC operation status of the batteries connected in this energy storage system.
- During abnormal system operation, they display corresponding error codes. Each light represents a number, with values of 1, 2, 4, 8, and 16, from right to left.

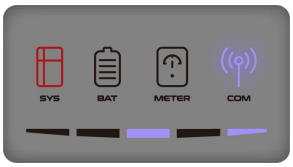
Communication Troubleshooting

LED Indicator	Error Code	LED Display	Description	Troubleshooting
SYS red light is flashing fast	4		Inverter lost	Inverter communication lost 1. Restart the system. 2. Contact customer service to remotely update the inverter program. 3. If the error persists, contact customer service for further check.
SYS red light is glowing. METER light is flashing fast if Grid meter lost. METER light is flashing slow if PV meter lost. METER light is off if all meters lost.	5		Grid meter lost	Grid side meter lost 1. Check whether the system configuration parameters of the AlphaESS App or AlphaCloud are correct and whether the meter is used on the grid side. 2. Check whether the communication cable of the grid meter is connected correctly (RS485:3A6B). 3. Check whether the communication

				configuration parameters of the grid meter are correct (communication address and baud rate). 4. If the error persists, contact customer service for further check.
	6		PV meter lost	PV inverter side meter lost 1. Check whether the system configuration parameters of the AlphaESS App or AlphaCloud are correct and whether the meter is used on the PV inverter side 2. Check whether the communication cable of the meter of PV inverter side is connected correctly (RS485:3A6B). 3. Check whether the communication configuration parameters of the meter on the PV inverter side are correct (communication address and baud rate). 4. If the error persists, contact customer service for further check.
SYS red light is glowing, BAT light is off	7		BMS lost	BMS lost 1. Check whether the BMS communication connection between the battery and the inverter is correct. 2. Check if the battery is switched on. 3. If the error persists, contact customer service

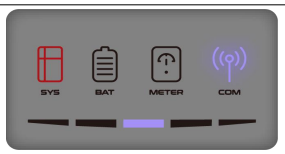
				for further check.

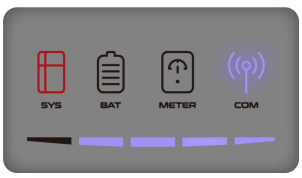
Battery Error Troubleshooting

LED Indicator	Error Code	LED Display	Description	Troubleshooting
SYS red light is on; BAT light is flashing if the battery is faulty.	60002		Circuit_Breaker_ Open	Try to switch on all batteries' circuit breakers. If the error persists, contact customer service for further check.
	60004		Follower_ Battery_ Communication_Lost	Check the communication cables between batteries. If the error persists, contact customer service for further check.
	60006		Host_Battery_ Communication_ Lost	
	60008		Multi_Host_ error	

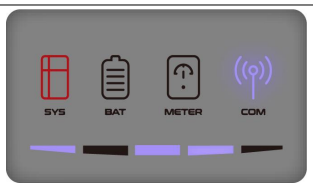
Inverter Error Troubleshooting

LED Indicator	Error Code	LED Display	Description	Troubleshooting
	100000		Grid_OVP	1. Check whether grid is abnormal. 2. Confirm whether the grid cable connection is normal. 3. Restart inverter. If the error persists, contact customer service for further

SYS red light is flashing fast.				check.
	100001		Grid_UVP	1. Check whether the PV input voltage of PV1, PV2 and PV3 exceeds 1000V. If there is no PV input overvoltage, restart the inverter. If the error persists, contact customer service for further check.
	100002		Grid_OFP	
	100003		Grid_UFP	1. Check whether the PV input voltage of PV1, PV2 and PV3 exceeds 1000V. If there is no PV input overvoltage, restart the inverter. If the error persists, contact customer service for further check.
	100005		BUS_OVP1	
	100007		Insulation_ fault	1. Check whether PV cable connection is reliable. 2. Check whether PV cable is damaged. If the error persists, contact customer service for further check.
	100008		GFCI_fault	1. Restart inverter and check whether the error persists. If so, please call customer service.
	100010		Grid_relay_ fault	

SYS red light is flashing fast	100011		Over_ Temperature	1. Check whether the environment around inverter has poor heat dissipation. 2. Confirm whether inverter installation meets the installation requirements.
	100012		PV_Reverse	1.Check whether the PV terminal of the inverter is reversed. If the PV terminal is right, please call customer service.
	100013		BAT_Reverse	1.Check whether the BAT terminal of the inverter is reversed. If the BAT terminal is right, please call customer service.
	100017		MPPT1_OVP	Check the PV1 voltage. If it exceeds 950VDC, reduce the number of PV modules.
	100021		MPPT2_OVP	Check the PV2 voltage. If it exceeds 950V, reduce the number of PV modules
	100025		BAT_OVP	Check whether the actual battery voltage exceeds the battery charge cut-off voltage by more than 20V.
	100026		BAT_UVP	1. Check whether the actual battery voltage is lower than the battery discharge cut-off voltage. If the error persists, contact customer service for further check.

SYS red light is flashing fast.	100027		Battery_lose	1. Confirm whether the battery communication cable connection is normal. 2. check whether the battery voltage sampling value is less than 75V. If the error persists, contact customer service for further check.
	100042		Output_short_circuit	1. Use a multimeter to test the impedance of the off-grid output. If it is low, check whether the wiring is correct. 2. Restart the inverter. If the error persists, contact customer service for further check.
	100043		Output_ overload	Check whether the load exceeds the rated power. 2. Restart the inverter. If the error persists, contact customer service for further check.
	100052		Backup_ovp	1. Restart the inverter. If the error persists, contact customer service for further check.
	100211		Para_CAN	Check the communication cables connection between inverters. If the error persists, contact customer service for further check.
	100213		Para_SW_Diff	Check the inverter software versions. If they are inconsistent, upgrade the

				inverters to the same software version.
	100214		Para_Module _Fault	Check parallel inverter mode Settings. Only one host is allowed.
	100216		Para_Multi_ Host	

9.2.2. Battery Protection Description for Series Battery

The three LED indicators on the front cover provide information about the protection status of the battery.

: Yellow LEDs flashing

: Yellow LEDs on

: Yellow LEDs off

LED Display State	Description	Troubleshooting
	Temperature difference	Wait for automatic recovery. If this protection state persists, please call customer service.
	High temperature	Stop discharging and charging until this protection state disappears. Wait for the temperature to drop.
	Low temperature discharge	Stop discharging until this protection state disappears. Wait for the temperature to rise.
	Overcurrent charge	Wait for automatic recovery. If this protection state persists, please call customer service.
	Overcurrent discharge	
	Cell overvoltage	Wait for automatic recovery. If this protection state persists for a long time, please

		call customer service.
	Cell under voltage	Stop discharging and call customer service immediately.
	Low temperature charge	Stop charging until this protection state disappears. Wait for the temperature to rise.

NOTICE

During work mode, if the protection status "Cell under voltage" appears, please take the following action:

First, switch off the circuit breaker which is located at the lower left of the battery, switch on the circuit breaker and wait for 3~5 seconds, switch off the circuit breaker, then switch on the circuit breaker and wait for 3~5 seconds, switch off the circuit breaker, at last switch on the circuit breaker of the battery. The BMS will be forced to turn on the MOSFET of discharge, allowing the energy storage inverter to detect the battery's open voltage and begin charging it.

9.2.3. Battery Error Description

The three LED indicators on the front cover provide information about the error status of the battery.

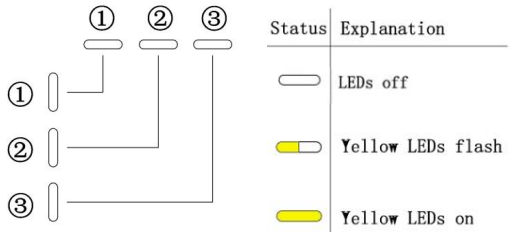


Figure 9-1 LED display

LED Display State	Description	Troubleshooting
	Hardware error	Wait for automatic recovery. If this error persists, please call customer service.
	Hardware error	
	Circuit breaker open	Switch on circuit breaker after power off the battery.
	LMU disconnect (follower)	Reconnect the BMS communication cable.
	SN missing	Please call customer service.

	LMU disconnect (host)	Reconnect the BMS communication cable.
	Software version inconsistent	Please call customer service.
	Multi-host	Restart all batteries.
	MOS over temperature	Power off the battery and power on the battery after 30 minutes.
	Insulation fault	Restart battery. In case this error persists, please call customer service.
	Total voltage fault	Restart battery. In case this error persists, please call customer service.
	Precharge failure	Restart battery. In case this error persists, please call customer service.

10. Product Removal & Return

10.1. Removing the Product

Procedure

Step 1: Power off the energy storage system as described in Chapter 8.2 Powering off the System.
Step 2: Disconnect all cables from the system, including communication cables, PV power cables, battery power cables, AC cables, and PE cables.
Step 3: Remove the Wi-Fi module.
Step 4: Remove the cable covers of the inverter and the battery.Remove the right cover of the inverter.
Step 5: Remove the inverter from the top of the battery.
Step 6: Remove the batteries.
Step 7: Remove the battery wall brackets.

10.2. 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.

10.3. Disposing of the Product

If the product's service life expires, dispose of it according to the local disposal rules rical equipment and electronic waste.

Dispose of the packaging and replaced parts according to the rules at the installation re the device is installed.

Do not dispose the product with regular household waste.

11. Technical Data

11.1. Datasheet of Inverter

Item	SMILE-G3-T5-INV	SMILE-G3-T10-INV
Input DC (PV Side)		
Recommended Max. PV Power	10000 W	20000W
Max. PV Input Voltage	1000 V	
Rated Voltage	720 V	
Start-up Voltage	120 V	
MPPT Voltage Range	140 to 950 V	
Max. Input Current per MPPT	16 A / 16 A / 16A	
Max. Short Circuit Current per MPPT	24 A / 24 A / 24A	
MPPT Number	3	
Max. Input Strings Number per MPPT	1	
Surge Category in Accordance with IEC 62109-1	III	
Battery		
Battery Type	LFP ($LiFePO_4$)	
Battery Voltage Range	90 to 700 V	
Max. Charge Power	5 kW	10 kW
Max. Discharge Power	5 kW	10 kW
Max. Charge/ Discharge Current	40 A / 40 A	
Communication	CAN	
Output AC (Back-up, On Grid)		
Rated Output Power	5 kW	10 kW
Rated Apparent Output Power	5 kVA	10 kVA
Rated Output Current	7.3 A	14.5 A
Max. Continuous Output Power	5 kW	10 kW
Max. Continuous Output Apparent Power	5 kVA	10 kVA
Max. Output Current	7.3 A	14.5 A
Rated Output Voltage	3L/N/PE, 230 / 400V	
Rated Frequency	50 / 60 Hz	
Output AC (Back-up, Off Grid)		
Rated Output Power	5 kW	10 kW

Rated Apparent Output Power	5 kVA	10 kVA
Rated Output Current	7.3 A	14.5 A
Max. Continuous Output Power	5 kW	10 kW
Max. Continuous Output Apparent Power	5 kW	10 kW
Max. Output Power ≤ 30s	7.5 kW	15 kW
Max. Output Apparent Power ≤ 30s	7.5 kVA	15 kVA
Max. Output Power ≤ 1s	10 kW	15 kW
Max. Output Apparent Power ≤ 1s	10 kVA	15 kVA
Back-up Switch Time	<20 ms	
Rated Output Voltage	3L/N/PE, 230 / 400V	
Rated Frequency	50 / 60 Hz	
Input AC (Grid Side)		
Rated Output Voltage	3L/N/PE, 230 / 400V	
Rated Frequency	50 / 60 Hz	
Max. Input Power	10 kW	15 kW
Max. Input Current	14.5 A	21.7 A
Output AC (Grid Side)		
Rated Output Power	5 kW	10 kW
Rated Apparent Output Power	5 kVA	10 kVA
Rating Grid Output Current	7.3 A	14.5 A
Operation Phase	Three-phase	
Rated Grid Voltage	3L/N/PE, 230 / 400V	
Grid Voltage Range	150 to 288 V	
Rated Grid Frequency	50 / 60 Hz	
Power Factor	>0.99 (0.8 leading to 0.8 lagging)	
Protection Class	I	
Overvoltage Category	III	
Surge Category in Accordance with IEC 60664-1	II	
Efficiency		

Max. Efficiency, η_{max}	97.8%	97.8%
European Weighted Efficiency, η_{EU}	97.0%	97.0%
Protection		
Anti-Islanding Protection	Integrated	
Insulation Resistor Detection	Integrated	
Residual Current Monitoring Unit	Integrated	
Output over Current Protection	Integrated	
Output Short Protection	Integrated	
Output Overvoltage Protection	Integrated	
PV Reverse Polarity Protection	Integrated	
PV Overvoltage Protection	Integrated	
PV Switch	Integrated	
Battery Breaker	Integrated	
General Data		
Dimensions (W*H*D)	610*416*212.5 mm	
Weight	29kg	
Topology	Transformerless	
Warranty	10 Years Product Warranty	
Operation Temperature Range	-25 to +60 °C	
Max. Permissible Value for Relative Humidity (Condensing)	100%	
Ingress Protection	IP65	
Display	LED	
Noise Emission	<30 dB(A) @1m	
Cooling Concept	Natural convection	
Max. Operating Altitude above MSL	3000 m	
Features		
PV Connection	Vaconn D4 connectors	
Grid Connection	Plug-in connector	
Backup Connection	Plug-in connector	
BAT Connection	Amphenol H4 connectors	

Communication	LAN, Wi-Fi

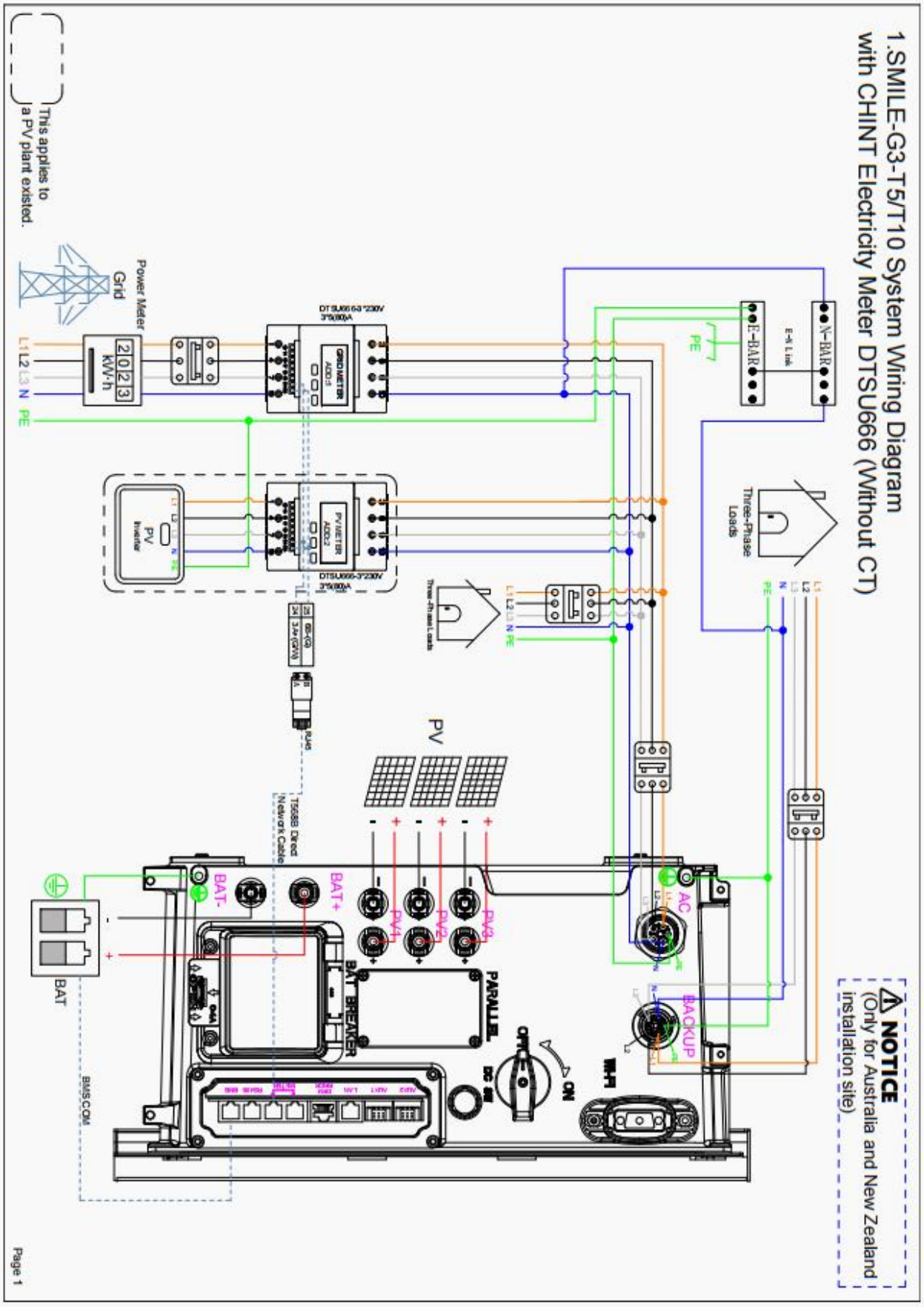
11.2. Datasheet of Battery SMILE-G3-BAT-9.3S

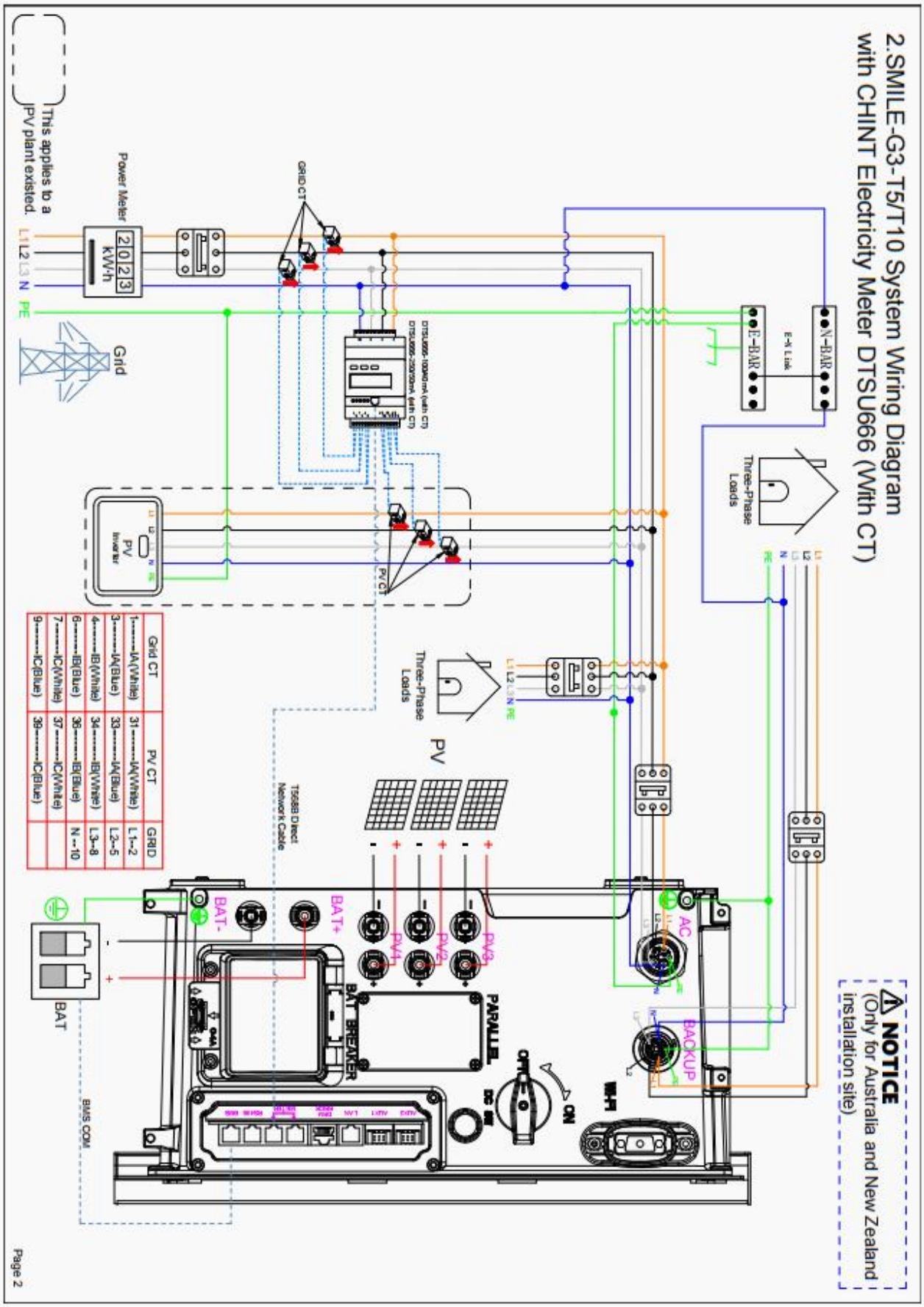
Model	SMILE-G3-BAT-9.3S	SMILE-G3-BAT-9.3S II	SMILE-G3-BAT-9.3S III
Battery Type	LFP ($LiFePO_4$)		
Battery Module	9.3 kWh, 81 kg		
Modules Connection	1	2	3
Usable capacity	9.3 kWh	18.6 kWh	27.9 kWh
Weight	81 kg	162 kg	243 kg
Dimension (W*D*H)	620 * 212 * 634 mm	620 * 212 * 1268 mm	620 * 212 * 634 mm and 620 * 212 * 1268 mm
Nominal voltage	96 V		
Operating voltage range	90 to 105.6 V		
Max. charge current*	52.5 A	52.5 A	52.5 A
Max. discharge current*	52.5 A	52.5 A	52.5 A
Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature		
BMS communication	CAN		
General Date			
Environmental Category	Outdoor		
Ingress protection	IP65		
Operating temperature range	Charge：-20＜T≤50℃ Discharge：-20＜T≤50℃		
Relative Humidity	0 ~ 100% (No condensation)		
Safety	IEC 62619, IEC 62040, IEC 61000-6-1/3		
Transportation	UN38.3		
Warranty	10 Years Product Warranty, 10 Years Battery Performance Warranty		
Model	**SMILE-G3-BAT-9.3S IV**	**SMILE-G3-BAT-9.3S V**	**SMILE-G3-BAT-9.3S VI**
Battery Type	LFP ($LiFePO_4$)		
Battery Module	5 kWh, 49.5 kg		
Modules Connection	4	5	6
Usable capacity	37.2 kWh	46.5 kWh	55.8 kWh
Weight	324 kg	405 kg	486 kg
Dimension (W*D*H)	620 * 212 * 1268 mm X 2	620 * 240 * 634 mm and 620 * 240 * 1268 mm X 2	620 * 212 * 1268 mm X 3
Nominal voltage	96 V		
Operating voltage range	90 to 105.6 V		
Max. charge current*	52.5 A	52.5 A	52.5 A

Max. discharge current*	52.5 A	52.5 A	52.5 A
Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature		
BMS communication	CAN		
General Date			
Environmental Category	Outdoor		
Ingress protection	IP65		
Operating temperature range	Charge：-20＜T≤50℃ Discharge：-20＜T≤50℃		
Relative Humidity	0 ~ 100% (No condensation)		
Safety	IEC 62619, IEC 62040, IEC 61000-6-1/3		
Transportation	UN38.3		
Warranty	10 Years Product Warranty, 10 Years Battery Performance Warranty		

* Max. charge/discharge current derating may occur with changes in temperature and SOC.

12. Appendix 1: System Wiring Diagram




2.SMILE-G3-T5/T10 System Wiring Diagram
with CHINT Electricity Meter DTSU666 (With CT)
NOTICE
(Only for Australia and New Zealand installation site)
This applies to a PV plant existed.
Power Meter
Grid
GRID CT
PV CT
PV Inverter
N-BAR
E-BAR
Three-Phase Loads
PV
AC
BACKUP
BAT
BAT+
BAT-
PV1
PV2
PV3
PV4
BAT BREAKER
PARALLEL
ON
OFF
WiFi
BMS COM
T568B Direct Network Cable
Grid CT
PV CT
GRID
L1
L2
L3
N
PE
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