

INSTALLATION, OPERATION & MAINTENANCE MANUAL OF SMILE - G3 - S6 / S5 / S3.6 / B5





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1. Introduction

1.1. Content and Structure of this Document

This document is valid for the SMILE-G3 single phase energy storage system which includes inverter SMILE-G3-S6/S5/S3.6/B5-INV and battery SMILE-G3-BAT-8.2P/10.1P, and SMILE-G3-BAT-3.6S/3.8S/4.0S.

SMILE-G3-BAT-3.6S is only for Greece market.

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 these documents 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 persons. Only qualified persons are allowed to perform the operations marked with a warning symbol in this document.

Qualified persons must have:

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

8 Introduction

1.3. Levels of Warning Messages

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



DANGER indicates a hazardous situation that will result in death or serious injury if not avoided.



WARNING indicates a hazardous situation that could result in death or serious injury if not avoided.

A 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 which are valuable for the optimal installation and operation of the product.

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1.4. Definition of Abbreviations and Nouns

Α

AC alternating current

APP application

AUX auxiliary

В

BAT battery

BMS battery management system

D

DC direct current

Ε

EMS energy management system

I

INV inverter

Ρ

PV photovoltaic

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-S6/S5/S3.6/B5-INV, SMILE-G3-BAT-10.1P and SMILE-G3-BAT-3.6S/4.0S are suitable for indoor and outdoor installation.

SMILE-G3-BAT-8.2P and SMILE-G3-BAT-3.8S are only suitable for indoor installation.

The SMILE-G3-S6/S5/S3.6-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 must only be used if their coupling capacity does not exceed 1.0 μ F.

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. Battery Safety Instructions

2.2.1. General Safety Precautions

• Before installing any part of the SMILE G3, please read the Installation Manual completely. If additional hardware is being installed at the same time as the SMILE G3 unit (e.g. a Backup device or a separate AC-coupled PV system), please read the Installation Manual for each component/system before commencing installation of any hardware. The installation of one piece of hardware may create hazards for the installation of another piece of hardware – be sure to read all Manuals to understand the interaction and safety implications of the combined systems.

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

2.2.2. Response to Emergency Situations

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

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

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

- Firefighting instructions
- 1. If fire occurs when charging the battery, disconnect the battery circuit breaker to shut off the power to charge if it is safe to do so.
- 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.



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

- 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 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 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 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.

1 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 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. Reaching into 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.



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 a 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.



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.



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.



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.



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.



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		
<u> </u>	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.		
4	Beware of electrical voltage The product operates at high voltages.		
	Beware of hot surface The inverter can get hot during operation.		
5min.	Danger to life due to high voltages in the inverter; observe a waiting time of 5 minutes. High voltages that can cause lethal electric shocks are present in the live components of the inverter. 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.		
I	Observe the documentations Observe all documentations supplied with the product.		
CE	CE marking The product complies with the requirements of the applicable EU directives.		
TÜVRheinland CERTIFIED	Certified safety The product is TUV-tested and complies with the requirements of the EU Equipment and Product Safety Act.		
	RCM (Regulatory Compliance Mark) The product complies with the requirements of the applicable Australian standards.		
UK	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
<u>^</u>	Beware of a danger zone This symbol indicates that the battery must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of electrical voltage The product operates at high voltages.
	Corrosive substances warning The product contains corrosive substances that can cause severe injury if they come into direct contact with the skin.
	Potentially explosive substances warning Improper handling or fire can cause the product to ignite or explode.
	Warning of hazards from batteries This symbol indicates the danger of handling batteries.
I	Observe the documentations Observe all documentations supplied with the product.
	Refer to the instruction for operation Observe all documentations supplied with the product.
	Use eye protection Wear eye protection for all work on the device.
	No open flame Handling an open flame and sources of ignition is forbidden in the immediate vicinity of the product.
	Access is prohibited for all children Children must be kept at a safe distance from the product.
	Do not short circuit Touching the short-circuit connection of the battery results in death or lethal injuries 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 locally applicable disposal regulations for batteries.
CE	CE marking The product complies with the requirements of the applicable EU directives.
	RCM (Regulatory Compliance Mark) The product complies with the requirements of the applicable Australian standards.

UK	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

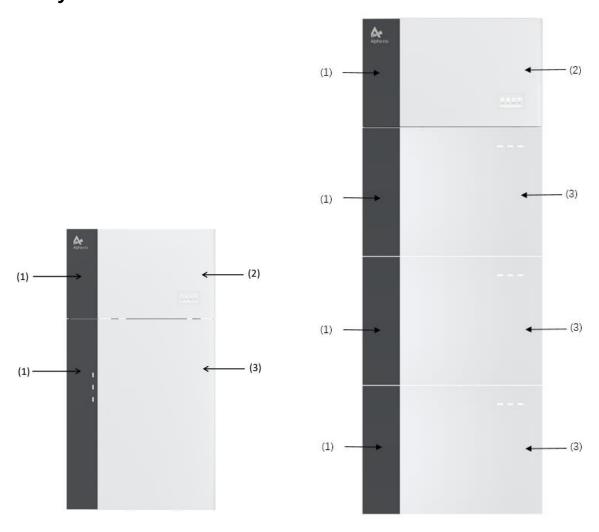
3.1. Naming Convention



Location	Name	Explanation	
1	SMILE	Residential energy storage system	
2	G3	Generation 3 for SMILE series	
		Prefix S = Solar Connections (i.e. Hybrid) Prefix B = Battery Only (i.e. AC-coupled)	
	S6	6kW Inverter with Solar Connections – single phase Hybrid energy storage system	
3	S5	5kW Inverter with Solar Connections – single phase Hybrid energy storage system	
	S3.6	3.6kW Inverter with Solar Connections –single phase Hybrid energy storage system	
	B5	5kW Battery-Only inverter – single-phase AC-coupled energy storage system	

Complete designation	Designation in this document
SMILE-G3-S6-INV,	Energy storage inverter
SMILE-G3-S5-INV,	Literary storage inverter
SMILE-G3-S3.6-INV,	
SMILE-G3-B5-INV	
SMILE-G3-BAT-8.2P,	Parallel batteries
SMILE-G3-BAT-10.1P	raiallel batteries
SMILE-G3-BAT-3.6S,	Series batteries
SMILE-G3-BAT-3.8S,	Series patteries
SMILE-G3-BAT-4.0S	
SMILE-G3-S6,	System/Energy storage system/BESS
SMILE-G3-S5,	System/Energy storage system/bcss
SMILE-G3-S3.6,	
SMILE-G3-B5	

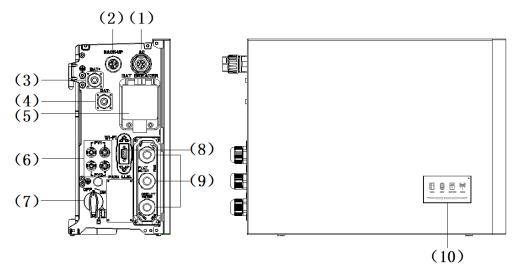
3.2. System Introduction



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-S6-INV, SMILE-G3-S5-INV, SMILE-G3-S3.6-INV, SMILE-G3-B5-INV	Energy storage inverter
3	SMILE-G3-BAT-8.2P SMILE-G3-BAT-10.1P SMILE-G3-BAT-3.6S SMILE-G3-BAT-3.8S SMILE-G3-BAT-4.0S	Battery

3.3. Product Description

3.3.1. Inverter Electrical Interface & Connections Introduction



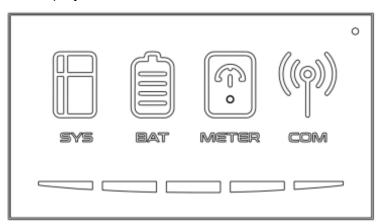
Position	Designation
1	Grid Connector (AC Supply)
2	Backup Connector
3	Battery Positive Cable Connector
4	Battery Negative Cable Connector
5	Battery Breaker of the Inverter
6	Positive and Negative PV Connectors, PV1/ PV2*
7	PV Switch*
8	Wi-Fi Port
9	Communication Ports (BMS, RS485, PV-CT, Meter&Grid-CT,
	DRM**&RRCR, LAN, AUX)
10	Inverter LED Display

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

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

3.3.2. Inverter Display Interface Introduction

LED Display



The upper four LED indicators and one reset button are provided on the display panel. These LED indicators provide information about the operation status of the system.

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

 LED Indicator
 SOC
 Description

 SOC
 SOC
 5% ≤ SOC < 20%</td>

 LEDs show the SOC of batteries
 20% ≤ SOC < 40%</td>

 40% ≤ SOC < 60%</td>
 60% ≤ SOC < 80%</td>

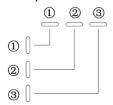
 80% ≤ SOC ≤ 100%
 80% ≤ SOC ≤ 100%

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

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 about the SOC of the battery with white lights on and off or flashing (0.5S on, 1.5S off).



Status Explanation	
	White LED is off.
#	White LED is flashing.
****	White LED is glowing.

LED Indicator	No.	SOC	Description
	1	# O	SOC≤10%
	2		10% <soc≤30%< td=""></soc≤30%<>
LEDs show the	3		30% <soc≤50%< td=""></soc≤50%<>
SOC status	4		50% <soc≤60%< td=""></soc≤60%<>
	5	****	60% <soc≤90%< td=""></soc≤90%<>
	6	****	90% <soc≤100%< td=""></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).

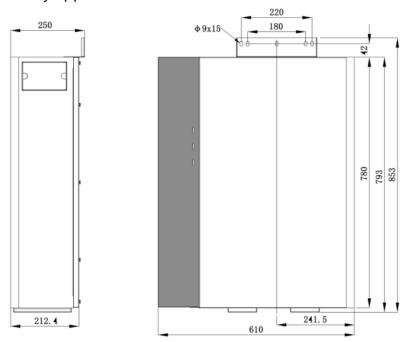
Protection: yellow LEDs are glowing or flashing (0.5s on and 0.5s off).

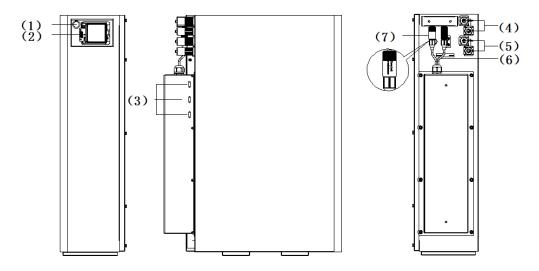
Error: yellow LEDs are glowing or flashing (0.5s on and 0.5s off).

Shutdown: all LEDs are off.

3.3.4. Battery Introduction of SMILE-G3-BAT-10.1P

Battery appearance and dimensions

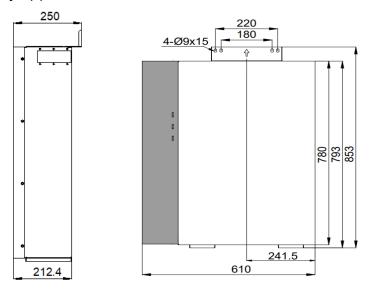


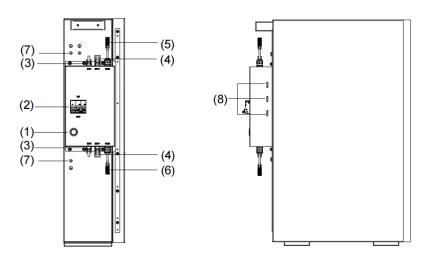


Position	Designation
1	Battery Power Button
2	Battery Breaker
3	Battery LED Display
4	Battery Positive Cable Connector
5	Battery Negative Cable Connector
6	Grounding Point
7	BMS COM Ports: BMS COM1, BMS COM2 (with Terminal Resistor)

3.3.5. Battery Introduction of SMILE-G3-BAT-8.2P

Battery appearance and dimensions

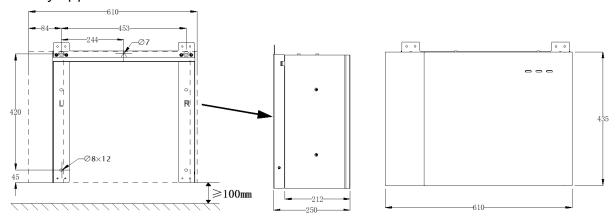


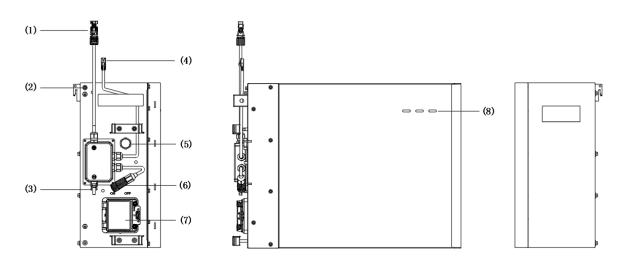


Position	Designation
1	Battery Power Button
2	Battery Breaker
3	Battery Negative Cable Connector
4	Battery Positive Cable Connector
5	BMS COM1
6	BMS COM2 (with Terminal Resistor)
7	Grounding Point
8	Battery LED Display

3.3.6. Battery Introduction of SMILE-G3-BAT-3.6S/4.0S

Battery appearance and Dimensions

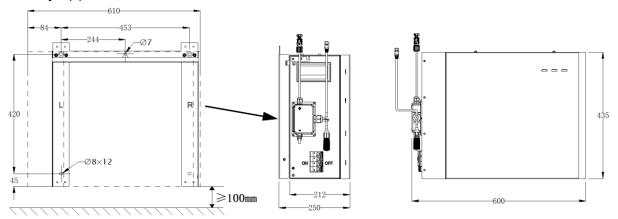


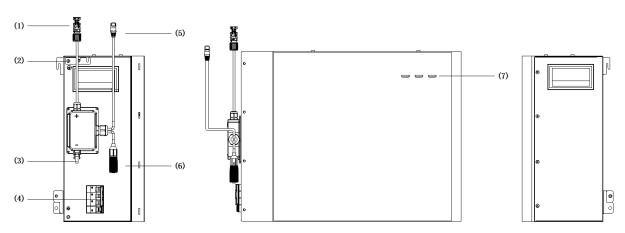


Position	Designation
1	Battery Positive Cable Connector
2	Grounding Point
3	Battery Negative Cable Connector
4	BMS COM1
5	Pressure Relief Valve
6	BMS COM2 (with Terminal Resistor)
7	Battery Circuit Breaker
8	LED Display

3.3.7. Battery Introduction of SMILE-G3-BAT-3.8S

Battery appearance and dimensions



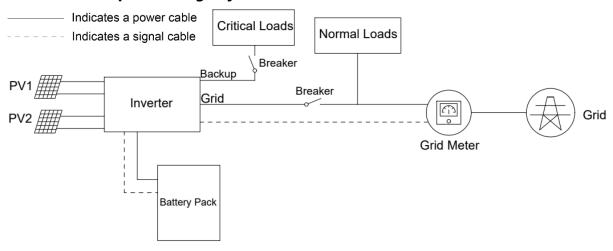


Position	Designation
1	Battery Positive Cable Connector
2	Grounding Point
3	Battery Negative Cable Connector
4	Battery Circuit Breaker
5	BMS COM1
6	BMS COM2 (with Terminal Resistor)
7	Battery LED Display

3.4. Application Scenarios

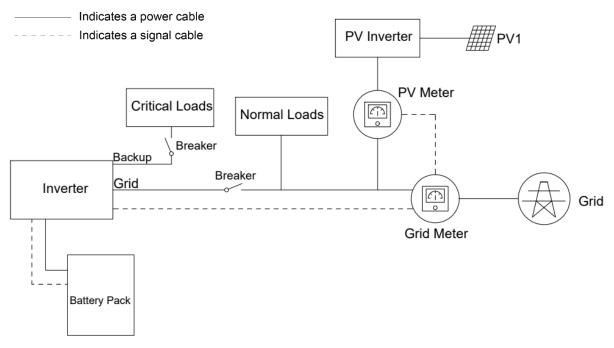
SMILE-G3 single phase system (comprise of the inverter SMILE-G3-S6/S5/S3.6/B5-INV and battery SMILE-G3-BAT-10.1P, SMILE-G3-BAT-8.2P, SMILE-G3-BAT-3.6S/3.8S/4.0S) can be connected as a DC-Coupled systems (mostly new installation), AC-Coupled systems (mostly retrofit), Hybrid-Coupled systems (mostly retrofit, and increase the PV capacity), and Off-Grid (with Generator) systems as shown in the following diagrams:

3.4.1. DC-Coupled Storage System



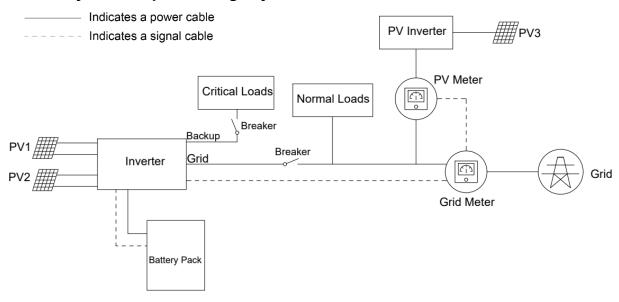
DC-Coupled Storage System - Scheme

3.4.2. AC-Coupled Storage System



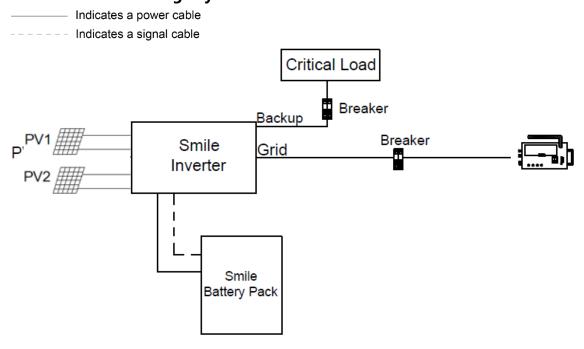
AC-Coupled Storage System – Scheme

3.4.3. Hybrid-Coupled Storage System



Hybrid-Coupled Storage System – Scheme

3.4.4. Off-Grid Storage System



Off-Grid (with Generator) Storage System - Scheme

NOTE: In all cases, Normal Loads and Essential Loads must be appropriately protected by earth fault protection devices (e.g. Type A or Type B RCDs, RCBOs) in accordance with appropriate Standards.

Backup/Essential Loads should not exceed the rated capacity of the inverter, even during on-grid operation.

4. Storage and Transport

4.1. Storage

4.1.1. Inverter Storage

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

- 1. Do not unpack the inverter.
- 2. Keep the storage temperature at $-40\sim60^{\circ}$ C and the humidity at $5\%\sim95\%$ 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:

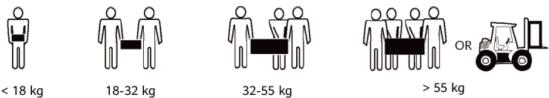
- 1. Place batteries according to the signs on the carton during storage. Do not put the batteries upside down or store them horizontally.
- 2. Stack battery cartons in accordance with the stacking requirements printed on the external carton.
- 3. Store the battery out of reach of children and animals.
- 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:
- a. Ambient temperature: -10~55°C, recommended storage temperature: 15~30°C
- b. Relative humidity: 15%~85%
- c. Place batteries in a dry, clean, ventilated location free from dust.
- d. Store batteries in a place that is away from corrosive organic solvents and gases.
- e. Keep batteries away from direct sunlight.
- f. 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.
- 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 $3\%\sim10\%$. 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 $65\sim75\%$ of the SOC.

4.2. Transport

During transportation, please follow these guidelines:

- 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.



- 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.

32 Mounting

5. Mounting

5.1. Check 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 Single Phase Inverter				
1982				1000
Inverter (×1)	TOP Cover (×1)	Right Cover (×1)	Cable Cover (×1)	Left Support Foot (×1)
600				
Right Support Foot (×1)	PV+ & PV- Connectors* (×2)	Grid Plug Connector (×1)	Backup Plug Connector (×1)	Backup Plug Connector** (×1)
				517
Wi-Fi Module (×1)	6 Pin AUX Ter- minal Block (×1)	Series Batteries Main Positive Power Cable*** (×1)	Series Batteries Main Negative Power Cable*** (×1)	Grounding Ca- ble (×1)
S				
Y Type Terminals (×5)	Hexagon Head Screw M5*12 (×9)	Quick Installation Guide (×1)	System Wiring Diagram Sheets (×1)	

^{*} Not include in SMILE-G3-B5-INV

^{**} Only for SMILE-G3-S6-INV

^{***} Not include in SMILE-G3-S6-INV

(Optional) Wall Bracket of SMILE-G3 Single Phase Inverter				
		R		
Bottom Frame (×1)	Lower Left Support Plate (×1)	Lower Right Support Plate (×1)	Wall Anchor ST6*55 (×6)	
Series Batteries Main Positive Power Cable (×1)	Series Batteries Main Negative Power Cable (×1)	Communication Cable Between Inverter and 1st Series Batteries (×1)	Hexagon Head Screw M5*12 (×10)	
Small Spirit Level (×1)				

(Optional) Cables for Distanced Horizontal Battery Expansion of SMILE-G3-BAT-3.6S/3.8S/4.0S				
Series Battery Main Negative Power Cable (×1)	Communication Cable Between Two Column Series Batteries (×1)	Power Cable Between Two Column Series Batteries (×1)		
M5 Y Type Terminal (×3)	PV&BAT Connector Disassembling Tool (×1)			

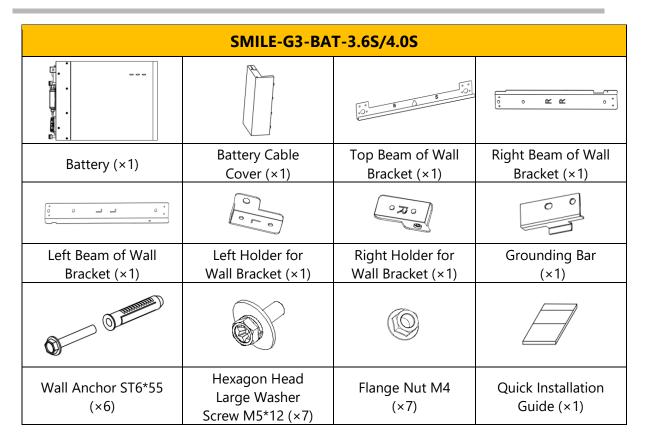
34 Mounting

SMILE-G3-BAT-8.2P					
	0000 0 0000 		65		
Battery (×1)	Top Wall Bracket (×1)	Battery Cable Cover (×1)	M5 Y Type Terminal (×2)		
	© © ©	0			
Wall Anchor ST6*55 (×4)	Gap Gasket for Battery Stacking (×2)	Support for Battery Cable Cover (×1)	Battery Communica- tion Cable (×1)		
BAT- Power Cable* (×1)	BAT+ Power Cable* (×1)	BAT+ Power Cable ** (×1)	BAT- Power Cable** (×1)		
โก			®		
Wall Gap Shim (×1)	Back Support Stud for Battery (×1)	Countersunk Screw M5*10 (×18)	Cheese Head Screw M5*10 (×2)		
Quick Installation Guide (×1)					

^{*} For connecting with SMILE-G3-T4/T5/T6/T8/T10-INV

^{**} For connecting with SMILE-G3-T12/T15/T20-INV, aslo suitable for connecting with battery SMILE-G3-BAT-8.2P expansion installation

SMILE-G3-BAT-10.1P				
	11111111111111111111111111111111111111			
Battery (×1)	Top Wall Bracket (×1)	M5 Y Type Terminal (×2)	Spanner (×1)	
Battery Cable Cover (×1)	Breaker Cover (×1)	Wall Anchor ST6*55 (×4)	Gap Gasket for Battery Stacking (×2)	
Countersunk Head BAT+ Power Cable Screw M5*10 (×10) (×1)		BAT- Power Cable (×1)	Battery Communication Cable (×1)	
โก				
Wall Gap Shim (×1)	Quick Installation Guide (×1)			



SMILE-G3-BAT-3.8S					
			* 0 70 b		
Battery	Battery Cable	Top Beam of Wall	Right Beam of Wall		
(×1)	Cover (×1)	Bracket (×1)	Bracket (×1)		
			00		
Left Beam of Wall Bracket (×1) Left Holder for Wa Bracket (×1)		Right Holder for Wall Bracket (×1)	Grounding Bar (×1)		
Wall Anchor ST6*55 (×6)	Support Stud for Battery Cable Cover (×2)	Hexagon Head Large Washer Screw M5*12 (×7)	Flange Nut M5 (×7)		
Quick Installation Guide (×1)					

Accessories for Base Unit of SMILE-G3-BAT-3.6S/3.8S/4.0S				
Base Unit (×1)	Top Wall Bracket (×1)	Position Plate (×1)	Right Connection Plate* (×4)	
Hexagon Head Limit Screw M5*10* (×10)	Right Connection Block for Base Unit (×1)	Hexagon Head Screw M5*12 (×20)	Z-Shaped Right Connection Plate** (×6)	
Pan Head Screw M5*10** (×13)	Limit block** (×10)			

^{*} Only for SMILE-G3-BAT-3.8S ** Only for SMILE-G3-BAT-3.6S&4.0S

5.3. Requirements for Mounting



Danger to life due to fire or explosion

Despite careful construction, electrical devices can cause fires.

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

5.3.1. Basic Requirements

• SMILE-G3-S6/S5/S3.6/B5-INV, SMILE-G3-BAT-10.1P and SMILE-G3-BAT-3.6S/4.0S are suitable for indoor and outdoor installation.

SMILE-G3-BAT-8.2P and SMILE-G3-BAT-3.8S are only suitable for indoor installation.

- Do not install the inverter in a place where people can easily touch it because the inverter's surface will get extremely hot during operation.
- 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.
- Do not mount the inverter at a place within the reach of children.
- Do not mount the system 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.

5.3.2. Mounting Environment Requirements

- The system must be mounted in a well-ventilated environment to ensure adequate heat dissipation.
- Do not mount in a location that will be exposed to direct sunlight. Mount the system in a sheltered place or mount an awning over it. When mounted under direct sunlight, the power of the system may be derated due to additional temperature rise and the longevity of the product will be reduced.
- The optimal temperature range for the battery to operate is 15 to 30°C.
- Favour locations that are indoors, under cover, or generally protected from the elements and extreme temperatures (e.g. in a garage). If the battery is mounted in the garage, ensure the product is adequately protected from potential mechanical impact.
- Do not place the system near water sources such as downpipes or sprinklers.

5.3.3. Mounting Structure Requirements

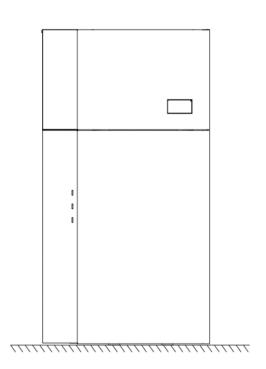
• The surface to which the Battery System is to be mounted shall be fire-rated where required by local regulations.

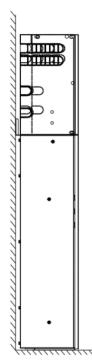
- Out of an abundance of caution, it is recommended that the system be mounted on non-flammable building materials, even when not required by local regulations.
- Ensure that the mounting surface is sufficiently sturdy to bear the weight of the Product.
- In residential installation, do not mount the 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.

5.3.4. Mounting Angle and Stack Requirements

The parallel battery should be placed on the ground and secured to the wall. The inverter should be placed on the top of the battery and secured to the battery. The installation angle requirement is as follows:

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





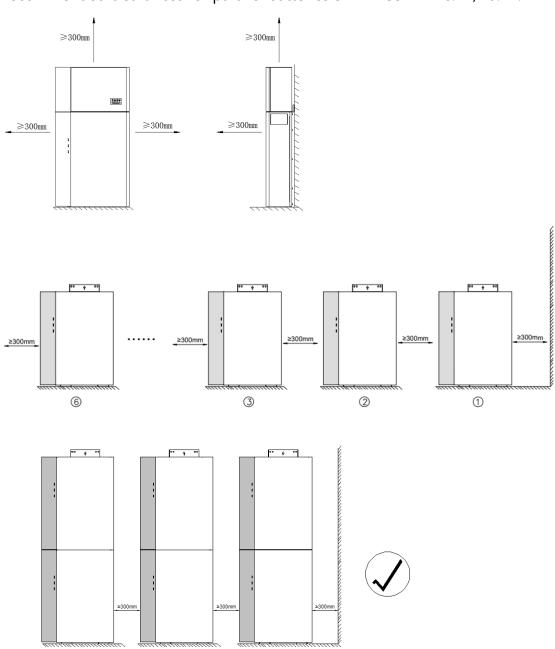
5.3.5. Mounting Space Requirements

 Reserve sufficient space around the energy storage system to ensure sufficient space for installation, maintenance and heat dissipation.

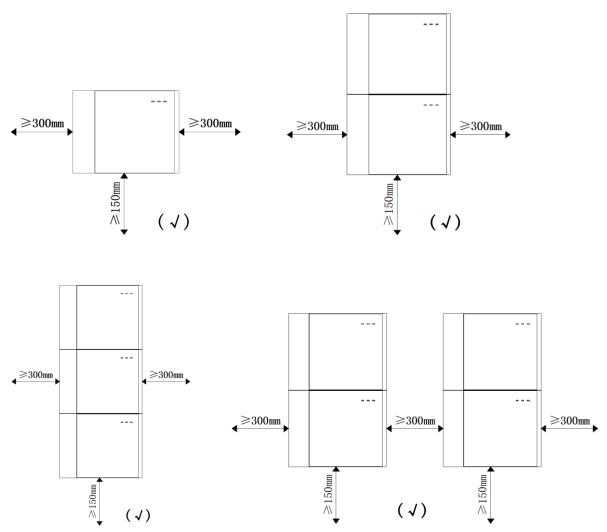
The side clearance is a recommendation which can be adjusted according to the
end-users requirements. Clearances may be up to 100mm less than noted if
ventilation is adequate and no restrictions or objects will limit access to the
labelling or switches of the Product or to the use of tools to remove covers or
service/remove the Product.

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

Recommended clearances for parallel batteries SMILE-G3-BAT-8.2P/10.1P.



Recommended clearances for series batteries SMILE-G3-BAT-3.6S/3.8S/4.0S. Recommend a minimum of 150mm off the ground was advisable to protect from submergence, so the series batteries should be mounted on base unit or by wall bracket.



Local Standards may add additional clearance requirements, particularly regarding clearances between the Battery System and other Electrical Appliances.



Category	Tools and Instruments			
		200	00.00	
	Hammer drill (with a Φ10mm drill bit)	Torque socket wrench SW8&SW10	Multimeter (DC voltage range ≥ 1000V)	
		5		
	Diagonal pliers	Wire stripper	T20/PH2 screwdriver (torque range: 0-5Nm), L=150mm	
		l hom		
Installation	Rubber mallet	Utility knife	Cable cutter	
mstanation			2000	
	Crimping tool (model: PV-CZM-22100)	Bootlace/Ferrule terminal crimper	Disassembly and assembly tool of PV connector	
	Vacuum cleaner	Heat shrink tubing	Heat gun	
	4		<u> </u>	
	Marker	Measuring tape	Spirit level	
Personal Protective Equipment				
	Safety gloves	Safety goggles	Anti-dust respirator	
	E LITTE			
	Safety shoes			

5.5. Mounting the System

5.5.1. Mounting Parallel Battery SMILE-G3-BAT-8.2P

Mounting steps for battery SMILE-G3-BAT-8.2P, please follow the steps below.

a. Remove the battery from the carton and transport it to the installation site with a trolley or other manual handling aid capable of safely moving the product weight. Secure the product during any movement or transport.

b. Pre-mount the top wall bracket to the battery top.

Secure the provided back support stud to the right lower corner of the battery back (tool: SW8 hexagon sleeve, torque: 2.5Nm).

Place the battery against the wall at the required final position. The battery should be level (check with spirit level) before marking the holes in the wall. Where the ground requires levelling beneath the battery, or where the battery is to be mounted on a sub-surface designed to provide level mounting, the levelling surface should be secure and solid (if using a cement pad) before locating the battery and marking the wall for the mounting positions.

c. Mark the drilling positions according to the hole of the top wall bracket.

Remove the top wall bracket after untightening their mounting screws, then cover the top of the battery with a plastic bag.

Then drill 3 holes on the wall with drill Φ 10 and a depth of about 70mm.

Clean the holes and insert screw anchors into the drilling holes.

- d. After removing the plastic bag, fix the top wall bracket on top of the battery (tool: T20 screwdriver, torque: 2.5Nm), secure the top wall bracket to the wall using the provided screws (tool: SW8 hexagon sleeve, torque: 6Nm).
- e. Take out the support for battery cable cover from the battery package and tighten it to the lower left of the battery housing with countersunk head screws M5*10 (tool: T20 screwdriver, torque: 2.5Nm), please see figure 5.
- f. If you want to mount additional batteries side by side, please repeat the mounting steps from a to e.

Note: the following steps only for the second battery stack installation (optional)

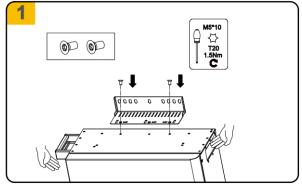
g. If you want to add another battery on top of the first battery, take out the 2 gap gaskets for battery stacking, 4 countersunk head screws M5*10, and tighten them to the top of the bottom battery (tool: T20 screwdriver, torque: 2.5Nm).

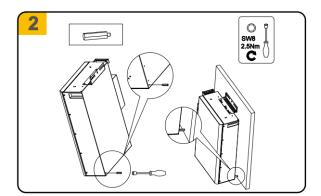
Take out 2 hexagon head screws M5*10, and tighten them to the top of the gap gaskets for battery stacking (tool: T20 screwdriver, torque: 2.5Nm). See figure 6.

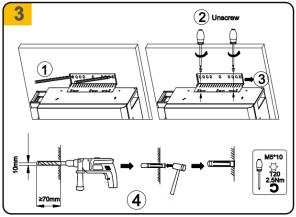
- h. Remove another battery from the carton and transport it to the installation site. Place a PE bag at the bottom of the battery before laying it down, then remove the 2 feet located at the bottom of the battery (tool: T20 screwdriver).
- i. Repeat the mounting steps from a to b. Hold the side handles, lift the second battery onto the bottom battery, and align the batteries' outer contour.
- j. Repeat the mounting steps from c to e.

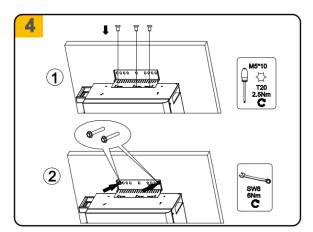
If two batteries are not aligned perfectly due to uneven wall, please put provided wall gap shim behind the top wall bracket of the upper battery.

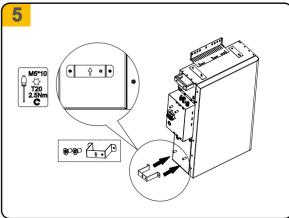
The first battery stack installation



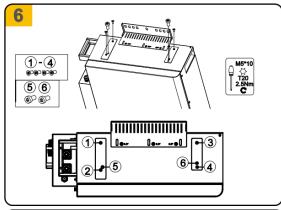


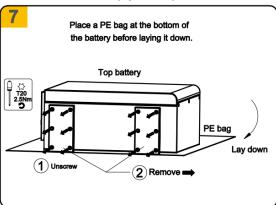


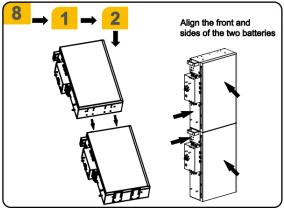


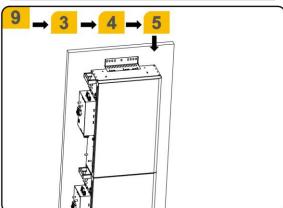


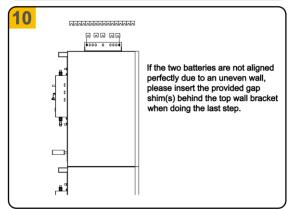
Note: step 6~10 only for the second battery stack installation (optional)











5.5.2. Mounting Parallel Battery SMILE-G3-BAT-10.1P

Mounting steps for battery SMILE-G3-BAT-10.1P, please follow the steps below.

- a. Remove the battery from the carton and transport it to the installation site with a trolley or other manual handling aid capable of safely moving the product weight. Secure the product during any movement or transport.
- b. Pre-mount the top wall bracket to the battery top (tool: T20 screwdriver, torque: 1.5Nm). Place the battery against the wall at the required final position. The battery should be level (check with spirit level) before marking the holes in the wall. Where the ground requires levelling beneath the battery, or where the battery is to be mounted on a sub-surface designed to provide level mounting, the levelling surface should be secure and solid (if using a cement pad) before locating the battery and marking the wall for the mounting positions.
- c. Mark the drilling positions according to the holes of the top wall bracket. Remove the top wall bracket after untightening their mounting screws, then cover the top of the battery with a plastic bag.
- d. Drill 3 holes on the wall with drill Φ 10 and a depth of about 70mm.

Clean the holes and insert screw anchors into the drilling holes.

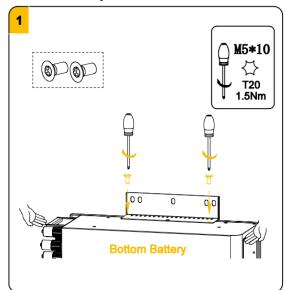
After removing the plastic bag, fix the top wall bracket on top of the battery (tool: T20 screwdriver, torque: 2.5Nm).

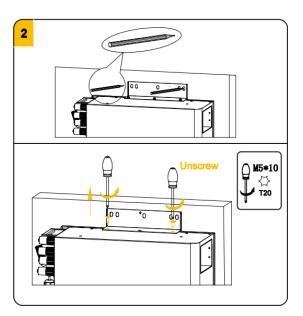
- e. Secure the top wall bracket to the wall using the provided screws (tool: SW8 hexagon sleeve, torque: 6Nm).
- f. If you want to mount additional batteries side by side, please repeat the mounting steps from a to e.

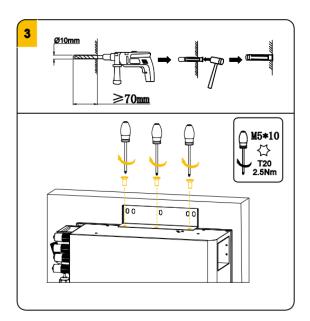
Note: the following steps only for the second battery stack installation (optional)

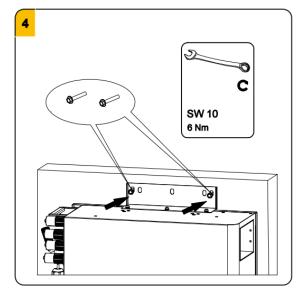
- g. If you want to add another battery on top of the first battery, take out the 2 gap gaskets for battery stacking and 4 countersunk head screw M5*10, tighten them to the top of the bottom battery (tool: T20 screwdriver, torque: 2Nm).
- h. Remove another battery from the carton and transport it to the installation site. Place a PE bag at the bottom of the battery before laying it down, then remove the 2 feet located at the bottom of the battery (tool: T20 screwdriver).
- i. Pre-mount the top wall bracket to the battery top (tool: T20 screwdriver, torque: 1.5Nm).
- j. Hold the side handles, lift the battery onto the bottom battery, and align the batteries' outer contour. Repeat the mounting steps from c to e.
- k. If the two batteries are not aligned perfectly due to uneven wall, please put provided wall gap shim behind the top wall bracket of the upper battery.

The first battery stack installation

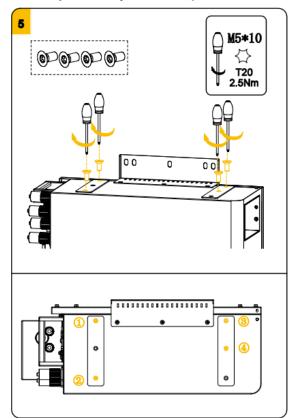


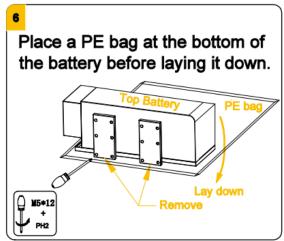


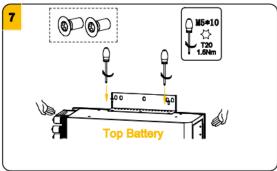


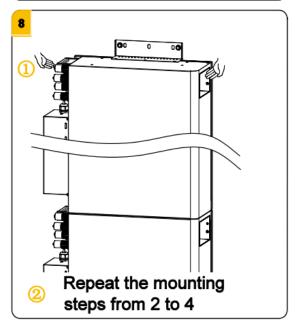


Note: step 5~9 only for battery stack installation (optional)

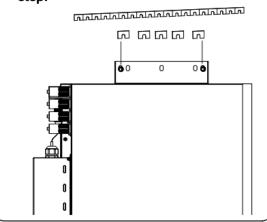








If the two batteries are not aligned perfectly due to an uneven wall, please insert the provided gap shim(s) behind the top wall bracket when doing the last step.



5.5.3. Mounting Series Batteries

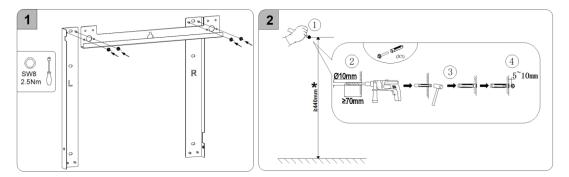
5.5.3.1 Wall Bracket Installation for one Battery Installation

Wall bracket installation for one battery installation, please follow the steps below.

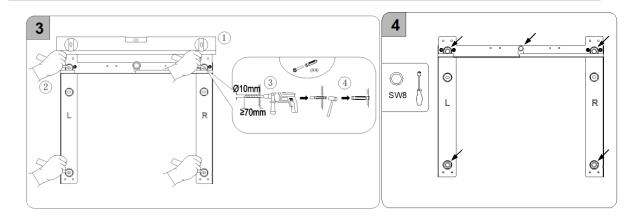
- a. Take out the top, left and right beams of the wall bracket from the package and assemble them with M5 nuts (tool: SW8 hexagon sleeve, torque: 2.5Nm).
- b. Select a suitable height for the wall bracket location. Please reserve enough height if you want to add more batteries later.

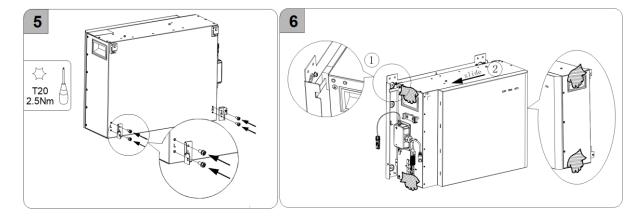
Mark one drilling position which is used to secure the upper middle location of the wall bracket later and drill the marked hole with a $\Phi 10$ drill. Insert the screw anchor into the drill hole, and pre-tighten the wall bracket horizontally with the provided screw (tool: SW8 hexagon sleeve, torque: 4Nm). Retain 5~10mm from the screw head to the wall, see figure 2.

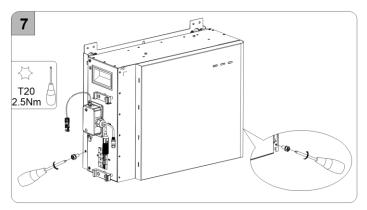
- c. Hang the wall bracket on the screw head, adjust its horizontal position, then mark the other drilling positions, drill the marked holes with a Φ 10 drill and insert the screw anchors into the drill holes, see figure 3.
- d. Secure the wall bracket to the wall (tool: SW8 hexagon sleeve, torque: 6Nm).
- e. Take out the left holder and right holder for wall bracket from the package and tighten them to the lower left and lower right of the battery back (tool: T20 screw-driver, torque: 2.5Nm).
- f. 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.
- g. Secure the battery to the wall bracket and tighten them with two M5*12 screws (tool: T20 screwdriver, torque: 2.5Nm).



* This recommended value "440mm" 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 150~200mm off the ground to protect the system from submergence.







5.5.3.2 Wall Bracket Installation for Multiple Batteries Installation

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

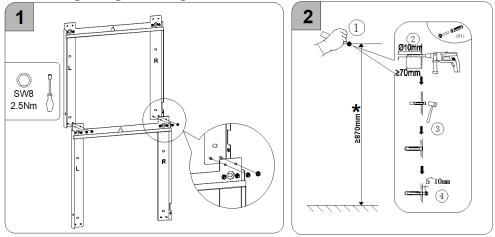
a. Take out the top, left and right beams of the wall bracket from the package, and assemble them with M5 nuts (tool: SW8 hexagon sleeve, torque: 2.5Nm).

Align the upper holes of the lower wall bracket to the lower rivets of the upper wall bracket, assemble them with M5 nuts (tool: SW8 hexagon sleeve, torque: 2.5Nm), and then combine several wall brackets into a whole.

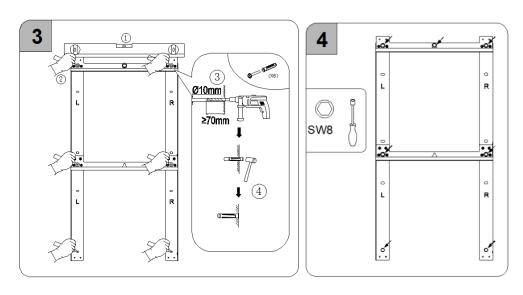
b. For other mounting steps, please see Chapter 5.5.3.1 Wall Bracket Installation for one Battery Installation and follow step b to step g.

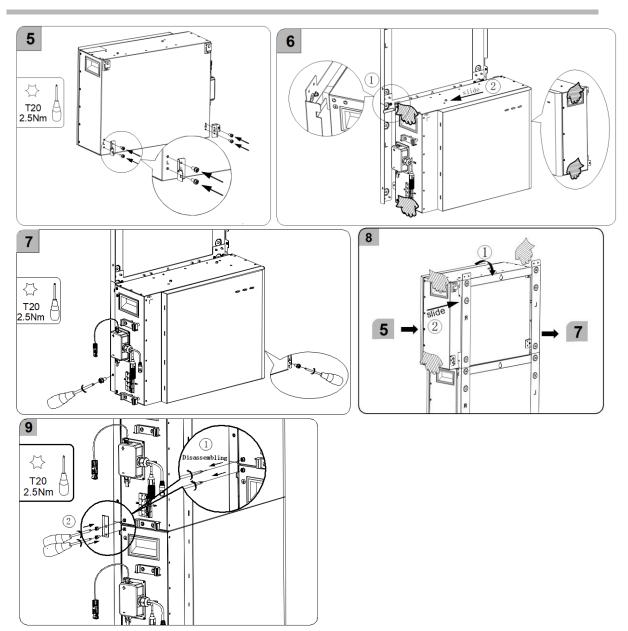
c. Take out the grounding bar from the package and use it to connect the lower left corner of the upper battery and the upper left corner of the lower battery (tool: T20 screwdriver, torque: 2.5Nm). When doing so, unscrew the two screws before

connecting the grounding bar.



* This recommended value "870mm" is for wall bracket location of the second battery seeing from the bottom up. This value may adjust depending on the number of expansion series batteries mounted later.



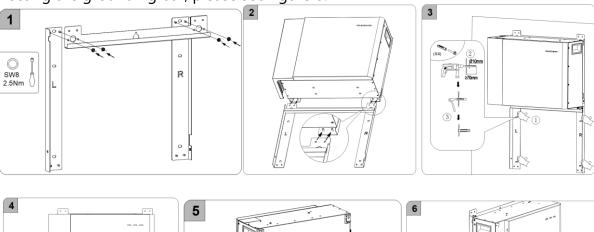


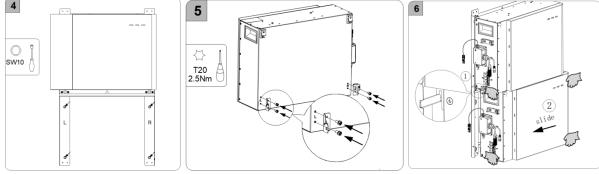
53

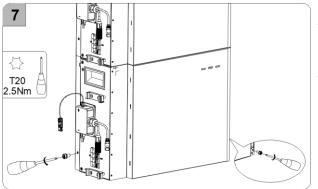
5.5.3.3 Wall Bracket Installation for Batteries Expansion Installation

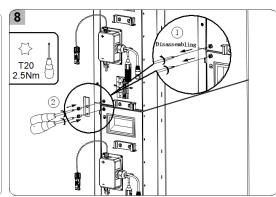
For additional batteries installation (from bottom to top), the expansion batteries should be mounted below existing batteries, please follow the below steps.

- a. Take out the top, left and right beams of the wall bracket from the package, and assemble them with M5 nuts (tool: SW8 hexagon sleeve, torque: 2.5Nm). Align the upper holes of the lower wall bracket to the lower rivets of the upper wall bracket, and mark the drilling position of the newly assembled wall bracket.
- b. Remove the newly assembled wall bracket and drill the marked hole with drill Φ 10. Insert screw anchors into the drilling holes, tighten the screws to secure the wall bracket to the wall (tool: SW8 hexagon sleeve, torque: 6Nm).
- c. For other mounting steps, please see Chapter 5.5.2.1 Wall Bracket Installation for One Battery Installation and follow step b to step g.
- d. Take out the grounding bar from the package and use it to connect the lower left corner of the upper battery and the upper left corner of the lower battery (tool: T20 screwdriver, torque: 2.5Nm). When doing so, unscrew the two screws before connecting the grounding bar, please see figure 8.









5.5.3.4 Wall-Mounted Battery Disassembling Special Feature Only for Battery SMILE-G3-BAT-3.6S/4.0S



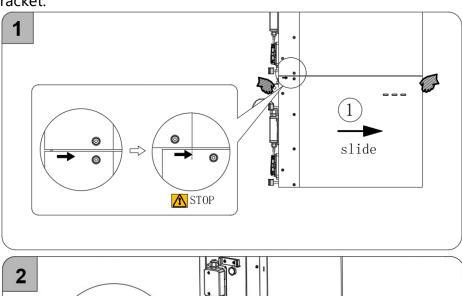
Risk of injury due to the weight of the battery

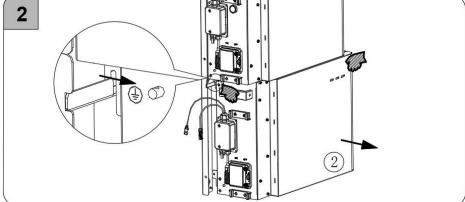
Injuries may be caused if the product is lifted improperly or dropped while being transported or mounted. To avoid this danger:

- Transport and lift the product carefully. Take the weight (45kg) of the product into account and use lifting and conveyance aids such as lifting trolleys.
- •Ensure that at least two individuals are present for mounting and disassembling the product.
- Wear suitable personal protective equipment for all work on the product.

Before disassembling the batteries, please turn off the battery switch, unplug the cables and disassemble the cable cover.

When disassembling a battery that has been mounted with wall bracket and is not directly connected to the inverter, always hold the handles on both sides of the battery firmly and slide it to the right. Once the arrow on the upper left of the cover aligns to the left protruding side of the upper battery, carefully lift the battery forward and off the wall bracket.





5.5.3.5 Base Installation for Several Series Batteries Installation

When mounting multiple series batteries SMILE-G3-BAT-3.8S with base installation for the first time, please follow the below steps.

a. Take out the base unit and tighten two hexagon head limit screws M5*12 to the designated location of the base unit's top (tool: T20 screwdriver, torque: 2.5Nm). Take out the right connection block for base unit from the package and tighten it to the right side of the base unit back.

Take out the position plate and place it against the wall. Place the base unit against the position plate and adjust the feet to level the base unit.

- b. Take out the left holder and right holder for wall bracket from the package and tighten them to the lower left and lower right of the battery back (tool: T20 screw-driver, torque: 2.5Nm).
- c. Unscrew the screw at the lower left of the bottom battery.
- d. Lift the battery by using the handles at two sides, align the bottom holes of the first battery to the screw heads on the top of the base unit. Take out 2 cheese head screws M5*10 and tighten them to battery top's designated location for later position limit.
- e. Secure the battery to the base unit, tighten them with one screw M5*12 from the lower left of the battery (tool: T20 screwdriver, torque: 2.5Nm).
- f. Take out one right connection plate from the base unit package, use it to connect the lower right corner of the first battery and the upper right corner of the base unit (tool: T20 screwdriver, torque: 2.5Nm).
- g. Take out the next battery from the package.

Take out the left holder and right holder for wall bracket from the package and tighten them to the lower left and lower right of the battery back (tool: T20 screw-driver, torque: 2.5Nm).

Take out 2 cheese head screws M5*10, and tighten them to battery top's designated location for later position limit.

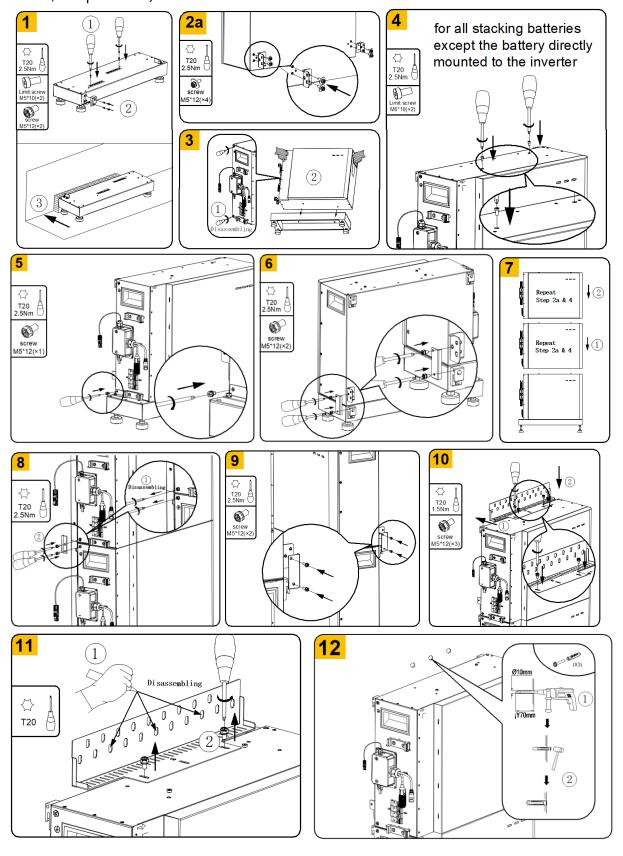
Lift the second battery by using the handles at two sides, align the bottom holes of the second battery to the screw heads on the top of the lower battery.

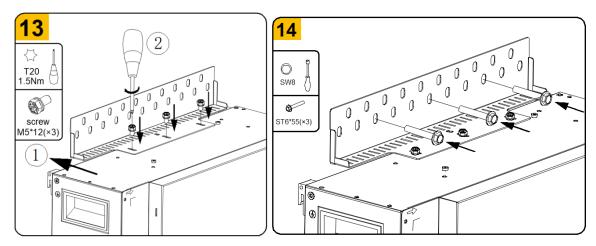
Continue mounting more batteries by repeating this step.

- e. Take out the grounding bars from the battery package, and use it to connect the lower left corner of the upper battery and the upper left corner of the lower battery (tool: T20 screwdriver, torque: 2.5Nm). When doing so, unscrew the two screws before connecting the grounding bar.
- h. Take out the right connection plates from the base unit package, use them to connect the lower right corner of the upper battery and the upper right corner of the lower battery (tool: T20 screwdriver, torque: 2.5Nm).
- i. Pre-mount the top wall bracket to the upper battery top and mark drilling positions.
- j. Remove the top wall bracket and cover the top of the battery with a plastic bag. Then, drill 3 holes in the wall with a Φ 10 drill to a depth of about 70mm and clean the holes and insert screw anchors into the drill holes.

k. After removing the plastic bag, tighten the top wall bracket to the top of the battery (tool: T20 screwdriver, torque: 2.5Nm).

I. Secure the top wall bracket to the wall with the provided screws (tool: SW8 hexagon sleeve, torque: 6Nm).



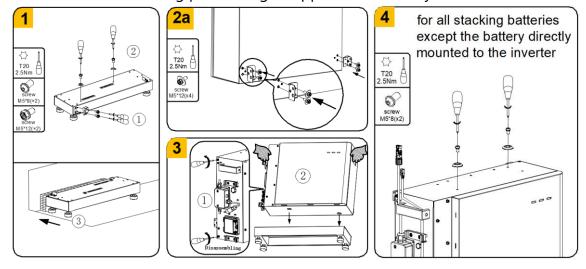


1 to 4 batteries are suitable for the SMILE-G3 single phase energy storage inverter.

For batteries base installation, there was a tiny difference in **stacking positioning materials** between these series batteries.

For SMILE-G3-BAT-3.8S, installers need to mount two **hexagon head limit screws M5*10** to the top of the batteries for stacking positioning of upper series battery.

For SMILE-G3-BAT-3.6S/4.0S, installers need to mount two **limit blocks** to the top of the batteries for stacking positioning of upper series battery.



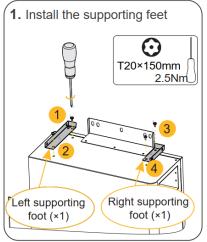
5.5.4. Mounting the Inverter

Mount the inverter standing on the battery, detailed steps as follows:

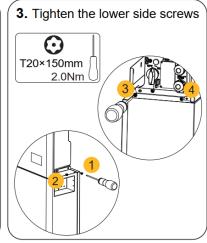
- a. Take out the left support foot and right support foot from the inverter package.
- b. Mount the left support foot and right support foot onto the top of the upper battery.
- c. Place the inverter into the two support feet.

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.

d. 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.



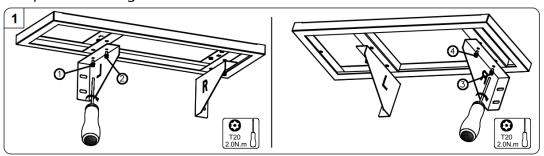




Mount the inverter with holding bracket, detailed steps as follows:

a. Take out the bottom frame, lower left support plate and lower right support plate from the package.

Assemble them with screws M5*12 (tool: T20 screwdriver, torque: 2Nm), and form a completed holding bracket

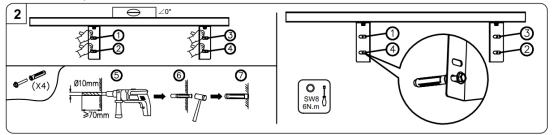


b. Select a suitable height.

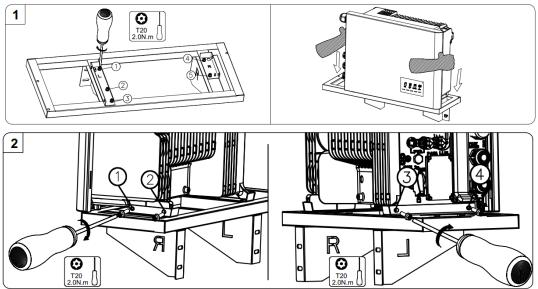
Please reserve enough height if you want to mount batteries below later.

Mark the four drilling positions of the holding bracket, and drill the marked holes with drill Φ 10. Insert screw anchors into the drilling holes. Ensure that the wall bracket is placed horizontally using a spirit level before securing it.

Secure the holding bracket to the wall with the screws provided (tool: SW8 hexagon sleeve, torque: 6Nm)

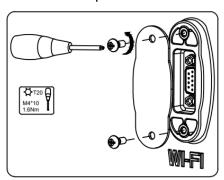


c. Take out the left support foot and right support foot from the inverter package. Mount the left support foot and right support foot onto the specified location of the holding bracket. For the remaining installation steps to fix the inverter, please follow the relative content at page 58.

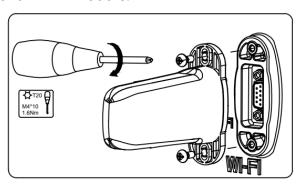


5.5.5. Mounting Wi-Fi Module of Inverter

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



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



6. Electrical Connection

Precautions



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

A 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.



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	Туре	Conductor Cross Section Area Range	Outer Diameter	Source
1	PV power cable	Standard PV cable (recommended type: H1Z2Z2-K)	4~6 mm²	5.5~9 mm	Purchased by the installer
2*	Signal cable	Standard network cable (recommended type: Cat5e, SFTP, UV-re- sistant for outdoor use)	0.12~0.2 mm ² (AWG26~AWG24)	4~6 mm	Purchased by the installer
3**	Signal cable	Two-core outdoor shielded twisted pair copper cable	0.5~1.5 mm ²	4~6mm	Purchased by the installer
4***	Signal cable	Outdoor shielded twisted pair copper cable	0.5~1.3 mm ²	4~6 mm	Purchased by the installer
5	AC power cable for backup	Three-core (L, N and PE) outdoor copper cable	4~6 mm ²	10~14mm	Purchased by the installer
6	AC power cable for grid	Three-core (L, N and PE) outdoor copper cable	4~10 mm ²	12~18mm	Purchased by the installer
7	PE cable	Single-core outdoor copper cable	2.5~10 mm ²	N/A	Purchased by the installer

^{*} For CAN/RS485, LAN, Meter (with CT), DRM communication connection with inverter.



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

^{***} For AUX communication connection with inverter.

6.2. Grounding Connection



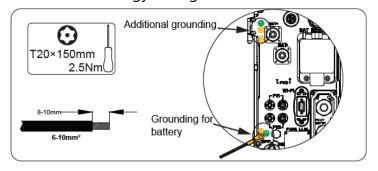
Electric Shock Hazard

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.

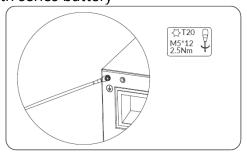
A grounding point is provided near the grid connector on the energy storage inverter. Prepare M5 Eye/Ring terminals, strip the grounding cable insulation, insert the stripped conductor into the ring terminal lug and crimp with a crimping tool.

Connect the grounding terminal to the inverter using the T20 screwdriver with a torque of 2.5Nm.

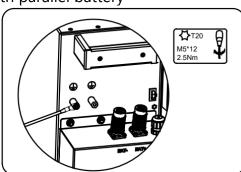
Grounding connection for the energy storage inverter.



Grounding connection with series battery



Grounding connection with parallel battery



6.3. AC Connection

6.3.1. Requirements for the AC Connection

AC cable requirements are as follows:
☐ Conductor type: copper conductor (tinned copper preferred)
☐ Current carrying capacity depends on the Model selected and should be such that
the AC cable can carry the full current of the AC supply and the Backup output:
Example for 5kW inverter model (SMILE-G3-S5/B5-INV)
AC Supply Max. current = 21.7A + Backup (total up to 43.5A)
Backup Output Max. current: 21.7A
Note: Account for temperature derating and voltage drop/rise when selecting wire di
ameters. 110°C or higher rated cable derates slower as temperatures increase.
☐ External diameter:
typically 12mm to 18mm for grid connector,
typically 10mm to 14mm for backup connector of SMILE-G3-S5/B5/S3.6-INV
☐ Conductor cross-section area:
Grid conductor cross-section recommendation: 4-10mm ²
Backup conductor cross-section recommendation: 4-6mm ² of SMILE-G3-S5/B5/S3.6-
INV
☐ Insulation stripping length
typically 16mm for grid connector
typically 10mm for backup connector of SMILE-G3-S5/B5/S3.6-INV
☐ Sheath stripping length
typically 45mm for grid connector
typically 33mm for backup connector of SMILE-G3-S5/B5/S3.6-INV

The backup connector and grid connector of SMILE-G3-S6-INV is the same type, but has different color. The backup cable requirements of SMILE-G3-S6-INV, please follow its grid cable requirements.



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



Residual-current monitoring unit

The inverter is equipped with an all-pole sensitive residual-current monitoring unit in accordance with IEC/EN 62109-2 and VDE 0126-1-1. The all-pole sensitive residual-current monitoring unit monitors AC and DC residual currents. It disconnects the inverter redundantly from the utility grid in the event of residual current jumps of > 30 mA. If the residual current monitoring unit malfunctions, the inverter is immediately disconnected from the utility grid at all poles. If the protection by automatic disconnection of supply according to DIN VDE 0100-410 is fulfilled by an appropriate overcurrent protective device, the inverter does not require an external residual-current device for safe operation. If local regulations require the use of a residual-current device, the following must be observed:

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

6.3.2. Select Suitable AC Circuit Breaker

The general requirements for the selection of circuit breakers are determined by standards and country-specific provisions. The following factors should be considered when selecting a suitable circuit breaker:

Factors influencing the current-carrying capacity of the cable: type of cable used, ambient temperature around the cable, type of cable routing, bundling of cables. Other influencing factors: loop impedance, mutual heating of circuit breakers, ambient temperature at the circuit breaker, selectivity, type of connected device.

If these factors are ignored, it will increase the risk of the circuit breaker tripping under normal operating conditions.

Selecting Circuit Breakers for the AC supply and Backup output is dependent on the maximum current of the backup circuit and the inverter (if it is force-charged), the model of MCBs used and their derated 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.



AC connection recommendation for SMILE-G3-S3.6-INV

Description	Max. Current	Breaker Type	Recommend cable cross section
Grid Side	32A	40A	6-10mm²
Backup Side	16A	25A	4-6mm²

AC connection recommendation for SMILE-G3-S5/B5-INV

Description	Max. Current	Breaker Type	Recommend cable cross section
Grid Side	43.5A	50A	10mm²
Backup Side	21.7A	32A	4-6mm²

AC connection recommendation for SMILE-G3-S6-INV

Description	Max. Current	Breaker Type	Recommend cable cross section
Grid Side	50A	63A	10mm²
Backup Side	50A	63A	10mm ²



Selecting suitable circuit breaker and copper conductor cross section

For SMILE-G3-S5/B5-INV, the MINIMUM allowable grid circuit breaker specification (if the unit is provided with full backup potential) is 50A, and the copper conductor cross section for grid connection should be at least 10mm². If the grid circuit breaker specification is 32A or 40A, you should use AlphaESS APP or AlphaCloud to make the appropriate settings, such as setting the MCB rating or allowing no backup mode. If such settings are not adjusted, it will increase the risk of the circuit breaker tripping under normal operating conditions.

6.3.3. Grid and Backup Connection



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



/!\ 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 Battery System 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. 21.7A for a 5kW inverter).

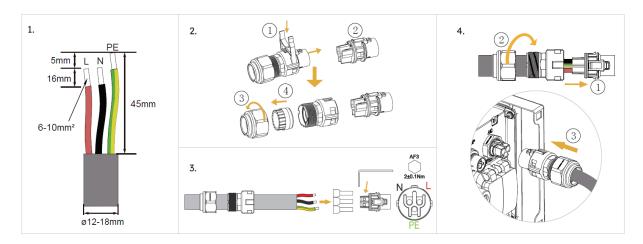
The combined current of the Battery Grid-charge and the backup circuit will be limited to the current rating of the MCB less 2A (to account for the temperature derating of a typical MCB). Installers must advise AlphaESS if the MCB used has a steeper derating factor where the 2A buffer would not be sufficient.

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

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 10mm²), 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 as follows:

- 1. Disconnect the PV switch, grid, backup and battery circuit breaker and secure them to prevent reconnection.
- 2. Dismantle the AC cable by 45mm.
- 3. Shorten L and N by 5mm each, so that the grounding conductor is 5mm 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 L, N and the grounding conductor 16mm.
- 5. If using fine stranded wire, fit L, N and PE with bootlace ferrules.
- 6. Unscrew the swivel nut from the threaded sleeve and pass the swivel nut and threaded sleeve over the AC cable.
- 7. Insert the three conductors into the screw terminals on the bush insert and tighten the screws using the torque 2.0 Nm with provided tool. Ensure that all conductors are securely in place in the screw terminals on the bush insert
- 8. Insert the threaded sleeve into the bush insert and hear the "click" sound. Screw the swivel nut onto the threaded sleeve.
- 9. Insert the grid connector plug into the socket for the grid connection, making sure to align the key on the grid connection socket to the keyway on the bush insert of the grid plug connector.



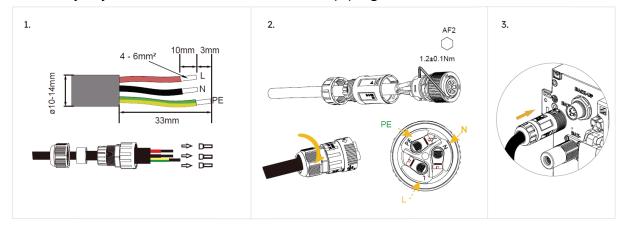
The above wiring steps are also suitable for backup connection of SMILE-G3-S6-INV. There is color difference between the grid connector and backup connector of SMILE-G3-S6-INV, backup connector is blue, grid connector is black.



The steps for connecting the backup connector as follows:

- 1. Disconnect the PV switch, grid, backup and battery circuit breaker and secure against reconnection.
- 2. Dismantle the AC cable by 33mm.
- 3. Shorten L and N by 3mm each, so that the grounding conductor is 3mm 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 L, N and the grounding conductor 10mm.
- 5. If using fine stranded wire, fit L, N and PE with bootlace ferrules.
- 6. Unscrew the swivel nut from the threaded sleeve and pass the swivel nut and threaded sleeve over the AC cable.
- 7. Insert the three conductors into the screw terminals on the bush insert and tighten the screws using the torque 1.2 Nm with provided tool. Ensure that all conductors are securely in place in the screw terminals on the bush insert.
- 8. Insert the threaded sleeve into the bush insert and hear the "click" sound. Screw the swivel nut onto the threaded sleeve.
- 9. Insert the backup connector plug into the jack for the backup connection and screw tight. When doing so, making sure to align the key on the backup socket with the keyway on the backup connector bush insert.

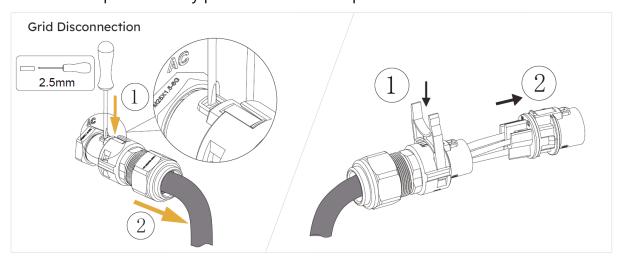
Insert the backup plug connector into the socket for the backup connection and screw tight. When doing so, making sure to align the key on the backup connection socket to the keyway on the bush insert of the backup plug connector.



The above wiring steps are not suitable for backup connection of SMILE-G3-S6 -INV.

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

- 1. Unplug the grid plug connector. To do this, insert a flat-blade screwdriver (blade width: 2.5 mm) into the coupling mechanism of the grid connector and carefully 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 the H-shaped tool into the side catch mechanism and pry the catch mechanism open. Carefully pull the bush insert apart.



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 anticlockwise, 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.

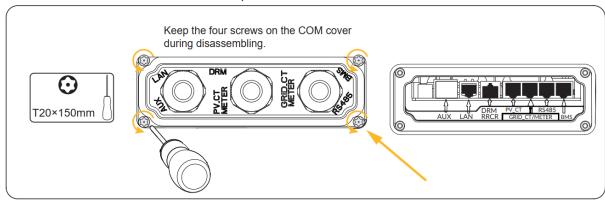




Item	Current	Scenarios
СТ	100A	CT (cable length 10m)
DTSU666-3*230V 5(80)A	80A	Three phase meter (without CT)
DTSU666-3*230V 100A/40mA	100A	Three phase meter (with CT)
DTSU666-3*230V 250A/50mA	250A	Three phase meter (with CT)

6.3.4. CT Connection & Meter Connection

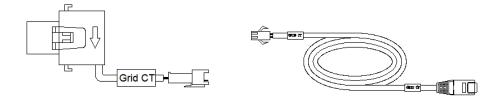
On the left-hand side of the inverter, loosen the strain relief of the cable glands on the COM connection cover, and unscrew the 4 screws on the corners to reveal the Grid CT, PV CT and meter communication ports.



6.3.4.1 CT Connection

A Grid CT & relative cable is provided as an accessory purchased separately for the SMILE-G3 single phase inverter.

For hybrid or AC-coupled storage system installations, an additional PV CT & relative cable must be purchased separately in order to measure the AC-coupled PV output. Please take out CT(s) from the package before installing. The CTs must be connected to the relative cables provided. The CT and the relative cables connect together via the connectors on each cable.



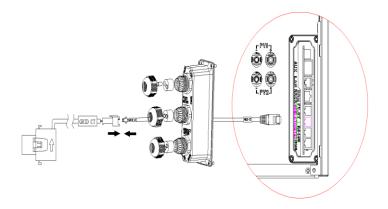
Step 1:

 Close the magnetic clamp of the Grid CT on the grid-supply cable. The ideal place for the Grid CT is between the Retail Meter and the Main Switch. If placed on either side of a Service Fuse, be very careful not to accidentally capture any Controlled Loads.

- The arrow on the casing of the Grid CT should point to the grid port of the energy storage inverter.
- In general, Controlled Loads should NOT be captured in the CT clamp. Step 2:
- For hybrid or AC-coupled storage system application, close and latch the magnetic clamp of the PV CT on the AC output cable(s) of the installed PV inverter(s). The arrow on the magnetic buckle of the PV CT should point away from the PV inverter, again "toward the mains grid".
- If multiple PV inverters are installed, ensure the PV CT captures the combined output either by combining the PV inverter outputs into a single wire to clamp or by clamping multiple wires. If clamping multiple wires, ensure that the multiple wires are aligned such that the arrow on the CT does not point to any of the PV inverters. Failure to follow this instruction would result in one PV output being subtracted from the other in the CT clamp measurement calculations.

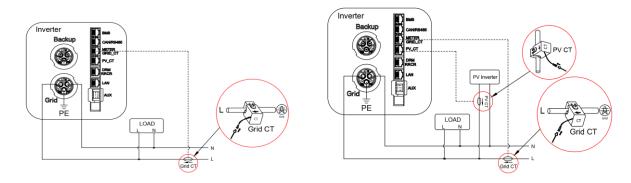
Step 3:

- Pass the CT cables through the cable gland of the COM connection cover but don't tighten the strain relief of the cable glands yet.
- Please follow the corresponding marking to insert the RJ45 plugs into the relevant RJ45 sockets.
- Only secure the cover in place after the CTs/Meter communication cable, the BMS cable, and the LAN cable (if used) have been clipped into their respective ports.
- When securing the cover over the communication ports, tighten the cover in place and then lightly push the communication cable into the cover as you tighten the strain relief gland onto the cables. This will ensure the communication cables are well-seated in the RJ45 ports.
- Connect the CT(s) and the relative cables together via the connectors on each cable, please follow the cable marking.



A CAUTION

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



DC-Coupled Storage System

AC-coupled and Hybrid-coupled Storage System

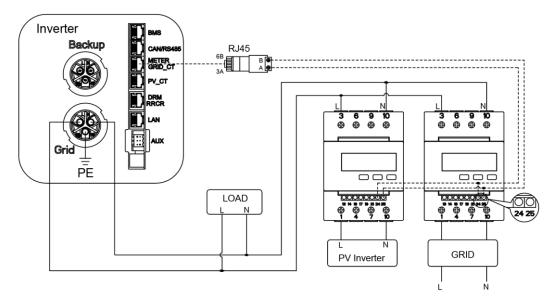
6.3.4.2 Meter Wiring

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.

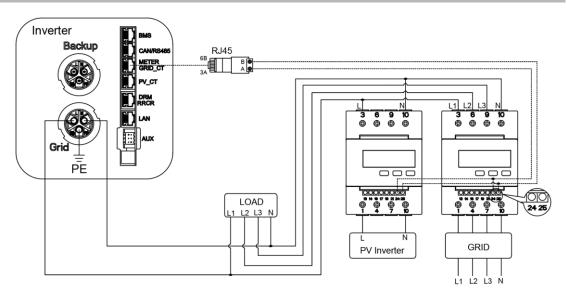
Insert the RJ45 plug of the meter communication cable into the METER communication port labelled "METER" of the inverter.

The other steps for meter connection as follows:

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



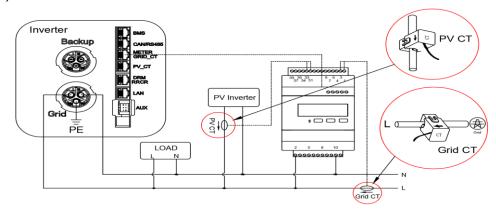
Wiring at single-phase feed in



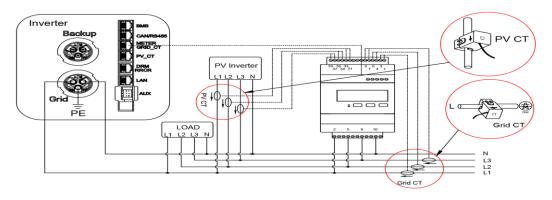
Wiring at three-phase feed in

Meter communication cable requirements: two-core outdoor shielded twisted pair copper cable (flexible), conductor cross-section 0.5~1.5mm², wires terminal should be fitted with bootlace ferrules.

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



Wiring at single-phase feed in



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

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



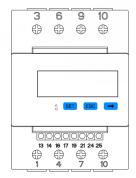
Be VERY careful when wiring or checking these connections because the connections appear reversed when the meter is secured in place on the Din Rail. Always physically check the label on the meter when wiring any CTs or grid reference wires.



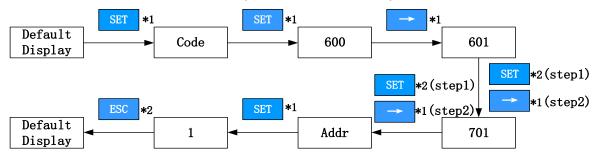
If connecting Chint DTSU666 meters without CTs, two meters are required if there is any AC-coupled PV. One for the Grid Import/Export and one for the AC-coupled PV measurements.

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

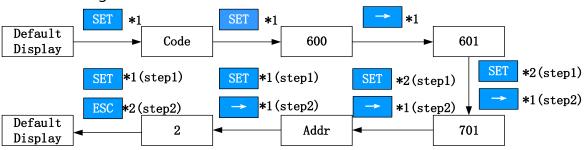
1. Meter setting for type DTSU666-3*230V 5(80)A, which is three-phase meter (without CT). When the meter is used as grid meter, the default address is 1. The installer doesn't need to make any other settings.



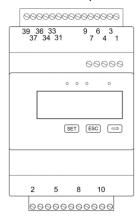
If installer wants to have a check, please follow the steps below:



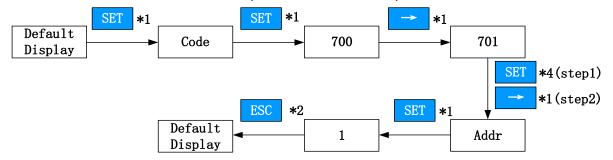
When the meter is used as PV meter, please follow the steps below to complete the address setting:



2. Meter setting for type DTSU666-3*230V 100A/40mA and DTSU666-3*230V 250A/50mA, three-phase 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:



Meter Setting on AlphaCloud

Step 1:

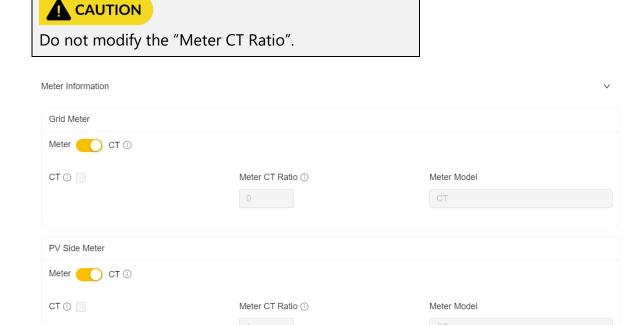
When the system work mode is selected as "DC", click the slider under the item "Grid Meter" to turn the "Meter" icon orange.

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.



Meter Setting on the AlphaESS App

Step 1:

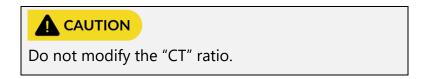
When the system work mode is selected as "DC", only tick the "Meter" icon on the right of the "Grid Meter".

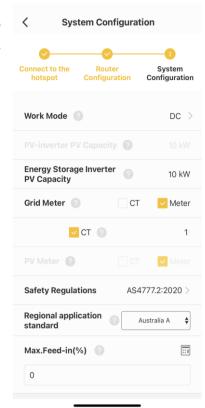
Save

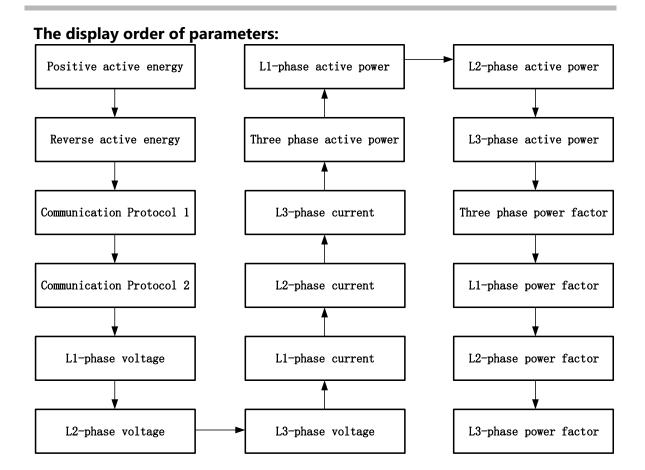
When the system work mode is selected as "AC" or "Hybrid", tick the two "Meter" icons on the right of the "Grid Meter" and the "PV Meter".

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.







6.4. PV Connection



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.



Destruction of the inverter due to overvoltage

If the open-circuit voltage of the PV modules exceeds the maximum input voltage of the inverter, the inverter can be destroyed due to overvoltage.

• 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.



Damage to the product due to ground fault on DC side during operation

Due to the transformerless topology of the inverter, the occurrence of 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. 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.



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

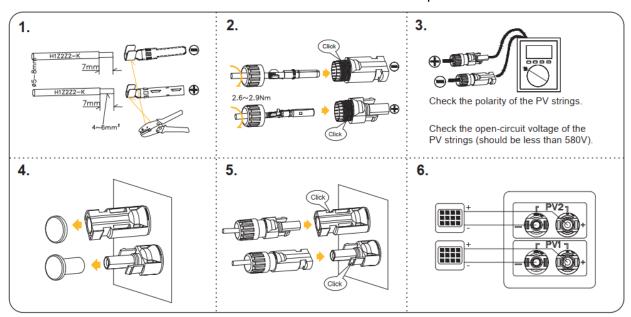
The inverteris only properly sealed when all unused PV inputs are closed with sealing plugs. Sand, dust and moisture penetration can damage the inverter and impair its functionality.

Seal all unused PV inputs using sealing plugs.

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

- Make sure the open voltage of the PV strings will not exceed the max. DC input voltage (580Vdc). Violating this condition will void the warranty.
- Make sure the polarity of the PV connectors is correct.
- Make sure the PV-switch, breakers of battery, AC-BACKUP and AC-Grid are all isolated/in their "off" states.
- Make sure the PV resistor to ground is higher than 200KOhms.

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 mm².



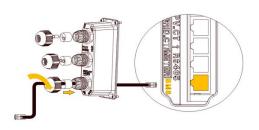


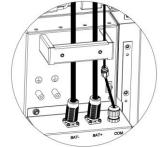
6.5. Electrical Connection between the Inverter and Battery

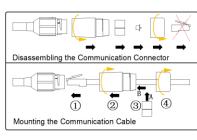
6.5.1. Communication Connection between the INV and BAT

Communication cable connection between inverter and parallel batteries SMILE-G3-BAT-8.2P/10.1P:

- a. Take out the battery communication cable from the battery packaging.
- b. Pass the battery communication cable (BMS communication cable) through the cable gland of the COM connection cover of the inverter. Do not tighten the strain relief nuts of the cable glands yet.
- c. Insert the RJ45 plug into the BMS communication port on the inverter communication board labelled "BMS".
- d. 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.
- e. 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.
- f. Battery communication ports of SMILE-G3-BAT-8.2P/10.1P are on the left side. Disassemble the battery communication connector components, unscrew the swivel nut, and push the cable support sleeve out of the threaded sleeve.
- g. Thread the swivel nut and threaded sleeve over the battery communication cable. At the same time, thread the cable through the opening in the cable support sleeve. Insert the RJ45 plug into the BMS communication port of the battery and screw the threaded sleeve. Press the cable support sleeve into the threaded sleeve. Screw the swivel nut onto the threaded sleeve.







Inverter side

Parallel battery side

Communication cable connection between the energy storage inverter and series batteries:

- a. Pass the battery communication cable of the upper battery through the cable gland of the COM connection cover of inverter. Do not tighten the strain relief nuts of the cable gland.
- b. Insert the RJ45 plug to the BMS communication port of the energy storage inverter.

6.5.2. System Connection between INV and BAT



Danger to life due to short-circuit of the battery

Touching the short-circuit connection of the battery can result in significant injuries or even death due to electric shock and massive energy release.

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

Power cables connection between the inverter and parallel battery SMILE-G3-BAT-8.2P/10.1P:

a. Take out the battery power cables from the battery packaging.

Please pay attention to the cable type.

No.	Picture	Description
1		Red power cable: connect BAT positive of parallel battery and the BAT positive of inverter, connect BAT positive terminals of parallel batteries.
2		Black power cable: connect BAT negative of parallel battery and the BAT negative of inverter, connect BAT negative terminals of parallel batteries.

b. Press the buckle with a flat-head screwdriver (blade width: 2.5mm) when unscrewing the threaded sleeve of the battery power connector.

Take out the sealing ring from the terminal.

Unscrew the screw on the terminal used to connect the battery power cable.

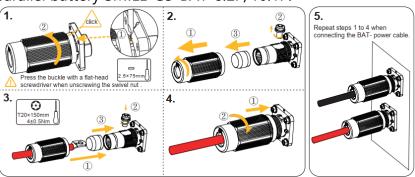
Pass the battery power+ cable through the threaded sleeve and the sealing ring, enter the terminal.

Tighten the screw to secure the battery power cable on the terminal (tool: T20 screw-driver, torque: 4Nm).

Push the sealing ring to the terminal.

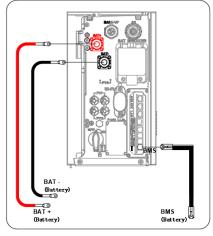
Tighten the threaded sleeve to the terminal by hand.

c. Repeat the above steps to finish another end connection of battery power+ cable. Refer to the above steps, connect the battery power- cable between the inverter and parallel battery SMILE-G3-BAT-8.2P/10.1P.

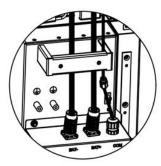


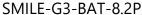


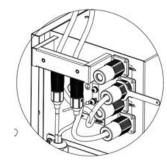
Final electrical connection diagram between the inverter and the first parallel battery:











SMILE-G3-BAT-10.1P

For electrical connection between multiple parallel batteries SMILE-G3-BAT-8.2P/10.1P, please follow the steps below.

- a. Take out battery power cables and communication cable from battery packaging.
- b. Connect the BMS communication cables from battery 2 to battery 1, follow the installing steps of the upper half at P84. Remove the terminal resistor of battery 1, retain the terminal resistor of battery 2.
- c. Connect the power cables from battery 2 to battery 1, follow the installing steps of the bottom half at P85.
- d. For grounding connection between batteries, please refer to chapter 6.2 Grounding Connecting.
- e. When installing more batteries, repeat the above connection steps a to d.

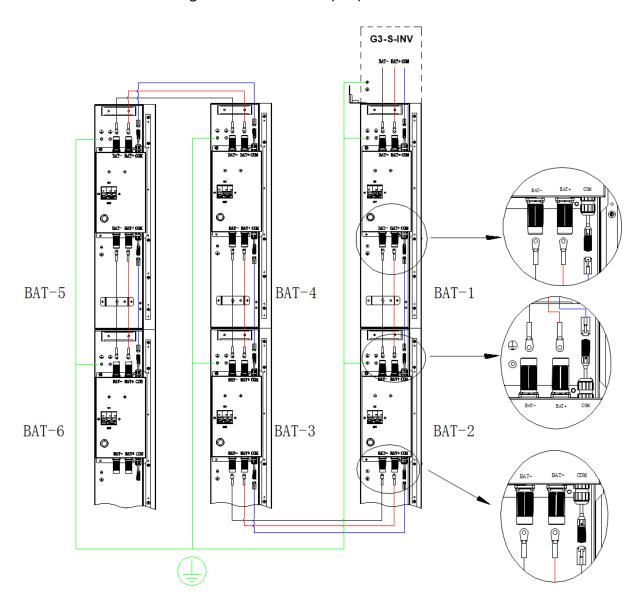
You can install extra batteries up to 6 batteries in a system. Please install extra batteries side by side.

Also, batteries can be stacked up to two batteries per column.

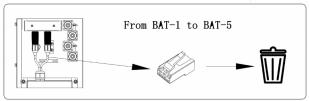


Connect the cables between the multiple parallel batteries, route them from the rear side of the battery when two batteries stacking installation.

Electrical connection diagram between multiple parallel batteries SMILE-G3-BAT-8.2P:

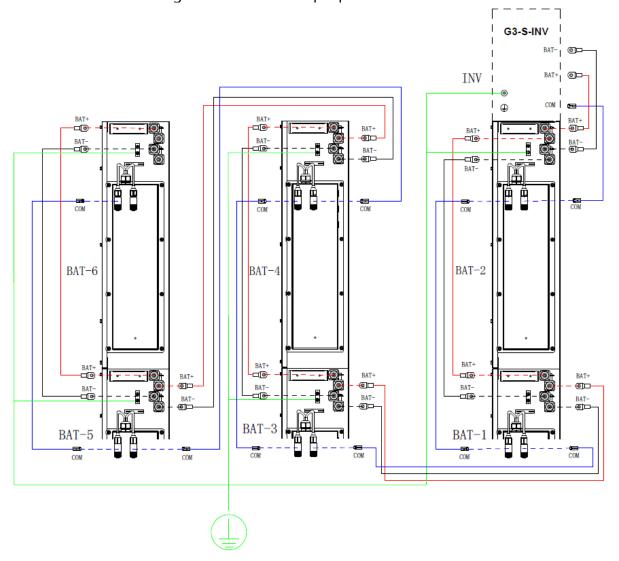


Remove the excess terminal resistor, retain the terminal resistor of last battery.

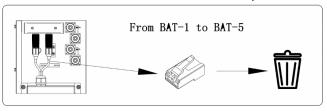




Electrical connection diagram between multiple parallel batteries SMILE-G3-BAT-10.1P:



Remove the excess terminal resistor, retain the terminal resistor of last battery.



You can install up to 4 series batteries in a system.

Cables connection between the inverter and series batteries of one column:

Please pay attention to the cable type, there are three kinds of cables.

No.	Picture	Description
1	27	Grounding cable between inverter and first series battery: connect the grounding point of the upper battery of first column series batteries and the grounding point of the inverter
2		The red power cable: connect BAT main positive of series battery and the BAT positive of inverter
3		The black power cable: connect BAT main negative of series battery and the BAT negative of inverter



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.



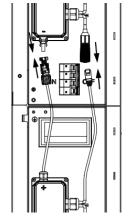
- Disconnect the battery from all voltages sources prior to performing any work on the battery.
- The upper connector of the lower battery must connect to the lower connector of the upper battery, otherwise the short-circuiting of the battery will occur.
- Observe battery safety information provided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

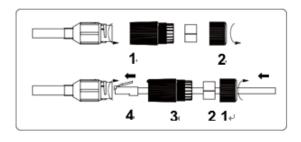
Detailed electrical connection between the inverter and series batteries as follows:

a. Complete the grounding, power and communication connection between the upper and lower series batteries.

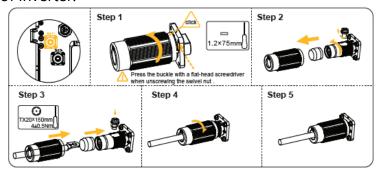
Take down the protective caps from the battery power connectors of the batteries. Connect the upper power connector of the lower series battery to the lower power connector of the upper series battery.

Connect the upper communication cable of the lower series battery to the lower communication connector of the upper series battery.

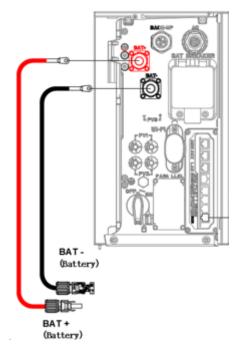




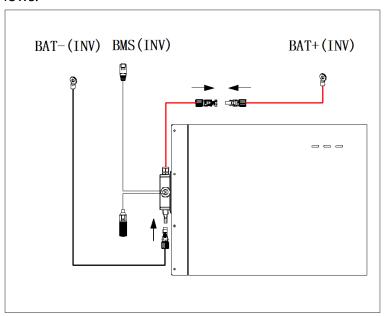
- b. Use the provided grounding cable to connect the grounding point of the inverter and the grounding point of the top battery.
- c. Take out the red power cable from the inverter packaging, connect BAT main positive of series batteries (directly below the inverter) to the BAT positive connector of inverter. Please follow the installing steps of the bottom half at page 85 for BAT positive connection of inverter.

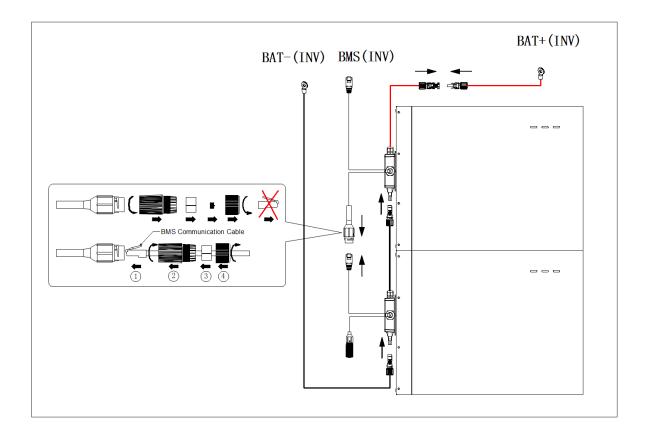


d. Take out the black power cable from the inverter packaging, connect BAT main negative of series batteries (the last series battery) to the BAT negative connector of inverter.

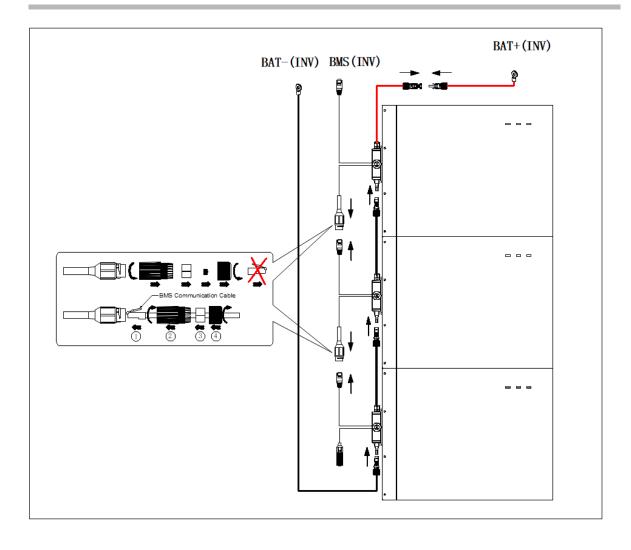


Electrical connection between the inverter and series batteries of one column as follows:









Electrical connection between the inverter and series batteries of two column as follows:

Cables for distanced horizontal series batteries expansion should be purchased additionally.

Please pay	attention	to the cable	type, there	are four	kinds of cables.
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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 two 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 comminucation cable, connect the lower comminucation connector of the bottom battery of first column series battery and the upper comminucation cable of the top battery of second column series battery
4	The state of the s	Grounding cable between two column series batteries: connect the grounding point of the bottom battery of first column series batteries and the grounding point of the top or bottom battery of second column series batteries

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

- a. Disconnect the energy storage system from all voltages sources prior to performing any work on the system.
- b. 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.

c. Complete the electrical connection between two column series batteries.

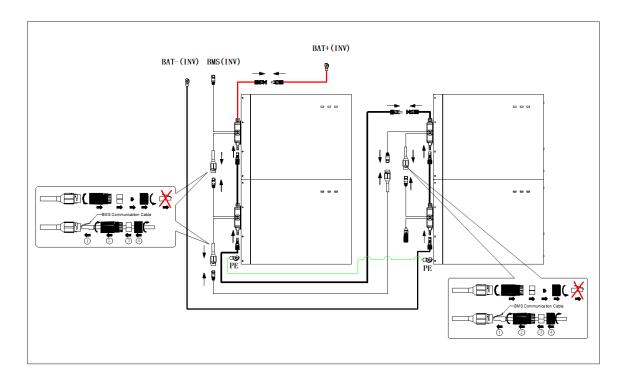
Use the provided power cable to connect BAT negative connector of the bottom battery of first column series batteries and BAT positive connector of the top battery of second column series batteries.

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

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.

e. Please remove or disassemble the original main negative power cable (2m) provided in the inverter packaging.

f. 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.





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



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

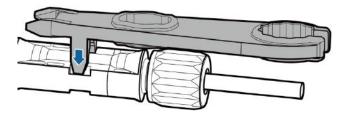
The BAT connectors can break or become damaged, become free of the DC cables, or no longer be connected correctly if the BAT connectors are released and disconnected incorrectly. This can result in the DC conductors or BAT plug contacts being exposed. Touching live DC conductors or BAT plug connectors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

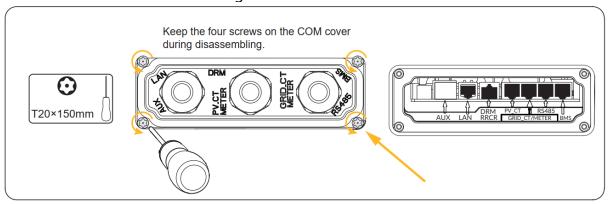




6.6. Communication Connection with Inverter

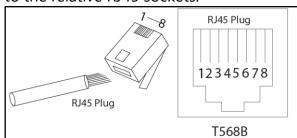
For other communication (AUX, LAN, RRCR, DRM, Meter, RS485) connection, please follow the steps below.

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.

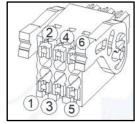


2. Pass the communication cables through the cable glands of the COM connection cover. Do not tighten the strain relief nuts of the cable glands yet.

Insert the RJ45 plugs to the relative RJ45 sockets.



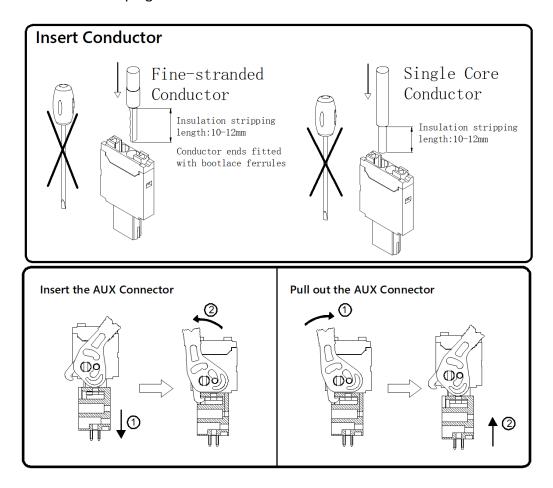
- 1) For meter wiring, refer to Section 6.3.4.2 for Meter Wiring.
- 2) If DRM support is specified, the system may only be used in conjunction with a Demand Response Enabling Device (DRED). This ensures that the system implements the commands from the grid operator for active power limitation at all times. The system and the Demand Response Enabling Device (DRED) must be connected in the same network. Only DRMO is available for SMILE-G3 inverter.
- 3) Take out 1 pcs 6 pin terminal block for AUX connection. For AUX position definition, please refer to the AUX wiring documentation.



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 0.5mm², 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.



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:

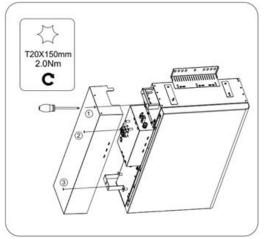
ITIM NO	1	2	3	4	5	6	7	8
BMS	NC	RS485_A4	NC	CAN1_H	CAN1_L	NC	RS485_B4	NC
RS485	12V	NC	GND	RS485_B5	RS485_A5	NC	NC	NC
GRID_CT/METER	GRID_CT-	GRID_CT+	RS485_A7	NC	NC	RS485_B7	NC	NC
PV_CT	PV_CT-	PV_CT+	RS485_A7	NC	NC	RS485_B7	NC	NC
RRCR	K1	K2	K3	K4	3.3V			
DRM	DRED1/5	DRED2/6	DRED3/7	DRED4/8	REFGEN/0	COMLOAD/0		
	DO1_NO	DO1_COM	DO1_NC	DI_NEGATIVE	DI_POSITIVE	GND		
AUX	2A 24VDC	2A 24VDC	2A 24VDC	44.00/50	44.04)/D0	4.0		
	2A 230VAC	2A 230VAC	2A 230VAC	1A 24VDC	1A 24VDC	1A		



6.7. Mount Covers of the Battery and Inverter

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

- 1. Mount the cable cover of battery Mount the cable cover of battery SMILE-G3-BAT-8.2P
- a. Cut a cable hole based on the cabling routing, and route the cables through the cable hole.
- b. Secure the cable cover to the battery housing (tool: T20 screwdriver, torque: 2.0Nm).

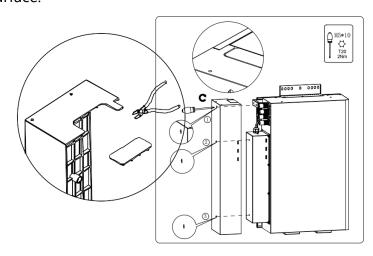


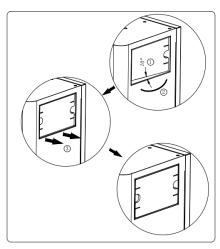
Disassemble the cable cover of the battery SMILE-G3-BAT-8.2P

- a. Unscrew the three screws of the cable cover to the battery housing (tool: T20 screwdriver, torque: 2.0Nm).
- b. Grasp the cable cover, then move it to the left.

Mount the left cable cover of the battery SMILE-G3-BAT-10.1P, then install the right breaker cover, detailed steps as follows:

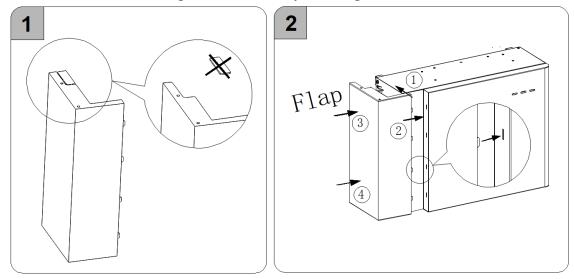
- a. Cut a cable hole based on the cabling routing, and route the cables through the cable hole.
- b. Secure the cable cover to the battery housing (tool: T20 screwdriver, torque: 2.0Nm).
- c. Slantly place the breaker cover into the rectangular hole and flatten it with housing surface.





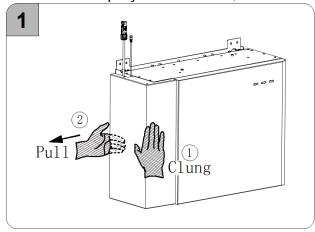
Mount the cable cover of the battery SMILE-G3-BAT-3.6S/4.0S

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



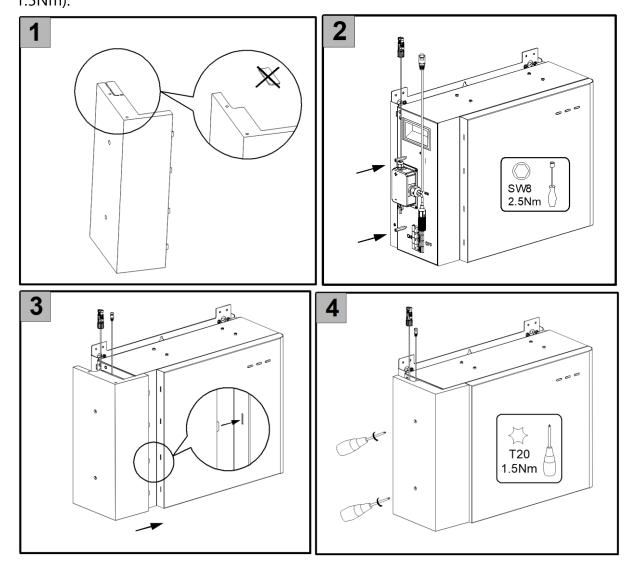
Disassemble the cable cover of the battery SMILE-G3-BAT-3.6S/4.0S

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



Mount the cable cover of the battery SMILE-G3-BAT-3.8S

- a. Cut a cable hole based on the cabling routing and route the cables through the cable hole.
- b. Tighten the two support studs for battery cable cover to the battery housing (tool: SW8 hexagon sleeve, torque: 2.5Nm).
- c. Align the four small protrusions on the right side of the cable cover to the slots on the left side of the battery's front cover, push the cable cover towards the right.
- d. Secure the cable cover to the battery housing (tool: T20 screwdriver, torque: 1.5Nm).



Disassemble the cable cover of the battery SMILE-G3-BAT-3.8S

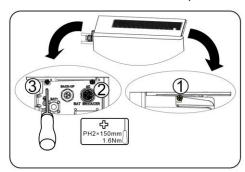
- a. Unscrew the two screws of the cable cover to the battery housing (tool: T20 screwdriver, torque: 1.5Nm).
- b. Grasp the cable cover, then move it to the left.



2. Mount the covers of the inverter Attach the top cover to the inverter.

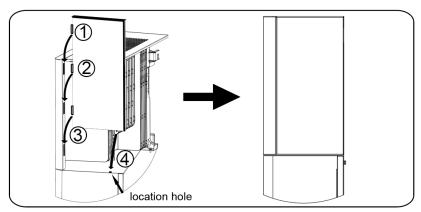
Place the top cover on top of the inverter and slide it forward. The three side screws of the top cover should align with the inverter mounting threaded holes. Secure the top cover to the inverter (tool: PH2 screwdriver, torque: 1.6Nm).



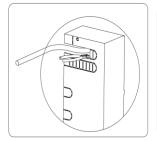


Mount the right cover and cable cover of the inverter when inverter standing on the battery, please follow the steps below.

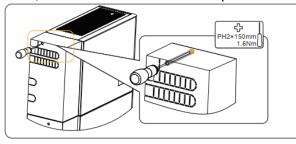
- a. Take out the right cover and cable cover from the inverter packaging.
- b. Align the hooks on the front side of the right cover to the slots on the front cover side, downwards insert the right cover along the edge of the inverter front cover.



- c. Cut a cable hole based on the AC cabling routing, and route the cables through the cable hole.
- d. Align the hooks on the side of the cable cover with the slots on the front cover side, secure the cable cover to the inverter (tool: PH2 screwdriver, torque: 1.6Nm).

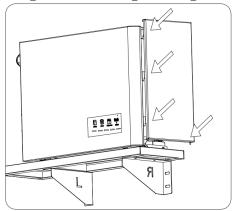




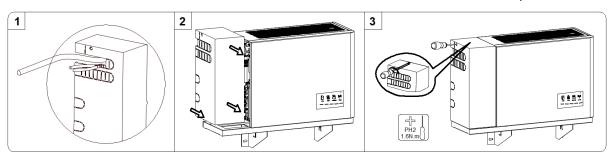


Mount left cable cover and right cover of the inverter when inverter mounting with holding bracket, please follow the steps below.

- a. Take out the right cover and cable cover from the inverter packaging.
- b. Align the hooks on the front side of the right cover to the slots to the front cover side, downwards insert the right cover along the edge of the inverter front cover.



- c. Cut a cable hole based on the AC cabling routing, and route the cables through the cable hole.
- d. Align the hooks on the side of the cable cover with the slots on the front cover side, secure the cable cover to the inverter (tool: PH2 screwdriver, torque: 1.6Nm).



7. Power on and off the System

7.1. Power on the System



- Before power on the energy storage system, please ensure the PV switch & all AC and BAT circuit breakers in the system are switched OFF and cannot be reactivated.
- Never power on the energy storage system without the correct and reliable installation and electrical connection.
- 1) Switch on the battery circuit breaker which is at the upper left of the inverter.
- 2) Switch on the battery circuit breakers of all batteries.
- 3) For series batteries, please skip this step.
- Shortly press the power buttons of all parallel batteries. For more than one parallel battery installed, please press all power buttons within 30 seconds. This power button is located just beside the battery circuit breaker on each parallel battery.
- 4) 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).
- 5) 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).
- 6) Switch on the PV switch at the lower left of the inverter (if there are PV strings directly connected to the energy storage inverter).
- 7) 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



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

- 1) Switch off the AC circuit breaker between the energy storage inverter and the backed-up loads.
- 2) Switch off the AC circuit breaker between the energy storage inverter and the mains grid.
- 3) Switch off the PV DC Isolator(s) between the PV strings and the energy storage inverter if there are any.
- 4) Switch off the PV switch on the lower left of the energy storage inverter (if there are PV strings directly connected the energy storage inverter).
- 5) For series batteries, please skip this step.

 Hold the battery power button located beside the battery circuit breaker for 6s to turn off each parallel battery.
- 6) Switch off the battery circuit breakers of all batteries.
- 7) 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 module should be mounted correctly, securely, and reliably.
4	Cable layout	Cables should be routed neatly and protected adequately where exposed, in accordance with standards.
5	Cable tie	Cable ties should be secured and trimmed evenly and no burr exists.
6	Grounding	The grounding cables should be connected correctly, securely, and reliably. Impedance/resistance checks should be conducted to confirm reliable grounding connections.
7	Switch and breakers status	The PV switch (if there is any) and battery breakers and any breakers connecting to the 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 connection ports	Unused power ports and communication ports should be sealed from water or dust ingress by watertight caps.

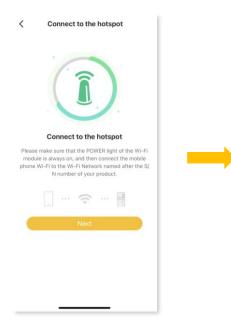
8.2. Wi-Fi Module Configuration and Basic Parameters Settings

8.2.1. Wi-Fi Configuration

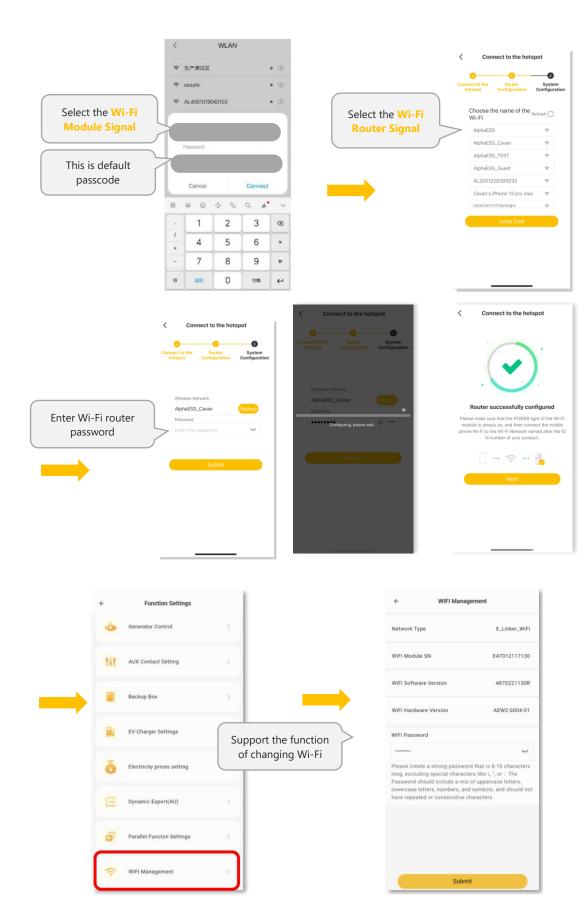
This section is for user who has an energy storage system with a Wi-Fi module. The AlphaESS App is used to configure the network, set system basic parameter, monitor system operating status and check configuration information.











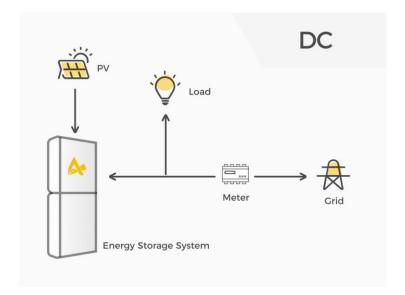


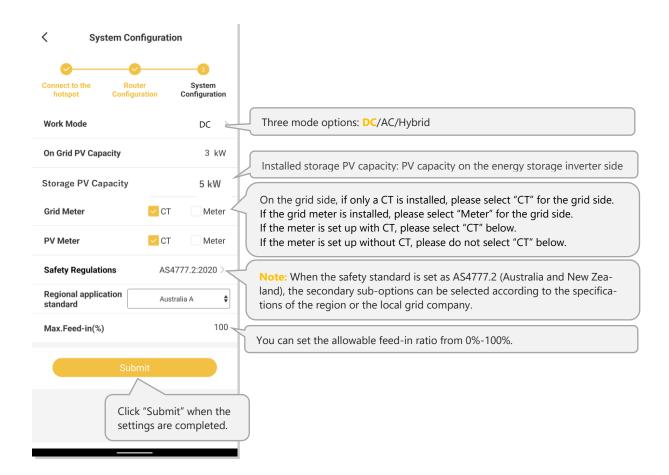
- The system will not be able to connect to the internet without either a physical LAN cable connection or configured Wi-Fi if the Wi-Fi module is used.
- To ensure account security, change the password periodically and keep the new password in mind. Not changing the initial password may cause password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



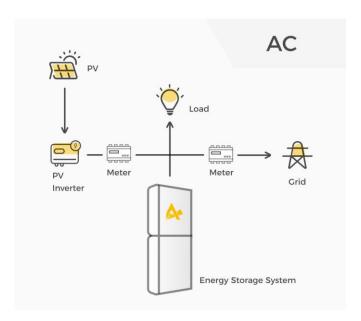
8.2.2. Basic Parameters Settings

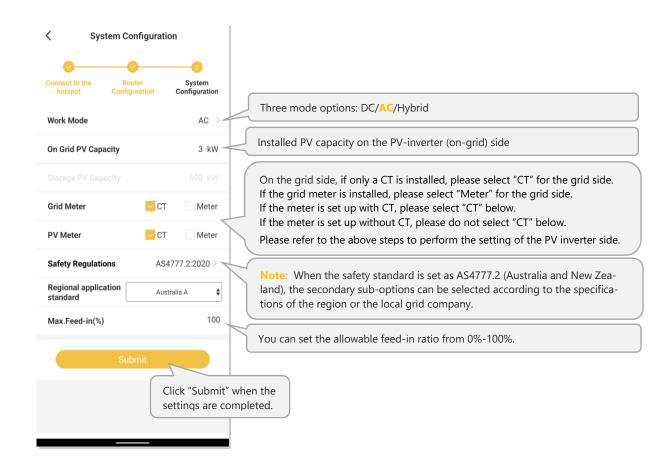
DC Mode



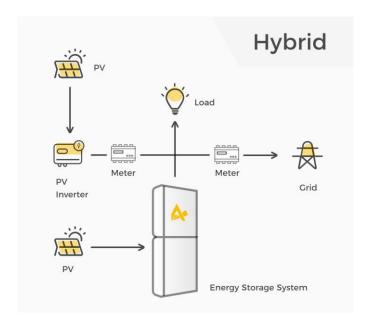


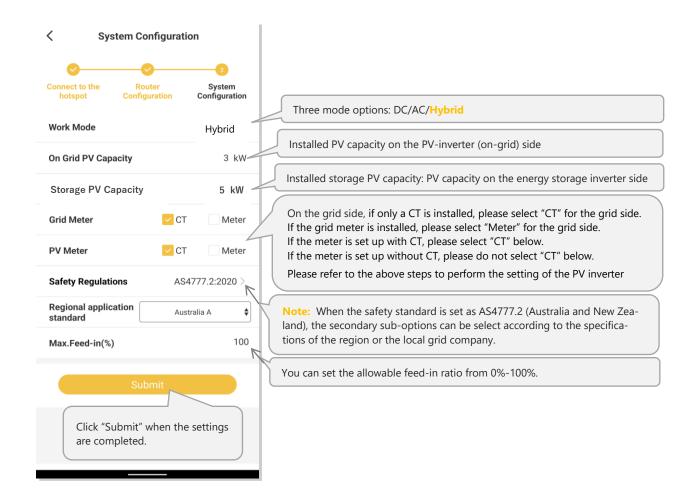
AC Mode





Hybrid Mode







The safety standard field must be set correctly

If you select a safety standard that is not valid for your country, region and purpose, a disturbance in the energy storage system, or problems with the Network Operator may occur. When selecting the safety standard, make sure to always observe the locally applicable standards and directives as well as the properties of the PV system (e.g. PV system size, grid-connection point).

• If you are not sure which safety standard is valid for your country, region or purpose, contact your Network Operator for information on which safety standard should be used.



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

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

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



8.3. Installing New System and Settings up the App

8.3.1. Download and Install the App

1. Android device users can download the App through major Android App stores such as Google Play.

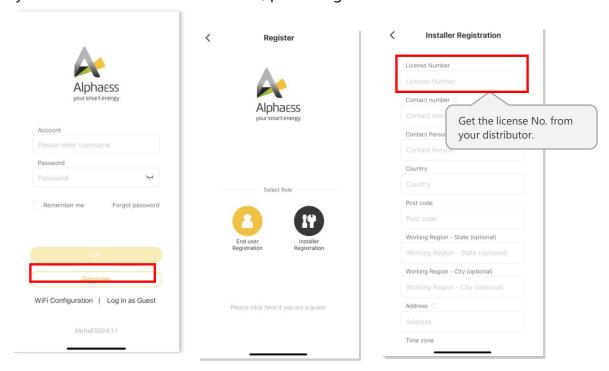
2. IOS device users can search for "AlphaESS" in the App Store and download the App.



AlphaESS App

8.3.2. Register as an Installer

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



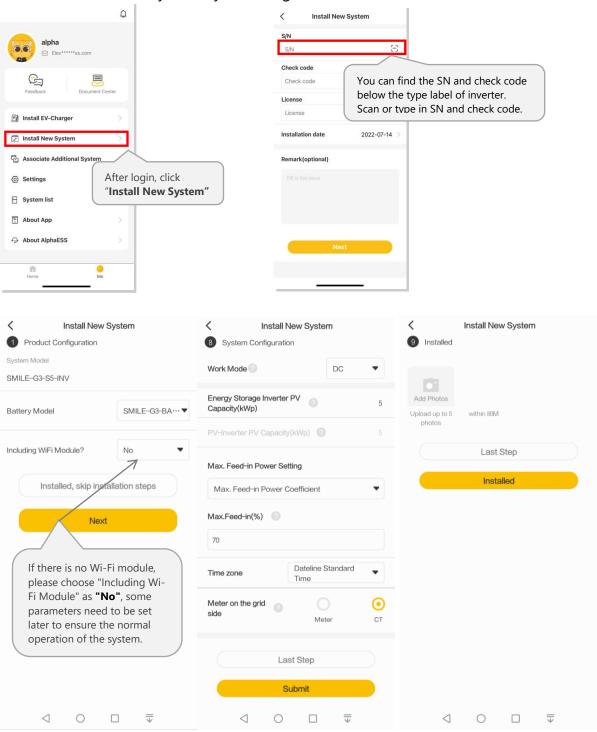
If you already have an installer account, please log in directly.

8.3.3. Overview of Functions for Installer Account



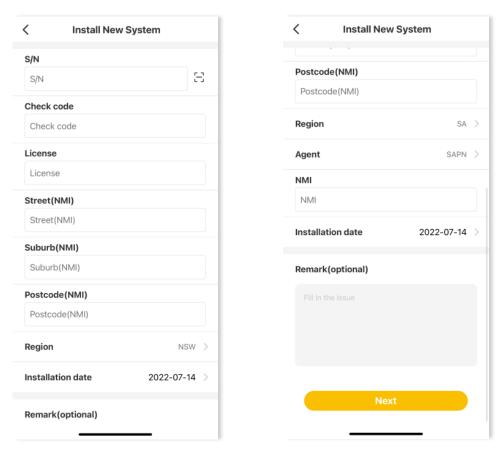
8.3.4. Install New System on the App

You can install a new system by following the instructions below:



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

*More settings are needed for installers in Australia. If you are an Australian installer, you will need to fill in the Street (NMI), Suburb (NMI) and Postcode (NMI) fields for the Region field, which has six fixed options (NSW, QLD, VIC, SA, TAS, WA). If SA is selected as the Region, two more fields are required, which are Agent and NMI. These fields are necessary in response to the requirements of the Network Operator for Dynamic Export and for PV output control by a Relevant Agent.



Australian Installer

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

8.3.5. Instruct the End User to Install the App

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



8.4. Register on AlphaCloud

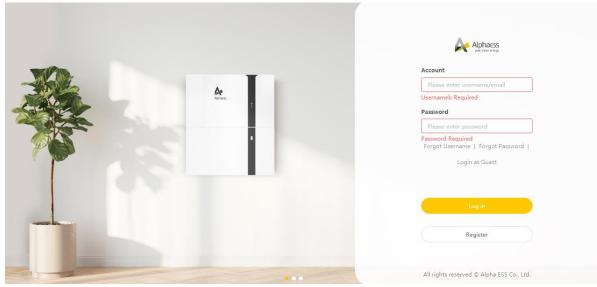
8.4.1. Register an Installer Account on AlphaCloud

If you don't have an Installer account, you can create a new account on our web server for system monitoring purposes.

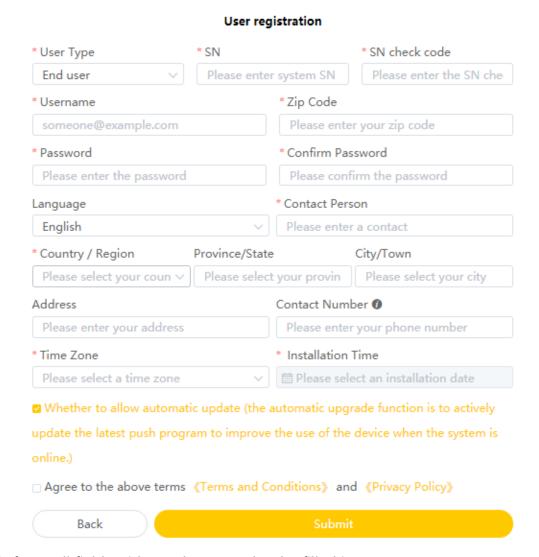
The data produced prior to registration can be synchronized to the web server.

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

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



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



In this form, all fields with a red star need to be filled in.

***Serial Number:** SN (please see the type label of the inverter)

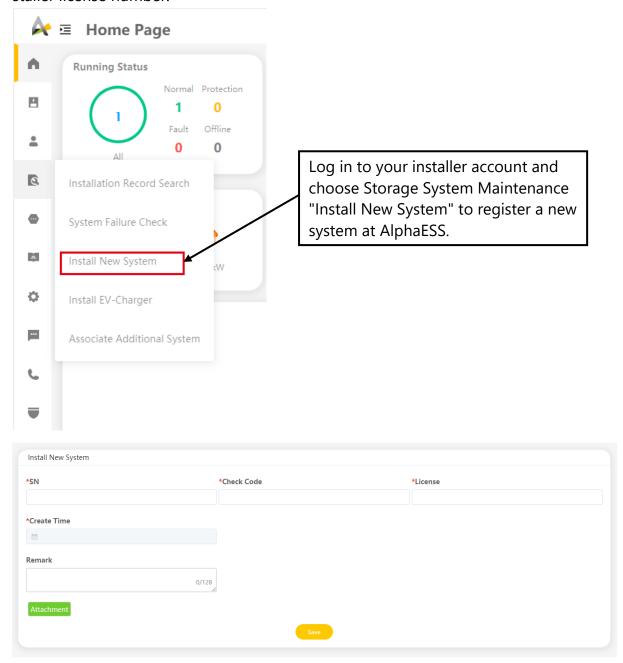
*Username: 5-15 letters / numbers

*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.

8.4.2. Install New System on AlphaCloud

Installers who haven't registered yet 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 AlphaESS sales team and get an AlphaESS Installer license number.

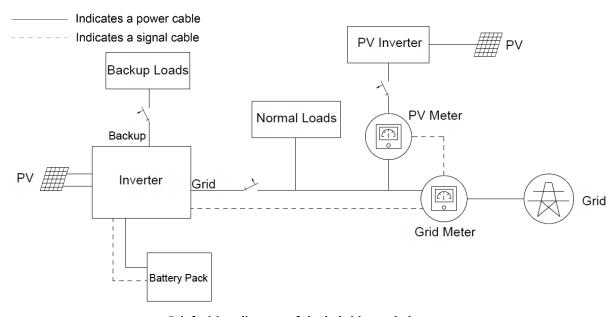


Enter the system S/N, check the code, license, and installation date, then click the "Save" button. All fields with a red star need to be filled in. Click the "Browse" button to select any attachment you want to add.

8.5. Check System Wiring and Meter Installation

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

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



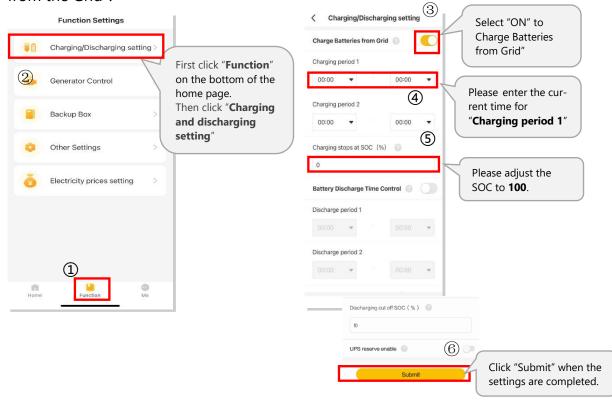
Brief wiring diagram of the hybrid-coupled system

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

- 1. Please perform the steps below for the circuit breakers and PV switch in the system
- a. Switch on the battery circuit breaker of the energy storage inverter.
- b. Switch on the battery circuit breakers of all batteries.
- c. For series batteries, please skip this step.
- Shortly press all power buttons of all parallel batteries within 30 seconds.
- d. Switch on the AC circuit breaker between the grid port of the energy storage inverter and the mains grid.
- e. Switch on the AC circuit breaker between the backup port of the energy storage inverter and the loads.
- f. Switch off the PV switch of the energy storage inverter.
- g. Switch off the AC circuit breaker (if there is any) between the PV inverter and the mains grid.
- h. At this moment, the energy storage inverter will enter NORMAL state.
- i. Turn off all loads. If not all loads can be turned off, please ensure that there are no major power fluctuations through in the system.
- j. Log in to the AlphaESS App and go to the "My System" page and record the current "**Load**". For example, in the figure below, **Load** equals 719 W.



2. In the AlphaESS App, follow the instructions below to enable "Charge Batteries from the 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.



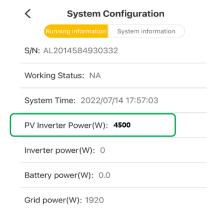
If the formula above does not apply, please perform the troubleshooting below

II the formula abo	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 technical service team for further check.		
Meter (without CT)	Check the wiring and location of the grid meter.		
Meter (with CT)	r (with CT) Check the location, direction, phase sequence and cable connection of grid CT.		
Only CT	Check the location, direction and cable connection of grid CT.		

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

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

Click 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 PV inverter is correct.



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.	
DD, DD PIUS	If the error persists, contact AlphaESS technical service team for further check.	
Meter (without CT) Check the wiring and location of the PV meter.		
Meter (with CT) Check the location, direction, phase sequence and cable connection of P\		
Only CT	Check the location, direction and cable connection of PV CT.	

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



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

6. Congratulation. All required checks of system wiring and meter installation have been completed.



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



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

Communication Troubleshooting

Communication In	Communication Troubleshooting				
LED Indictor	Error Code	LED Display	Description	Troubleshooting	
SYS red light is flashing fast	4	<u> </u>	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	5	SYS METER	Grid meter lost	Grid side meter lost 1. Check whether the system configuration parameters of 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.	
flashing slow if PV meter lost . METER light is off if all meters lost.	6	SYS METER	PV meter lost	PV inverter side meter lost 1. Check whether the system configuration parameters of 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	SVE BAT	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 service for further check.	



Battery Error Troubleshooting

LED Indictor	Error Code	LED Display	Description	Troubleshooting
CVC I	60002	BUT BAST SANT CORN	Circuit_Breaker_Open	Try to switch on the circuit breakers of all batteries. If the error persists, contact customer service for further check.
SYS red light is glowing, BAT light is flashing	60004	SYS BAT METER COM	Follower_Battery_ Communication_Lost	
during battery is in faulty.	60006	SYS BAT METER COM	Host_Battery_Commu nication_Lost	Check the communication cables between batteries. If the error persists, contact customer service for further check.
	60008	SYS BAT METER COM	Multi_Master_error	

Inverter Error Troubleshooting

Inverter Error Troubleshooting					
LED Indictor	Error Code	LED Display	Description	Troubleshooting	
	100000	SYS BAT METER COM	Grid_OVP	 Check whether grid is abnormal. Confirm whether the grid cable connection is normal. Restart inverter. If the error persists, contact customer service for further check. 	
SYS red light is flashing 10000 fast.	100001	SYS BAT METER COM	Grid_UVP	Check whether the PV input voltage of PV1 and PV2 exceeds	
	100002	SYS BAY METER COM	Grid_OFP	580V. If there is no PV input overvoltage, restart the inverter. If the error persists, contact cus tomer service for further check.	
	100003	SYS BAT METER COM	Grid_UFP		

	100005	SVS BAT METER COM	BUS_OVP1	1. Check whether the PV input voltage of PV1 and PV2 exceeds 580V. If there is no PV input overvoltage, restart the inverter. If the error persists, contact customer service for further check.
	100007	SYS BAT METER COM	Insulation_ fault	Check whether PV cable connection is reliable. Check whether PV cable is damaged. If the error persists, contact customer service for further check.
	100008	SVE BAT METER COM	GFCI_fault	Restart inverter and check whether the error persists. The start inverter and check whether the error persists. The start inverter and check whether the error persists.
	100010	SYS BAY METER COM	Grid_relay_ fault	If it so, please call customer service.
SYS red	100011	SYS BAT METER COM	Over_ Temperature	Check whether the environment around inverter has poor heat dissipation. Confirm whether inverter installation meets the installation requirements.
light is flashing fast	100012	SYS BAT METER COM	PV_Reverse	1.Check whether the PV terminal of the inverter is reversed. If the connection of PV terminals is right and the error persists, please call customer service.
	100013	SYB BAT METER COM	BAT_Reverse	1.Check whether the BAT terminal of the inverter is reversed. If the connection of BAT terminals is right and the error persists, please call customer service.
	100017	SVS BAT METER COM	MPPT1_OVP	Check the PV1 voltage. If it exceeds 585VDC, reduce the number of PV modules.
	100021	SYS BAT METER COM	MPPT2_OVP	Check the PV2 voltage. If it exceeds 585V, reduce the number of PV modules.
	100025	SYS BAT METER COM	BAT_OVP	Check whether the actual battery voltage exceeds the battery charge cut-off voltage by more than 20V.



10	100026	SYS BAY METER COM	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	SVS BAT METER COM	Battery_lose	Confirm whether the battery communication cable connection is normal. Check whether the battery voltage sampling value is less than 75V. If the error persists, contact customer service for further check.
	100042	SYS BAT METER COM	Output_short_ circuit	Use a multimeter to test the impedance of the off-grid output. If it is low, check whether the wiring is correct. Restart the inverter. If the error persists, contact customer service for further check.
	100043	SYS BAT METER COM	Output_ overload	Check whether the load exceeds the rated power. Restart the inverter. If the error persists, contact customer service for further check.
SYS red light is flashing fast.	100052	SYS BAT ((0))	Backup_ovp	Restart the inverter. If the error persists, contact customer service for further check.
	100211	SYS BAT METER COM	Para_CAN	Check the communication cables connection between inverters. If the error persists, contact customer service for further check.
	100213	SYS BAT METER COM	Para_SW_Diff	Check the inverter software versions. If they are inconsistent, upgrade the inverters to the same software version.
	100214	SYS BAT METER COM	Para_Module_ Fault	- Check parallel inverter mode
	100216	SYS BAT METER COM	Para_Multi_ Master	settings. Only one host is allowed.

Accessories Error Troubleshooting of EV Charger

LED Indictor	Error Code	LED Display	Description	Troubleshooting
	39	SYS BAT METER COM	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	SVS BAT METER COM	Relay OTP	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.	200001	SYS BAT METER COM	Output overload	Check whether the load exceeds the rated power. Restart the inverter. If the error persists, contact customer service for further check.
	200010	SYS BAT METER COM	AC leakage current	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.
	200011	SYS BAT METER COM	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 cus- tomer service for further check.
	200014	SVS BAT METER COM	Relay abnormal	1. The EV charger has a hardware failure and need to be replaced, please contact customer service.
	200015	SYS BAT METER COM	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	SVE BAT METER COM	Reverse phase	1. Shut off the leakage current protection switch in 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.

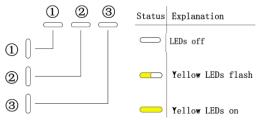


- 1. The four LEDs in the first row are system (SYS), battery (BAT), meter (METER), and communication (COM).
- 2. The five LEDs in the second row serve two functions:
- 1) During normal system operation, they indicate the SOC operation status of the batteries connected in this energy storage system.
- 2) During abnormal system operation, they display corresponding error codes. Each light represents a number, with values of 1, 2, 4, 8, and 16, from right to left.



9.2.2. Battery Protection Description for Parallel Battery

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



LED Display State	Description	Troubleshooting
	High temperature	Stop discharging and charging until this display state is eliminated and wait for the temperature to drop.
0	Low temperature discharge	Stop discharging until this display state is eliminated and wait for the temperature to rise.
0	Overcurrent charge	Wait for automatic recovery. If this protection state persists, please call customer service.
0	Overcurrent discharge	Wait for automatic recovery. If this protection state persists, please call customer service.
0	Cell under voltage	Stop discharging and call customer service immediately.
0	Low temperature charge	Stop charging until this protection state is eliminated and wait for the temperature to rise.



During working mode, if the protection status "Cell under voltage" appears, please press the power button of the battery 5 times within 10 seconds, the BMS will be forced to turn on the MOSFET of discharge so that the inverter can detect the battery's open voltage and begin charging the battery.

9.2.3. 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
	Overcurrent dis- charge	service.
	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.

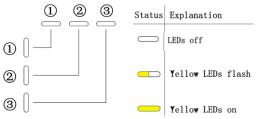


During work mode, if the protection status "Cell under voltage" — — — appears, please take the following action:

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 so that the inverter can detect the battery's open voltage and begin charging the battery.

9.2.4. 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.
	Hardware error	If this error persists, please call customer service.
. • • •	Circuit breaker open	Switch on circuit breaker after powering off the battery.
	LMU disconnect (follower)	Reconnect the BMS communication cable.
	SN missing	Please call customer service.
	LMU disconnect (host)	Reconnect the BMS communication cable.
	Software version inconsistent	Please call customer service.
	Multi-host	Restart all batteries.
-	MOS over temperature	Power off the battery and power on the battery after 30 minutes.
	Insulation fault	Restart battery. In case this error persists, please call customer service.
	Total voltage fault	Restart battery. In case this error persists, please call customer service.
0 0 0	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 top cover and right cover of the inverter.
- Step 5: Remove the inverter from the top of the battery.
- Step 6: Remove the battery wall brackets.
- Step 7: Remove the batteries.

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

- The product must be disposed of in accordance with the locally applicable disposal regulations for waste electrical and electronic equipment.
- 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.



Privilégiez la réparation ou le don de votre appareil!

11. Technical Data

11.1. Datasheet of Inverter SMILE-G3 Single Phase Inverter

Item	SMILE-G3- S6-INV	SMILE-G3- S5-INV	SMILE-G3- S3.6-INV	SMILE-G3 -B5-INV
Input DC (PV side)				
Recommended max. PV power	10000 W 7360 W		N/A	
Max. PV input voltage		580 V		N/A
Rated voltage		360 V		N/A
Start-up voltage	120V	90	V	N/A
MPPT voltage range		100 to 550 V		N/A
Max. input current per MPPT	15 A / 15 A		N/A	
Max. short circuit current per MPPT	22.5/22.5A 18.75 A / 18.75 A		N/A	
MPPT number		2		N/A
Max. input strings number per MPPT	1		N/A	
Surge category in accordance with IEC 62109-1	II		N/A	
Battery				
Battery type	LFP (LiFePO ₄)			
Battery voltage range	80 to 467.2 V		80 to 450 V	
Max. charge power	6 kW	5 kW	3.68 kW	5 kW
Max. discharge power	6 kW	5 kW	3.68 kW	5 kW
Max. charge/ discharge current	60 A / 60 A			
Communication	CAN			
Output AC (Back-up	, on Grid)			
Rated output power	6 kW	5 kW	3.68 kW	5 kW
Rated apparent output power	6 kVA	5 kVA	3.68 kVA	5 kVA
Rated output current	26 A	21.7 A	16 A	21.7 A
Rated output voltage	L/N/PE, 230 V			
Rated frequency	50/60 Hz			
Output AC (Back-up	-			
Rated output power	6 kW	5 kW	3.68 kW	5 kW
Rated apparent output power	6 kVA	5 kVA	3.68 kVA	5 kVA
Rated output current	26 A	21.7 A	16 A	21.7 A
Max. continuous output power	6.6 kW	5.5 kW	4.0 kW	5.5 kW

Max. continuous	C C) / A	F F 1.)/A	401)/4	F F 1.)/A
output apparent	6.6 kVA	5.5 kVA	4.0 kVA	5.5 kVA
power				
Max. output	9 kW	7.5 kW	5.5 kW	7.5 kW
power ≤ 30s				
Max. output apparent power ≤ 30s	9 kVA	7.5 kVA	5.5 kVA	7.5 kVA
Max. output				
power ≤ 1s	12 kW	10 kW	7.36 kW	10 kW
Max. output apparent	40.114	40114	7.061114	40114
power ≤ 1s	12 kW	10 kVA	7.36 kVA	10 kVA
Back-up switch time		<20	Oms	
Rated output voltage		L/N/PE	i, 230 V	
Rated frequency		50/6	0 Hz	
Input AC (Grid side)				
Rated output voltage		L/N/PE	i, 230 V	
Rated frequency		50/6	0 Hz	
Rated input power	11.5 kW	10 kW	7.36 kW	10 kW
Max. input current	50 A	43.5 A	32 A	43.5 A
Output AC (Grid sid	e)			
Rated output power	6 kW	5 kW	3.68 kW	5 kW
Rated apparent	6 kVA	5 kVA	3.68 kVA	5 kVA
output power	OKVA	JKVA	3.00 KVA	JKVA
Rating grid output	26 A	21.7 A	16 A	21.7 A
current	2071			21.77
Operation phase			phase	
Rated grid voltage	L/N/PE, 230 V			
Grid voltage range	150 to 287V	50.77	180 to 270 V	
Rated grid frequency		50 / 60 Hz		
Power factor	>0.99 (0.8 leading to 0.8 lagging)			
THDi	< 3%			
Protection class	I Total Transfer of the Indian Transfer of th			
Overvoltage category	III			
Surge category in				
accordance with	II			
IEC 60664-1				
Efficiency				
Max. efficiency	>97%			
EU efficiency	>96.2%			
Protection				
Anti-Islanding		Inted	rated	
protection				
Insulation resistor	Integrated			
detection	integrated			
Residual current	Integrated			
monitoring unit				
Output over current	Integrated			
protection				



Output short protection	Integrated		
Output overvoltage			
protection	Integrated		
PV reverse polarity protection	Integrated		
PV overvoltage protection	Integrated		
PV switch	_		
Battery breaker	Integrated Integrated		
General data			
Dimensions (W*H*D)		610*366*212 mm	
Weight	20.5kg	19.5kg	
Topology		Transformerless	
Operation temperature range	-25 to +60 °C		
Max. permissible value for relative humidity (condensing)	100%		
Ingress protection	IP65		
Display	LED		
Noise emission	<30 dB(A) @1m		
Cooling concept	Natural convection		
Max. operation altitude	3000 m		
Features			
PV connection		Vaconn D4 connector	
Grid connection	Vaconn plug in connector		
Backup connection	Handa plug in connector		
BAT connection	Screw terminal		
Communication	LAN, Wi-Fi		

11.2. Datasheet of Battery

11.2.1. Datasheet of Battery SMILE-G3-BAT-8.2P

Model	SMILE-G3-BAT-8.2P
Battery type	LFP (LiFePO ₄)
Rated capacity	30.4 Ah
Weight	78.3 kg
Dimension (W*H*D)	610*793*212 mm
Ingress protection	IP21
Installed energy	8.2 kWh
Usable capacity	7.8 kWh
DoD	95%
Nominal voltage	256 V
Operating voltage range	240 to 288 V
Max. continuous charge current*	32 A
Max. continuous discharge current*	32 A
Operating temperature range	Charge: 0 <t≤50℃< th=""></t≤50℃<>
Operating temperature range	Discharge: -10 <t≤50℃< td=""></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-10.1P

Model	SMILE-G3-BAT-10.1P
Battery type	LFP (LiFePO ₄)
Rated capacity	99.7 Ah
Weight	90 kg
Dimension (W*H*D)	610*790*210 mm
Ingress protection	IP65
Installed energy	10.1 kWh
Usable energy	9.6 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 to 108 V
Max. continuous charge current*	52.5 A
Max. continuous discharge current*	52.5 A
Operating temperature range	Charge: 0 <t≤50°c< th=""></t≤50°c<>
Operating temperature range	Discharge: -10 <t≤50°c< td=""></t≤50°c<>
Monitoring parameters	System voltage, current, cell voltage,
Widintoring parameters	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-3.6S

Model	SMILE-G3-BAT-3.6S
Battery type	LFP (LiFePO ₄)
Rated capacity	37.5 Ah
Weight	43.2 kg
Dimension (W*H*D)	610*435*212.5 mm
Ingress protection	IP65
Installed energy	3.6 kWh
Usable energy	3.6 kWh
DoD	100%
Nominal voltage	96 V
Operating voltage range	90 to 108 V
Max. continuous charge current*	42 A
Max. continuous discharge current*	42 A
Operating temperature range	Charge: 0 <t≤50℃< th=""></t≤50℃<>
Operating temperature range	Discharge: -10 <t≤50℃< td=""></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. SMILE-G3-BAT-3.6S is only for Greece market.



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

Model	SMILE-G3-BAT-3.8S
Battery type	LFP (LiFePO ₄)
Rated capacity	38 Ah
Weight	38.5 kg
Dimension (W*H*D)	610*435*212 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 108 V
Max. continuous charge current*	40 A
Max. continuous discharge current*	40 A
Operating temperature range	Charge: 0 <t≤50°c< th=""></t≤50°c<>
Operating temperature range	Discharge: -10 <t≤50℃< td=""></t≤50℃<>
Monitoring parameters	System voltage, current, cell voltage,
Wionitoring parameters	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.

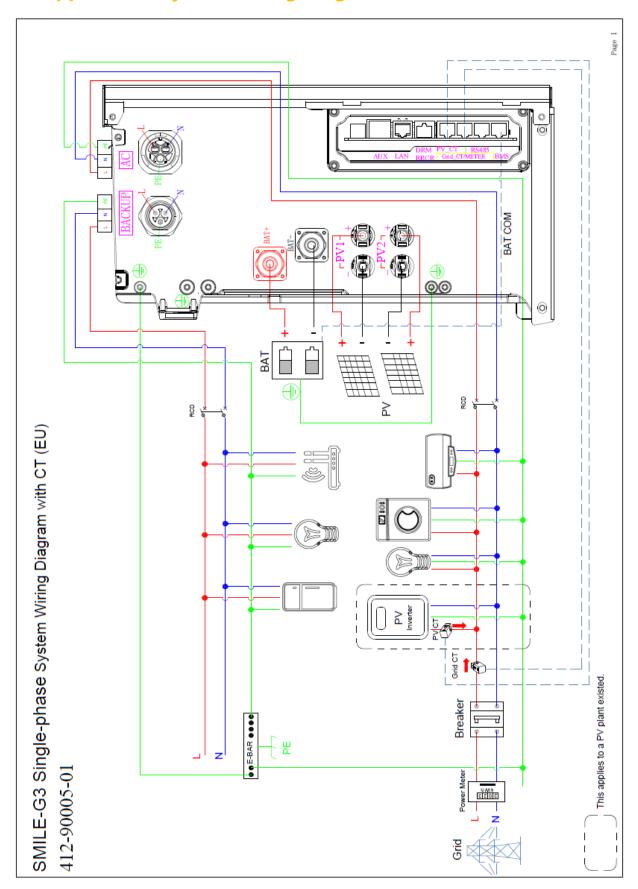
11.2.5. Datasheet of Battery SMILE-G3-BAT-4.0S

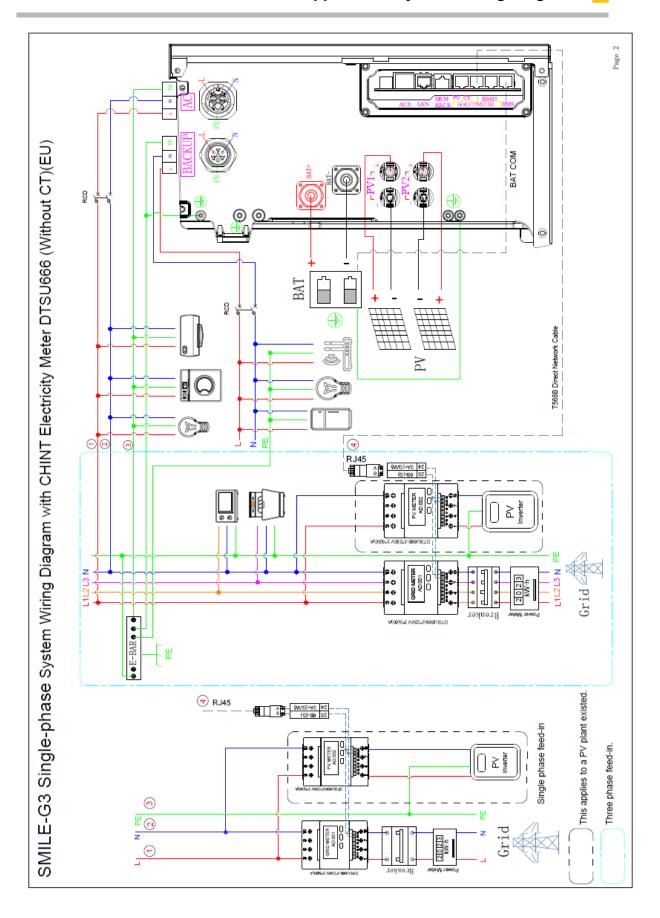
Model	SMILE-G3-BAT-4.0S
Battery type	LFP (LiFePO ₄)
Rated capacity	39.9 Ah
Weight	43.2 kg
Dimension (W*H*D)	610*435*212.5 mm
Ingress protection	IP65
Installed energy	4.0 kWh
Usable energy	3.8 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 to 108 V
Max. continuous charge current*	42 A
Max. continuous discharge current*	42 A
Operating temperature range	Charge: 0 <t≤50℃< th=""></t≤50℃<>
Operating temperature range	Discharge: -10 <t≤50℃< td=""></t≤50℃<>
Monitoring parameters	System voltage, current, cell voltage,
DMC communication	cell temperature, PCBA temperature
BMS communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

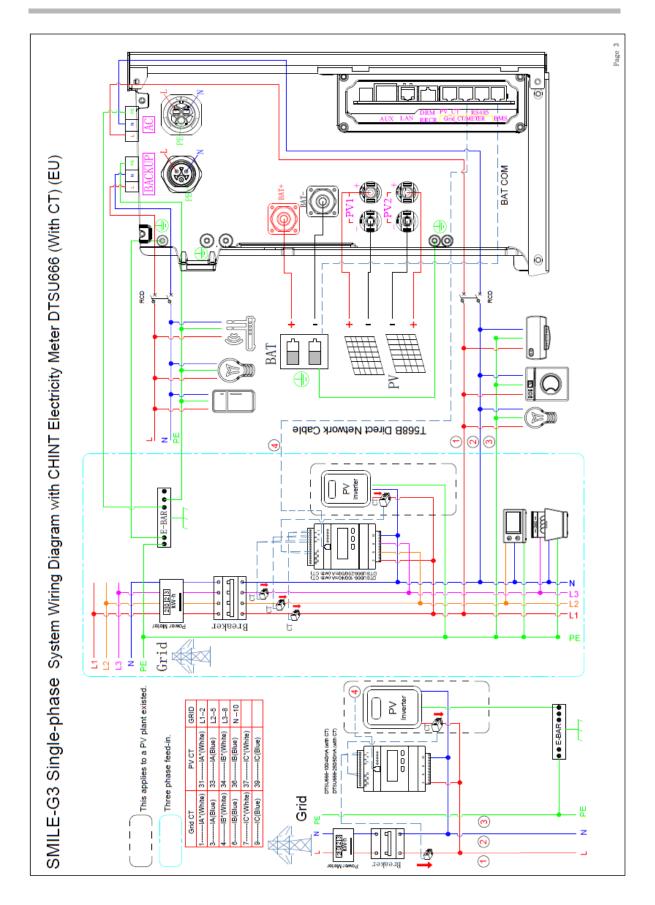
^{*} Max. charge/discharge current derating may occur with changes in temperature and SOC.

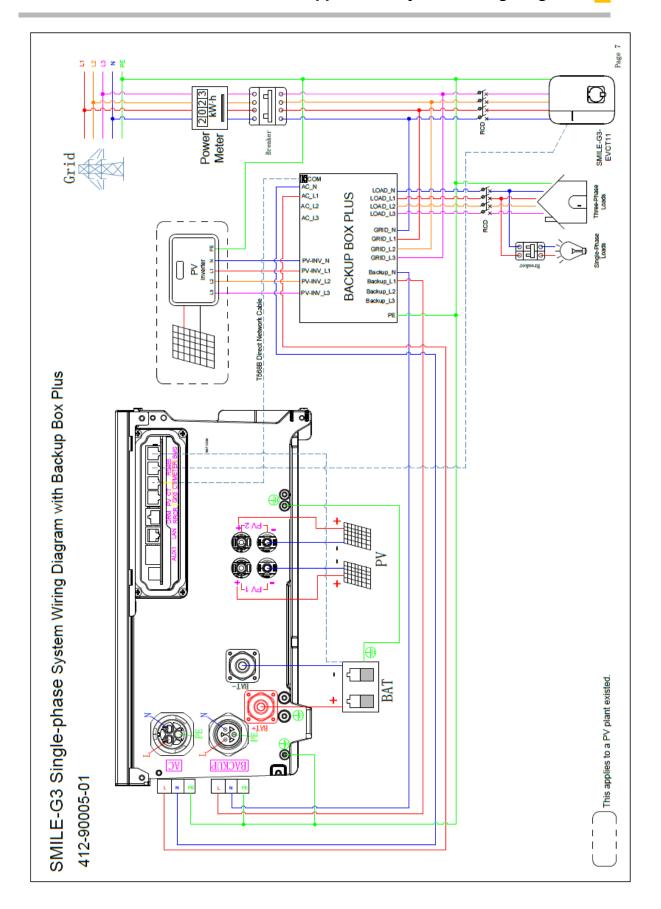


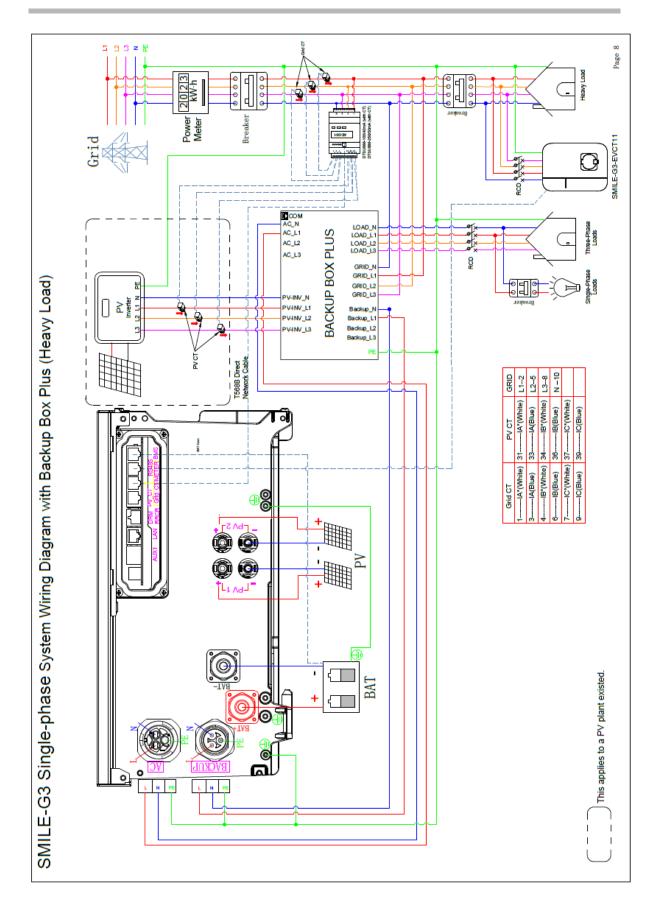
Appendix 1: System Wiring Diagram

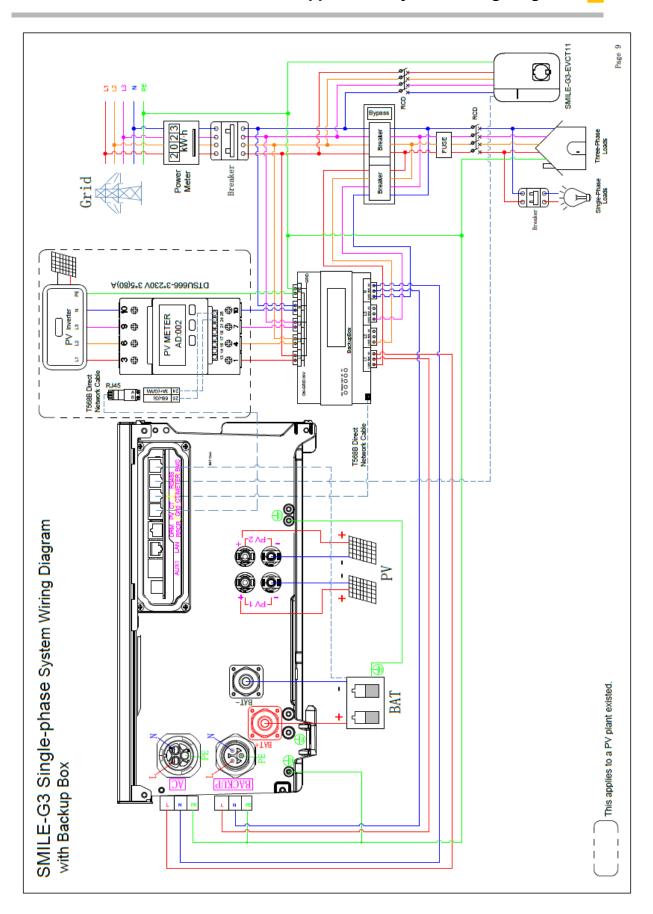


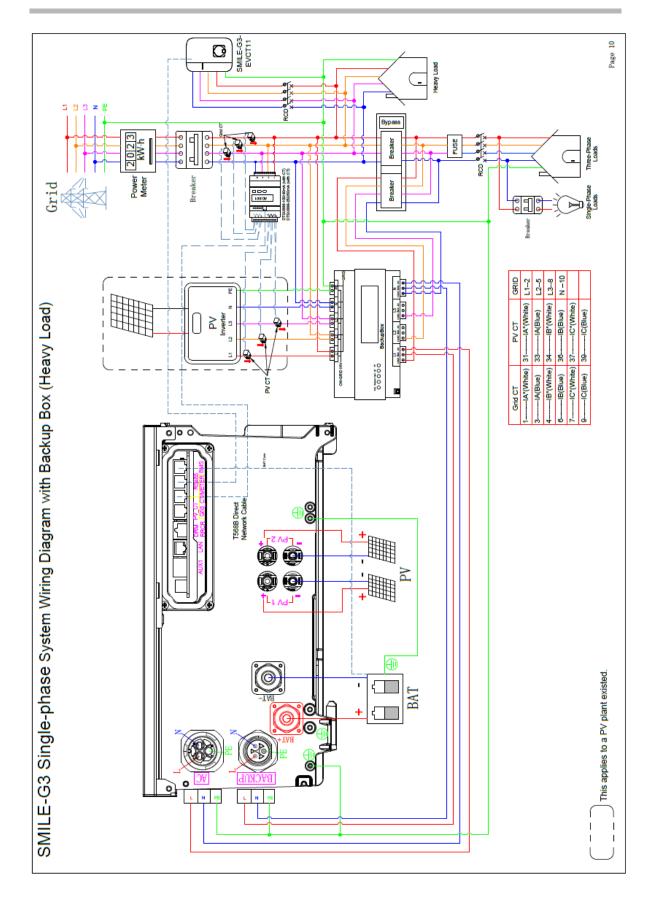












Appendix 2: Regional Application Standard

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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