

SunPower Reserve

Home energy storage system



Safety & Installation Instructions

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This document is valid for installing the SunPower Reserve home energy system including:

- Inverter: RESERVE-INV-1-P5-L1-INT
- Batteries: RESERVE-BAT-1-DC-4-INT, RESERVE-BAT-1-DC-10.1-INT
- Meter: CHINT-DTSU666-AC-L3-INT

This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the products, as well as the operation of the product user interface. The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and comply with all provided instructions.

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



For the latest version please refer to
www.sunpower.maxeon.com/int/InstallGuideReserve
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1.0 Introduction

1.1 Disclaimer of Liability

This document is intended for qualified persons and end users.

Operations marked with a DANGER or CAUTION symbol may only be performed by qualified persons. End users without specific qualifications may perform any unmarked tasks.

Qualified persons must have:




- Knowledge of how an inverter works and is operated
- Knowledge of how batteries work and are operated
- Training on how to handle the dangers and risks associated with installing, repairing, and using electrical devices, batteries, and installations
- Training on the installation and commissioning of electrical devices and installations
- Knowledge of the applicable laws, standards, and directives in installation region
- Knowledge of and compliance with this document, including all safety precautions
- Knowledge of and compliance with the documents of the battery manufacturer, including all safety precautions

1.2 Open Source License

This product contains Open Source software, developed by third parties and licensed using vehicles including GPL and/or LGPL. For more details, a list of Open Source software used and the related license texts, please refer to the Licenses section on our Sunpower app and Maxeon website (<https://corp.maxeon.com/legal>).

1.3 Levels of Messages

The following levels of messages may occur when handling the product

 DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 CAUTION	CAUTION indicates a situation which, if not avoided, can result in property damage and/or minor to moderate injury.
 TIP	TIP provides information for the optimal installation and operation of the product.

1.4 Definition of Abbreviations and Nouns

Abbreviation	Description
AC	Alternating current
AUX	Auxiliary
BAT	Battery
BMS	Battery management system
CT	Current transformers
DC	Direct current
DNISP	Distributed network service provider
DRM	Demand response mode
EMS	Energy management system
INV	Inverter
LED	Light emitting diode
PV	Photovoltaic
SOC	State of charge

2.0 Safety

2.1 Intended Use

Product(s)	Intended use & installation requirements
SunPower Reserve system including: <ul style="list-style-type: none">• RESERVE-INV-1-P5-L1-INT• RESERVE-BAT-1-DC-4-INT• RESERVE-BAT-1-DC-10.1-INT• CHINT-DTSU666-AC-L3-INT	<p>The SunPower Reserve system is intended for installation in residential homes to optimise self-consumption.</p> <p>It is suitable for indoor and outdoor installation.</p> <p>All components must operate in a scenario suitable for their operation. Any use of the product(s) other than that described in this section does not qualify as appropriate. Be sure to use this product in accordance with the information provided in the accompanying documents and in accordance with local applicable standards and directives.</p> <p>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 Maxeon Solar Technologies.</p> <p>Unauthorized alterations will void guarantee and warranty claims. Maxeon Solar Technologies shall not be held liable for any damage caused by such changes.</p> <p>The type label must remain permanently attached to the product.</p> <p>This document is an integral part of this product. Ensure it is accessible for future reference and comply with all instructions contained therein.</p>
Inverter: RESERVE-INV-1-P5-L1-INT	<p>The inverter is used for bidirectional transfer between AC current and DC current.</p> <p>It must only be operated with PV arrays of protection class II in accordance with IEC 61730, application class A. The PV modules coupling capacitance must not exceed 1.0 µF.</p>
Battery: RESERVE-BAT-1-DC-4-INT RESERVE-BAT-1-DC-10.1-INT	<p>The battery pack must only be used for energy storage with a SunPower Reserve inverter.</p>

2.2 Safety Instructions for Battery

2.2.1 General Safety Precautions

1. Overvoltage or wrong wiring can damage the battery pack and cause deflagration, which can be extremely dangerous.
2. All types of breakdown of the battery may lead to a leakage of electrolyte or flammable gas.
3. Battery pack is not user-serviceable. There is a high voltage in the device.


4. Read the label with Warning Symbols and Precautions, which is on the right side of the battery pack.
5. Do not connect any AC conductors or PV conductors directly to the battery pack which should be only connected to the inverter.
6. Do not charge or discharge damaged battery.
7. Do not damage the battery pack in such ways as dropping, deforming, impacting, cutting or penetrating with a sharp object. It may cause a leakage of electrolyte or fire.
8. Do not expose battery to open flame.

2.2.2 Response to Emergency Situations






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


If an accident takes place on land, remove items away from the damaged battery pack and segregate if it is possible do so safely and call local fire department or service engineer.




If an accident takes place in water, stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged. Do not use battery again and contact the technical support.

Scenario	Recommended actions
If the battery shell is damaged and user touches the inner material of the battery cells	<ol style="list-style-type: none"> 1. In case of inhalation: Leave the contaminated area immediately and seek medical attention. 2. If eyes are injured: Rinse eyes with running water for 15 minutes and seek medical attention. 3. If skin is injured: Wash the contacted area with soap thoroughly and seek medical attention. 4. In case of ingestion: Induce vomiting and seek medical attention.
If a fire breaks out in the place where the battery pack is installed	<p>You will need:</p> <ul style="list-style-type: none"> • FM-200, CO² or other suitable extinguisher on the battery fire. • ABC fire extinguisher could be used on other items, where it won't come in contact with the battery pack. <p>What to do:</p> <ol style="list-style-type: none"> 1. If fire occurs when charging batteries, if it is safe to do so, disconnect the battery pack circuit breaker to shut off the power to charge. 2. If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire. 3. If the battery pack is on fire, do not try to extinguish but evacuate people immediately.
 If battery back is burning	<p>There may be a possible explosion when batteries are heated above 150 °C. When the battery pack is burning, it leaks poisonous gases. Do not approach.</p>












2.3 Important Safety Instructions













High risk scenarios	Recommended actions
 <p>Danger to life due to electric shock when live components or cables are touched</p>	<p>There is high voltage in the conductive components or cables of the inverter. Touching live parts and cables can result in death or lethal injuries due to electric shock.</p> <ul style="list-style-type: none"> • Do not touch non-insulated parts or cables. • Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery pack. • After disconnection, wait for 5 minutes until the capacitors inside the inverter have discharged. • Do not open the product. • Wear suitable personal protective equipment for all operations on the product.
 <p>Danger to life due to dangerous voltages on the battery pack</p>	<p>There is dangerous voltage at the pin connector for the power cable. Reaching into the pin connector for the power cable can result in lethal electric shock.</p> <ul style="list-style-type: none"> • Do not open the battery pack. • Do not wipe over the battery pack with a damp cloth. • Leave the protective caps on the pin connectors for the batteries power connection until the inverter cables are connected to the battery pack. Disconnect the system from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery pack
 <p>Danger to life due to electric shock from touching an ungrounded PV module or array frame</p>	<ul style="list-style-type: none"> • Touching ungrounded PV modules or array frames can result in death or lethal injuries due to electric shock. • Connect and ground the frame of the PV modules, the array frame and the electrically conductive surfaces so that there is continuous conduction. • Observe the applicable local regulations.
 <p>Danger to life due to electric shock when live components or PV cables are touched</p>	<p>When PV panels exposed to sunlight, the PV array generates high DC voltage which presents in the DC conductors. Touching the live DC cables can result in death or lethal injuries due to electric shock.</p> <ul style="list-style-type: none"> • Disconnect the inverter from voltage sources and make sure it cannot be reconnected before working on the device. • Do not touch non-insulated parts or cables. • Do not disconnect the DC connectors under load. • Wear suitable personal protective equipment for all work on the inverter.
 <p>Danger to life due to electric shock when touching live system components in case of a ground fault</p>	<p>When a ground fault occurs, parts of the system may still be live. Touching live parts and cables can result in death or lethal injuries due to electric shock.</p> <ul style="list-style-type: none"> • 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.

High risk scenarios	Recommended actions
 <p>Risk of chemical burns from electrolyte or toxic gases</p>	<p>During normal operation, no electrolyte would leak from the battery pack and no toxic gases would form. Despite careful construction, if the battery pack is damaged or a fault occurs, it is possible that electrolyte may be leaked, or toxic gases may form.</p> <ul style="list-style-type: none"> • Store the battery pack in a cool and dry place. • Do not drop the battery pack or damage it with sharp objects. • Only set the battery pack down on its back or its bottom. • Do not open the battery pack. • Do not install or operate the battery pack in potentially explosive atmosphere or areas of high humidity. • If moisture has penetrated the battery pack (e.g., due to a damaged housing), do not install or operate the battery pack. • In case of contact with electrolyte, rinse the affected areas immediately with water and consult a doctor without delay.

Cautionary scenarios	Recommended actions
 <p>Risk of burns due to hot heatsink and housing</p>	<p>The enclosure and cover of the inverter can get hot during operation. During operation, do not touch any other than the cover of the inverter.</p>
 <p>Damage to the inverter due to electrostatic discharge</p>	<ul style="list-style-type: none"> • Touching electronic components can cause damage to or destroy the inverter and the battery through electrostatic discharge. • Ground yourself before touching any component.
 <p>Damage due to cleaning agents</p>	<ul style="list-style-type: none"> • The use of cleaning agents may cause damage to the energy storage system and its components. • Clean the system and all its components only with a cloth moistened with clear water.

2.4 Symbols explanation

Inverter Symbols	Explanation
	Beware of a danger zone This symbol indicates that the inverter must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of electrical voltage The product operates at high voltages.
	Beware of hot surface The product can get hot during operation.
	Danger to life due to high voltages in the inverter, observe a waiting time of 5 minutes. Prior to performing any work on the inverter, disconnect it from all voltage sources as described in this document.
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	Observe the documentation
	CE marking The product complies with the requirements of the applicable EU directives.
	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.
	UKCA marking The product complies with the regulations of the applicable laws of England, Wales and Scotland.
	RoHS labeling The product complies with the requirements of the applicable EU directives.

Battery Symbols	Explanation
	Beware of a danger zone This symbol indicates that the battery pack must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Risk of chemical burns
	Risk of explosion
	Observe the documentation
	Risk of electrolyte leakage
	CE marking The product complies with the requirements of the applicable EU directives.
	Refer to the instruction for operation
	Use eye protection
	Fire, naked light and smoking prohibited
	Install the product out of reach of children
 Li-Ion	Do not dispose of the battery pack together with the household waste but in accordance with the locally applicable disposal regulations for batteries
	Recycling code
UN38.3	Marking for transport of dangerous goods The product passes the certifications of the UN38.3

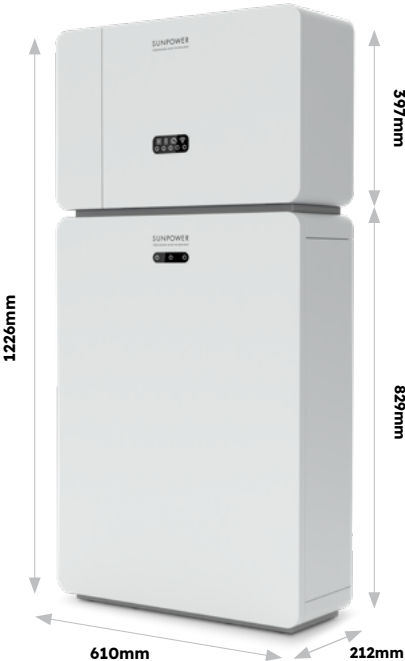
3.0 Product Introduction and Application Scenarios

3.1 System Introduction

Inverter RESERVE-INV-1-P5-L1-INT with battery RESERVE-BAT-1-DC-4-INT

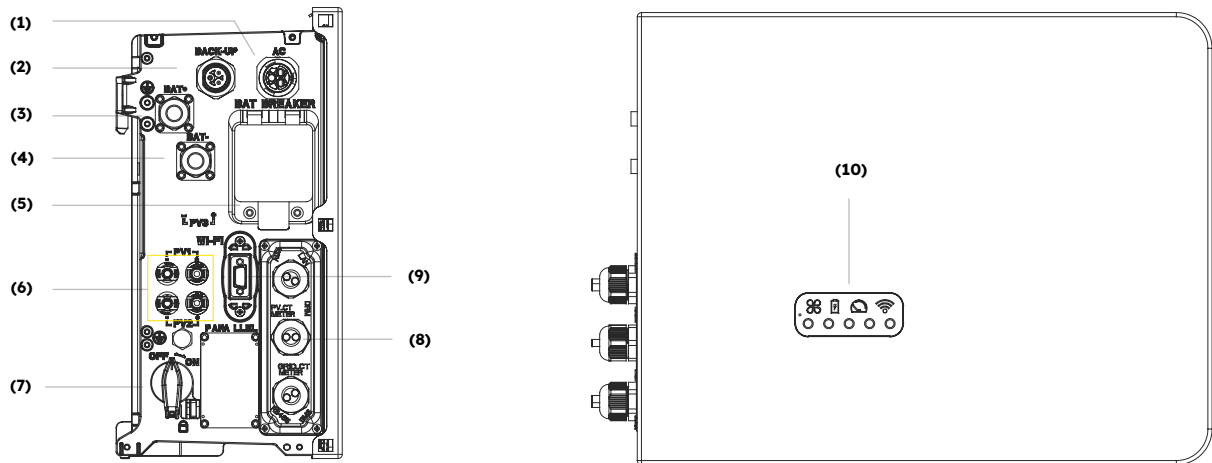


Inverter RESERVE-INV-1-P5-L1-INT with battery RESERVE-BAT-1-DC-10.1-INT



3.2 Inverter Description

3.2.1 Inverter Electrical Interface Introduction



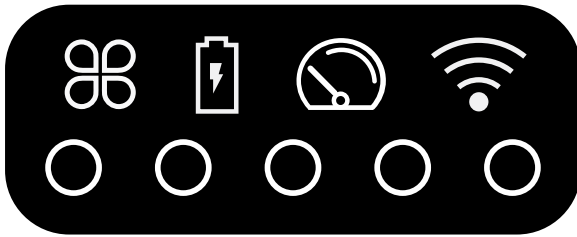
Position	Description
1	Grid Connector
2	Backup Connector
3	Battery Positive Power Connector
4	Battery Negative Power Connector
5	Battery Circuit Breaker* of the Inverter
6	Positive and Negative PV connectors, PV1/ PV2
7	PV Switch*
8	Communication (Ports CAN/RS485, BMS, LAN, Meter/Grid-CT, DRM**, PV-CT, AUX)
9	Wi-Fi Port
10	Inverter LED Display

* All breaker and switch of the inverter are switched off when shipped.

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

3.2.2 Inverter LED Display

Nine LED indicators are provided on the inverter display panel.




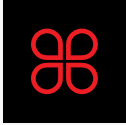


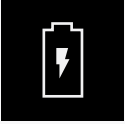
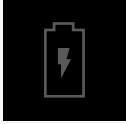


Upper LED indicators

The four system LEDs provide information about status and operations of the system

Lower LED indicators

Five LEDs are used to indicate the state of charge of the battery(ies) in normal operation

However, when the system is experiencing a fault, the combination of both upper and lower LEDs are used to show error codes, such as:



Normal status	Description	Fault status	Description
 SYSTEM	White light The system working normally	 SYSTEM	Red light The system is in fault
 METER	White light CT/Meter data available	 METER	No light CT/Meter data unavailable
 BATTERY	White light Battery working normally	 BATTERY	No light Battery is not working normally
 COMMS	White light Internet connected	 COMMS	No light No internet

The inverter lights will also operate differently during the software downloading and upgrading process:

Light	During the software downloading and upgrading process
Inverter lower LED indicators	While the inverter is downloading the file to update its firmware, the lower 5 LEDs will flow from both sides to the middle. When the download process has completed and the upgrade process begins, the lower 5 LEDs will flow from the middle to the two sides.
Battery LED indicators	The number of lights from left to right is 1-3. During upgrading, No. 3 white light is flashing fast, other two LEDs are off.

The lower LED indicators on the front cover of the inverter provide information about the State of Charge (SOC). If all batteries are operating normally, they will display solid white or off.

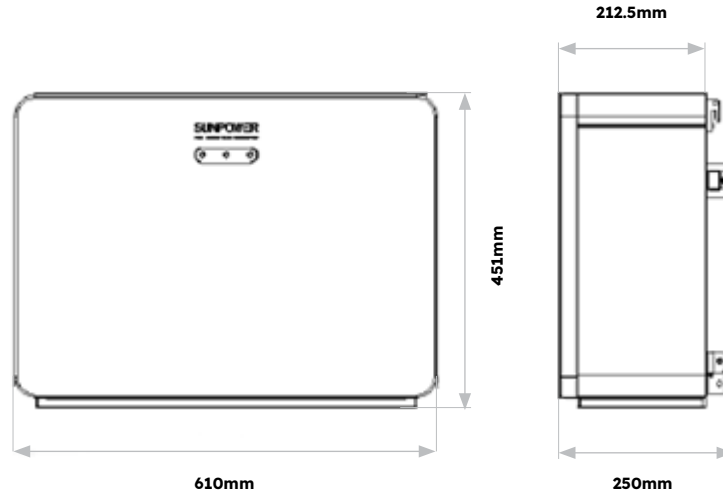
During the various states of charge, the lights will display:

State of Charge (SoC)	Description
	SOC<5%
	5%≤SOC<20%
	20%≤SOC<40%
	40%≤SOC<60%
	60%≤SOC<80%
	80%≤SOC≤100%

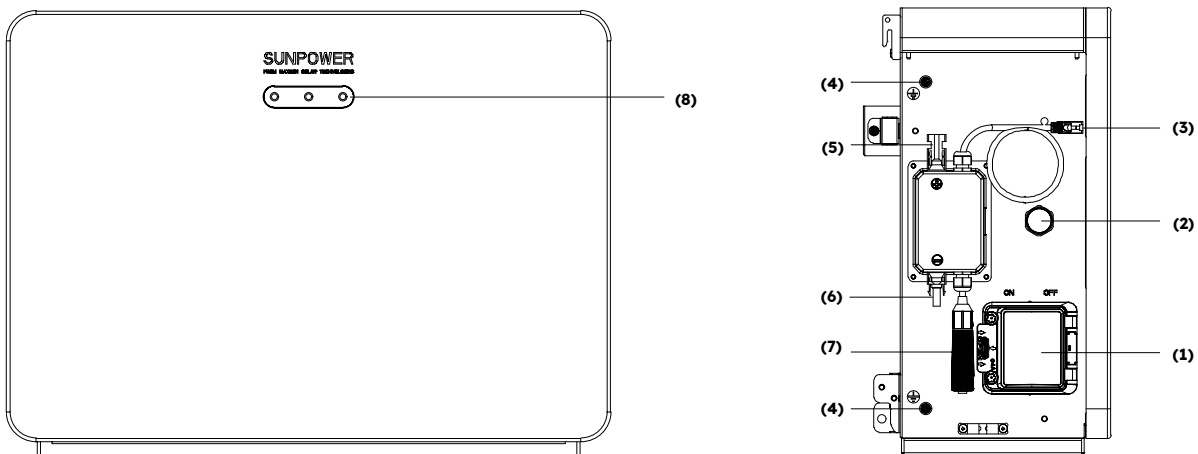
3.3 Battery Description

3.3.1 RESERVE-BAT-1-DC-4-INT Electrical Interface Introduction

Battery pack appearance and dimensions:



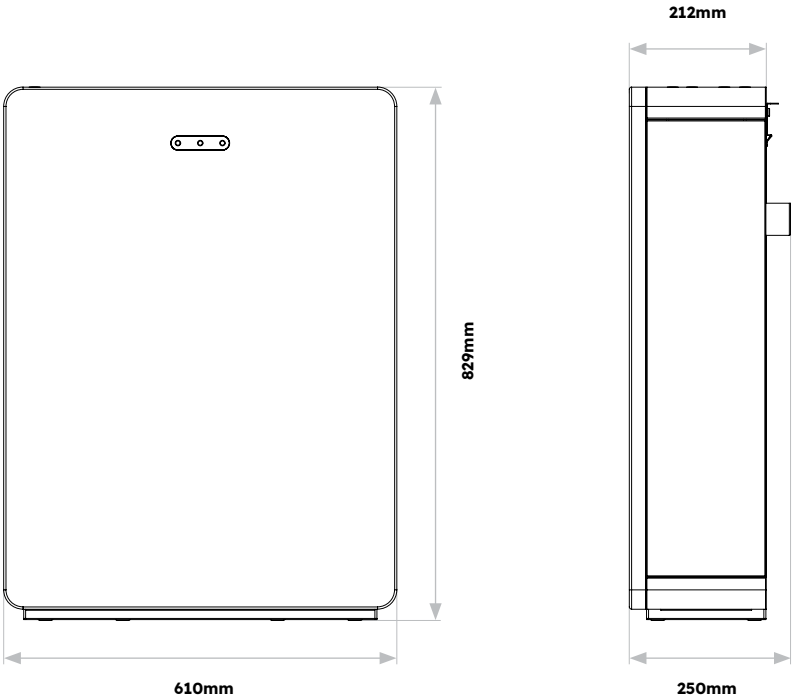
Connection area overview:



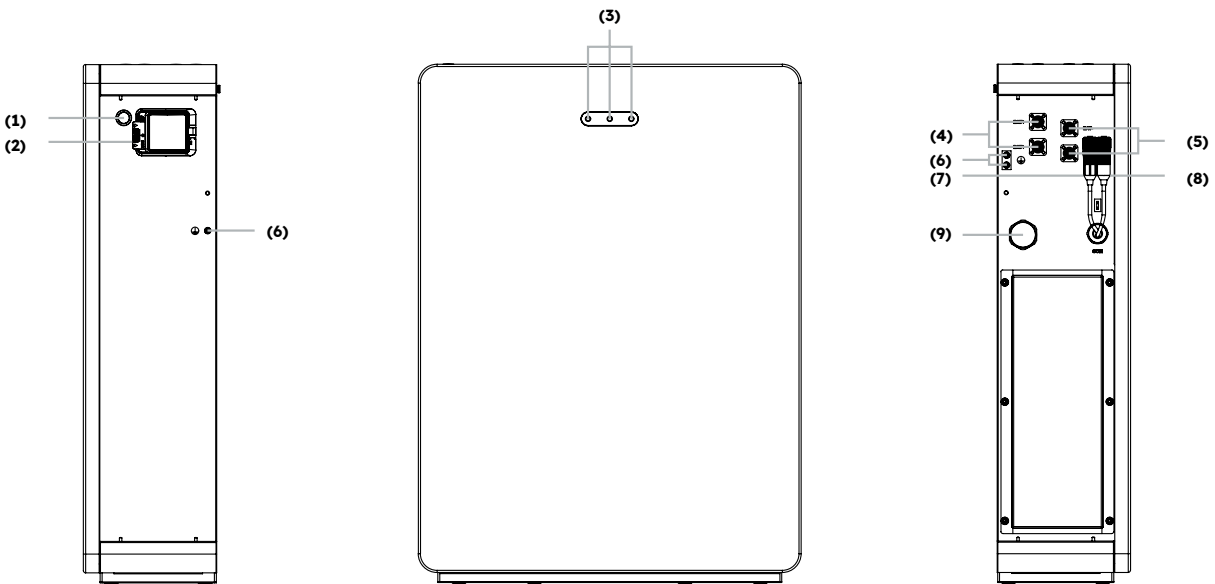
Position	Description
1	Battery Circuit Breaker
2	Pressure Relief Valve
3	BMS Communications Port (1)
4	Grounding Point
5	Battery+ Power Connector
6	Battery- Power Connector
7	BMS Communications Port (2) (with terminal resistor)
8	Battery LED Display

3.3.2 RESERVE-BAT-1-DC-10.1-INT Electrical Interface Introduction

Battery pack appearance and dimensions:



Connection area overview:












Position	Description
1	Battery Start Button
2	Battery Circuit Breaker
3	Battery LED Display
4	Battery+ Power Connector
5	Battery- Power Connector
6	Grounding terminal
7	BMS Communications Port (1)
8	BMS Communications Port (2) (with terminal resistor)
9	Pressure Relief Valve

3.3.3 Battery Display Introduction

Battery LED Display

The three LED indicators on the front cover of the battery provide information about the SOC operational status of the single battery with lights displaying solid white or flashing:

Symbol	Description
	White LED is flashing.
	White LED is on.
	White LED is off.

State of Charge (SoC)	Description
	$SOC \leq 10\%$
	$10\% < SOC \leq 30\%$
	$30\% < SOC \leq 50\%$
	$50\% < SOC \leq 60\%$
	$60\% < SOC \leq 90\%$
	$90\% < SOC \leq 100\%$

Battery LEDs State Display

The LEDs indicate the operating state of the product.

State	Description
Standby	All white LEDs are flashing (0.5s on and 0.5s off).
Normal	White LEDs are on or flashing (0.5s on and 1.5s off).
Protection	Yellow LEDs are on or flashing (0.5s on and 0.5s off).
Error	Yellow LEDs are on or flashing (0.5s on and 0.5s off).
Shutdown	All LEDs are off.

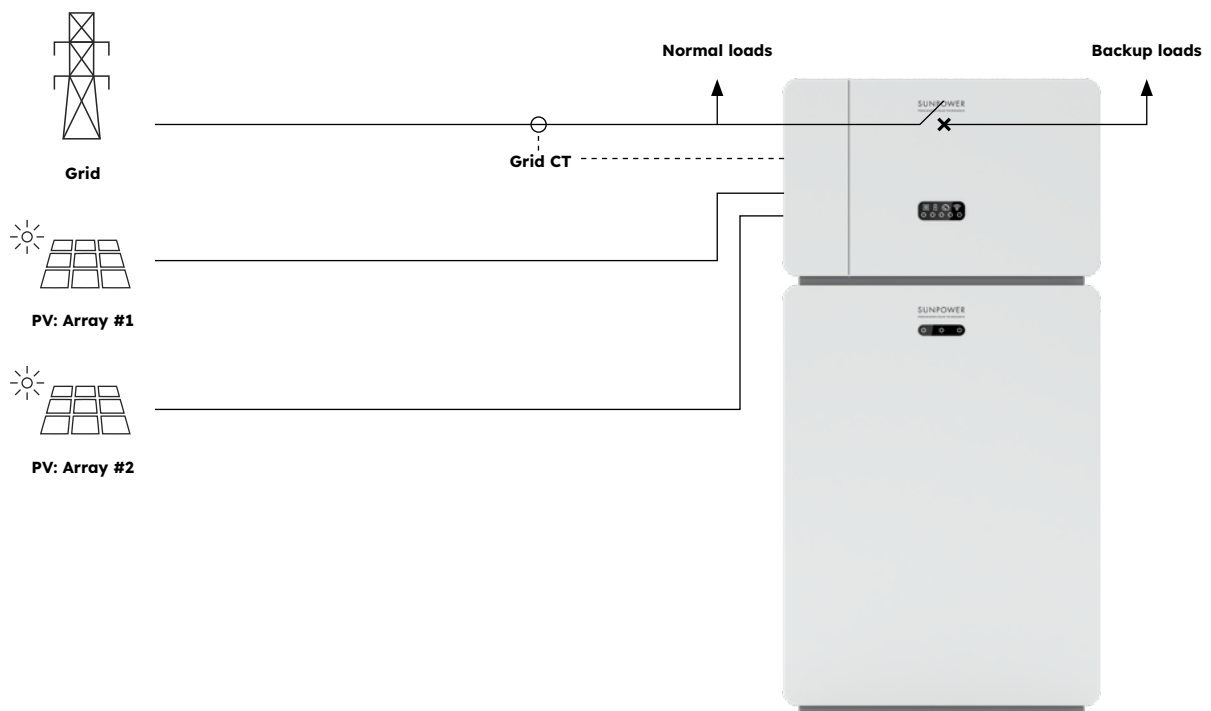
3.4 Application Scenarios

The SunPower Reserve system is a flexible storage system that can be applied in all of the following scenarios:

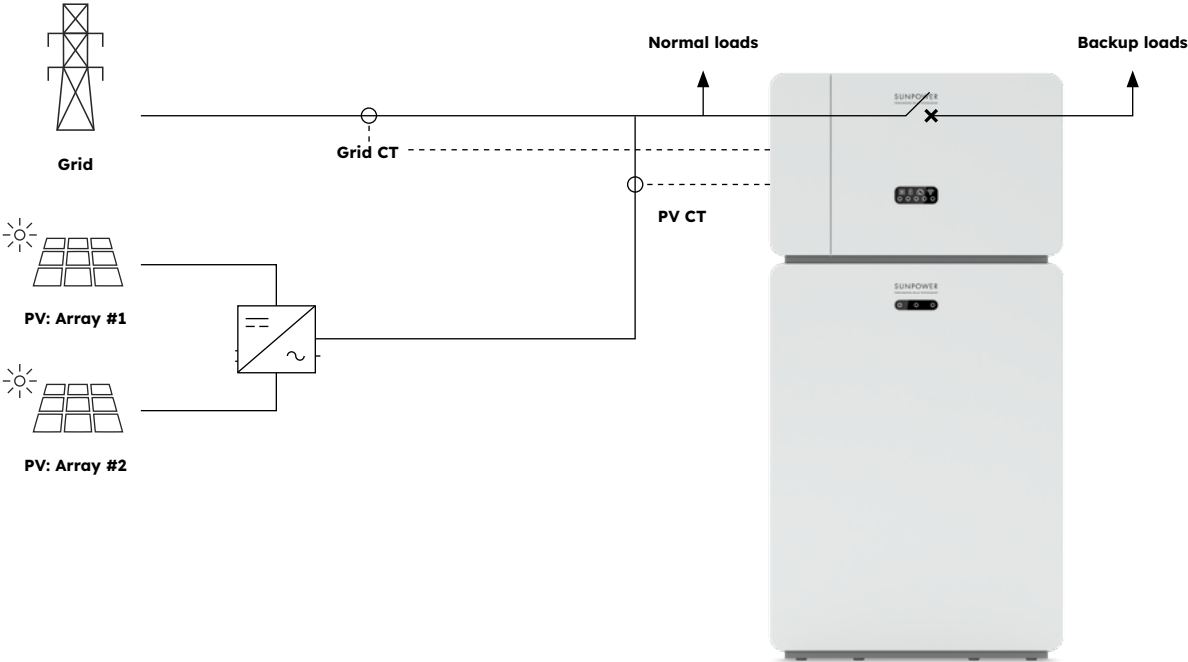
An example of each of these scenarios:

Application	Description	Advantages
DC	First-time PV array install Hybrid inverter will run both solar and battery. PV strings connected directly to the SunPower Reserve.	Additional PV inverter not required
AC	A PV array was previously installed or the PV array is using microinverters. The system will be composed of dedicated inverters for solar and battery. A separate PV inverter is connected to the PV array.	<ul style="list-style-type: none"> Storage can be added to an existing PV system ('retrofit') Loads can be drawn from battery and PV simultaneously
Hybrid	A PV array was previously installed and a new PV array is added as a separate system. Some PV strings are connected directly to the SunPower Reserve and some to separate PV inverter(s). Hybrid inverter will run new solar and battery.	<ul style="list-style-type: none"> Additional PV and Storage can be added to an existing system Increase system size and control without altering original PV system

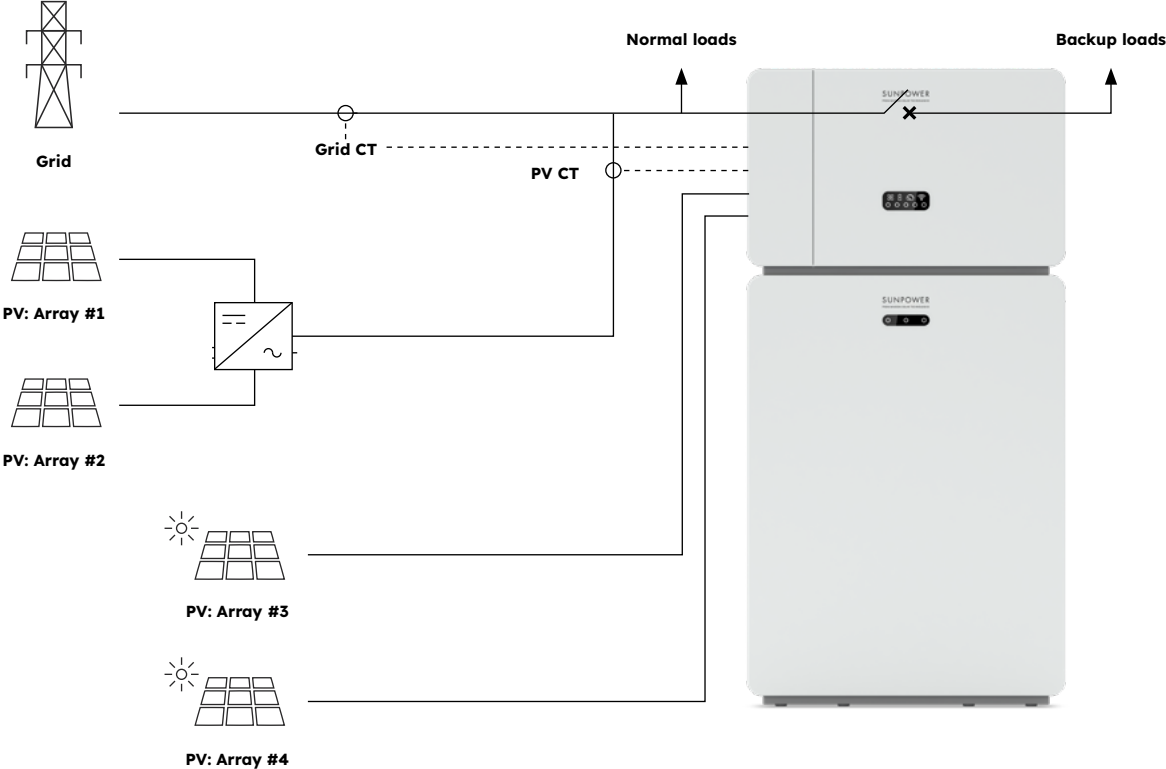
3.4.1 DC-coupled Storage System



3.4.2 AC-coupled Storage System



3.4.3 Hybrid-coupled Storage System



4.0 Storage and Transport

4.1 Storage

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

Product(s)	Storage directions
Inverter: RESERVE-INV-1-P5-L1-INT	<ol style="list-style-type: none">1. Do not unpack the inverter.2. Keep the storage temperature at -40 to +60 °C and the humidity at 5 to 95% RH.3. The inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.4. A maximum of five inverters can be stacked. To avoid personal injury or device damage, stack inverters with caution to prevent them from falling over.5. During the storage period, check the inverter periodically. Replace the packing materials which are damaged by insects or rodents in a timely manner.6. If the inverters have been stored for more than two years, it must be checked and tested by professionals before being put into use.
Battery: RESERVE-BAT-1-DC-4-INT RESERVE-BAT-1-DC-10.1-INT	<ol style="list-style-type: none">1. Place batteries according to the signs on the packing case during storage. Do not put batteries upside down or their side.2. Stack battery packing cases by complying with the stacking requirements on the external package.3. Store the battery pack out of reach of children and animals.4. Store the battery pack where it should be minimal dust and dirt in the area.5. Handle batteries with caution to avoid damage.6. The storage environment requirements are as follows:<ol style="list-style-type: none">a. Ambient temperature: -10 to +55 °C, recommended storage temperature: 15 to 30 °Cb. Relative humidity: 15 to 85%c. Place batteries in a dry and clean place with proper ventilation.d. Place 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 m away from heat sources.7. The batteries in storage must be disconnected from external devices. The indicators (if any) on the batteries should be off.

8. Batteries should be delivered based on the „first in, first out“ rule. We recommend observing the dates on the packaging and shipping the oldest units first
9. The warehouse keeper should collect battery storage information every month and periodically report the battery inventory information to the planning department. The batteries that have been stored for nearly 12 months should be recharged.
10. If a lithium battery is stored for a long time, capacity loss may occur. After a lithium battery is stored for 12 months in the recommended storage temperature, the irreversible capacity loss rate is 3 to 10%. It is recommended that batteries not be stored for a long period. If the batteries need to be stored for more than 6 months, it is recommended to recharge the batteries to 65 to 75% of the SOC.

4.2 Transport

During transportation, please follow these guidelines:

1. Use the original packaging for transportation.
2. Handle with care, choose the corresponding handling method according to the weight, and pay attention to safety.
3. During transportation, avoid mechanical damage and keep dry.
4. Please secure the packaging during transportation to prevent damage.
5. Observe local regulations for lifting heavy objects and safety hazards.

5.0 4kWh Battery Based System

5.1 Checking the Outer Packing




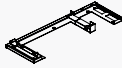
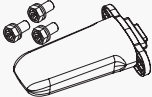
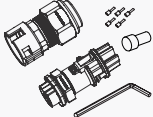
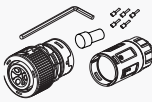
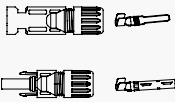

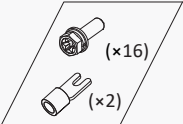
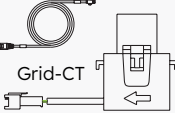
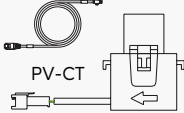

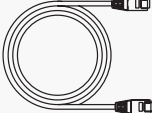

Before unpacking the product, check the outer packing for damage, such as holes and cracks. If any damage is found, do not unpack the product and contact your supplier as soon as possible.


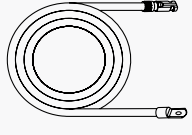
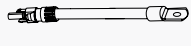


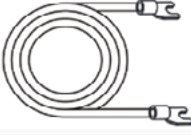


5.2 Scope of Delivery

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

5.3 Included in the Box

Check the components included with inverter and battery from the list below.

Inverter RESERVE-INV-1-P5-L1-INT				
				
Inverter (x1)	Side Cover (x1)	Cable Cover (x1)	Inverter Base (x1)	Wi-Fi Module (x1)
				
Grid Connector (x1)	Backup Connector (x1)	PV MC4 Connector Pair (x2)	AUX Terminal Block (x1)	Screws M5*12 and Grounding Terminals Set (x1)
				
Grid-CT (x1)	PV-CT (x1)	Grounding Cable between Inverter and 1st Battery (x1)	Parallel Battery Communication Cable* (x1)	Parallel Battery Positive Power Cable* (x1)

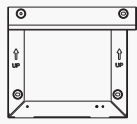
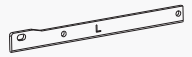
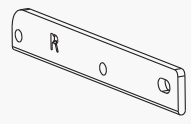
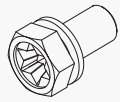
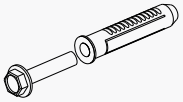
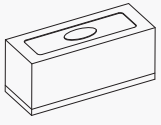
				
Parallel Battery Negative Power Cable* (x1)	Series Batteries Main Negative Power Cable** (x1)	Series Batteries Main Positive Power Cable** (x1)	Power Cable between two Column Series Batteries** (x1)	Communication Cable between two Column Series Batteries** (x1)
				
Grounding Cable between two Column Series Batteries** (x1)	System Wiring Diagram sheets (x1)	Quick Installation Guide (x1)		

* Only suitable for RESERVE-BAT-1-DC-10.1-INT


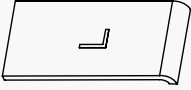

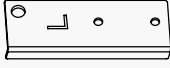
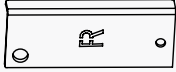






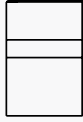
** Only suitable for RESERVE-BAT-1-DC-4-INT

If you install the energy storage system in only one column for the first time, please keep the rest cables properly which are used to connect with the second column series battery RESERVE-BAT-1-DC-4-INT.

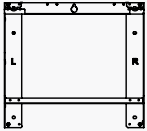

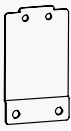
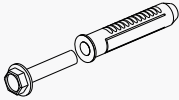


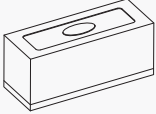
Additional components for inverter wall bracket (optional)

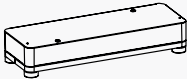
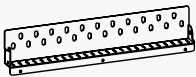
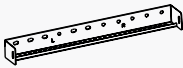
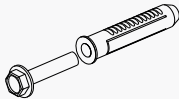
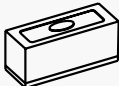

Wall bracket of Inverter RESERVE-INV-1-P5-L1-INT				
				
Wall Bracket (x1)	Left Connecting Beam (x1)	Right Connecting Beam (x1)	Hexagon Head Screw M5*12 (x12)	Wall Anchor ST6*55 (x4)
				
Small Spirit Level (x1)				

Check the components included with battery from the list below.

Series Battery RESERVE-BAT-1-DC-4-INT				
				
Series Battery (x1)	Left Side Plate (x1)	Right Side Plate (x1)	Lower Left Connection Piece (x1)	Lower Right Connection Piece (x1)
				
Grounding Cable 115mm (x1)	Battery Power Cable 205mm (x1)	Hexagon Head Screw M5*12 (x3)	Silicone Stopper (x9)	Plastic Blockage (x1)
				
Cable Tie Buckle (x3)	Quick Installation Guide (x1)			





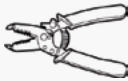










Additional components for series battery wall bracket (optional):








Wall bracket of Series Battery RESERVE-BAT-1-DC-4-INT				
				
Wall Bracket (x1)	Connection Plate between Wall Brackets of Se- ries Batteries (x2)	Connection Plate between Wall Brackets of 3P Inverter and first Series Battery (x2)	Wall Anchor ST6*55 (x6)	Hexagon Head Large Washer Screw M5*12 (x3)
				
Flange Nut M5 (x7)	Small Spirit Level (x1)			

System Unit of Series Battery RESERVE-BAT-1-DC-4-INT				
				
Base Unit (x1)	Wall Connection Plate of Base Unit (x1)	Wall Connection Plate of Series Battery (x1)	Wall Anchor ST6*55 (x6)	Small Spirit Level (x1)
				
Hexagon Head Screw M5*12 (x8)				

5.4 Preparing Tools and Instruments

Ensure the following equipment and safety gear is available prior to installation of the unit:

Tools and Instruments and Personal Protective Equipment				
				
Hammer drill (With a \varnothing 10mm drill bit)	Torque socket wrench M10	Multimeter (DC voltage range 0-1000 V DC)	Diagonal pliers	Wire stripper
				
PH2 screwdriver (Torque range: 0-5 N m)	Rubber mallet	Utility knife	Cable cutter	Crimping tool
				
Terminal crimper	Disassembly and Assembly Tool of PV connector	Vacuum cleaner	Heat shrink tu- bing	Heat gun

				
Marker	Measuring tape	Bubble or digital level	Anti-dust respirator	Safety shoes
				
Safety gloves	Safety goggles			

5.5 Requirements for Mounting



Despite careful construction, electrical devices can cause fires.

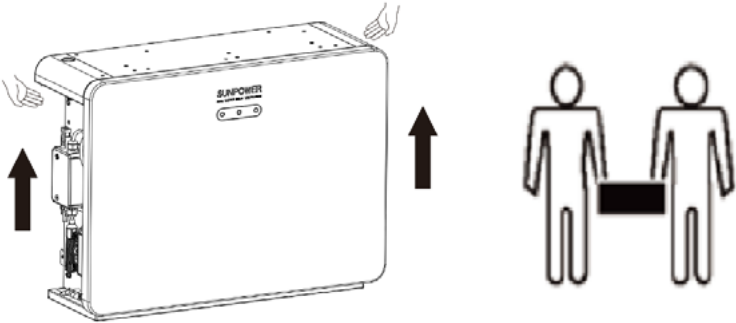
- Do not mount the energy storage system in areas containing highly flammable materials or gases.
- Do not mount the system in potentially explosive atmospheres.

Type	Requirements
Basic	<ul style="list-style-type: none"> • The SunPower Reserve system is suitable for indoor and outdoor use. • Do not install the inverter in a place where a person can easily touch it because its enclosure and cover can be very hot during operation. • Do not mount the system in areas with flammable or explosive materials. • Do not mount the system at a place within children's reach. • Do not mount the system outdoors in salt areas because it will be corroded there and may cause fire. A salt area refers to the region within 500 m from the coast or prone to sea breeze.
Mounting Environment	<ul style="list-style-type: none"> • The system must be mounted in a well-ventilated environment to ensure good heat dissipation. • Do not mount the system in areas where it could be exposed to sunlight, the power of the system may be derated due to additional heat. • Mount the system in a sheltered place or mount an awning over the product. • The optimal temperature range for the battery pack is from 15 °C to 30 °C and not exposed to sunlight. • Do not expose or place near water sources like downspouts or sprinklers. • If the battery pack is mounted in an area where vehicles are present, ensure mechanical protection from vehicles.

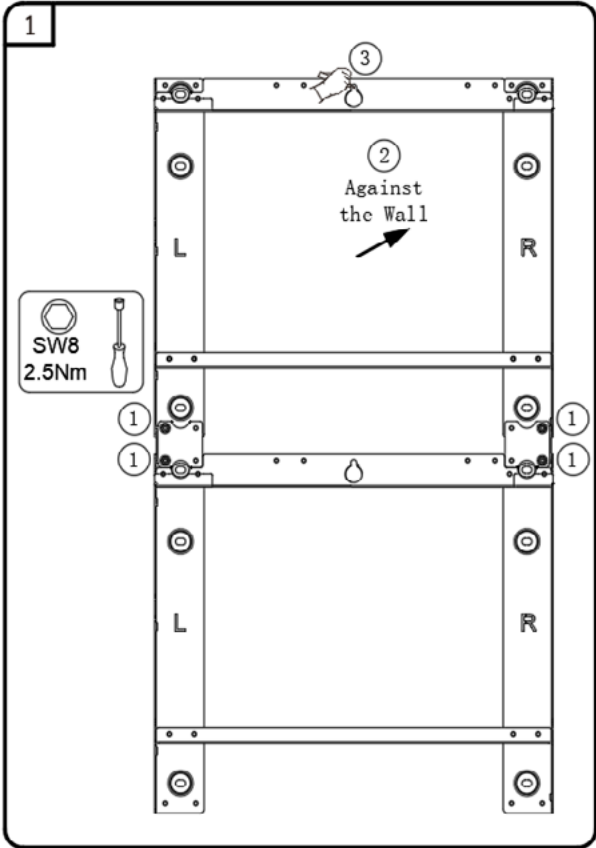
Mounting Structure	<ul style="list-style-type: none"> The mounting surface behind the system should not allow the propagation of fire. Ensure that the mounting floor is solid and able to bear the weight of the system.
Mounting Angle and Stack	<ul style="list-style-type: none"> The inverter should be mounted on the battery. The installation angle requirement is: <div data-bbox="603 421 1209 779" style="text-align: center;"> </div> Do not mount the battery at forward tilted, side tilted, horizontal, or upside-down positions
Mounting Space	<ul style="list-style-type: none"> Reserve sufficient clearance around the product to ensure sufficient space for installation, maintenance and heat dissipation. The side clearance is a recommendation. Keep the clearance as short as you can if there is no influence on the operation and maintenance. <div data-bbox="510 1025 1321 1496" style="text-align: center;"> </div>

5.6 Mounting

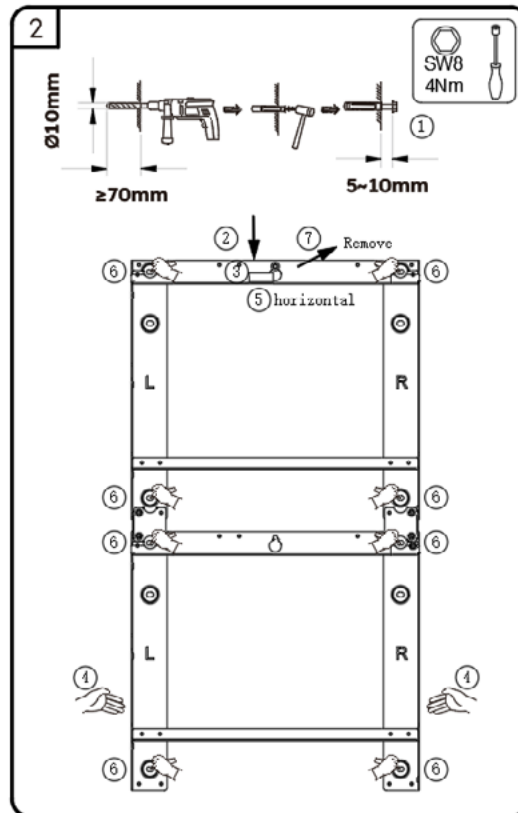
- 1. Take out the battery from the carton, transport it to the installation site.



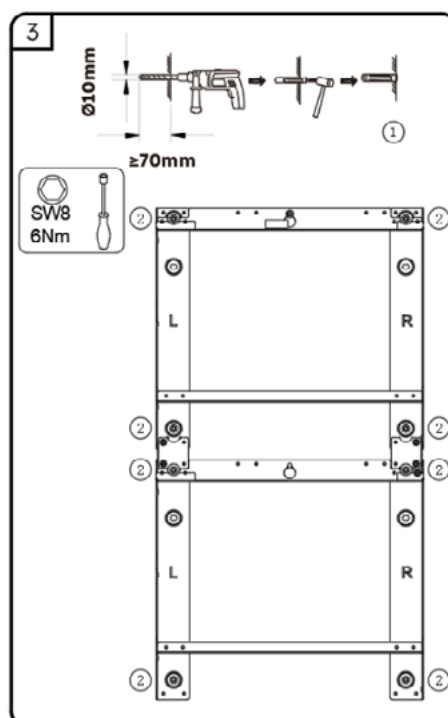
- 2. Take out the wall brackets and connection plates between wall brackets of batteries from the package, assemble them with M5 flange nuts to form a large wall bracket. Select a suitable height, please reserve enough space below if you want to add more batteries follow-up.
Place the wall bracket against the wall, mark the upper middle drill position of the wall bracket, and remove the wall bracket.



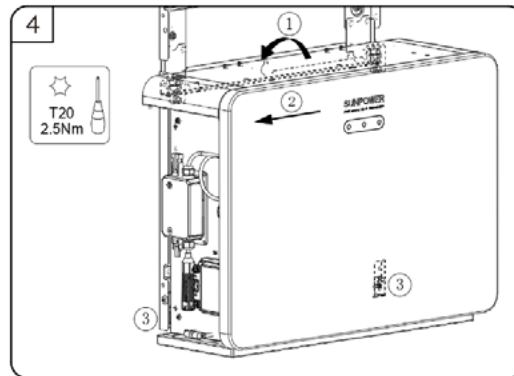
- Drill the marked hole with a 10mm drill. Insert the screw anchor into the drill hole, and pre-tighten the provided screw, retain 5-10mm from the screw head to the wall. Hang the wall bracket on the screw head, adjust its horizontal position, mark the other drill positions, and remove the wall bracket.



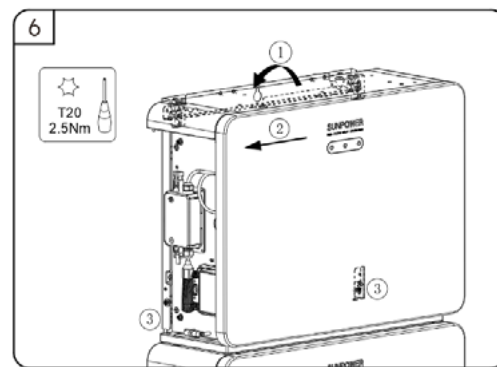
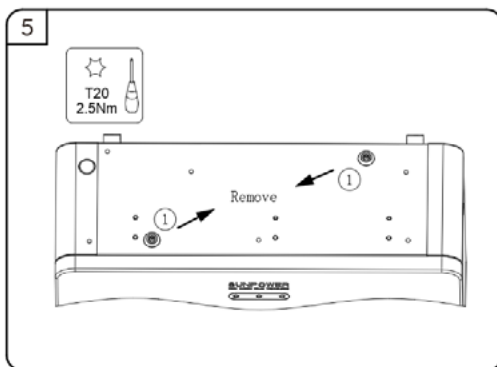
- Drill the marked holes with a 10mm drill. Insert the screw anchors into the drill holes. Hang the wall bracket on the screw head, secure the wall bracket to the wall with the provided screws (tool: SW8 socket wrench, torque: 6Nm).



- Always hold the handles on both sides of the battery firmly, hook the battery into the bottom wall bracket, and move it to the left limit. Ensure that the battery is securely in place. Secure the lower holes on both sides of the battery to the wall bracket and tighten them with two screws M5*12 (tool: T20 screwdriver, torque: 2.5Nm).



- Please remove the two limit blocks located on the top of the battery when the next battery will be mounted with wall bracket. Continue to mount more batteries by repeating step 4 and step 5.



Series battery wall-mounting disassembling instructions.

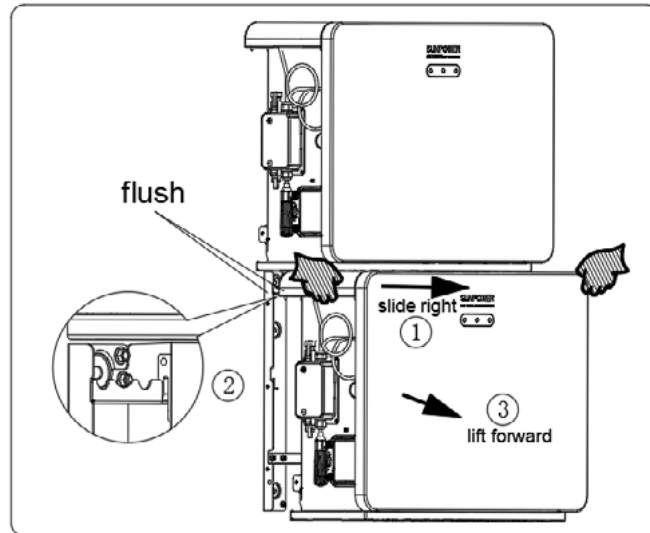


Risk of injury due to the weight of the battery

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

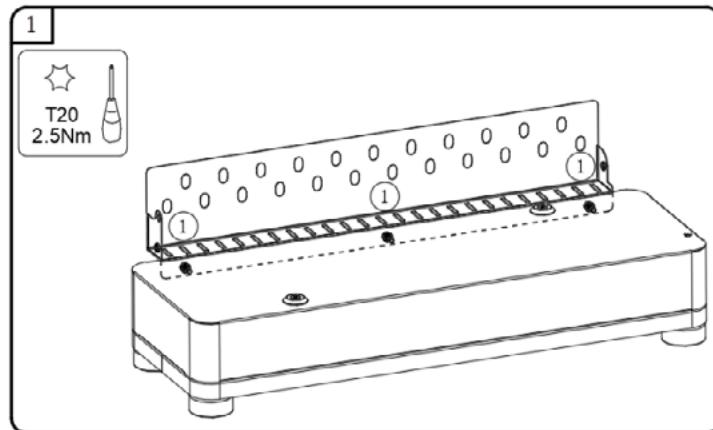
- Transport and lift the product carefully. Take the weight (44 kg) of the product into account.
- Always have two or more people to mount and disassemble the product.
- Wear suitable personal protective equipment for all work on the product.

When disassembling the battery that has been mounted with wall bracket and has 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 left handle of the lower battery aligns to the left edge of the upper battery base, carefully lift the battery forward and off the wall bracket.

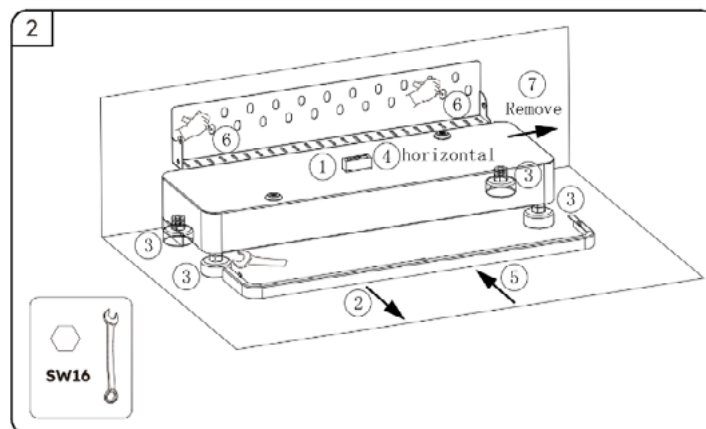


5.6.1 Mounting the Battery with Base Unit

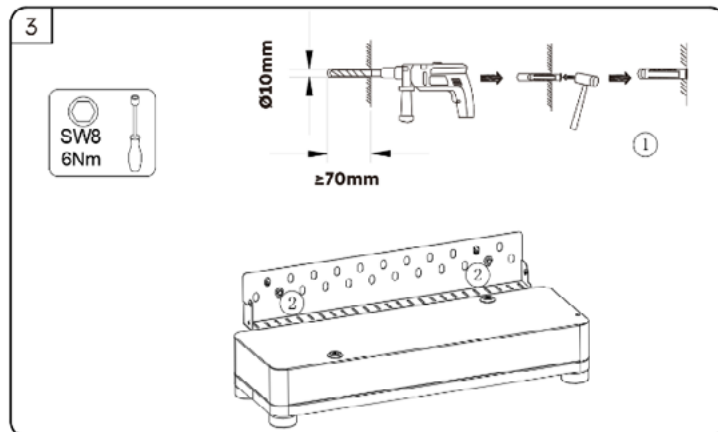
1. Take out the base unit and the wall connection plate of base unit, tighten them together with three screws M5*12 (tool: T20 screwdriver, torque: 2.5Nm).



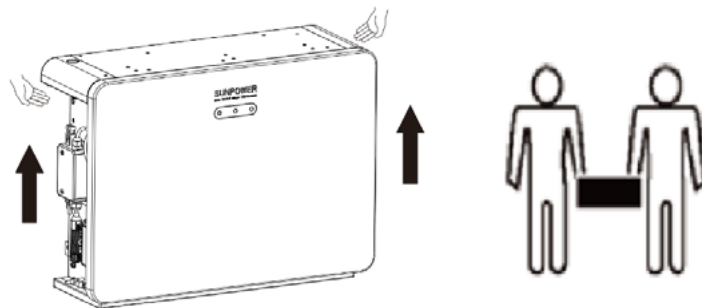
2. Place the small spirit level at the center of the base unit, remove the cover of the feet, adjust the four feet to level the base unit, assemble the cover of the feet to the base unit, mark the drill positions on the wall, and remove the base unit.



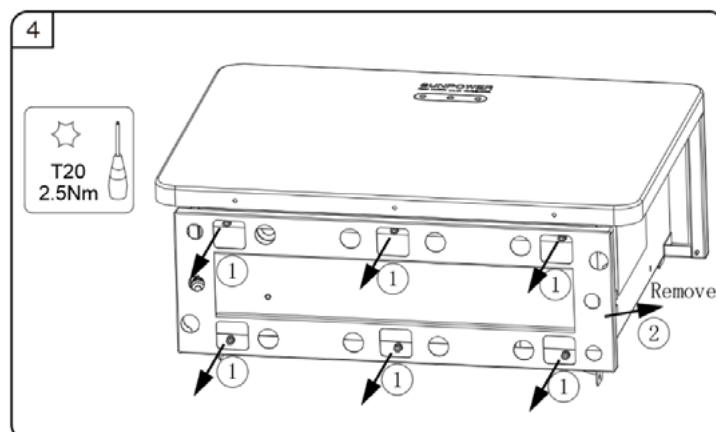
3. Drill the marked holes with a $\varnothing 10\text{mm}$ drill. Insert the screw anchors into the drill holes, secure the base unit to the wall with the provided screws (tool: SW8 socket wrench, torque: 6Nm).



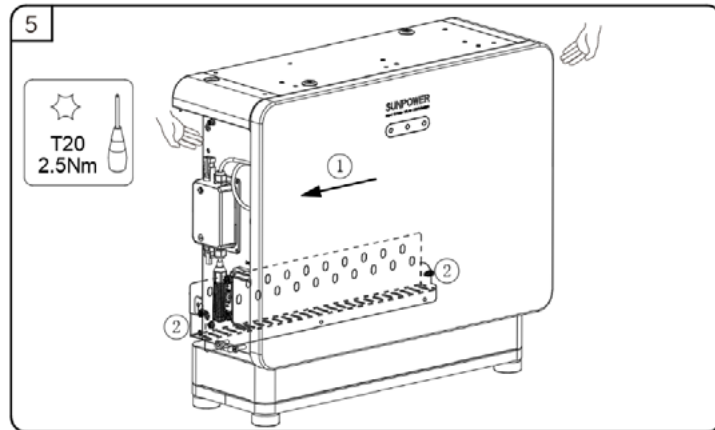
4. Take out the battery from the carton, transport it to the installation site.



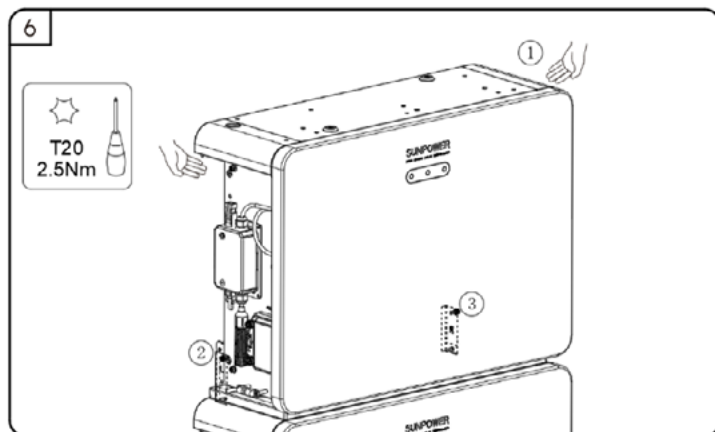
5. Remove the battery base from the battery bottom (tool: T20 screwdriver, torque: 2.5Nm), the battery will be located at the bottom. When doing so, please protect the appearance of the battery.



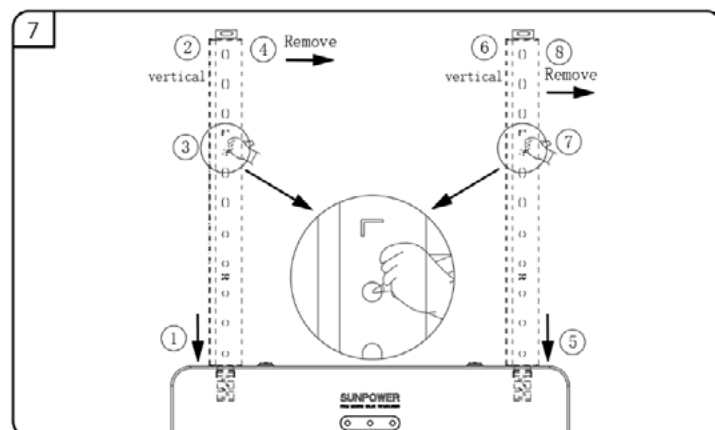
6. Lift the battery by using the handles at two sides, place the battery on the base unit and move it to the left limit. Align the lower holes on both sides of the battery back to the wall connection plate of base unit, tighten them together with two screws M5*10 (tool: T20 screwdriver, torque: 2.5Nm).



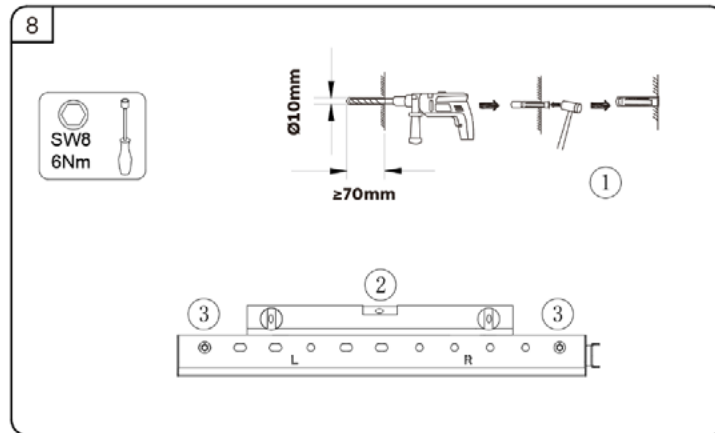
7. Please jump to step 8 if there are only two batteries in the column.
 Lift the battery by using the handles at two sides, place this battery on the bottom battery. When doing so, align the two depressed positions at the bottom of the upper battery to the raised limit blocks at the top of the lower battery.
 Take out the lower left connection piece and lower right connection piece, use them to connect the lower left of the upper battery to the upper left of the lower battery with screws M5*10 (tool: T20 screwdriver, torque: 2.5Nm), connect the lower right of the upper battery to the upper right of the lower battery.



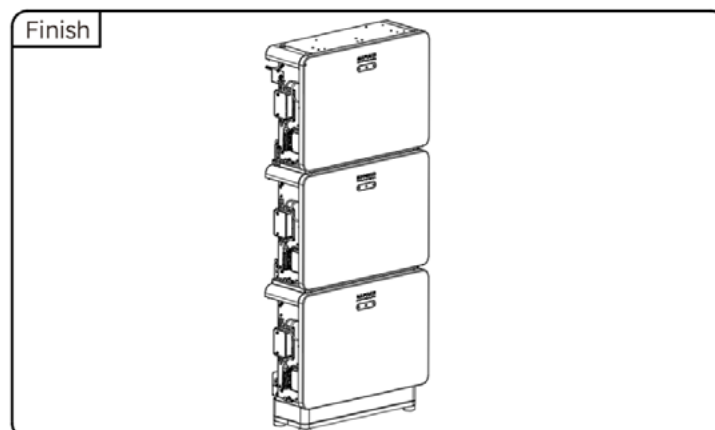
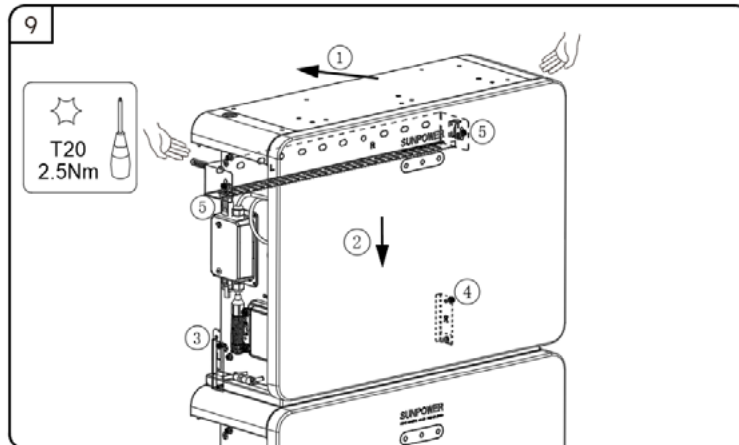
8. Take out the wall connection plate of battery.
 Place the raised edge of the plate facing left, push the lower end of the plate against the left and right hooks on the battery back, adjust its vertical position, and mark the drill positions through the circular hole on the wall.



- Drill the marked holes with a $\varnothing 10\text{mm}$ drill. Insert the screw anchors into the drill holes, secure the wall connection plate of battery to the wall with the provided screws (tool: SW8 socket wrench, torque: 6Nm).



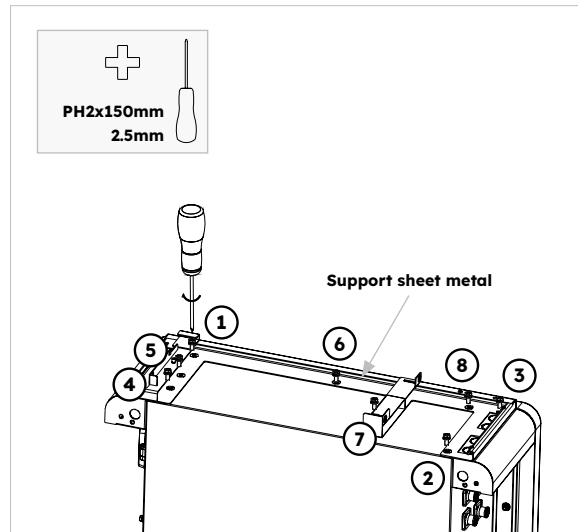
- Horizontally lift the battery, let the upper part of the battery pass through the wall connection plate of battery, and vertically place the battery onto the lower battery. Take out the lower left connection piece and lower right connection piece, use them to connect the lower left of the upper battery to the upper left of the lower battery with screws $M5*10$ (tool: T20 screwdriver, torque: 2.5Nm), connect the lower right of the upper battery to the upper right of the lower battery. Secure the battery to the wall connection plate of battery with two $M5*12$ (tool: T20 screwdriver, torque: 2.5Nm).



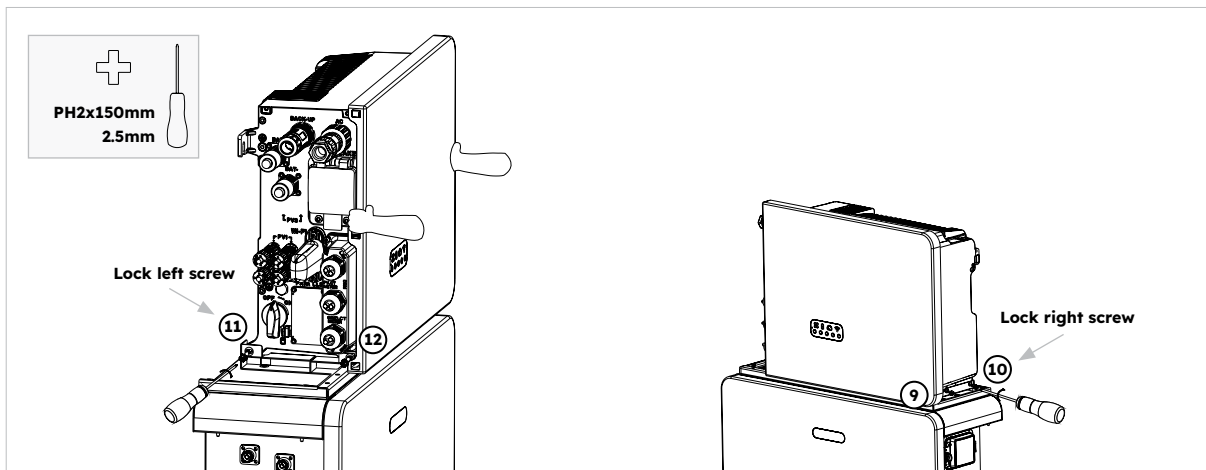
5.6.2 Mounting the Inverter

Inverter Mounting Instructions:

1. Fit the inverter base onto the top of the battery and attach.



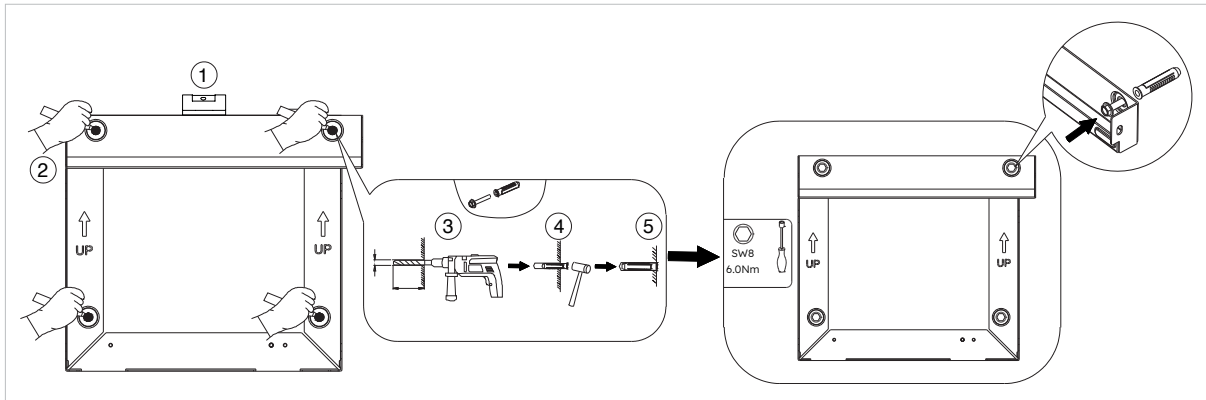
2. Attach the inverter to the sides of the inverter base and lock left screws:



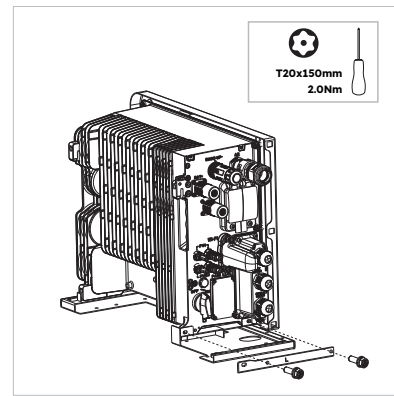
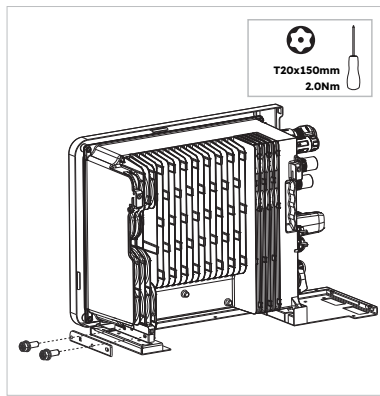
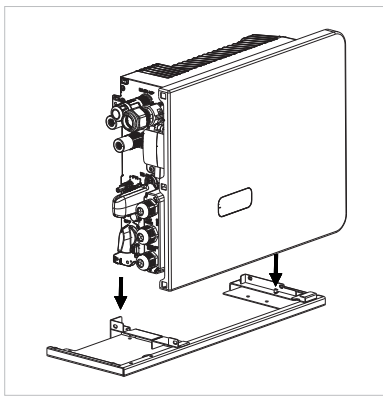
5.6.3 Mounting the Inverter Hanging on the Wall Bracket

Mount the inverter with wall bracket which is suitable for battery ready scenario, detailed instructions as follows:

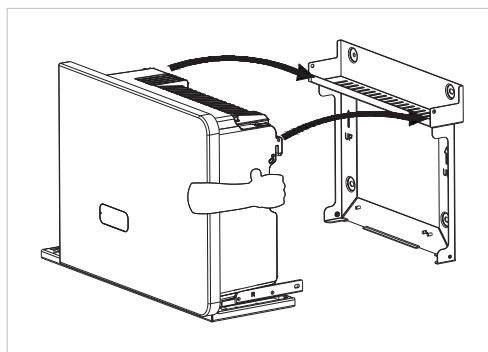
1. Take out the wall bracket of the inverter. Select a suitable height, please reserve enough space below if you want to add batteries follow-up. Mark the four drilling positions of the wall bracket, drill the marked holes with drill 10mm. Insert screw anchors into the drilling holes. Ensure that the wall bracket is placed horizontally using a spirit level before securing it. Secure the bracket to the wall, tighten the screws with the SW8 hexagon sleeve.



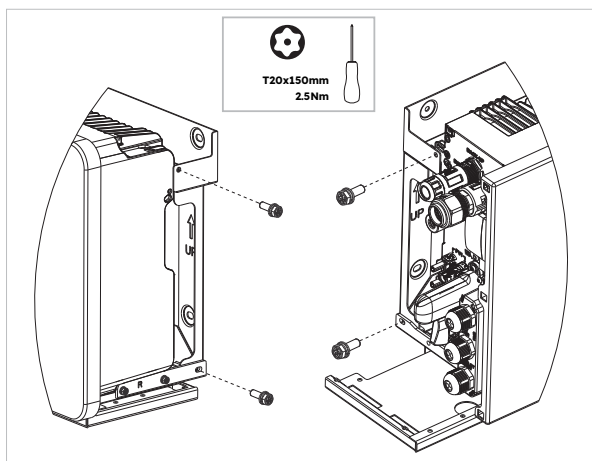
2. Take out the inverter base, place the inverter into the inverter base. When doing so, the lower right and left holes on the bottom of the inverter must be inserted into the respective guides in the inverter base. Secure the inverter base to the inverter with each two screws M5*12 on the left and right sides (tool: T20 screwdriver, torque: 2.5Nm).



3. Hook the inverter into the wall bracket. Ensure that the battery is securely in place.



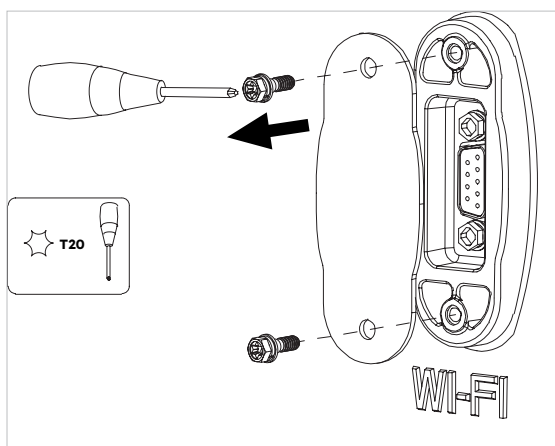
4. Secure the inverter to the wall bracket. To do so, insert the four screws M5*12 into the lower and upper threaded holes on both sides of the inverter and tighten them (tool: T20 screwdriver, torque: 2.5Nm).



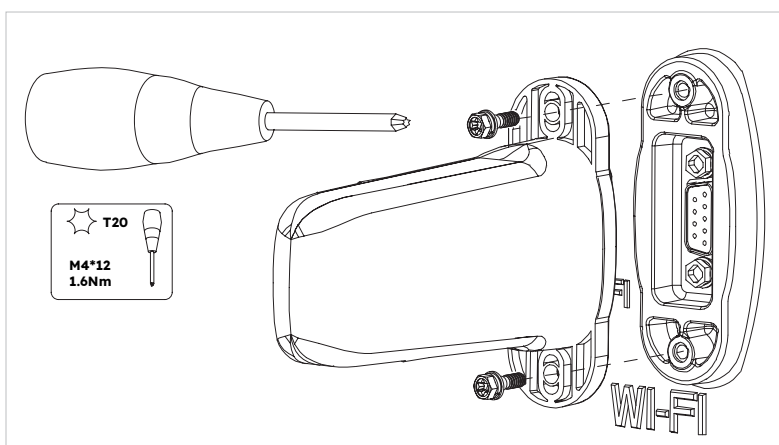
5.6.4 Mounting the Wi-Fi Module

Inverter Mounting Instructions

1. Remove the Wi-Fi anti-dust cover from the left side of the inverter



2. Tighten the Wi-Fi module onto the inverter with screw M4*10 (X2)



Note: you may prefer to install the Wi-Fi dongle last to maximize access for connecting the electrical cables.

5.7 Cable Requirements for Connection



The energy storage system damage caused by incorrect cable connections is not covered under any warranty. Only certified electricians are allowed to connect cables. Operation personnel must wear proper PPE when connecting cables.



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



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).

No.	Cable	Type	Conductor Cross Section Area	Outer Diam.	Source
1	Battery power cables with inverter	Standard PV cable in the industry	16mm ²	N/A	Delivered with the inverter
2	Battery communication cable with inverter	Standard network cable in the industry	0.12-0.20mm ²	N/A	Delivered with the inverter
3 ₁	Signal cable	Standard network cable in the industry	0.12-0.20mm ²	N/A	Delivered with the inverter
4	PV Power cable	Standard PV cable in the industry (recommended type: PV1-F)	4-6mm ²	5.5-9mm	Purchased by the installer
5 ₂	Signal cable	Standard network cable in the industry (recommended type: C-Bus cable)	0.12-0.20mm ²	4-6mm	Purchased by the installer
6 ₃	Signal cable	Multiple-core outdoor shielded twisted pair cable	0.1-1.3mm ²	4-6mm	Purchased by the installer
7	AC power cable for backup	Three-core (L, N and PE) outdoor copper cable	4-6mm ²	10-14mm	Purchased by the installer
8	AC power cable for grid	Three-core (L, N and PE) outdoor copper cable	6-10mm ²	9-18mm	Purchased by the installer
9	PE cable	Single-core outdoor copper cable	4-10mm ²	N/A	Purchased by the installer
10	Expansion Battery power cables	Standard PV cable in the industry	16mm ²	N/A	Delivered with the battery

11	Expansion Battery communication cable	Standard network cable in the industry (recommended type: C-Bus)	0.12 - 0.20mm ²	N/A	Delivered with the battery
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¹ For CT communication connection with inverter.

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

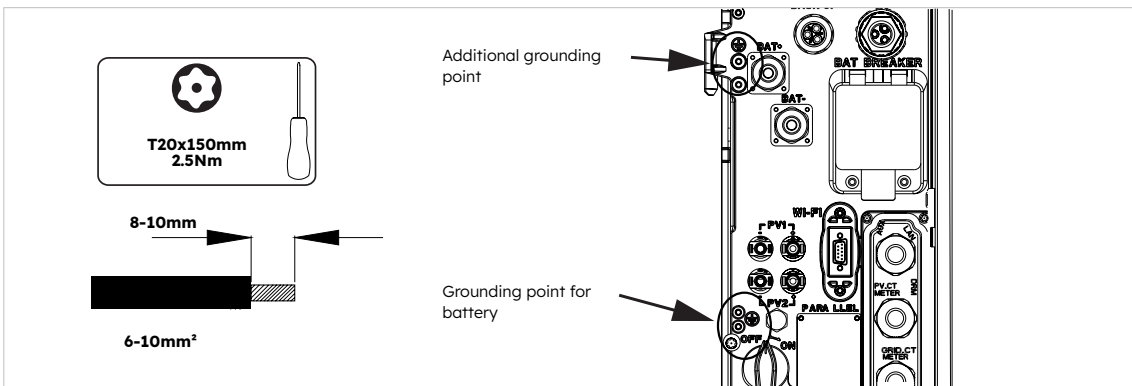
³ For AUX communication connection with inverter.

5.8 Connecting Additional Grounding

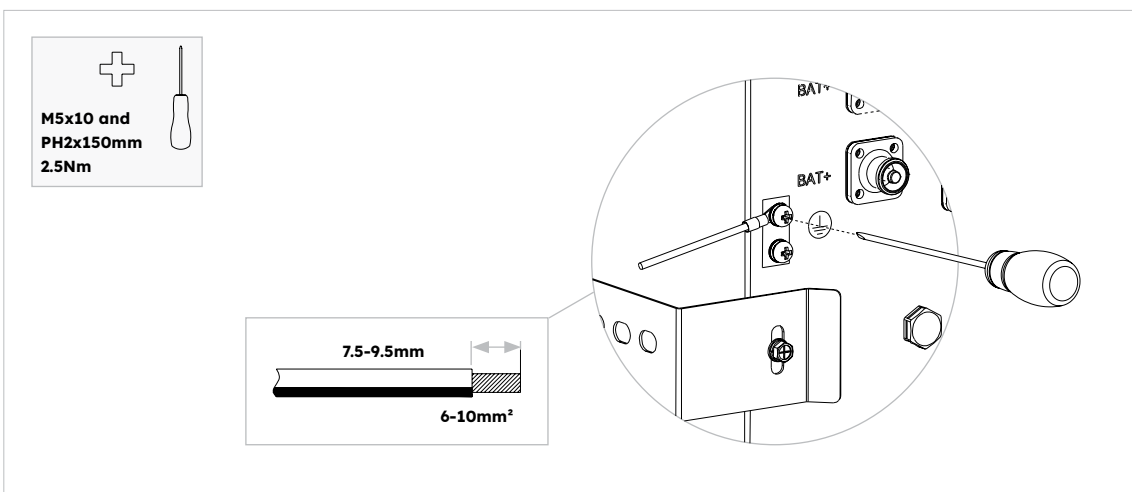


Electric Shock Hazard: Before doing electrical connection, please ensure the PV switch & all AC and BAT circuit breakers in the energy storage system are switched off and cannot be reactivated.

A grounding point is provided near the BAT positive connector on the 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 (Tool: T20 screwdriver, torque: 2.5Nm).



Grounding connection for battery:



5.9 AC Connection

5.9.1 Requirements for the AC Connection



Residual-current monitoring unit: The inverter does not require an external residual-current device when operating. If local regulations require the use of a residual-current device, or Hybrid-coupled storage system with big coupling capacity from the PV array and PV inverter, the following must be observed: The inverter is compatible with type A residual-current devices with a rated residual current of 100 mA or higher. Each inverter in the system must be connected to the utility grid via a separate residual-current device.



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

AC cable requirements as follows:

- Conductor type: copper wire
- External diameter: 9mm to 18mm for grid connector, 10mm to 14mm for backup connector
- Conductor cross-section area recommendation: 10mm² for grid connection, 6mm² for back-up connection
- Insulation stripping length: 10mm
- Sheath stripping length: 50mm

5.9.2 Selecting Suitable AC Circuit Breaker



The maximum allowable grid circuit breaker specification is **50 A** when the copper conductor cross section for grid connection is **10 mm² and factors influencing the ampacity of the cable, other influences on dimensioning must be considered**. You should use APP (SunPower One app) or installer platform (SunPower One installer dashboard) to select correct setting if the grid circuit breaker specification is 32 A or 40 A, otherwise it increases the danger of the circuit breaker tripping under normal operating conditions.



The maximum allowable grid circuit breaker specification is **40 A** when the copper conductor cross section for grid connection must be **6 mm² (in some countries: 8 mm²) and factors influencing the ampacity of the cable, other influences on dimensioning must be considered seriously**. You should use APP (SunPower One app) or installer platform (SunPower One installer dashboard) to select correct setting if the grid circuit breaker specification is 32 A or 40 A, otherwise it increases the danger of the circuit breaker tripping under normal operating conditions.

The general requirements for the selection of circuit breakers are determined by standards and country specific provisions. In the following, generally applicable influencing factors to be considered when selecting a suitable circuit breaker are listed:

- Factors influencing the ampacity of the cable: type of cable used, ambient temperature around the cable, type of cable routing, bundling of cables.
- Other influences on dimensioning: loop impedance, mutual heating of circuit breakers, ambient temperature at the circuit breaker, selectivity, type of connected device.

If these factors are ignored, it increases the danger of the circuit breaker tripping under normal operating conditions.

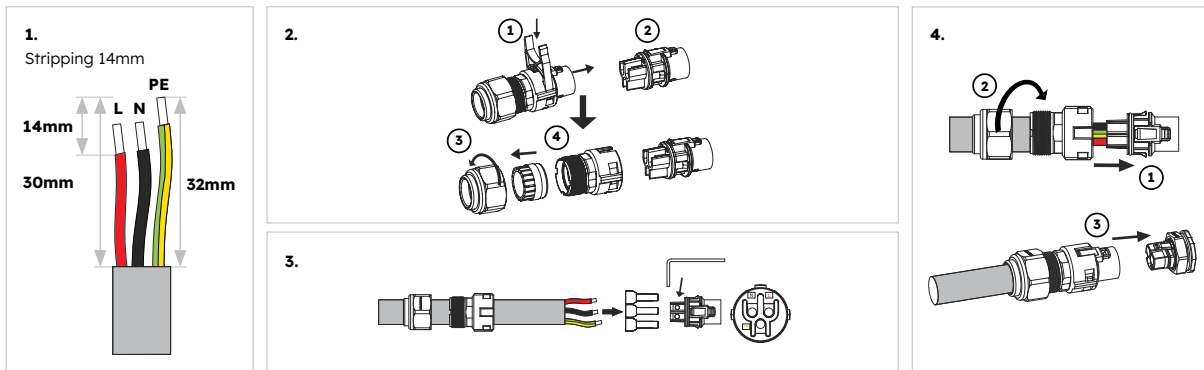
5.9.3 Grid and Backup Connection

Description	Max. Current	Circuit Breaker Size for RESERVE-INV-1-P5-L1-INT
Grid Side	43.5 A	32/40/50 A
Backup Side	21.7 A	32 A

Grid and Backup Connector Instructions:

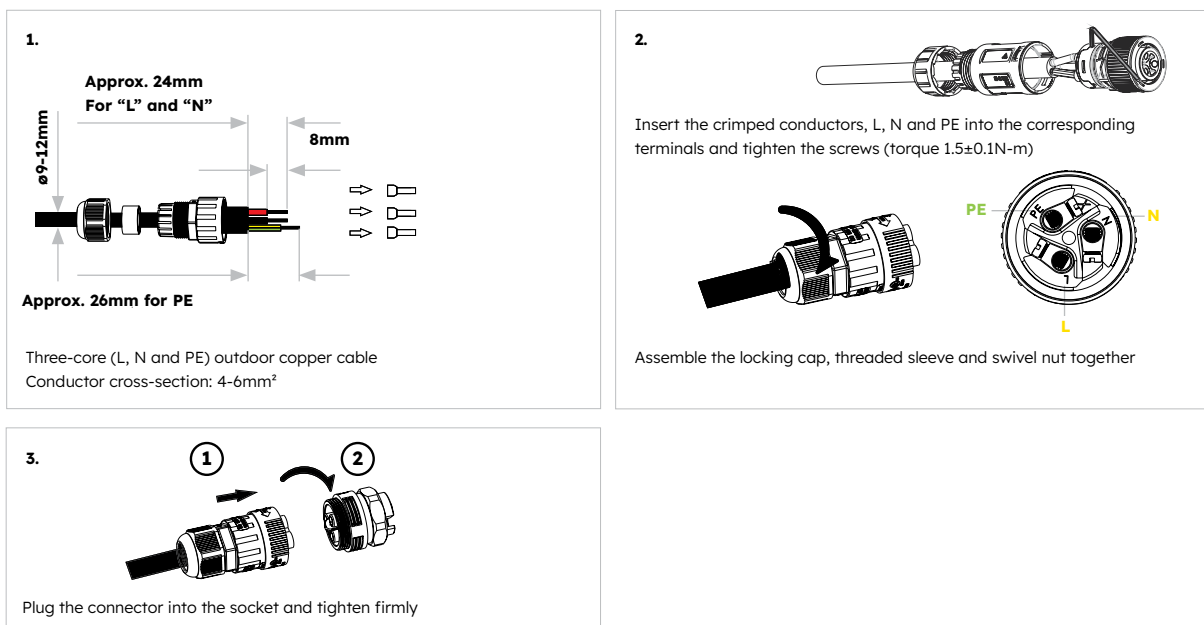
1. Disconnect the circuit breakers and secure against reconnection.
2. Dismantle the AC cable by 50mm.
3. Shorten L and N by 2mm each, so that the grounding conductor is 2 mm longer. This ensures that the grounding conductor is the last to be pulled from the screw terminal in the event of tensile strain.
4. Strip the insulation of L, N and the grounding conductor 10mm.
5. In the case of fine stranded wire L, N and PE are to be fitted with bootlace ferrules.
6. Disassemble the AC connector and connect the conductors to the AC connector.
7. Ensure that all conductors are securely connected to the AC connector, assemble the AC connector.
8. Plug the grid connector into the socket for the grid connection. When doing so, align the grid connector so that the key on the inverter grid socket is inserted into the keyway on the grid connector bush insert.
9. For backup connection, plug the backup connector into the inverter backup socket and tighten clockwise firmly.

To connect the grid connector:



Please ensure connector has been correctly installed.

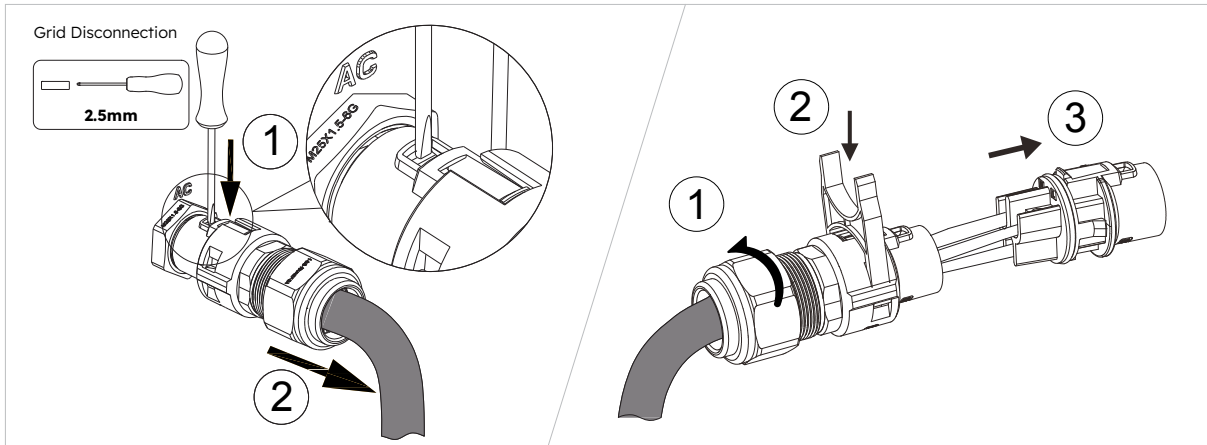
To connect the backup connector:



Please ensure connector has been correctly installed.

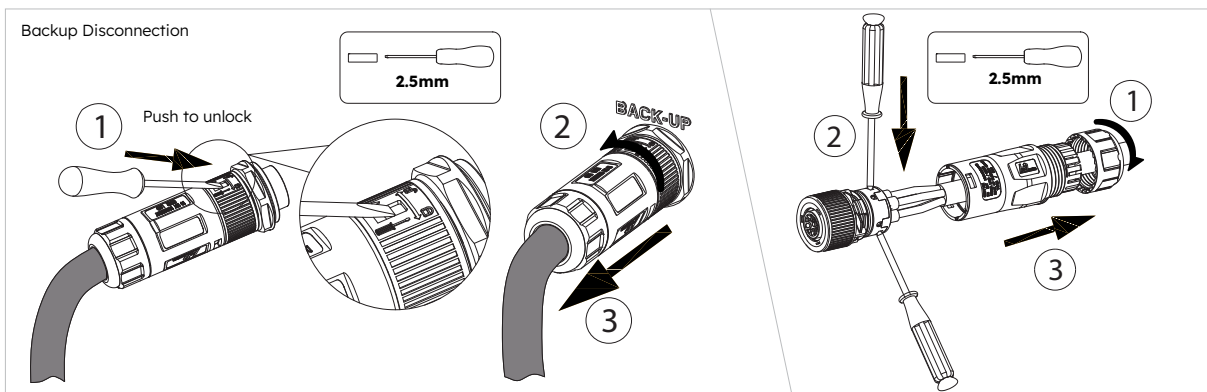
Disassemble the grid plug connector (e.g. due to faulty assembly), proceed as follows.

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. Rotate the bush insert of the backup plug connector anticlockwise. Use a flat-blade screwdriver (blade width: 2.5 mm) to push the orange latch forwards to unlock the connector coupling structure, 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.



TIP

For Australia and New Zealand installation sites, the Neutral is switched internally between the Grid and Backup Ports of the inverter. The backup port Neutral must be connected to the site Neutral bar.

5.9.4 CT Rating

Use SunPower One app or installer platform (SunPower One installer dashboard) 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.



TIP

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 SunPower if the MCB used has a steeper derating factor where the 2A buffer would not be sufficient.

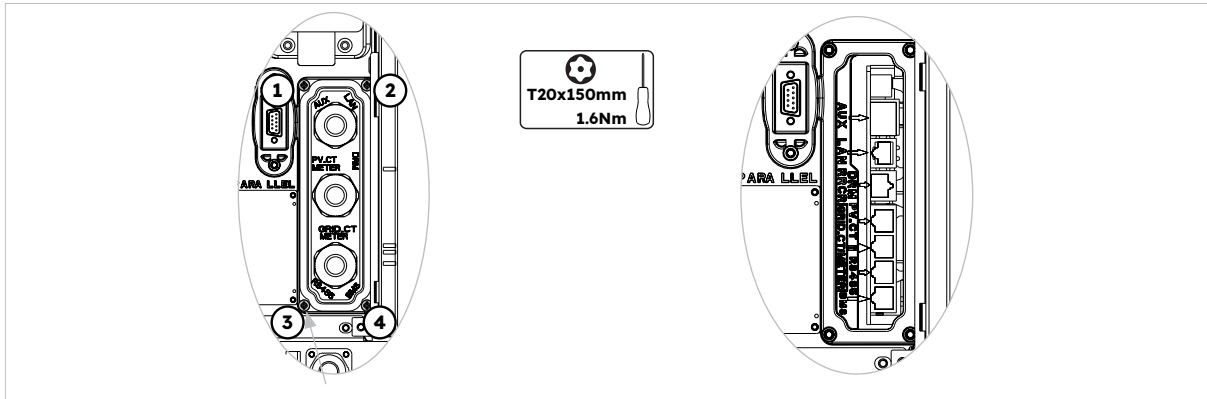
Example: If a 32A MCB is used and the backup circuit is drawing 15A, any force charging of the battery will be limited to $(32A - 2A) - 15A = 15A$. If the load on the backup circuits drops to 11A, the maximum Grid-charge current would increase to 19A.

Item	Current	Scenarios
CT	100 A	CT

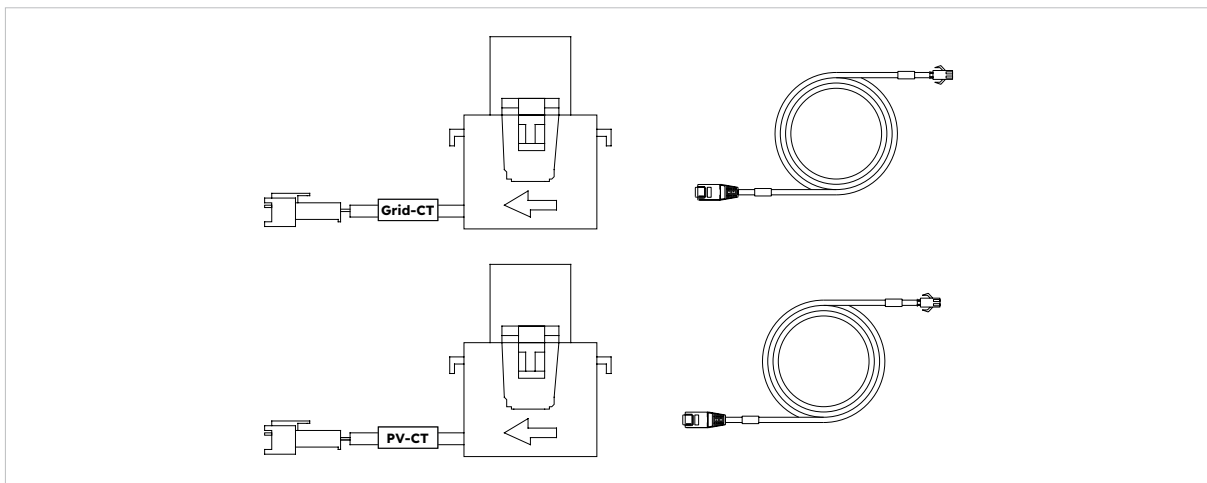
5.9.5 CT Connection

CT Connection Instructions:

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



2. Locate the included Grid CT and PV CT.



3. Lead the CT cable through the cable gland of the COM connection cover, don't tighten the swivel nuts of the cable glands.
4. Insert the RJ45 plugs to the relative RJ45 sockets.
5. Buckle the magnetic snap of the Grid CT on the house-service live cable. The arrow on the magnetic snap of the Grid CT should point to the grid port of inverter.
6. For hybrid or AC-coupled storage system application, buckle the magnetic snap of the PV CT on the live cable of the installed PV inverter. The arrow on the magnetic snap of the PV CT should point to the mains grid.
7. Connect the CT cables to the Grid CT and PV CT respectively.



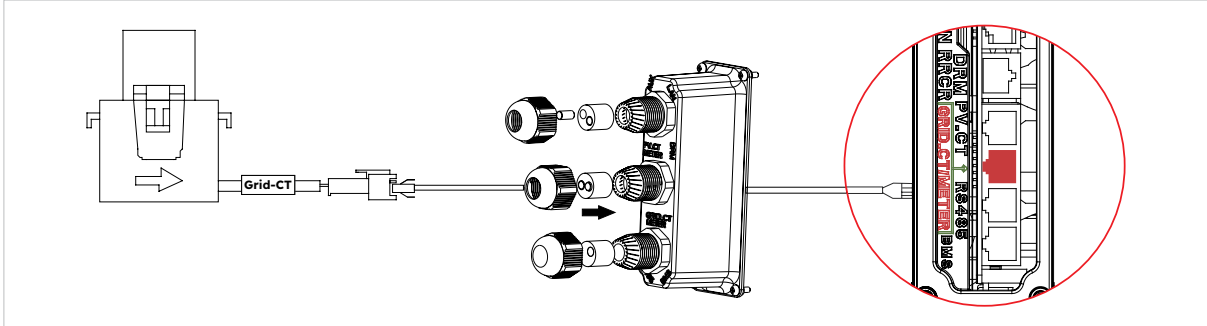
TIP

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.

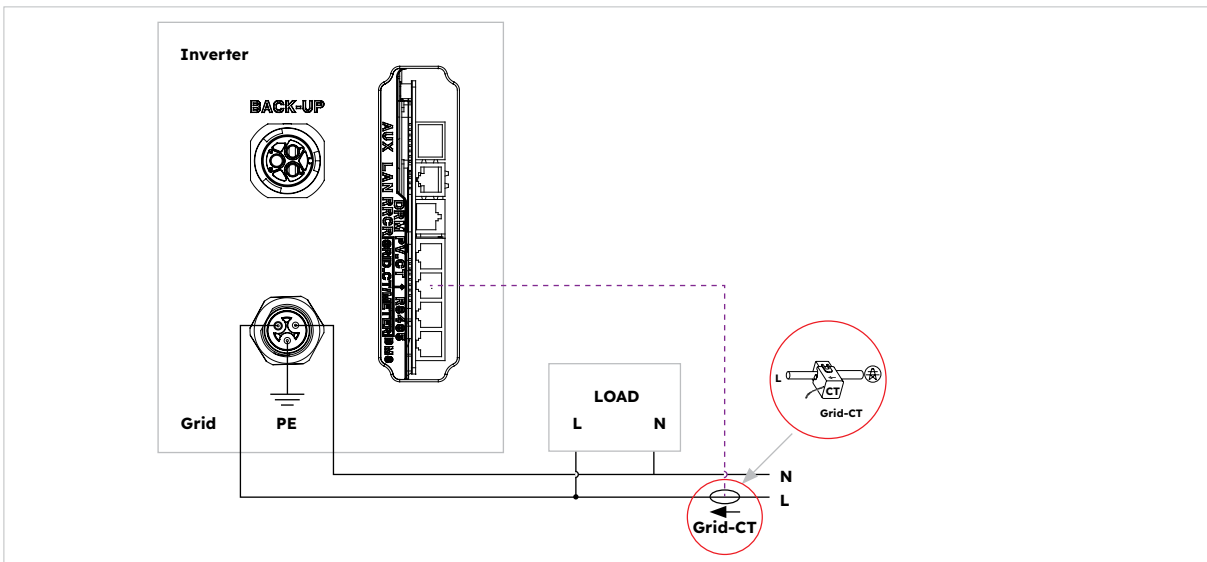


TIP

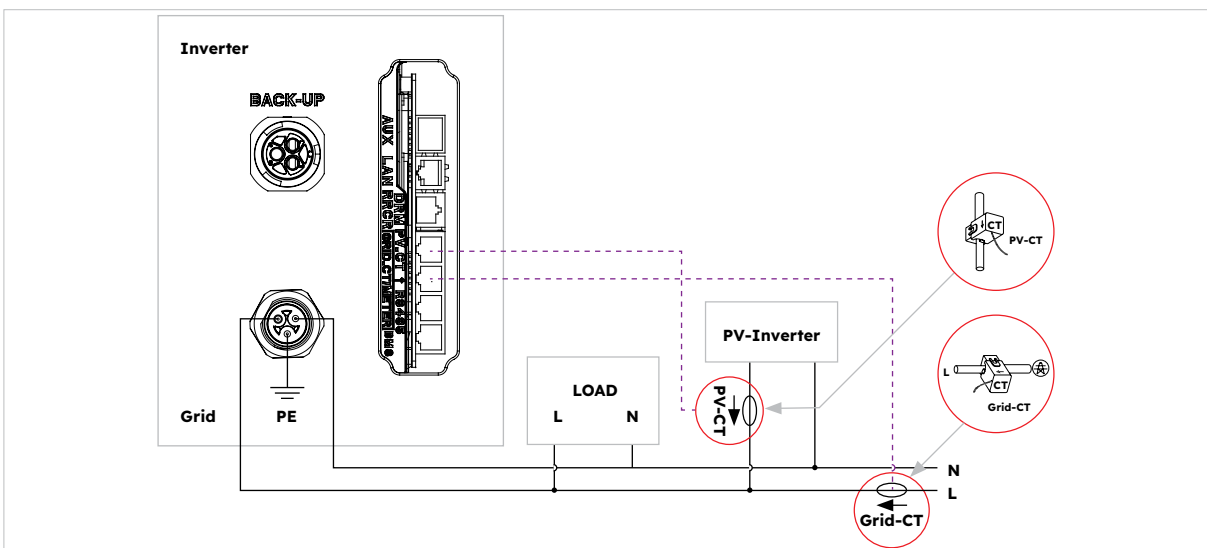
The CT wiring may be extended to a maximum of 20m. Note that extending CT's will reduce measurement accuracy. If making custom cables, please use a twisted pair cable with a suitable insulation rating.



CT placement in DC-coupled Storage System



CT placement in AC-coupled and Hybrid-coupled Storage System



5.9.6 Meter Connection

The system supports an external SunPower Reserve meter. The meter can be installed on a 1, 2 or 3 phase 4 wire 220-240V 120 grid supply.

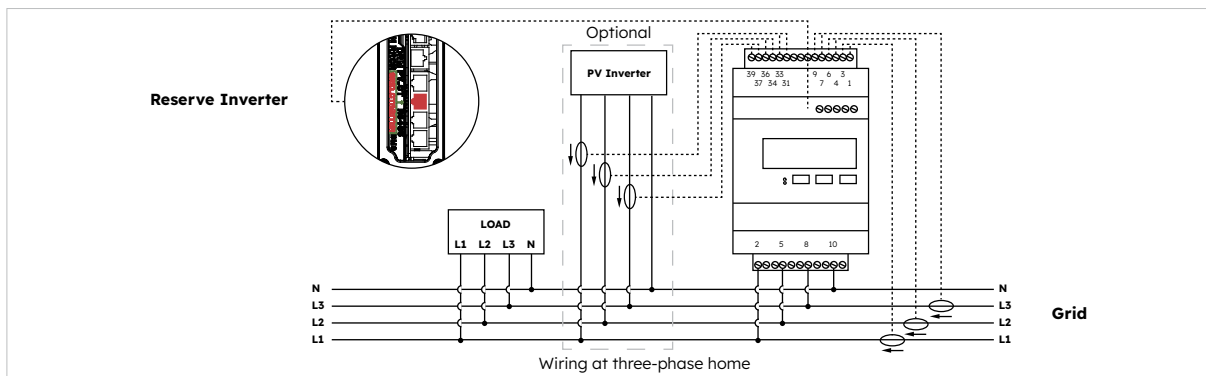
A Sunpower Reserve meter is recommended where the grid measurement point is more than 20m from the Sunpower Reserve. A Sunpower Reserve meter can be located up to 80m from the Sunpower Reserve, connected via RS485 cabling.

The SunPower Reserve meter is supplied with six 100A current transformers (CT's). Three for monitoring the grid, three for monitoring a PV inverter. The meter has custom programming to communicate with the Sunpower Reserve.

Installing all six CT's is optional. For example, an installation with a 3 phase supply and a PV inverter on one phase will only need four CT's. Three Grid CT's would be installed to monitor the grid and one PV CT would be installed to monitor a PV inverter.

Only 1 meter can be used per installation. 2 3 phase meters or a combination of 3 phase meter and supplied 1 phase CT is not supported. Please refer to wiring diagrams for more information.

Three-phase meter (with 6 CTs) connection and direction of CTs

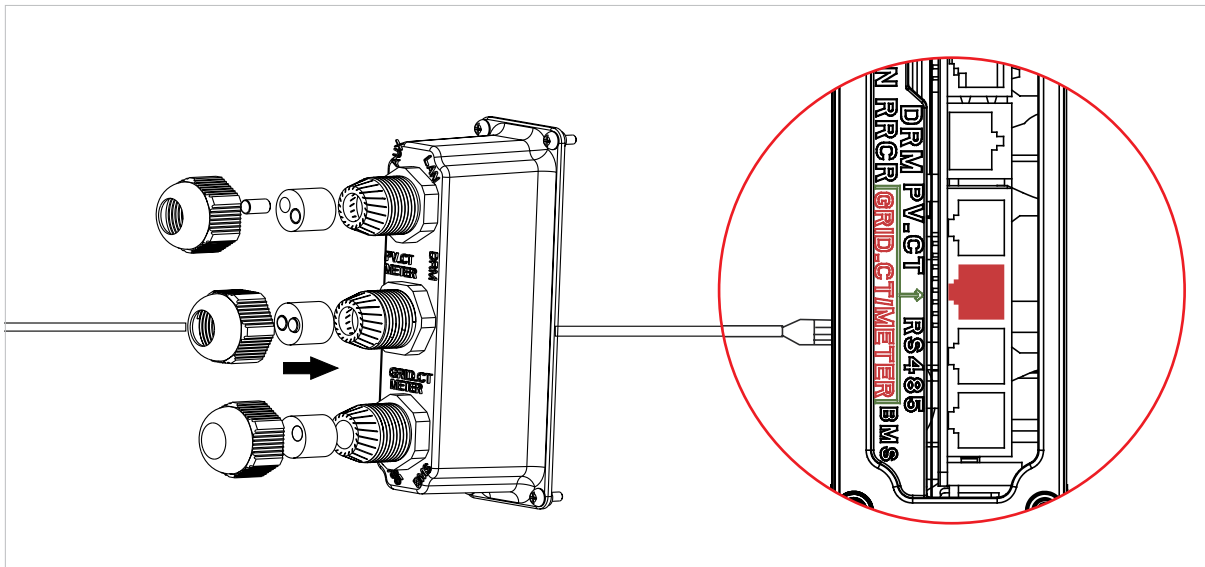


Identification of CT wiring

The meter is supplied with 6 CTs that are labelled. Follow the table below to connect the CTs to the correct terminals of the meter.

Phase	GRID CT			PV CT			Grid	
	Label	Wire Colour	Meter Terminal	Label	Wire Colour	Meter Terminal	Label	Meter Terminal
L1	IA*	White	1	IA*	White	31	L1	2
	IA	Blue	3	IA	Blue	33	L2	5
L2	IB*	White	4	IB*	White	34	L3	8
	IB	Blue	6	IB	Blue	36	N	10
L3	IC*	White	7	IC*	White	37		
	IC	Blue	9	IC	Blue	39		

Connection to the inverter



Meter Setting on SunPower One App for commissioning

During the commission process, “Meter” must be selected for meter option instead of “CT” which is default value.

Troubleshooting

Loads not measuring correctly	Turn off PV. Unclip L2 and L3 Grid CT's. Use a current clamp to confirm measurement matches the web portal realtime data. If not make sure the Meter Voltage supply terminals (2,5,8,10) are wired correctly, L1 should be wired to pin 2 of the meter with Neutral connected to Pin10. Check the CT is not reversed. Repeat for each phase.
CT's left unused after install	CT's are only required where a measurement is required. e.g if a single phase PV inverter is installed on L2 only, then L2 PV CT is required, L1 & L3 PV CT's are not.
Low measurements on L2 & L3	Make sure all supply phase voltages are connected to the meter e.g meter terminals 5 & 8 connected to L2 and L3 on a 3 phase site.

5.10 PV Connection

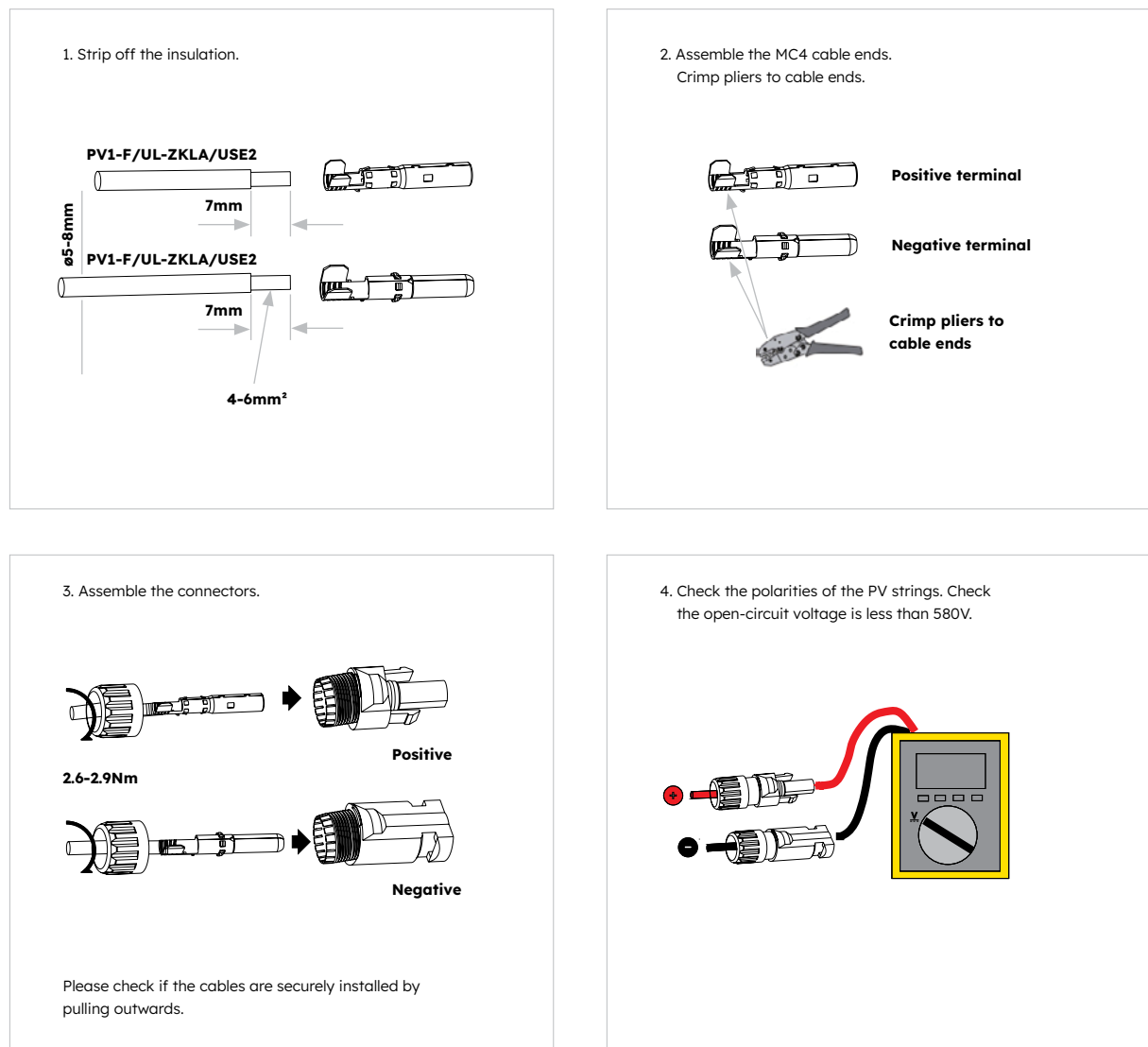
Please ensure the follows before connecting PV strings to the inverter:

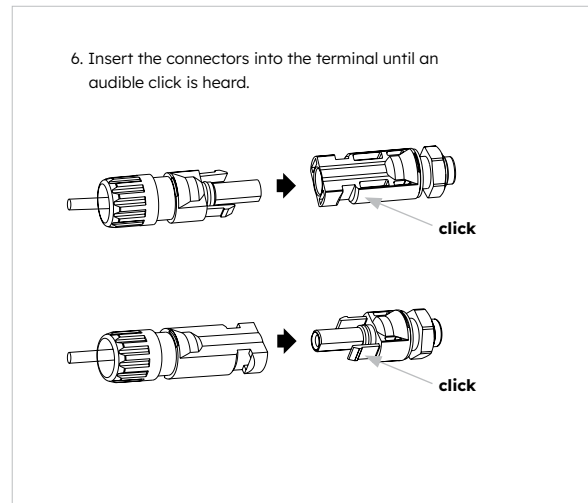
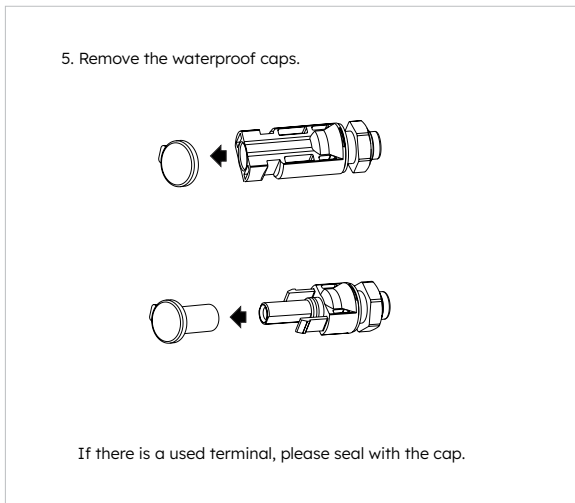
- Make sure the open voltage of the PV strings will not exceed the max. DC input voltage (580 VDC). Violating this condition will void the warranty.
- Make sure the polarity of the PV connectors is correct.
- Make sure the PV-switch, breakers of battery, AC-BACKUP and AC-Grid are all in their off-states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

The inverter includes Staubli MC4 PV connectors.

Please follow the picture below to assemble the PV connectors.

PV conductor cross section requirements: 4-6mm²





5.11 Electrical Connection

5.11.1 Electrical Connection between Batteries

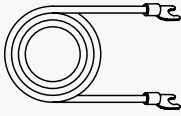


There is a specific sequence for cables passing through the cable holes of the battery left hand side and battery base. **First take the BAT power cable passing through the cable holes**, then the battery communication cable from the battery below, at last the grounding cable.

Please pay attention to the cable type, there is five kinds of cables.

No.	Picture	Description
1		The short power cable, black, provided by battery. Connect the upper power+ connector of the lower battery to the lower power- connector of the upper battery.
2		The short grounding cable, provided by battery. Connect the grounding points of the adjacent batteries.
3		The medium length power cable, black, provided by inverter. Connect lower power- connector of the bottom battery of the first column series battery and upper power+ connector of the top battery of the second column series battery.
4		The battery communication cable, provided by inverter. Connect the lower communication connector of the bottom battery of the first column series battery and the upper communication connector of the top battery of the second column series battery.

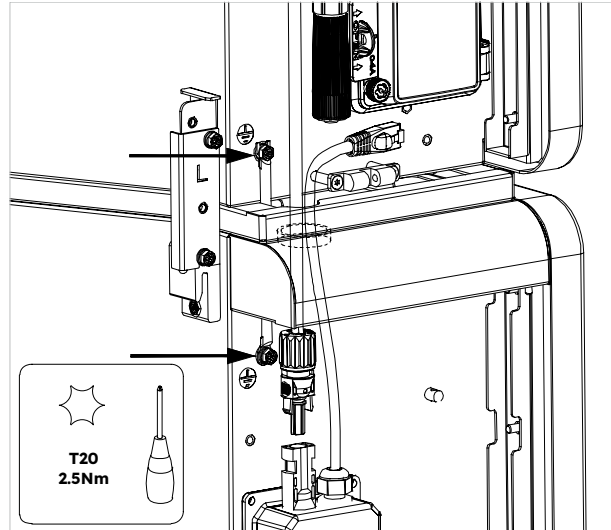
5



The long grounding cable, provided by inverter. Connect the grounding point of the bottom battery of the first column series battery and the grounding point of the bottom battery (or the top battery) of the second column series battery.

Instructions for grounding cable connection between the adjacent batteries:

1. Take out the Grounding cable from the inverter package.
2. Connect the Grounding cable to the inverter and battery packs.

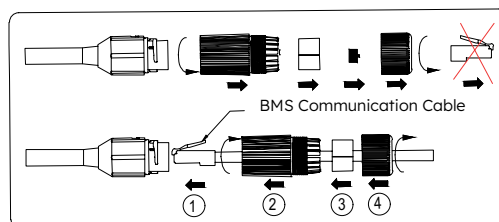


Instructions for power cables connection between the adjacent batteries:

1. Connect the upper power positive connector of the lower battery to the lower power negative connector of the upper battery using the provided BAT power cable. When doing so, please pay attention to the label at the cable end.

Instructions for communication connection between the adjacent batteries:

1. Pick up the communication connector located at the lower left of the battery and disassemble it. Unscrew the swivel nut from the threaded sleeve, remove the sealing ring, rubber plug and terminal resistor. Retain the terminal resistor of the last battery.
2. Pass the swivel nut and threaded sleeve over the communication cable from the battery below. Insert the RJ45 plug to the RJ45 socket, tighten the threaded sleeve, insert the cable from the side split of the sealing ring, push the sealing ring to the end of the threaded sleeve and tighten the swivel nut at last.



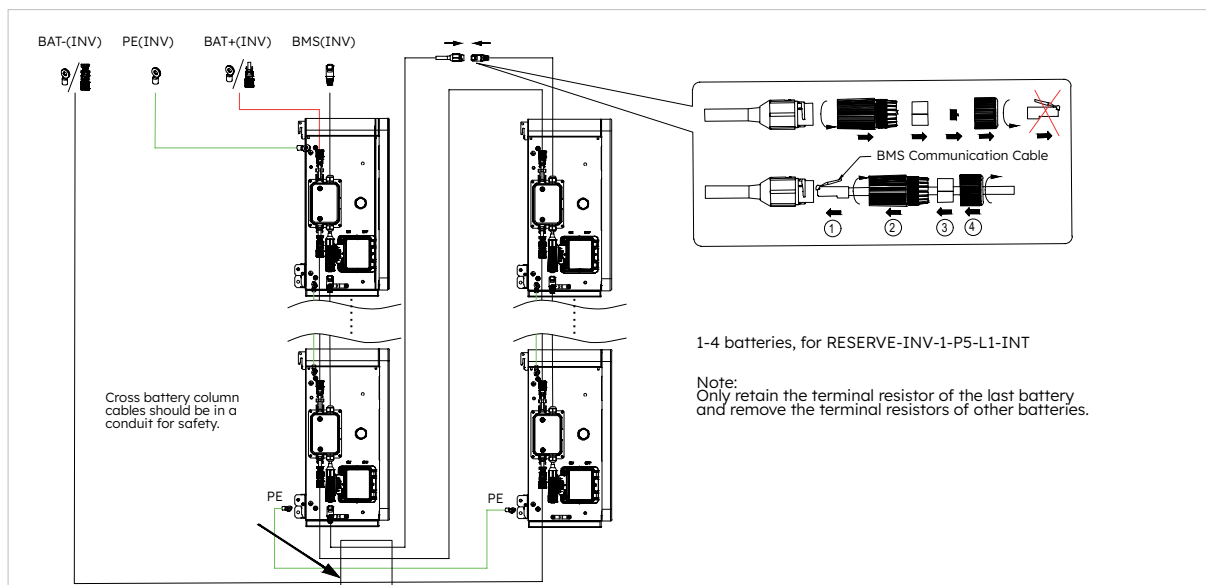
If there are two column batteries, you should perform other electrical connection.

Take out the grounding cable, power cable and communication cable, provided by the inverter.

Perform electrical connection between the bottom battery of the first column series battery and the top battery of the second column series battery, refer to this Section and the system wiring diagram of next page for the detailed installation.

5.11.2 Electrical Connection between the Inverter and the Battery

Typical system wiring diagram for inverter and RESERVE-BAT-1-DC-4-INT batteries (Max. 4) as follows:



There is a specific sequence for cables passing through the cable holes of the battery left hand side and inverter base, **first take the BAT main positive power cable passing through the cable holes**, then the battery communication cable from the battery below, at last the grounding cable.

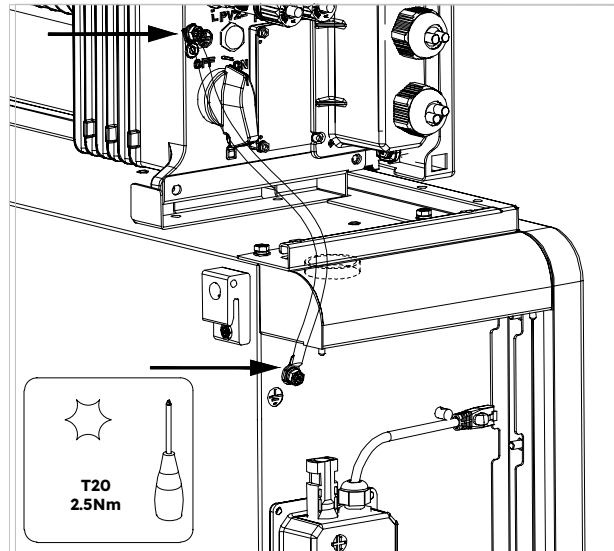
Please pay attention to the cable type, there is three kinds of cables.

No.	Picture	Description
1		The shortest power cable, red. Connect BAT main positive of battery and the BAT positive of inverter.
2		The longest power cable, black. Connect BAT main negative of battery and the BAT negative of inverter.
3		The grounding cable. Connect the grounding point of the inverter and the grounding point of the first battery.

5.11.3 Grounding Connection between Inverter and first Battery

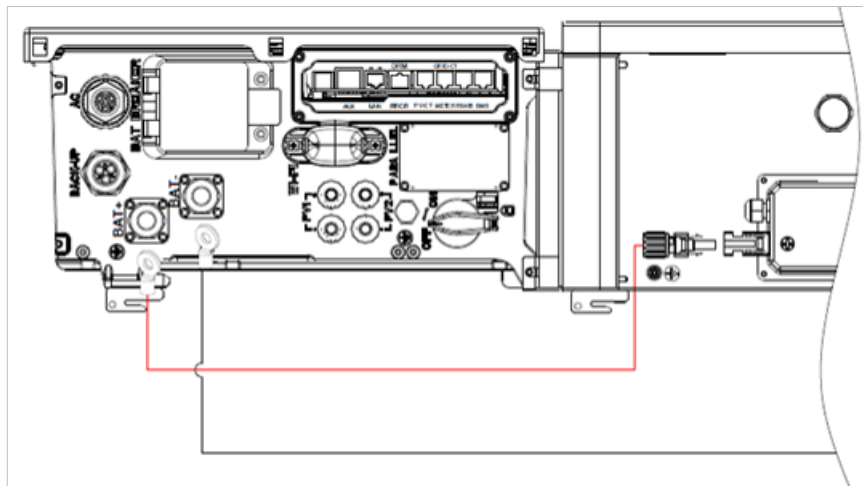
Grounding cable connection instructions:

1. Loose the M5 screws tightened at the grounding points.
2. Connect grounding point of the inverter and the grounding point of the first battery with two M5 screws (tool: T20 screwdriver, torque: 2.5Nm).



5.11.4 Power Connection between Inverter and Battery

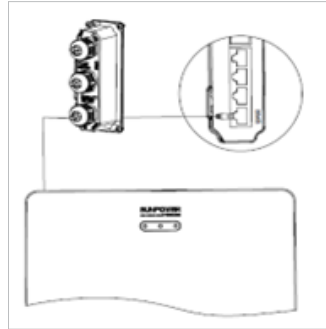
1. Take down the protective caps from the BAT power connectors of the inverter.
2. Take out the BAT main negative power cable, plug the power connector to the BAT- connector of the inverter, when doing so please pay attention to the label at the cable end. Perform the similar action to connect the BAT main negative power cable to the lower power connector of the last battery.
3. Take out the BAT main positive power cable, plug the power connector to the BAT+ connector of the inverter, when doing so please pay attention to the label at the cable end. Perform the similar action to connect the BAT main positive power cable to the upper power connector of the first battery.



5.1.1.5 Communication Connection between Inverter and Battery

Communication cable connection between the inverter and RESERVEBAT-1-DC-4-INT battery instructions:

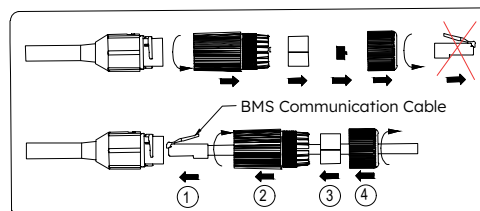
1. Pass the battery communication cable of the first battery through the cable gland of the COM connection cover of inverter. Do not tighten the strain relief nut of the cable gland
2. Insert the RJ45 plug to the BMS communication port of the inverter.



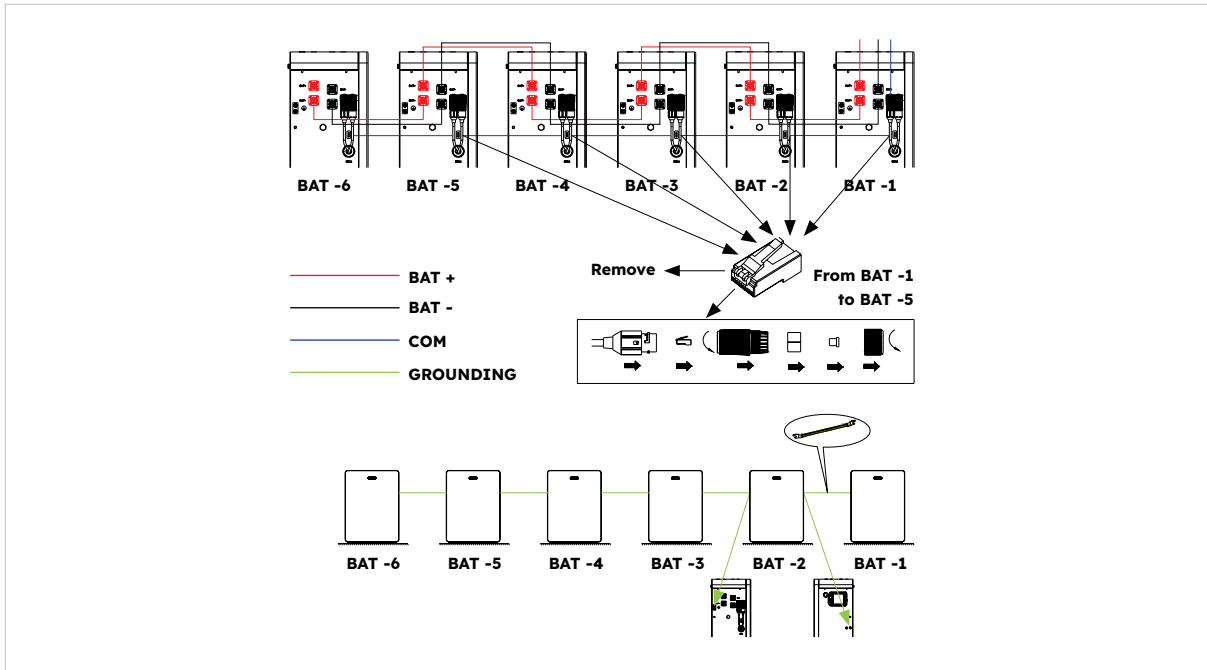
5.1.1.6 Electrical Connection for Expansion Batteries

Electrical connection for expansion batteries up to 6 units as follows:

1. Take out the expansion battery power cables and communication cable from the battery package.
2. Remove the protective caps from the battery power connectors. Connect the battery power cables to the two batteries.
3. Please pay attention to the connector polarity, red is for battery positive.
4. Insert the RJ45 plugs to the relative RJ45 sockets provided by batteries.
 - a. Pick up the communication connector located at the upper left of the battery, and disassemble it. Unscrew the swivel nut from the threaded sleeve, remove the sealing ring, rubber plug and terminal resistor.
 - b. Pass the swivel nut and threaded sleeve over the communication cable. Insert the RJ45 plug to the RJ45 socket, tighten the threaded sleeve, insert the cable from the side split of the sealing ring, push the sealing ring to the end of the threaded sleeve and tighten the swivel nut at last.



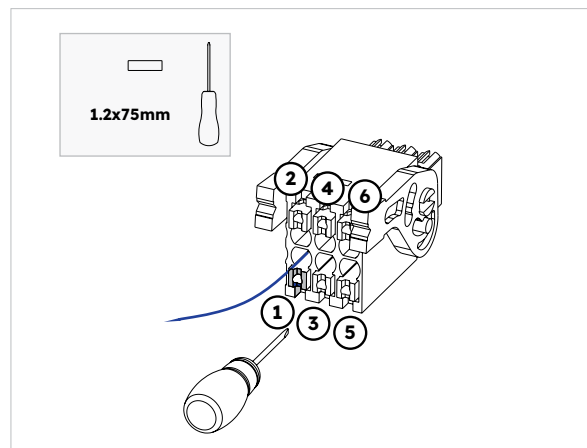
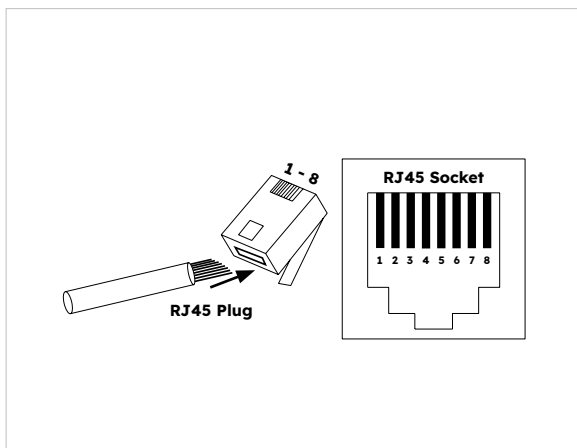
5. Only retain the terminal resistor of the last battery, remove the other terminal resistor.
6. Please do grounding connection between two batteries by reference to the corresponding section 5.8 Connecting additional grounding.



5.11.7 Other Communication Connection of Inverter

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

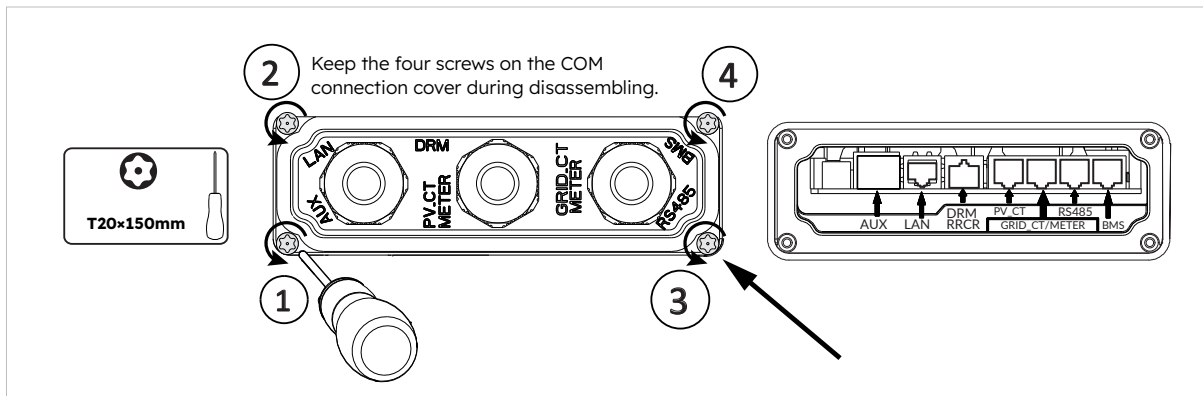
1. Loosen the cable glands on the COM connection cover, and then unscrew the 4 screws on the COM connection cover.
2. Lead the communication cables through the cable glands of the COM connection cover, don't tighten the swivel nuts of the cable glands. Insert the RJ45 plugs to the relative RJ45 sockets.
 - a. 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 always implements the commands from the grid operator for active power limitation. The system and the Demand Response Enabling Device (DRED) must be connected in the same network.
Only DRM0 is available for this product.
 - b. Take out 6 pin terminal block for AUX connection. To do wiring connection, insert a screwdriver (blade width: 1.2 mm) into the relative connection position side. For AUX position definition, please see the AUX wiring documentation.



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

The pin definition of the communication ports:

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



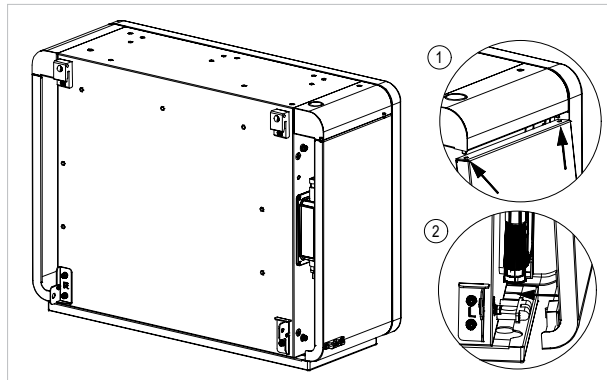
5.12 Mounting the Battery and Inverter Facade

After finishing electrical connection of the energy storage system, do the following operations.

5.12.1 Mounting the Decorative Parts of the Battery

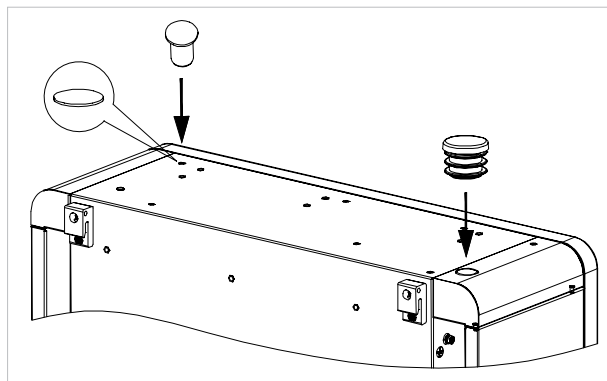
Mounting the side plates of RESERVE-BAT-1-DC-4-INT battery:

1. Take out the left side plate and the right side plate.
2. Align the left side plate so that the two holes on the top edge of the left side plate should point to the raised pins on the bottom of the left handle, then push the lower part of the left side plate to the battery housing till hear the „click“ sound.
Take similar actions to mount the right side plate.



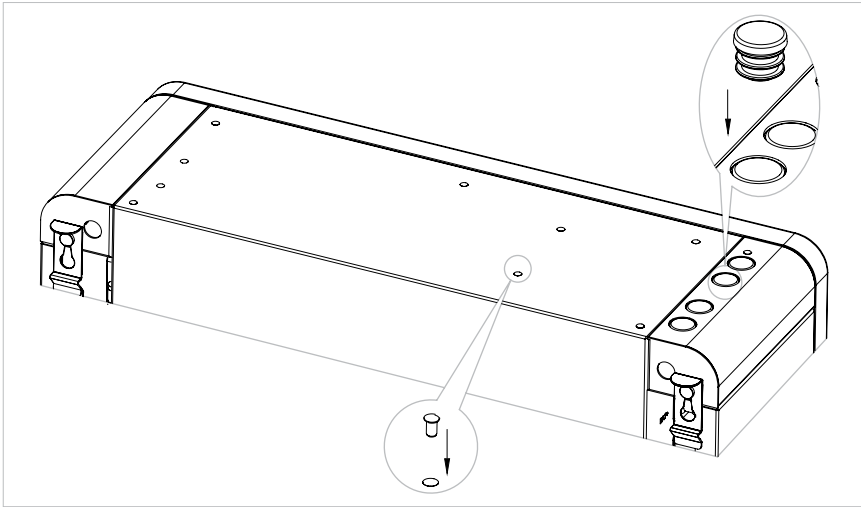
Mounting the silicone stopper and plastic buckle on the battery top:

If the second column of series batteries have been installed, take out the silicone stoppers and plastic buckle, plug them to the designated holes to improve the appearance of the battery top.



5.12.2 Mounting the Screw Plugs

If more than one battery is installed, you can perform the following operations to improve the appearance of the battery top.



5.13 Startup and Shutdown Procedure

5.13.1 Startup Procedure

1. Switch ON the BATTERY SYSTEM ISOLATOR at the left side of the inverter, immediately below the grid connector.
2. Switch ON the BATTERY CIRCUIT BREAKER for each battery.
3. Switch ON the AC GRID SUPPLY to the inverter.
4. Switch ON the AC BACKUP SUPPLY from the inverter if installed.
5. Switch ON the PV switch (if there is any) between the PV strings and the inverter.
6. Switch ON the PV ISOLATOR at the left side of the inverter if PV arrays are connected to inverter directly.
7. Switch ON the AC circuit breaker (if there is any) between the PV inverter and the grid.

5.13.2 Shutdown Procedure



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

Procedure

1. Set the Changeover switch to MAINS to supply loads from the GRID, if installed.
2. Switch OFF the AC BACKUP SUPPLY from the inverter if installed.
3. Switch OFF the PV switch (if there is any) between the PV strings and the inverter.
4. Switch OFF the PV ISOLATOR at the left side of the inverter if PV arrays are connected to the inverter directly.
5. Switch OFF the BATTERY CIRCUIT BREAKER for each battery.
6. Switch OFF the BATTERY SYSTEM ISOLATOR at the left side of the inverter, immediately below the grid connector.
7. Switch OFF the AC GRID SUPPLY to the inverter.
8. Switch OFF the circuit AC breaker (if there is any) between the PV inverter and the grid.

5.13.3 Checks before Startup

No.	Check Item	Acceptance Criteria
1	Mounting environment	The mounting location is suitable, and the mounting environment is clean and tidy, without foreign objects.
2	Battery pack and inverter mounting	The battery pack and inverter are mounted correctly and securely.
3	WiFi mounting	The WiFi module is mounted correctly and securely.
4	Cable layout	Cables are routed correctly and securely to local wiring requirements.

5	Cable tie	Cable ties are secured evenly, and no burr exists.
6	Grounding	The ground cable is connected correctly, securely, and reliably.
7	Switch and breakers status	The PV switch (if there is any) and battery breakers and all the breakers connecting to the product are OFF.
8	Cable connections	All AC, DC and communication plugs and connectors are secured.
9	Unused power terminals	Unused terminals are protected from moisture ingress.

6.0 10kWh Battery Based System

6.1 Checking the Outer Packing



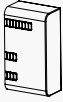
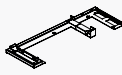
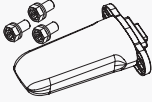
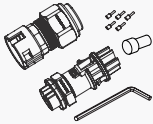
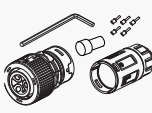
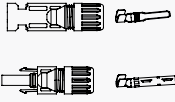
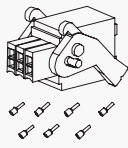
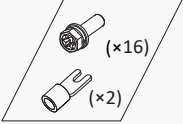
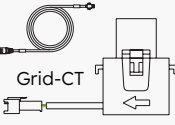
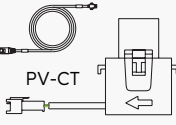

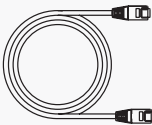
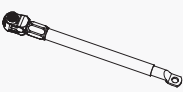
Before unpacking the product, check the outer packing for damage, such as holes and cracks. If any damage is found, do not unpack the product and contact your supplier as soon as possible.

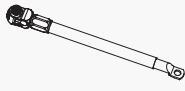
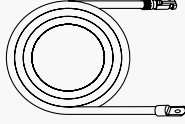
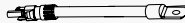


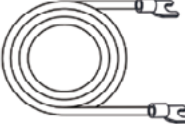


6.2 Scope of Delivery

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

6.3 Included in the Box

Check the components included with inverter and battery from the list below.

Inverter RESERVE-INV-1-P5-L1-INT				
				
Inverter (x1)	Side Cover (x1)	Cable Cover (x1)	Inverter Base (x1)	Wi-Fi Module (x1)
				
Grid Connector (x1)	Backup Connector (x1)	PV MC4 Connector Pair (x2)	AUX Terminal Block (x1)	Screws M5*12 and Grounding Terminals Set (x1)
				
Grid-CT (x1)	PV-CT (x1)	Grounding Cable between Inverter and 1st Battery (x1)	Parallel Battery Communication Cable* (x1)	Parallel Battery Positive Power Cable* (x1)

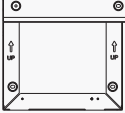

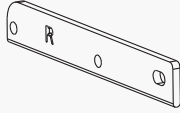
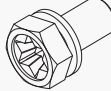
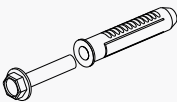
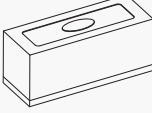
				
Parallel Battery Negative Power Cable* (x1)	Series Batteries Main Negative Power Cable** (x1)	Series Batteries Main Positive Power Cable** (x1)	Power Cable between two Column Series Batteries** (x1)	Communication Cable between two Column Series Batteries** (x1)
				
Grounding Cable between two Column Series Batteries** (x1)	System Wiring Diagram sheets (x1)	Quick Installation Guide (x1)		

* Only suitable for RESERVE-BAT-1-DC-10.1-INT

** Only suitable for RESERVE-BAT-1-DC-4-INT



If you install the energy storage system in only one column for the first time, please keep the rest cables properly which are used to connect with the second column series battery RESERVE-BAT-1-DC-4-INT.

Additional components for inverter wall bracket (optional)

Wall bracket of Inverter RESERVE-INV-1-P5-L1-INT				
				
Wall Bracket (x1)	Left Connecting Beam (x1)	Right Connecting Beam (x1)	Hexagon Head Screw M5*12 (x12)	Wall Anchor ST6*55 (x4)
				
Small Spirit Level (x1)				

Check the components included with parallel battery from the list below.

Parallel Battery RESERVE-BAT-1-DC-10.1-INT

				
Parallel Battery (x1)	Left Side Plate (x1)	Right Side Plate (x1)	Wall Panel (x1)	Screw M5x12 (x3)
				
Limit Bracket (x2)	Silicone Stopper (x12)	Plastic Blockage (x4)	Wall Anchor (x4)	Expansion Battery Grounding Cable (x1)
				
Expansion Battery Communication Cable (x1)	Expansion Battery Positive Power Cable (x1)	Expansion Battery Negative Power Cable (x1)	Quick Installation Guide (x1)	

6.4 Preparing Tools and Instruments

Ensure the following equipment and safety gear is available prior to installation of the unit:

Tools and Instruments and Personal Protective Equipment				
				
Hammer drill (With a \varnothing 10mm drill bit)	Torque socket wrench M10	Multimeter (DC voltage range 0-1000 V DC)	Diagonal pliers	Wire stripper
				
PH2 screwdriver (Torque range: 0-5 N m)	Rubber mallet	Utility knife	Cable cutter	Crimping tool
				
Terminal crimper	Disassembly and Assembly Tool of PV connector	Vacuum cleaner	Heat shrink tubing	Heat gun
				
Marker	Measuring tape	Bubble or digital level	Anti-dust respirator	Safety shoes
				
Safety gloves	Safety goggles			

6.5 Requirements for Mounting



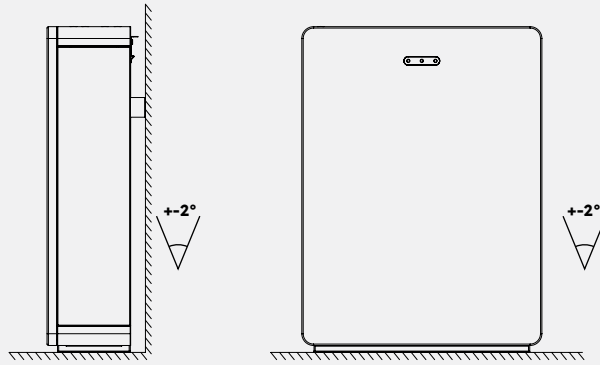
Despite careful construction, electrical devices can cause fires.

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

Type	Requirements
Basic	<ul style="list-style-type: none"> • The SunPower Reserve system is suitable for indoor and outdoor use. • Do not install the inverter in a place where a person can easily touch it because its enclosure and cover can be very hot during operation. • Do not mount the system in areas with flammable or explosive materials. • Do not mount the system at a place within children's reach. • Do not mount the system outdoors in salt areas because it will be corroded there and may cause fire. A salt area refers to the region within 500 m from the coast or prone to sea breeze.
Mounting Environment	<ul style="list-style-type: none"> • The system must be mounted in a well-ventilated environment to ensure good heat dissipation. • Do not mount the system in areas where it could be exposed to sunlight, the power of the system may be derated due to additional heat. • Mount the system in a sheltered place or mount an awning over the product. • The optimal temperature range for the battery pack is from 15 °C to 30 °C and not exposed to sunlight. • Do not expose or place near water sources like downspouts or sprinklers. • If the battery pack is mounted in an area where vehicles are present, ensure mechanical protection from vehicles.
Mounting Structure	<ul style="list-style-type: none"> • The mounting surface behind the system should not allow the propagation of fire. • Ensure that the mounting floor is solid and able to bear the weight of the system.

Mounting Angle and Stack

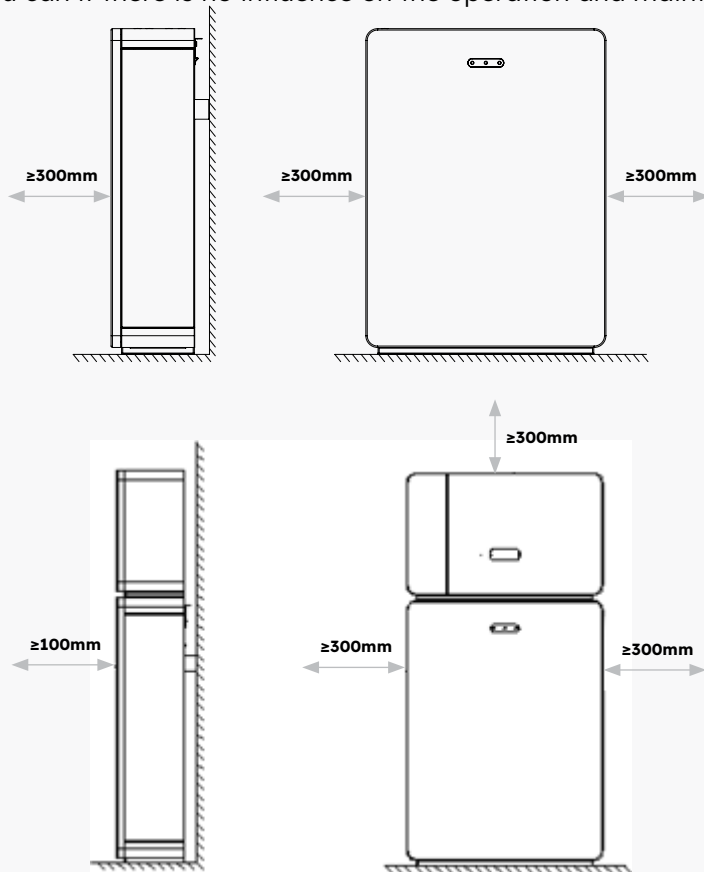
- The inverter should be mounted on the battery. The installation angle requirement is:



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

Mounting Space

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

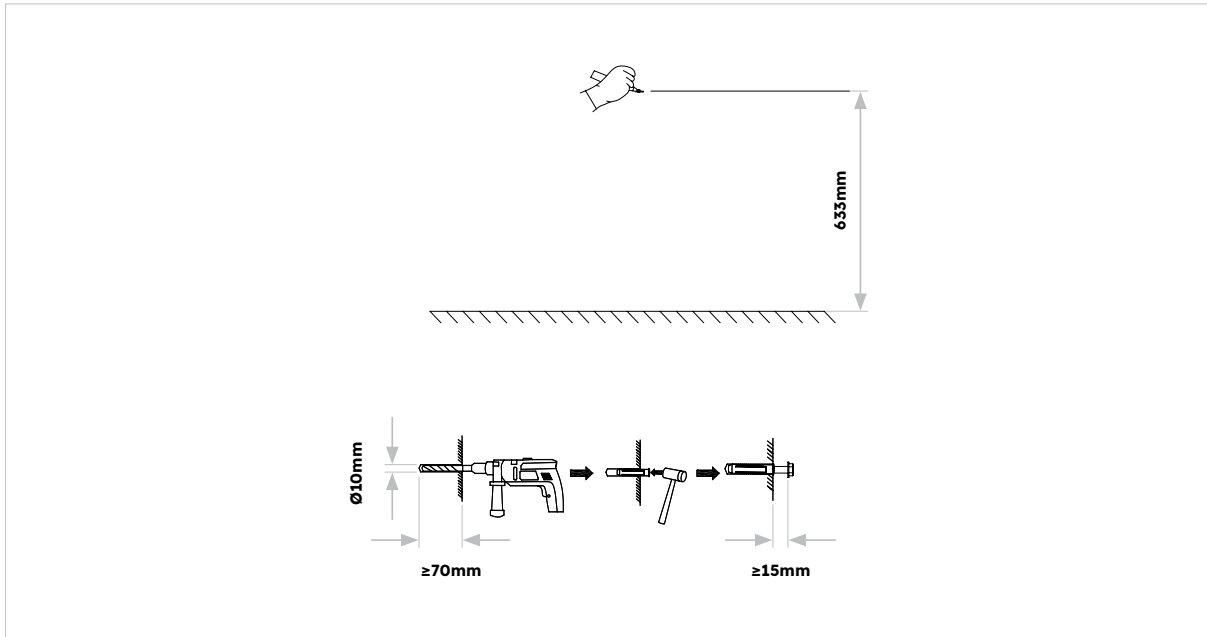


6.6 Mounting

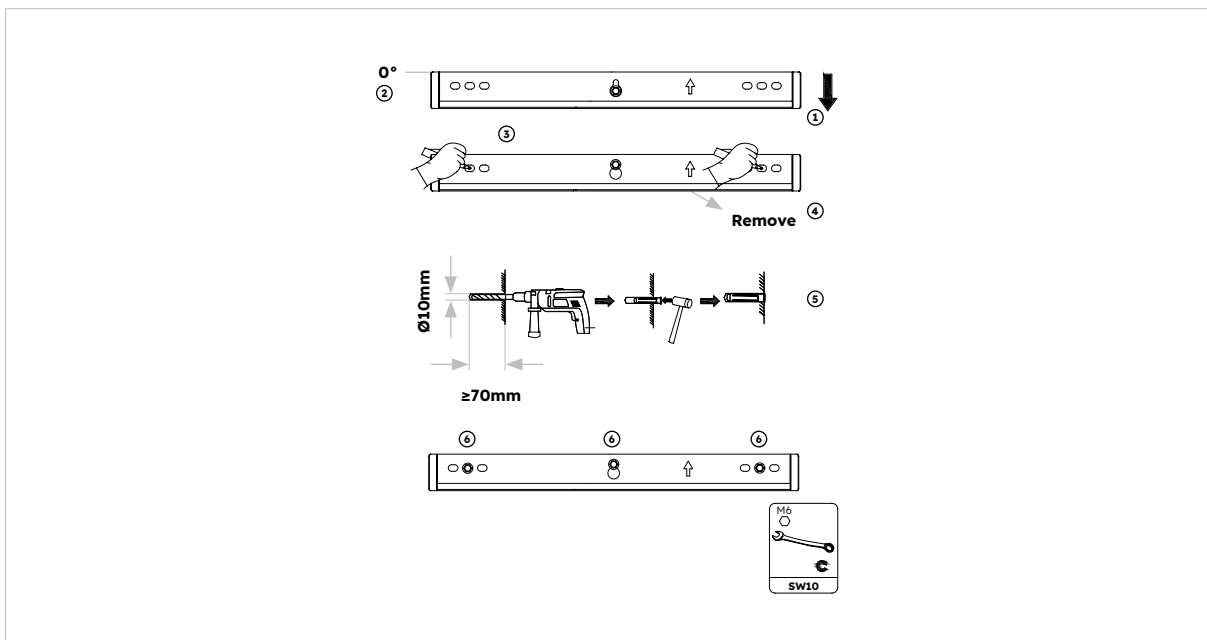
6.6.1 Mounting the Battery

Battery Mounting Instructions:

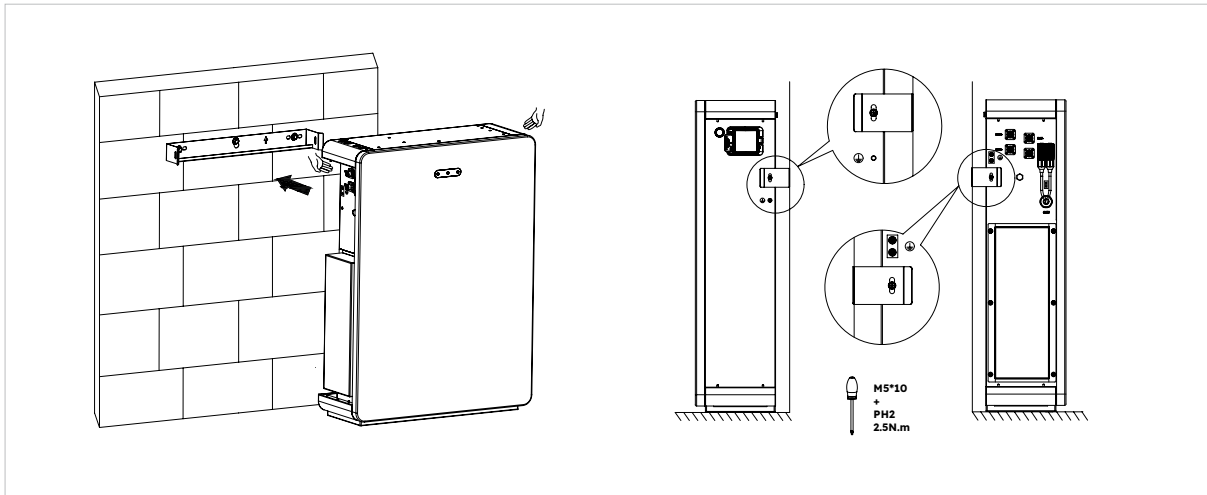
1. Take out the battery from the carton, transport it to the installation site with a suitable hand-cart with securing facility.



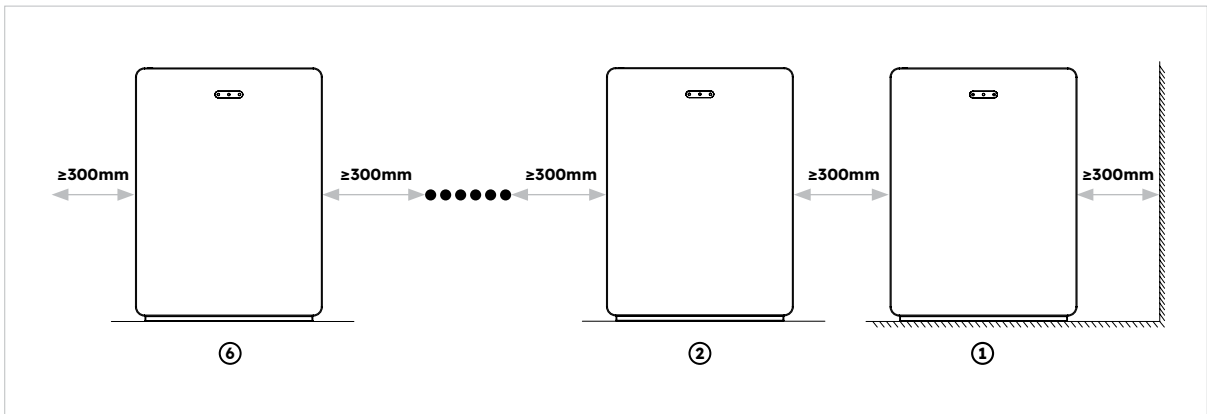
2. Mark the holes and mount the wall panels. Please make sure the surface under the batterie(s) are solid and level.



3. Fix the battery on the wall bracket with two M5*10 screws.



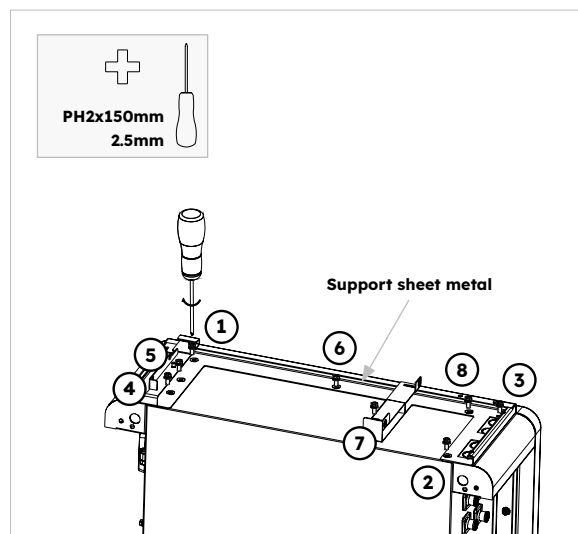
4. To mount additional batteries (max. 6 units), please follow as above steps:



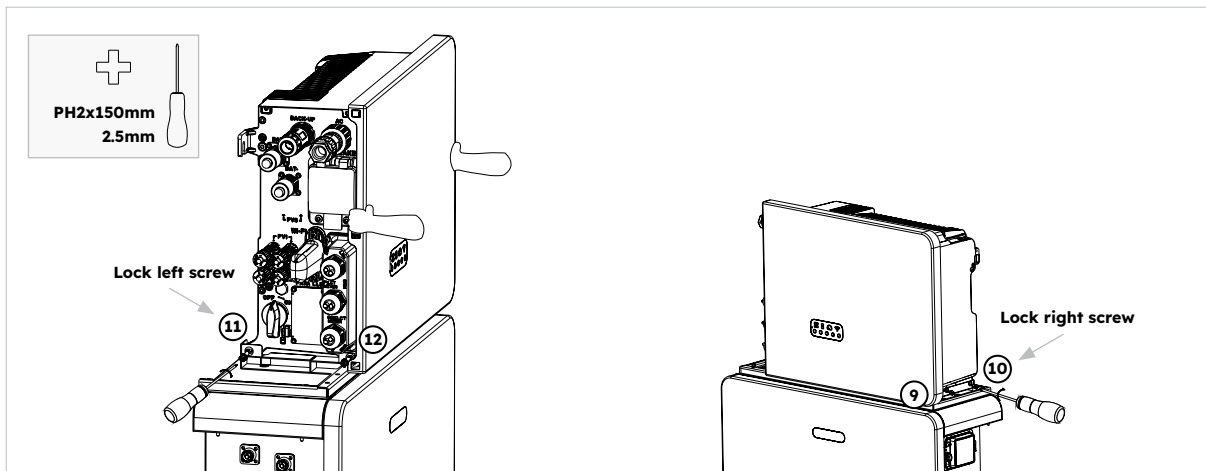
6.6.2 Mounting the Inverter

Inverter Mounting Instructions:

1. Fit the inverter base onto the top of the battery and attach.



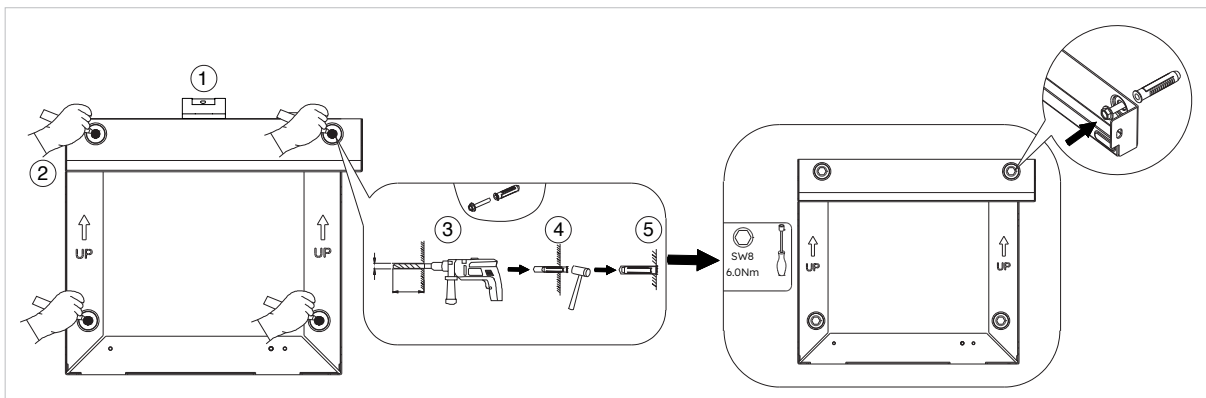
2. Attach the inverter to the sides of the inverter base and lock left screws:



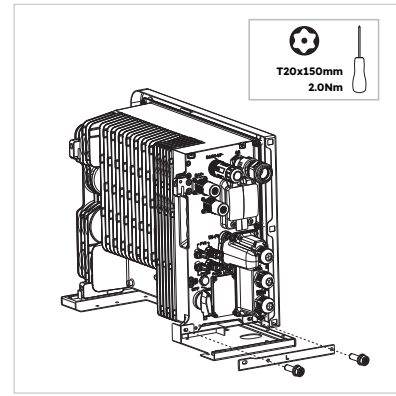
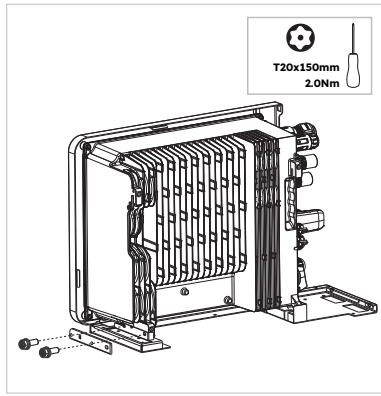
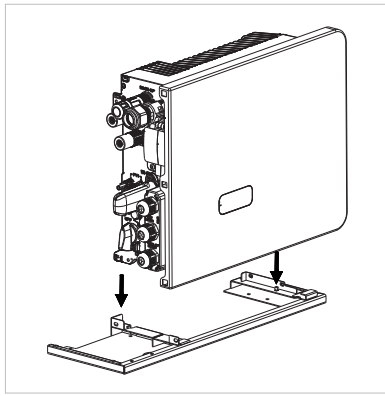
6.6.3 Mounting the Inverter Hanging on the Wall Bracket

Mount the inverter with wall bracket which is suitable for battery ready scenario, detailed instructions as follows:

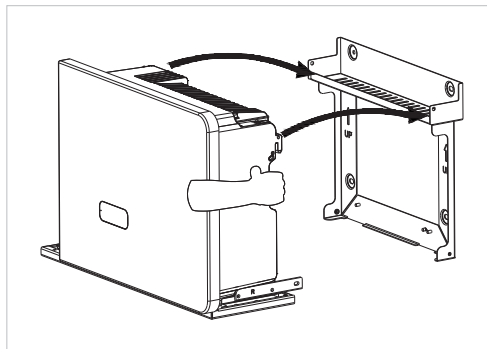
1. Take out the wall bracket of the inverter. Select a suitable height, please reserve enough space below if you want to add batteries follow-up. Mark the four drilling positions of the wall bracket, drill the marked holes with drill 10mm. Insert screw anchors into the drilling holes. Ensure that the wall bracket is placed horizontally using a spirit level before securing it. Secure the bracket to the wall, tighten the screws with the SW8 hexagon sleeve.



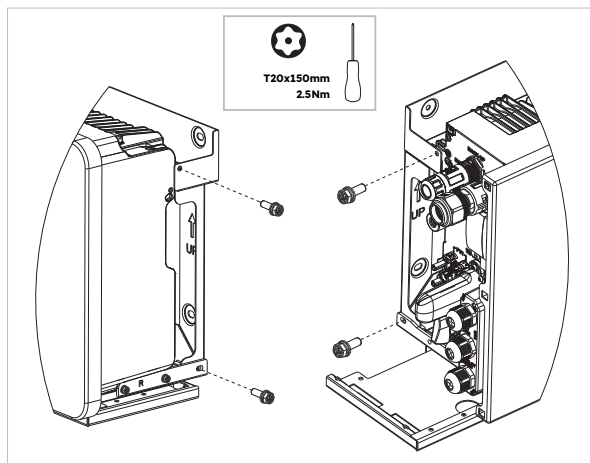
2. Take out the inverter base, place the inverter into the inverter base. When doing so, the lower right and left holes on the bottom of the inverter must be inserted into the respective guides in the inverter base. Secure the inverter base to the inverter with each two screws M5*12 on the left and right sides (tool: T20 screwdriver, torque: 2.5Nm).



3. Hook the inverter into the wall bracket. Ensure that the battery is securely in place.



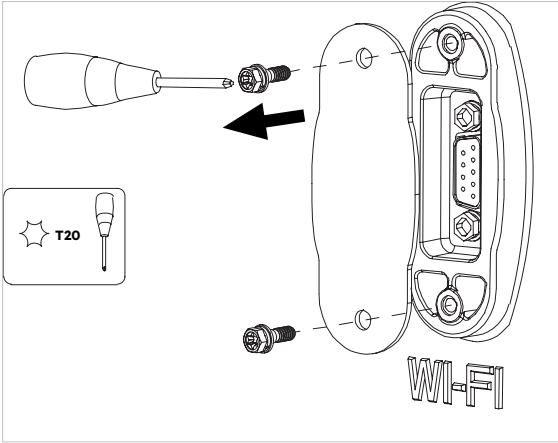
4. Secure the inverter to the wall bracket. To do so, insert the four screws M5*12 into the lower and upper threaded holes on both sides of the inverter and tighten them (tool: T20 screwdriver, torque: 2.5Nm).



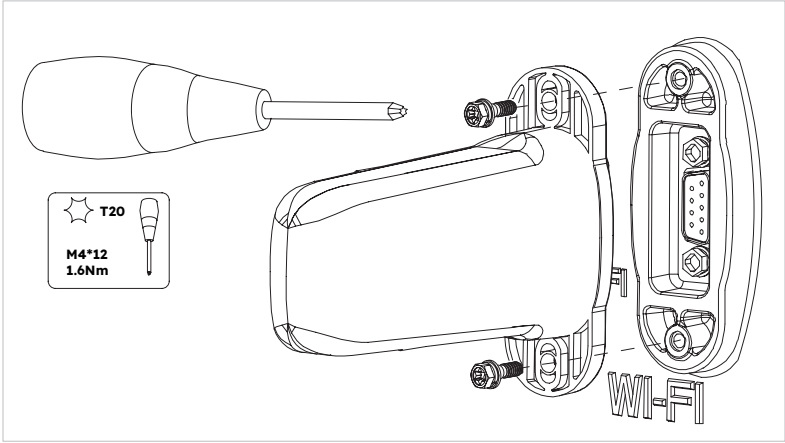
6.6.4 Mounting the Wi-Fi Module

Inverter Mounting Instructions

- 1. Remove the Wi-Fi anti-dust cover from the left side of the inverter



- 2. Tighten the Wi-Fi module onto the inverter with screw M4*10 (X2)



Note: you may prefer to install the Wi-Fi dongle last to maximize access for connecting the electrical cables.

6.7 Cable Requirements for Connection



The energy storage system damage caused by incorrect cable connections is not covered under any warranty. Only certified electricians are allowed to connect cables. Operation personnel must wear proper PPE when connecting cables.



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



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).

No.	Cable	Type	Conductor Cross Section Area	Outer Diam.	Source
1	Battery power cables with inverter	Standard PV cable in the industry	16mm ²	N/A	Delivered with the inverter
2	Battery communication cable with inverter	Standard network cable in the industry	0.12-0.20mm ²	N/A	Delivered with the inverter
3 ₁	Signal cable	Standard network cable in the industry	0.12-0.20mm ²	N/A	Delivered with the inverter
4	PV Power cable	Standard PV cable in the industry (recommended type: PV1-F)	4-6mm ²	5.5-9mm	Purchased by the installer
5 ₂	Signal cable	Standard network cable in the industry (recommended type: C-Bus cable)	0.12-0.20mm ²	4-6mm	Purchased by the installer
6 ₃	Signal cable	Multiple-core outdoor shielded twisted pair cable	0.1-1.3mm ²	4-6mm	Purchased by the installer
7	AC power cable for backup	Three-core (L, N and PE) outdoor copper cable	4-6mm ²	10-14mm	Purchased by the installer
8	AC power cable for grid	Three-core (L, N and PE) outdoor copper cable	6-10mm ²	9-18mm	Purchased by the installer
9	PE cable	Single-core outdoor copper cable	4-10mm ²	N/A	Purchased by the installer
10	Expansion Battery power cables	Standard PV cable in the industry	16mm ²	N/A	Delivered with the battery

11	Expansion Battery communication cable	Standard network cable in the industry (recommended type: C-Bus)	0.12 - 0.20mm ²	N/A	Delivered with the battery
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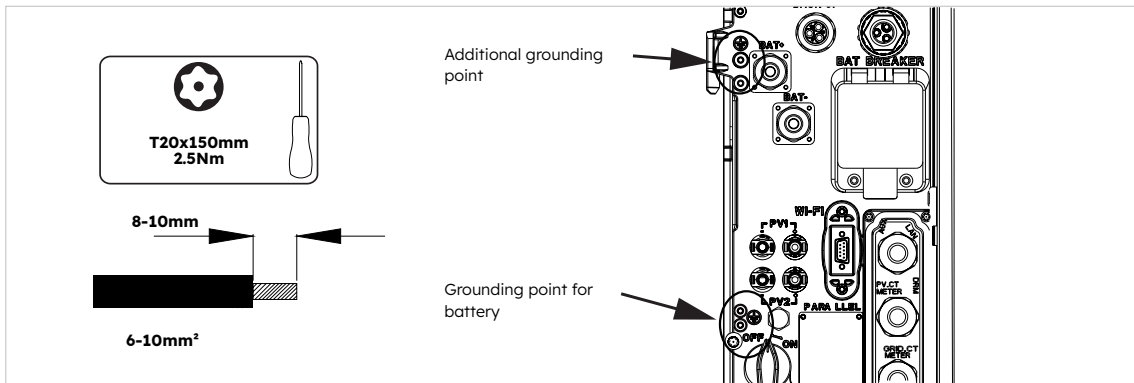
¹ For CT communication connection with inverter.
² For CAN/RS485, LAN, Meter, DRM communication connection with inverter.
³ For AUX communication connection with inverter.

6.8 Connecting Additional Grounding

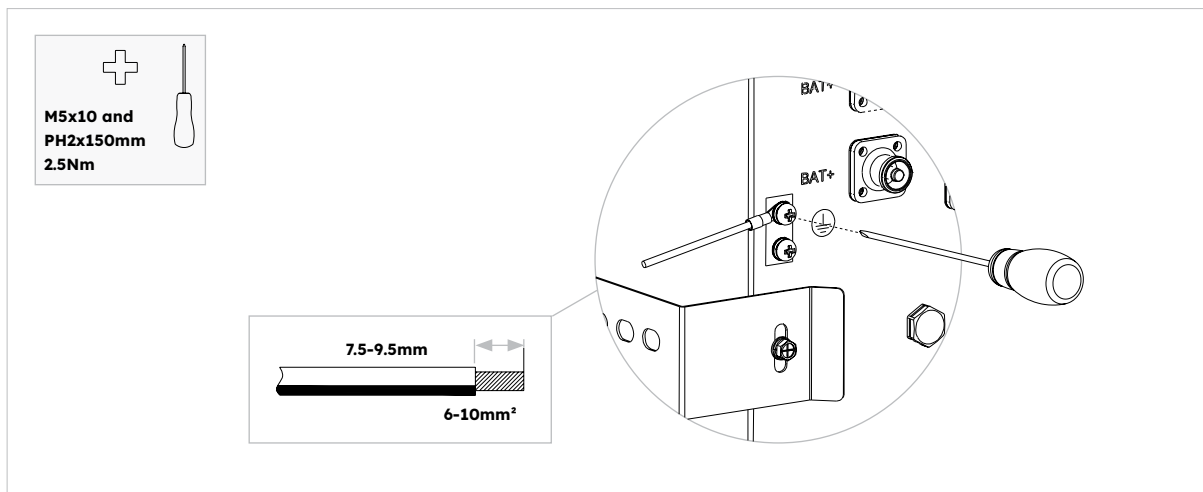


Electric Shock Hazard: Before doing electrical connection, please ensure the PV switch & all AC and BAT circuit breakers in the energy storage system are switched off and cannot be reactivated.

A grounding point is provided near the BAT positive connector on the 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 (Tool: T20 screwdriver, torque: 2.5Nm). Grounding connection for battery:



Grounding connection for battery:



6.9 AC Connection

6.9.1 Requirements for the AC Connection



Residual-current monitoring unit: The inverter does not require an external residual-current device when operating. If local regulations require the use of a residual-current device, or Hybrid-coupled storage system with big coupling capacity from the PV array and PV inverter, the following must be observed: The inverter is compatible with type A residual-current devices with a rated residual current of 100 mA or higher. Each inverter in the system must be connected to the utility grid via a separate residual-current device.



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

AC cable requirements as follows:

- Conductor type: copper wire
- External diameter: 9mm to 18mm for grid connector, 10mm to 14mm for backup connector
- Conductor cross-section area recommendation: 10mm² for grid connection, 6mm² for back-up connection
- Insulation stripping length: 10mm
- Sheath stripping length: 50mm

6.9.2 Selecting Suitable AC circuit Breaker



The maximum allowable grid circuit breaker specification is **50 A** when the copper conductor cross section for grid connection is **10 mm² and factors influencing the ampacity of the cable, other influences on dimensioning must be considered.** You should use APP (SunPower One app) or installer platform (SunPower One installer dashboard) to select correct setting if the grid circuit breaker specification is 32 A or 40 A, otherwise it increases the danger of the circuit breaker tripping under normal operating conditions.



The maximum allowable grid circuit breaker specification is **40 A** when the copper conductor cross section for grid connection must be **6 mm²** **(in some countries: 8 mm²) and factors influencing the ampacity of the cable, other influences on dimensioning must be considered seriously.** You should use APP (SunPower One app) or installer platform (SunPower One installer dashboard) to select correct setting if the grid circuit breaker specification is 32 A or 40 A, otherwise it increases the danger of the circuit breaker tripping under normal operating conditions.

The general requirements for the selection of circuit breakers are determined by standards and country specific provisions. In the following, generally applicable influencing factors to be considered when selecting a suitable circuit breaker are listed:

- Factors influencing the ampacity of the cable: type of cable used, ambient temperature around the cable, type of cable routing, bundling of cables.
- Other influences on dimensioning: loop impedance, mutual heating of circuit breakers, ambient temperature at the circuit breaker, selectivity, type of connected device.

If these factors are ignored, it increases the danger of the circuit breaker tripping under normal operating conditions.

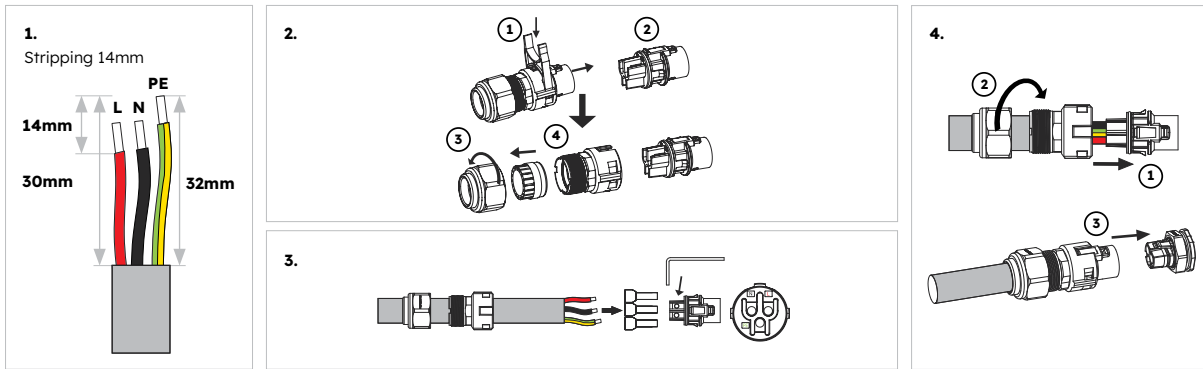
Description	Max. Current	Circuit Breaker Size for RESERVE-INV-1-P5-L1-INT
Grid Side	43.5 A	32/40/50 A
Backup Side	21.7 A	32 A

6.9.3 Grid and Backup Connection

Grid and Backup Connector Instructions:

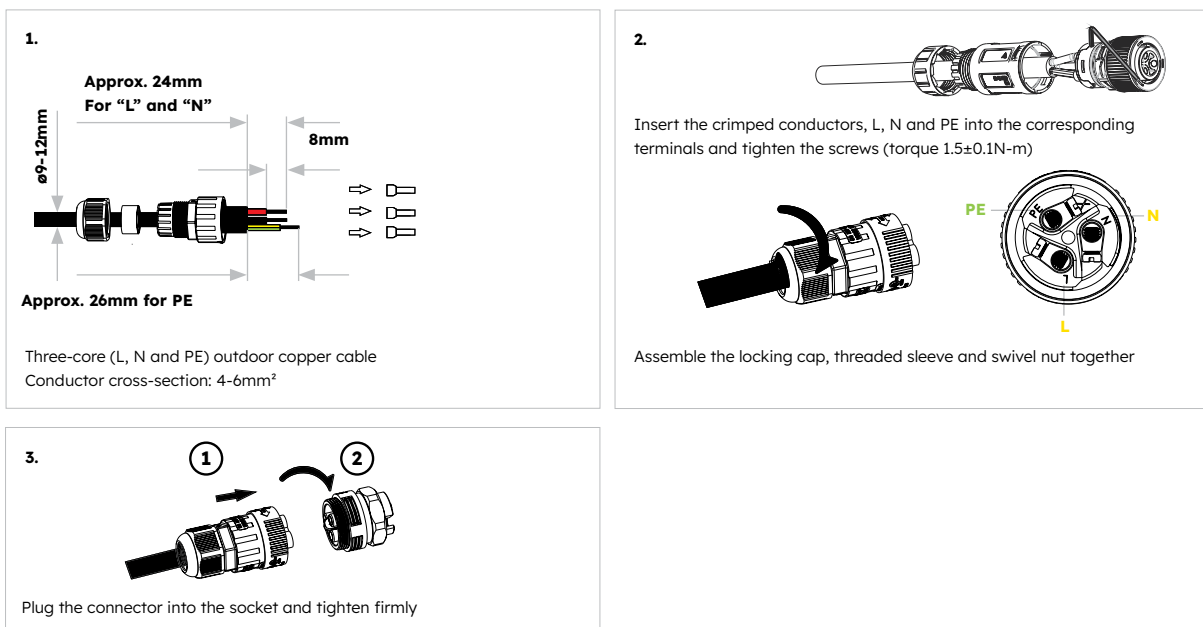
1. Disconnect the circuit breakers and secure against reconnection.
2. Dismantle the AC cable by 50mm.
3. Shorten L and N by 2mm each, so that the grounding conductor is 2 mm longer. This ensures that the grounding conductor is the last to be pulled from the screw terminal in the event of tensile strain.
4. Strip the insulation of L, N and the grounding conductor 10mm.
5. In the case of fine stranded wire L, N and PE are to be fitted with bootlace ferrules.
6. Disassemble the AC connector and connect the conductors to the AC connector.
7. Ensure that all conductors are securely connected to the AC connector, assemble the AC connector.
8. Plug the grid connector into the socket for the grid connection. When doing so, align the grid connector so that the key on the inverter grid socket is inserted into the keyway on the grid connector bush insert.
9. For backup connection, plug the backup connector into the inverter backup socket and tighten clockwise firmly.

To connect the grid connector:



Please ensure connector has been correctly installed.

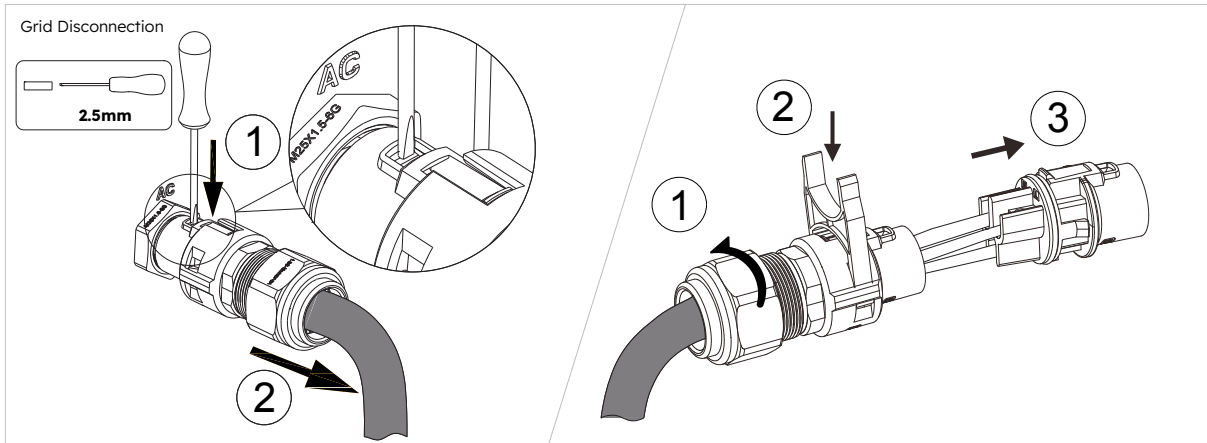
To connect the backup connector:



Please ensure connector has been correctly installed.

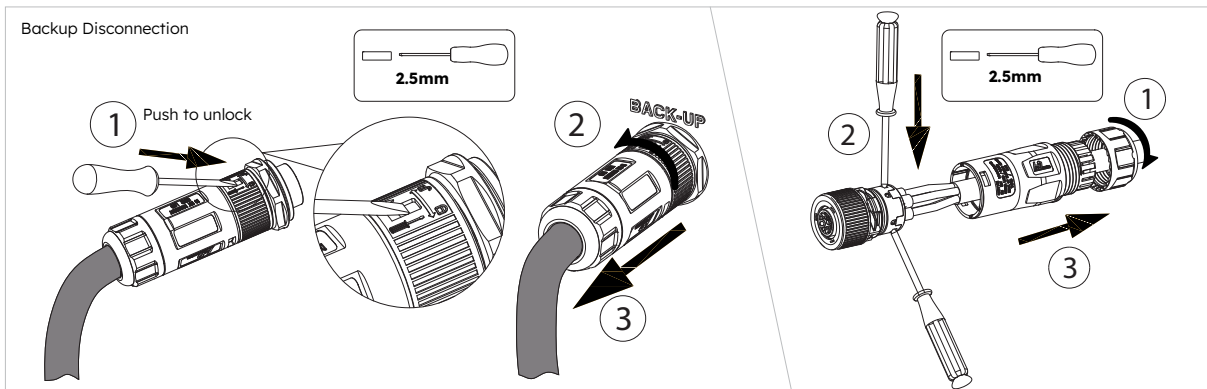
Disassemble the grid plug connector (e.g. due to faulty assembly), proceed as follows.

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. Rotate the bush insert of the backup plug connector anticlockwise. Use a flat-blade screwdriver (blade width: 2.5 mm) to push the orange latch forwards to unlock the connector coupling structure, 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.



For Australia and New Zealand installation sites, the Neutral is switched internally between the Grid and Backup Ports of the inverter. The backup port Neutral must be connected to the site Neutral bar.

6.9.4 CT Rating

Use SunPower One app or installer platform (SunPower One installer dashboard) 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.



TIP

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 SunPower if the MCB used has a steeper derating factor where the 2A buffer would not be sufficient.

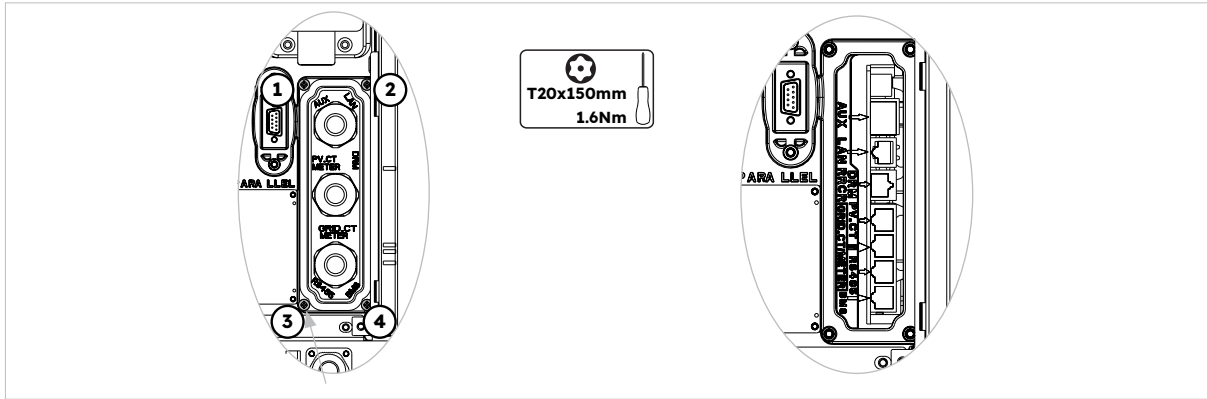
Example: If a 32A MCB is used and the backup circuit is drawing 15A, any force charging of the battery will be limited to $(32A - 2A) - 15A = 15A$. If the load on the backup circuits drops to 11A, the maximum Grid-charge current would increase to 19A.

Item	Current	Scenarios
CT	100 A	CT

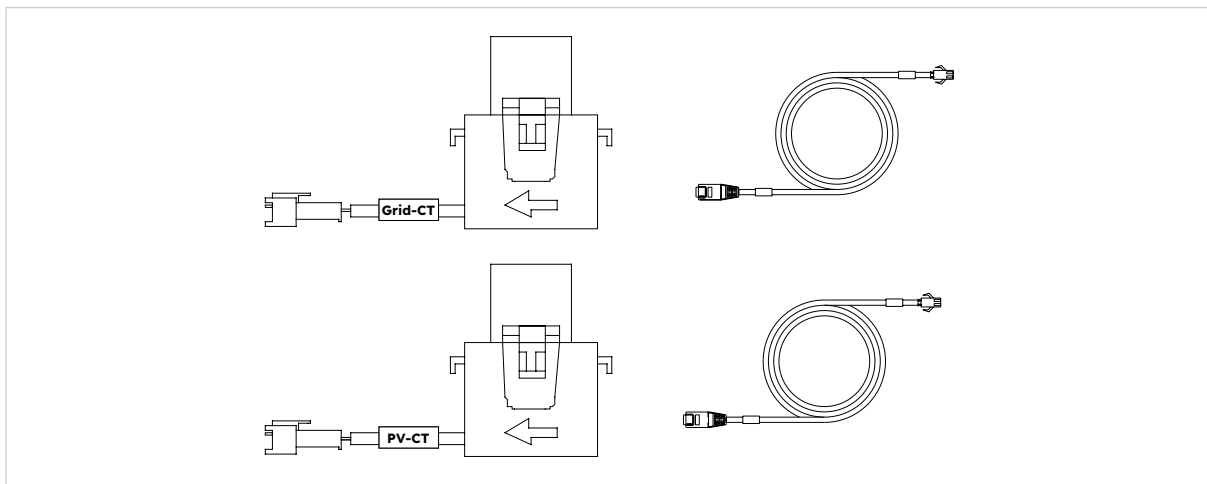
6.9.5 CT Connection

CT Connection Instructions:

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



2. Locate the included Grid CT and PV CT.



3. Lead the CT cable through the cable gland of the COM connection cover, don't tighten the swivel nuts of the cable glands.
4. Insert the RJ45 plugs to the relative RJ45 sockets.
5. Buckle the magnetic snap of the Grid CT on the house-service live cable. The arrow on the magnetic snap of the Grid CT should point to the grid port of inverter.
6. For hybrid or AC-coupled storage system application, buckle the magnetic snap of the PV CT on the live cable of the installed PV inverter. The arrow on the magnetic snap of the PV CT should point to the mains grid.
7. Connect the CT cables to the Grid CT and PV CT respectively.

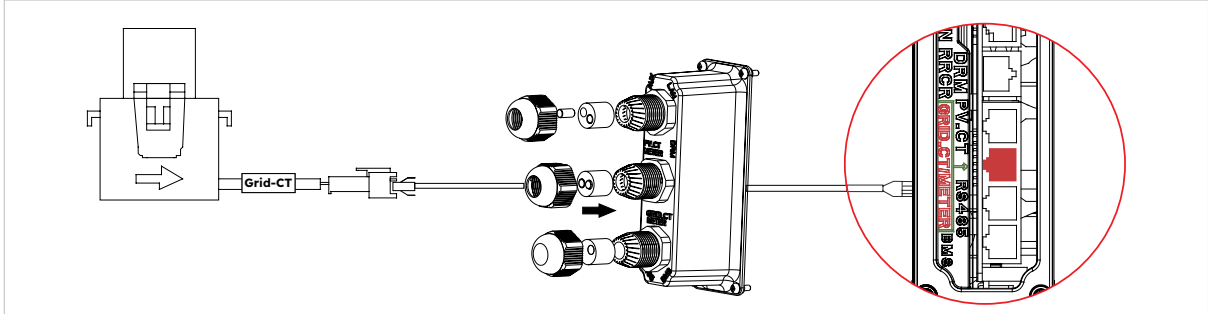


The CT cable marked Grid CT should be connected to the Grid CT, and the CT cable marked PV CT should be connected to the PV CT.

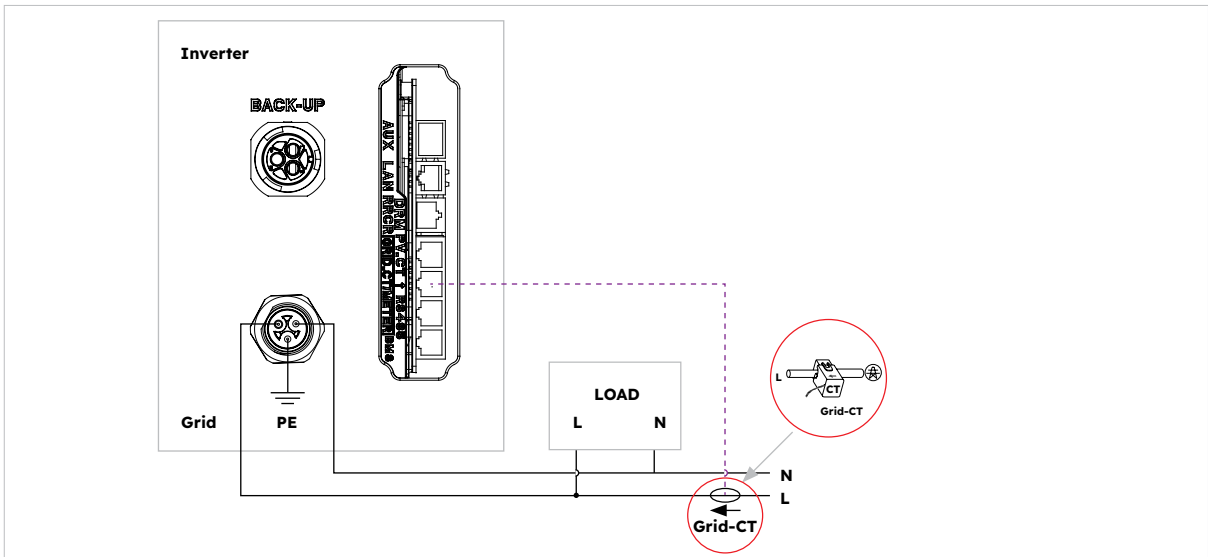


TIP

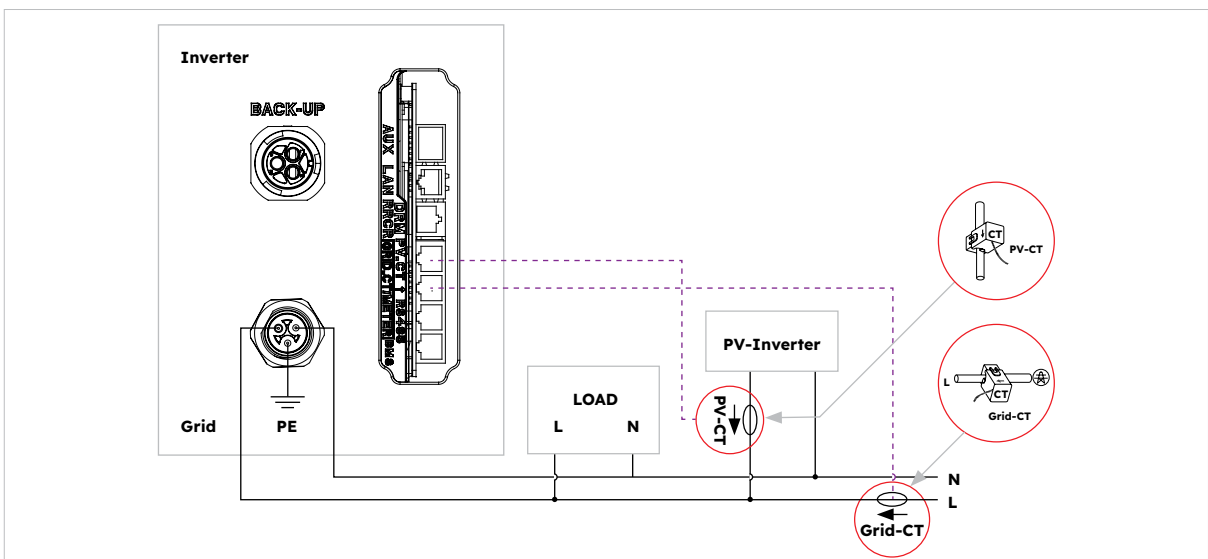
The CT wiring may be extended to a maximum of 20m. Note that extending CT's will reduce measurement accuracy. If making custom cables, please use a twisted pair cable with a suitable insulation rating.



CT placement in DC-coupled Storage System



CT placement in AC-coupled and Hybrid-coupled Storage System



6.9.6 Meter Connection

The system supports an external SunPower Reserve meter. The meter can be installed on a 1, 2 or 3 phase 4 wire 220-240V 120 grid supply.

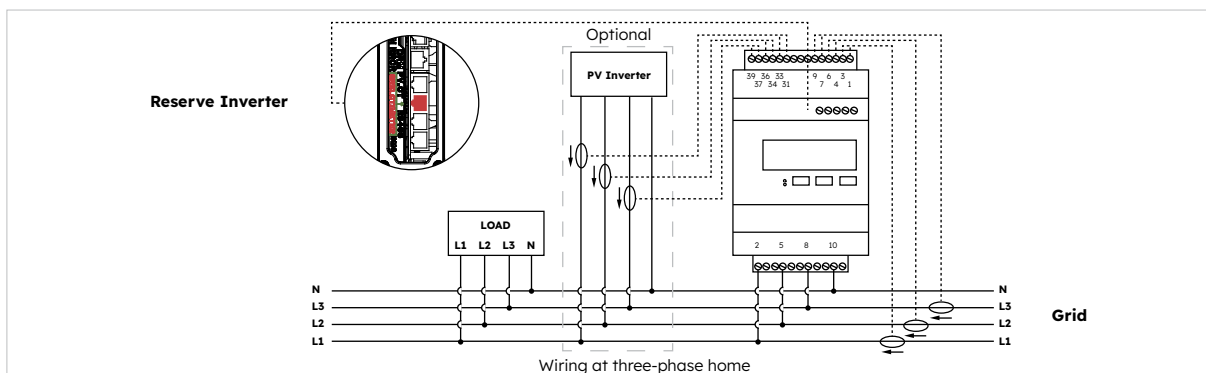
A Sunpower Reserve meter is recommended where the grid measurement point is more than 20m from the Sunpower Reserve. A Sunpower Reserve meter can be located up to 80m from the Sunpower Reserve, connected via RS485 cabling.

The SunPower Reserve meter is supplied with six 100A current transformers (CT's). Three for monitoring the grid, three for monitoring a PV inverter. The meter has custom programming to communicate with the Sunpower Reserve.

Installing all six CT's is optional. For example, an installation with a 3 phase supply and a PV inverter on one phase will only need four CT's. Three Grid CT's would be installed to monitor the grid and one PV CT would be installed to monitor a PV inverter.

Only 1 meter can be used per installation. 2 3 phase meters or a combination of 3 phase meter and supplied 1 phase CT is not supported. Please refer to wiring diagrams for more information.

Three-phase meter (with 6 CTs) connection and direction of CTs



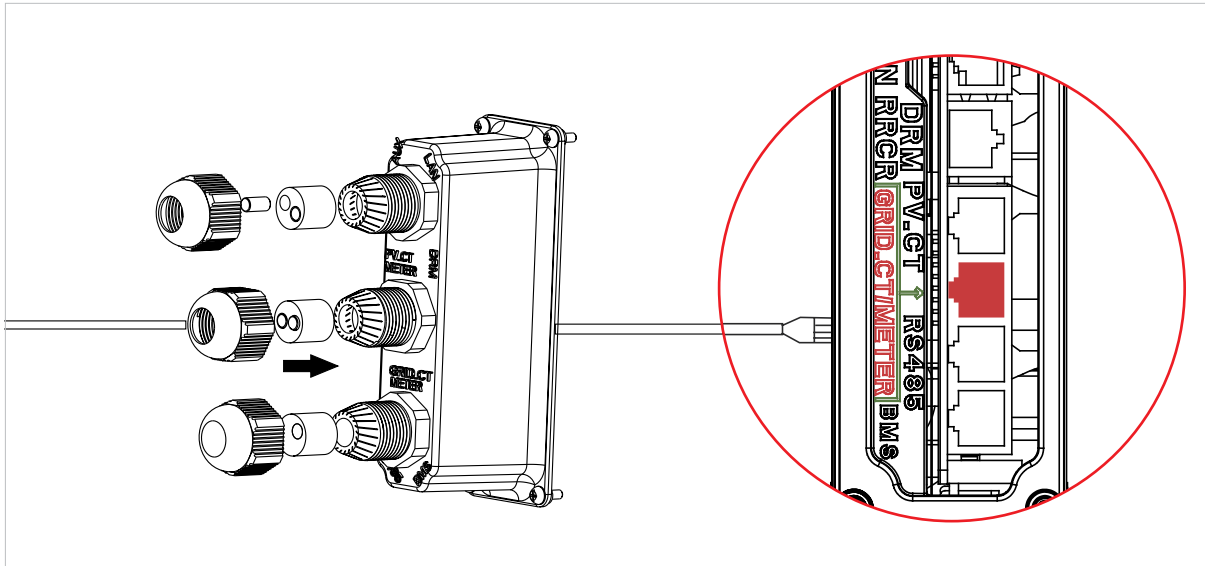
Identification of CT wiring

The meter is supplied with 6 CTs that are labelled. Follow the table below to connect the CTs to the correct terminals of the meter.

	GRID CT			PV CT			Grid	
Phase	Label	Wire Colour	Meter Terminal	Label	Wire Colour	Meter Terminal	Label	Meter Terminal
L1	IA*	White	1	IA*	White	31	L1	2
	IA	Blue	3	IA	Blue	33	L2	5

L2	IB*	White	4	IB*	White	34	L3	8
	IB	Blue	6	IB	Blue	36	N	10
L3	IC*	White	7	IC*	White	37		
	IC	Blue	9	IC	Blue	39		

Connection to the inverter



Meter Setting on SunPower One App for commissioning

During the commission process, “Meter” must be selected for meter option instead of “CT” which is default value.

Troubleshooting

Loads not measuring correctly	Turn off PV. Unclip L2 and L3 Grid CT’s. Use a current clamp to confirm measurement matches the web portal realtime data. If not make sure the Meter Voltage supply terminals (2,5,8,10) are wired correctly, L1 should be wired to pin 2 of the meter with Neutral connected to Pin10. Check the CT is not reversed. Repeat for each phase.
CT’s left unused after install	CT’s are only required where a measurement is required. e.g if a single phase PV inverter is installed on L2 only, then L2 PV CT is required, L1 & L3 PV CT’s are not.
Low measurements on L2 & L3	Make sure all supply phase voltages are connected to the meter e.g meter terminals 5 & 8 connected to L2 and L3 on a 3 phase site.

6.10 PV Connection

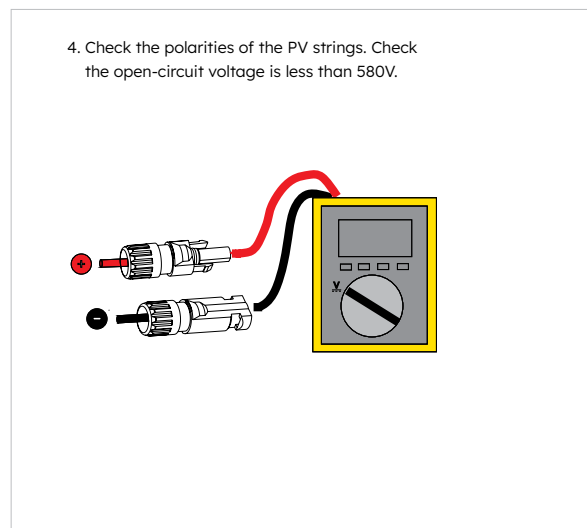
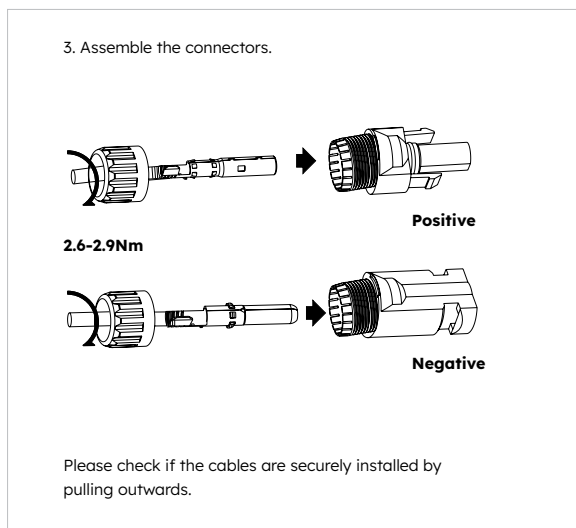
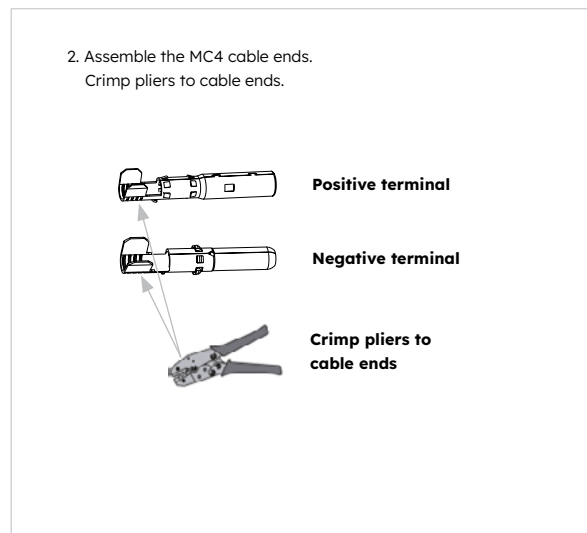
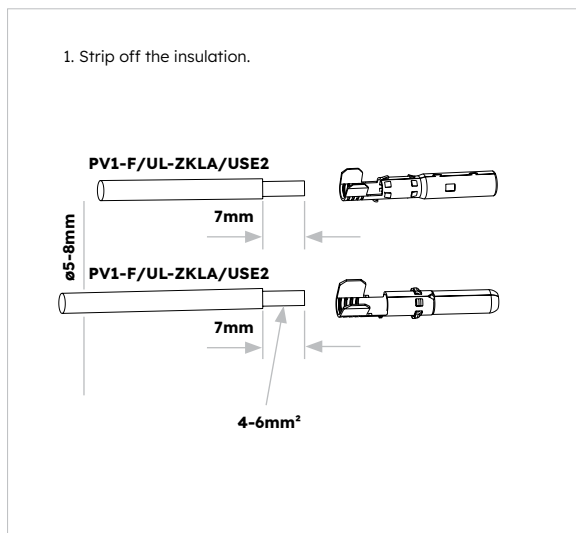
Please ensure the follows before connecting PV strings to the inverter:

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

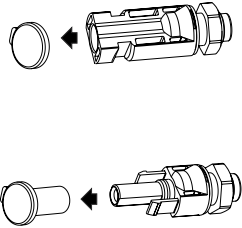
The inverter includes Staubli MC4 PV connectors.

Please follow the picture below to assemble the PV connectors.

PV conductor cross section requirements: 4-6mm²

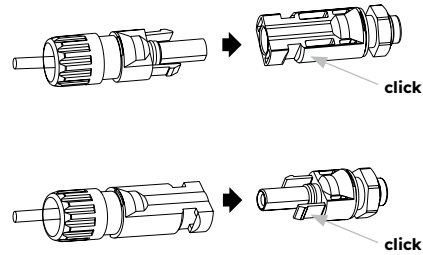


5. Remove the waterproof caps.



If there is a used terminal, please seal with the cap.

6. Insert the connectors into the terminal until an audible click is heard.



6.11 Electrical Connection



DANGER

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

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

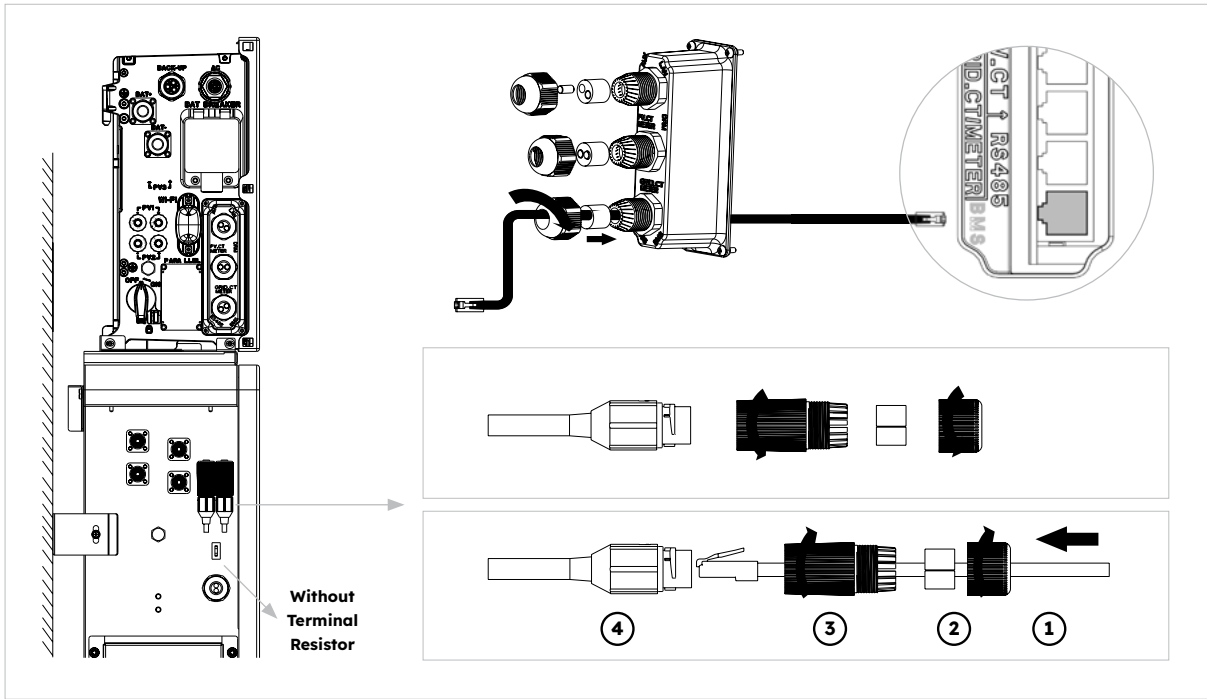
- Disconnect the battery from all voltages sources prior to performing any work on the battery.
- Please connect both ends of one battery power cable completely before connecting the next power cable.
- Observe battery safety information provided in the Safety and Installation Instructions.

6.11.1 Communication Cable Connection between Inverter and Battery

Communication connection instructions:

1. Take out the battery communication cable from the inverter package.
2. Lead the battery communication cable through the cable gland of the COM connection cover of inverter, don't tighten the swivel nuts of the cable glands, insert the RJ45 plug to the BMS communication port of the inverter. Insert the other RJ45 plug to the relative RJ45 sockets provided by battery.

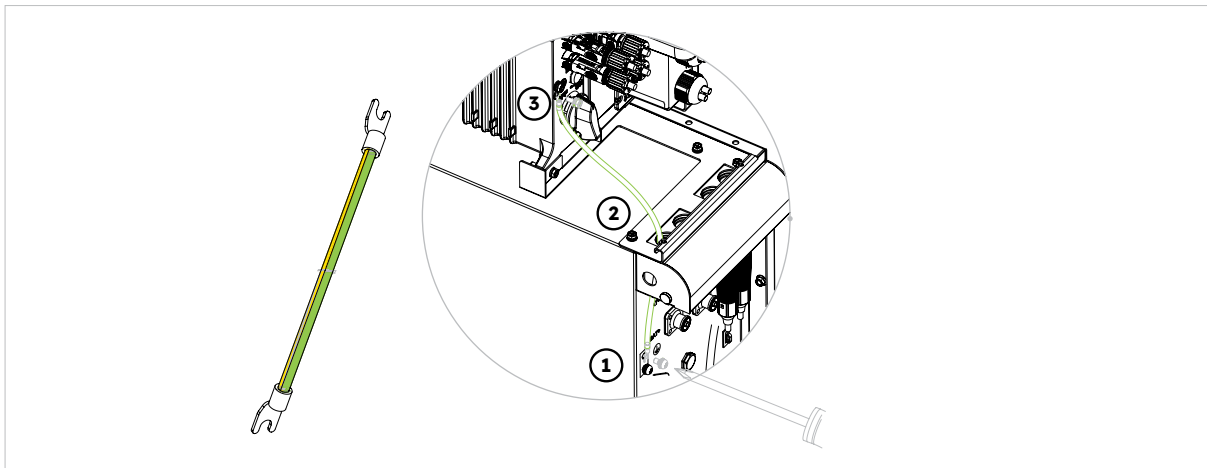
Note: The magnetic ring on the battery communication cable must be close to the inverter side.



6.11.2 Grounding Connection between Inverter and first Battery

Electrical connection instructions:

1. Take out the grounding cable from the inverter package.
2. Connect the grounding cable to the inverter and battery packs.

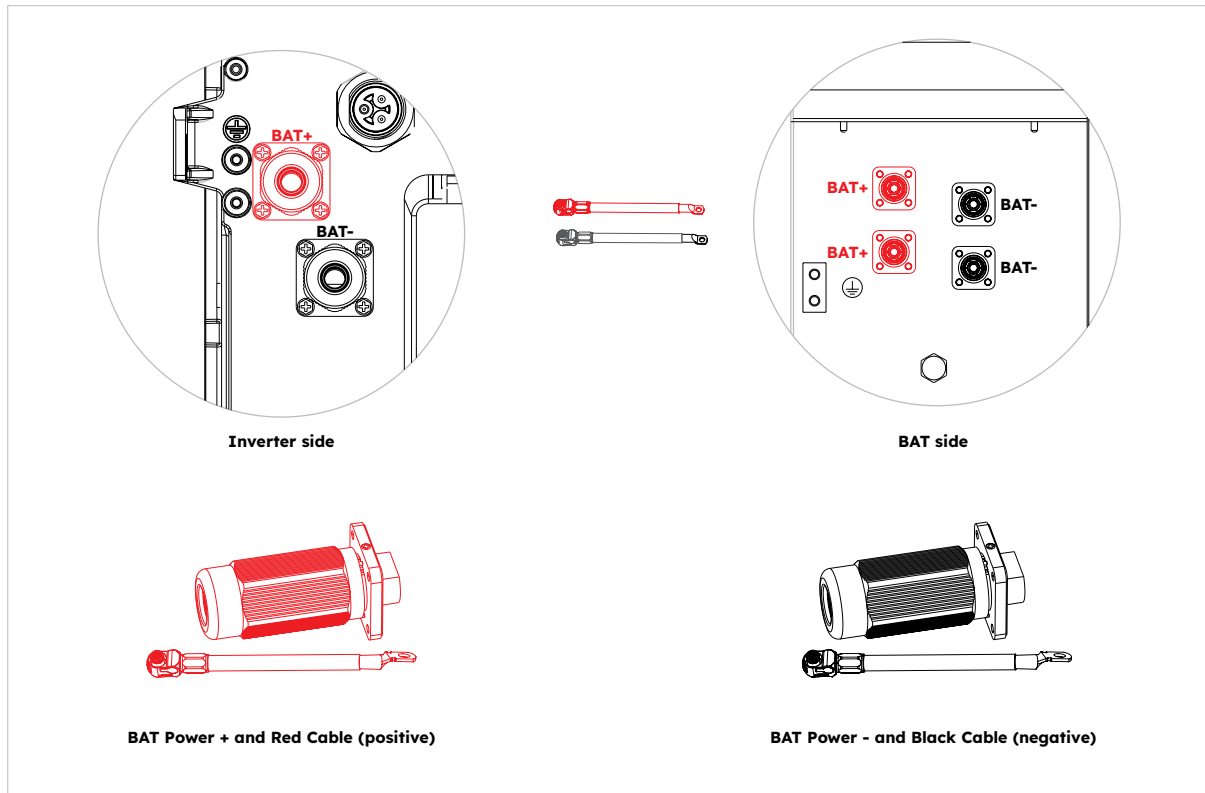


6.1.1.3 Power Cable Connection between Inverter and first Battery

Connection on the battery side:

1. Take out the battery power cables from the inverter package.
2. Remove the protective caps from the battery power connectors.

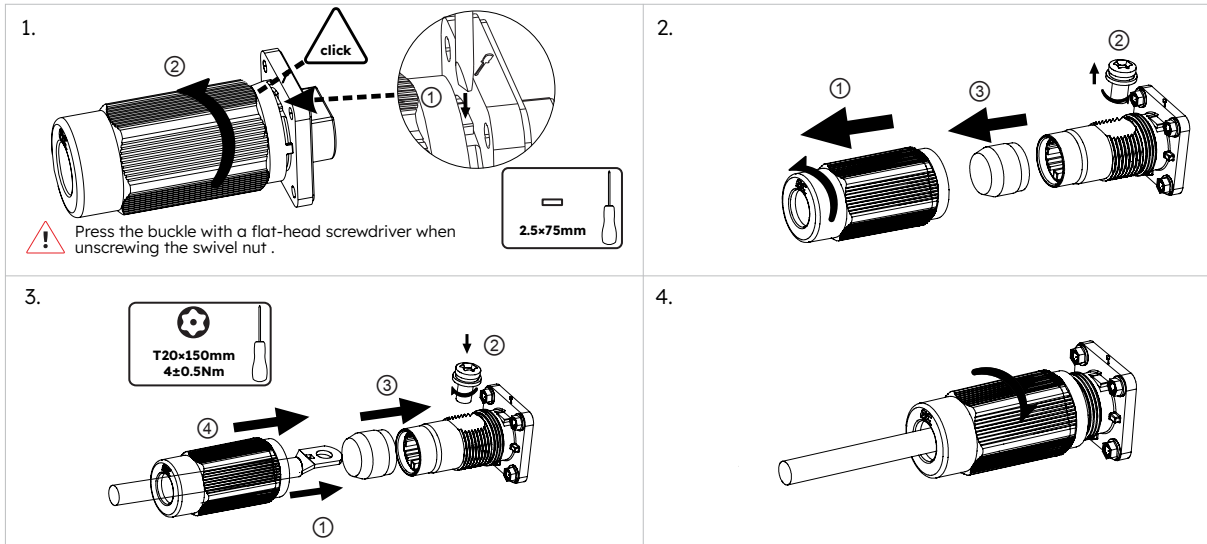
Connect the battery power cables to the inverter and battery packs. Please pay attention to the connector polarity, red is for battery positive.



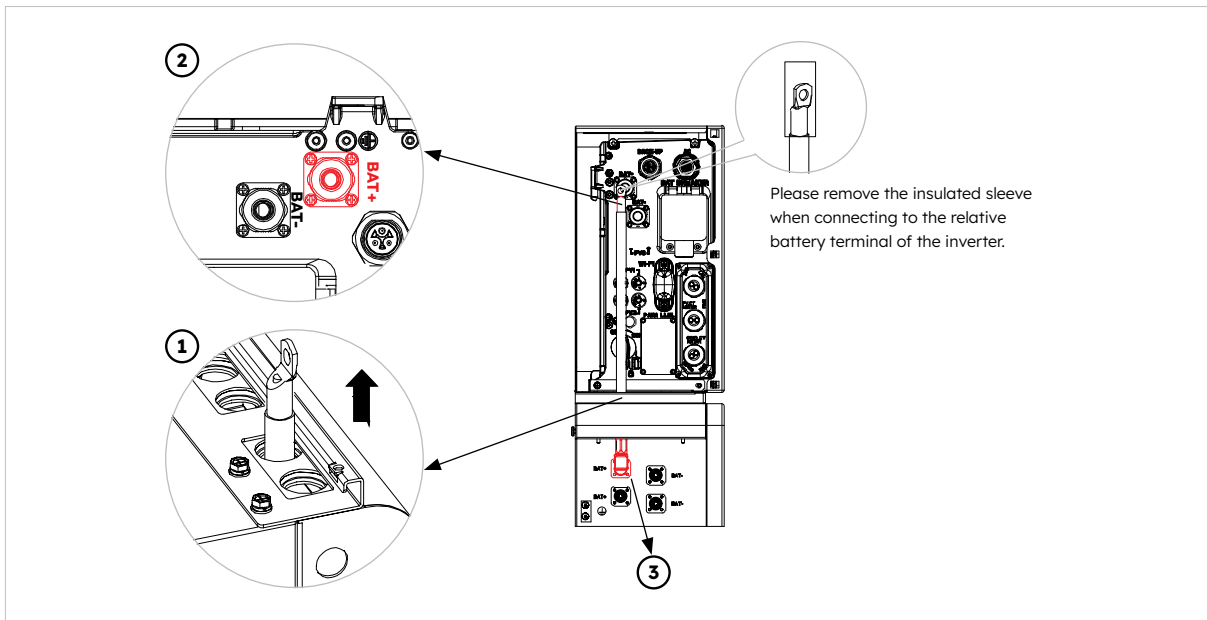
Connection on the inverter side:

1. Press the buckle with a flat-head screwdriver (blade width: 1.2mm) when unscrewing the threaded sleeve of the battery power connector of the inverter. Remove the sealing ring from the terminal. Unscrew the screw on the terminal used to connect the battery power cable. Guide the power positive cable passing through the cable hole of the battery left handle and inverter base from the bottom up.

Pass the battery power positive 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 screwdriver, torque: 4Nm). Push the sealing ring to the terminal. Tighten the threaded sleeve to the terminal by hand. Take out the battery power cables from the inverter package.



2. Connect the other end of the power positive cable to the first parallel battery.



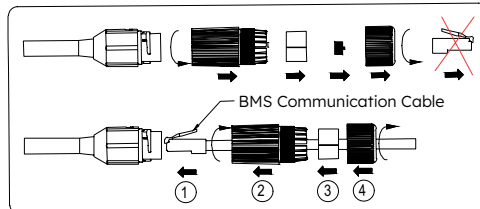
3. Refer to steps 1. and 2., connect the battery power negative cable between the inverter and the first parallel battery.

6.11.4 Electrical connection for expansion batteries

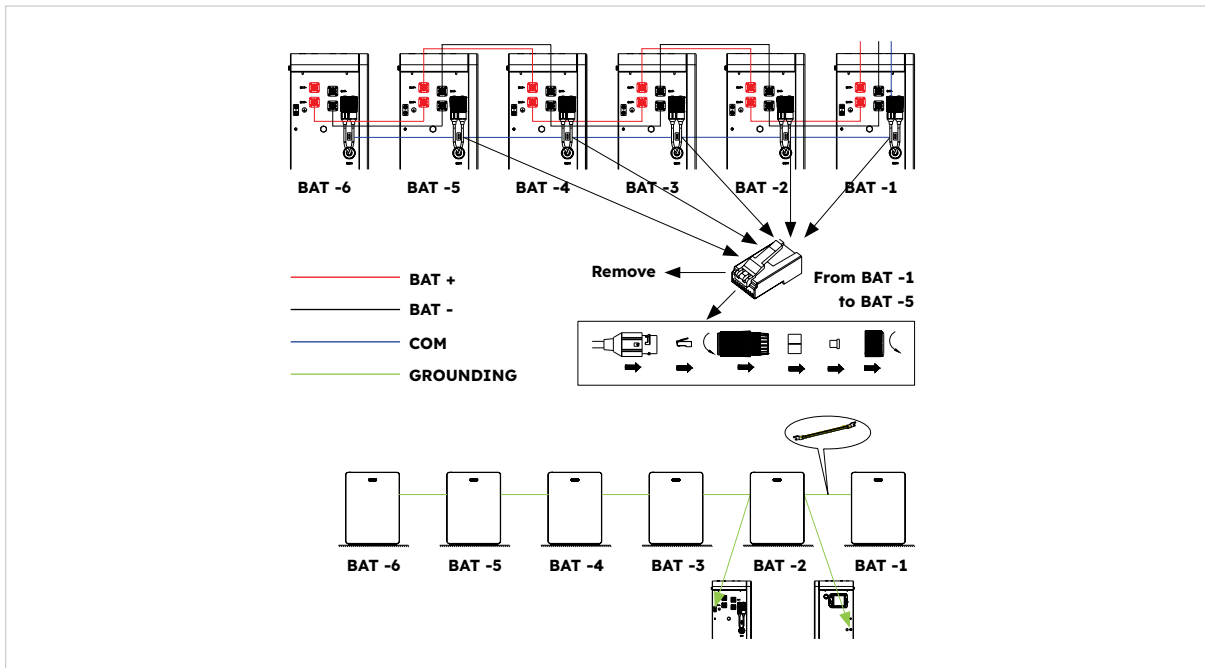
Electrical connection for expansion batteries up to 6 units as follows:

1. Take out the expansion battery power cables and communication cable from the battery package.
2. Remove the protective caps from the battery power connectors. Connect the battery power cables to the two batteries.
3. Please pay attention to the connector polarity, red is for battery positive.
4. Insert the RJ45 plugs to the relative RJ45 sockets provided by batteries.

- a. Pick up the communication connector located at the upper left of the battery, and disassemble it. Unscrew the swivel nut from the threaded sleeve, remove the sealing ring, rubber plug and terminal resistor.
- b. Pass the swivel nut and threaded sleeve over the communication cable. Insert the RJ45 plug to the RJ45 socket, tighten the threaded sleeve, insert the cable from the side split of the sealing ring, push the sealing ring to the end of the threaded sleeve and tighten the swivel nut at last.



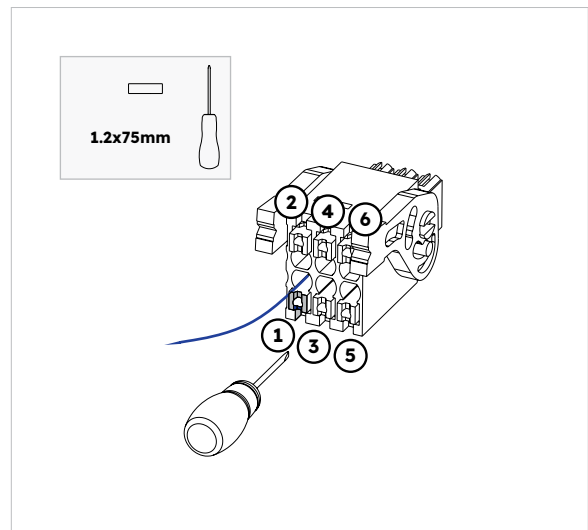
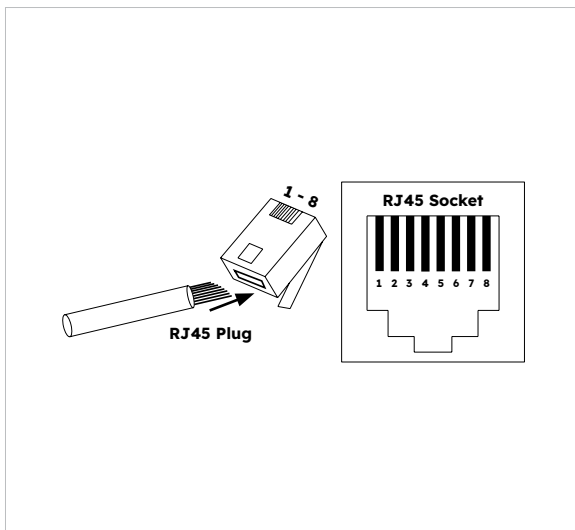
5. Only retain the terminal resistor of the last battery, remove the other terminal resistor.
6. Please do grounding connection between two batteries by reference to the corresponding section 6.8 Connecting additional grounding.



6.11.5 Other Communication Connection of Inverter

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

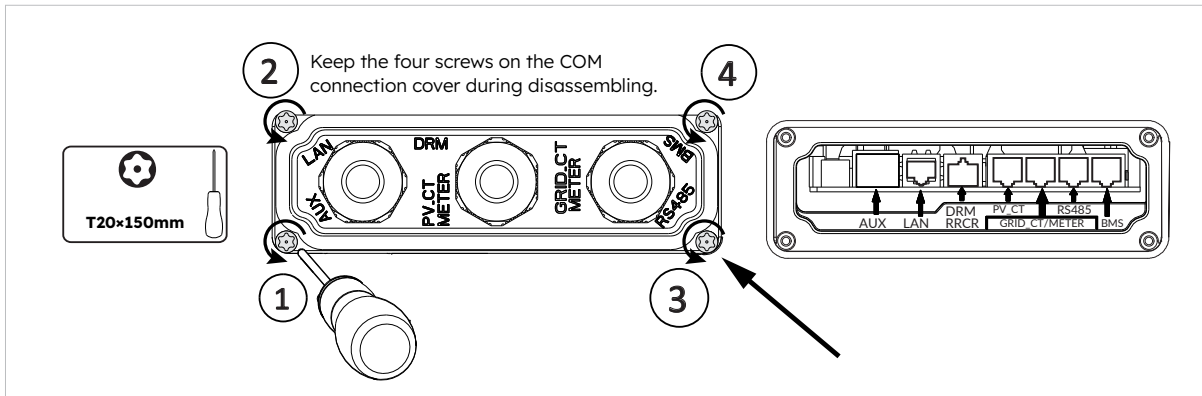
1. Loosen the cable glands on the COM connection cover, and then unscrew the 4 screws on the COM connection cover.
2. Lead the communication cables through the cable glands of the COM connection cover, don't tighten the swivel nuts of the cable glands. Insert the RJ45 plugs to the relative RJ45 sockets.
 - a. 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 always implements the commands from the grid operator for active power limitation. The system and the Demand Response Enabling Device (DRED) must be connected in the same network.
Only DRM0 is available for this product.
 - b. Take out 6 pin terminal block for AUX connection. To do wiring connection, insert a screwdriver (blade width: 1.2 mm) into the relative connection position side.
For AUX position definition, please see the AUX wiring documentation.



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

The pin definition of the communication ports:

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



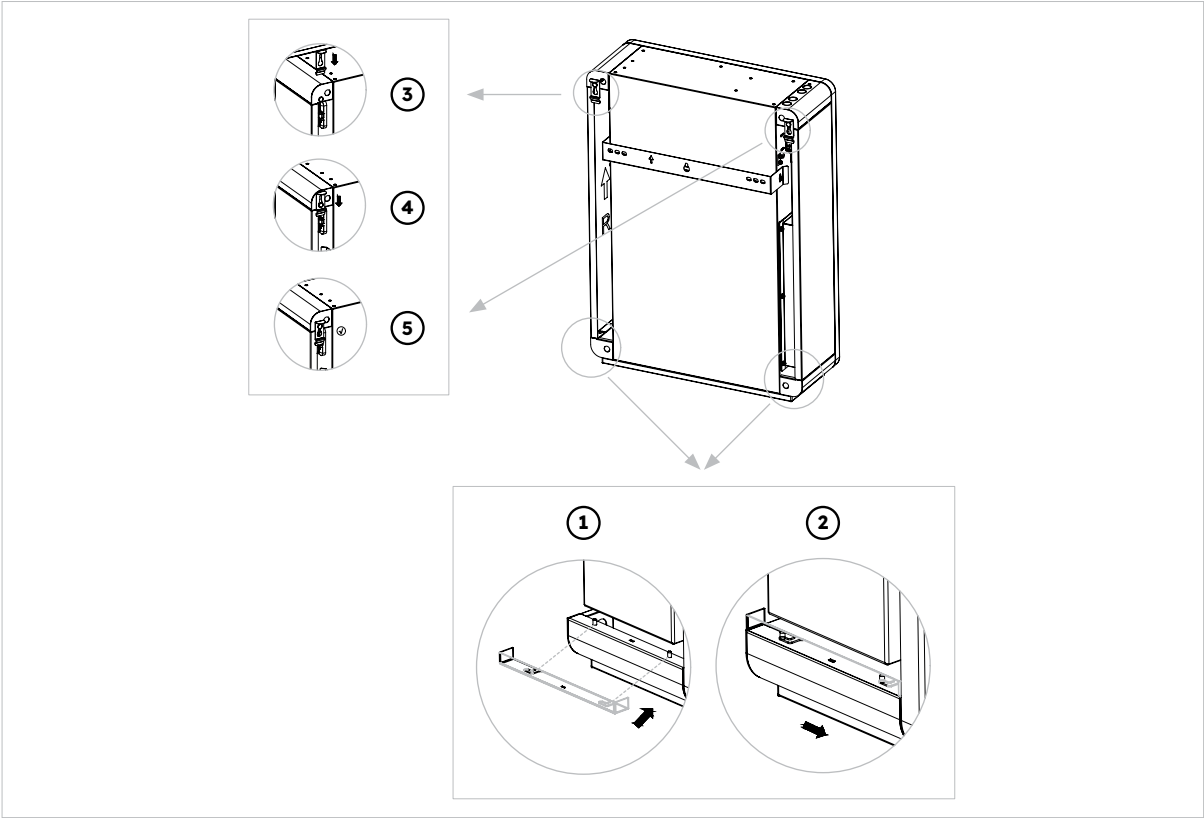
6.12 Mounting the Battery and Inverter Facade

After finishing electrical connection of the energy storage system, do the following operations.

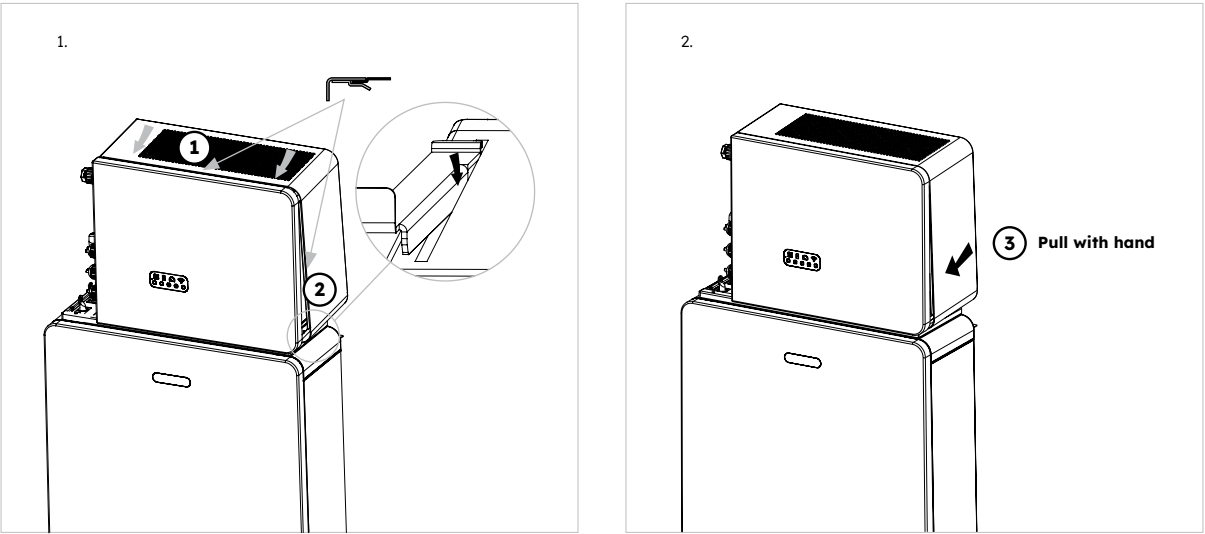
6.12.1 Mounting the Decorative Parts of the Battery

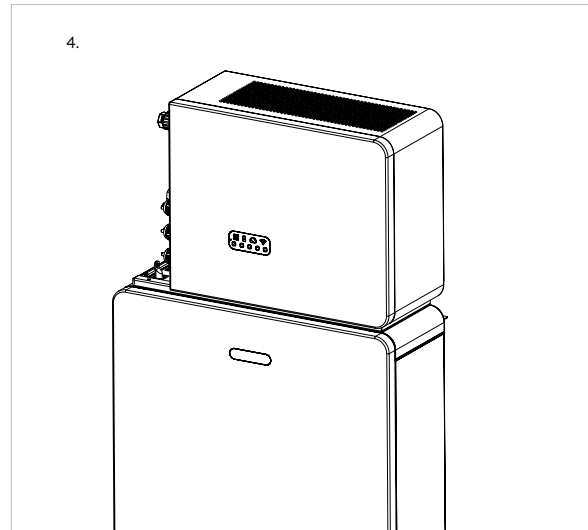
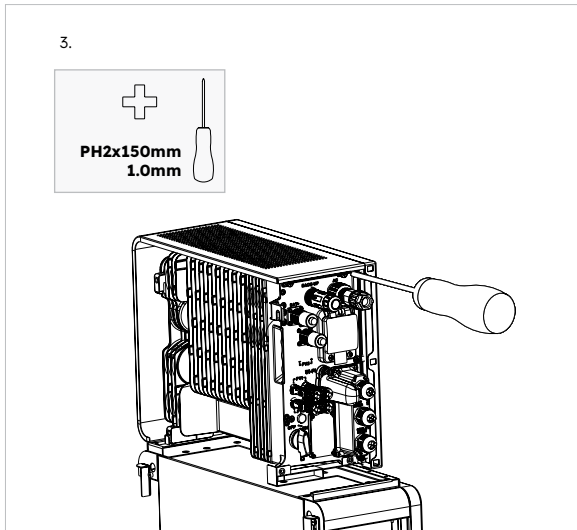
Instructions:

1. Mount the side plates of the battery.



2. Install the top cover of the inverter.

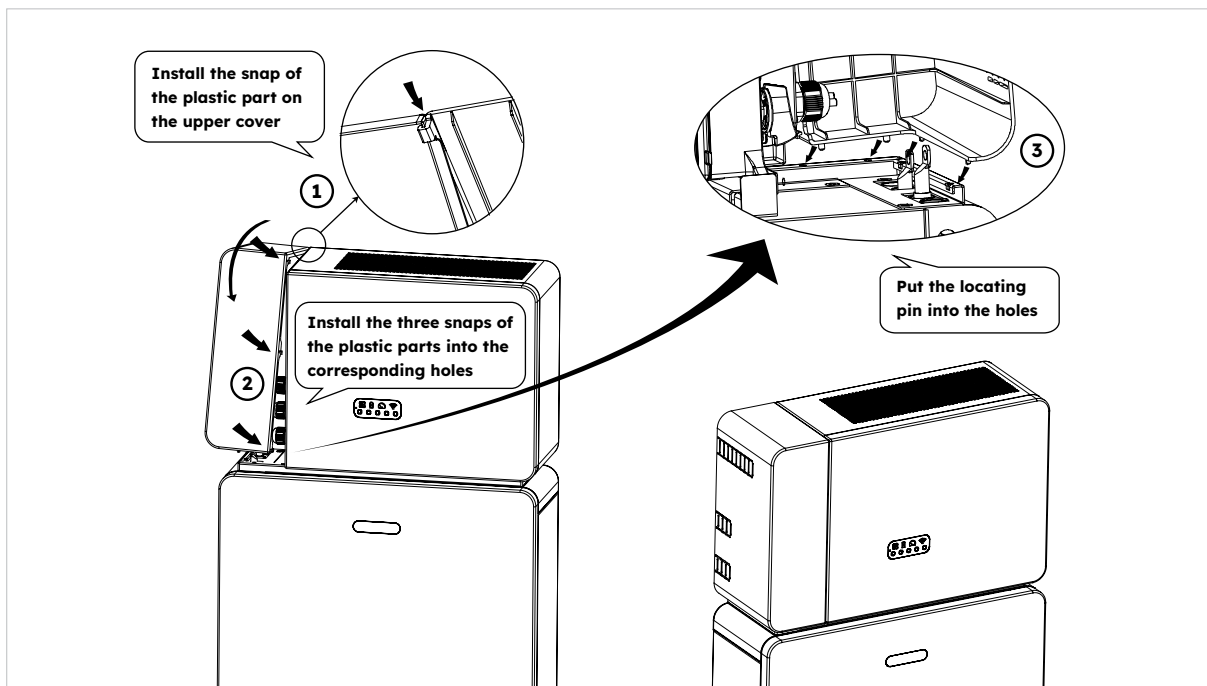




TIP

The serial number and check code of the inverter is located on right side of the inverter. Make sure that you have made a note of them before installing this cover.

3. Install the left cable cover of the inverter.

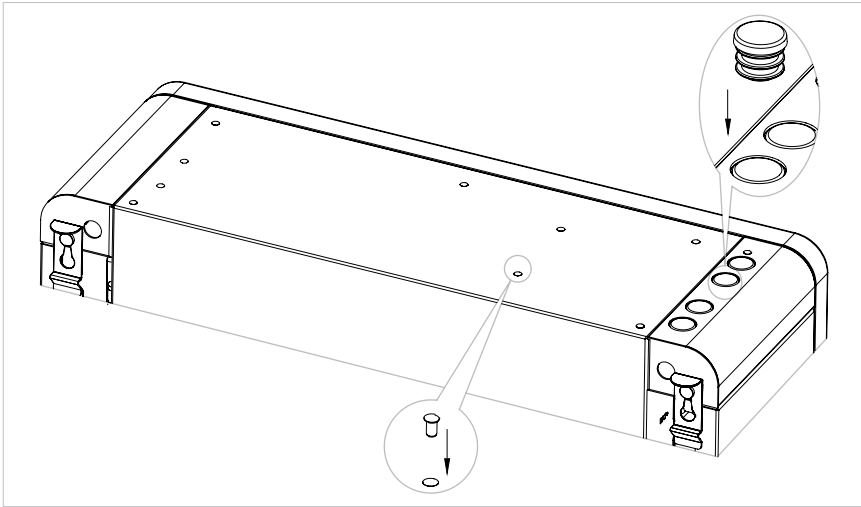


TIP

Make sure all the wiring is secure and the system is working properly and then install the top cover on the left side of the inverter.

6.12.2 Mounting the Screw Plugs

If more than one battery is installed, you can perform the following operations to improve the appearance of the battery top.



6.13 Startup and Shutdown Procedure

6.13.1 Startup Procedure

1. Switch ON the BATTERY SYSTEM ISOLATOR at the left side of the inverter, immediately below the grid connector.
2. Switch ON the BATTERY CIRCUIT BREAKER for each battery.
3. Press the BATTERY START BUTTON located next to the battery circuit breaker for 1s. Repeat for additional batteries in sequential order within 30s.
4. Switch ON the AC GRID SUPPLY to the inverter.
5. Switch ON the AC BACKUP SUPPLY from the inverter if installed.
6. Switch ON the PV switch (if there is any) between the PV strings and the inverter.
7. Switch ON the PV ISOLATOR at the left side of the inverter if PV arrays are connected to inverter directly.
8. Switch ON the AC circuit breaker (if there is any) between the PV inverter and the grid.

6.13.2 Shutdown Procedure



DANGER

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

Procedure

1. Set the Changeover switch to MAINS to supply loads from the GRID, if installed.
2. Switch OFF the AC BACKUP SUPPLY from the inverter if installed.
3. Switch OFF the PV switch (if there is any) between the PV strings and the inverter.
4. Switch OFF the PV ISOLATOR at the left side of the inverter if PV arrays are connected to the inverter directly.
5. Hold the BATTERY START BUTTON located next the BATTERY CIRCUIT BREAKER for 6s to turn off each battery.
6. Switch OFF the BATTERY CIRCUIT BREAKER for each battery.
7. Switch OFF the BATTERY SYSTEM ISOLATOR at the left side of the inverter, immediately below the grid connector.
8. Switch OFF the AC GRID SUPPLY to the inverter.
9. Switch OFF the circuit AC breaker (if there is any) between the PV inverter and the grid.

6.13.3 Checks before Startup

No.	Check Item	Acceptance Criteria
1	Mounting environment	The mounting location is suitable, and the mounting environment is clean and tidy, without foreign objects.
2	Battery pack and inverter mounting	The battery pack and inverter are mounted correctly and securely.
3	WiFi mounting	The WiFi module is mounted correctly and securely.
4	Cable layout	Cables are routed correctly and securely to local wiring requirements.
5	Cable tie	Cable ties are secured evenly, and no burr exists.
6	Grounding	The ground cable is connected correctly, securely, and reliably.
7	Switch and breakers status	The PV switch (if there is any) and battery breakers and all the breakers connecting to the product are OFF.
8	Cable connections	All AC, DC and communication plugs and connectors are secured.
9	Unused power terminals	Unused terminals are protected from moisture ingress.

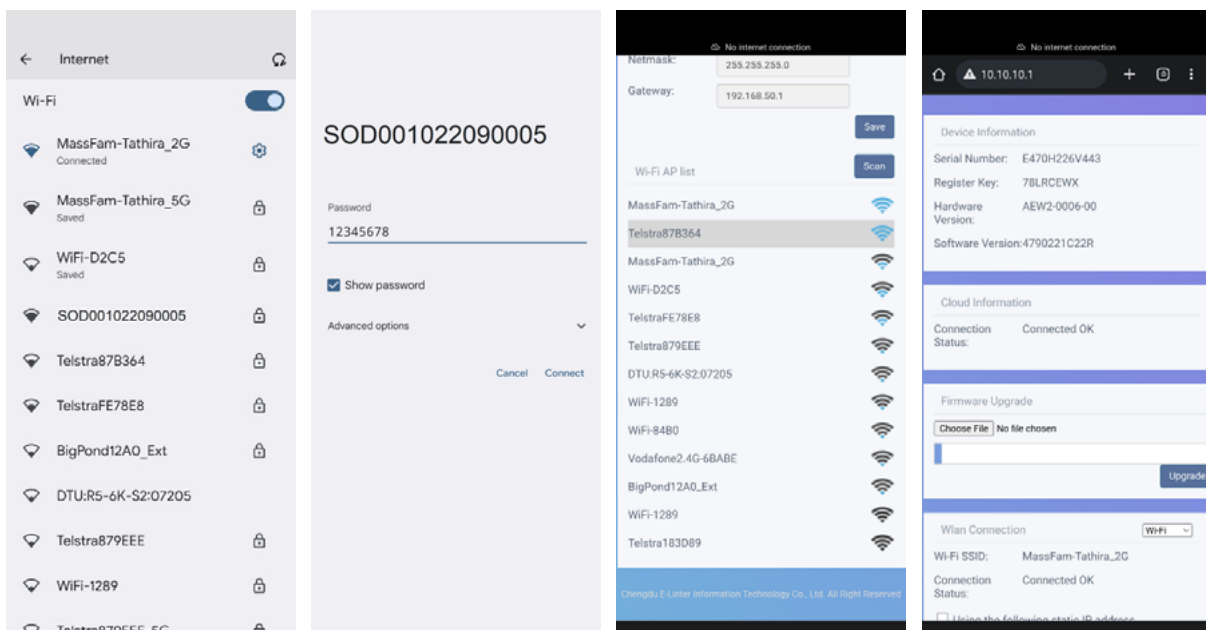
7.0 Set up a new System (Commissioning)

7.1 Connect Reserve to internet

To initiate the commissioning process for the recently installed SunPower Reserve, it is essential to establish a functional internet connection which is also required for ongoing monitoring. The SunPower Reserve offers two methods of connecting to the internet: Ethernet and Wi-Fi.

If you opt for an Ethernet connection, no additional configuration is necessary. However, if you prefer a Wi-Fi connection, please adhere to the following steps to connect the system to the homeowner's Wi-Fi network:

1. On your mobile device, access the Wi-Fi settings and locate the Wi-Fi network associated with the SunPower Reserve unit. This network is identifiable as the serial number of the unit.
2. Connect to the Reserve unit network using the default password: 12345678.
3. Once connected, launch a mobile browser and enter the IP address of the SunPower Reserve: 10.10.10.1. This action will display a simple interface enabling the connection of the Reserve unit to the on-site Wi-Fi network.
4. Scroll down and select the 'Scan' option at the bottom of the screen to search for available networks.
5. From the list of displayed networks, select the desired network to which the Reserve unit will connect, and input the corresponding Wi-Fi password.
6. Once the connection is successfully established, the interface will provide a connection status stating 'Connected OK'.



If SunPower Reserve has for some reason lost its connection to the internet, for example if the customer changes the Wi-Fi password, the steps above will also allow customers to reset the internet connection of SunPower Reserve.

7.2 Download and Install the SunPower One App

1. Android device users can download the SunPower One app by Maxeon from Google Play.
2. iOS device users can download the SunPower One app from the Appstore.



Commissioning tools including login details are only available to installers that have completed the necessary training modules.

7.3 Switch On the System and Check System Status

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

7.4 Check the AC backup (if available)

Switch ON an electrical appliance connected on the backup load port of the energy storage inverter.

Switch ON the AC breaker on the backup port of the energy storage inverter.

Switch OFF the external AC breaker between the grid and the energy storage inverter.

The product will enter the AC-Backup mode at once.

Check if the electrical appliance on the backup side continues to operate.

7.5 Commissioning SunPower Reserve

Before commencing, ensure that the Reserve system is correctly installed and has a functional internet connection.

Below is a summary of the steps required to successfully commission the SunPower Reserve. Please refer to the following instructions:

1. Launch the SunPower One app and log in using your Installer SunPower One username (email) and password.
2. On the home screen, initiate the commissioning process for a new system.
3. On the subsequent screen, enter the email address of the customer for whom you are installing the system. This email will be utilized to pre-configure the customer account required for logging into the SunPower One app. It is crucial to verify the accuracy of the email with the customer and ensure that they can access it on their mobile device.
4. Select the appropriate system configuration as outlined in section 3.3, and follow the app's provided steps to complete the activation and configuration of your installation.
5. Once the Reserve setup is complete, a confirmation email will be sent to the customer. This email will contain a link to the SunPower One app, enabling the customer to activate their SunPower One account and enjoy the comprehensive SunPower One experience.

Please follow the above steps to effectively commission the SunPower Reserve system.



The safety standard must be set correctly

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



In step 5 of the commissioning process, the available parameters change depending on the configuration selected. It is important to ensure correct values are entered.



During commissioning, if the LED indicators on the display panel of the inverter show red or the LED indicators on the display panel of the battery is yellow, please refer to the troubleshooting section (9.0)

7.6 Instruct the End User to Install the SunPower One App

Please make sure that the home owner has downloaded the App and activated their account via the welcome email.



The warranty registration of the SunPower Reserve is completed when the home owner has activated their customer account.

7.7 Check the Firmware Version

Firmware versions can be checked via the SunPower Installer Web Portal, e.g. Login > System Setup > Software Information.

Major firmware updates are automatic unless the automatic updates are disabled via the web portal. Firmware updates are enabled by default.

8.0 Maintenance and Troubleshooting

8.1 Routine Maintenance

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

Check Item	Acceptance Criteria	Maintenance Interval
Product cleanliness	The heatsink on the back of the inverter and vent covers are clean and free from obstruction.	6 months
Product visible damage	The product is not damaged or deformed.	6 months
Product running status	1. The product operates with no abnormal sound. 2. All parameters of the product are correctly set. Perform this check when the product is running.	6 months
Electrical connections	1. Cables are securely connected. 2. Cables are intact and undamaged. 3. Unused cable glands are sealed.	6 months



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

Risk of burns due to hot enclosure and cover of the inverter.

The enclosure and cover of the inverter can get hot during operation.

During operation, do not touch any parts other than the side covers. Wait approx. 30 minutes before cleaning until the inverter has cooled down.

8.2 Troubleshooting

To maintain the accuracy of the SOC, it may be required to fully charge the battery. This will reset the battery's SOC.

8.2.1 Inverter Error Troubleshooting

Error No.	Error description	Solution
4	Inverter_lost	Inverter communication lost 1. Restart the system and check whether the fault has been cleared. 2. Contact the customer service to remotely update the inverter EMS and DSP program, after that confirm whether the fault continues. 3. If the fault can't be cleared, please contact the service center for further check.
100000	Grid_OVP	1. Check whether Grid is abnormal. 2. Confirm whether the grid cable connection is normal. 3. Restart inverter and check whether the fault is existing.
100001	Grid_UVP	
100002	Grid_OFP	
100003	Grid_UFP	
100005	BUS_OVP1	Check whether the input voltage of PV1 and PV2 exceeds 580 V. If the first one does not exist, restart the inverter to see if the fault still exists. If it still exists, please call the service center.
100007	Insulation_fault	1. Check whether PV cable connection is reliable. 2. Check whether PV cable is damaged.
100008	GFCI_fault	1. Restart inverter and check whether the fault is existing.
100010	GFCI_fault	
100011	Over_Temperature	1. Check whether the environment around inverter is with poor heat dissipation. 2. Confirm whether inverter installation meet the installation requirements.
100012	PV_Reverse	1. Check whether the PV terminal of the inverter is reversed. 2. If the PV terminal is right, please call the service center.
100013	BAT_Reverse	1. Check whether the PV terminal of the inverter is reversed. 2. If the PV terminal is right, please call the service center.
100017	MPPT1_OVP	Check the PV1 voltage. If it exceeds 585 VDC, reduce the number of PV modules.
100021	MPPT2_OVP	Check the PV2 voltage. If it exceeds 585 V, reduce the number of PV modules
100025	BAT_OVP	Check whether the actual battery voltage exceeds the battery charging cut-off voltage by more than 20 V.
100026	BAT_UVP	Check whether the actual battery voltage is lower than the battery discharge cut-off voltage.
100027	Battery_lose	Confirm that the wiring is normal, and check whether the battery voltage sampling value is less than 75 V.

Error No.	Error description	Solution
100042	Output_short_circuit	<ol style="list-style-type: none"> 1. Use a multimeter to test the impedance of the offgrid output. If it is small, check whether the wiring is correct. 2. Restart the inverter to see if the fault still exists. If it still exists, please call the service center.
100043	Output_overload	Check whether the load exceeds the rated power. Restart the inverter to see if the fault still exists. If it still exists, please call the service center.
100052	Backup_ovp	Restart the inverter to see if the fault still exists. If it still exists, please call the service center.
7	BMS lost	<p>BMS lost</p> <ol style="list-style-type: none"> 1. Check whether the BMS communication connection between the battery and the inverter is normal. 2. Check if the battery is switched on 3. If the fault can't be cleared, please contact the customer support for further check.
60002	Circuit_Breaker_Open	Try to switch on all batteries breakers, If the action cannot solve the problem, please contact customer support.
60004	Slave_Battery_Communication_Lost	Check the communication cables between batteries
60006	Master_Battery_Communication_Lost	
60008	Multi_Master_error	
5	Grid meter lost	<p>Grid side meter lost</p> <ol style="list-style-type: none"> 1. Check whether the system configuration parameters 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 is correct (communication address and baud rate). 4. If the fault can't be cleared, please contact the customer support for further check.
6	PV meter lost	<p>PV inverter side meter lost</p> <ol style="list-style-type: none"> 1. Check whether the system configuration parameters are correct and the meter is used at the PV inverter side. 2. Check whether the communication configuration parameters of the meter of PV inverter side is correct (communication address and baud rate). (RS485: 3A6B). 3. Check whether the communication configuration parameters of the meter of PV inverter side is correct (communication address and baud rate). 4. If the fault can't be cleared, please contact the customer support for further check.













8.2.2 Inverter Error Description
















The four LEDs in the upper row are system (SYS), battery (BAT), meter (METER), and communication (COM).

The five LEDs in the lower row are divided into two functions:

Battery SOC of all batteries in the energy storage system

When an error occurs, the corresponding error code will be displayed. From right to left, the numbers represented by each light are 1, 2, 4, 8, 16.

LED Indicator	Error Code	LED Display	Description
SYS red is fast blink	4		Inverter lost
SYS red light is ON; METER light flashing quickly if Grid meter lost. SYS red light is ON; METER light flashing slowly if PV meter lost; METER light is OFF if all meters lost;	5		Grid meter lost
	6		PV meter lost
SYS red light is ON, bat is off	7		BMS lost
Inverter is faulty, SYS red flashing quickly	100000		Grid_OVP
Inverter is faulty, SYS red flashing quickly	100001		Grid_UVP
	100002		Grid_OFP
	100003		Grid_UFP
Inverter is faulty, SYS red flashing quickly	100005		BUS_OVP1
	100007		Insulation_fault
	100008		GFCI_fault
	100010		Grid_relay_fault

LED Indicator	Error Code	LED Display	Description
	100011		Over_Temperature
	100012		PV_Reverse
	100013		BAT_Reverse
	100017		MPPT1_OVP
	100021		MPPT2_OVP
Inverter is faulty, SYS red flashing quickly	100025		BAT_OVP
	100026		BAT_UVP
	100027		Battery_lose
	100042		Output_short_circuit
	100043		IOutput_overload
	100052		Backup_ovp
SYS red light is ON, BAT light is flashing during battery is faulty.	60002		Circuit_Breaker_ OpenCircuit Breaker_ Open
	60004		Slave_Battery_ Communication_Lost
	60006		Master_Battery_ Communication_Lost
SYS red light is ON, BAT light is flashing during battery is faulty	60008		Multi_Master_error

**TIP**

1. The four LEDs in the first row are system (SYS), battery (BAT), meter (METER), and communication (COM).
2. The five LEDs in the second row are divided into two functions:
 - Battery SOC
 - When a fault occurs, the corresponding fault code will be displayed.

8.2.3 Battery Protection Description

The three LED indicators on the battery front cover provide information about the protection status of the battery with lights displaying solid yellow or flashing.

Symbol	Description
	Flashing yellow LED
	On yellow LED
	Off LED

LED Indicator	Protection No.	LED Display	Description	Troubleshooting
Yellow LEDs on or Yellow LEDs flash once per second	1		Temperature difference	Wait for automatic recovery. If the problem is not solved yet, please call the service center.
	2		High temperature	Stop discharging and charging until this display state is eliminated and wait for the temperature to drop.
	3		Low temperature discharge	Stop discharging until this display state is eliminated and wait for the temperature to rise.
	4		Over-current charge	Wait for automatic recovery. If the problem is not be solved yet, please call the service center.
	5		Over-current discharge	
	6		Cell overvoltage	
	7		Cell under voltage	Stop discharging and call the service immediately.
	8		Low temperature charge	Stop discharging until this display state is eliminated and wait for the temperature to rise.



TIP

In the case of work mode, if the protection status “Cell under voltage” appears, please press the power button 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 open voltage and charge the battery.

8.2.4 Battery Error Description

LED Indicator	Error No.	LED Display	Description	Troubleshooting
Yellow LEDs on or Yellow LEDs flash once per second	Error 01		Hardware error	Wait for automatic recovery. If the problem is not solved yet, please call Error 05 Hardware error the service center.
	Error 05		Hardware error	
	Error 06		Circuit breaker open	Switch on circuit breaker after powering off the battery.
	Error 08		LMU disconnect (slave)	Reconnect the BMS communication cable.
	Error 09		SN missing	Contact your installer or customer service.
	Error 10		LMU disconnect (master)	Reconnect the BMS communication cable.
	Error 11		Software version inconsistent	Contact your installer or customer service.
	Error 12		Multi master	Restart all batteries.
	Error 13		MOS over temperature	Power off the battery and power on the battery after 30 minutes.
	Error 14		Insulation fault	Restart battery and in case the problem is not resolved, please contact your installer.
Error 15		Total voltage fault	Restart battery and in case the problem is not resolved, please contact your installer or customer service.	



TIP

In the case of work mode, if the protection status “Cell under voltage” appears, please press the power button 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 open voltage and charge the battery.

9.0 Uninstallation & Return

9.1 Removing the Product

Procedure

1. Power OFF the energy storage system by following instructions in Chapter 7.2 Shutdown procedure of the System.
2. Disconnect all cables from the product, including all communication cables, PV power cables, battery power cables, AC cables, and PE cables.
3. Remove the WiFi module.
4. Remove the inverter from the top of the battery.
5. Remove the wall bracket of the battery.
6. Remove the battery.
7. Remove the wall bracket of the expansion battery if there is any.
8. Remove the expansion battery if there is any.

9.2 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.

9.3 Disposing the Product

If the product service life expires, dispose of it according to the local disposal rules for electrical equipment and electronic component waste.

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

Do not dispose the product with normal domestic waste.



10.0 Specification

10.1 Datasheet of Inverter

Item	RESERVE-INV-1-P5-L1-INT
Input DC (PV side)	
Recommended max. PV power	10000 W
Max. PV input voltage	580 V
Rated voltage	360 V
Start-up voltage	90 V
MPPT voltage range	100 - 550 V
Max. input current per MPPT	15 A / 15 A
Max. short circuit current per MPPT	18.75 A /18.75 A
MPPT number	2
Max. input strings number per MPPT	1
Battery	
Battery type	Li-ion
Battery voltage range	80 - 450 V
Maximum charging power	5 kW
Maximum charge/ discharge current	60 A / 60 A
Communication	CAN
Output AC (Back-up)	
Rated output power	5 kW
Max. apparent output power	5 kVA
Back-up switch time	< 20 ms
Rated output voltage	L/N/PE, 230 V
Rated Frequency	50/60 Hz
Rated output current	21.7 A
THDv(@linear load)	3%

Item	RESERVE-INV-1-P5-L1-INT
Input AC (Grid side)	
Rated input voltage	L/N/PE, 230 V
Rated frequency	50 / 60 Hz
Rated input power	10 kW
Max. input current	43.5 A
Output AC (Grid side)	
Rated output power	5 kW
Max. apparent output Power	5 kVA
Operation phase	Single phase
Rated grid voltage	L/N/PE, 230 V
Grid voltage range	180 - 270 V
Rated grid frequency	50 / 60 Hz
Rating grid output current	21.7 A
Power factor	>0.99 (0.8 leading - 0.8 lagging)
Thdi	< 3%
Protection class	I
Overvoltage category	III
Efficiency	
Max. efficiency	>97%
EU efficiency	>96.2%
Protection	
Anti-Islanding protection	Integrated
Insulation resistor detection	Integrated
Residual current monitoring unit	Integrated
Output overcurrent protection	Integrated
Output short-circuit protection	Integrated
Output overvoltage protection	Integrated
DC reverse polarity protection	Integrated
PV overvoltage protection	Integrated
PV switch	Integrated
Battery breaker	Integrated

Item	RESERVE-INV-1-P5-L1-INT
General Data	
Dimensions (W*D*H)	610*212*380mm
Weight	20kg
Topology	Transformerless
Operation temperature range	-25 / +60°C
Ingress protection	IP65
Noise emission	<30 dB(A) @1m
Cooling concept	Natural convection
Max. operation altitude	2000m
Features	
PV connection	Plug-in connectors, MC4
Grid connection	Plug-in connectors
Back-up connection	Plug-in connectors
BAT connection	Screw terminal
Communication	LAN, WiFi

10.2 Datasheet of Battery

Item	RESERVE-BAT-1-DC-4-INT
General Data	
Battery type	LFP (LiFePO4)
Weight	44 kg
Dimension (W*D*H)	610 * 213 * 451 mm
Ingress protection	IP65
Energy capacity	4.0 kWh
Usable capacity	3.8 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 ~ 108 V
Max. charge/discharge current*	42 A
Operating temperature range	Charge: $0 < T \leq 60^{\circ}\text{C}$ Discharge: $-10 < T \leq 60^{\circ}\text{C}$
Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS communication	CAN
System	
Safety	IEC62619/IEC63056/IEC62040
Transportation	UN38.3

*Max. charge/discharge current derating will occur related to temperature and SOC

Item	RESERVE-BAT-1-DC-10.1-INT
General Data	
Battery type	LFP (LiFePO4)
Weight	90 kg
Dimension (W*D*H)	610 * 212 * 829 mm
Ingress protection	IP65
Energy capacity	10.1 kWh
Usable capacity	9.6 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 ~ 108 V
Max. charging /discharging current*	60 A
Operating temperature range	Charge: $0 < T \leq 50^{\circ}\text{C}$ Discharge: $-10 < T \leq 50^{\circ}\text{C}$
Monitoring parameters	System voltage, current, cell voltage, cell temperature, PCBA temperature
BMS communication	CAN
System	
Safety	IEC62619/IEC63056/IEC62040/IEC61000
Transportation	UN38.3

*Max. charge/discharge current derating will occur related to temperature and SOC

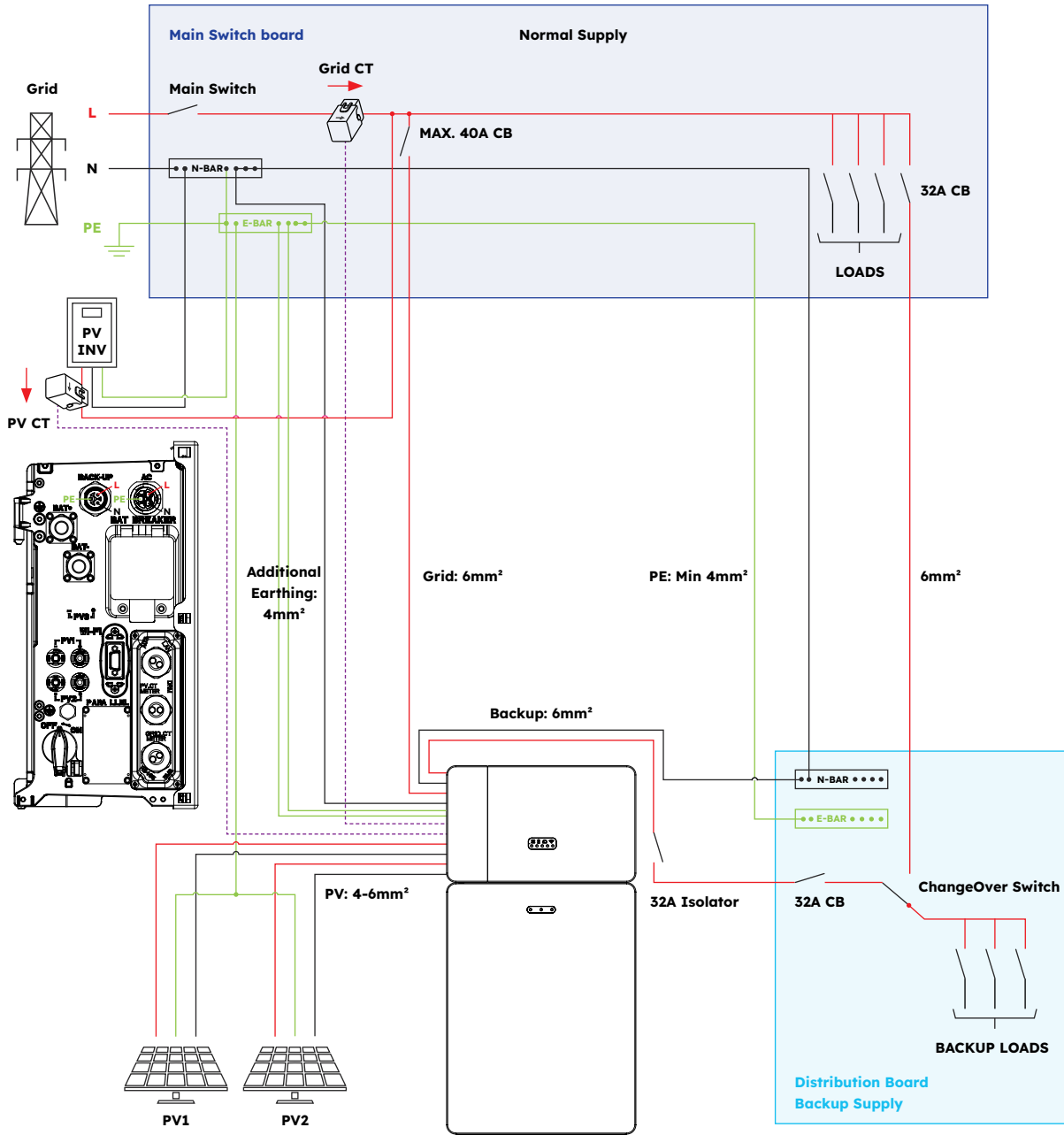
11.0 Appendix 1: System Overview

11.1 System wiring diagram for Australia

11.1.1 Hybrid or AC coupled configuration (AUS)

Sun Power Reserve Wiring Diagram-Hybrid Coupled with Single Phase (AU)

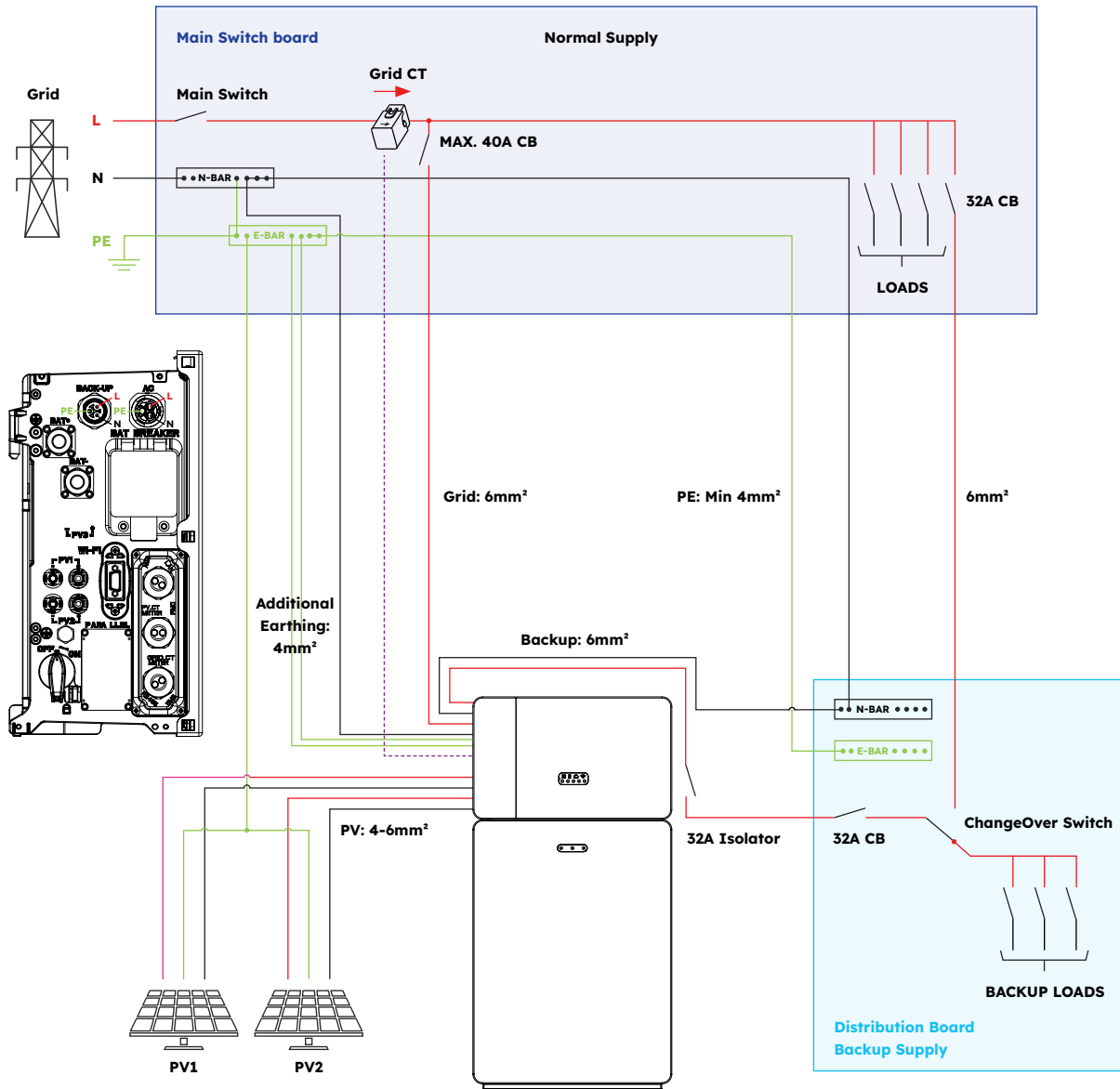
Note: The AC Backup Neutral must be connected to the Neutral Bar.



11.1.2 DC coupled configuration (AUS)

Sun Power Reserve Wiring Diagram - DC Coupled with Single Phase (AU)

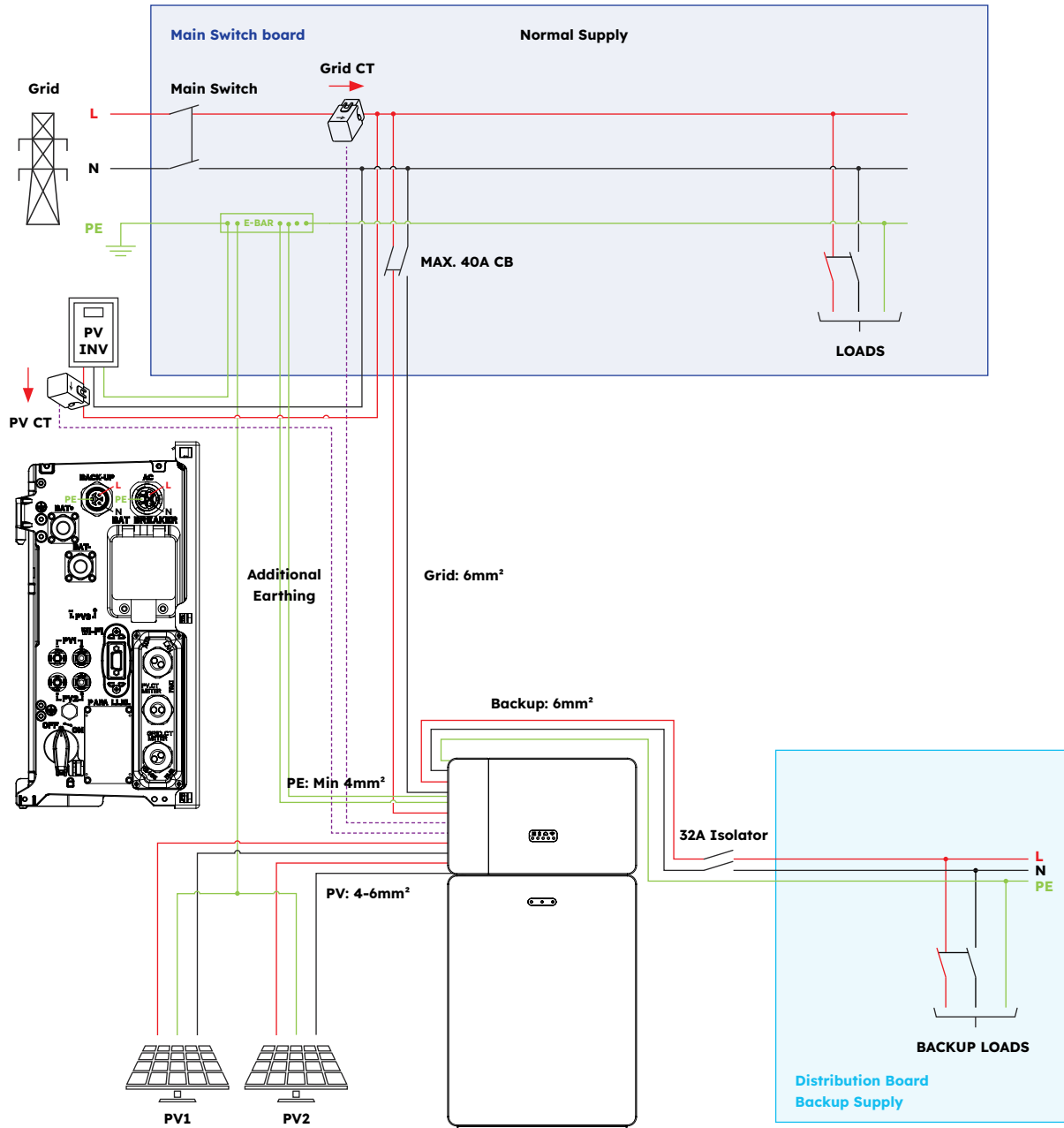
Note: The AC Backup Neutral must be connected to the Neutral Bar.



11.2 System wiring diagram for Europe

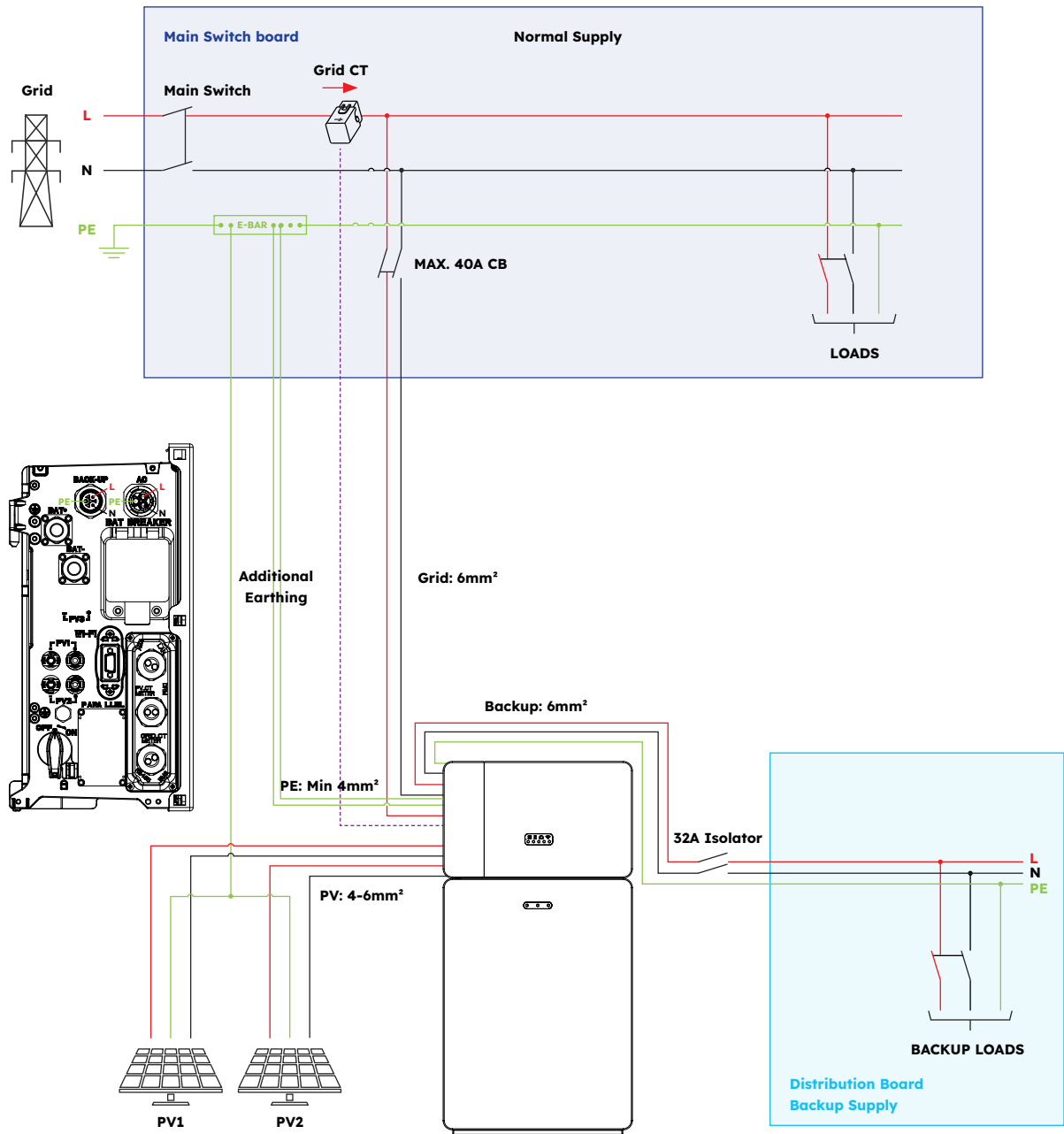
11.2.1 Hybrid or AC coupled configuration (EU)

SunPower Reserve Wiring Diagram-Hybrid Coupled with Single Phase (EU)



11.2.2 DC coupled configuration (EU)

Sun Power Reserve Wiring Diagram - DC Coupled with Single Phase (EU)



12.0 Appendix 2: Regional Application Standard

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

Country (DNSP)	Safety standard	Region Setting
Ausgrid, Ausnet, Citipower, Endeavour Energy, Energex, Ergon, Essential Energy, Evoenergy, Jemena, SA Power Networks, PowerCor, United Energy	AS/NZS 4777.2: 2020	Australia A
Western Power	AS/NZS 4777.2: 2020	Australia B
Horizon Power and TasNetworks	AS/NZS 4777.2: 2020	Australia C
New Zealand	AS/NZS 4777.2: 2020	New Zealand
Germany	VDE4105/11.18	Germany
Italy	CEI 0-21	Italy
Spain	RD1699/UNE	Spain
Belgium	C10/C11	Belgium
Netherlands	EN50549	Netherlands
United Kingdom	G99	United Kingdom