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V06

INSTALLATION, OPERATION & MAINTENANCE MANUAL OF SMILE-G3-T4/T5/T6/T8/T10/T12/T15 & SMILE-G3-BAT-3.8S/4.5S/9.3S



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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-T4/T5/T6/T8/T10/T12/T15-INV and battery, SMILE-G3-BAT-3.8S, SMILE-G3-BAT-4.5S, 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:

1. Knowledge of working principle of inverters.
2. Knowledge of how to deal with the dangers and risks associated with installing and using electrical devices, batteries and energy storage system.
3. Knowledge of the installation and commissioning of electrical devices and energy storage system.
4. Knowledge of the applicable standards and directives relevant to the product and its installation.
5. Understood and complied with this document, including all safety precautions.
6. 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
ESS	energy storage 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-T4/T5/T6/T8/T10/T12/T15-INV and SMILE-G3-BAT-4.5S&SMILE-G3-BAT-9.3S are suitable for indoor and outdoor installation.

SMILE -G3-BAT-3.8S is only suitable for indoor installation.

The SMILE-G3-T4/T5/T6/T8/T10/T12/T15-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 AlphaESS. Unauthorized alterations will void the

product warranty(s). AlphaESS 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

1. 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.
2. Overvoltage or incorrect wiring can damage the battery and cause deflagration, which can be extremely dangerous.
3. All types of battery breakdown may lead to electrolyte or flammable gas leakage.
4. The battery is not user-serviceable because there is high voltage in the device.
5. Read the label with Warning Symbols and Precautions on the right side of the battery.
6. Do not connect any AC conductors or PV conductors directly to the battery which should be connected only to the inverter.
7. Do not charge or discharge a damaged battery.
8. 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.
9. 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:

1. Inhalation: Leave the contaminated area immediately and seek medical attention.

2. Eye injuries: Rinse eyes with running water for 15 minutes and seek medical attention.
3. Skin injuries: Wash the affected area thoroughly with soap and seek medical attention.
4. Ingestion: Induce vomiting and seek medical attention.

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

1. Fire extinguishing methods

(1) A Respirator is not required during normal operations.

(2) Use an FM-200 or CO_2 extinguisher for battery fire.

(3) 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.

2. Firefighting instructions

(1) 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.

(2) If the battery is not on fire yet, extinguish the fire before the battery catches fire.

(3) 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.

3. Effective ways to deal with accidents

(1) On land: Place damaged battery in a segregated place and call local fire department or technical service engineer.

(2) In water: Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.

(3) Do not use submerged battery again and contact an AlphaESS–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.
	Read the Product documentation
	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.

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.
	Risk of chemical burns
	Risk of explosion
	Risk of electrolyte leakage
	Read the Product documentation
	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.
	Fire, naked light and smoking prohibited
	Avoid close proximity. Do not approach the Product unnecessarily.
	Do not short circuit the battery. 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

Location	Name	Explanation
1	SMILE	Residential energy storage system
2	G3	3rd Generation of SMILE series
3	T4	4 kW Inverter with Solar Connections — Three–phase Hybrid energy storage system
	T5	5 kW Inverter with Solar Connections — Three–phase Hybrid energy storage system
	T6	6 kW Inverter with Solar Connections — Three–phase Hybrid energy storage system
	T8	8 kW Inverter with Solar Connections — Three–phase Hybrid energy storage system
	T10	10 kW Inverter with Solar Connections — Three–phase Hybrid energy storage system
	T12	12 kW Inverter with Solar Connections — Three–phase Hybrid energy storage system

	T15	15 kW Inverter with Solar Connections — Three-phase Hybrid energy storage system

Complete Designation	Designation in This Document
SMILE-G3-T4-INV SMILE-G3-T5-INV SMILE-G3-T6-INV SMILE-G3-T8-INV SMILE-G3-T10-INV SMILE-G3-T12-INV SMILE-G3-T15-INV	Energy storage inverter
SMILE-G3-BAT-3.8S SMILE-G3-BAT-4.5S SMILE-G3-BAT-9.3S	Series battery
SMILE-G3-T4 SMILE-G3-T5 SMILE-G3-T6 SMILE-G3-T8 SMILE-G3-T10 SMILE-G3-T12 SMILE-G3-T15	Energy storage system / System

3.2. System Introduction

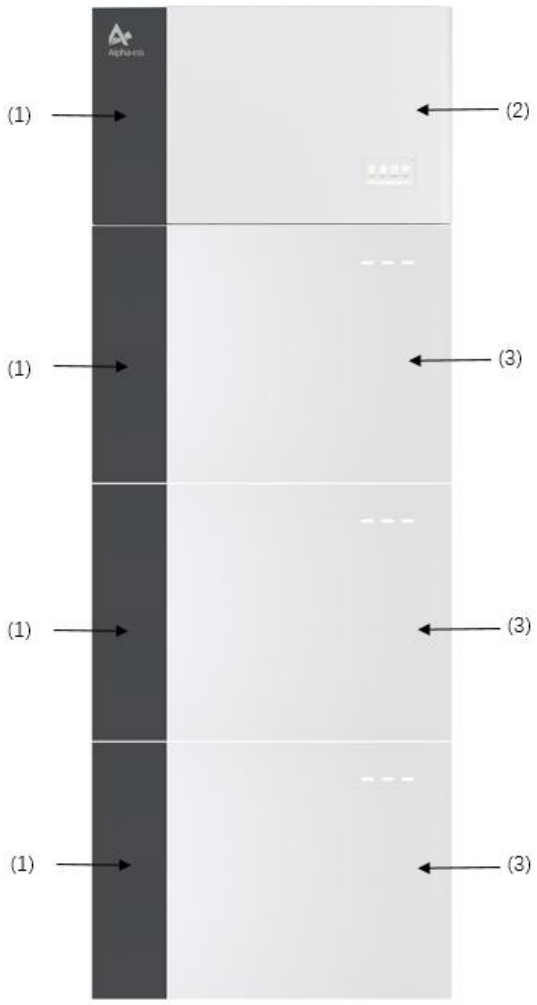


Figure 3-1 System product diagram

Object	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-T4-INV SMILE-G3-T5-INV SMILE-G3-T6-INV SMILE-G3-T8-INV SMILE-G3-T10-INV SMILE-G3-T12-INV	Energy storage inverter

	SMILE-G3-T15-INV	
3	SMILE-G3-BAT-3.8S SMILE-G3-BAT-4.5S SMILE-G3-BAT-9.3S	Battery

3.3. Product Description

3.3.1. Inverter Electrical Interface & Connections Introduction

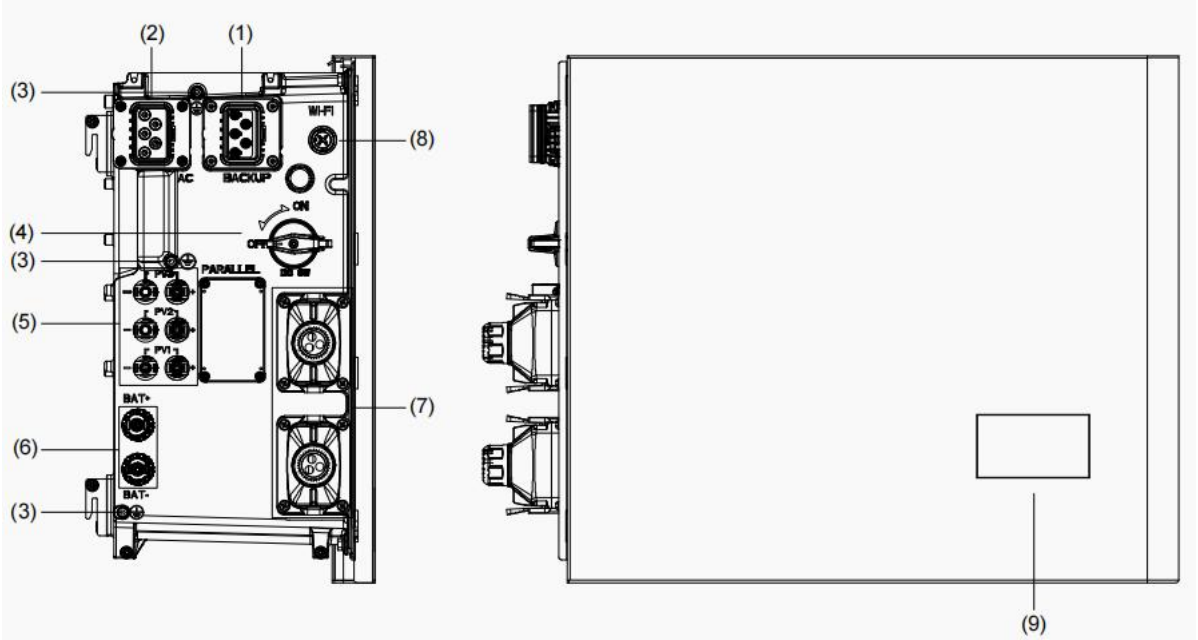


Figure 3-2 Inverter electrical interface diagram

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

* PV switch of the inverter is switched off when shipped.

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

3.3.2. Inverter Display Interface Introduction

LED Display

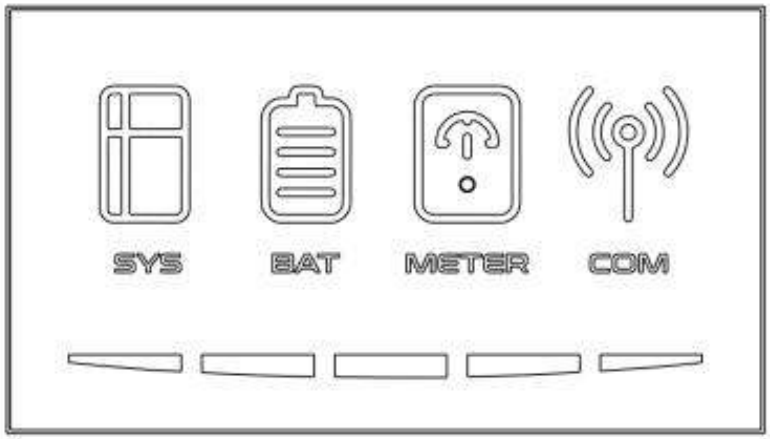


Figure 3-3 LED display

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

Status	Explanation	Status	Explanation
	White light The system works normally		**White light** The battery works normally
	**Red light** The system is in fault		**No light** The battery is in fault
	**White light** Meter communication works normally		**White light** Connected to the server
	**Flashing when SYS is white** The system is in UPS mode **Flashing or No light when SYS is red** Meter lost		**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.

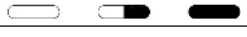
Status	Explanation
	White LED is off
	White LED is flashing
	White LED is glowing

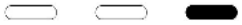
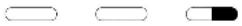
LED Indicator	SOC	Description
LEDs show the SOC of batteries		SOC≤5%
		5%＜SOC≤20%
		20%＜SOC≤40%
		40%＜SOC≤60%
		60%＜SOC≤80%
		80%＜SOC≤100%

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-3.8S

Battery appearance and dimensions

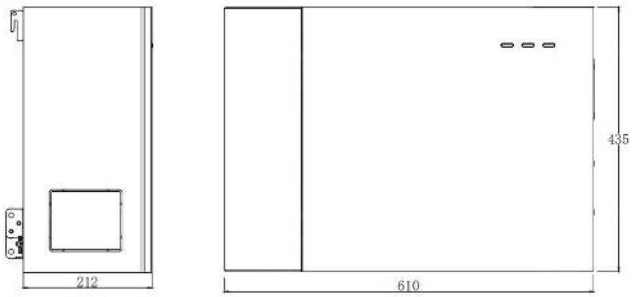


Figure 3-4 Battery appearance and dimensions

Connection area overview

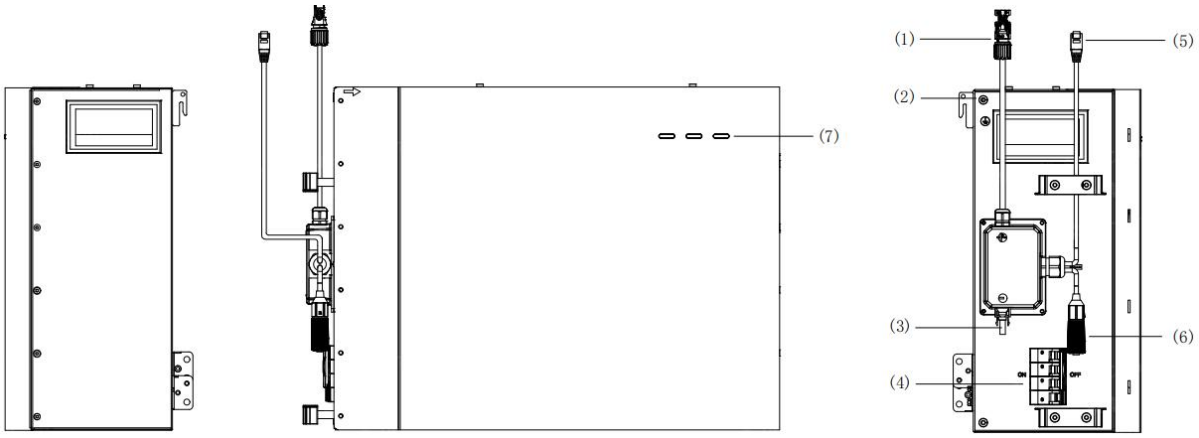


Figure 3-5 Connection area overview

Position	Designation
1	Battery Positive Connector
2	Grounding Point
3	Battery Negative Connector
4	Battery Circuit Breaker
5	BMS COM1
6	BMS COM2 (with Terminal Resistor)
7	LED Display

3.3.5. Battery Introduction of SMILE-G3-BAT-4.5S

Battery appearance and dimensions

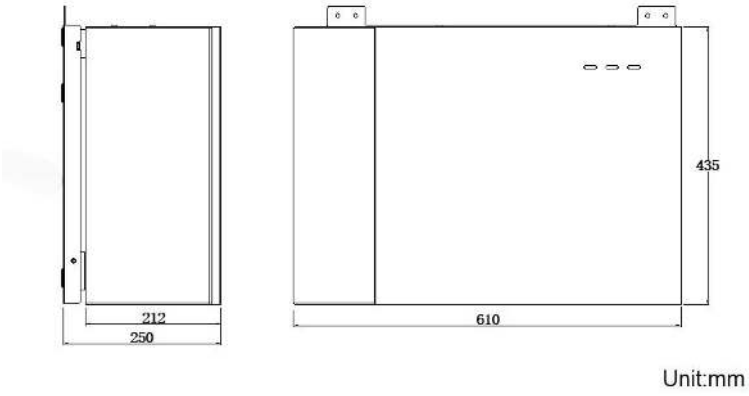


Figure 3-6 Battery appearance and dimensions

Connection area overview

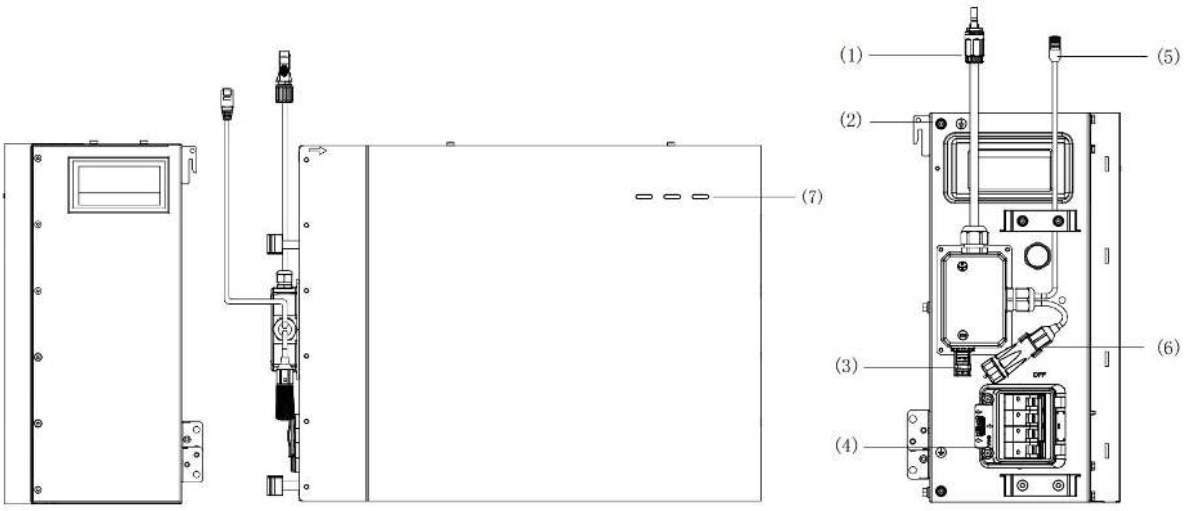


Figure 3-7 Connection area overview

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

6	BMS COM2 (with Terminal Resistor)
7	LED Display

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

Battery appearance and dimensions

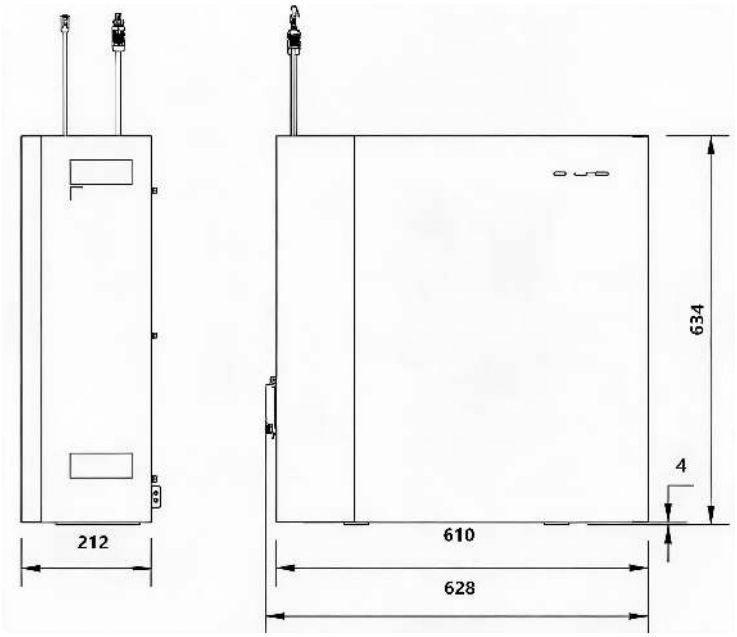


Figure 3-8 Battery appearance and dimensions

Connection area overview

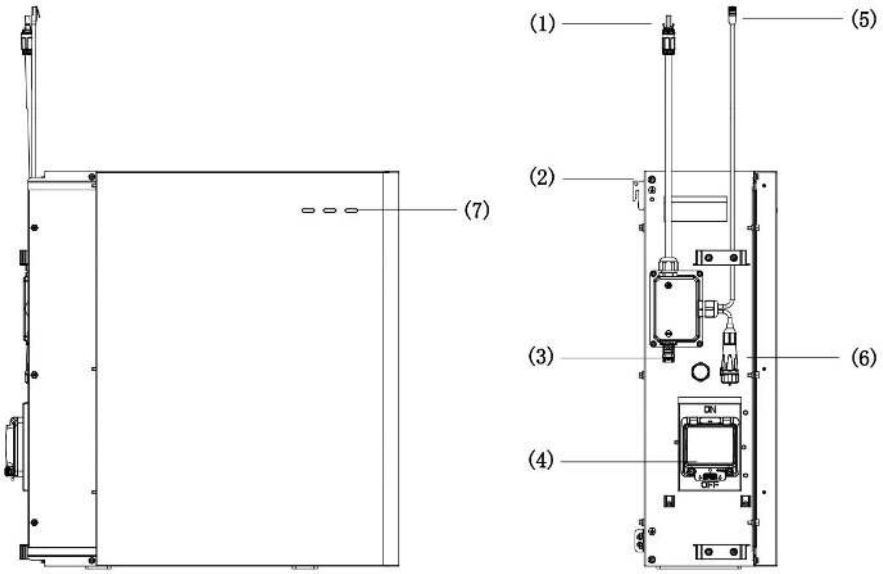


Figure 3-9 Connection area overview

Position	Designation
1	Battery Positive Connector
2	Grounding Point
3	Battery Negative 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-T4/T5/T6/T8/T10/T12/T15-INV, battery SMILE-G3-BAT-3.8S, SMILE-G3-BAT-4.5S and 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

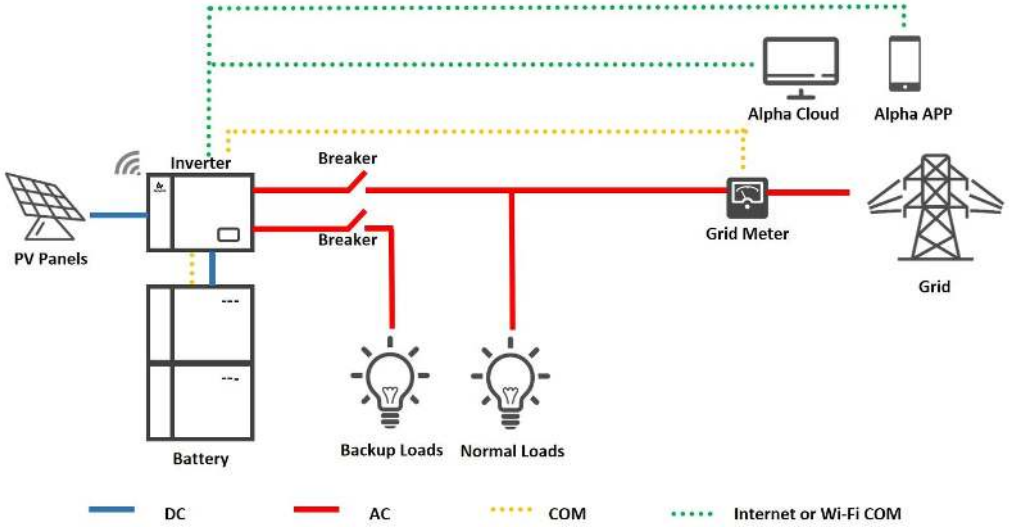


Figure 3-10 DC-Coupled Storage System — Scheme

3.4.2. AC-Coupled Energy Storage System

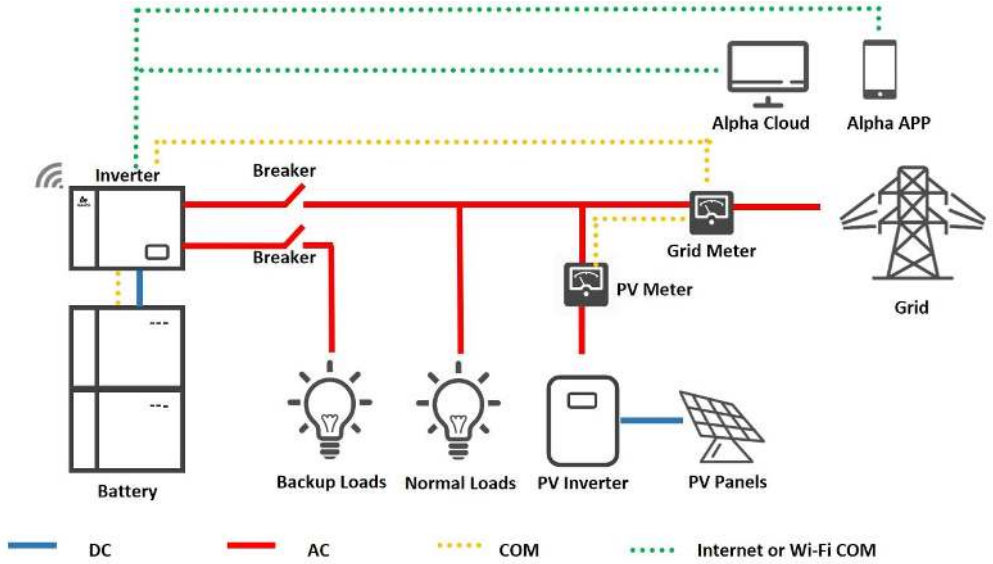


Figure 3-11 AC-Coupled Storage System — Scheme

3.4.3. Hybrid-Coupled Energy Storage System

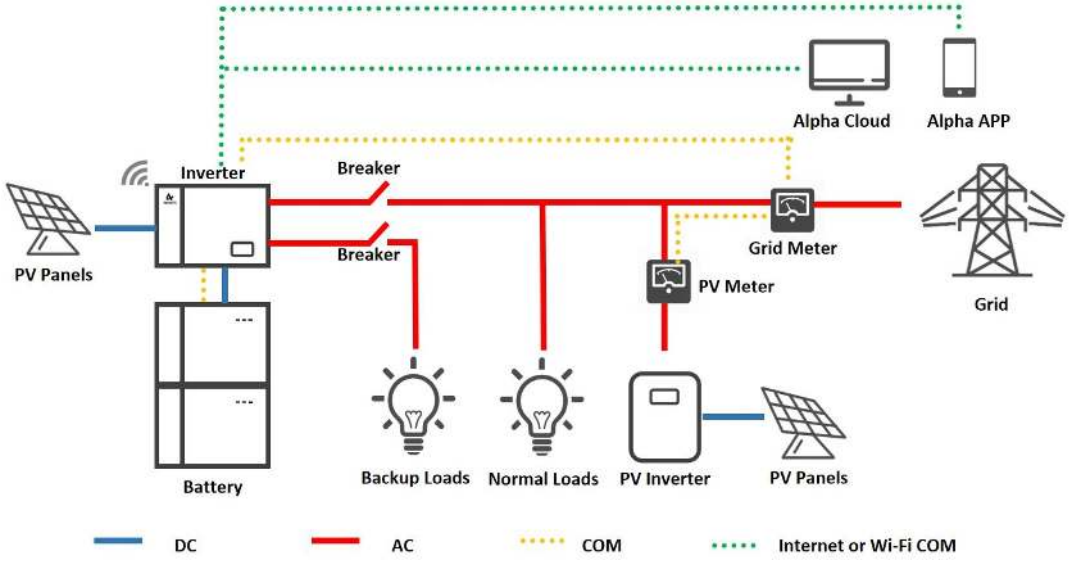


Figure 3–12 Hybrid–Coupled Storage System — Scheme

NOTES:

1. In all cases, Normal Loads and Backup 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. Normal/Backup Loads should not exceed the rated capacity of the inverter, even during on–grid operation.
3. While the GRID RLY and Backup RLY are open, the Bypass RLY is closed, the inverter will be in Bypass mode and functions properly.

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:

(1) Ambient temperature: –10~55°C, recommended storage temperature: 15~30°C

(2) Relative humidity: 15%~85%

(3) Place batteries in a dry, clean, ventilated location free from dust.

(4) Store batteries in a place that is away from corrosive organic solvents and gases.

(5) Keep batteries away from direct sunlight.

(6) 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.

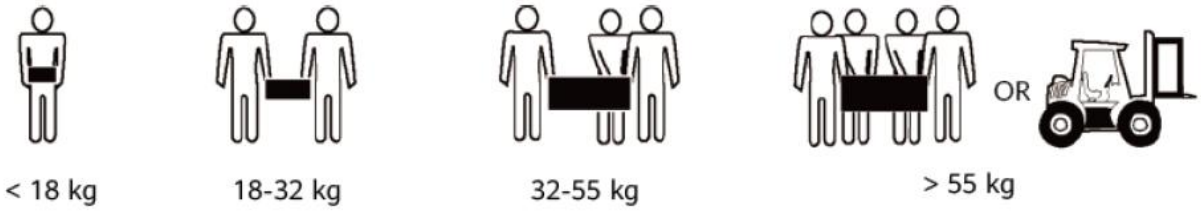


Figure 4–1 Handling methods for batteries of different weights

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

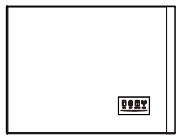
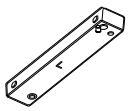
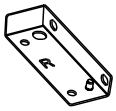
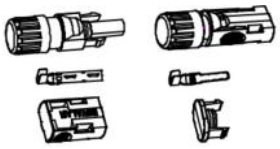
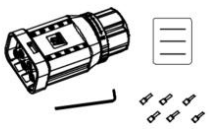
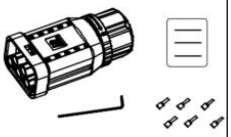
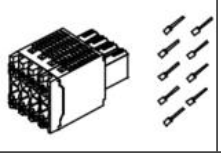
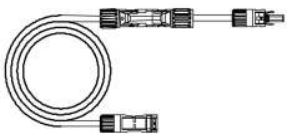
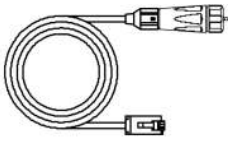
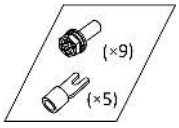
5.1. Checking the Outer Packaging

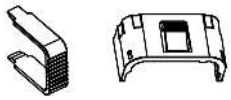
Before unpacking the product, check the outer packaging for damage, such as holes, signs of mechanical damage or water damage. If any damage is found, do not unpack the product and contact your dealer as soon as possible.

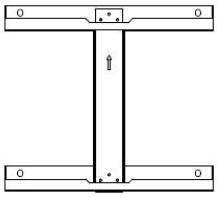
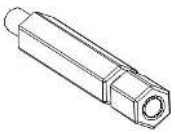
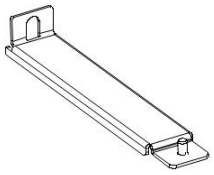
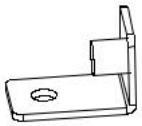
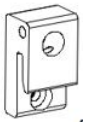
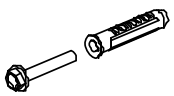
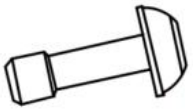
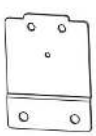
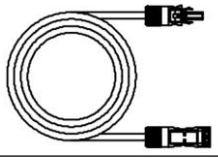
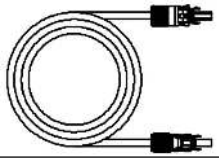
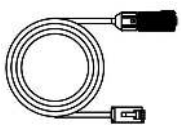
5.2. Scope of Delivery

Check the scope of delivery and inspect components to ensure they are present and undamaged.

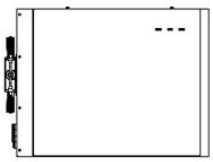
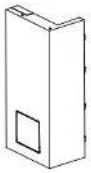
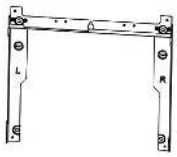
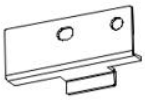
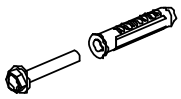
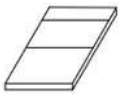
Contact your distributor if the packed components are incomplete or damaged.

SMILE-G3-T4/T5/T6/T8/T10/T12/T15 Inverter				
				
Inverter (×1)	TOP Cover (×1)	Right Cover (×1)	Cable Cover (×1)	Left Support Foot (×1)
				
Right Support Foot (×1)	PV+ & PV- Connector&Blocking Cover(×3)	Grid Connector (×1)	Backup Connector (×1)	Wi-Fi Dongle (×1)
				

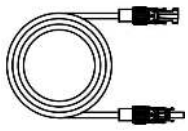
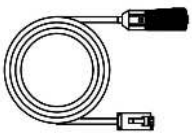
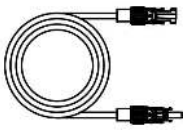
AUX Terminal Block (×1)	BAT Power Cable (×2)	Communication Cable Between Two Column Series Batteries (×1)	Grounding Cable (×1)	Screws and Terminals Set (×1)
				
Documents (×4)	PV removal Tool (×1)	BAT Removal Tool (× 1)	Grid & Backup Removal Tool (× 1)	

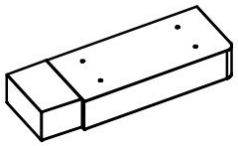
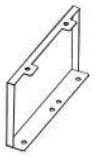
(Optional) Accessories of Inverter for Wall Mounting			
			
Wall Bracket (×1)	Support Stud for Right Cover (×1)	Support Plate for Cable Cover (×1)	Support plate for cable cover (×1)
			
Hooks for Wall Bracket (×4)	Wall Anchor ST6*55 (×4)	Screw M4*10(×2)	Hexagon Head Screw M5*12 (×8)
			

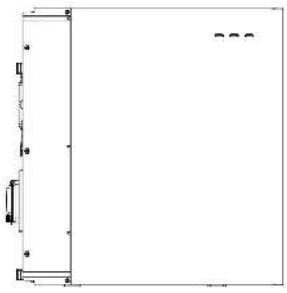
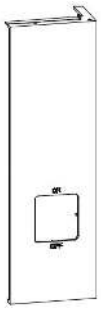
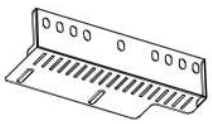
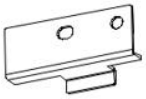
Connector for Wall Brackets (×2)	Series Battery Main Positive Power Cable for 4.5S/9.3S (× 1)	Series Battery Main Positive Power for 3.8S (× 1)	Communication Cable between Inverter and 1st Series Batteries (×1)
			
Series Battery Main Negative Power Extension Cable (× 1)			

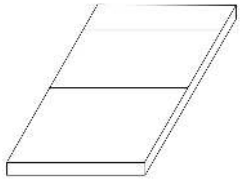
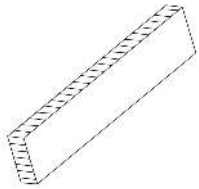
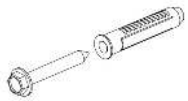
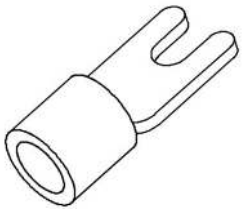
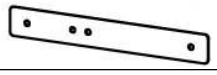
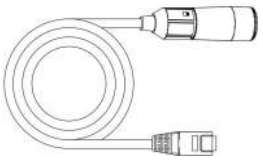
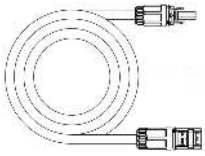
SMILE-G3-BAT-3.8S/4.5S			
			
Battery (×1)	Battery Cable Cover (×1)	Wall Bracket (×1)	Grounding Bar (×1)
			
Wall Anchor ST6*55 (×6)	Hexagon Head Large Washer Screw M5*12 (×3)	Flange Nut M5 (×7)	Quick Installation Guide (×1)

(Optional) Cables for Distanced Horizontal Battery Expansion of

SMILE-G3-BAT-3.8S				
				
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)

(Optional) Top Cover Unit of SMILE-G3-BAT-3.8S/4.5S /9.3S			
			
Top Cover (×1)	Top Cover Bracket (×2)	Hexagon Head Screw M5*12(×5)	Countersunk Head Screw M4*8 (×5)

SMILE-G3-BAT-9.3S			
			
Battery (×1)	Battery Cable Cover (×1)	Top Bracket (×1)	Grounding Bar (×1)

			
Quick Installation Guide (×1)	Position Plate (×1)	Wall Anchor ST6*55 (×4)	M5 Y Type Terminal (×2)
		a 	
BAT Connector Disassembling Tool (×1)	Hexagon Head Screw M5*12 (×4)	Connecting Plate (×2)	Countersunk Head Screw M5 * 8 (×2)
b 	b 	C 	C 
Communication Cable (×1) Code: A	Power Cable (×1)Code: B	Power Cable (×1) Code: C	Power Cable (×1) Code: D

a: For batteries top connection during batteries forward expansion mounting.

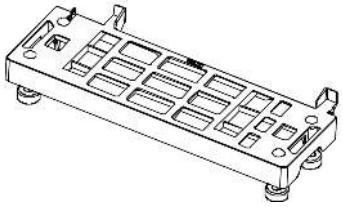
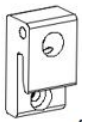
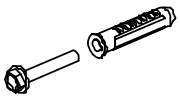
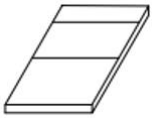
b: Only applicable to Australia and New Zealand.

c: Connect to SMILE–

G3 single phase inverter with M6 OT battery connection terminals.

Only provide for Australia and New Zealand markets.

(Optional)Battery Base Unit of SMILE–G3–BAT–3.8S/4.5S/9.3S

			
Base Unit (×1)	Fixing Brackets (×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 and c are for SMILE-G3-BAT-3.8S

*c, d, e and f are for SMILE-G3-BAT-4.5S

*f is for SMILE-G3-BAT-9.3S

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

5.3.1. Basic Requirements

1. SMILE-G3-T4/T5/T6/T8/T10/T12/T15-INV and SMILE-G3-BAT-4.5S and SMILE-G3-BAT-9.3S are suitable for indoor and outdoor installation. SMILE-G3-BAT-3.8S are only suitable for indoor installation.
2. Do not install the ESS in a place where people can easily touch it because the inverter's surface will get extremely hot during operation.
3. Do not engage screws into tapped holes using a Hammer Driver, Impact Driver or "Rattle gun". Do not damage screws or threaded holes by tightening with too much torque.
4. To ensure safety, children should not operate or be near the ESS unless supervised by an adult

5.3.2. Mounting Environment Requirements

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.

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. Do not place the system near water sources such as downpipes or sprinklers.
3. The ESS must be mounted in a well-ventilated environment to ensure adequate heat dissipation.
4. Do not mount in a location that will be exposed to direct sunlight. Mount the ESS in a sheltered place or mount an awning over it. When mounted under direct sunlight, the power of the ESS may be derated due to additional temperature rise and the longevity of the product will be reduced.
5. Favour locations that are indoors, under cover, or generally protected from the elements and extreme temperatures (e. g. in a garage). If the ESS is mounted in the garage, ensure the product is adequately protected from potential mechanical impact.
6. In the UK , the energy storage battery shall be installed outdoors.
7. The optimal temperature range for the battery to operate is 15 to 30 ℃.
8. In the UK, If the energy storage batteries are installed within a dwelling area, an extra audible warning shall be used for battery persistent dangerous conditions.
9. In the UK , Batteries shall not be installed in any of the following locations:

   (1) Rooms in which persons are intended to sleep;
   (2) Routes used as a means of escape that are not defined as protected escape routes, including landings, staircases and corridors;
   (3) Corridors, shafts, stairs or lobbies of protected escape routes;
   (4) Firefighting lobbies, shafts or staircases;
   (5) Storage cupboards, enclosures or spaces opening into rooms in which persons are intended to sleep;
   (6) Outdoors (ground-mounted or wall-mounted in a suitable enclosure) within 1 m of:
      a. escape routes;
      b. doors;
      c. windows; or

d. ventilation ports.

(7) Voids, roof spaces or lofts;

(8) Within 2 m of stored flammable materials and fuel storage tanks or cylinders;

(9) Cellars or basements that have no access to the outside of the building.

10. In the UK, after the system is installed, the surrounding environment needs to be equipped with fire alarm or fire extinguishing devices in accordance with the BS EN54 standard.
11. In the UK, if the system is installed in areas prone to vehicle damage (such as garages, driveways, etc.), please install protective devices (such as protective barriers, protective enclosures, etc.) in these areas.
12. The flash arcs of the SMILE-G3-BAT-4.5S and SMILE-G3-BAT-9.3S batteries are both below 3 cal/cm^^{2} (using the calculation method described in AS/NZS 5139). Therefore, tools are required when contacting the battery cells in the UK.

5.3.3. Mounting Structure Requirements

1. The surface to which the ESS 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

1. The battery should be mounted on the base unit or hanged on the wall bracket and secured to the wall.
2. The inverter should be placed on the top of the battery and secured to the battery.

3. The installation angle requirement is as follows: do not mount the inverter at forward-tilted, side-tilted, horizontal, or inverted positions.

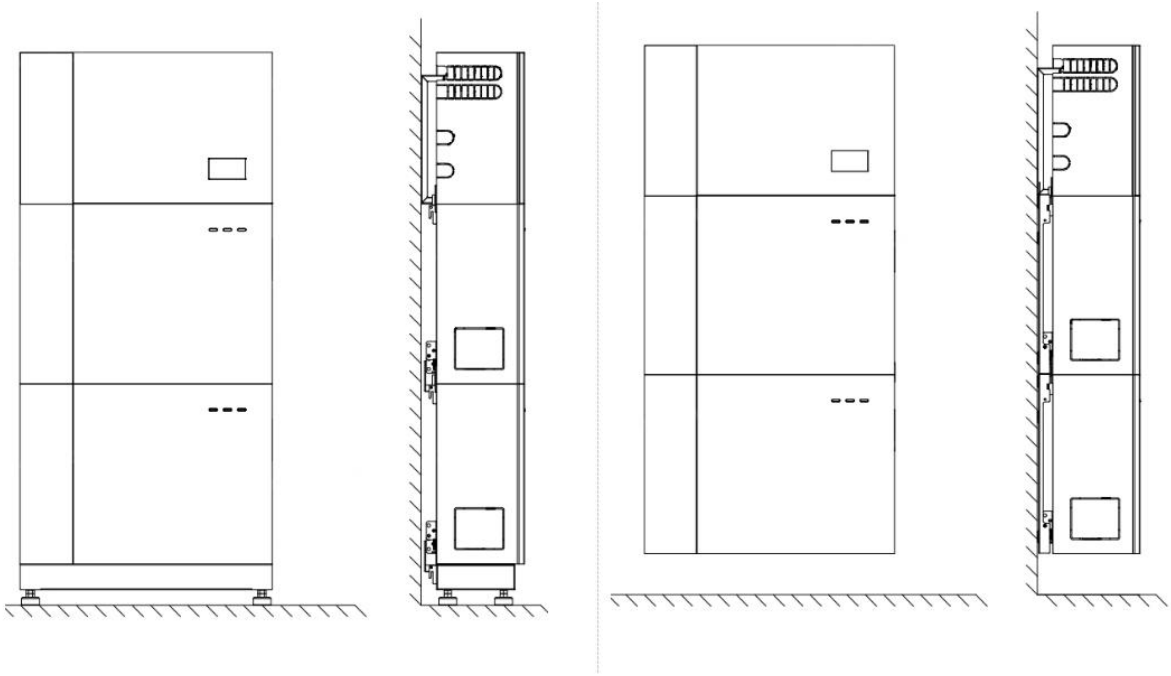


Figure 5-1 Product installation diagram

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.

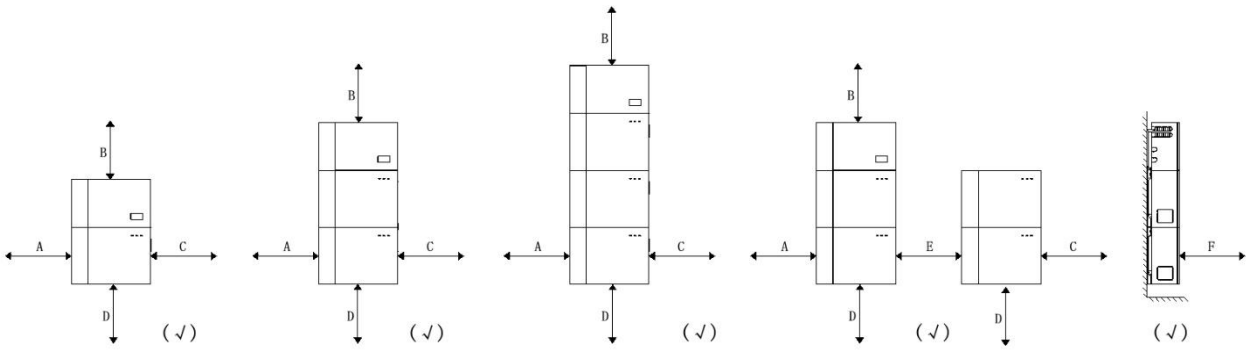


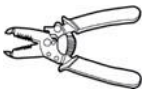
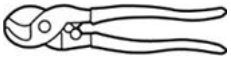
Figure 5-2 Installation space requirements

Position	Distance (Unit: mm)
A	⩾300
B	⩾300
C	⩾300
D	⩾200
E	⩾300
F	⩾100

Note: Local Standards may add additional clearance requirements, particularly regarding clearances between the ESS and other Electrical Appliances.

5.3.6. 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 ⩾ V 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	Vacuum cleaner
			
	Heat shrink tubing	Heat gun	Marker
			
	Measuring tape	Spirit level	
Personal Protective Equipment			
	Safety gloves	Safety goggles	Anti-dust respirator
			
	Safety shoes		

5.4. Mounting the System

5.4.1. Mounting the Series Battery SMILE-G3-BAT-3.8S/4.5S/9.3S

Note: The following battery installation instructions only list the general steps. There may be slight differences for each battery. Install the battery using the 9.3S battery as an example.

5.4.1.1 Mounting the Battery with Base Unit

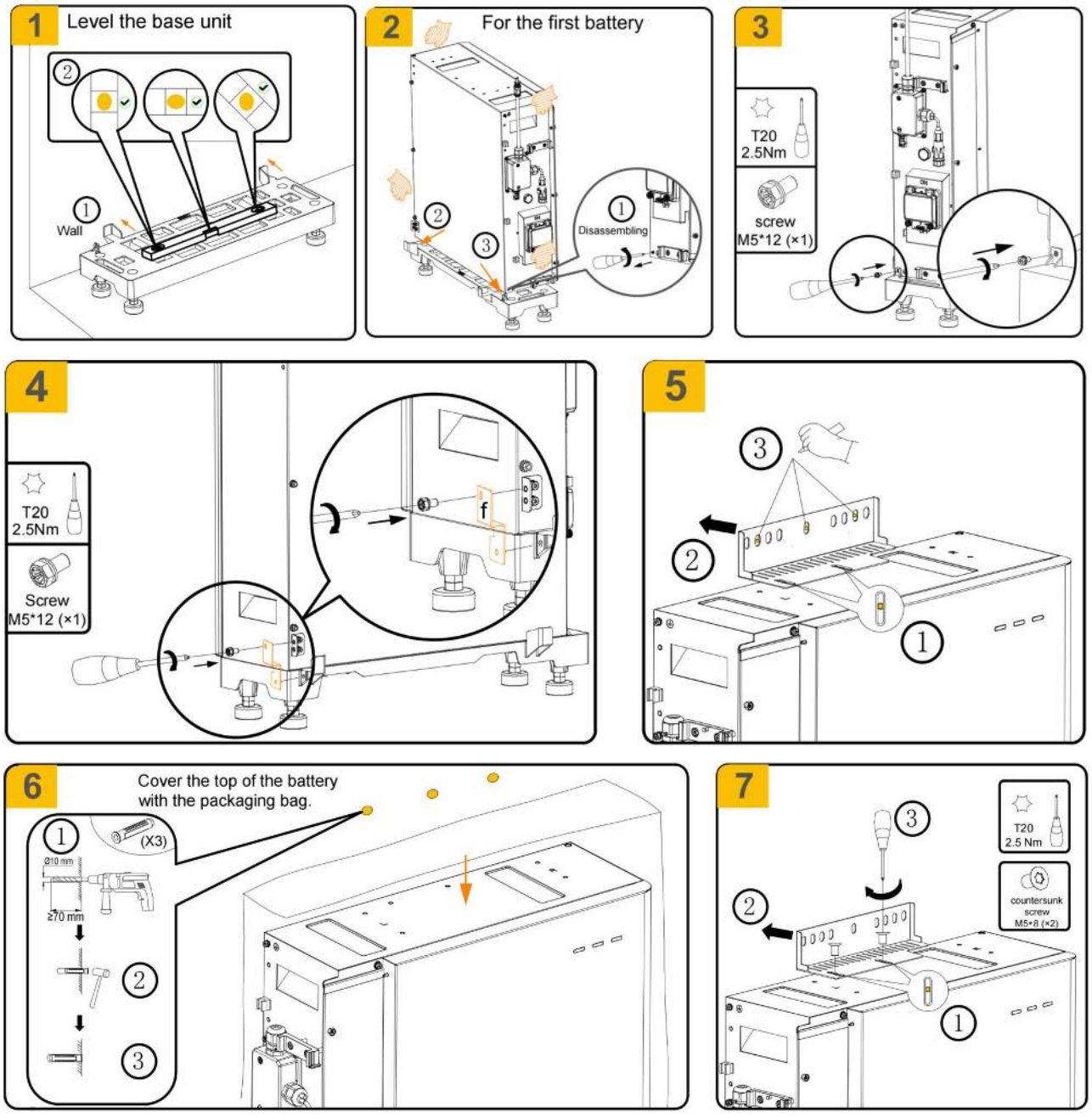
When mounting battery SMILE-G3-BAT-3.8S/4.5S/9.3S with base unit, please follow the below steps.

1. Take out the base unit, place it on the floor, and level it using a spirit level. Refer to 1 in Figure 5-3.
2. Release the base unit clip and place the first battery onto the base unit. Refer to 2 in Figure 5-3.
3. Tighten the M5 screw into the limit hole. (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 3 in Figure 5-3..
4. Tighten the base unit to the battery using the connection plate. (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 4 in Figure 5-3.
5. Position the wall bracket at the top of the battery, aligning it with the battery's mounting holes. Mark the contact points against the wall using a marker pen. Refer to 5 in Figure 5-3.
6. Cover the top of the battery with the packaging bag. Using a hammer drill, bore holes along the previously marked positions on the wall. Drive the expansion plugs into the holes using a hammer, then remove the packaging bag. Refer to 6 in Figure 5-3.
7. Secure the wall bracket and the top of the battery using M5 screws. (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 7 in Figure 5-3.
8. Screw the ST6 into the expansion nut. (tool: SW8, torque: 6 Nm). Refer to 8 in Figure 5-3.

9. Place the second battery on top of the first battery, ensuring the battery switch is closed. Refer to 9 in Figure 5–3.

10. Secure the grounding bar between the two batteries. (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 10 in Figure 5–3.

11. Repeat steps 5 to 8 to complete the installation of two batteries.



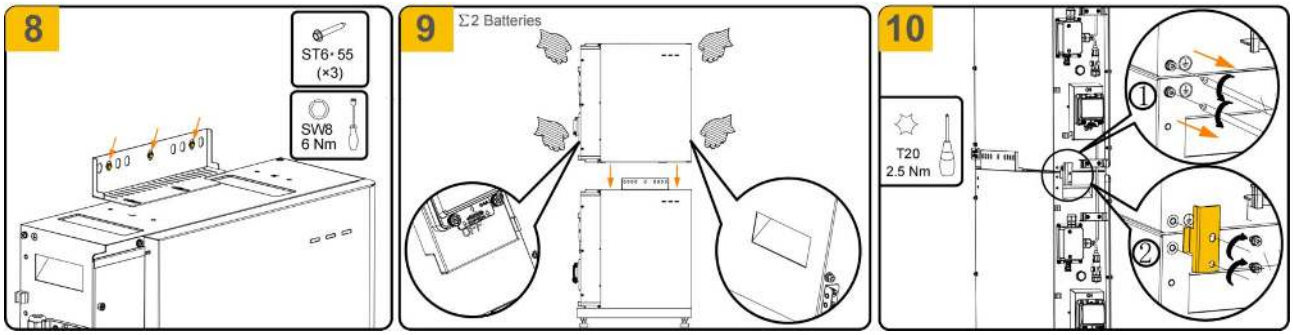


Figure 5–3 Battery Base Installation Steps Diagram

5.4.1.2 Mounting the Battery without Base Unit

When mounting multiple series batteries with wall brackets for the first time, please follow the below steps.

1. Take out the limit cardboard, place horizontally against the wall. Refer to 1 in Figure 5–4.
2. Attach the battery tightly to the limit cardboard. Refer to 2 in Figure 5–4.
3. Position the wall bracket at the top of the battery, aligning it with the battery's mounting holes. Mark the contact points against the wall using a marker pen. Refer to 3 in Figure 5–4.
4. Cover the top of the battery with the packaging bag. Using a hammer drill, bore holes along the previously marked positions on the wall. Drive the expansion plugs into the holes using a hammer, then remove the packaging bag. Refer to 4 in Figure 5–4.
5. Secure the wall bracket and the top of the battery using M5 screws. (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 5 in Figure 5–4.
6. Screw the ST6 into the expansion nut. (tool: SW8, torque: 6 Nm). Refer to 6 in Figure 5–4.

7. Place the second battery on top of the first battery, ensuring the battery switch is closed. Refer to 7 in Figure 5–4.

8. Secure the grounding bar between the two batteries. (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 8 in Figure 5–4.

9. Repeat steps 3 to 8 to complete the installation of two batteries.

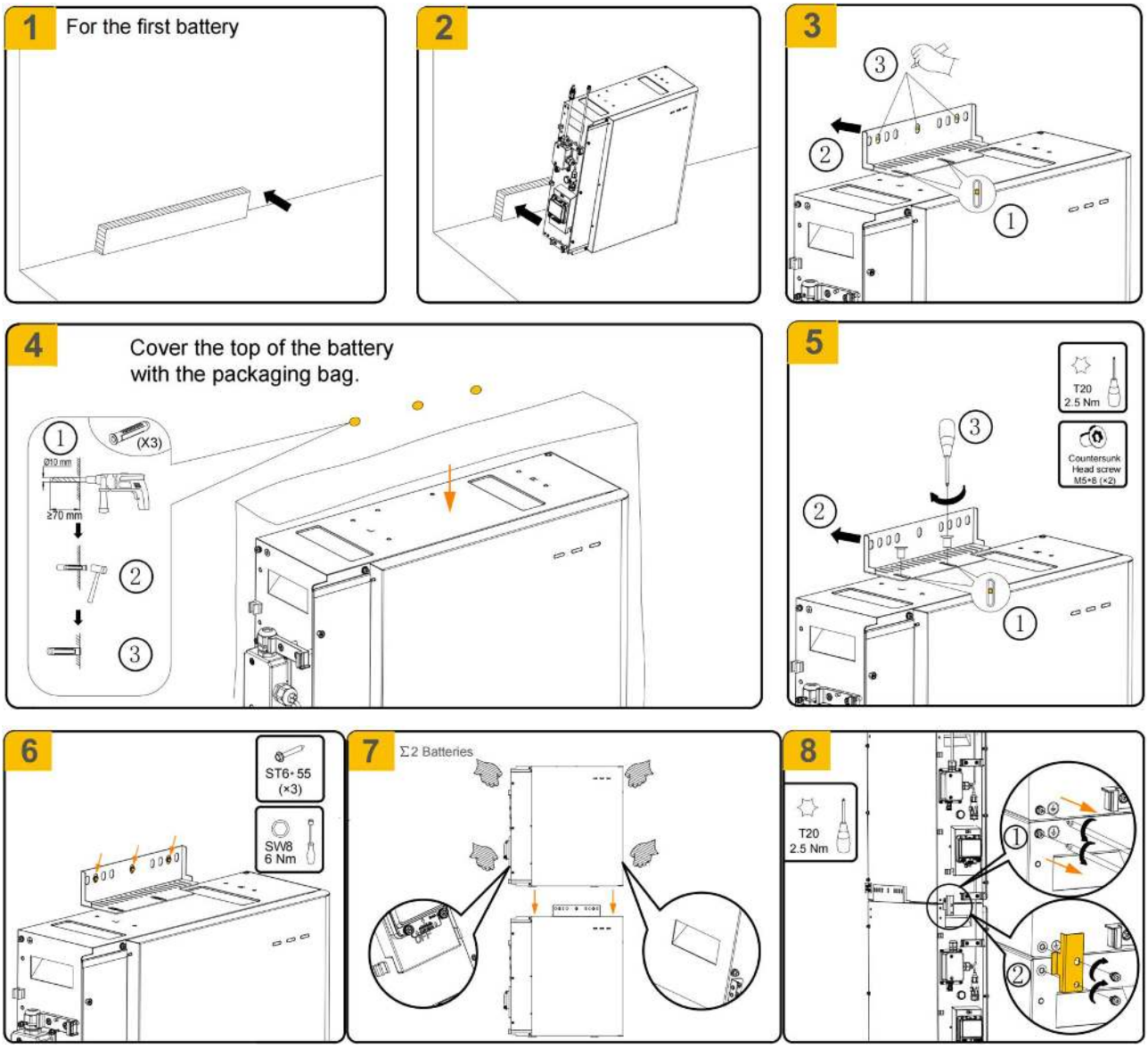


Figure 5-4 Battery Base Installation Steps Diagram

5.4.1.3 Mounting the Battery with Wall Bracket

For additional batteries installation, the expansion batteries should be mounted below existing batteries, please follow the below steps.

1. Select a suitable height for the wall bracket location. Please reserve enough height if you want to add more batteries later.
2. Mark one drilling position which is used to secure the upper middle location of the wall bracket later and drill the marked hole with a Φ10 drill. Insert the screw anchor into the drill hole, and pre–tighten the wall bracket horizontally with the provided screw (tool: Socket wrench SW8, torque: 4 Nm). Retain 5~10 mm from the screw head to the wall. Refer to Figure 5-5.
3. Take out the wall bracket from the packaging and hang the wall bracket on the screw head, adjust its horizontal position, then mark the other drilling positions, drill the marked holes with a Φ10 drill and insert the screw anchors into the drill holes. Refer to 2 in Figure 5-6.
4. Secure the wall bracket to the wall (tool: Socket wrench SW8, torque: 6 Nm).Refer to 3 in Figure 5-6.
5. Horizontally lift the battery using the handles at two sides and let the top hooks on the back of the battery slide from right to left in the upper beam of the wall bracket. Refer to 4 in Figure 5-6.
6. Secure the battery to the wall bracket and tighten them with two M5*12 screws (tool: T20 screwdriver, torque: 2.5 Nm). Refer to 5 in Figure 5-6.

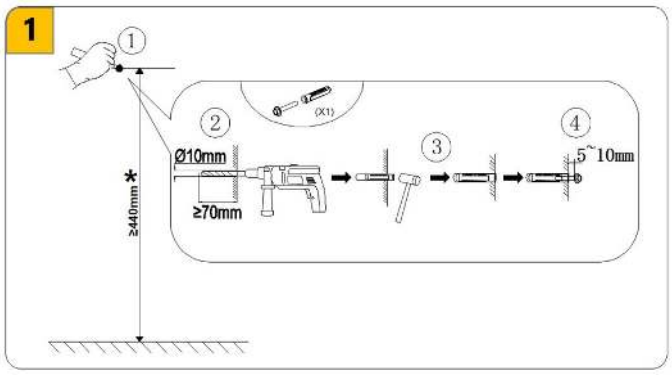


Figure 5-5 Selection of wall–mounted bracket position

* This recommended value “440 mm” is for wall bracket location of the bottom battery. Depending on the number of expansion batteries mounted later, meanwhile it is advisable to have a minimum of 100 mm off the ground to protect the system from submergence.

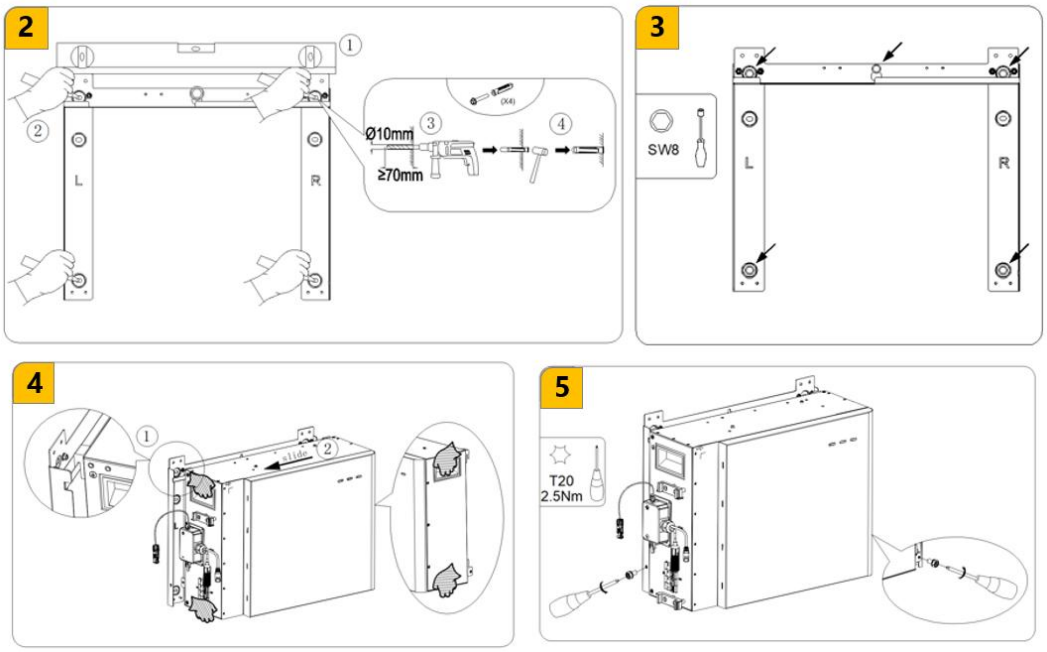


Figure 5-6 Installation diagram of a single battery wall-mounted bracket

5.4.1.4 Mounting the top Cover of the Battery(Optional)

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

1. 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). Refer to 1 in Figure 5-7.

2. 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). Refer to 2 in Figure 5-7.

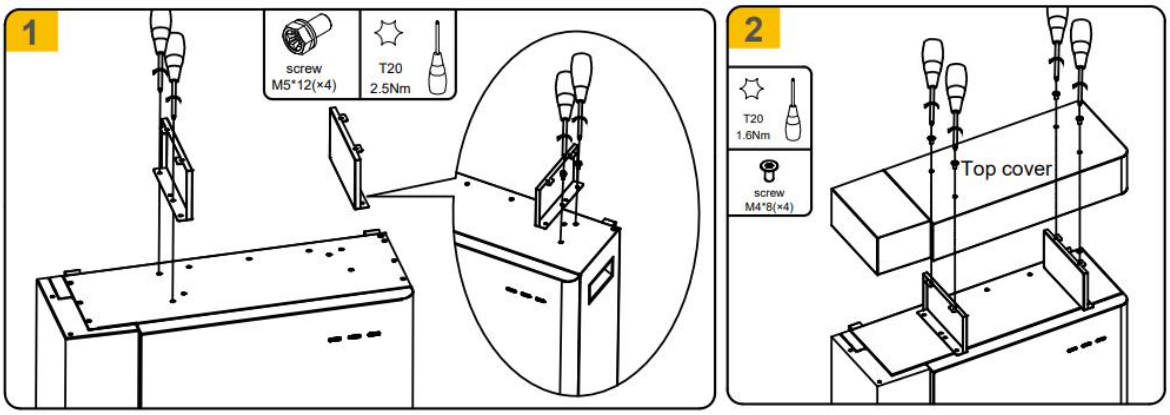


Figure 5-7 Battery top cover installation

5.4.2. Mounting the Inverter

Mount the inverter standing on the battery

1. Take out the left support foot and right support foot from the inverter packaging.
2. Mount the left support foot and right support foot onto the top of the upper battery. Refer to 1 in Figure 5-8.
3. Place the inverter into the two support feet.
4. When doing so, the lower right and left holes on the bottom of the inverter must be inserted into the respective guides in the support feet. Refer to 2 in Figure 5-11.
5. 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 5-8.

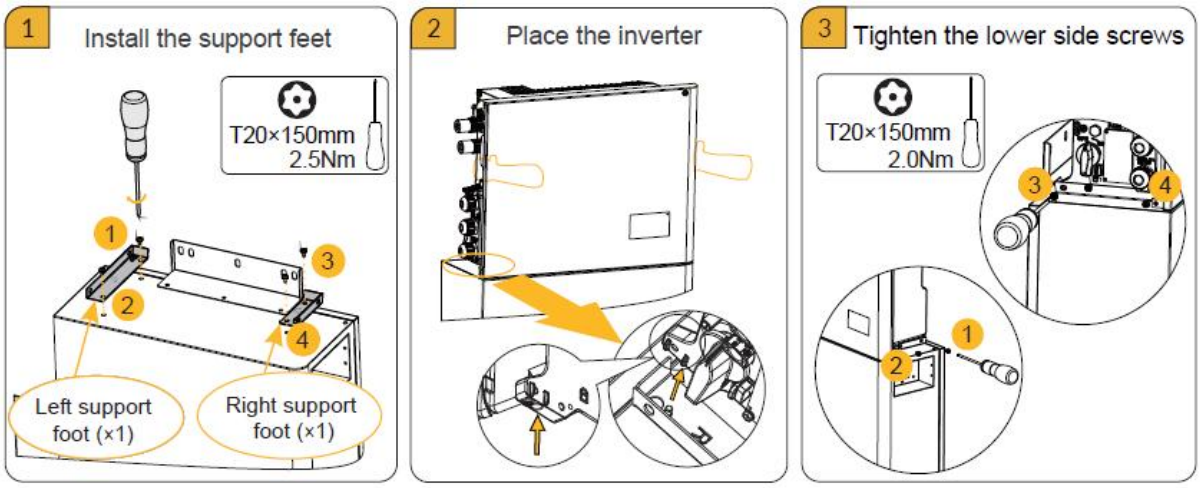


Figure 5-8 Inverter installation diagram

Mount the inverter on the wall using the bracket.

1. Take out the wall bracket of the energy storage inverter from the packaging.
2. Choose a suitable height to install the inverter wall mount. Please note that if a battery is to be installed later, the installation space for the battery should also be taken into account.

3. Use a spirit level to ensure that the wall mount is in a horizontal state. The first step is to mark the hole positions, then remove the wall mount and use a 10mm diameter electric drill to drill holes, and then insert the expansion nuts into the wall. Then place the wall mount in the position that needs to be fixed and fix it with expansion screws (tool: torque wrench SW8, torque 6Nm). Refer to Figure 5-9 below.

4. Hook the inverter onto the wall bracket. Refer to 4 in Figure 5-11.

5. Secure the inverter to the wall bracket. Insert the hexagon head screws M5*12 into the lower and upper holes on both sides of the inverter respectively and tighten them. Ensure that the inverter is securely in place. Refer to Figure 5-11.

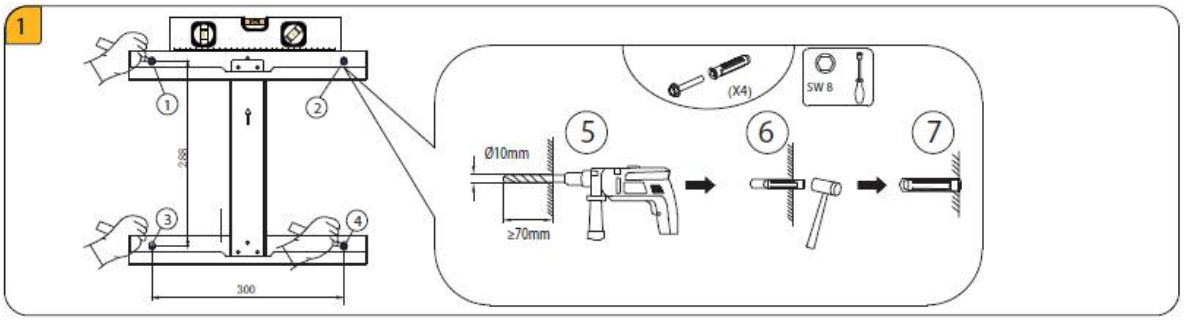


Figure 5-9 Inverter bracket fixation diagram

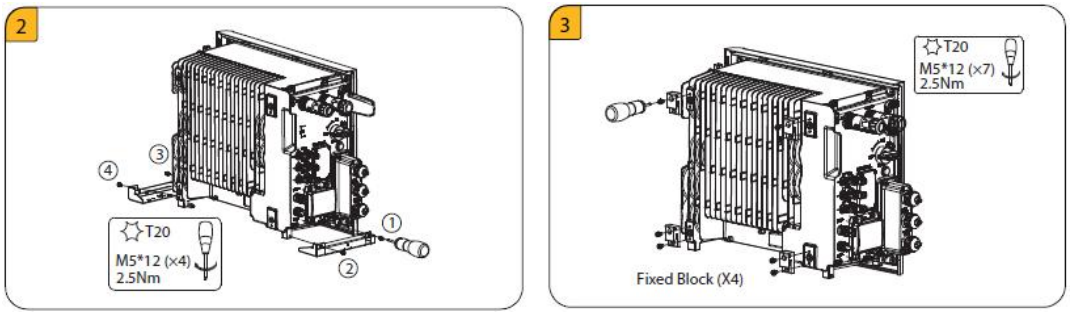


Figure 5-10 Four hooks fixation diagram

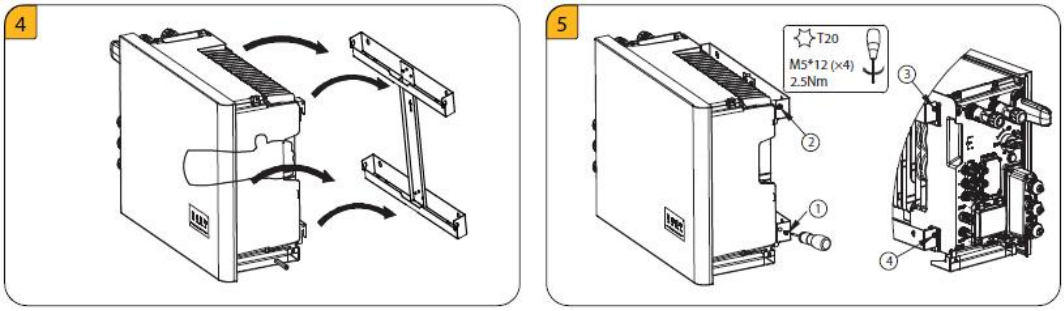


Figure 5-11 The inverter is connected to the bracket diagram

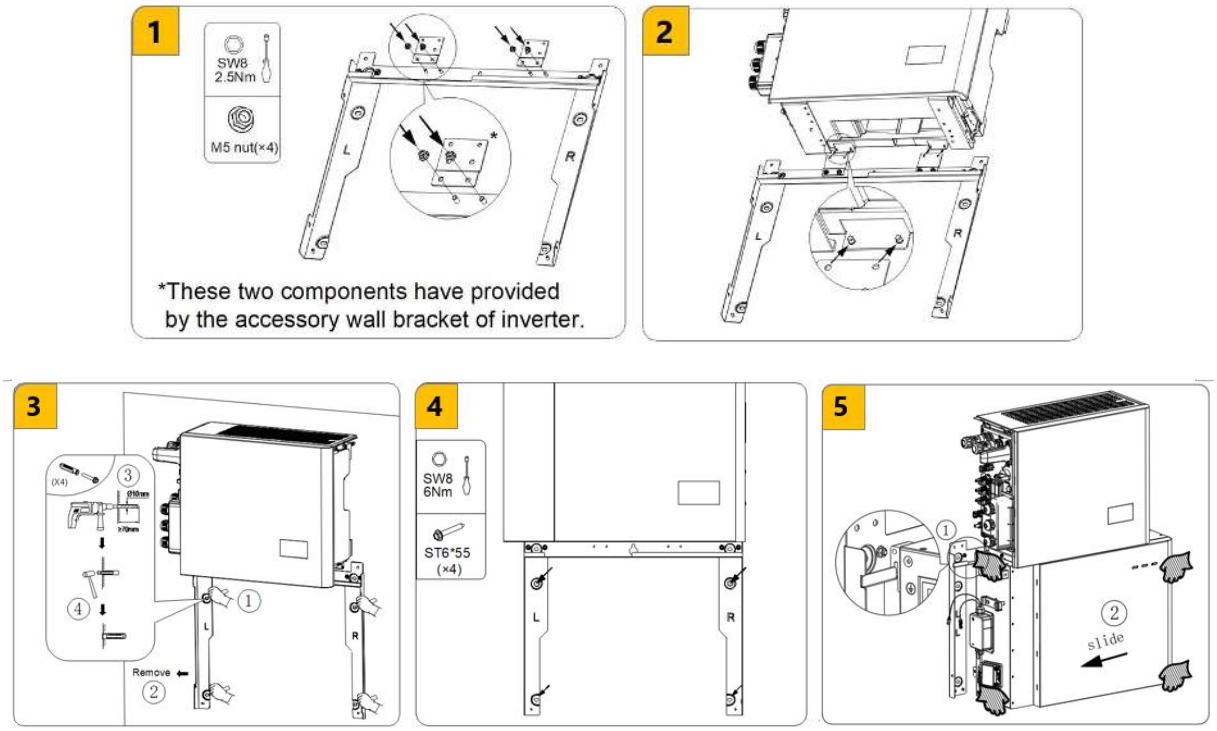
5.4.3. Battery Installation for Battery-Ready Application(optional)

Battery Ready scenario is that end users initially only installed ESS 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 5-12.

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 5-12.

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 5-12.



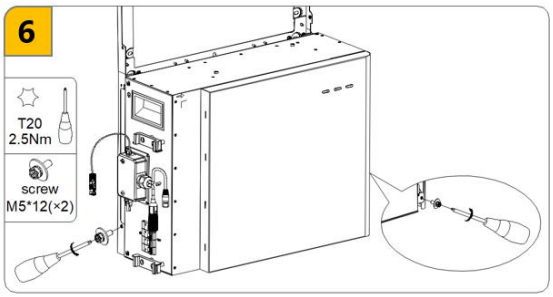


Figure 5–12 the first series battery installation

5.4.4. Mounting the Wi–Fi Dongle

Mount the Wi–Fi dongle 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.

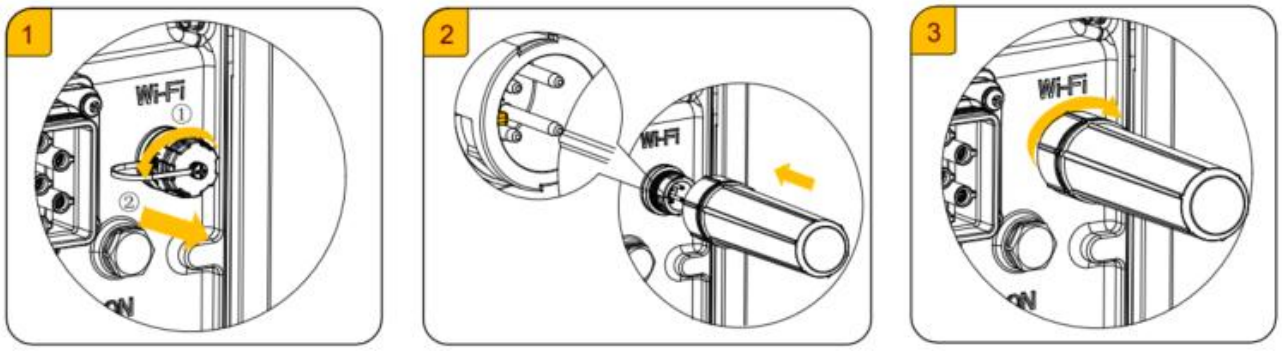


Figure 5–13 Installation diagram of Wi–Fi Dongle

2. Rotate the Wi–Fi Dongle onto the inverter.

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 AlphaESS 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)	4~6mm^2	5.5~ 9mm	Purchased by the installer
2*	Signal cable	Standard network cable (recommended type: Cat5e, SFTP, UV–resistant for outdoor use)	0.12~0.2mm^2 (AWG26~AWG24)	4~6mm	Purchased by the installer
3**	Signal cable	Two–core outdoor shielded twisted pair copper cable	0.5~1.5mm^2	4~6mm	Purchased by the installer
4***	Signal cable	Outdoor shielded twisted pair copper	0.5~1.3mm^2	4~6mm	Purchased by the installer

		cable			
5	AC power cable	Five-core (L1, L3, L3, N and PE) outdoor copper cable	4~6mm^2	13 ~17.5mm	Purchased by the installer
6	PE cable	Single-core outdoor copper cable	2.5~6mm^2	N/A	Purchased 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

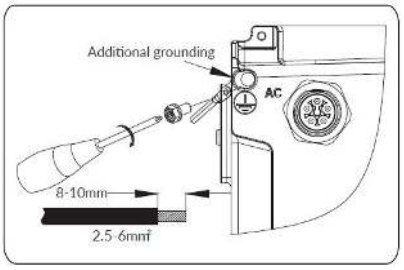
Electric Shock Hazard

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.

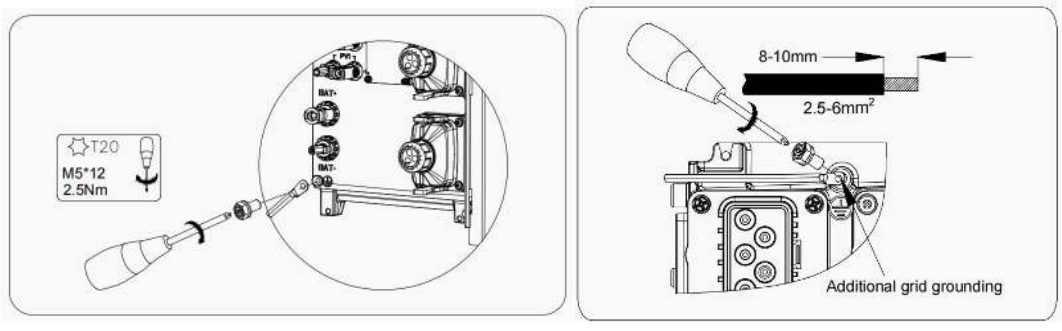
A grounding point is provided near the grid connector of the energy storage inverter. Take out M5 Y terminals, strip the grounding cable insulation, insert the stripped conductor into the ring terminal lug and crimp with a crimping tool.

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

Grounding connection for the energy storage inverter.



Grounding connection between the energy storage inverter and series battery.



Inverter side Series Battery side

6.3. AC Connection

6.3.1. Requirements for the AC Connection

AC cable requirements as follows:

1. Conductor type: copper conductor (tinned copper preferred).
2. Grid cable current carrying capacity depends on the inverter model selected and max. full current from grid, example for 10kW inverter model, max. current: 21.7A.
3. 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: 21.7A.

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

1. External diameter: usually 13 mm to 17.5 mm for grid connector and backup connector
2. Grid and backup conductor cross-section recommendation: 4–6 mm^2.
3. Insulation stripping length: 10 mm.
4. Sheath stripping length: 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 does not require an external residual-current device when operating.

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

The inverter is compatible with type A residual-current devices with a rated residual current of 100mA or higher. Each inverter in the system must be connected to the utility grid via a separate residual-current device.

CAUTION

For Australia and New Zealand installation sites, the neutral cables of grid side and backup side must be connected together, otherwise the backup output function will not work normally.

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:

1. 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.
2. Other influencing factors: loop impedance, mutual heating of circuit breakers, ambient temperature at the circuit breaker, selectivity, type of connected device.
3. If these factors are ignored, it will increase the risk of the circuit breaker tripping under normal operating conditions.
4. 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-T4-INV

Description	Max. Current	Breaker Type	Recommended Cable Cross Section
Grid Side	11.6 A	16 A	2.5~6 mm^2
Backup Side	8.7 A	16 A	2.5~6 mm^2

AC connection recommendation for SMILE-G3-T5-INV

Description	Max. Current	Breaker Type	Recommended Cable Cross Section
Grid Side	14.5 A	25 A	4~6 mm^2
Backup Side	10.9 A	16 A	2.5~6 mm^2

AC connection recommendation for SMILE-G3-T6-INV

Description	Max. Current	Breaker Type	Recommended Cable Cross Section
Grid Side	17.4 A	25 A	4~6 mm^2
Backup Side	13 A	20 A	4~6 mm^2

AC connection recommendation for SMILE-G3-T8-INV

Description	Max. Current	Breaker Type	Recommended Cable Cross Section
Grid Side	17.4 A	25 A	4~6 mm^2
Backup Side	13 A	20 A	4~6 mm^2

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 mm^2
Backup Side	21.7 A	32 A	4~6 mm^2

AC connection recommendation for SMILE-G3-T12-INV

Description	Max. current	Breaker type	Recommend cable cross section
Grid Side	24.6 A	40 A	6~10 mm^2
Backup Side	19.1 A	32 A	6~10 mm^2

AC connection recommendation for SMILE-G3-T15-INV

Description	Max. current	Breaker type	Recommend cable cross section
Grid Side	29 A	50 A	6~10 mm^2
Backup Side	23.9 A	40 A	6~10 mm^2

6.3.3. Grid and Backup Connection

WARNING

Use AlphaESS App or AlphaCloud to select the current rating of the circuit breaker

used to protect the AC cable connecting to the inverter

The BESS is programmed to limit the battery charge rate (from the grid) depending on the backup circuit current and the size of the MCB used. This avoids the risk of the backup circuit combining with a force-charge or VPP charge and pulling too much current through the grid-supply AC cable/MCB.

Note that an Automatic Transfer Switch can be used to bypass the battery AC cable and backup connection if preferred. In this case, the current on the Backup Output plug will be 0A until there is a power outage. This means that the MCB on the AC supply to the battery only needs to be sized for the maximum current rating of the inverter (i. e. 21.7 A for a 5kW inverter).

The combined current of the Battery Grid-charge and the backup circuit will be limited to the current rating of the MCB less 2 A (to account for the temperature derating of a typical MCB). Installers must advise AlphaESS if the MCB used has a steeper derating factor where the 2A buffer would not be sufficient.

Example: If a 32A MCB is used and the backup circuit is drawing 15 A, any force charging of the battery will be limited to (32 A-2 A) — 15 A = 15 A. If the load on the backup circuits drops to 11 A, the maximum grid-charge current would increase to 19 A.

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 mm2), 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.

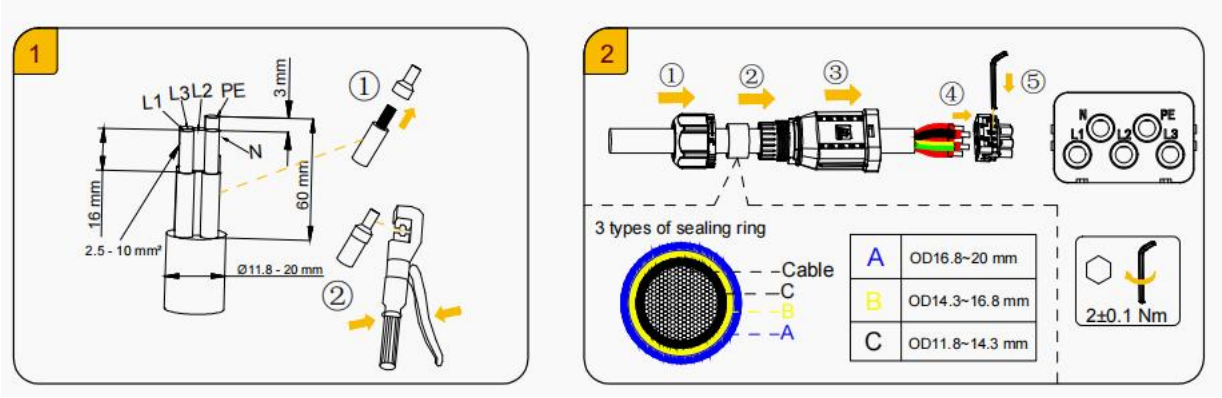


Figure 6-1 Grid connection steps diagram

The steps for backup connection are similar to the grid connection, with a distinction in step 9:

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.

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.

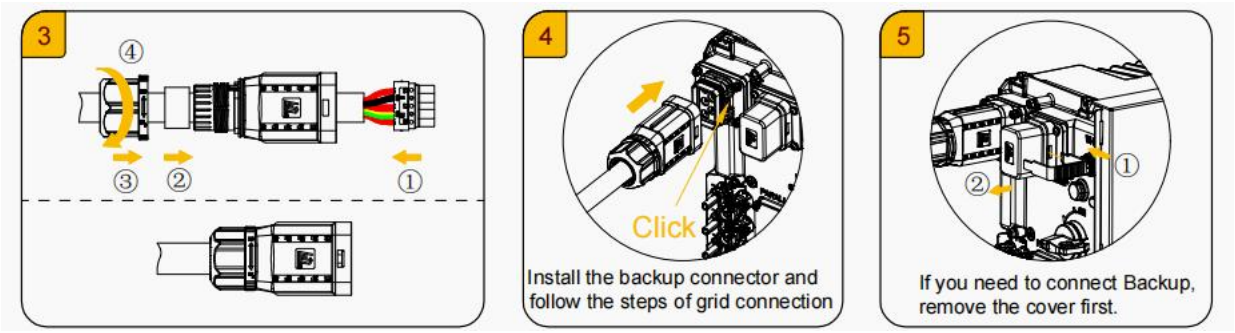


Figure 6-2 Backup connector installation

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.

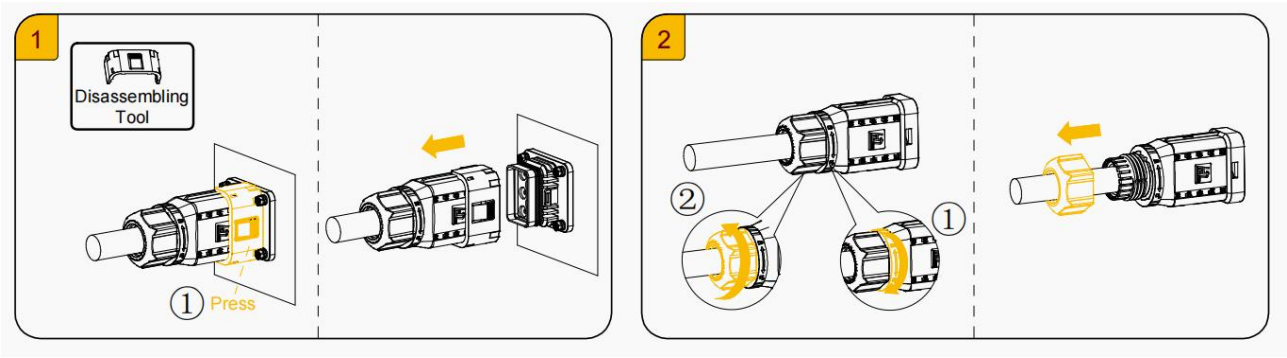


Figure 6-3 Disassembly of the Backup connector

6.3.5. Meter Connection

Item	Scenarios
DTSU666-3*230V 5(80)A	Three-phase meter (without CT)
DTSU666-3*230V 100A/40mA	Three-phase meter (with CT)
DTSU666-3*230V 250A/50mA	Three-phase meter (with CT)
SMILE-TLMeter-CH3C60/100/250/400 (Single-Circuit)	Single phase wireless meter(1CT)
SMILE-TLMeter-CH6C60/100/250/400 (Dual-Circuit)	Single phase wireless meter(2CT)

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.

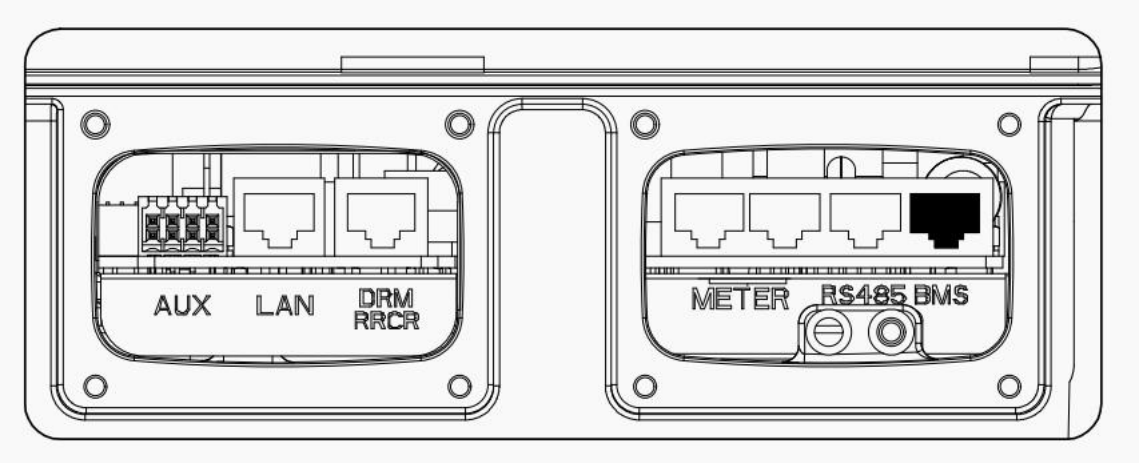


Figure 6-4 Electric meter connection

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 follows:

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

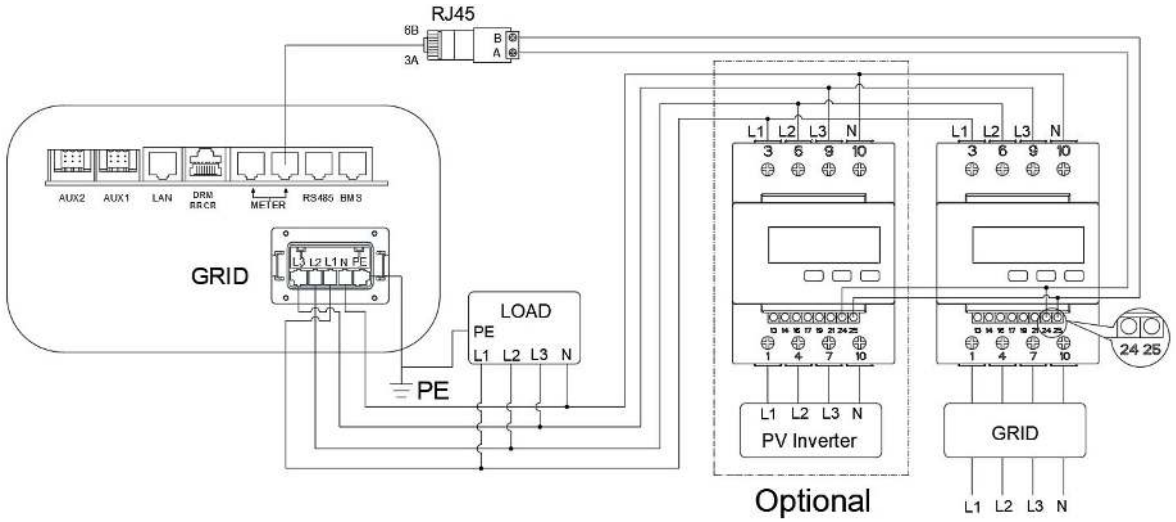


Figure 6-5 Wiring at three-phase feed in

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

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

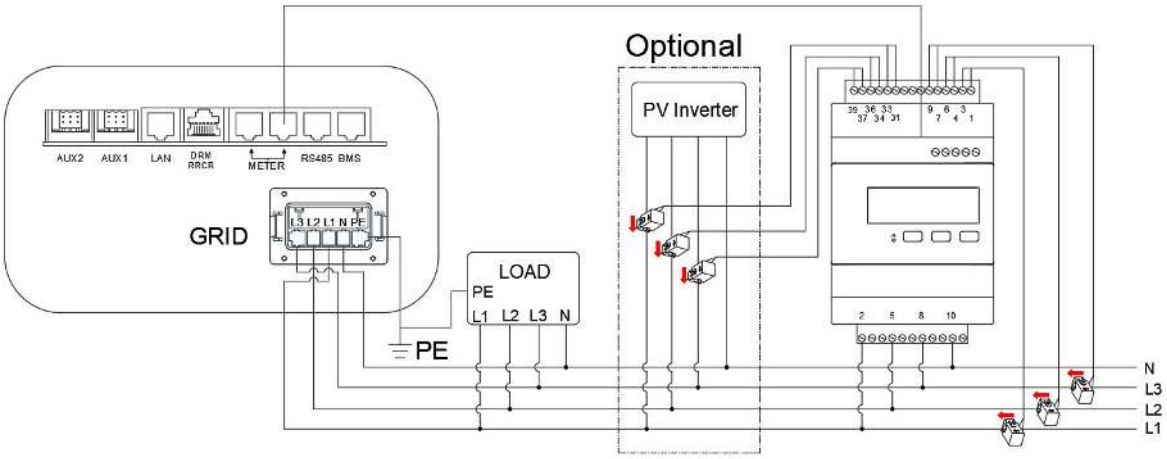


Figure 6-6 Wiring at three-phase feed in

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

3. SMILE-TLMeter-CH3C60/100/250 (Single-Circuit) ： Three-phase single-circuit meter

(1 CT) connection

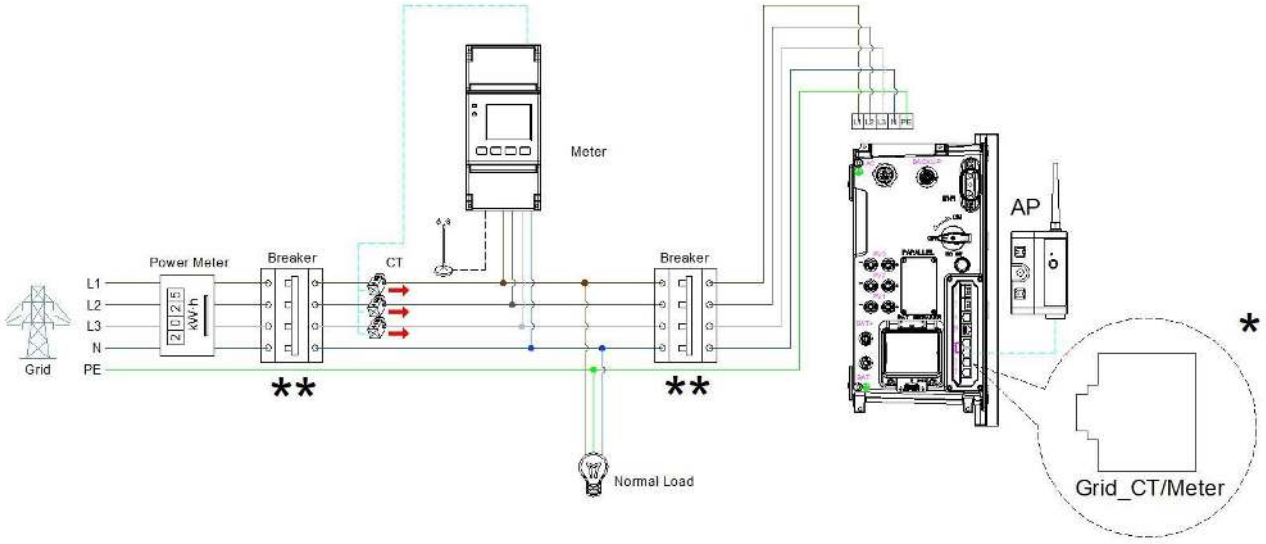


Figure 6-7 Wiring at three-phase feed in

4. SMILE-TLMeter-CH6C60/100/250 (Dual-Circuit) ： Three-phase dual-circuit meter (2

CT)connection

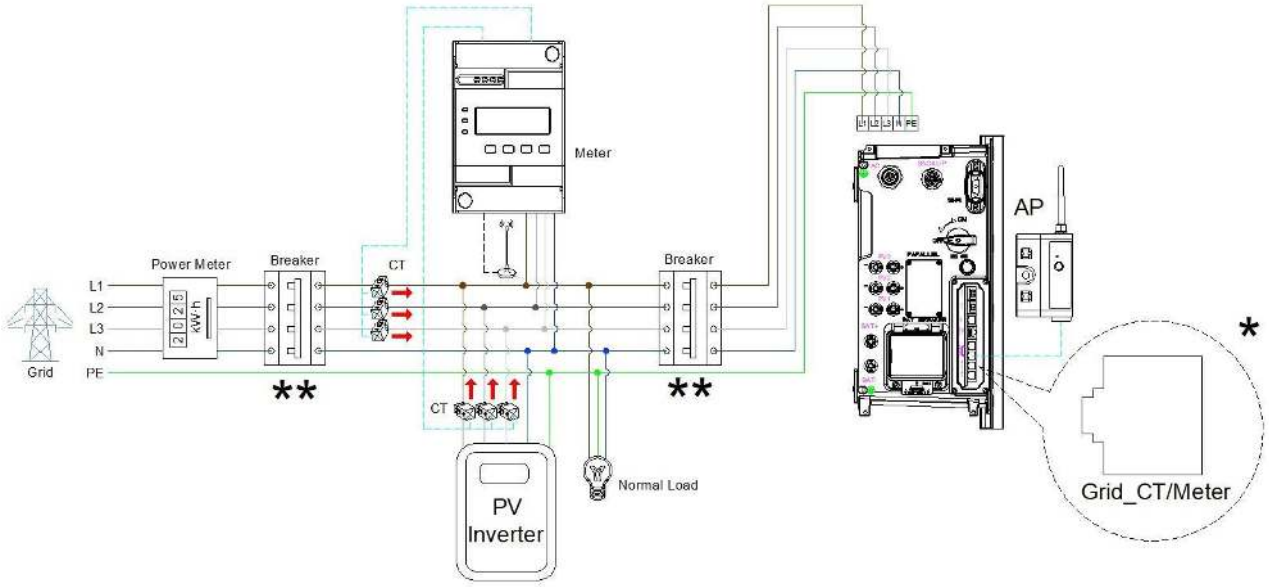


Figure 6-8 Wiring at three-phase feed in

* When used with the G3-T5/T10 series, the AP module is connected to the 'Grid_CT/METER' port.

** In Australia and New Zealand, the N wire does not need to be connected to a circuit

breaker.

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 Chint DTSU666 meters 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	1	2
DTSU666-3*230V 100A/40mA (with	1	N/A
DTSU666-3*230V 250A/50mA (with	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.

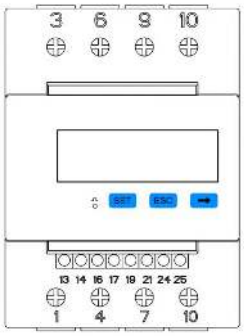


Figure 6-9 DTSU666-3*230V 5 (80) A type three-phase electricity meter (without CT) setting

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

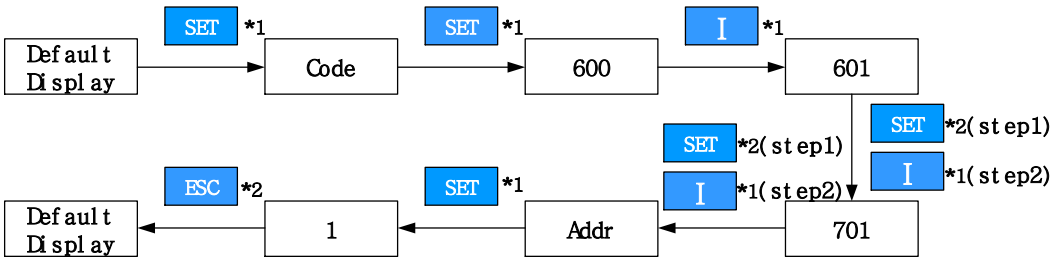


Figure 6-10 Installation program check

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

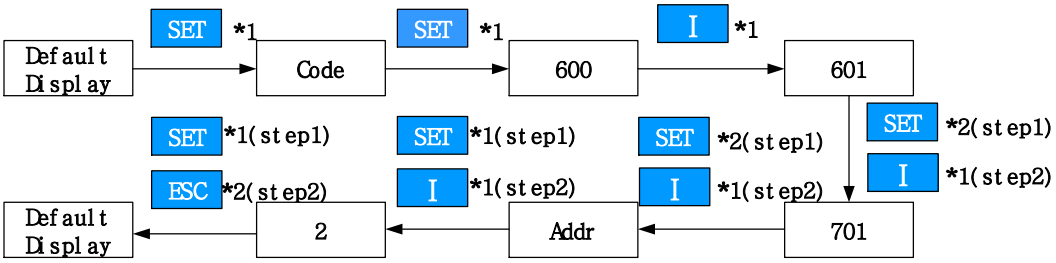


Figure 6-11 Address setting for photovoltaic electricity meters

2. Meter setting for type DTSU666-3*230V 100A/40mA and DTSU666-3*230V 250A/50mA, three-phase meter (with CT)

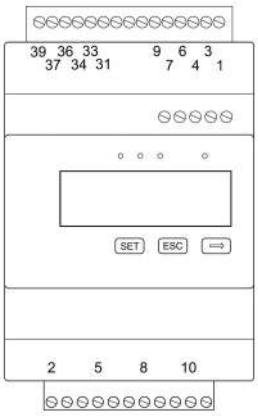


Figure 6-12 Range setting of DTSU666-3*230V 100A/40mA three-phase electricity meter (with CT)

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:

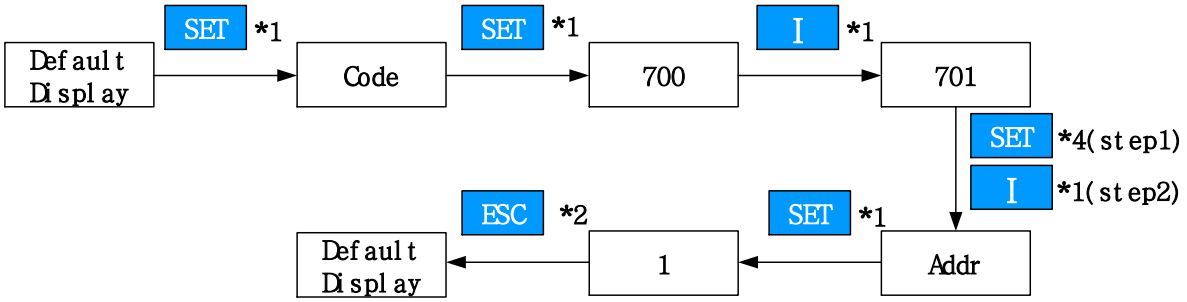


Figure 6-13 Installation program check

The display order of parameters:

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

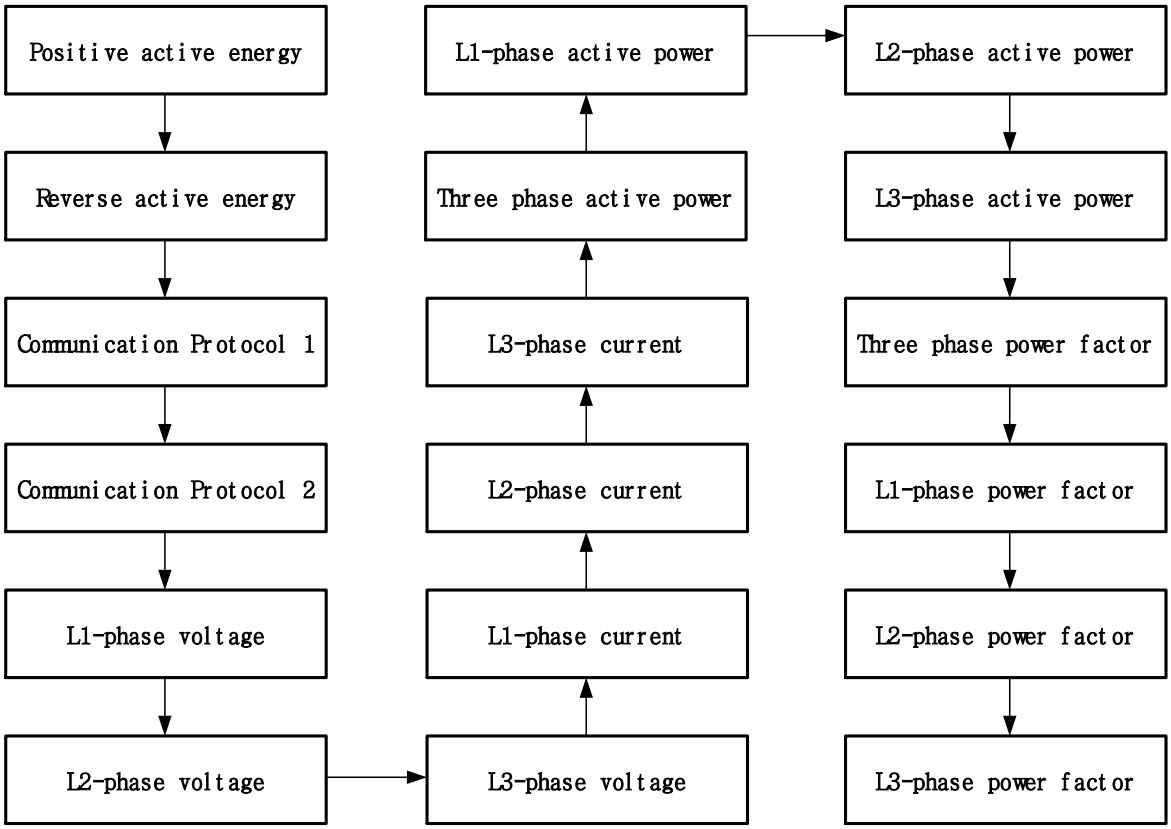


Figure 6-14 Parameter display sequence

3. Meter setting for type SMILE-TLMeter-CH3C60/100/250/400 (Single-Circuit) is the same as DTSU666-3*230V 5(80)A.

4. Meter setting for type SMILE-TLMeter-CH6C60/100/250/400 (Dual-Circuit) is the same as DTSU666-3*230V 100A/40mA.

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:

1. Make sure the open voltage of the PV strings will not exceed the max. DC input voltage (1100Vdc). Violating this condition will void the warranty.
2. Make sure the polarity of the PV connectors is correct.
3. Make sure the PV–switch, circuit breakers of battery, AC–BACKUP and AC–Grid are all isolated/in their “off” states.
4. 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.

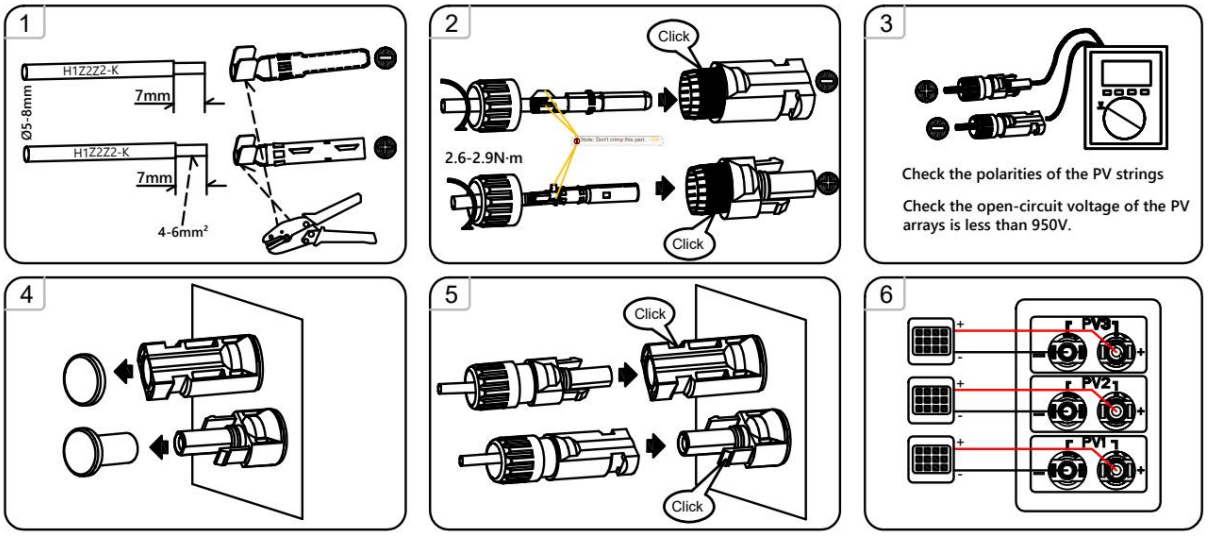


Figure 6–15 Assembly of photovoltaic connectors

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 Connector removal wrench.

Removing the PV connector without the PV Connector Disassembling Tool isn't allowed and dangerous.

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.

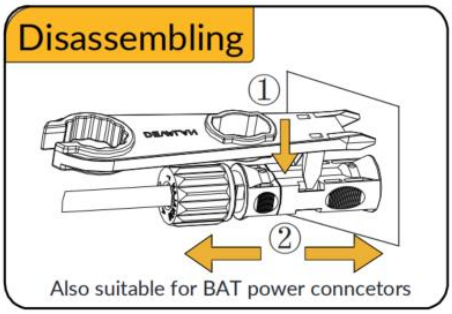


Figure 6-16 Disassembly of PV connectors

2. If there are PV connectors unused, please use the PV covers to seal the PV connectors.

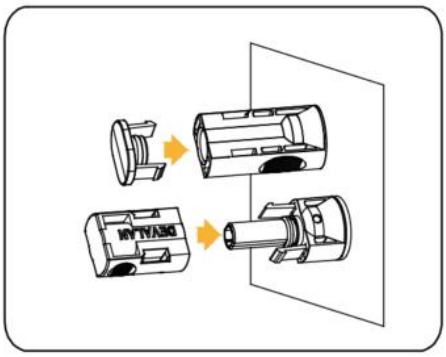


Figure 6-17 Seal the PV connectors

6.5. Electrical Connection between the ESS Inverter and Battery

6.5.1. Communication Connection between INV and BAT

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

1. Take out the battery communication cable from the battery packaging.
2. Pass the battery communication cable (BMS cable) through the cable gland of the COM connection cover of energy storage inverter. Do not tighten the strain relief nuts of the cable glands yet.
3. Insert the RJ45 plug into the BMS communication port on the Inverter Communication ports labelled “BMS”.
4. 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.
5. 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.

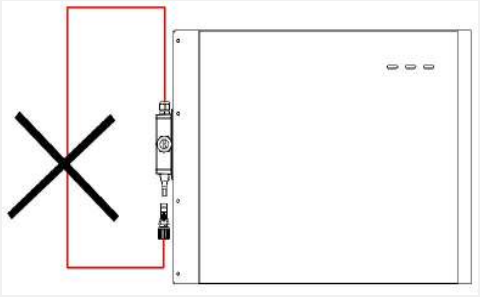
6.5.2. System Connection between INV and BAT

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.

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

1. Take out all cables from the inverter packaging.
2. Remove the protective caps from the battery power connectors of the inverter and all series batteries.
3. 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 connector of the lower series battery to the lower communication connector of the upper series battery.

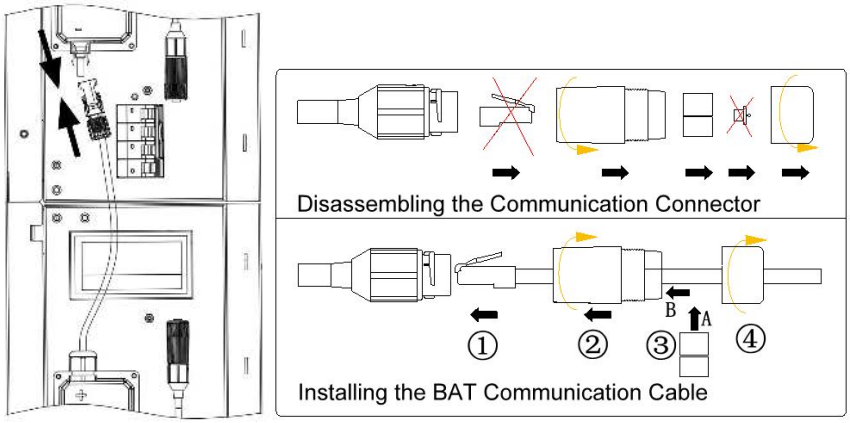


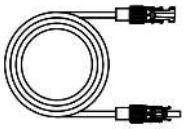
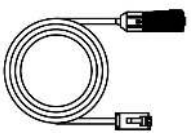
Figure 6-18 Installation of battery connection cables

4. Use the provided grounding cable to connect the grounding point of the inverter and the grounding point of the top battery.
5. Take out the red power cable, connect BAT main positive of series batteries (directly below the inverter) to the BAT positive connector of inverter.
6. Take out the black power cable, connect BAT main negative of series batteries (the last series battery) to the BAT negative connector of inverter.

Cables connection between the Inverter and series batteries of two column.

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 cable (black) of the system (3m): Connect BAT main negative of series battery and the BAT negative of inverter
2		The power cable between different column series battery (3m): Connect BAT negative of the bottom battery of first column series battery and BAT positive of the top battery of second column series battery
3		The battery communication cable (3m): Connect the lower communication connector of the bottom battery of first column series battery and the upper communication connector of the top battery of second column series battery

Detailed electrical connection between the inverter and the second 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 to connect the grounding points between the two column series battery.
   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.
3. Complete the electrical connection between two column series batteries.

(1) Use the provided power cable to connect BAT negative connector of the bottom battery of first column series batteries and BAT positive connector of the top battery of second column series batteries.

(2) Use the provided communication cable to connect the lower communication connector of the bottom battery of first column series batteries and the upper communication connector of the top battery of second column series batteries.

(3) Use the assembled grounding cable to connect the grounding point of the bottom battery of first column series batteries and the grounding point of the bottom or top battery of second column series batteries.

4. Please remove or disassemble the original main negative power cable (2m) provided in the inverter packaging.
5. Take out the main negative power cable (3m) from accessory of Cables for Distanced Horizontal Battery Expansion, connect BAT main negative of series batteries (the last series battery) to the BAT negative connector of inverter.

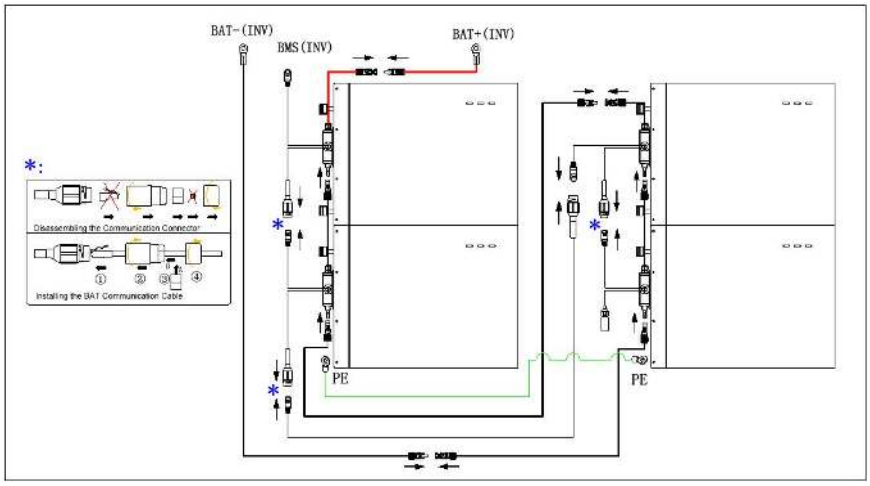


Figure 6-19 Separate series batteries side wiring diagrams

6.5.3. Disassembling BAT Connectors

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 battery 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:

1. 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.

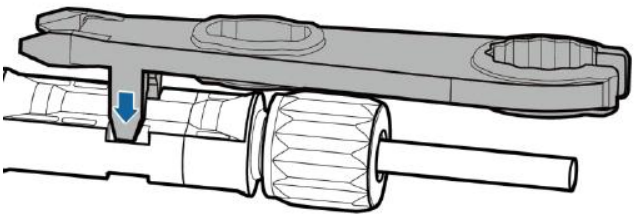


Figure 6-20 Disassemble the BAT connectors

6.6. Communication Connection with Inverter

For other communication (AUX,, 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.

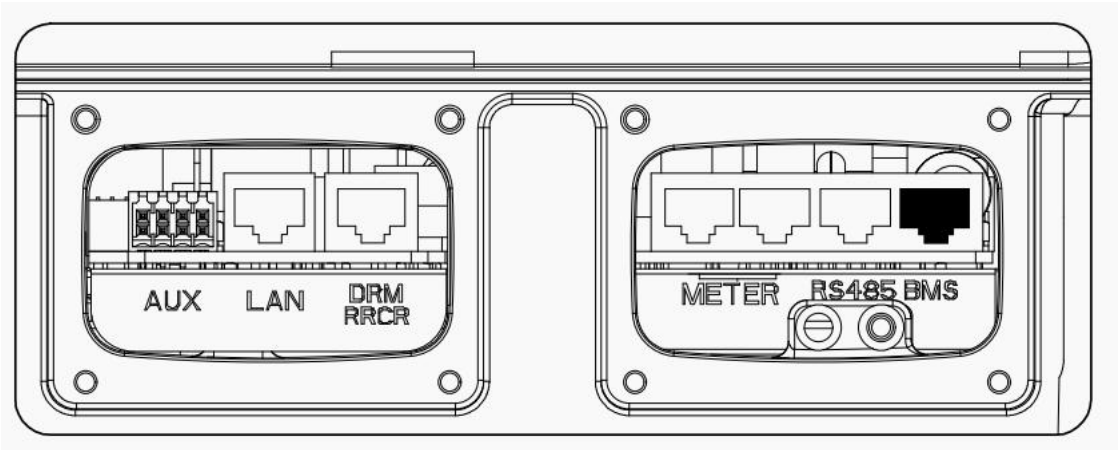


Figure 6-21 COM connection cover

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.

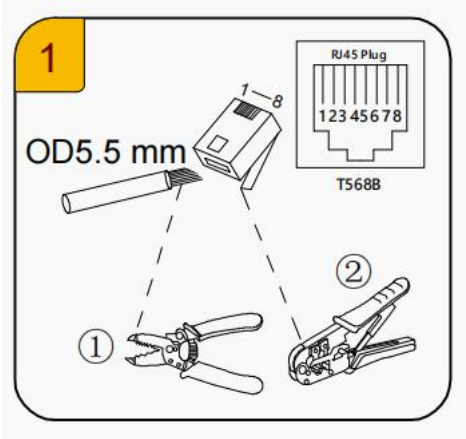


Figure 6-22 RJ45 plug connection

(1) For meter wiring, please refer to Chapter 6.3.5.1 for Meter Wiring.

(2) If DRM support is specified, the system may only be used in conjunction with a Demand Response Enabling Device (DRED). This ensures that the system implements the commands from the grid operator for active power limitation at all times. The system and the Demand Response Enabling Device (DRED) must be connected in the same network.

Only DRM0 is available for SMILE-G3 inverter.

(3) Take out 8-pin terminal block for AUX connection.

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

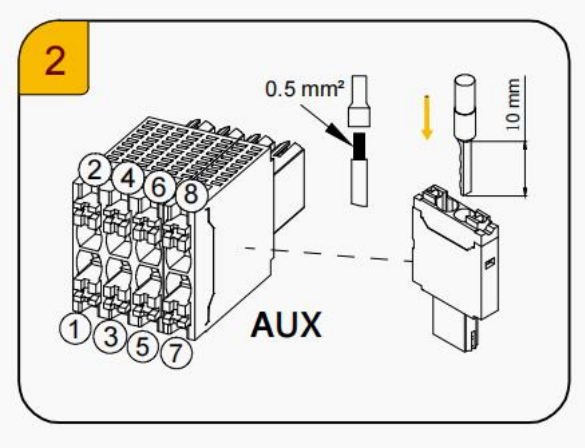


Figure 6-23 A 6-pin terminal block with AUX connection

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.

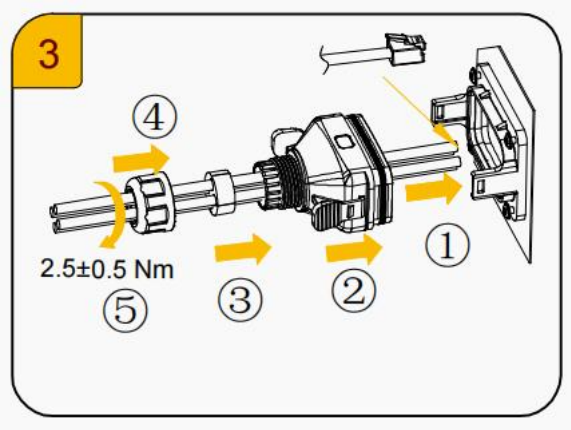


Figure 6-24 Disconnect the AUX connection

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 / ITEM	1	2	3	4	5	6	7	8
BMS	/	RS485_A4	/	CAN1_H	CAN1_L	/	RS485_B4	/
RS 485	12V	/	GND	RS 485_B5	RS 485_A5	RS 485_A7	GRID_CT-_L3	RS485_B7
GRID_CT / METER	GRID_CT-_L1	GRID_CT+_L1	RS485_A7	GRID_CT-_L2	GRID_CT+_L2	RS 485_B7	GRID_CT-_L3	GRID_CT+_L3
PV_CT / METER	PV_CT-_L1	PV_CT+_L1	RS485_A7	PV_CT-_L2	PV_CT+_L2	RS 485_B7	PV_CT-_L3	PV_CT+_L3
DRM	DRED 1/5	DRED 2/6	DRED 3/7	DRED 4/8	REF GEN/0	COMLOAD/0	GND	GND
RRCR	K1	K2	K3	K4	5V	/	GND	GND
AUX1	DO1_NO	DO1_COM	DO2_NO	DI_negative1	DO2_COM	GND	DI_positive2	GND

6.7. Mount the Covers of the Inverter and Battery

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

1. Mount the cable cover of the battery, Refer to 1-2 in Figure 6-25.

(1) Cut a cable hole based on the cabling routing and route the cables through the cable hole.

(2) Align the top surface of the cable cover to the top surface of the battery housing.

(3) 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.

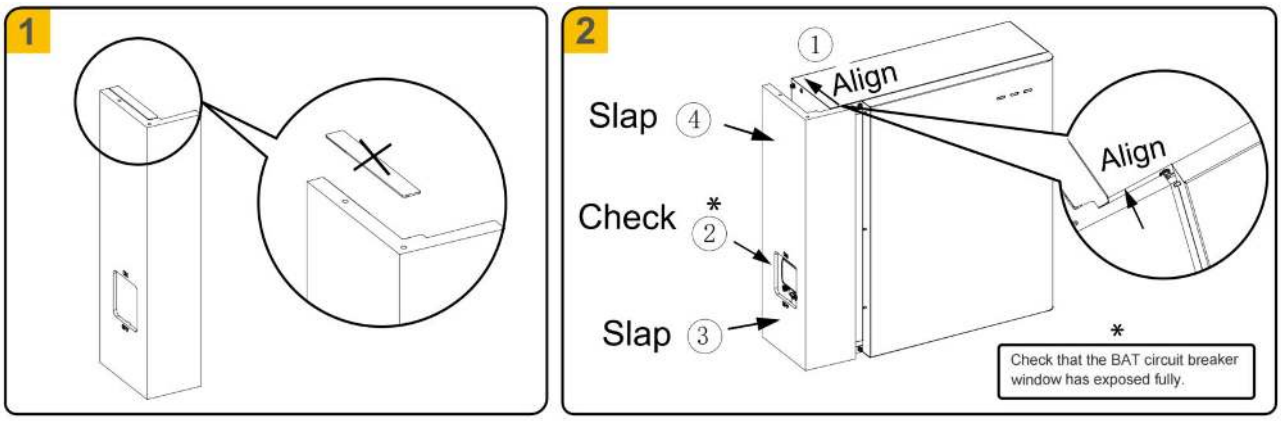


Figure 6-25 Install the cable cover for the battery

1. Disassemble the cable cover of the battery, Refer to 1 in Figure 6-26.

(1) Grasp the cable cover, then pull it to the left.

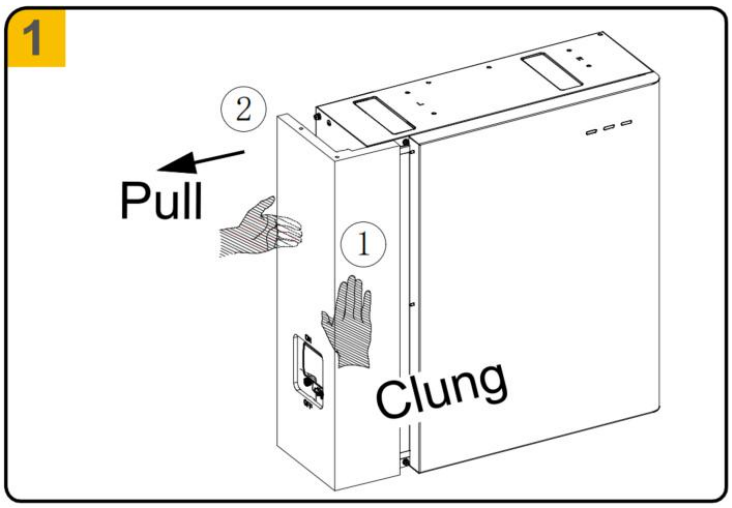


Figure 6-26 Disassemble Cable Cover

2. Mount the covers of the inverter

(1) 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).

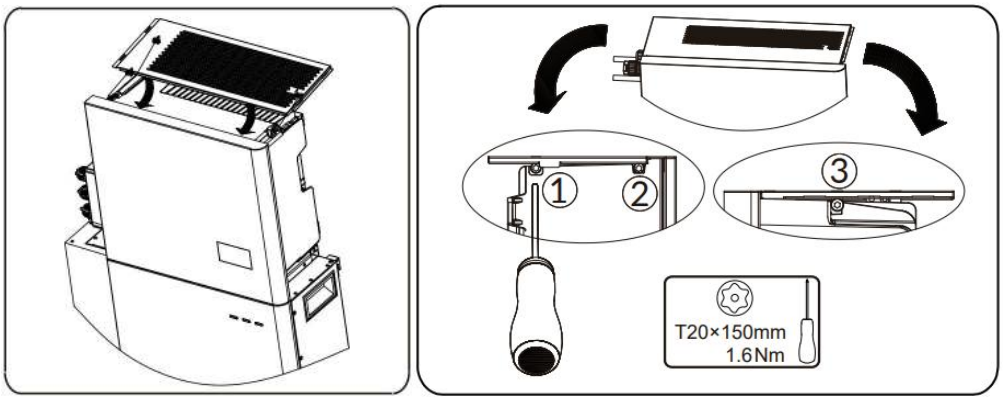


Figure 6-27 Attach the top cover to the inverter

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

- Take out the right cover and cable cover from the inverter packaging.
- 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.

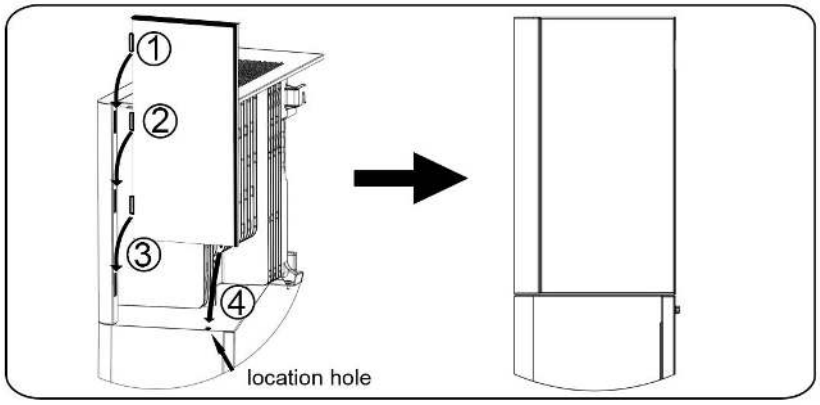


Figure 6-28 Mount the right cover

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

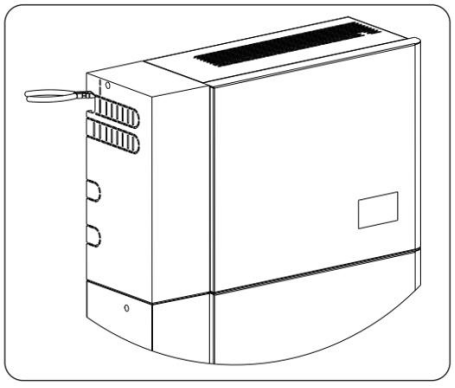


Figure 6-29 Cut a cable hole

- 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.

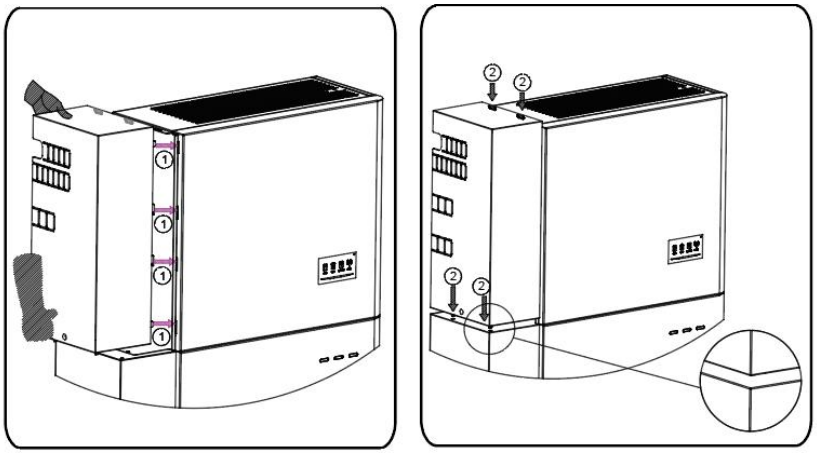


Figure 6-30 Mount the cable cover

(3) Disassemble the cable cover of the inverter

- 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.
- Grasp the cable cover and lift it up by about 20mm, then move it to the left.

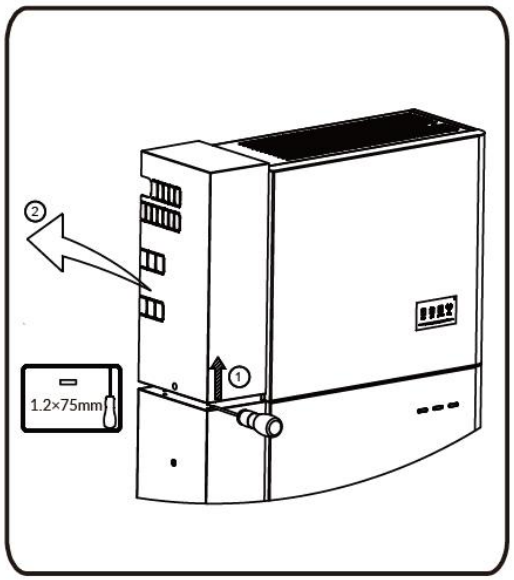


Figure 6-31 Disassemble the cable cover of the inverter

7. Operation

7.1. Power On the System

WARNING

• Before doing electrical connection, 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 is PV string 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 ESS inverter and the backed-up

loads.

2. Switch off the AC circuit breaker between the ESS inverter and the mains grid.
3. Switch off the PV DC Isolator(s) between the PV strings and the ESS inverter if there are any.
4. Switch off the PV switch on the lower left of the ESS inverter (if there are PV strings directly connected the ESS inverter).
5. Switch off the battery circuit breakers of all batteries.
6. Switch off the battery circuit breaker which is at the upper 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 Dongle 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 circuit 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

WARNING

• Before doing the electrical connection, 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. Check the grid's allowed voltage range and frequency range and the installation (including location, direction and phase sequence) of all CT(s) and/or meter(s).
2. Switch on the battery circuit breaker at the left of the energy storage inverter.
3. Switch on the battery circuit breakers of all batteries.
4. Switch on the external AC circuit breaker between the grid and the energy storage inverter.
5. Please strictly follow the aforementioned steps to power on the system.

8.3. Download The AlphaPartner And Registration

WARNING

• Only Installer Organisation Self-register via the APP; One person, one organisation, one role(One account corresponds to one role within an organisation).

The country / region determines the Data Centre and Review Rules: AU / NZ If the criteria are met, APProval is automatic, Non-AU go through manual review.

8.3.1. Download and Install the APP

AlphaESS Partner APP is a dedicated mobile Application for distributors, installer companies, installers and other partners.It supports assigning separate accounts to administrators, installers and other organisational roles. This avoids shared accounts, improves management accuracy, and reduces security risks.

AlphaESS Partner APP can help you complete installation, after-sales service and commissioning.

It also provides digital services such as organisation management, online communication, installation guidance and an online store.

AlphaPartner For Android

AlphaPartner For IOS

Figure 8-1 QR codes for downloading the AlphaPartner APP

8.3.2. Register as an Installer

Step 1: Open the Partner APP and, on the login page, tap “Register”.

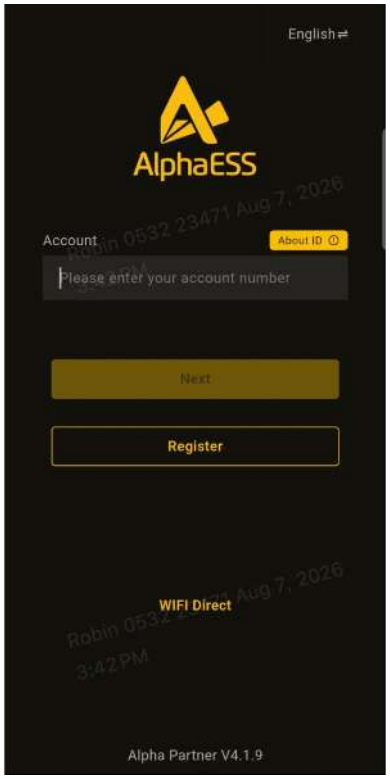


Figure 8-2 Step 1: Tap "Register" on the Partner APP login page

Step 2： Select Country / Region (Determines the data center and review rules according to the actual place of business).



Figure 8-3 Step 2: Select the country/region

Step 3： Enter Organisation Information: organisation name, country, address, and

ABN / Business Licence Number(mandatory depending on the country classification; after submission verification).

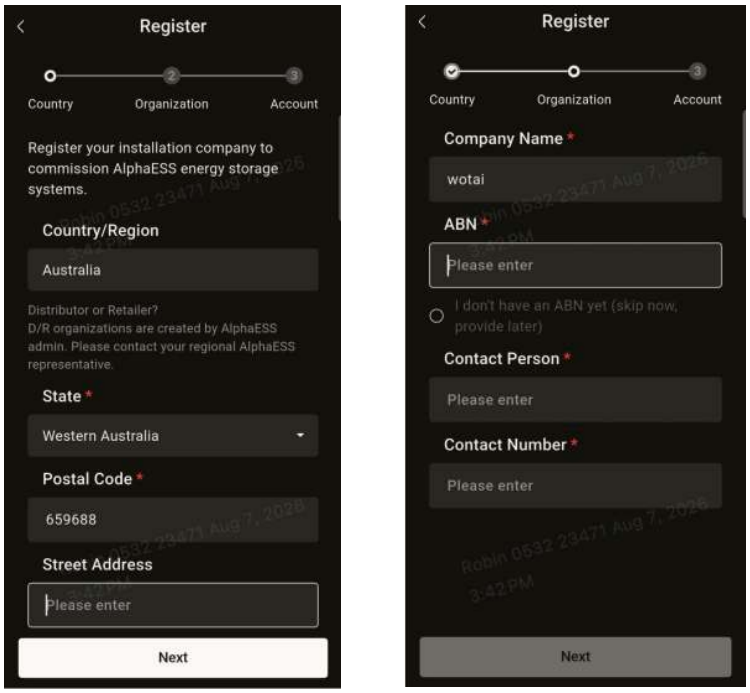


Figure 8-4 Step 3: Enter the organisation information

Step 4: Enter Account Information: Email, Verification Code (email verification code), Password, Confirm Password.

Tick the terms and consent checkbox, then tap "Register / Submit" to submit.

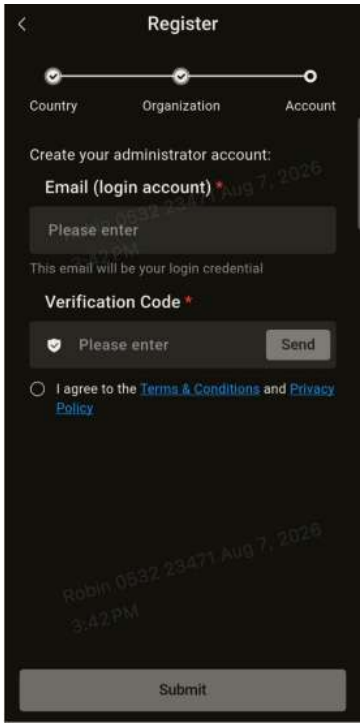


Figure 8-5 Step 4: Enter the account information and submit the registration

8.3.3. Review Result and Activation

AU / NZ: If the criteria are met approved automatically, you can log in directly.

Non-AU: Enter manual review, with the result notified by email—approved or rejected (including the rejection reason);

No additional emails will be sent while the review is pending.

After approval, log in with the registered account.

8.4. Account Login And Workspace Selection

8.4.1. Account Login

Step 1: Login Page Input Email and Password, tap "Login"; or switch to "Login with Code" to log in with the email verification code.

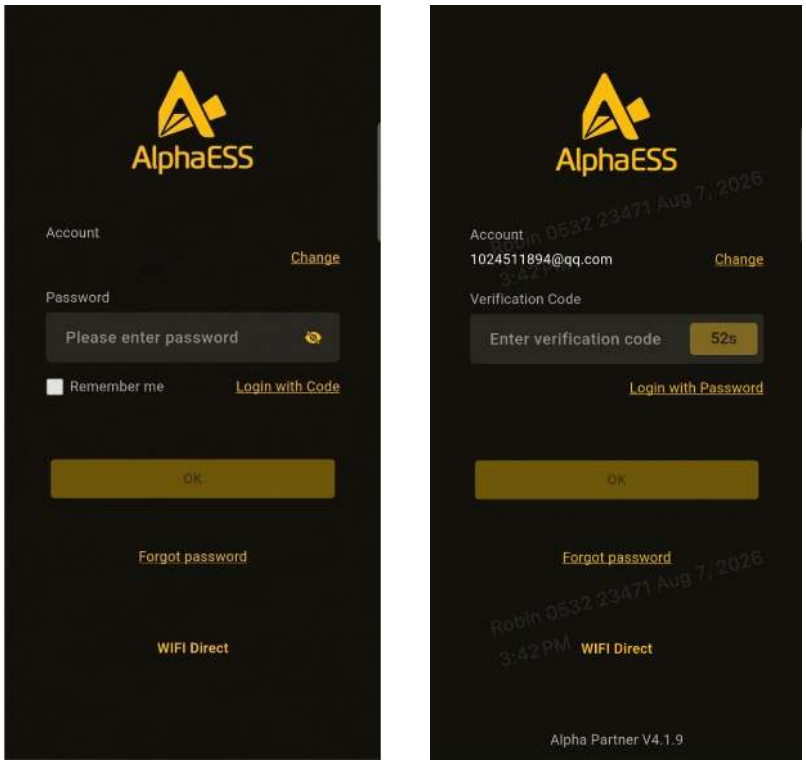


Figure 8-6 Step 1: Log in with the account password or the email verification code

Step 2: If you forget your password, tap "Forgot Password" to reset it via the email verification code.

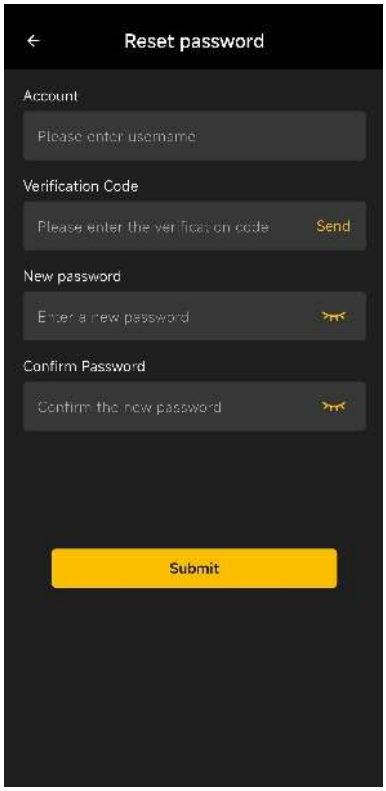


Figure 8–7 Step 2: Reset the password with the email verification code

8.4.2. Select And Switch Workspace

One account can belong to multiple organisations, and within the same organisation has one role.



Figure 8–8 Organisation and role list of the account

You can switch at any time in the APP Organisation / Role, after switching, the interface and permissions refresh according to the selected workspace.

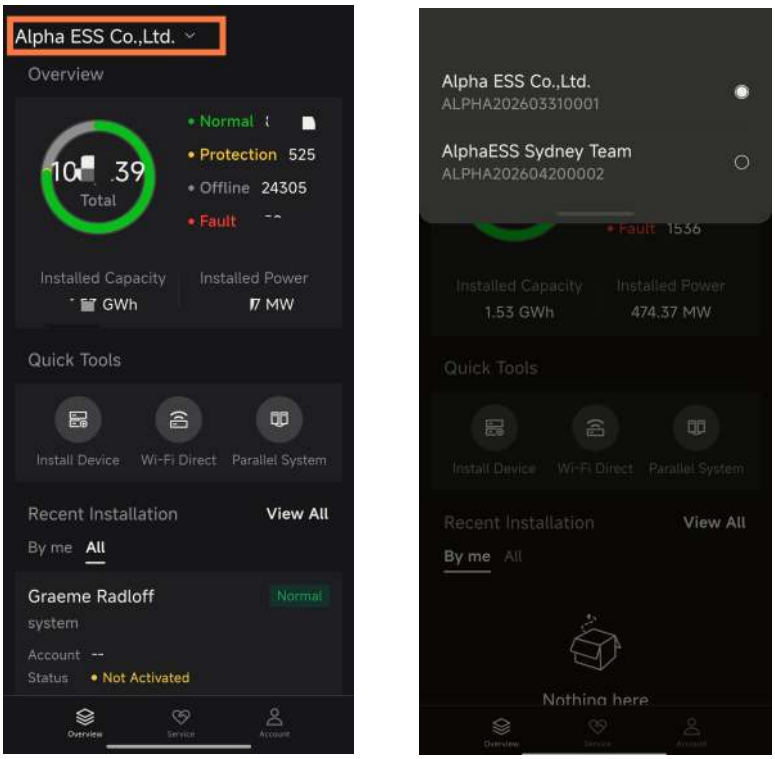


Figure 8–9 Workspace overview pages after switching the organisation/role

8.5. Installation, Network Configuration & Commissioning

8.5.1. Standalone Installation

8.5.1.1 Prerequisites

Device Side: The energy storage unit is powered on, and the Wi–Fi communication stick is plugged in,The POWER indicator light is steadily on.

Home Router: The network name and password are known, 2.4GHz The band is enabled, and the signal covers the device installation location.

Phone: Wi–Fi and Bluetooth are both enabled, location permission has been granted (required for Android Wi–Fi scanning and silent connection), and the person is standing within a few meters of the device.

Phone Internet Connection: It is recommended to enable mobile data — when falling back to direct AP connection, the phone will temporarily switch to the device hotspot and disconnect from the internet.

8.5.1.2 Network Configuration

Step 1: Tap Quick Tools — Install Device



Figure 8–10 Step 1: Tap "Quick Tools – Install Device" on the APP home page

Step 2: Bluetooth automatically scans nearby devices, usually devices starting with “AL”, matching the device SN. (If the device does not support the Bluetooth function, it cannot be found during search. In this case, please select to connect the device by scanning the device SN).

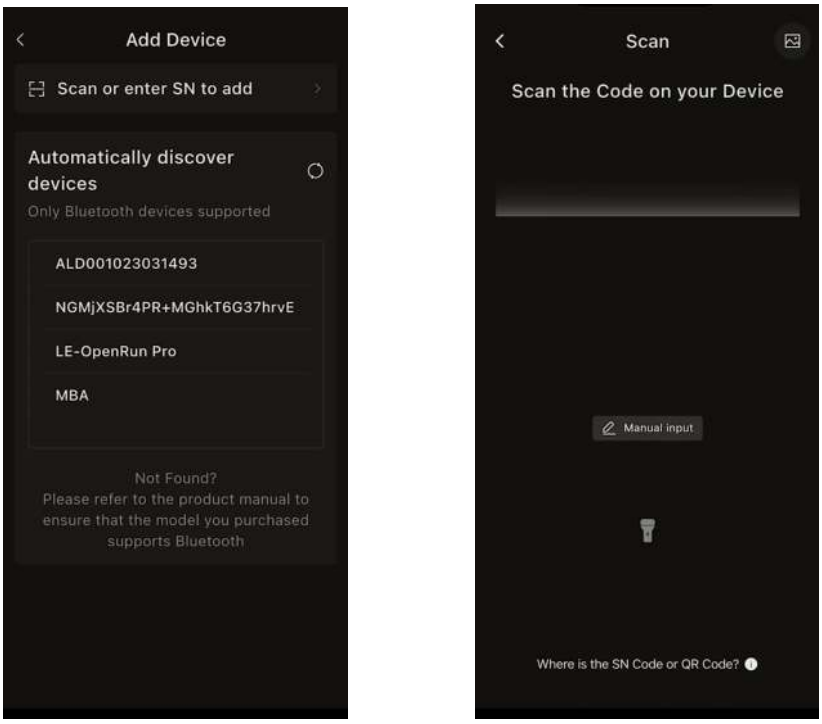


Figure 8–11 Step 2: Scan or automatically discover the device via Bluetooth

Please refer to the following for the physical location of the scannable SN label on the device.

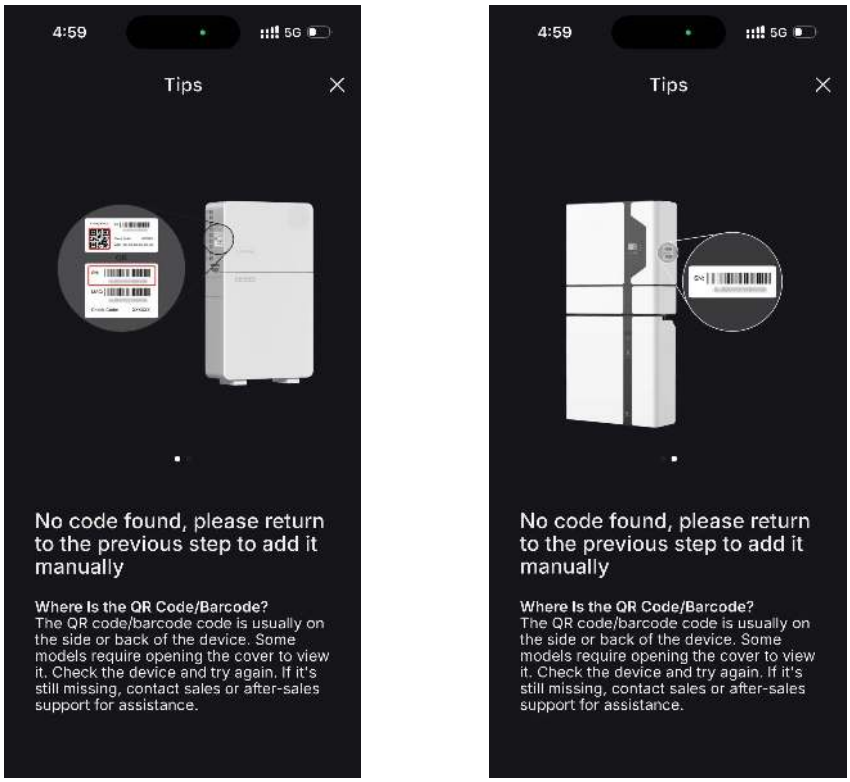


Figure 8–12 Location of the SN/QR code label on the device

Step 3: Select the device found via Bluetooth, and enter the device check code. The

APP will redirect to the "Confirm device info" screen. Verify the information and click Next.

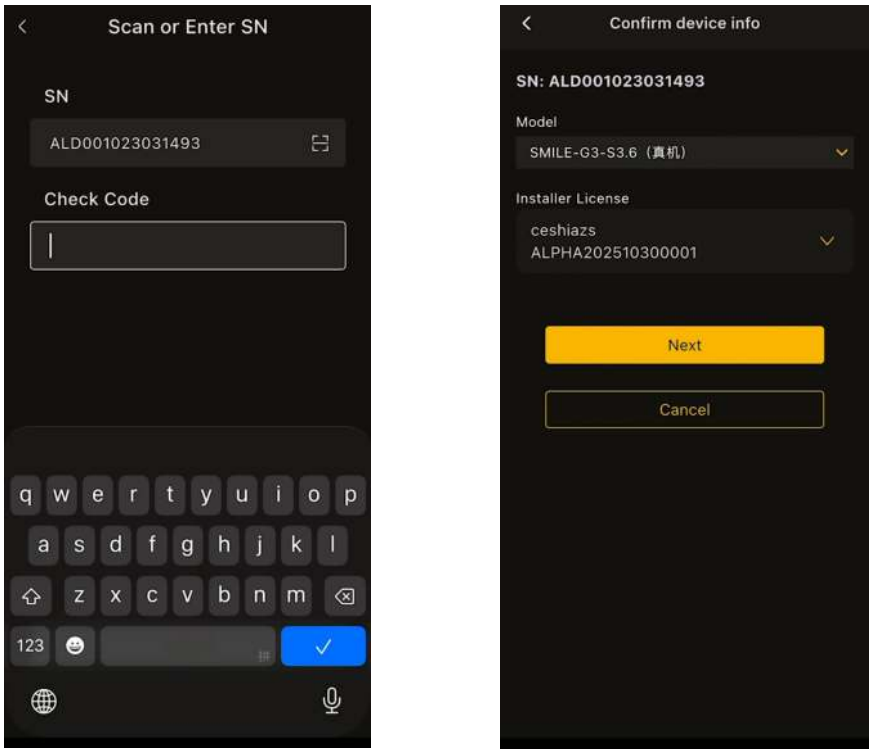


Figure 8–13 Step 3: Enter the device SN and check code, and confirm the device information

Step 4：Wait for the phone to connect to the device.

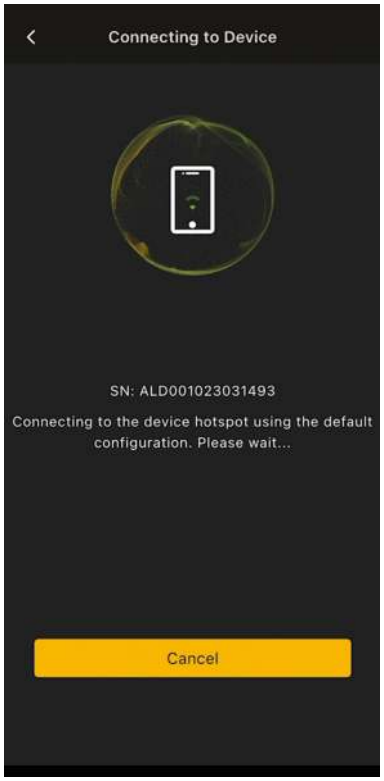


Figure 8–14 Step 4: Wait for the phone to connect to the device

Step 5：Once the phone has successfully connected to the device, select the home Wi-Fi the device needs to connect to and enter the correct password.

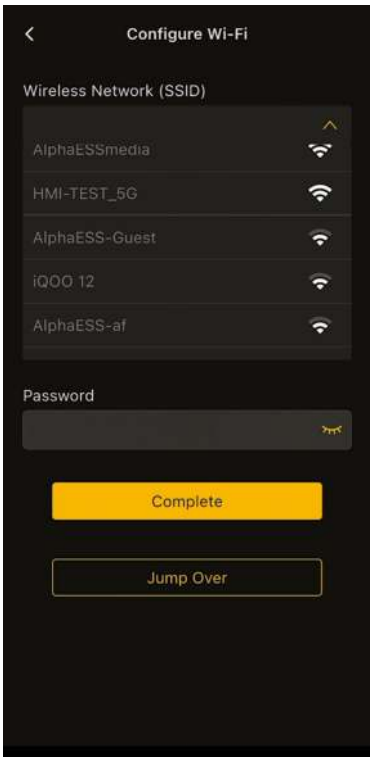


Figure 8-15 Step 5: Select the home Wi-Fi and enter the password

Step 6：Wait for the device to connect to the network and the cloud.



Figure 8-16 Step 6: Wait for the device to connect to the network and the cloud

8.5.2. Basic Information Entry And Device Parameter Configuration

8.5.2.1 Basic Information Entry

Step 1: Enter the "Install System" screen, select "Basic Information" first to access the basic information form.



Figure 8–17 Step 1: Open the "Install System – Basic Information" screen

Step 2: Automatically locate or manually enter the device installation address.

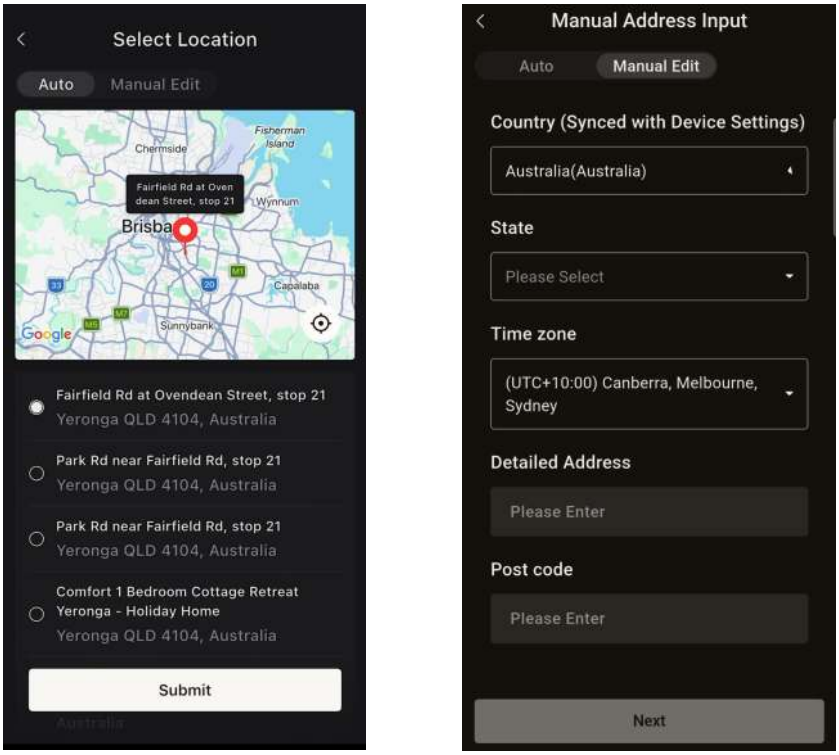


Figure 8-18 Step 2: Automatically locate or manually enter the device installation address

Step 3： Set the device site name and enter the end-user account.Back to "Install System" screen; "Basic Information" marked complete.

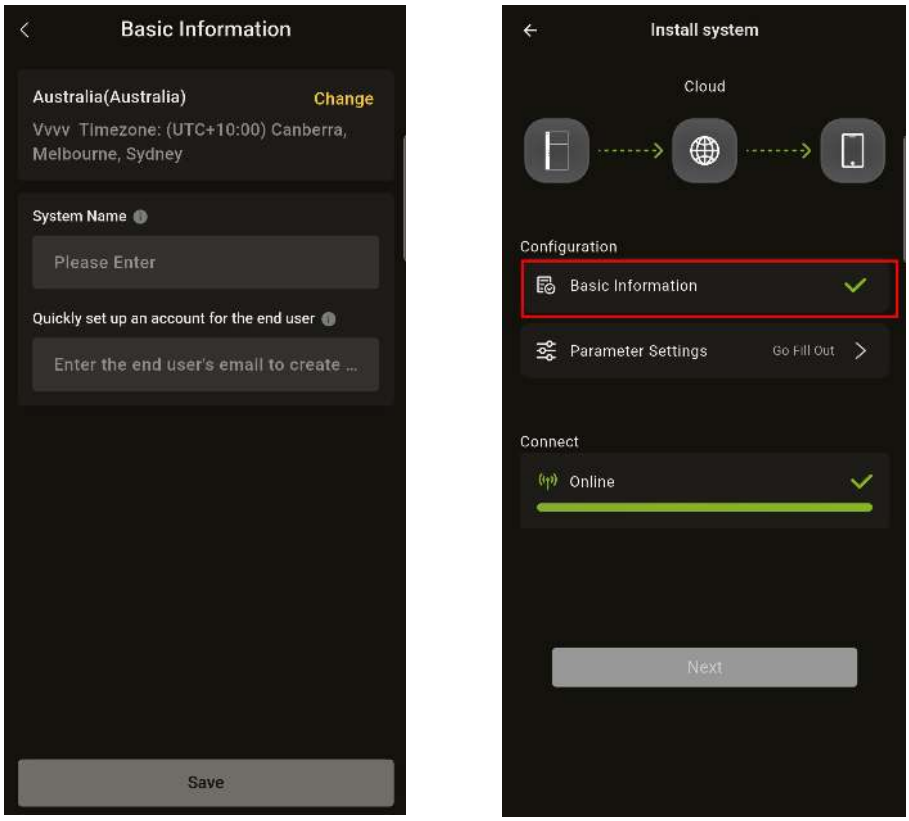


Figure 8-19 Step 3: Set the site name and enter the end-user account

WARNING

- If the automatically located address is found to be inaccurate after verification, you can update the address through the "Change" interface in Step 3.

8.5.2.2 Device Parameter Configuration

Step 1: Select "Parameter Settings"on the "Install System" screen.

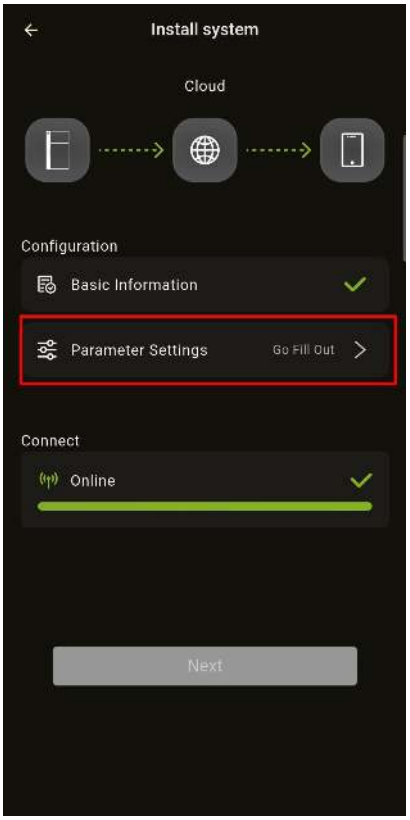


Figure 8-20 Step 1: Select "Parameter Settings" on the "Install System" screen

Step 2: Enter the device installation mode, PV installed capacity, maximum PV feed-in power limit, select the meter type, and other information (For AU, enter region, DNSP, NMI, and other information as required).

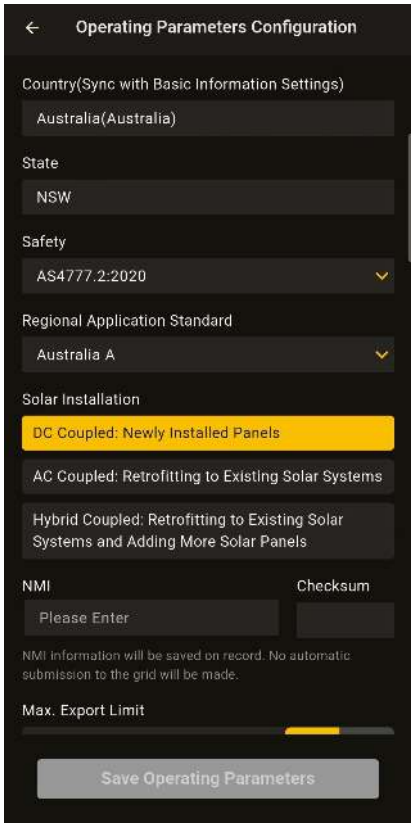


Figure 8-21 Step 2: Configure the device installation mode, PV capacity and meter type

Step 3：Select Device Self-Test / Skip (only some models support self-test).

Models that support self-test: SMILE-G3 Series, SMILE-M Series.

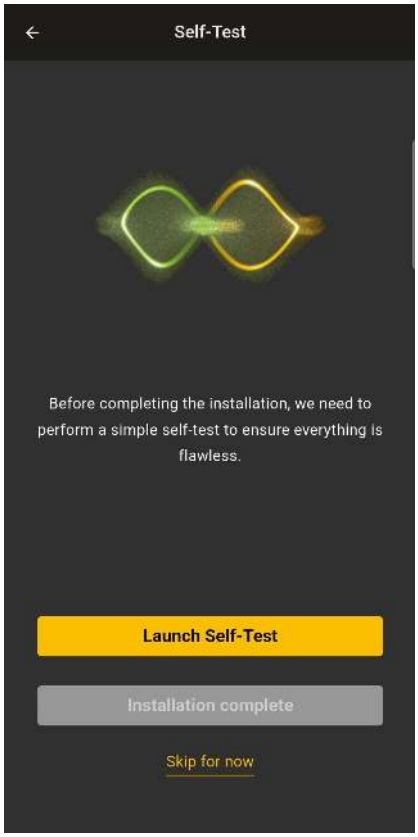


Figure 8-22 Step 3: Select the device self-test

Step 4: Enter the self-test screen and wait for completion. If issues arise, perform detailed checks via Troubleshoot, then re-run the self-test. Self-test completes when no issues are found.

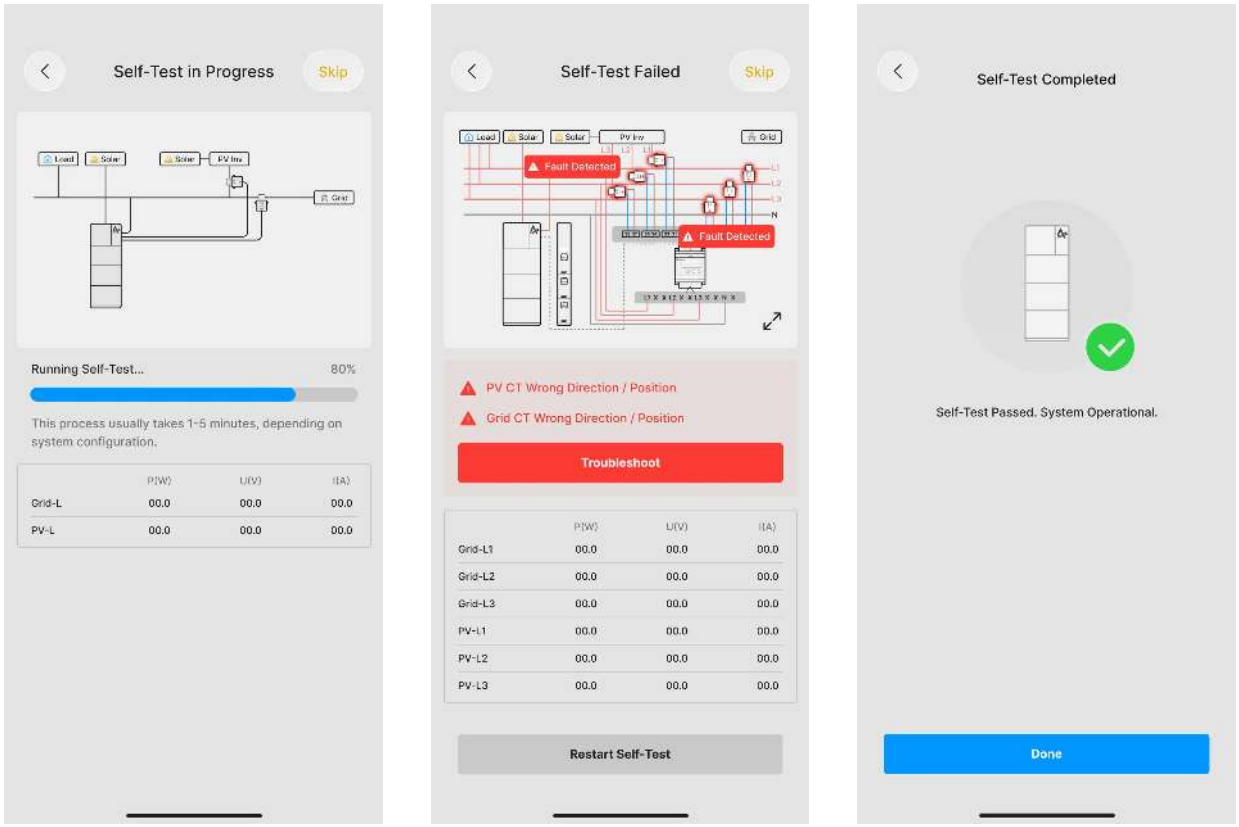


Figure 8–23 Step 4: Self–test in progress, failed and completed screens

8.6. Site And System Overview

After installing and commissioning the equipment, check the operating status daily on the Site / System Overview. Log in and select the Workspace to enter.

8.6.1. Site / System List

Enter Site / System List, you can search by Site Name / SNsearch.Click the target site to enter the overview.

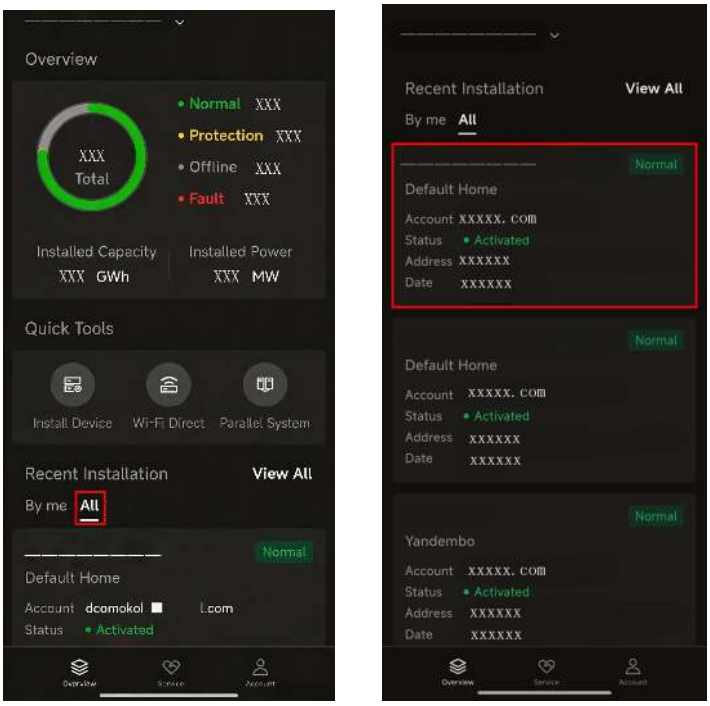


Figure 8–24 Site/System list with search by site name or SN

8.6.2. Overview Energy Flow Overview

Top Status Indicator:

Status
Normal(All online)
Offline(All offline)
Protection(Protection Status)
Fault(Fault present)

When offline, you can click into the "Offline Devices" list.

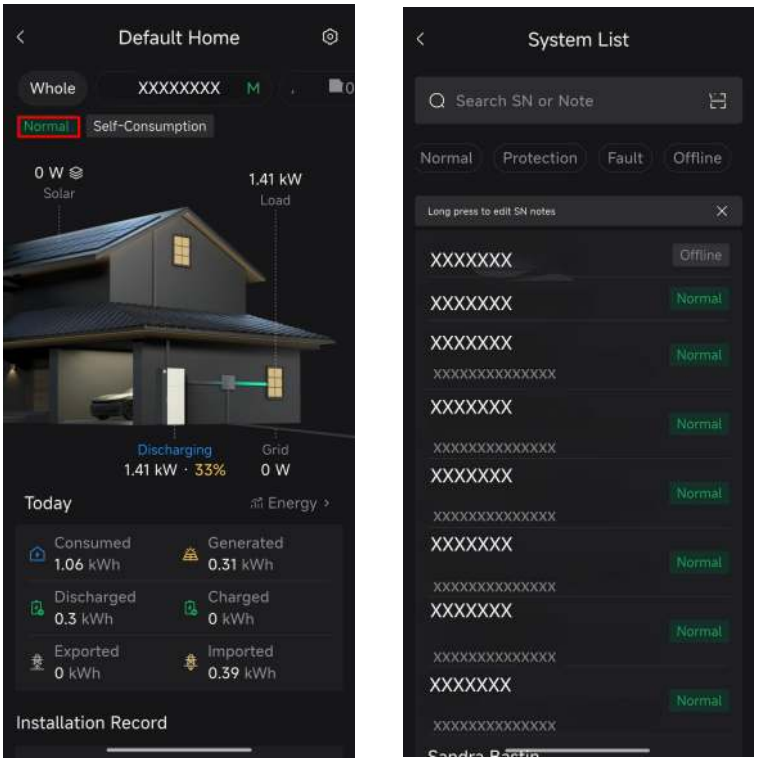


Figure 8–25 Top status indicator and the system list

Middle Energy Flow Visualisation: Real–time display of the power flow directions between PV, the grid, Load, Battery (and EV chargers, etc.) power flow direction and current power values.

Click the top right to view and configure the site operating mode, tariff information, VPP scheduling and individual devices.

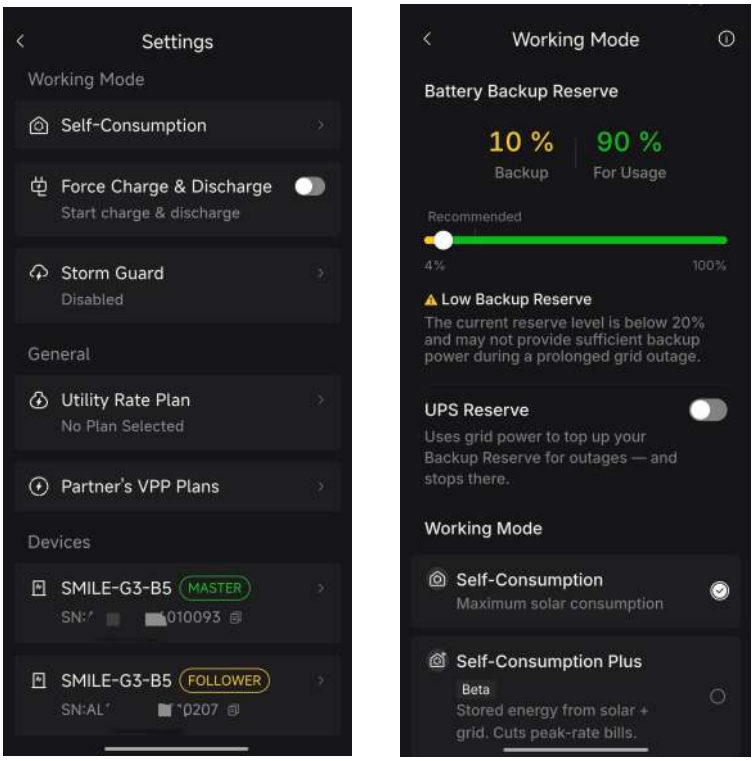


Figure 8–26 Site operating mode and configuration entries

8.6.3. Energy Charts and Data

Switch Daily / Monthly / Yearly dimensions to view electricity consumption trends and the balance between generation & consumption.

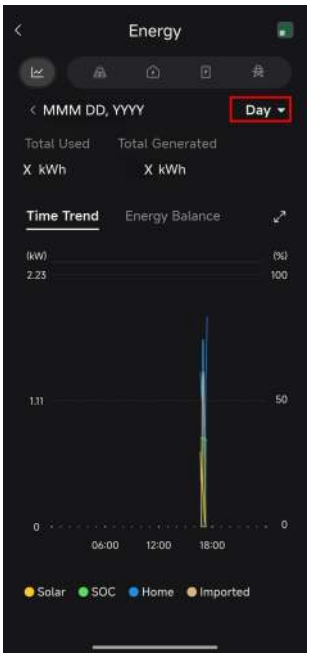


Figure 8–27 Daily/monthly/yearly energy consumption and generation trends

Switch the daily/monthly/yearly energy data corresponding to each metric such as installed PV, Home Load, Battery, grid, etc.

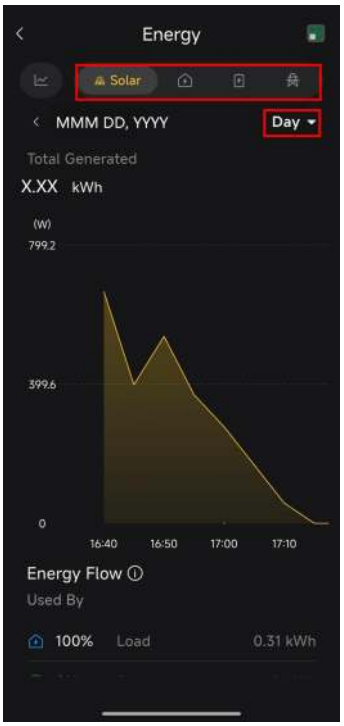


Figure 8–28 Energy data of each metric (PV, Home Load, Battery, grid, etc.)

View the site's renewable energy achievement data.



Figure 8–29 Renewable energy achievement data

8.7. Parallel Installation

8.7.1. Parallel Installation

Step 1： Carry out the standalone installation in sequence (see Chapter 4: Wi-Fi Network Configuration and Commissioning for standalone installation).

Step 2： Select "Parallel System" in Quick Tools, click "Add Parallel" at the bottom, then distinguish Master/Slave SN and Check Code as prompted.

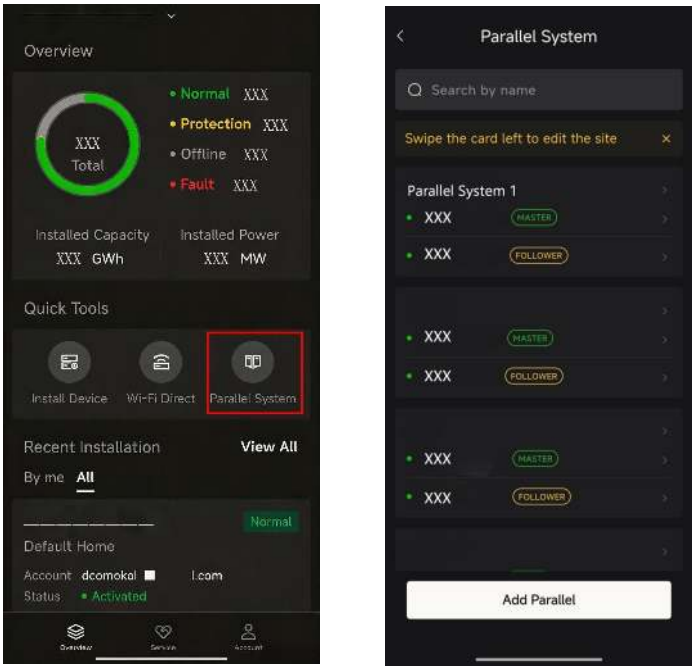


Figure 8-30 Step 2: Enter the "Parallel System" page and add the Master/Slave devices

Step 3： Submit the parallel operation information; once the system has completed the software update, the parallel installation is complete.

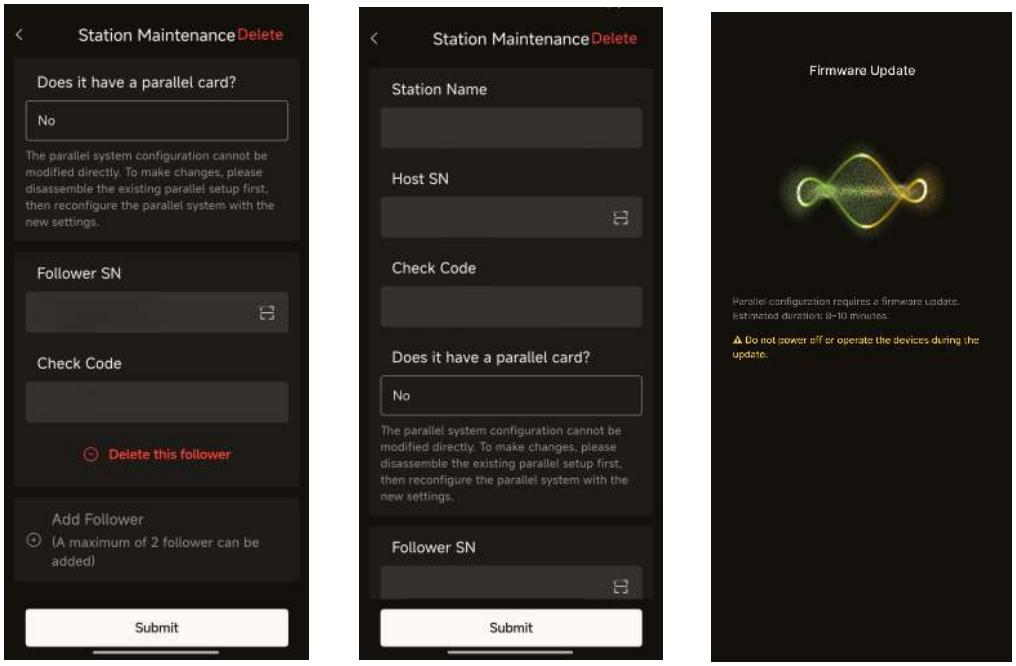


Figure 8–31 Step 3: Submit the parallel system information and wait for the firmware update

WARNING

• If you are installing a G3–S5/B5 series model, please confirm whether the device is equipped with a parallel card. If so, select the "Yes" option in the "Does it have a parallel card?" field.

8.7.2. Parallel System Management

Step 1: On the home page, select Quick Tools Parallel System.



Figure 8-32 Step 1: Select "Quick Tools – Parallel System" on the home page

Step 2: View the parallel system list, and select the parallel site to enter.

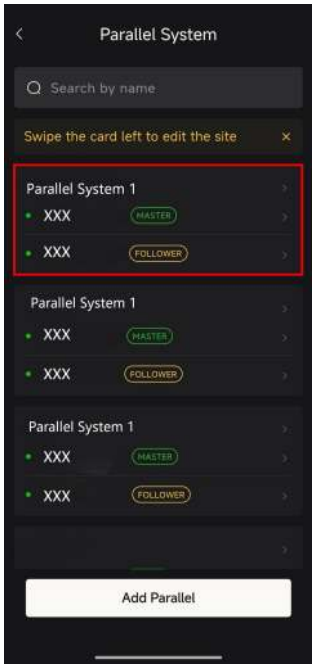


Figure 8-33 Step 2: View the parallel system list and select the parallel site

Step 3: View the overall operating information of the parallel site, and switch to the standalone view at the top.



Figure 8-34 Step 3: View the overall operating information of the parallel site

8.7.3. Parallel Removal

Step 1：In the parallel system list, after selecting the site to be removed, swipe left to edit.

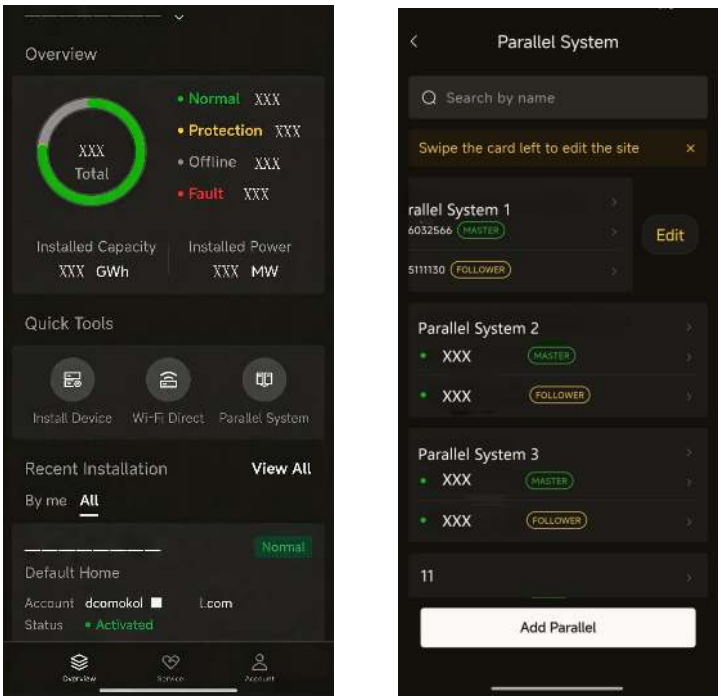


Figure 8–35 Step 1: Select the parallel site to be removed and swipe left to edit

Step 2：In the edit details, click delete to remove the parallel site.

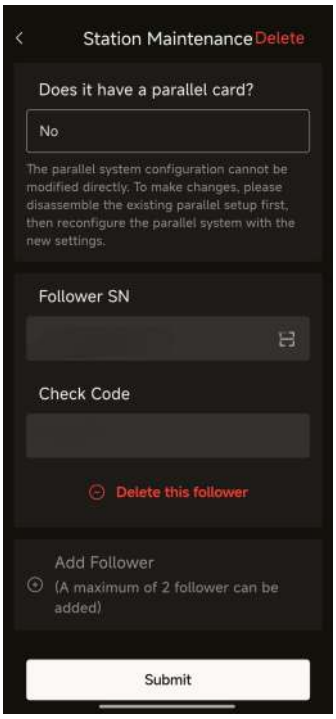


Figure 8–36 Step 2: Click "Delete" in the edit details to remove the parallel site

WARNING

- Parallel Removal ≠ Device Removed from Site: After the parallel relationship is removed, the Device remains at the original site.
- Removed from Site Yes an independent second step operation, and must be carried out separately.
- When deleting the parallel configuration, remove the parallel wiring harness physically at the same time to avoid inaccurate single-unit data.

8.8. Register on AlphaCloud

8.8.1. 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.

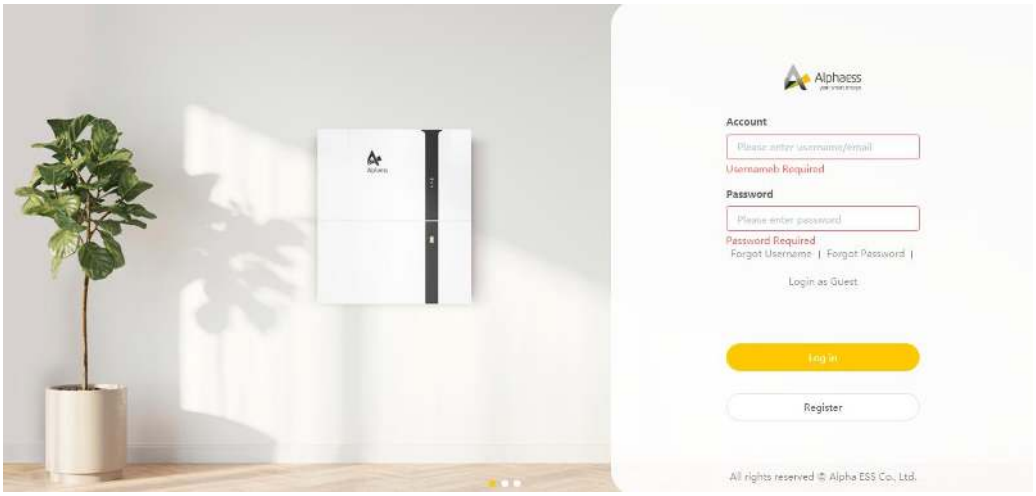


Figure 8-37 Alpha Cloud platform login page

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

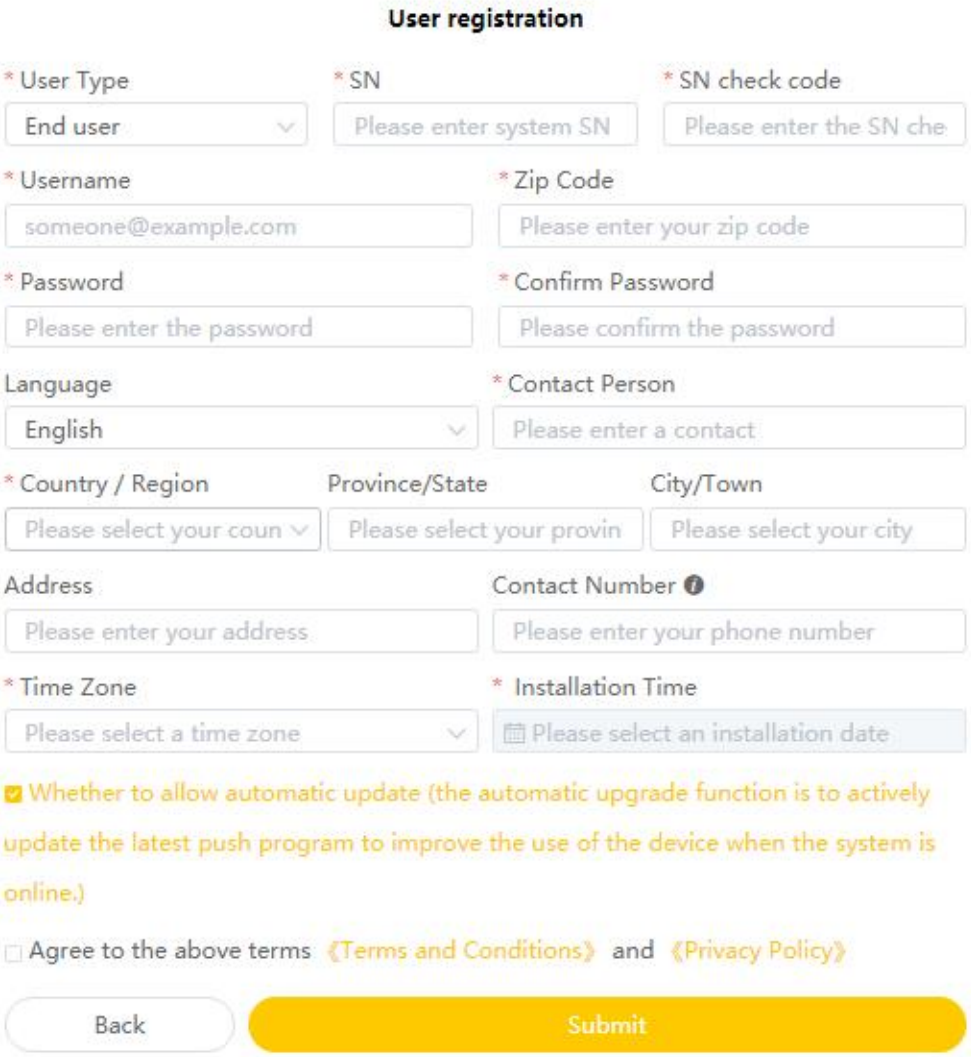


Figure 8–38 User registration

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.

8.8.2. 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.

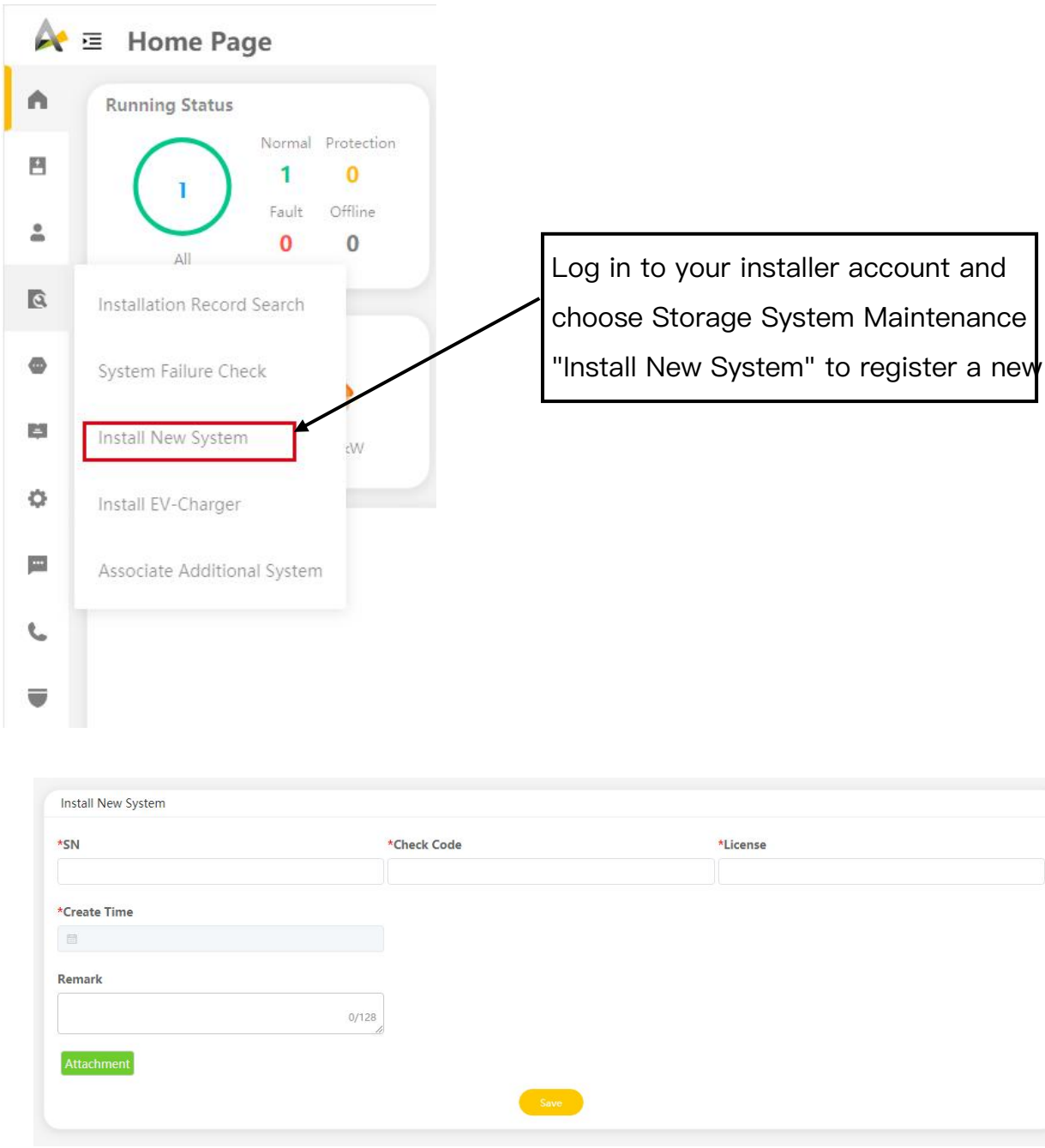


Figure 8–39 Install the new system on the Alpha Cloud platform

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.

8.9. 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 commission the system after the system configuration process.

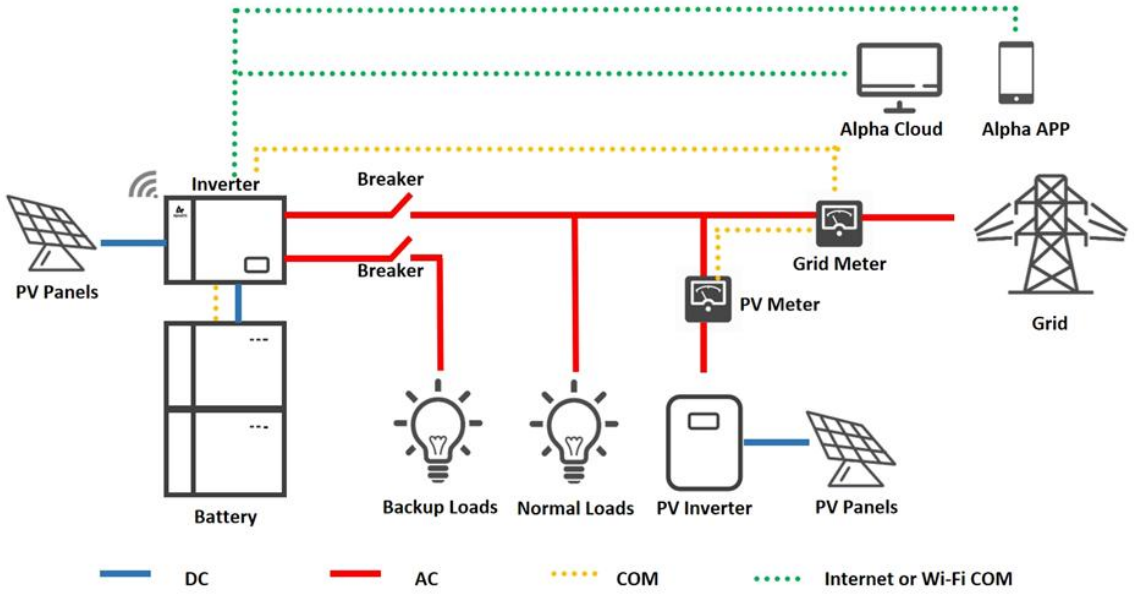


Figure 8-40 Brief wiring diagram of hybrid system

4. 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.

(1) Switch on the battery circuit breaker of the energy storage inverter.

(2) Switch on the battery circuit breakers of all batteries.

(3) Switch on the AC circuit breaker between the grid port of the energy storage inverter and the grid.

(4) Switch on the AC circuit breaker between the backup port of the energy storage inverter and the loads.

(5) Switch off the PV switch of the energy storage inverter (if there is any).

(6) Switch off the AC circuit breaker (if there is any) between the PV inverter and the grid.

(7) At this moment, the energy storage inverter will enter NORMAL state.

(8) Please turn off all loads. If you can't, please ensure that there aren't loads of large power fluctuations connected in the system.

(9) Log on to the App and click to page "My System" and note the current "Load".



Figure 8–41 My system page on the APP

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

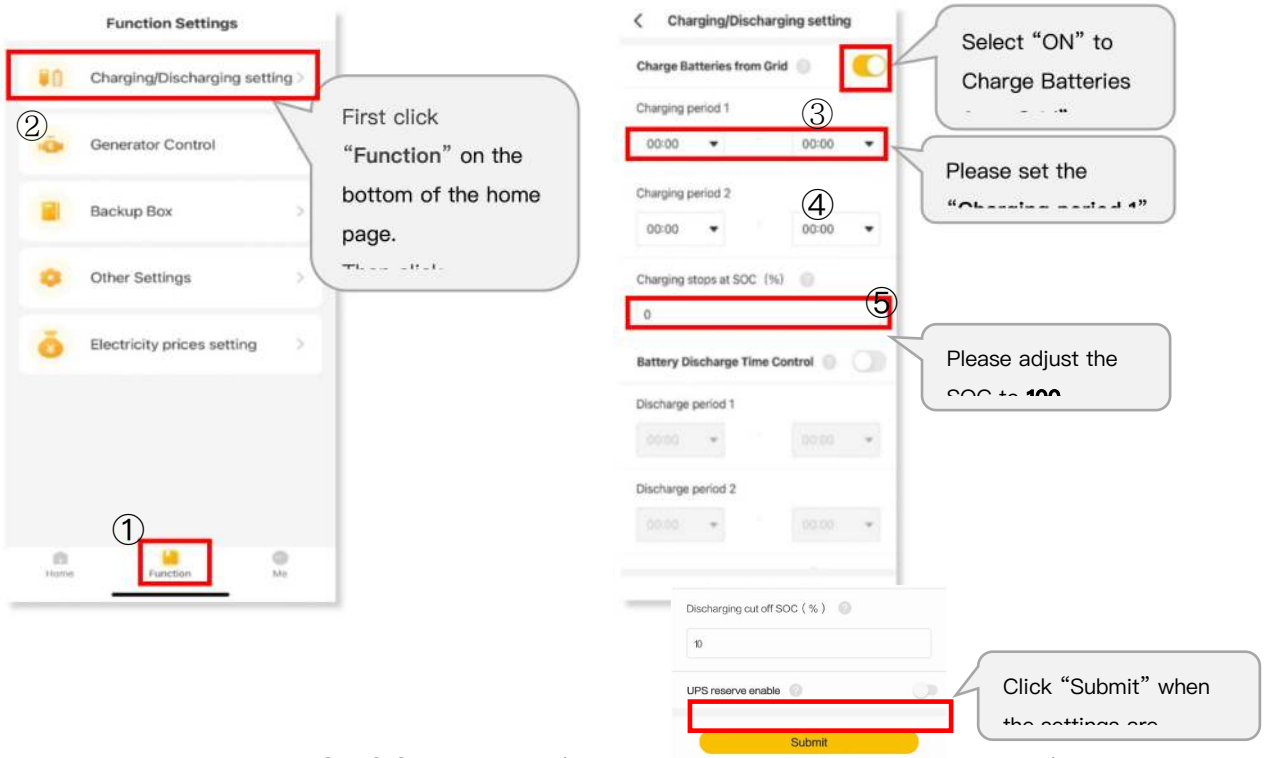


Figure 8-42 Settings for charging the battery from the power grid

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 8-43 Confirmation of installation of power grid electricity meters

If the formula above does not apply, please perform the troubleshooting below.

Meter Type	Solution
BB, BB Plus	Please refer to the relative system wiring diagram to check the wiring.

	If the error persists, contact AlphaESS customer service for further check.
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.
CT Only	Check the location, direction and cable connection of the grid CT.
P1 meter reader	Check the connection and installation configuration of the P1 meter reader.

6. If there is no PV inverter in the system, please skip this step.

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

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

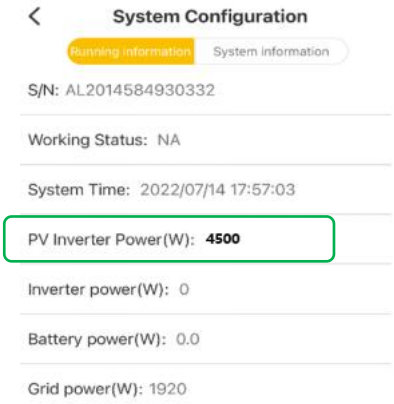


Figure 8-44 Check the power of the photovoltaic inverter

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

Meter Type	Solution
BB, BB Plus	Please refer to the relative system wiring diagram to check the

	wiring. If the error persists, contact AlphaESS customer service for further check.
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.
CT Only	Check the location, direction and cable connection of the grid CT.
P1 meter reader	Check the connection and installation configuration of the P1 meter reader.

7. If there are PV modules connected directly to the energy storage inverter, switch on the PV switch of the energy storage inverter.
8. 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.

NOTICE

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.

9. Congratulations! All required checks of system wiring and meter installation have been completed.

8.10. Meter Setting

8.10.1. Meter Setting on Alpha Cloud

Step 1:

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

When the system work mode is selected as “AC” or “Hybrid”, click the sliders under the items “Grid Meter” and “PV side meter” to turn the “Meter” icons orange.

Step 2:

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

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

> **CAUTION**
>
> Do not modify the “Meter CT Ratio”.

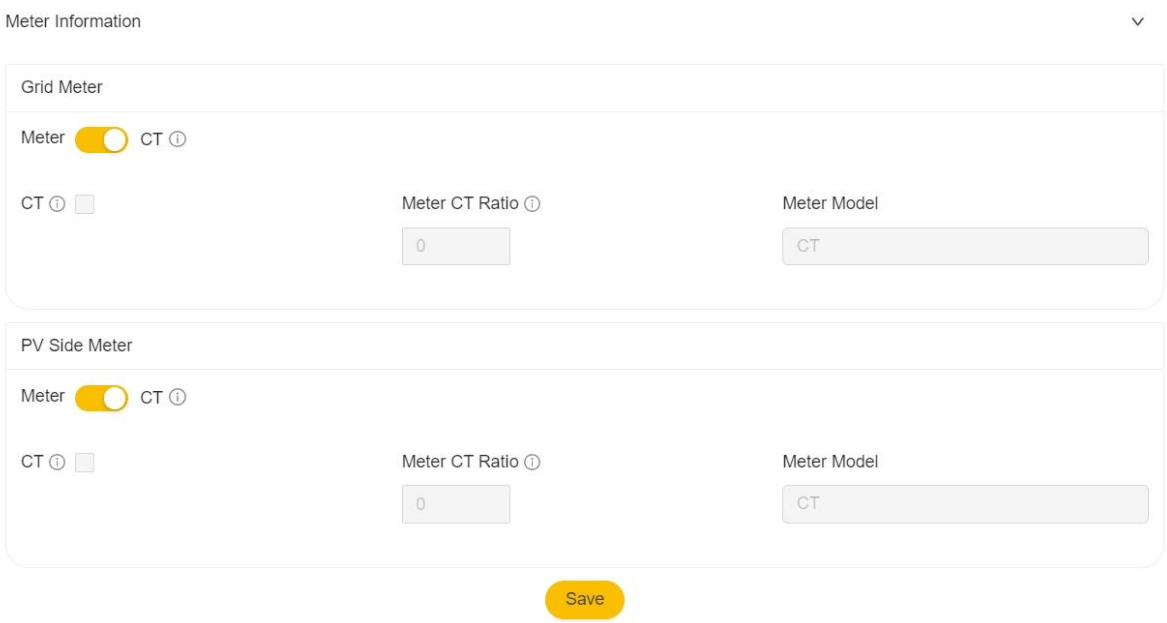


Figure 8-45 Electricity meter Settings in AlphaCloud

8.10.2. Meter Setting on the AlphaESS App

Step 1:

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

When the system work mode is selected as “AC” or “Hybrid”, tick the two "Meter" icons on the right of the “Grid Meter” and the “PV Meter”.

Step 2:

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

> **CAUTION**
>
> Do not modify the “CT” ratio.

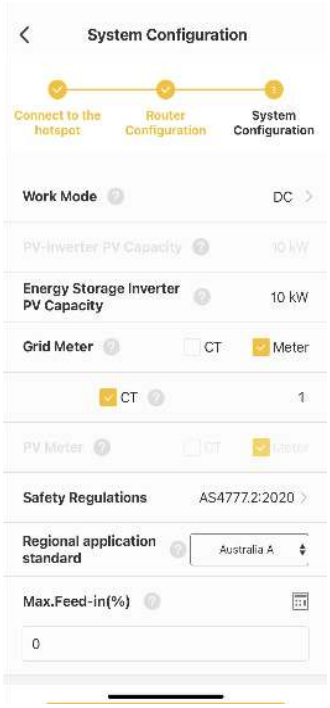


Figure 8-46 Electricity meter Settings in Alpha ESS App

8.11.P1 Meter Setting

Note: Versions 6.4.3 and above of the AlphaESS APP support P1 Meter.

Step 1:

Open the AlphaESS App → Enter the installation system → Check the installation configuration.

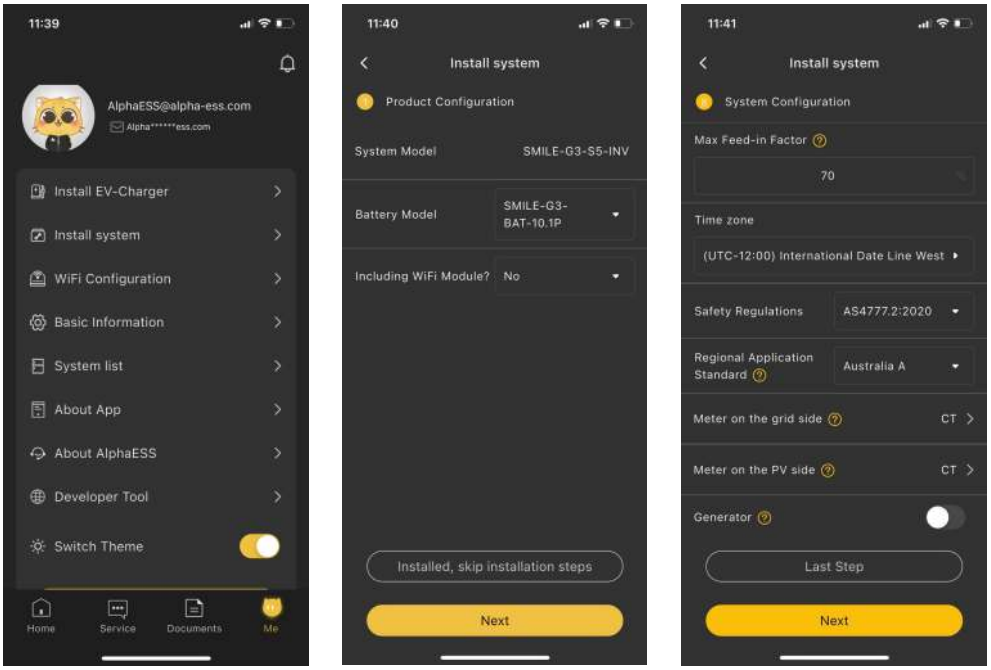


Figure 8-47 Check the installation configuration

Step 2:

Select the "P1 Meter" type in the grid-side electricity meter.

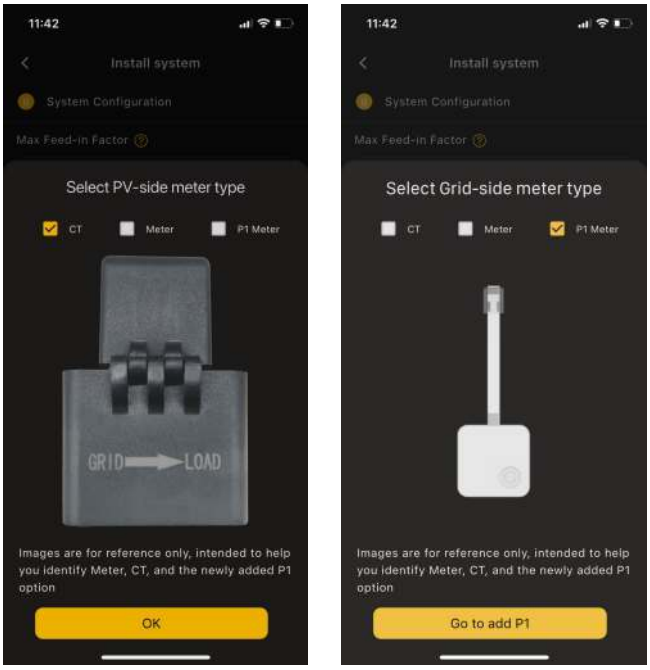


Figure 8-48 Select "P1 Meter"

Step 3:

Proceed to add, and select the addition method:

Method 1: Scan the QR code on the P1 Reader.

Method 2: Search for nearby P1 Reader via Bluetooth.

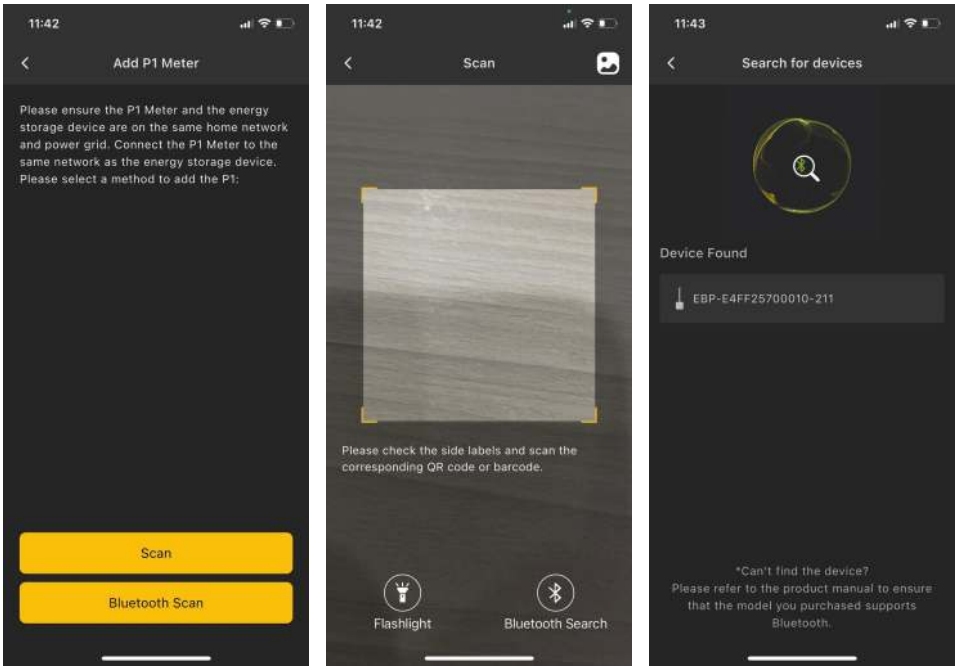


Figure 8–49 Add "P1 Meter"

Step 4:

Input pairing code.

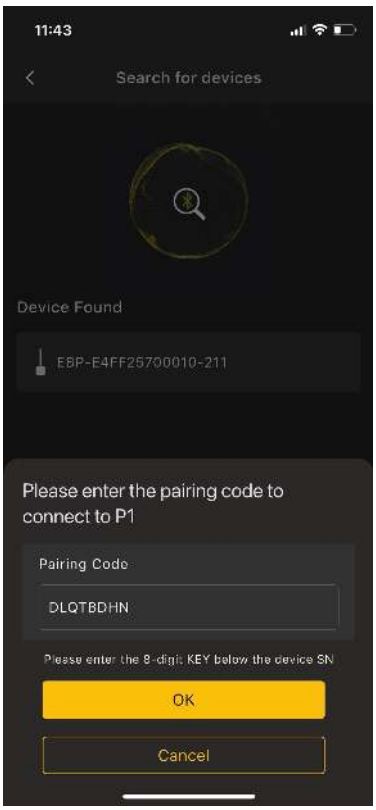


Figure 8–50 Input pairing code

Step 5:

Connect to Wi-Fi, then manually select the Wi-Fi name and enter the password.

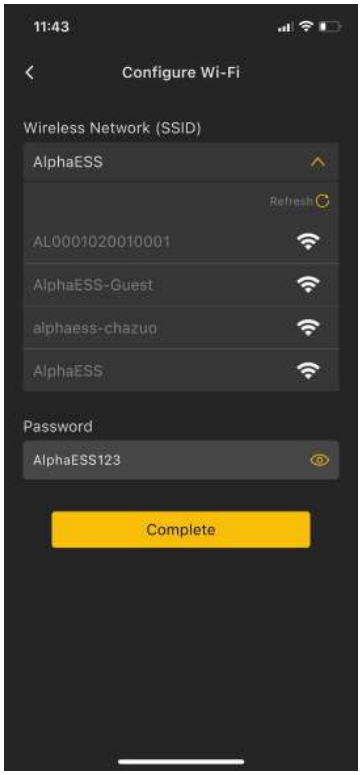


Figure 8-51 Connect to Wi-Fi

Step 6:

Click "Finish" and wait for the App to prompt "P1 has been successfully launched".

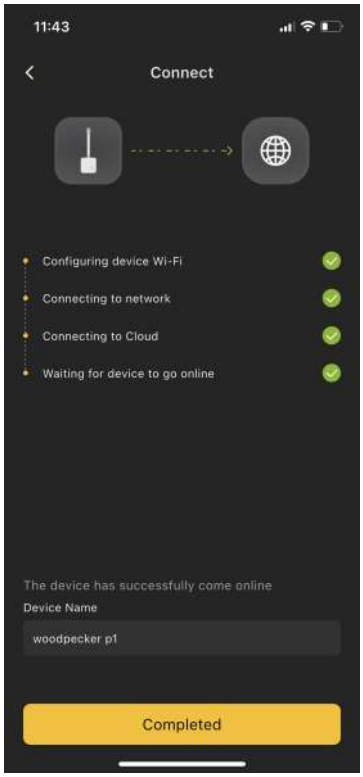


Figure 8–52 Connection Completion Diagram

Step 7:

Return to the configuration page, confirm that the P1 information is displayed (electric meter name, serial number, grid data), and complete the P1 configuration.

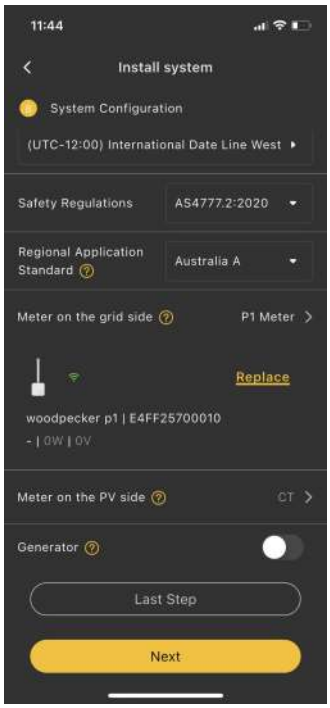


Figure 8–53 Confirm that the P1 information has been displayed

9. Maintenance and Troubleshooting

9.1. Routine Maintenance

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

However, in order to maintain the accuracy of the SOC, it is recommended to perform a full charge calibration for SOC (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:

1) During normal system operation, they indicate the SOC operation status of the batteries connected in this energy storage system.

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
SYS red light is flashing fast.	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 check.
	100001		Grid_UVP	1. Check whether the PV input voltage of PV1, PV2 and PV3 exceeds 1100V. If there

SYS red light is flashing fast	100002		Grid_OFP	is no PV input overvoltage, restart the inverter. If the error persists, contact customer service for further check.
	100003		Grid_UFP	1. Check whether the PV input voltage of PV1, PV2 and PV3 exceeds 1100V. 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	
	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.
	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.

SYS red light is flashing fast.	100043		Output_ overload	1. 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	

Accessories Error Troubleshooting

LED Indicator	Error Code	LED Display	Description	Troubleshooting
SYS red light is on, METER light is flashing fast.	39		EV Charger Lost	EV Charger lost 1. Check whether the EV communication connection between the EV charger and the inverter is normal. 2. Check whether the batteries are switched on. If the error persists, contact customer service for further check.
	200000		Relay OTP	1. Unplug the charging connector of the EV charger, and wait for about 10 minutes before plugging it back in. If the error persists, contact customer service for further check.
	200001		Output overload	1. Check whether the load exceeds the rated power. 2. Restart the inverter. If the error persists, contact customer service for further check.
	200010		AC leakage current	1. Unplug the charging connector of the EV charger, and wait for about 10 minutes before plugging it back in. If the error persists, contact customer service for further check.

SYS red light is on, METER light is flashing fast.	200011		Input terminal OTP	1. Unplug the charging connector of the EV charger, and wait for about 10 minutes before plugging it back in. If the error persists, contact customer service for further check.
	200014		Relay abnormal	1. The EV charger has a hardware failure and need to be replaced, please contact customer service.
	200015		Ground fault	1. Check whether the grounding method is correct. If there is no grounding or the grounding method is wrong, please follow the correct grounding method.
	200016		Reverse phase	1. Shut off the leakage current protection switch of the power distribution cabinet immediately. 2. Check whether the AC input/output cable connection is normal, and verify whether there is an inverse connection of L/N input cables.

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

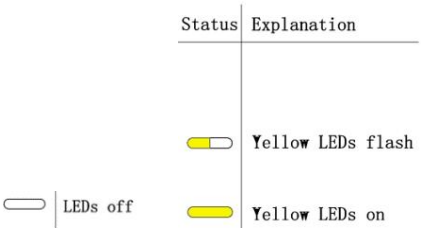
During work mode, if the protection status “Cell under voltage”

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 3~5s, switch off the circuit breaker, then switch on the circuit breaker and wait for 3~5s, 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.



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 LEDs off	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 for electrical equipment and electronic waste.
- Dispose of the packaging and replaced parts according to the rules at the installation site where the device is installed.
- Do not dispose the product with regular household waste.


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11. Technical Data

11.1. Datasheet of Inverter (SMILE-G3 Three Phase Inverter)

Item	SMILE-G3-T4-INV	SMILE-G3-T5-INV	SMILE-G3-T6-INV
Input DC (PV Side)			
Recommended Max. PV Power	8000 W	10000W	12000 W
Max. PV Input Voltage	1100 V		
Rated Voltage	720 V		
Start-up Voltage	85 V		
MPPT Voltage Range	140 to 950 V		
Max. Input Current per MPPT	18 A / 18 A / 18 A		
Max. Short Circuit Current per MPPT	27 A / 27 A / 27 A		
MPPT Number	3		
Back feed current	24 A		
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		
Nominal Battery voltage	360V		
Max. Charge Power	4 kW	5 kW	6 kW
Max. Discharge Power	4 kW	5 kW	6 kW
Max. Charge/ Discharge Current	50 A / 50 A		
Communication	CAN		
Back feed current	60 A		
Output AC (Back-up, On Grid)			
Rated Output Power	4 kW	5 kW	6 kW

Rated Apparent Output Power	4 kVA	5 kVA	6 kVA
Rated Output Current	5.8 A	7.2 A	8.7 A
Max. Continuous Output Power	4 kW	5 kW	6 kW
Max. Continuous Output Apparent Power	4 kVA	5 kVA	6 kVA
Max. Output Current	5.8 A	7.2 A	8.7 A
MAX.Fault Current	34 A rms		
THDV(@linear load)	< 3%		
DVC	DVC–C		
Back feed current	37A		
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c		
Rated Frequency	50 / 60 Hz		
Output AC (Back–up, Off Grid)			
Rated Output Power	4 kW	5 kW	6 kW
Rated Apparent Output Power	4 kVA	5 kVA	6 kVA
Rated Output Current	5.8 A	7.2 A	8.7 A
Max. Continuous Output Power	4 kW	5 kW	6 kW
Max. Continuous Output Apparent Power	4 kVA	5 kW	6 kVA
Max. Output Power ⩽ 30s	6 kW	7.5 kW	9 kW
Max. Output Apparent Power ⩽ 30s	6 kVA	7.5 kVA	9 kVA
Max. Output Power ⩽ 1s	8 kW	10 kW	12 kW
Max. Output Apparent Power ⩽ 1s	8 kVA	10 kVA	12 kVA
Back–up Switch Time	<10 ms		
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c		

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	8 kW	10 kW	12 kW
Inrush Current	35 A	35 A	35 A
Max. Input Current	12.1 A	15.2 A	18.2 A
Output AC (Grid Side)			
Rated Output Power	4 kW	5 kW	6 kW
MAX. Apparent Output Power	4 kVA	5 kVA	6 kVA
Rating Grid Output Current	5.8 A	7.2 A	8.7 A
Operation Phase	Three-phase		
Rated Grid Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c		
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		
Pollution Degree	II		
Overvoltage Category	III		
Surge Category in Accordance with IEC 60664-1	II		
DVC	DVC-C		
Anti-islanding protection Method	Frequency shift		
Efficiency			
Max. Efficiency, η_{max}	97.8%	97.8%	97.8%
European Weighted Efficiency, η_{EU}	97.0%	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*D*H)	590*205*416 mm
Weight	27.5 kg
Topology	Transformerless
Operation Temperature Range	–25 to +60 ˚C
Max. Permissible Value for Relative Humidity (Condensing)	100%
Ingress Protection	IP65
Display	LED
Noise Emission	<35 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	
Grid Connection Standard	G98, VDE-AR-N 4105, EN 50549-10, VDE 0126, CEI 0-21, C10/11, TOR Erzeuger, MEA, PEA, AS/NZS 4777.2	
Safety/ EMC Standard	IEC62109-1/-2 IEC/EN61000-6-1/2/3/4	
Warranty	10 Years Product Warranty	
Item	**SMILE-G3-T8-INV**	**SMILE-G3-T10-INV**
Input DC (PV Side)		
Recommended Max. PV Power	16000 W	20000W
Max. PV Input Voltage	1100 V	
Rated Voltage	720 V	
Start-up Voltage	85 V	
MPPT Voltage Range	140 to 950 V	
Max. Input Current per MPPT	18 A / 18 A / 18 A	
Max. Short Circuit Current per MPPT	27 A / 27 A / 27 A	
MPPT Number	3	
Back feed current	24 A	
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	
Nominal Battery voltage	360V	
Max. Charge Power	8 kW	10 kW
Max. Discharge Power	8 kW	10 kW
Max. Charge/ Discharge Current	50 A / 50 A	
Communication	CAN	
Back feed current	60 A	

Output AC (Back-up, On Grid)		
Rated Output Power	8 kW	10 kW
Rated Apparent Output Power	8 kVA	10 kVA
Rated Output Current	11.6 A	14.5 A
Max. Continuous Output Power	8 kW	10 kW
Max. Continuous Output Apparent Power	8 kVA	10 kVA
Max. Output Current	11.6 A	14.5 A
MAX.Fault Current	34 A rms	
THDV(@linear load)	< 3%	
DVC	DVC-C	
Back feed current	37A	
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
Rated Frequency	50 / 60 Hz	
Output AC (Back-up, Off Grid)		
Rated Output Power	8 kW	10 kW
Rated Apparent Output Power	8 kVA	10 kVA
Rated Output Current	11.6 A	14.5 A
Max. Continuous Output Power	8 kW	10 kW
Max. Continuous Output Apparent Power	8kVA	10 kW
Max. Output Power ⩽ 30s	12 kW	15 kW
Max. Output Apparent Power ⩽ 30s	12 kVA	15 kVA
Max. Output Power ⩽ 1s	15 kW	15 kW
Max. Output Apparent Power ⩽ 1s	15 kVA	15 kVA
Back-up Switch Time	<10 ms	
Rated Output	3/N/PE, 220 / 380, 230 / 400 Va.c	

Voltage		
Rated Frequency	50 / 60 Hz	
Input AC (Grid Side)		
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
Rated Frequency	50 / 60 Hz	
Max. Input Power	16 kW	20 kW
Inrush Current	35 A	35 A
Max. Input Current	24.2 A	29 A
Output AC (Grid Side)		
Rated Output Power	8 kW	10 kW
Rated Apparent Output Power	8 kVA	10 kVA
Rating Grid Output Current	11.6 A	14.5 A
Operation Phase	Three-phase	
Rated Grid Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
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	
Pollution Degree	II	
Overvoltage Category	III	
Surge Category in Accordance with IEC 60664-1	II	
DVC	DVC-C	
Anti-islanding protection Method	Frequency shift	
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*D*H)	590*205*416 mm
Weight	27.5 kg
Topology	Transformerless
Operation Temperature Range	-25 to +60 ˚C
Max. Permissible Value for Relative Humidity (Condensing)	100%
Ingress Protection	IP65
Display	LED
Noise Emission	<35 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
Grid Connection Standard	G98, VDE-AR-N 4105, EN 50549-10, VDE 0126, CEI 0-21, C10/11, TOR Erzeuger, MEA, PEA, AS/NZS 4777.2
Safety/ EMC Standard	IEC62109-1/-2 IEC/EN61000-6-1/2/3/4
Warranty	10 Years Product Warranty

Item	SMILE-G3-T12-INV	SMILE-G3-T15-INV
Input DC (PV Side)		
Recommended Max. PV Power	24000 W	30000W
Max. PV Input Voltage	1100 V	
Rated Voltage	720 V	
Start-up Voltage	85 V	
MPPT Voltage Range	140 to 950 V	
Max. Input Current per MPPT	18 A / 18 A/ 18 A	
Max. Short Circuit Current per MPPT	27 A / 27 A / 27 A	
MPPT Number	3	
Max. Input Strings Number per MPPT	1	
Surge Category in Accordance with IEC 62109-1	III	
Back feed current	24A	
Battery		
Battery Type	LFP ($LiFePO_4$)	
Battery Voltage Range	90 to 700 V	
Nominal Battery voltage	360V	
DVC	DVC-B&C	
Max. Charge Power	12 kW	15 kW
Max. Discharge Power	12 kW	15 kW
Max. Charge/	50 A / 50 A	

Discharge Current		
Communication	CAN	
Output AC (Back-up, On Grid)		
Rated Output Power	12 kW	15 kW
Rated Apparent Output Power	12 kVA	15 kVA
Rated Output Current	17.4 A	21.7 A
Max. Continuous Output Power	12 kW	15 kW
Max. Continuous Output Apparent Power	12 kVA	15.75 kVA
Max. Output Current	17.4 A	22.8 A
Max fault current	34 A rms	
THDV(@linear load)	< 3%	
DVC	DVC-C	
Back feed current	37 A	
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
Rated Frequency	50 / 60 Hz	
Output AC (Back-up, Off Grid)		
Rated Output Power	12 kW	15 kW
Rated Apparent Output Power	12 kVA	15 kVA
Rated Output Current	17.4 A	21.7 A
Max. Continuous Output Power	12 kW	15 kW
Max. Continuous Output Apparent Power	12 kVA	15 kW
Max. Output Power ⩽ 30s	15.75 kW	15.75 kW
Max. Output Apparent Power ⩽ 30s	15.75 kVA	15.75 kVA
Max. Output Power ⩽ 1s	20 kW	20 kW
Max. Output Apparent Power ⩽ 1s	20 kVA	20 kVA

Back-up Switch Time	<10 ms	
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
Rated Frequency	50 / 60 Hz	
Input AC (Grid Side)		
Rated Output Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
Rated Frequency	50 / 60 Hz	
Max. Input Power	20 kW	20 kW
Inrush current	35 A	35 A
Max. Input Current	29 A	29 A
Output AC (Grid Side)		
Rated Output Power	12 kW	15 kW
Rated Apparent Output Power	12 kVA	15 kVA
Rating Grid Output Current	17.4 A	21.7 A
Operation Phase	Three-phase	
Rated Grid Voltage	3/N/PE, 220 / 380, 230 / 400 Va.c	
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	
Pollution Degree	II	
DVC	DVC-C	
Anti-islanding protection Method	Frequency shift	
Surge Category in Accordance with IEC 60664-1	II	
Efficiency		
Max. Efficiency, η_{max}	97.8%	97.8%
European Weighted	97.0%	97.0%

Efficiency, η_{EU}		
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*D*H)	590*205*416 mm	
Weight	27.5 kg	28 kg
Topology	Transformerless	
Operation Temperature Range	–25 to +60 ˚C	
Max. Permissible Value for Relative Humidity (Condensing)	100%	
Ingress Protection	IP65	
Display	LED	
Noise Emission	<45 dB(A) @1m	
Cooling Concept	Natural convection	Smart Fan cooling
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
Grid Connection Standard	G98, VDE–AR–N 4105, EN 50549–10, VDE 0126, CEI 0–21, C10/11, TOR Erzeuger, MEA, PEA, AS/NZS 4777.2
Safety/ EMC Standard	IEC62109–1/–2 IEC/EN61000–6–1/2/3/4
Warranty	10 Years Product Warranty

11.2. Datasheet of Battery

11.2.1. Datasheet of Battery SMILE-G3-BAT-3.8S

Model	SMILE-G3-BAT-3.8S
Battery type	LFP (LiFePO4)
Rated capacity	38 Ah
Weight	38.5 kg
Dimension (W*D*H)	610*212*435 mm
Ingress protection	IP21
Installed energy	3.84 kWh
Usable energy	3.65 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 to 105.6 V
Max. continuous charge current*	40 A
Max. continuous discharge current*	40 A
Operating temperature range	Charge：0＜T≤50 ℃ Discharge：-10＜T≤50 ℃
Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS communication	CAN

System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

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

11.2.2. Datasheet of Battery SMILE-G3-BAT-4.5S

Model	SMILE-G3-BAT-4.5S
Battery type	LFP (LiFePO4)
Rated capacity	47.5 Ah
Weight	53 kg
Dimensions (W*D*H)	610*212*435 mm
Ingress protection	IP65
Installed energy	4.8 kWh
Usable energy	4.56 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 ~ 105.6 V
Max. charge current*	50 A
Max. discharge current*	50 A
Operating temperature range	Charge: −20 ⩽ T ⩽ 50 ˚C Discharge: −20 ⩽ T ⩽ 50 ˚C

Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

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

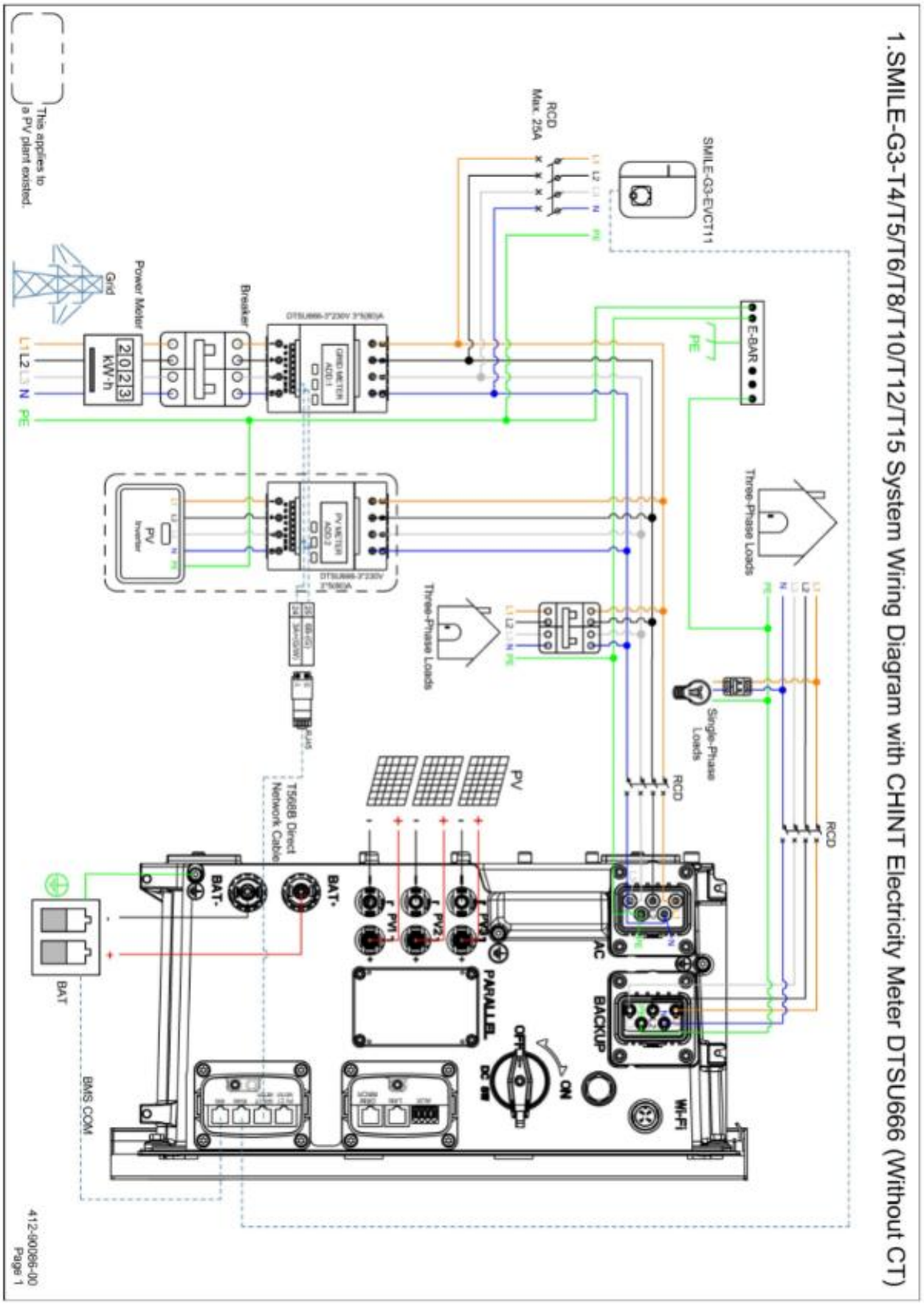
11.2.3. Datasheet of Battery SMILE-G3-BAT-9.3S

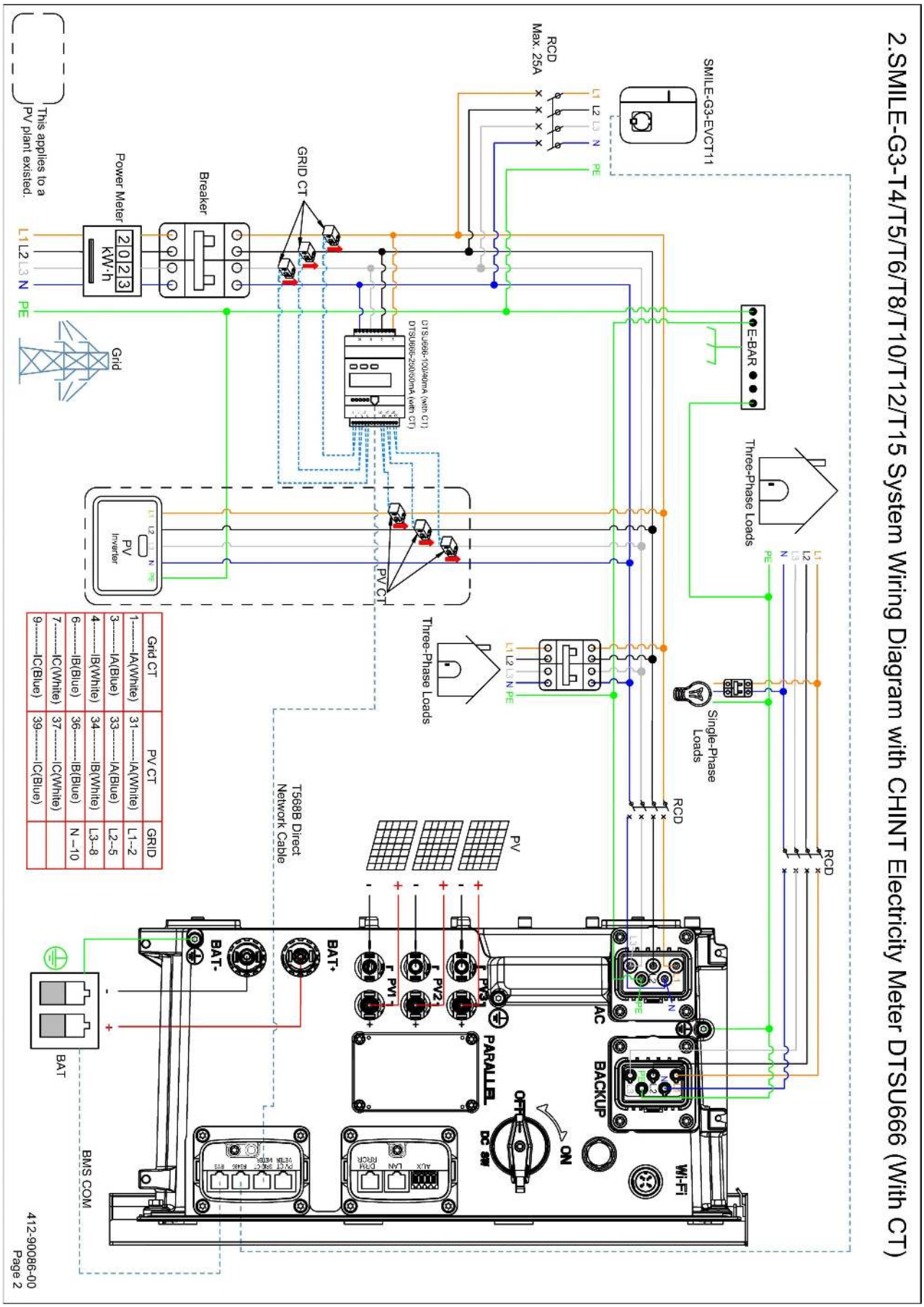
Model	SMILE-G3-BAT-9.3S
Battery type	LFP (LiFePO4)
Rated capacity	95 Ah
Weight	81 kg
Dimensions (W*D*H)	610*212*634 mm
Ingress protection	IP65
Installed energy	9.6 kWh
Usable energy	9.3 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 ~ 105.6 V
Max. charge current*	52.5 A
Max. discharge current*	52.5 A

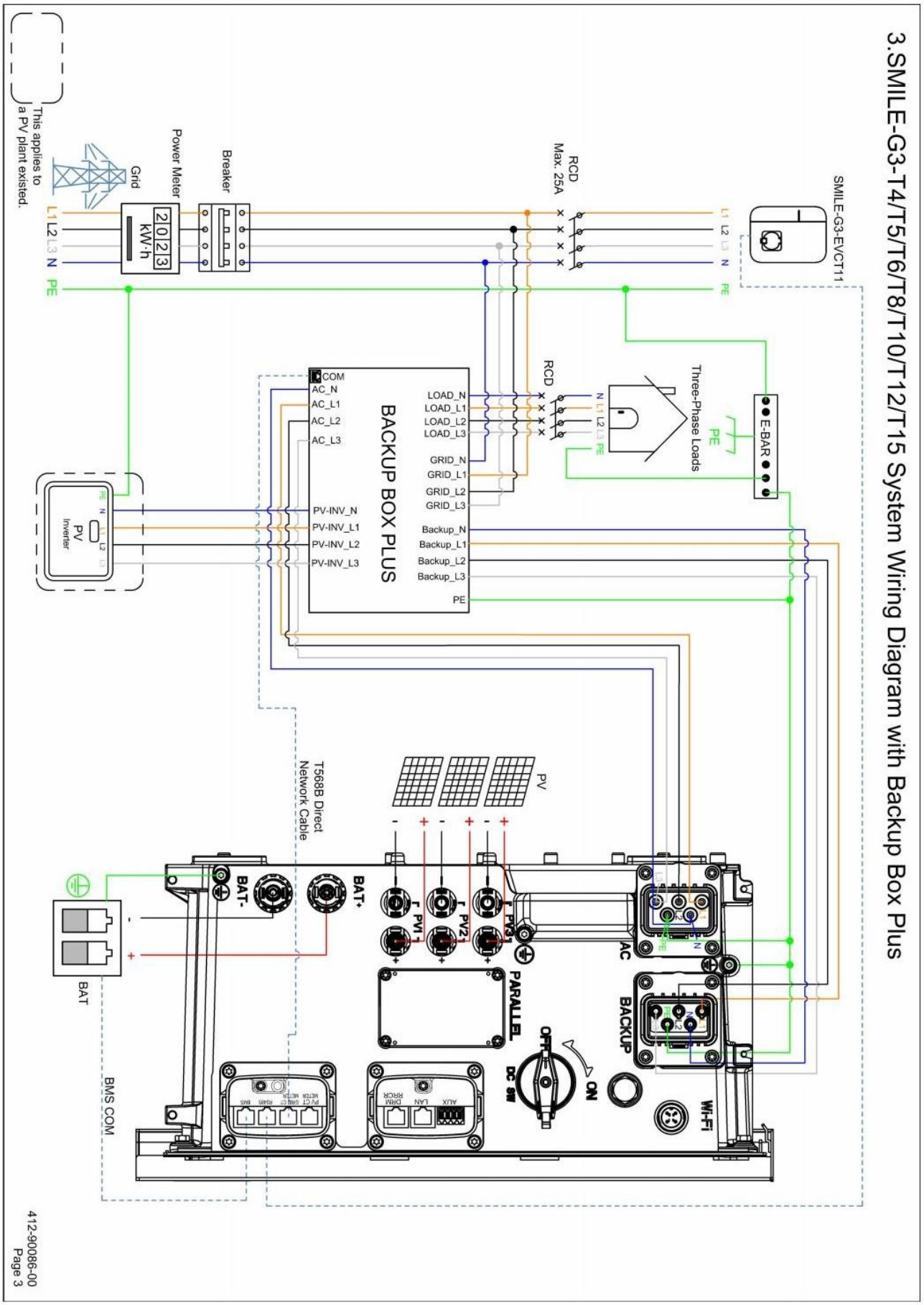
Operating temperature range	Charge: –20 ⩽ T ⩽ 50 ˚C Discharge: –20 ⩽ T ⩽ 50 ˚C
Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

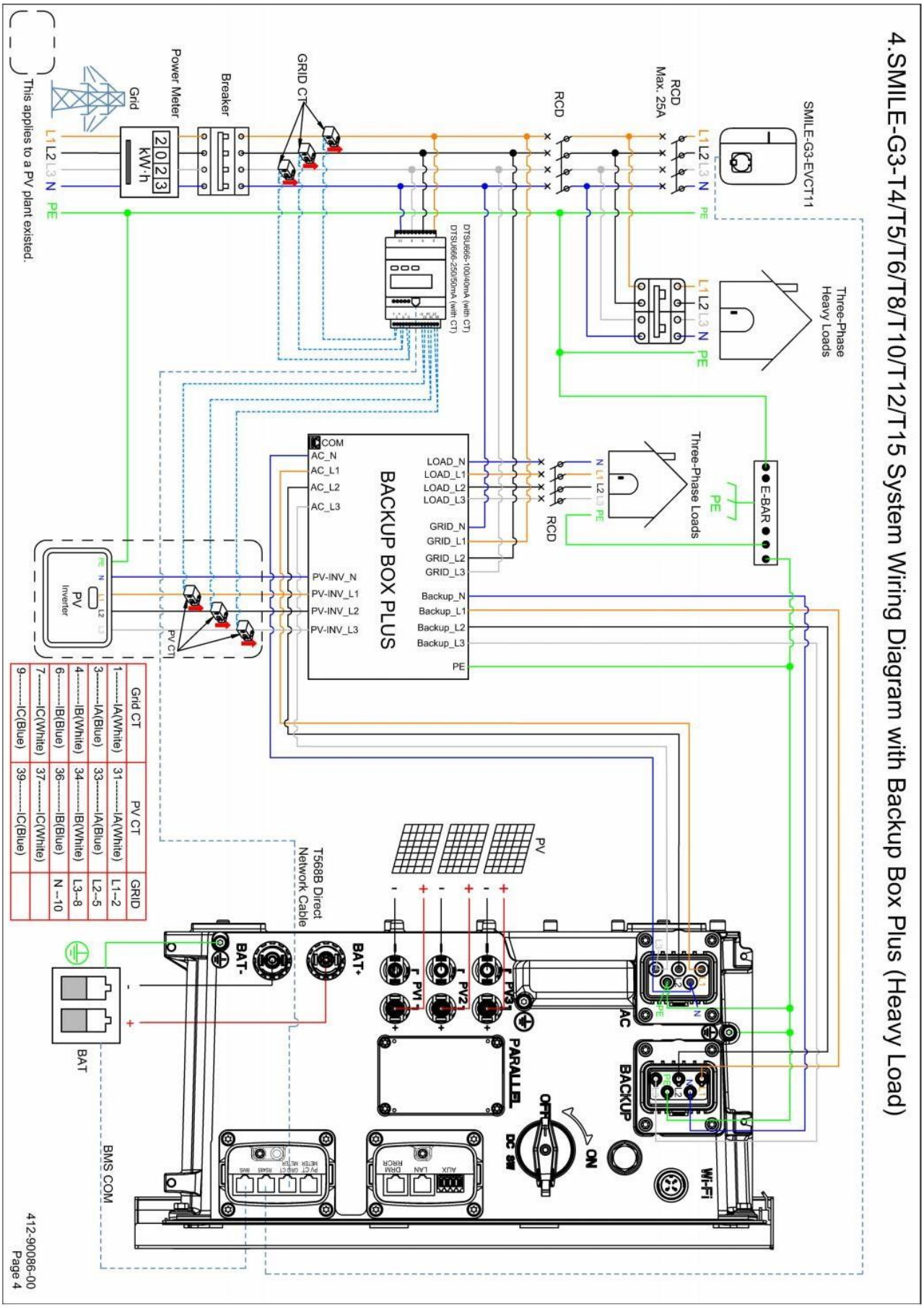
* Max. charge/discharge current derating may occur with changes in temperature and SOC.

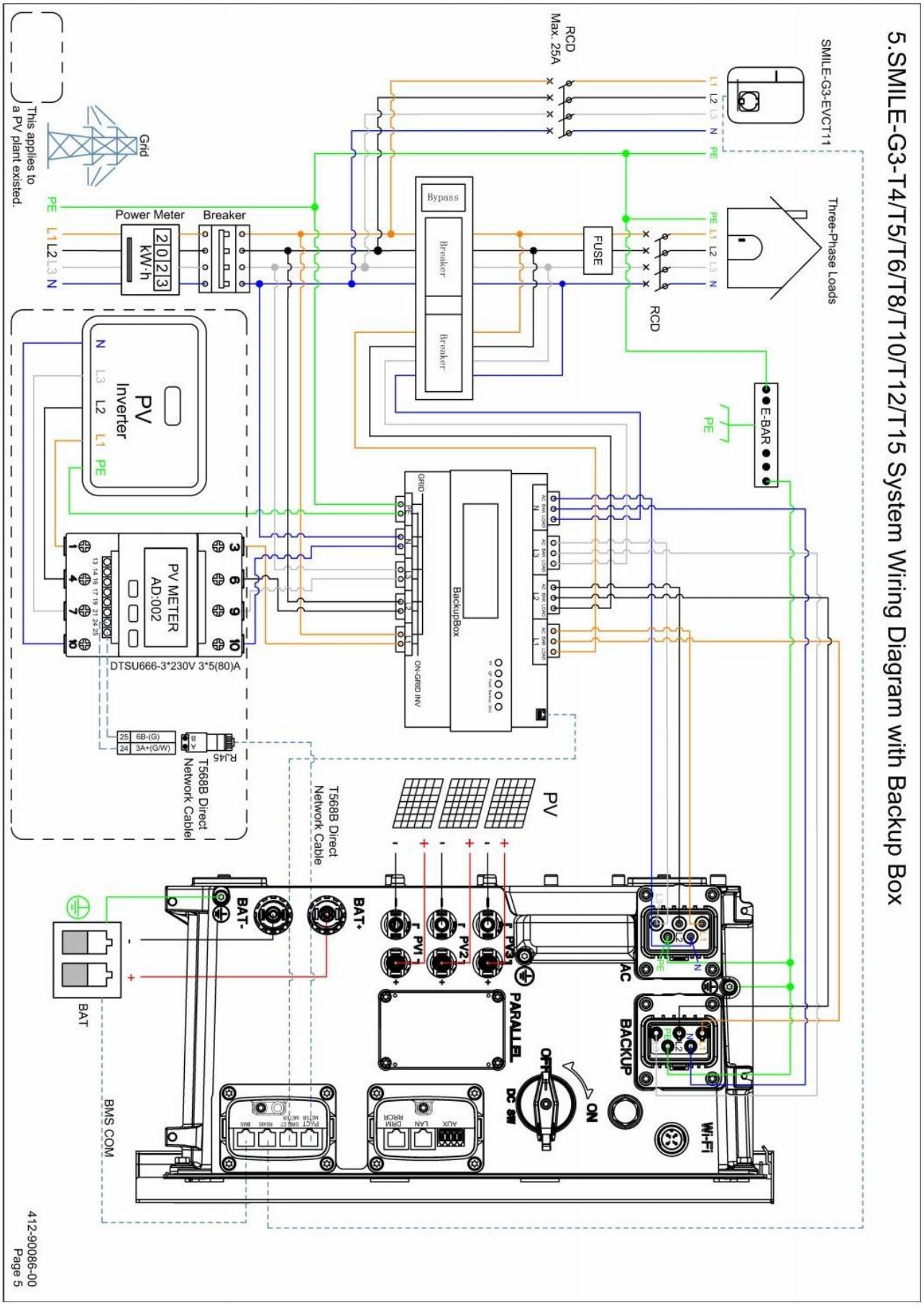
Appendix1:System Wiring Diagram

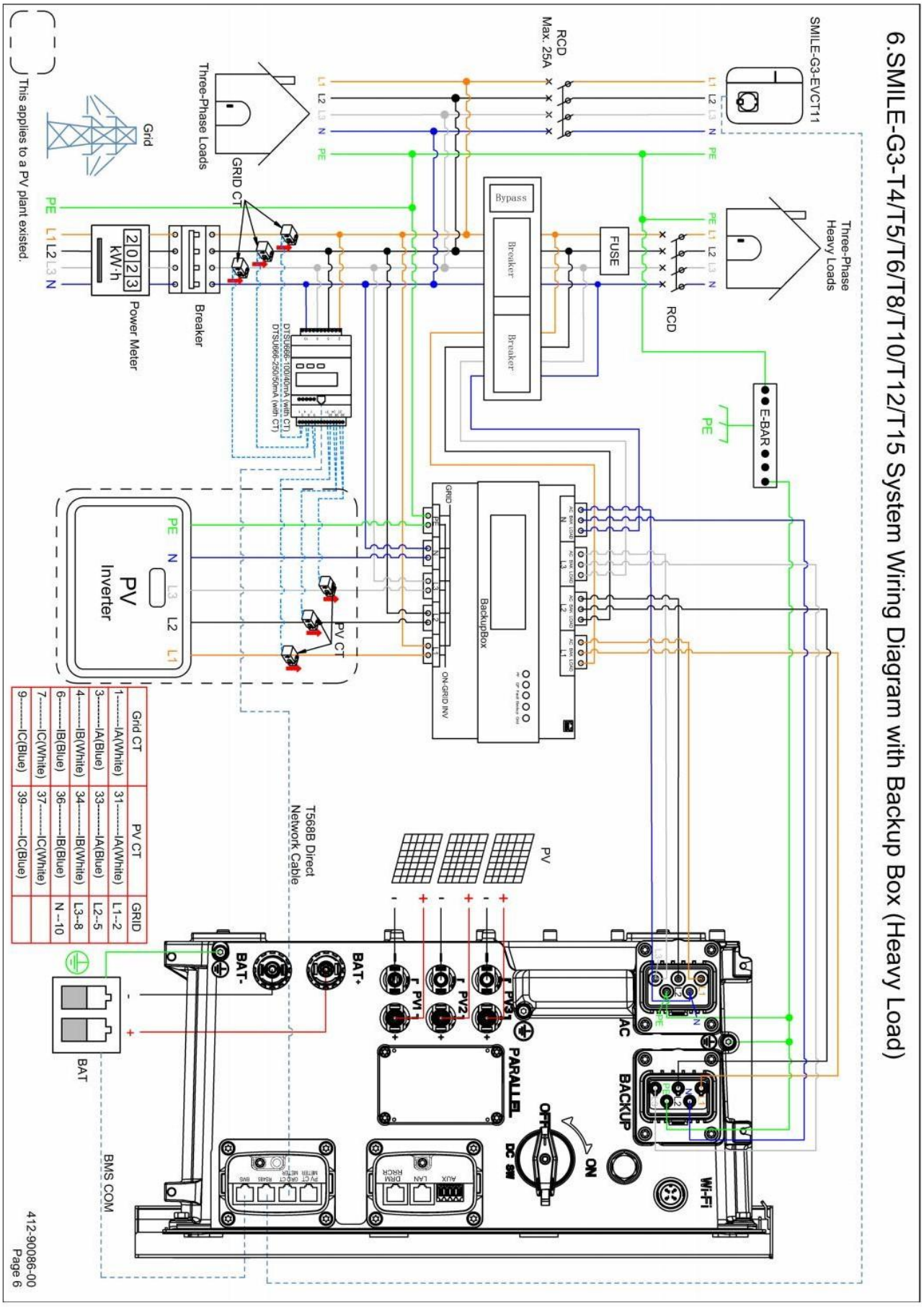

1.SMILE-G3-T4/T5/T6/T8/T10/T12/T15 System Wiring Diagram with CHINT Electricity Meter DTSU666 (Without CT)
This applies to a PV plant existed.
Grid
Power Meter
Breaker
RCD
Max. 25A
SMILE-G3-EVCT11
E-BAR
Three-Phase Loads
Single-Phase Loads
PV
PV Inverter
RS485
T568B Direct Network Cable
BAT
BAT+
BAT-
PV1
PV2
PV3
PARALLEL
AC
BACKUP
OFF
ON
Wi-Fi
BMS COM
412-00086-00
Page 1

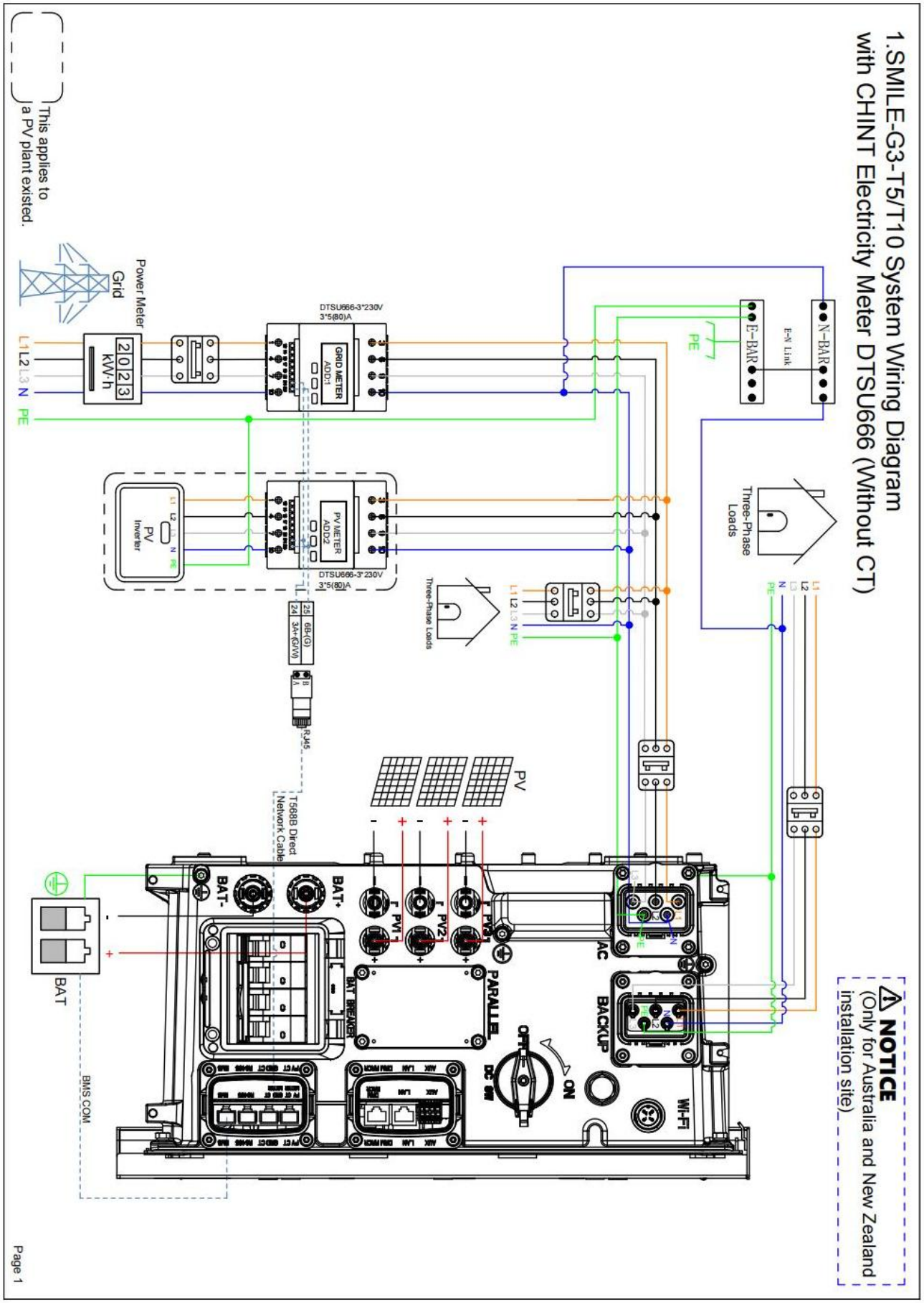

2.SMILE-G3-T4/T5/T6/T8/T10/T12/T15 System Wiring Diagram with CHINT Electricity Meter DTSU666 (With CT)
SMILE-G3-EVCT11
RCD
Max. 25A
L1 L2 L3 N PE
GRID CT
Power Meter
Breaker
This applies to a PV plant existed.
Grid
DTSU666-100/40mA (with CT)
DTSU666-250/50mA (with CT)
E-BAR
Three-Phase Loads
PV Inverter
PV CT
Single-Phase Loads
RCD
T568B Direct Network Cable
PV
BAT-
BAT+
PV1
PV2
PV3
AC
PARALLEL
BACKUP
OFF
ON
DC SW
Wi-Fi
BAT
BMS COM
Grid CT
1--------IA(White)
3--------IA(Blue)
4--------IB(White)
6--------IB(Blue)
7--------IC(White)
9--------IC(Blue)
PV CT
31--------IA(White)
33--------IA(Blue)
34--------IB(White)
36--------IB(Blue)
37--------IC(White)
39--------IC(Blue)
GRID
L1--2
L2--5
L3--8
N --10
412-90086-00
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3.SMILE-G3-T4/T5/T6/T8/T10/T12/T15 System Wiring Diagram with Backup Box Plus
This applies to a PV plant existed.
Grid
Power Meter
Breaker
RCD Max. 25A
SMILE-G3-EVCT11
L1 L2 L3 N PE
RCD
Three-Phase Loads
E-BAR
COM
AC_N
AC_L1
AC_L2
AC_L3
BACKUP BOX PLUS
LOAD_N
LOAD_L1
LOAD_L2
LOAD_L3
GRID_N
GRID_L1
GRID_L2
GRID_L3
Backup_N
Backup_L1
Backup_L2
Backup_L3
PE
PV-INV_N
PV-INV_L1
PV-INV_L2
PV-INV_L3
PV Inverter
T568B Direct Network Cable
PV
BAT-
BAT+
PV1
PV2
PV3
PARALLEL
AC
BACKUP
OFF
ON
DC SW
Wi-Fi
BAT
BMS COM
412-90086-00
Page 3


4.SMILE-G3-T4/T5/T6/T8/T10/T12/T15 System Wiring Diagram with Backup Box Plus (Heavy Load)
This applies to a PV plant existed.
Grid
Power Meter
Breaker
GRID CT
RCD
RCD Max. 25A
SMILE-G3-EVCT11
Three-Phase Heavy Loads
Three-Phase Loads
E-BAR
DTSU666-100/40mA (with CT)
DTSU666-250/50mA (with CT)
BACKUP BOX PLUS
COM
AC_N
AC_L1
AC_L2
AC_L3
LOAD_N
LOAD_L1
LOAD_L2
LOAD_L3
GRID_N
GRID_L1
GRID_L2
GRID_L3
PV-INV_N
PV-INV_L1
PV-INV_L2
PV-INV_L3
Backup_N
Backup_L1
Backup_L2
Backup_L3
PE
PV Inverter
PV CT
PV
T568B Direct Network Cable
BAT-
BAT+
PV1
PV2
PV3
AC
BACKUP
PARALLEL
OFF
ON
DC SW
Wi-Fi
BAT
BMS COM
Grid CT
1--------IA(White)
3--------IA(Blue)
4--------IB(White)
6--------IB(Blue)
7--------IC(White)
9--------IC(Blue)
PV CT
31--------IA(White)
33--------IA(Blue)
34--------IB(White)
36--------IB(Blue)
37--------IC(White)
39--------IC(Blue)
GRID
L1--2
L2--5
L3--8
N --10
412-90086-00
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5.SMILE-G3-T4/T5/T6/T8/T10/T12/T15 System Wiring Diagram with Backup Box
SMILE-G3-EVCT11
RCD
Max. 25A
Three-Phase Loads
Grid
This applies to a PV plant existed.
Power Meter
Breaker
Bypass
Breaker
Breaker
FUSE
RCD
E-BAR
PV Inverter
PV METER AD-002
DTSU666-3*230V 3*5(80)A
BackupBox
ON-GRID INV
T568B Direct Network Cable
PV
BAT-
BAT+
PV1
PV2
PV3
PARALLEL
AC
BACKUP
OFF
ON
DC SW
Wi-Fi
BAT
BMS COM
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6.SMILE-G3-T4/T5/T6/T8/T10/T12/T15 System Wiring Diagram with Backup Box (Heavy Load)
SMILE-G3-EVCT11
Three-Phase Heavy Loads
RCD Max. 25A
RCD
FUSE
Bypass
Breaker
Breaker
E-BAR
PE
Grid
Three-Phase Loads
GRID CT
Power Meter
Breaker
This applies to a PV plant existed.
DTSU666-100/40mA (with CT)
DTSU666-250/50mA (with CT)
PV Inverter
PV CT
BackupBox
ON-GRID INV
PV
T568B Direct Network Cable
BAT
BAT+
BAT-
PV1
PV2
PV3
PARALLEL
AC
BACKUP
OFF
ON
DC SW
Wi-Fi
BMS COM
AUX
LAN
DRM
RRCR
Grid CT
1--------IA(White)
3--------IA(Blue)
4--------IB(White)
6--------IB(Blue)
7--------IC(White)
9--------IC(Blue)
PV CT
31--------IA(White)
33--------IA(Blue)
34--------IB(White)
36--------IB(Blue)
37--------IC(White)
39--------IC(Blue)
GRID
L1--2
L2--5
L3--8
N --10
412-90086-00
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1.SMILE-G3-T5/T10 System Wiring Diagram
with CHINT Electricity Meter DTSU666 (Without CT)
This applies to a PV plant existed.
Power Meter
Grid
L1 L2 L3 N PE
DTSU666-3*230V 3*5(80)A
GRID METER ADD1
PV METER ADD2
PV Inverter
Three-Phase Loads
N-BAR
E-BAR
E-N Link
PE
RJ45
T568B Direct Network Cable
PV
BAT
BMS COM
BAT-
BAT+
PV1
PV2
PV3
BAT BREAKER
PARALLEL
AC
BACKUP
OFF
ON
DC SW
WI-FI
NOTICE
(Only for Australia and New Zealand installation site)
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Appendix 2: Regional Application Standard

Please check with your local grid company and choose the corresponding regional application standard, the power quality modes Volt–VAR and Volt–Watt will be running automatically. (Only for regions with AS/NZW 4777.2 safety standard)

Regional Application Standard	Electric Company
Australia A	N/A
Australia B	N/A
Australia C	N/A
New Zealand	N/A
Vector	New Zealand Vector

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