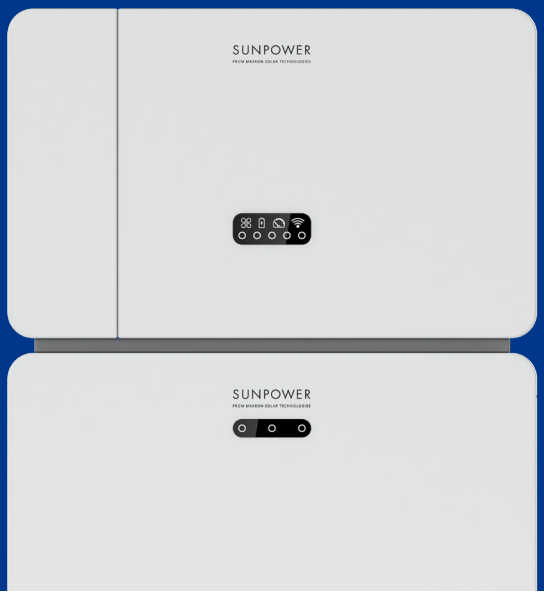
SunPower Reserve

Home energy storage system



Safety & Installation Instructions for SunPower Reserve 3-Phase

552687 Revision B
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This document is valid for installing SunPower Reserve 3-phase home energy system including:

- Inverter: RESERVE-INV-1-P10-L3-INT
- Battery: RESERVE-BAT-1-DC-4-INT
- Energy 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/InstallGuideReserve3P
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POWERING POSITIVE CHANGE

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
DNSP	Distributed network service provider
DRM	Demand response mode
RRCR	Radio ripple control receiver
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: • **RESERVE-INV-1-P10-L3- INT** • **RESERVE-BAT-1-DC-4- INT** • **CHINT-DTSU666-AC-L3-INT**	The SunPower Reserve system is intended for installation in residential homes to optimise self-consumption. It is suitable for indoor and outdoor installation. 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. 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. Unauthorized alterations will void guarantee and warranty claims. Maxeon Solar Technologies shall not be held liable for any damage caused by such changes. The type label must remain permanently attached to the product. This document is an integral part of this product. Ensure it is accessible for future reference and comply with all instructions contained therein.
INVERTER: **RESERVE-INV-1-P10-L3-INT**	The inverter is used for bidirectional transfer between AC current and DC current.
BATTERY: **RESERVE-BAT-1-DC-4-INT**	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.

2.2 Safety Instructions for Battery

2.2.1 General Safety Precautions

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

1. Overvoltage or incorrect wiring can damage the battery pack and may cause deflagration, which can be extremely dangerous.

2. All types of battery breakdown may lead to electrolyte or flammable gas leakage
3. Battery pack is not user-serviceable. There is a high voltage in the device.
4. Read the label with Warning Symbols and Precautions on the right side of the battery.
5. Do not connect any AC conductors or PV conductors directly to the battery which should be connected only to the inverter.
6. Do not charge or discharge damaged battery.
7. Do not damage the battery by dropping, deforming, impacting, cutting or penetrating it with a sharp object. Battery damage may cause a leakage of electrolyte or fire.
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 do not touch anything if any part of the battery, inverter, or wiring is submerged. Do not use battery again and contact the technical support.

Product(s)	Intended use & installation requirements
If the battery shell is damaged and user touches the inner material of the battery cells	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	**You will need:** • FM-200, CO^2 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. **What to do:** 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**	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.

2.3 Important Safety Instructions

High risk scenarios	Recommended actions
 **Danger to life due to electric shock when live components or cables are touched**	There is high voltage in the conductive components or cables of the inverter. Touching live parts and cables can result in death or lethal injuries due to electric shock. • Do not touch non-insulated parts or cables. • Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the inverter or the battery pack. • After disconnection, wait for 5 minutes until the capacitors inside the inverter have discharged. • Do not open the product. • Wear suitable personal protective equipment for all operations on the product.
 **Danger to life due to dangerous voltages on the battery pack**	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. • 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
 **Danger to life due to electric shock from touching an ungrounded PV module or array frame**	• Touching ungrounded PV modules or array frames can result in death or lethal injuries due to electric shock. • Connect and ground the frame of the PV modules, the array frame and the electrically conductive surfaces so that there is continuous conduction. • Observe the applicable local regulations.
 **Danger to life due to electric shock when live components or PV cables are touched**	When PV panels exposed to sunlight, the PV array generates high DC voltage which presents in the DC conductors. Touching the live DC cables can result in death or lethal injuries due to electric shock. • Disconnect the inverter from voltage sources and make sure it cannot be reconnected before working on the device. • Do not touch non-insulated parts or cables. • Do not disconnect the DC connectors under load. • Wear suitable personal protective equipment for all work on the inverter.

High risk scenarios	Recommended actions
 **Danger to life due to electric shock when touching live system components in case of a ground fault**	When a ground fault occurs, parts of the system may still be live. Touching live parts and cables can result in death or lethal injuries due to electric shock. • Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the device. • Touch the cables of the PV array on the insulation only. • Do not touch any parts of the substructure or frame of the PV array. • Do not connect PV strings with ground faults to the inverter.
 **Risk of chemical burns from electrolyte or toxic gases**	During normal operation, no electrolyte would leak from the battery pack and no toxic gases would form. Despite careful construction, if the battery pack is damaged or a fault occurs, it is possible that electrolyte may be leaked, or toxic gases may form. • Store the battery pack in a cool and dry place. • Do not drop the battery pack or damage it with sharp objects. • Only set the battery pack down on its back or its bottom. • Do not open the battery pack. • Do not install or operate the battery pack in potentially explosive atmosphere or areas of high humidity. • If moisture has penetrated the battery pack (e.g., due to a damaged housing), do not install or operate the battery pack. • In case of contact with electrolyte, rinse the affected areas immediately with water and consult a doctor without delay.

Cautionary scenarios	Intended use & installation requirements
 **Risk of burns due to hot heatsink and housing**	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.
 **Damage to the inverter due to electrostatic discharge**	• Touching electronic components can cause damage to or destroy the inverter and the battery through electrostatic discharge. • Ground yourself before touching any component.
 **Damage due to cleaning agents**	• 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	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

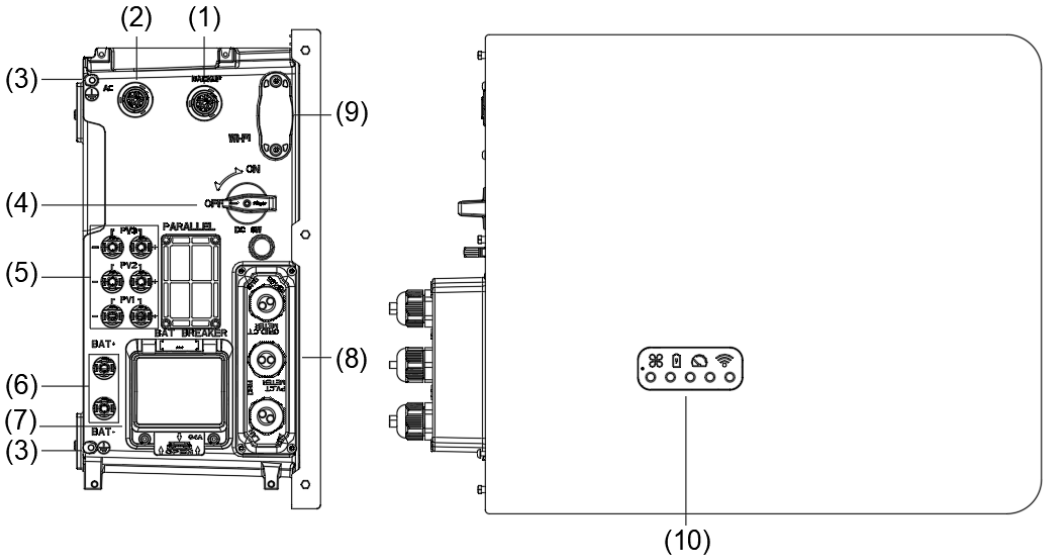
3.1 System Appearance Introduction

Inverter
RESERVE-INV-1-P10-L3-INT

Battery
RESERVE-BAT-1-DC-4-INT

3.2 Inverter Description

3.2.1 Inverter Electrical Interface Introduction



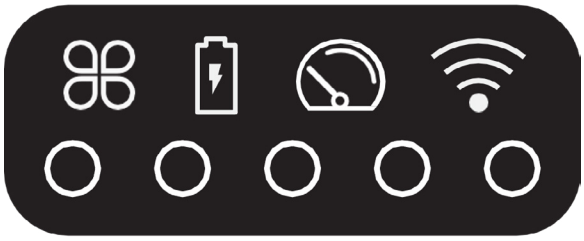
Position	Description
1	Backup Connector
2	Grid Connector (3P-AC Supply)
3	Grounding Point
4	PV Switch*
5	Positive and Negative PV Connectors, PV1, PV2, PV3
6	Battery + Connector Battery - Connector
7	Battery Circuit Breaker*
8	Communication Ports (BMS, RS485, Meter, DRM**&RRCR, LAN, AUX)
9	Distributed network service provider
10	Inverter LED Display

* Battery circuit breaker and PV 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 Display Interface

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

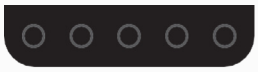
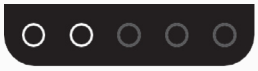
However, when the system is experiencing a fault, the combination of both upper and lower LEDs are used to show error codes, such as:

Normal status	Description	Abnormal status	Description
 **SYSTEM**	**White light** The system works normally	 **SYSTEM**	**Red light** The system is in fault
 **METER**	**White light** Meter Communication works normally	 **METER**	**No light** Meter lost
 **BATTERY**	**White light** Battery works normally	 **BATTERY**	**No light** Battery is not working normally
 **COMMS**	**White light** Server Connected	 **COMMS**	**No light** Server Disconnected

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

Light	During the software downloading and upgrading process
Inverter light display	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 light display	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) of the system. If all batteries are operating normally, they will display solid white or off. During the various states of charge, the lights will display:

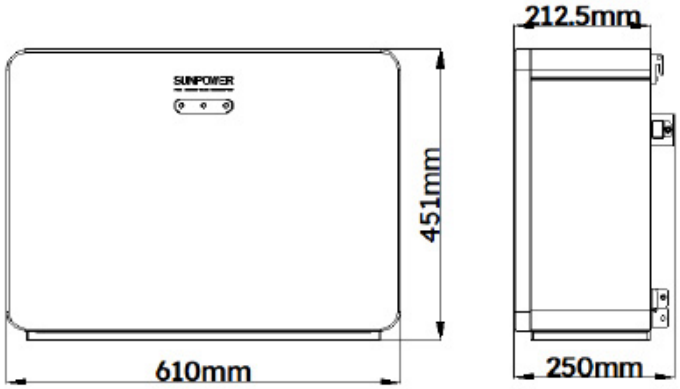
State of Charge (SoC)	Description
	SOC<5%
	5%≤SOC<20%
	20%≤SOC<40%
	40%≤SOC<60%
	60%≤SOC<80%
	80%≤SOC≤100%

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

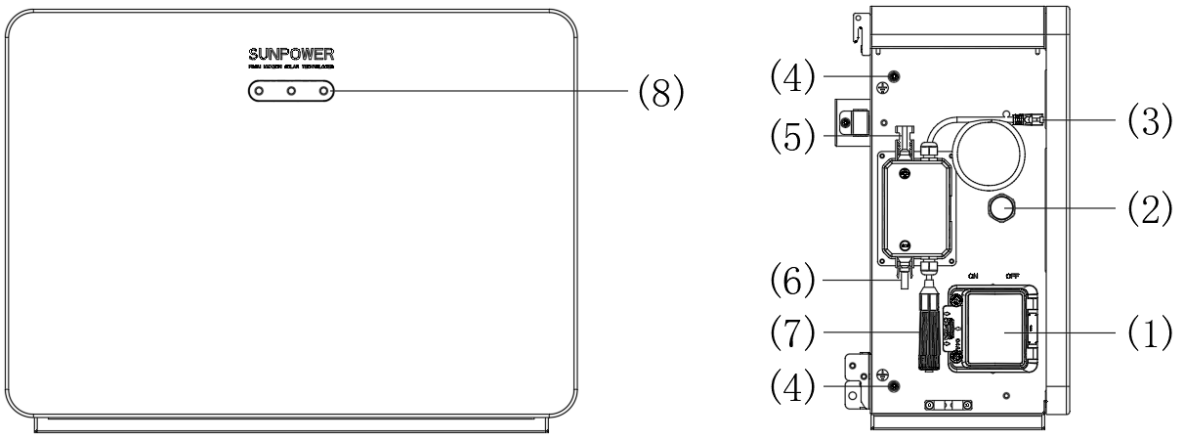
3.3 Battery Description

3.3.1 Battery Electrical Interface Introduction

Series battery appearance and dimensions



Connection area overview



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

3.3.2 Battery Display Introduction

Battery LEDs SOC Display

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

Symbols	Description
	White LED is flashing.
	White LED is glowing.
	White LED is off.

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

Battery LEDs State Display

The LEDs indicate the operating state of the product.

Standby: all white LEDs are flashing (0.5s on and 0.5s off).

Normal: white LEDs are glowing or flashing (0.5s on and 1.5s off).

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

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

Shutdown: all LEDs are off.

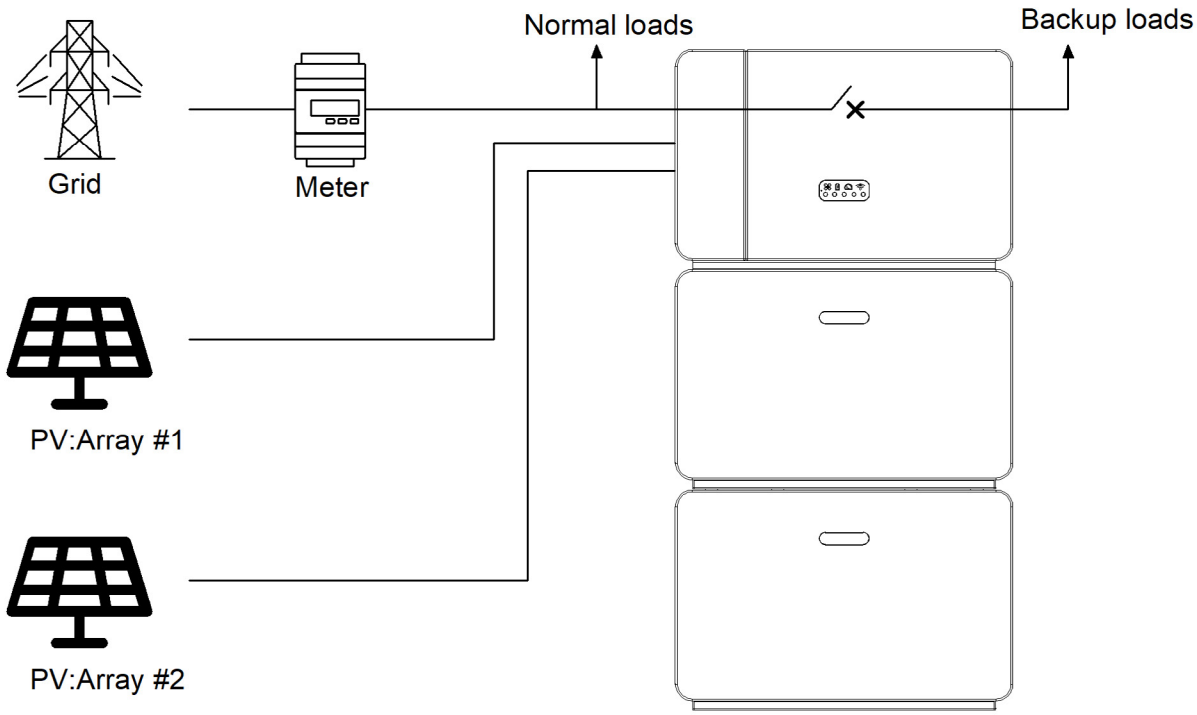
3.4 Application Scenarios

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

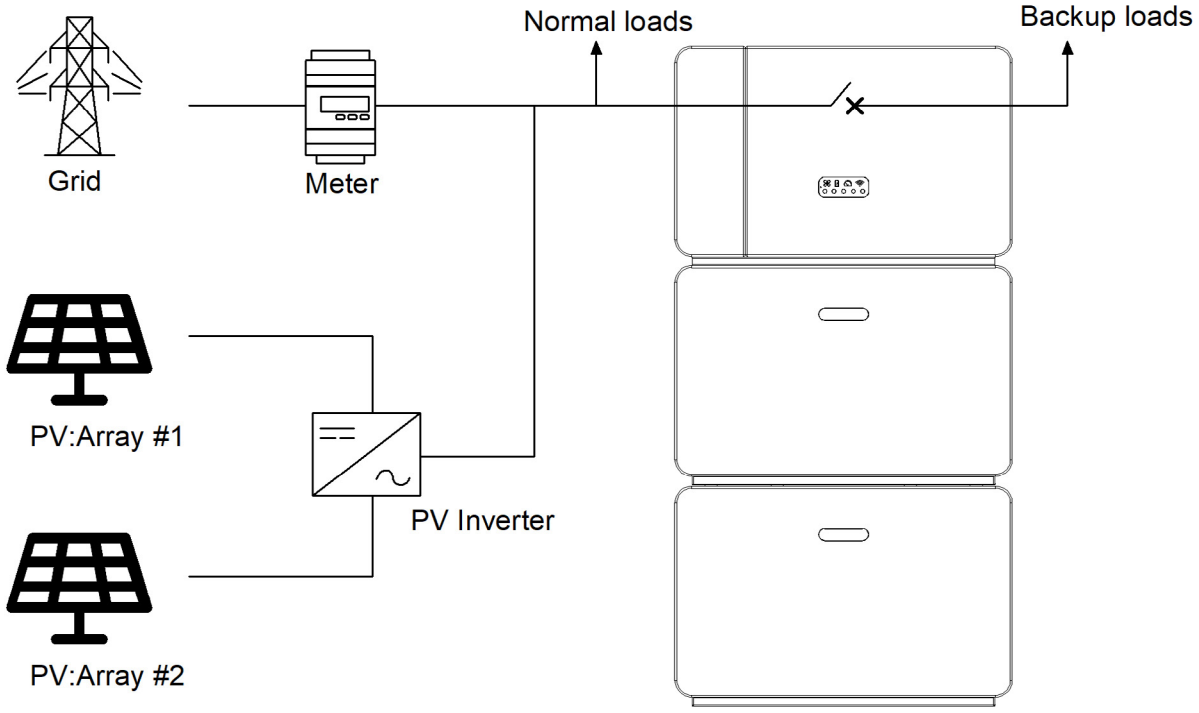
Application	Description	Advantages
DC	PV arrays connected directly to the SunPower Reserve PV inputs.	No additional inverter needed
AC	PV Arrays connected a separate AC Coupled PV inverter.	• Loads can be drawn from battery and PV simultaneously • Battery system can be retrofitted
Hybrid	PV Arrays. connected directly to SunPower Reserve PV inputs and connected to an AC Coupled PV Inverter.	• Can be coupled to any existing PV system • Increase system size and control without altering original PV system

An example of each of these scenarios:

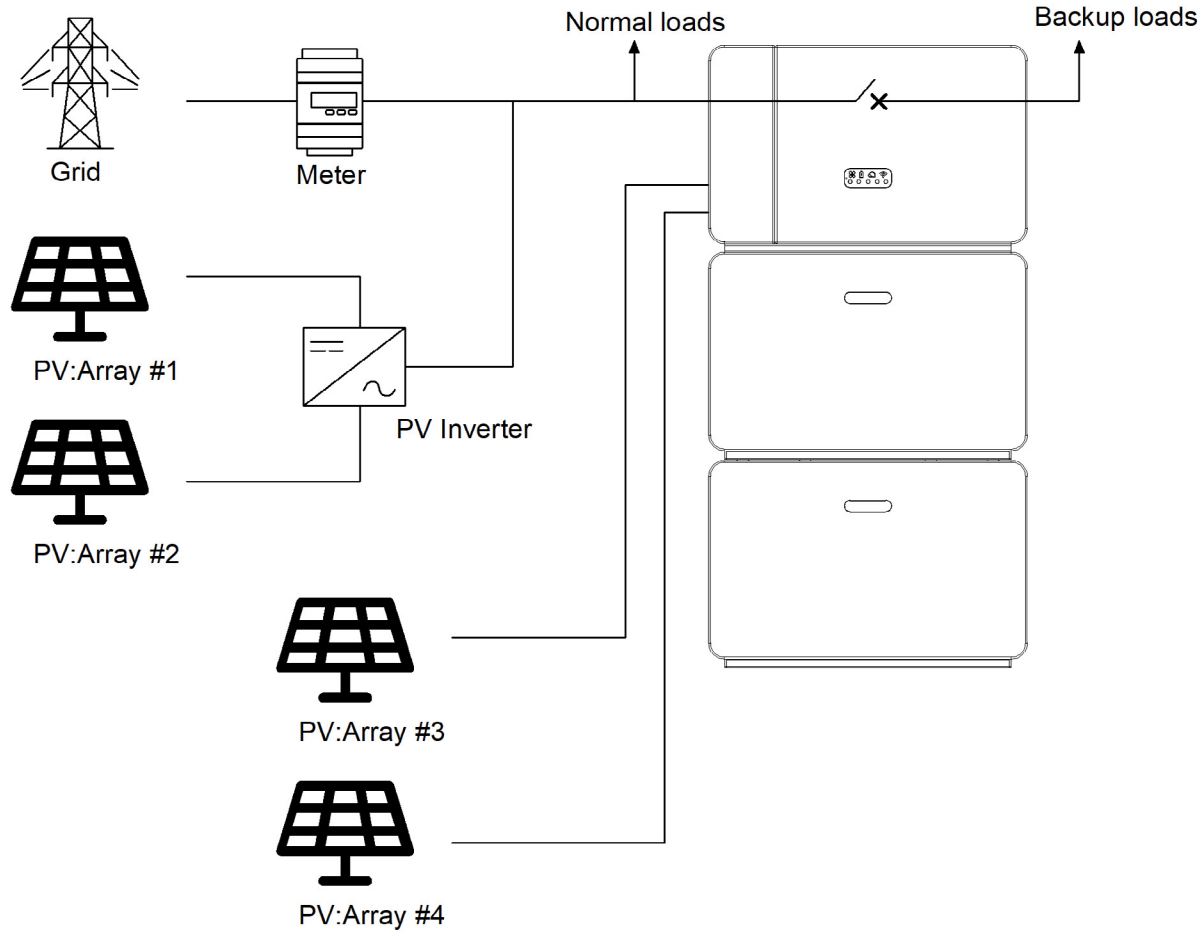
3.4.1 DC-coupled Storage System



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-P10-L3-INT**	1. Do not unpack the inverter. 2. Keep the storage temperature at -40 °C to 60 °C and the humidity at 5% / 95% RH. 3. The inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion. 4. A maximum of 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 any damaged packaging promptly. 6. The inverters stored for more than 2 years should be inspected and tested before being put into service.
Battery: **RESERVE-BAT-1-DC-4-INT**	1. Place batteries according to the signs on the carton during storage. 2. Stack battery cartons in accordance with the stacking requirements printed on the external carton. 3. Store the battery pack out of reach of children and animals. 4. Store the battery pack in an area where there is minimal dust and dirt. 5. Handle batteries with care to avoid damage 6. The requirements for the storage environment are as follows: a. Ambient temperature: -10 °C to 55 °C, recommended storage temperature: 15 °C to 30 °C b. Relative humidity: 15% to 85% c. Place batteries in a dry, clean, ventilated location free from dust d. Store batteries in a place that is away from corrosive organic solvents and gases. e. Keep batteries away from direct sunlight. f. Keep batteries at least 2 meters away from heat sources. 7. The batteries in storage must be disconnected from external devices. The indicators (if any) on the batteries should be off. 8. Warehoused batteries should be delivered based on the „first in, first out“ stock control. 9. Batteries stored for more than 6 months should be assessed and charged periodically. 10. It is recommended to put batteries into service as soon as practical. Storing for more than 12 months at a SOC less than 30% may lead to capacity loss.

4.2 Transport

During transportation, please follow these guidelines:

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

5.1 Checking the Outer Packing

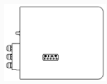
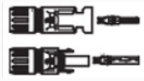
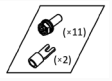
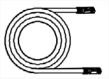
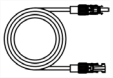
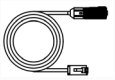
Before unpacking the product, check the outer packaging for damage, such as holes, signs of mechanical damage or water damage. If any damage is found, do not unpack the product and contact your supplier as soon as possible.

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

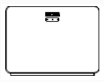
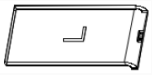
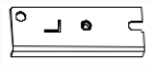
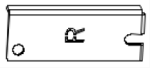
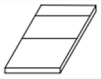
Check the components included with inverter from the list below.

Inverter (RESERVE-INV-1-P10-L3-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 (X3)	6 Pin AUX Terminal Block (X2)	Screws M5X12 and Grounding Terminals Set (X1)
				
Grounding Cable between Inverter and 1st Battery (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 (×1)	System Wiring Diagram sheets (X1)	Quick Installation Guide (X1)		

Additional components for inverter wall bracket (optional)

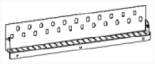
Wall bracket for Inverter (RESERVE-INV-1-P10-L3-INT)				
				
Wall Bracket (X1)	Hook for Wall Bracket (X4)	Hexagon Head Screw M5*12 (X18)	Wall Anchor ST6*55 (X4)	Small Spirit Level (X1)

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

Battery (RESERVE-BAT-1-DC-4-INT)				
				
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)			

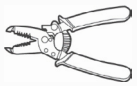
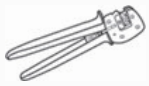
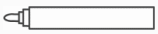
Additional components for battery wall bracket (optional)

Wall bracket for Battery (RESERVE-BAT-1-DC-4-INT)				
				
Wall Bracket (X1)	Connection Plate between Wall Brackets of Batteries (X2)	Connection Plate between Wall Brackets of 3P Inverter and first Battery (X2)	Wall Anchor ST6*55 (X6)	Hexagon Head Large Washer Screw M5*12 (X3)
				
Flange Nut M5 (X7)	Small Spirit Level (X1)			

Floor Mount for 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 energy storage system.

Tools and Instruments and Personal Protective Equipment				
				
Hammer drill (With a ø10mm drill bit)	Socket wrench SW8	Multimeter (DC voltage range ≥ 1000 V DC)	Diagonal pliers	Wire stripper
				
T20 screwdriver(torque range: 0~5 Nm), L=150mm	Rubber mallet	Utility knife	Cable cutter	MC4 Crimping pliers
				
Cord End Terminal Crimper(model:HSC8 0.25-10mm2)	Network plug clamp	Current clamp	Disassembly and assembly tool of PV connector	Vacuum cleaner
				
Marker	Measuring tape	Spirit level	Anti-dust respirator	Safety shoes
				
Safety gloves	Safety goggles			

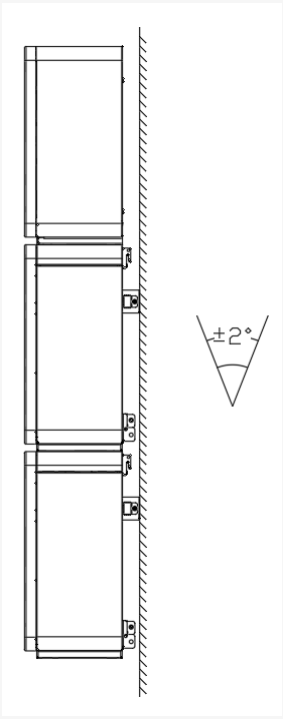
5.5 Requirements for Mounting

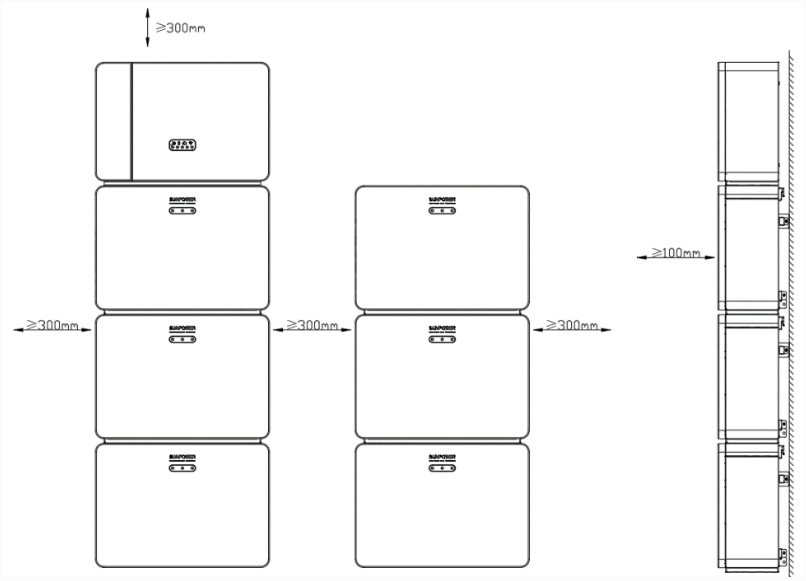
DANGER

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	• 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 the reach of children. • Do not engage screws into tapped holes using a Hammer Driver, Impact Driver or “Rattle gun”. Do not damage screws or threaded holes by tightening with too much torque. • Recommend a minimum of 150mm off the ground was advisable to protect from submergence.
Mounting Environment	• The system must be mounted in a well-ventilated environment to ensure adequate heat dissipation. • Mount the system in a sheltered place or mount an awning over it. • The optimal temperature range for the battery to operate is 15°C to 30°C. • Do not mount the system in areas where it could be exposed to sunlight, the power of the system may derate due to additional heat. • Do not expose or place near water sources like downspouts or sprinklers. • Do not mount the system outdoors in areas of high salt mist likelihood where corrosion may cause damage. An area of high salt mist likelihood refers to a region within 500m from the coast or prone to the sea breeze. • If the battery is mounted in the garage, ensure the product is adequately protected from potential mechanical impact. • Recommend locations that are indoors, under cover, or generally protected from the elements and extreme temperatures (e.g. in a garage)

Mounting Structure	• The mounting surface behind the system should not allow the propagation of fire. The mounting surface behind the system should not allow the propagation of fire and shall be fire-rated where required by local regulations. • Ensure that the mounting floor is solid and able to bear the weight of the system.
Mounting Angle with Wall-mounted Type	The inverter should be mounted on the battery. The installation angle requirement is:  Do not mount the system 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 which can be adjusted according to the end-users requirements. Clearances may be up to 100mm less than noted if ventilation is adequate and no restrictions or objects will limit access to the labelling or switches of the Product or to the use of tools to remove covers or service/remove the Product. • Local Standards may add additional clearance requirements, particularly regarding clearances between the Battery System and other Electrical Appliances 

5.6 Mounting the Energy Storage System

5.6.1 Mounting the Battery with Wall Bracket

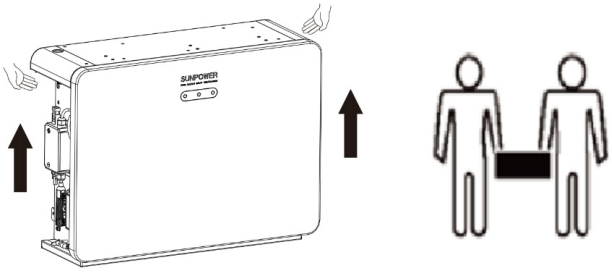
Battery wall-mounting instructions:

CAUTION

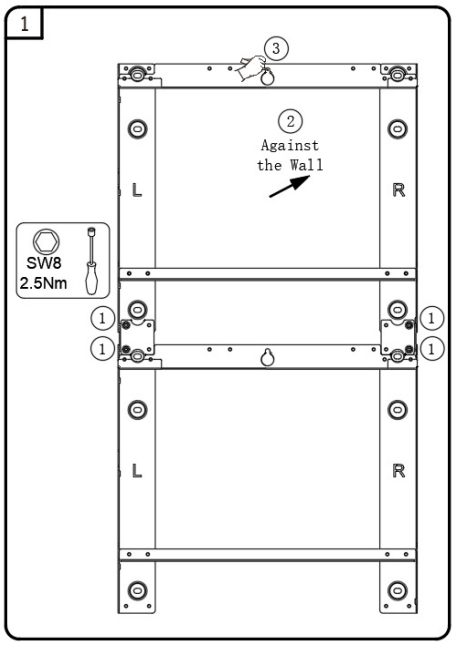
Risk of injury when lifting the battery as the battery weighs 44 kg. There is a risk of injury if the battery is lifted incorrectly or dropped while being transported or mounted.

- Transport and lift the battery always as described below. Take the weight of the product into account.
- Always have two persons mount and disassemble the product and pay attention to safety.
- Wear suitable personal protective equipment for all work on the product.

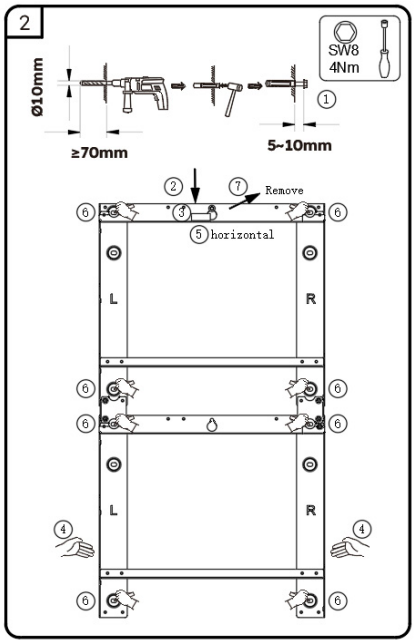
1. Take out the battery from the carton, transport it to the installation site.



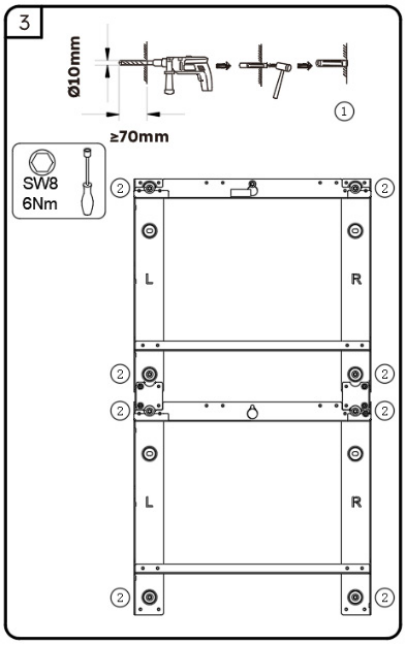
2. Unpack the wall brackets and connection plates. Assemble them together to form a frame with M5 nuts. Select a suitable height, please reserve enough space below if you want to add more batteries follow-up.



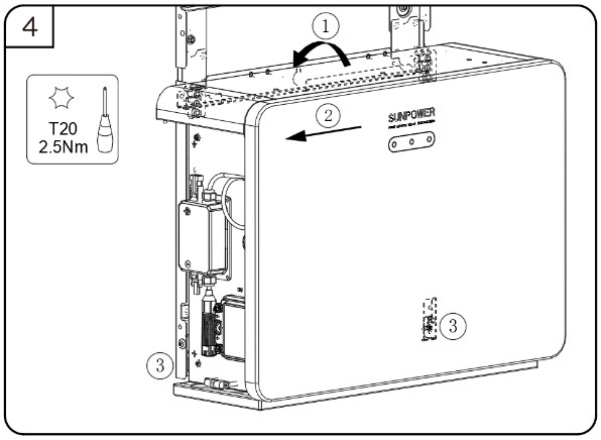
3. Drill the marked hole with a 10mm drill. Insert the screw anchor into the drill hole, and pre-tighten the provided screw, retain 5~10mm from the screw head to the wall.
   Hang the wall bracket on the screw head, adjust its horizontal position, mark the other drill positions, and remove the wall bracket.



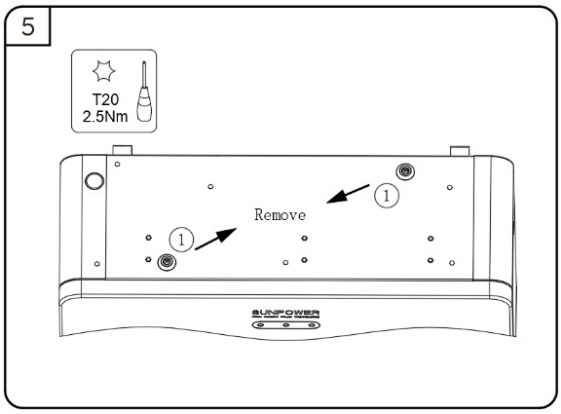
4. Drill the marked holes with a 10mm drill. Insert the screw anchors into the drill holes.
   Hang the wall bracket on the screw head, secure the wall bracket to the wall with the provided screws (tool: 8mm socket wrench, torque: 6Nm).

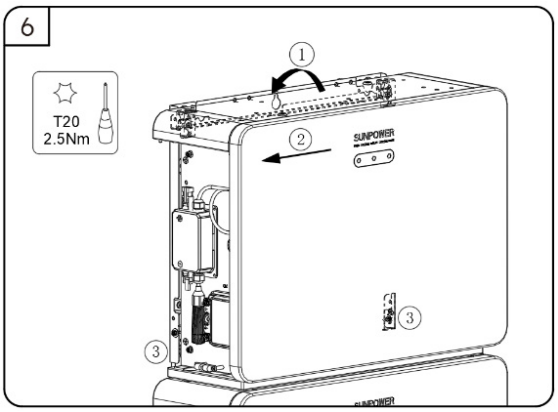


5. Always hold the handles on both sides of the battery firmly, hook the battery into the bottom wall bracket, and move it to the left limit.
   Secure the lower holes on both sides of the battery to the wall bracket and tighten them with two screws M5*12 (tool: T20 screwdriver, torque: 2.5Nm).



6. 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.





5.6.2 Battery wall-mounting disassembling instructions

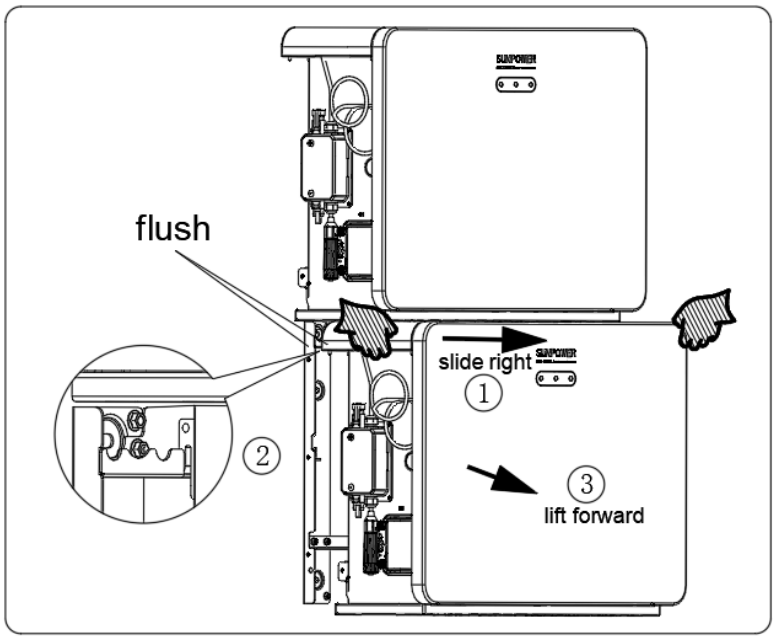
CAUTION

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 via a wall bracket and is not directly connected to the inverter, always hold the handles on both sides of the battery firmly and slide it to the right. Once the 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.



5.6.3 Mounting the Battery using the Floor Mount

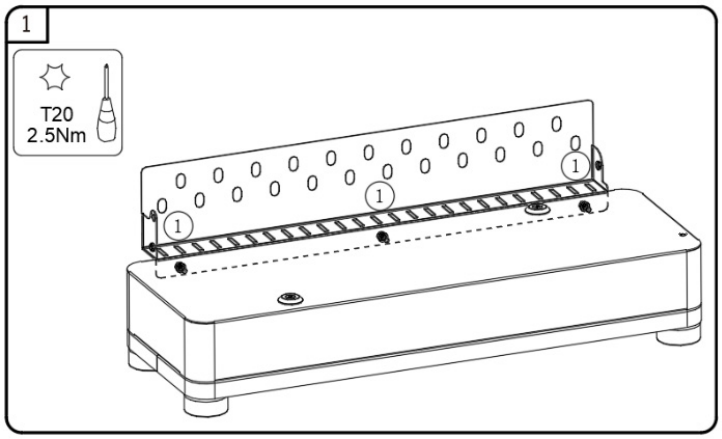
Battery mounting on the floor back to wall instructions:

CAUTION

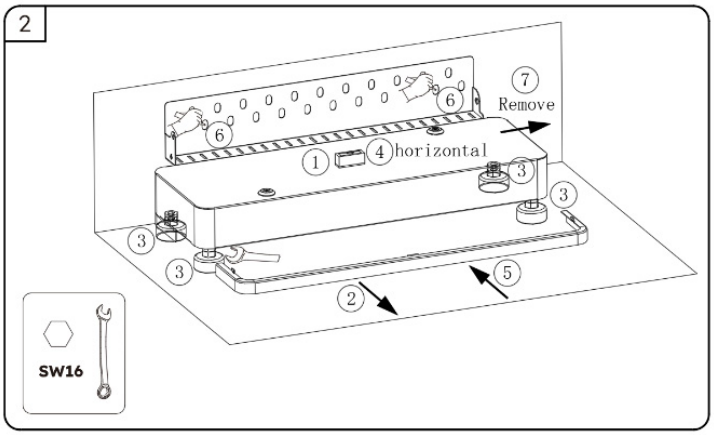
Risk of injury when lifting the battery as the battery weighs 44 kg. There is a risk of injury if the battery is lifted incorrectly or dropped while being transported or mounted.

- Transport and lift the battery always as described below. Take the weight of the product into account.
- Always have two persons mount and disassemble the product and pay attention to safety.
- Wear suitable personal protective equipment for all work on the product.

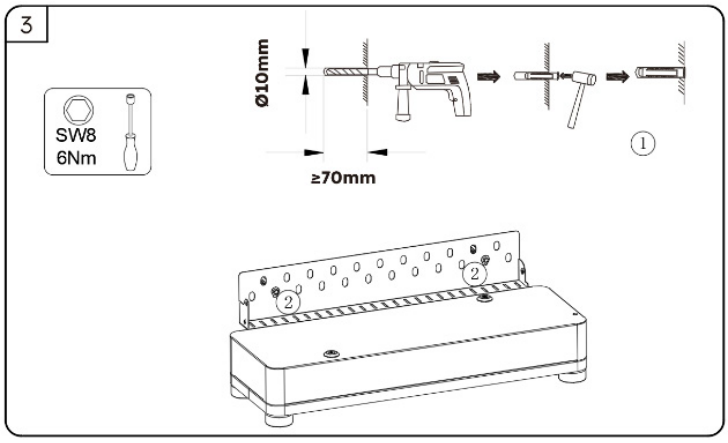
1. Take out the base unit and the wall connection plate of base unit, tighten them together with three screws M5*12 (tool: T20 screwdriver, torque: 2.5Nm).



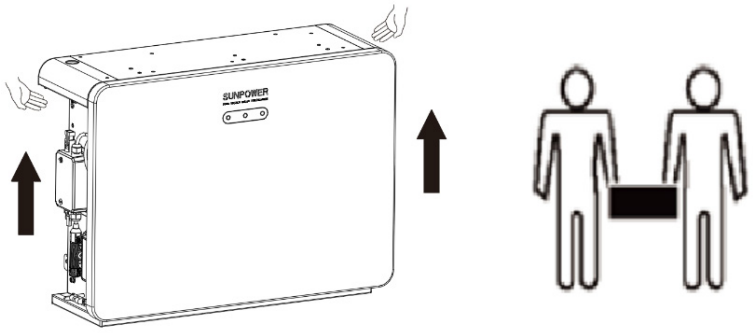
2. Place the small spirit level at the center of the base unit, remove the cover of the feet, adjust the four feet to level the base unit, assemble the cover of the feet to the base unit, mark the drill positions on the wall, and remove the base unit.



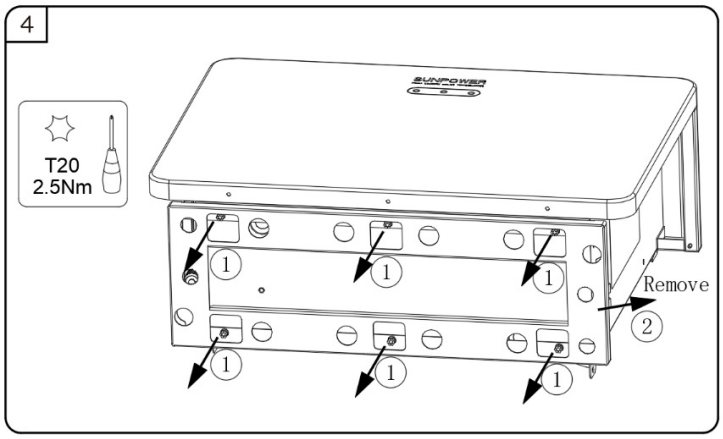
3. Drill the marked holes with a ø10mm drill. Insert the screw anchors into the drill holes, secure the base unit to the wall with the provided screws (tool: SW8 socket wrench, torque: 6Nm).



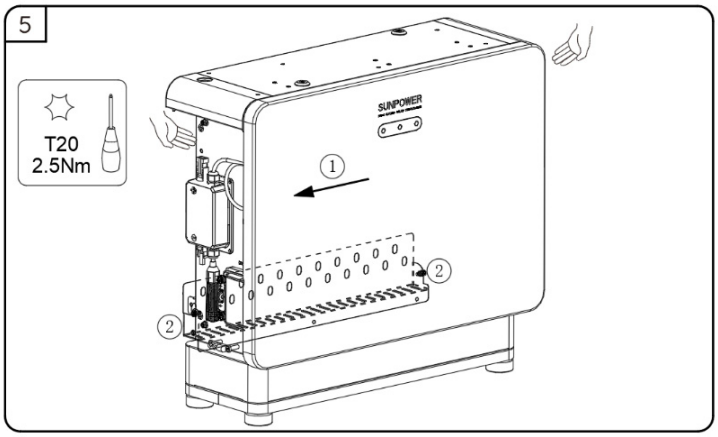
4. Take out the battery from the carton, transport it to the installation site.



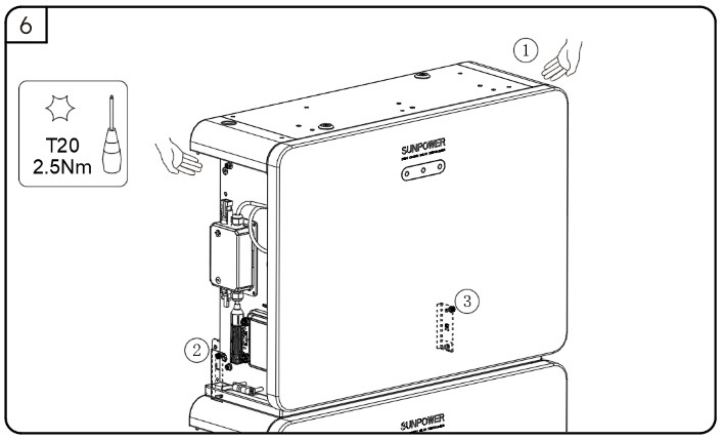
5. Remove the battery base from the battery bottom (tool: T20 screwdriver, torque: 2.5Nm), the battery will be located at the bottom. When doing so, please protect the appearance of the battery.



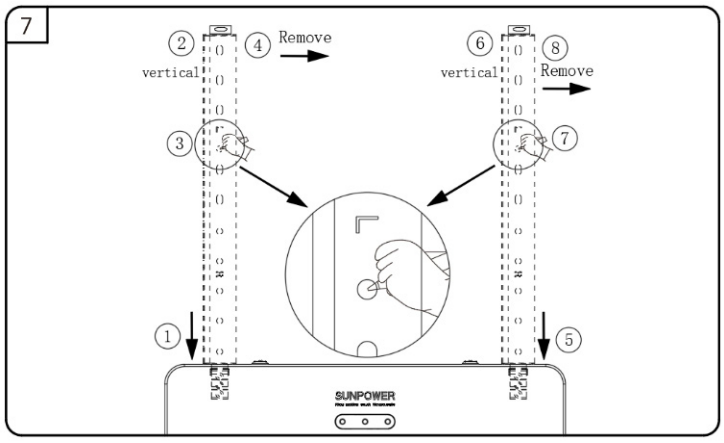
6. Lift the battery by using the handles at two sides, place the battery on the base unit and move it to the left limit. Align the lower holes on both sides of the battery back to the wall connection plate of base unit, tighten them together with two screws M5*10 (tool: T20 screwdriver, torque: 2.5Nm).



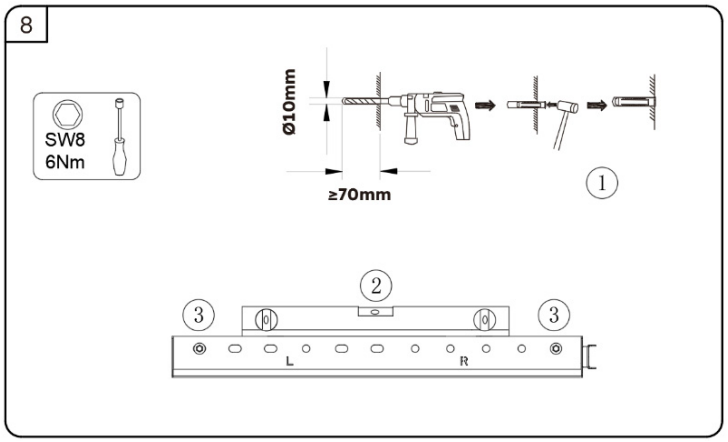
7. Please jump to step 8 if there are only two batteries in the column.
   Lift the battery by using the handles at two sides, place this battery on the bottom battery. When doing so, align the two depressed positions at the bottom of the upper battery to the raised limit blocks at the top of the lower 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.



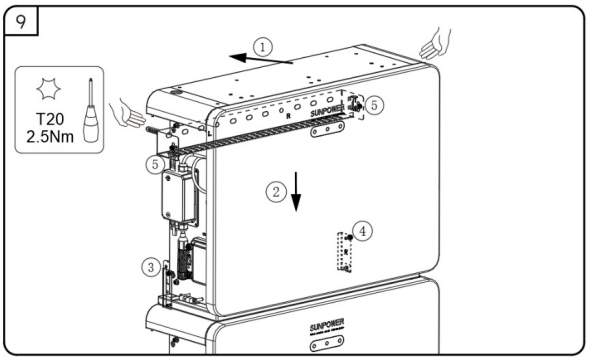
8. Take out the wall connection plate of battery.
   Place the raised edge of the plate facing left, push the lower end of the plate against the left and right hooks on the battery back, adjust its vertical position, and mark the drill positions through the circular hole on the wall.

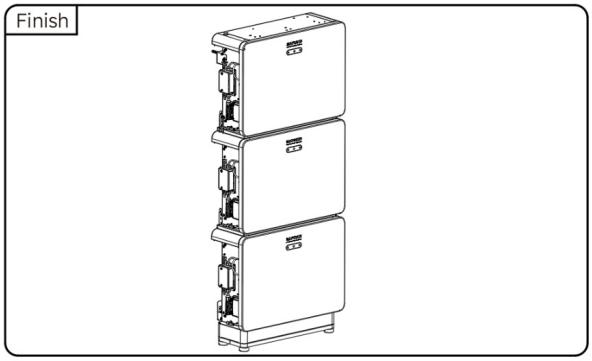


9. Drill the marked holes with a ø10mm drill. Insert the screw anchors into the drill holes, secure the wall connection plate of battery to the wall with the provided screws (tool: SW8 socket wrench, torque: 6Nm).



10. 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).

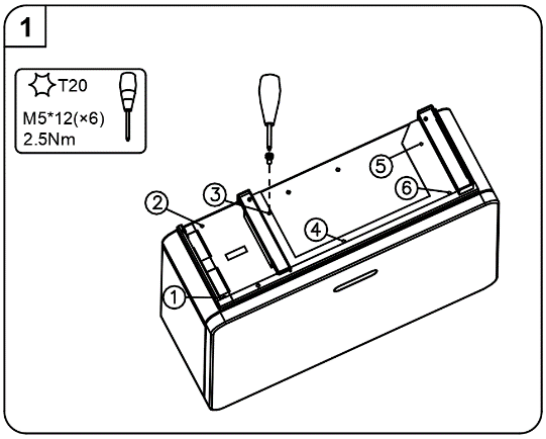




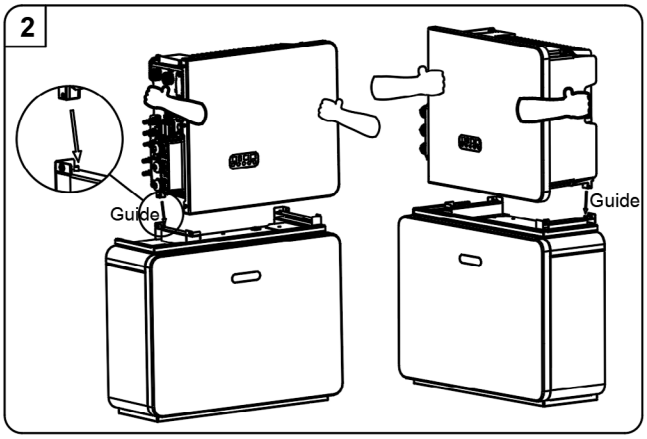
5.6.4 Mounting the Inverter on the Battery

Mount inverter standing on the battery:

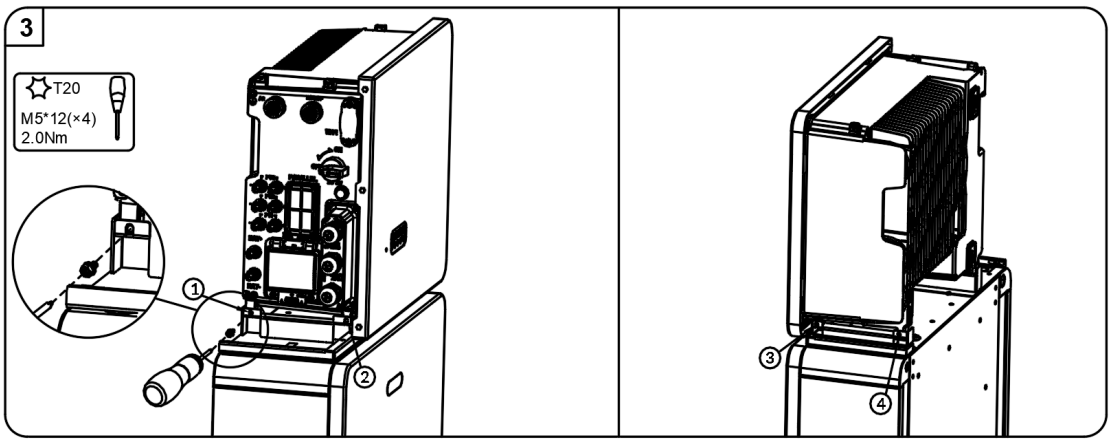
1. Take out the inverter base, fit it onto the top of the battery and attach them with six screws M5*12 (tool: T20 screwdriver, torque: 2.5Nm).



2. Place 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.



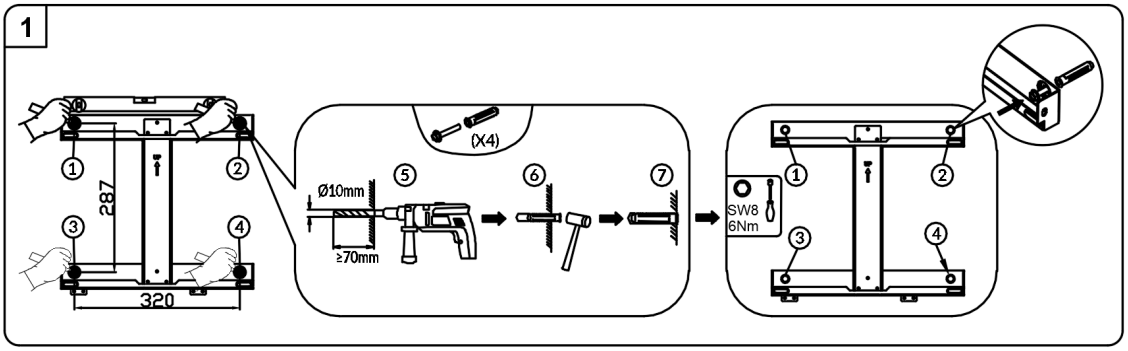
3. Attach the inverter to the inverter base. The inverter mounting holes should align to the horizontal holes of the inverter base, secure them with each two screws M5x12mm on the left and right sides (tool: T20 screwdriver, torque: 2.5Nm).



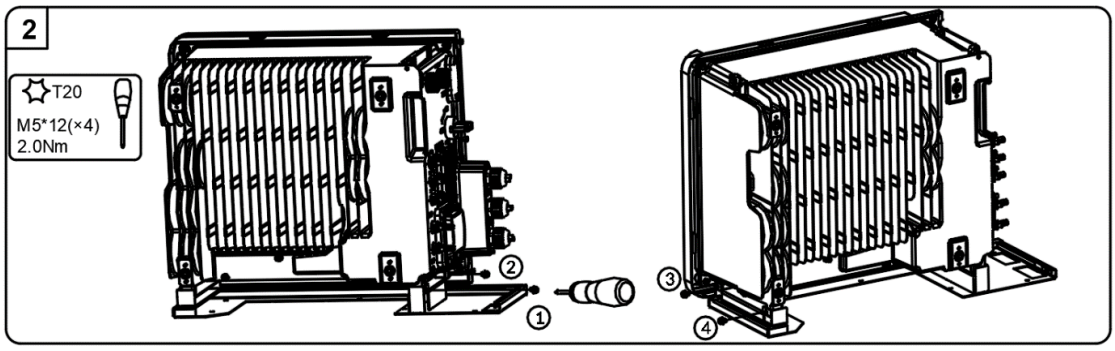
5.6.5 Mounting the Inverter on a Wall Bracket

Mounting the inverter with a wall bracket can provide a simplified path for a future battery addition.

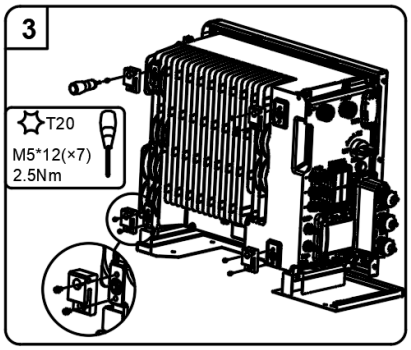
1. Unpack the wall bracket for the inverter. Select a suitable battery height. It is recommended to allow enough height for an additional battery to the added.
   Mark the four drilling positions of the wall bracket. Drill the marked holes with drill 10mm. Insert screw anchors into the drilling holes. 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 8mm hex.



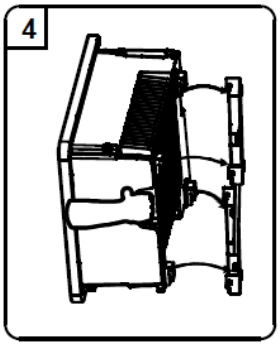
2. Take out the inverter base, place the inverter into the inverter base. When doing so, the lower right and left holes on the bottom of the inverter must be inserted into the respective guides in the inverter base. Secure the inverter base to the inverter with each two screws M5x12mm on the left and right sides (tool: T20 screwdriver, torque: 2.5Nm)



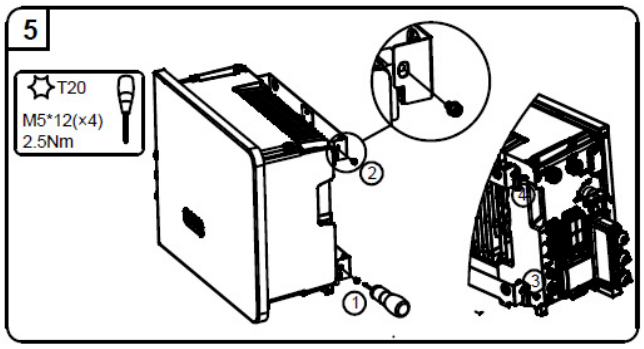
3. Take out the four hooks for wall bracket, assemble them to the inverter back with screws M5x12mm (tool: T20 screwdriver, torque: 2.5Nm).



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



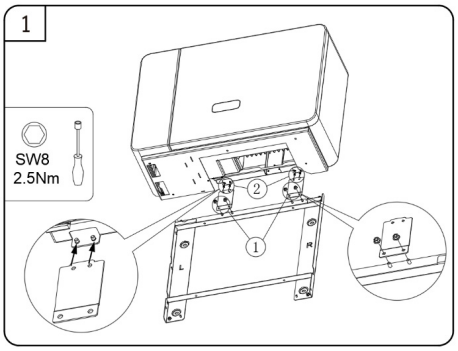
5. Secure the inverter to the wall bracket. To do so, insert the four screws M5x12mm into the lower and upper threaded holes on both sides of the inverter and tighten them (tool: T20 screwdriver, torque: 2.5Nm).

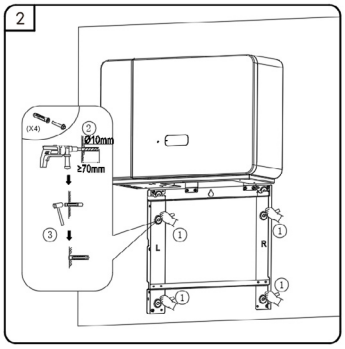


5.6.6 Battery Mounting for Battery Ready Application

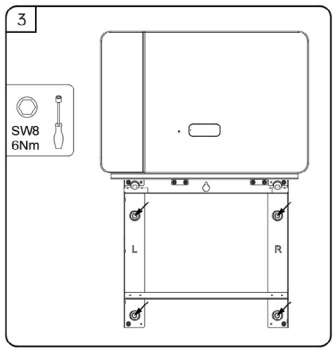
Battery ready scenario is where user installed hybrid inverter as a PV inverter and not installed a battery. Later the user may decide to install a battery. At this section we will introduce how to mount the first battery, please follow these steps.

1. Take out the battery wall bracket and two connection plates between wall brackets of inverter and first battery, assemble them with M5 nuts (tool: SW8 hexagon sleeve, torque: 2.5Nm).
2. Align the upper holes of the connection plates between wall brackets of inverter and first battery to the lower rivets of the wall bracket of the inverter, mark the drilling positions on the wall and remove the battery wall bracket.

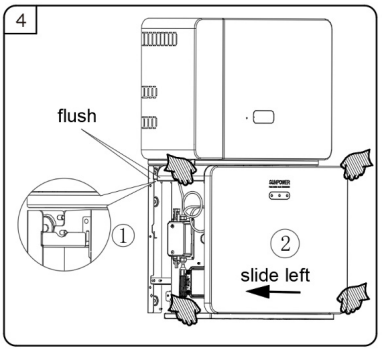




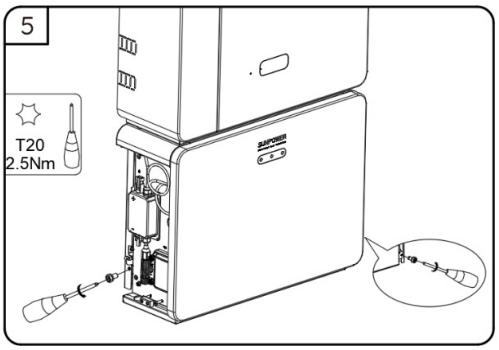
3. Drill the marked holes with a ø10mm drill. Insert the screw anchors into the drill holes. Align the upper holes of the connection plates between wall brackets of inverter and first battery to the lower rivets of the wall bracket of the inverter, secure the battery wall bracket to the wall with the provided screws (tool: SW8 socket wrench, torque: 10Nm).



4. Always hold the handles on both sides of the battery firmly and move it to the left, let the left hook of the battery passes through the opening of the battery wall bracket, carefully lift the battery backward and move it to the left limit.



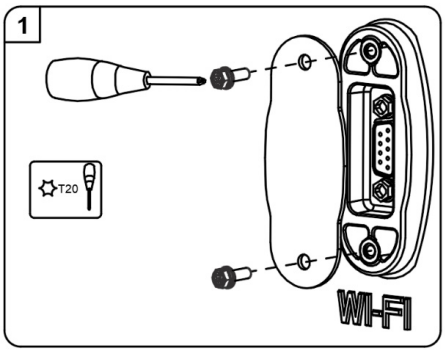
5. Secure the battery to its wall bracket and tighten them with two screws (tool: T20 screwdriver, torque: 2.5Nm).



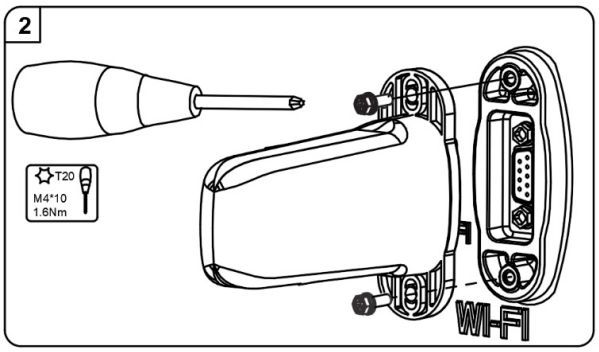
6. For mounting steps for additional batteries please see Section 5.6.1. Mounting the Battery with Wall Bracket.

5.6.7 Mounting the Wi-Fi Module

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



2. Tighten the Wi-Fi module onto the inverter with two M4x12mm screws provided (tool: T20 screwdriver, torque: 1.6Nm). DO NOT OVERTIGHTEN – or there may be damage to the plastic housing of the Wi-Fi module.



6.0 Electrical Connection

DANGER

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

DANGER

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

CAUTION

The cable colors shown in the electrical connection diagrams provided in this chapter are for reference only. Select cables in accordance with local cable specifications (green-and-yellow cables are only used for PE).

6.1 Cable Requirements (not included)

No.	Cable	Type	Conductor Cross Section Area Range	Outer Diameter
1	PV Power cable	Standard PV cable (subject to local regulations)	4 to 6mm²	5-8mm
2*	Signal cable	Standard network cable (recommended type: Cat5e, SFTP, UV-resistant for outdoor use)	0.12 to 0.2mm² (AWG26 to AWG24)	4-6mm
3**	Signal cable	Outdoor shielded twisted pair copper cable	0.5 to 1.3mm²	4-6mm
4	AC Power cable	Five-core (L1, L3, L3, N and PE) outdoor copper cable	4 to 6mm²	13 -17.5mm
5	PE cable	Single-core outdoor copper cable	4 to 6mm²	N/A

* For RS485, LAN, three-phase meter, DRM communication connection with inverter.

** For AUX communication connection with inverter.

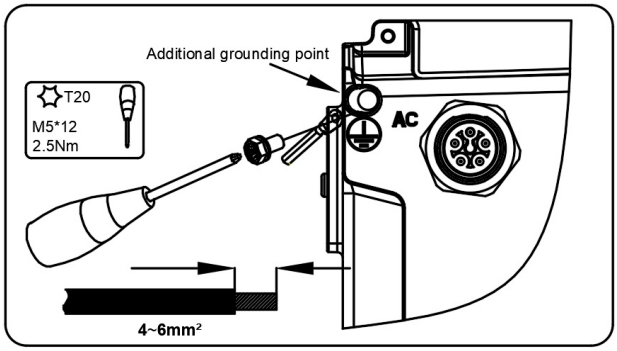
6.2 Grounding Connection

CAUTION

Electric Shock Hazard:

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

A grounding point is provided near the AC socket 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).



6.3 AC Connection

6.3.1 Requirements for the AC Connection

AC cable requirements as follows:

- Conductor type: copper wire (tinned copper preferred)
- Current carrying capacity depends on the inverter model selected and should be such that the AC cable can carry the full current of the AC supply and the Backup output:
  Example for 10kW inverter model
  AC Supply Max. current: 21.7A
  Backup Output Max. current: 21.7A
  Note: Account for temperature derating and voltage drop/rise when selecting wire diameters. 110°C or higher rated cable derates slower as temperatures increase.
- External diameter: typically 13 mm to 17.5 mm for grid connector and backup connector
- Grid and backup conductor cross-section recommendation: 4 to 6 mm²
- Insulation stripping length: 10 mm
- Sheath stripping length: 43 mm

DANGER

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

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

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

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

6.3.2 Select Suitable AC Circuit Breaker

The general requirements for the selection of circuit breakers are determined by standards and country specific provisions. 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.

Selecting Circuit Breakers for the AC supply and Backup output is dependent on the maximum current of the backup circuit and the inverter (if it is force-charged), the model of MCBs used and their derated current rating considering their maximum temperatures. Supplier Datasheets detail temperature derating for their MCBs. Ensure the MCBs used are appropriate for the current and the operating temperature, otherwise it increases the danger of the circuit breaker tripping under normal operating conditions.

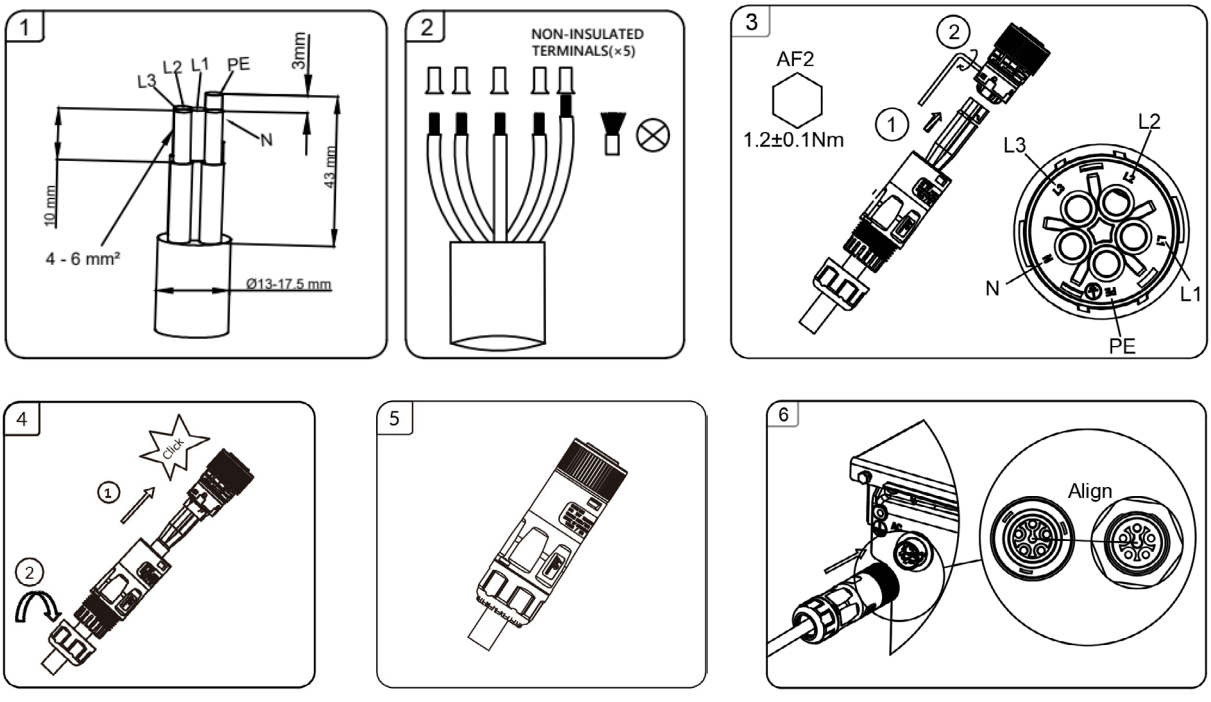
AC connection recommendation

Description	Rated Current	Breaker Type	Recommend cable cross section
Grid Side	21.7 A	32 A	4 to 6mm2
Backup Side	21.7 A	32 A	4 to 6mm2

6.3.3 Grid and Backup Connection

The steps for connecting the grid connector as follows:

1. Disconnect the PV switch, grid, backup and battery circuit breaker and secure them to prevent reconnection.
2. Strip the AC cable outer insulation by 43 mm.
3. Shorten L1, L2, L3 and N by 3 mm each, so that the grounding conductor is 3 mm longer. This ensures that the grounding conductor is the last to be pulled from the screw terminal in the event of tensile strain.
4. Strip the insulation of L1, L2, L3, N and the grounding conductor 10 mm.
5. If using fine stranded wire, fit L1, L2, L3, N and PE with bootlace ferrules.
6. Disassemble the grid plug connector, pass the swivel nut and threaded sleeve over the AC cable.
7. Insert the five conductors into the screw terminals on the bush insert and tighten the screws using the torque 1.2 Nm with provided tool. Ensure that all conductors are securely in place in the screw terminals on the bush insert.
8. Insert the threaded sleeve into the bush insert and hear the „click“ sound. Screw the swivel nut onto the threaded sleeve.
9. Plug the grid plug connector into the socket for the grid connection until it audibly snaps into place. When doing so, align the grid plug connector so that the convex rib on the bush insert on the grid plug connector should point to the groove on the grid connection socket first, then insert the grid plug connector to the grid connection socket.

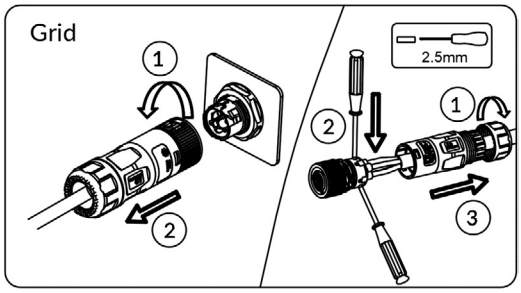


The steps for backup connection are similar as the grid connection, the difference is step 9 as follows:

Plug the backup plug connector into the socket for the backup connection until it audibly snaps into place. When doing so, align the backup plug connector so that the **groove** on the bush insert on the backup plug connector should point to the **convex rib** on the backup connection socket first, then insert the backup plug connector to the backup connection socket.

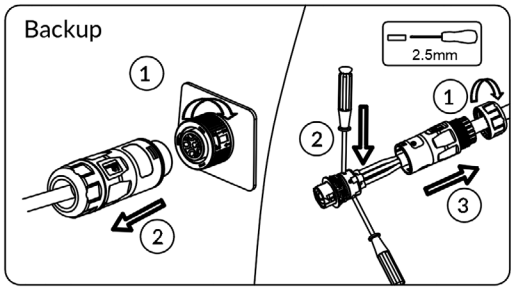
Disassemble the grid plug connector (e.g. due to faulty assembly), proceed as follows.

1. Unplug the grid plug connector. Rotate the bush insert of the grid plug connector anticlockwise, then pull the grid plug connector apart from the grid connection socket. Do not pull on the cable.
2. Unlock the grid plug connector. To do this, unscrew the swivel nut from the threaded sleeve, then insert a flat-blade screwdriver (blade width: 2.5 mm) into the side catch mechanism and pry the catch mechanism open. Carefully pull the bush insert apart.



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 clockwise, then pull the backup plug connector apart from the backup connection socket. Do not pull on the cable.
2. Unlock the backup plug connector. To do this, unscrew the swivel nut from the threaded sleeve, then insert a flat-blade screwdriver (blade width: 2.5 mm) into the side catch mechanism and pry the catch mechanism open. Carefully pull the bush insert apart.



6.3.4 Energy Meter Connection

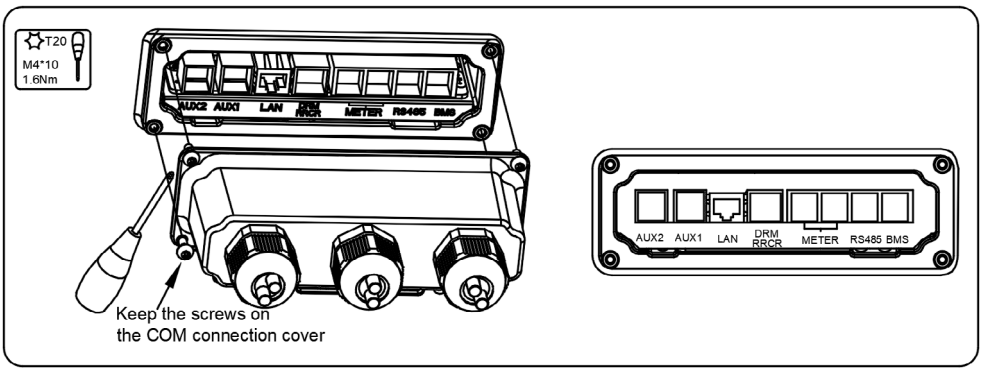
6.3.4.1 Energy Meter Rating

Item	Current	Scenarios
DTSU666-3*230V 100A/40mA	100 A	Three phase meter

6.3.4.2 Meter Wiring

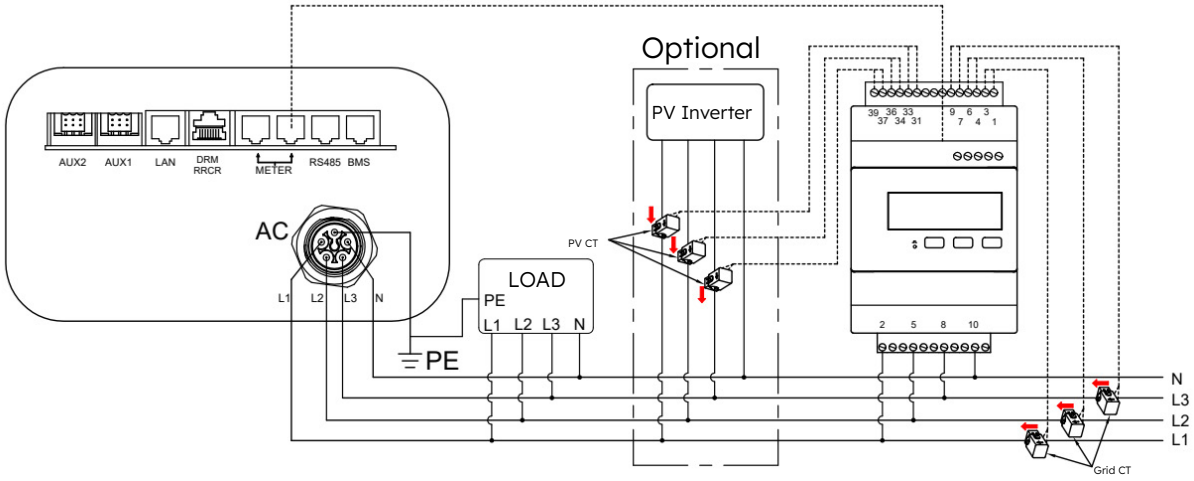
Meter Wiring Instructions:

1. Take out the meter, type: DTSU666-3*230V 100A/40mA.
2. Prepare the meter communication cable, its requirements: standard network cable (recommended type: Cat5e, SFTP, UV-resistant for outdoor use).
3. Loosen the strain relief nut of the cable gland on the COM connection cover of inverter, and unscrew the 4 screws on the corners, then you will see two meter communication ports with the same function.



4. Pass the meter cable through the cable gland of the COM connection cover but don't tighten the strain relief nut of the cable gland.
5. Insert the RJ45 plug into the communication port symbolled with " METER".
6. Perform the meter wiring according to the below wiring diagram as follows. The connections are marked clearly on the meter.

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



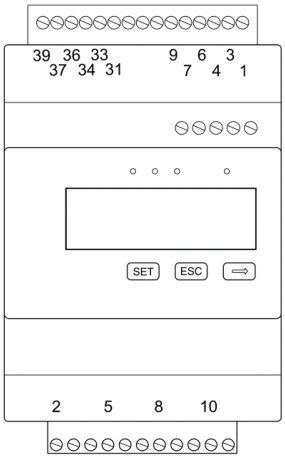
Wiring location description of the meter

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

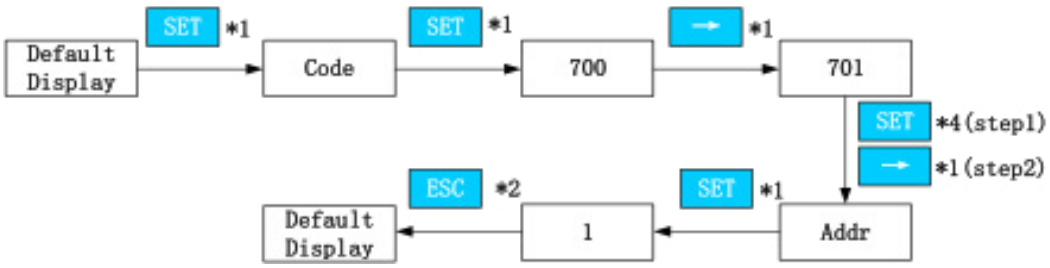
CT Group	Grid-> Load								PV->Load					
CT Phase	IA*	IA	IB*	IB	IC*	IC			IA*	IA	IB*	IB	IC*	IC
Terminal	1	3	4	6	7	9	X	X	31	33	34	36	37	39
Colour	White	Blue	White	Blue	White	Blue			White	Blue	White	Blue	White	Blue

6.3.4.3 Meter Configuration

3-phase meter setting instructions:



The default address is 1. The installer doesn't need to make any other settings. If installer wants to have a check, please follow the steps below.



CAUTION

Do not modify the "Meter CT Ratio".

6.4 PV Connection

DANGER

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

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

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

NOTICE

Destruction of the inverter due to overvoltage

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

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

NOTICE

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

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

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

NOTICE

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

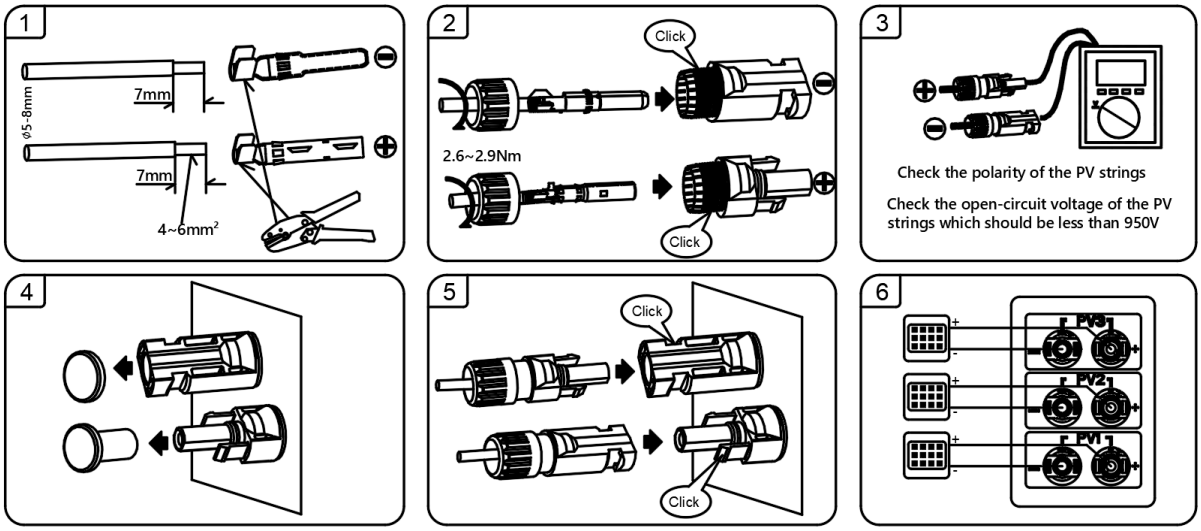
The inverter is only properly sealed when all unused PV inputs are closed with sealing plugs. Sand, dust and moisture penetration can damage the inverter and impair its functionality.

- Seal all unused PV inputs using sealing plugs.

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

- Make sure the open voltage of the PV strings will not exceed 950V. Violating this condition will void the warranty.
- Make sure the polarity of the PV connectors is correct.
- Ensure that the PV switch is off.
- Make sure PV output resistance to ground is higher than 200KOhms.

The inverter uses the MC4 PV connectors. Please follow the picture below to assemble the PV connectors. PV conductor cross section requirements: 4~6 mm2



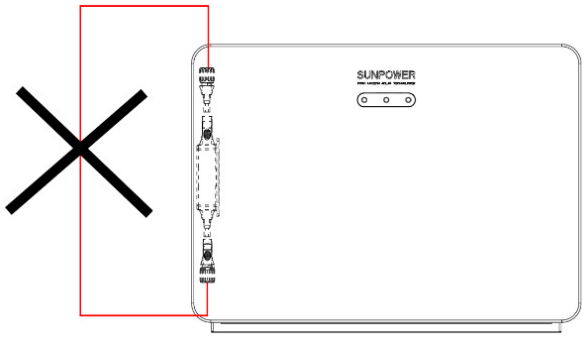
6.5 Electrical Connection between Batteries

DANGER

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

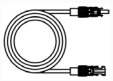
Short-circuit currents in the battery can cause heat build-up and electric arcs. Heat build-up and electric arcs may result in lethal injuries due to burns.

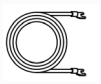
- Disconnect the battery from all voltages sources prior to performing any work on the battery.
- The upper connector of the lower battery is connected to the lower connector of the upper battery, otherwise the short-circuiting of the battery will occur.
- Observe battery safety information provided in the Safety and Installation Instructions.



There is a specific sequence for cables passing through the cable holes of the battery 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.

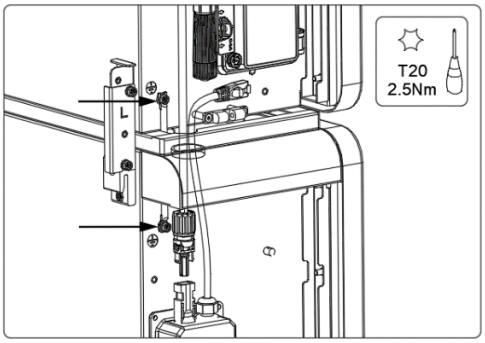
Please pay attention to the battery cable types

No.	Picture	Description
1		The 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. Loosen the M5 screws tightened at the grounding points.
2. Connect the grounding points of the adjacent batteries with M5 screws.

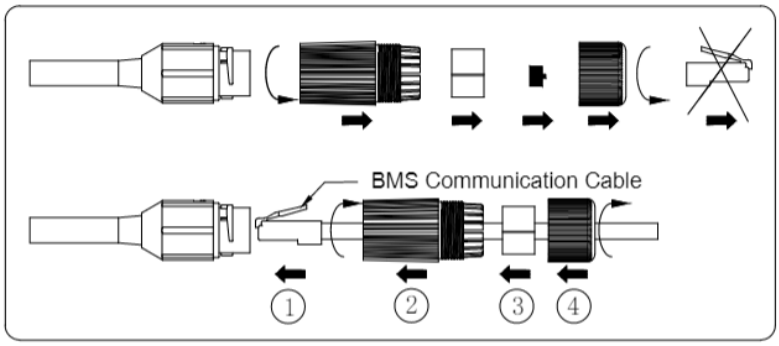


Instructions for power cables connection between the adjacent batteries:

1. Connect the upper power+ connector of the lower battery to the lower power- 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:

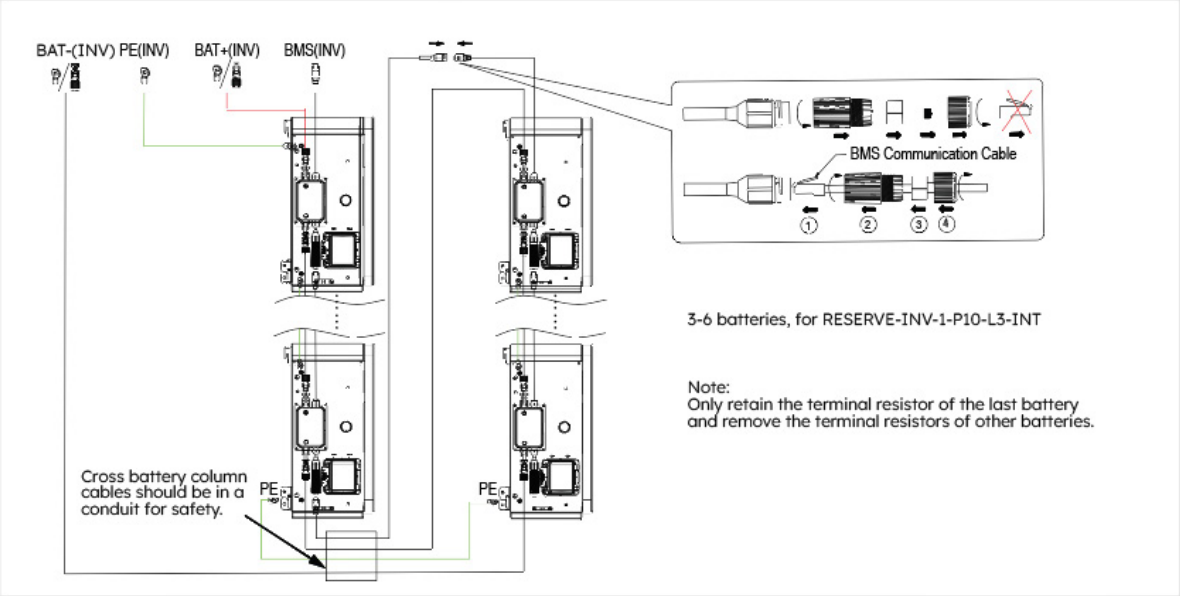
1. Pick up the communication connector located at the lower left of the battery, and disassemble it. Unscrew the swivel nut from the threaded sleeve, remove the sealing ring, rubber plug and terminal resistor. Retain the terminal resistor of the last battery.
2. Pass the swivel nut and threaded sleeve 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 battery and the top battery of the second column battery, refer to this Section and the system wiring diagram of next page for the detailed installation

6.6 Electrical Connection between the Inverter and RESERVE-BAT-1-DC-4-INT

Typical system wiring diagram for inverter and RESERVE-BAT-1-DC-4-INT batteries (Max. 6) as follows:



There is a specific sequence for cables passing through the cable holes of the battery left handes 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.

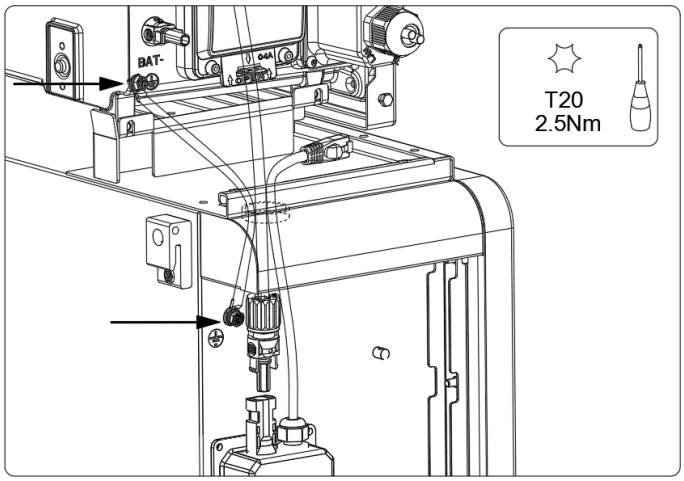
Please pay attention to the cable type, there is three kinds of cables.

No.	Picture	Description
1		Using the red power cable 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.

6.6.1 Grounding Connection between INV and first BAT

Grounding cable connection instructions:

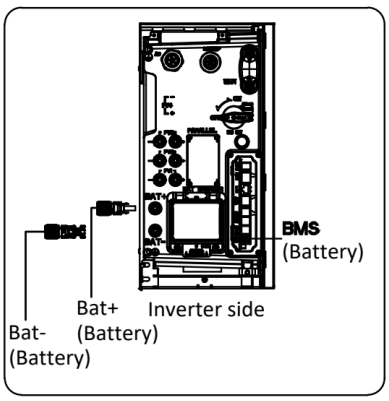
1. Loosen the M5 screws tightened at the grounding points.
2. Connect grounding point of the inverter and the grounding point of the first battery with two M5 screws (tool: T20 screwdriver, torque: 2.5Nm).



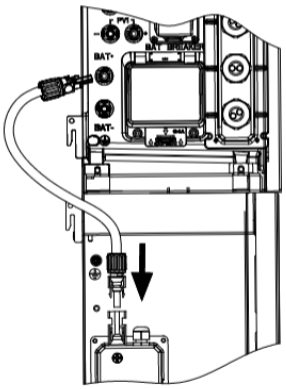
6.6.2 Power Connection between INV and BAT

Power cables connection between the inverter and batteries instructions:

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.



Inverter side

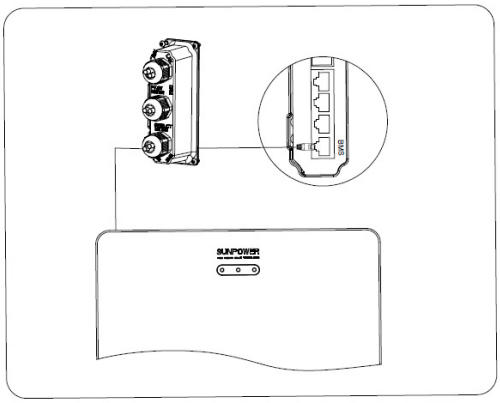


Positive connection between 1st BAT and INV

6.6.3 Communication Connection between INV and BAT

Communication cable connection between the inverter and battery instructions:

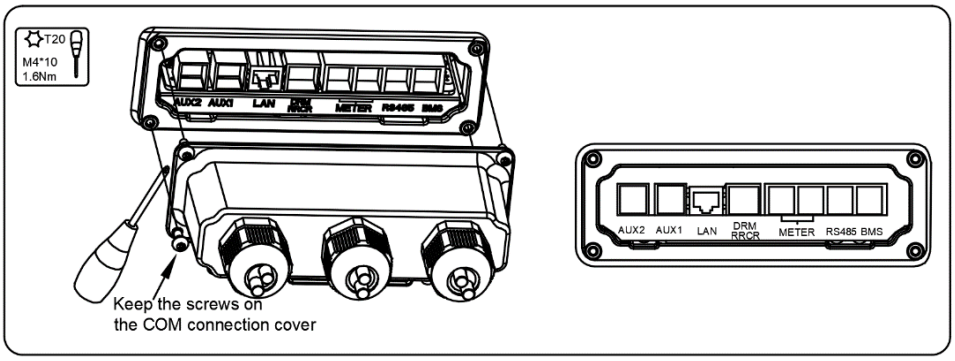
1. Pass the battery communication cable of the first battery through the cable gland of the COM connection cover of inverter. Do not tighten the strain relief nut of the cable gland.
2. Insert the RJ45 plug to the BMS communication port of the inverter.



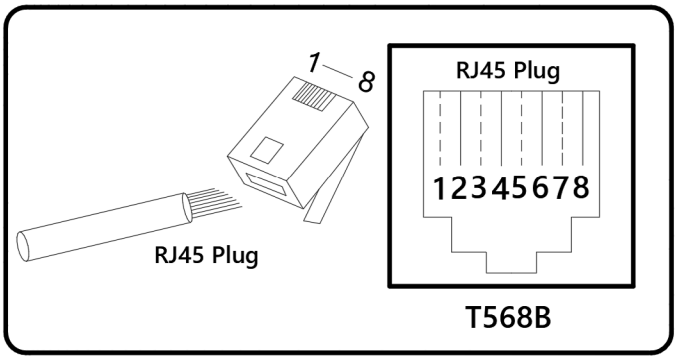
6.7 Other Communication Connection with Inverter

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

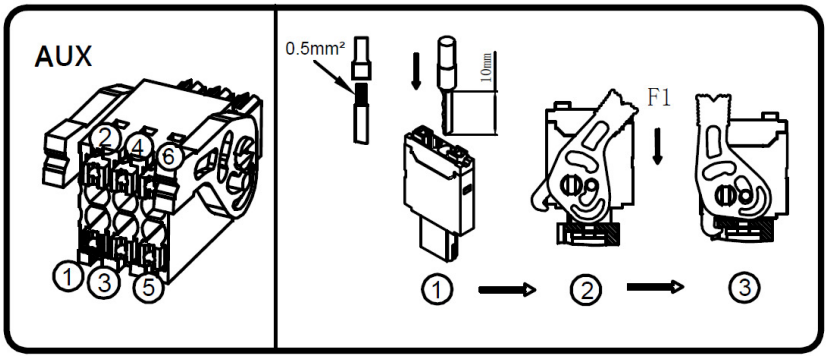
1. Loosen the cable glands on the COM connection cover of the inverter, and then unscrew the 4 screws on the COM connection cover.



2. Pass the communication cables through the cable glands of the COM connection cover. Do not tighten the strain relief nuts of the cable glands yet.
   Insert the RJ45 plugs to the relative RJ45 sockets.



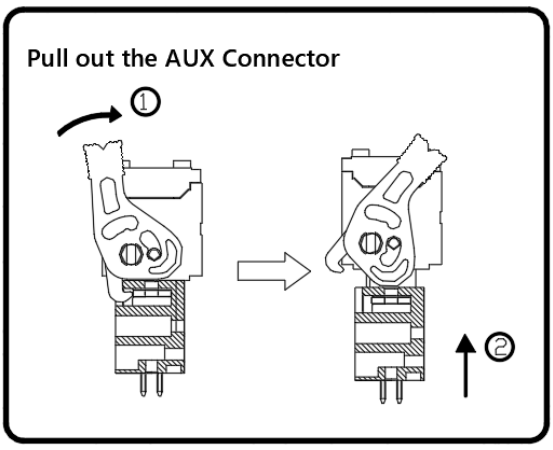
3. For meter wiring, refer to Section 6.3.4.1
4. If DRM support is specified, the system may only be used in conjunction with a Demand Response Enabling Device (DRED). This ensures that the system implements the commands from the grid operator for active power limitation at all times. The system and the Demand Response Enabling Device (DRED) must be connected in the same network. Only DRM0 is available for RESERVE inverter.
5. Take out 1 pc 6 pin terminal block for AUX connection. For AUX position definition, please refer to the AUX wiring documentation.



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

AUX cable requirements: outdoor shielded copper cable (flexible), recommended conductor cross-section 0.5mm2, conductor ends should be fitted with bootlace ferrules.

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



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

The pin definition of the communication ports:

Port	Pin Numbers							
BMS	1	2	3	4	5	6	7	8
	/	RS485_A4	/	CAN1_H	CAN1_L	/	RS485_B4	/
RS485	1	2	3	4	5	6	7	8
	12 V	DEBUG_RXD_COM	GND	RS485_B5	RS485_B5	/	DEBUG_TXD_COM	/
METER	1	2	3	4	5	6	7	8
	/	/	RS485_A7	/	/	RS485_B7	/	/
DRM	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	/	/
RRCR	1	2	3	4	5	6		
	K1	K2	K3	K4	3.3V	/		
AUX1	1	2	3	4	5	6		
	DO1_NO	DO1_COM	DO1_NC	DI_negative	DI_positive	GND		
AUX2	1	2	3	4	5	6		
	DO2_NO	DO2_COM	DO2_NC	DI_negative	DI_positive	GND		

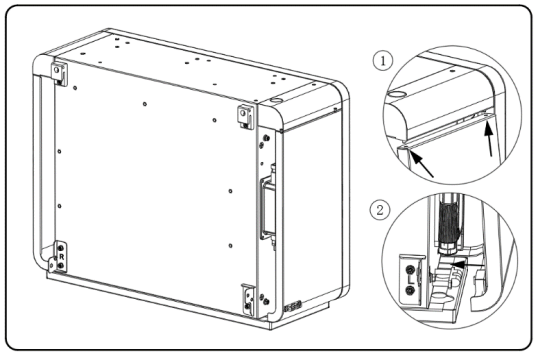
6.8 Mounting Covers of the Inverter and Battery

Make sure all the wiring is secure and the system is working normally and then mount the covers of the inverter and the battery.

6.8.1 Mounting the Side Plates of Battery

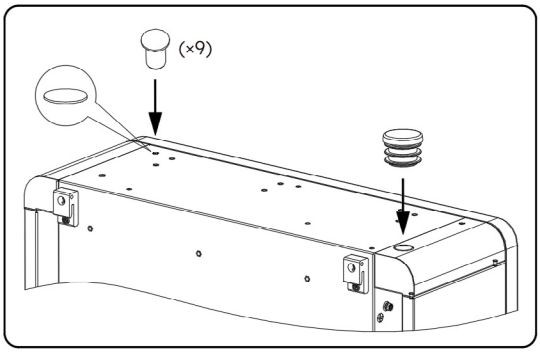
Mounting the side plates of battery

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



6.8.2 Mounting the Silicone Stopper and Plastic Buckle on 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.



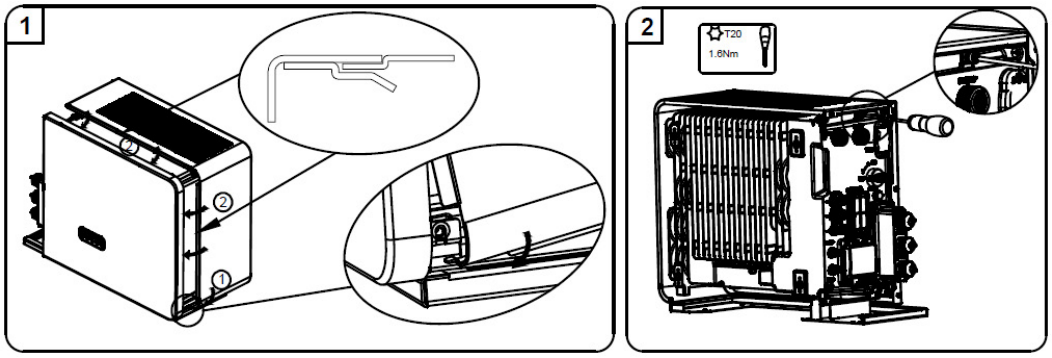
6.8.3 Mounting the Covers of the Inverter

TIP

The serial number ana 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.

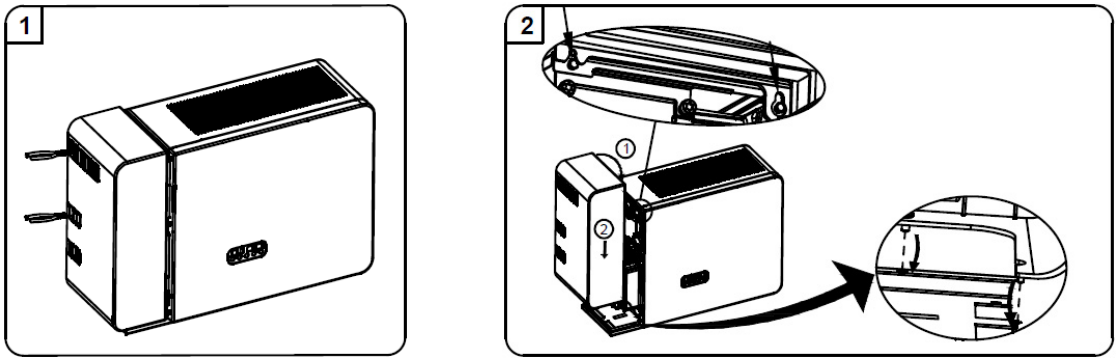
Attach the side cover to the inverter.

1. Take out the side cover.
2. Insert the lower right edge of the side cover to the slot on the inverter base, push the front edge of the side cover towards the edge of the inverter front cover till the two side screws on the side cover align with the inverter mounting threaded holes, secure them (tool: T20 screwdriver, torque: 1.6Nm).



Attach the cable cover to the inverter.

1. Take out the cable cover.
2. Place the cable cover against the inverter left side. Cut cable holes based on the PV and AC cabling routing, and route the cables through the cable holes.
3. Align the holes on the right side of the cable cover to the hooks on the left side of the inverter front cover, push the cable cover along the edge of the front cover downwards.



7.0 Startup and Shutdown Procedure

7.1 Startup Procedure

1. Switch ON the BATTERY SYSTEM ISOLATOR which is at the lower left of the inverter.
2. Switch ON the BATTERY CIRCUIT BREAKERS of all batteries which are at the lower left of the batteries.
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 on the left side of the inverter immediately below the Wi-Fi port, if PV arrays are connected to inverter directly.
7. Switch ON the AC breaker (if there is any) between the PV inverter and the grid.

7.2 Shutdown Procedure

DANGER

After the energy storage system is powered off, the remaining charge 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.

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 on the left side of the inverter, immediately below the Wi-Fi port, if PV arrays are connected to inverter directly.
5. Switch OFF the BATTERY CIRCUIT BREAKERS of all batteries which are at the lower left of the batteries.
6. Switch OFF the BATTERY SYSTEM ISOLATOR which is at the lower left of the inverter.
7. Switch OFF the AC GRID SUPPLY to the inverter.
8. Switch OFF the AC breaker (if there is any) between the PV inverter and the grid.

7.3 Checks before start-up

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

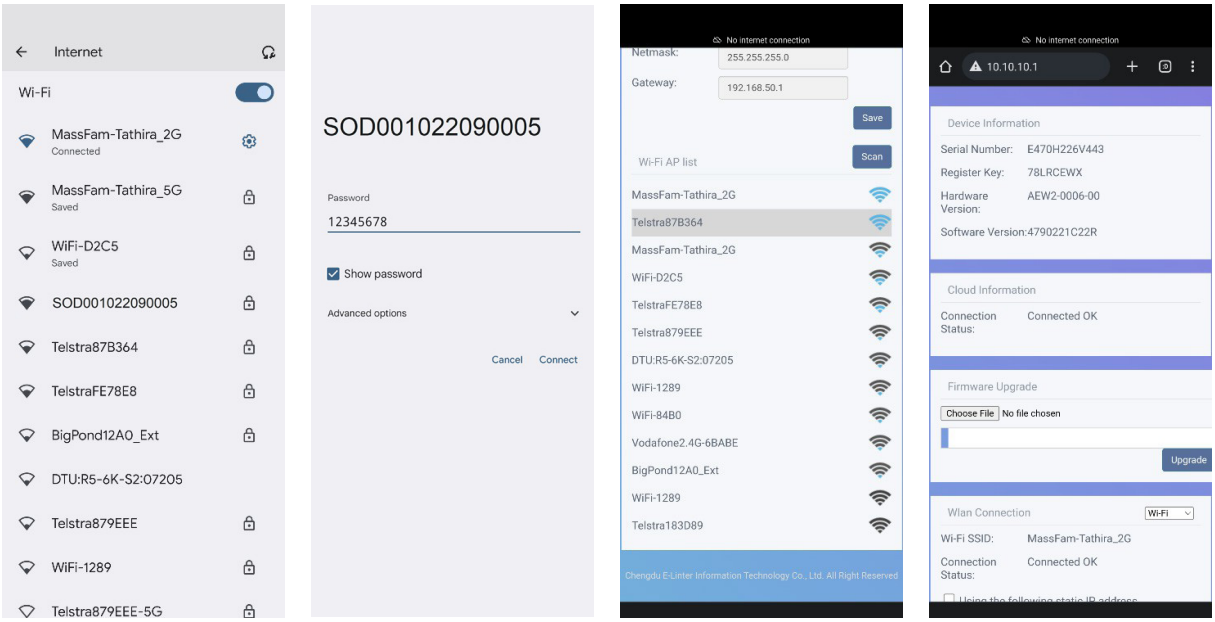
8.0 Set up a new System (Commissioning)

8.1 Connect Reserve to internet

To initiate the commissioning process for the recently installed SunPower Reserve, it is essential to establish a functional data connection which is also required for ongoing monitoring. The SunPower Reserve offers two methods of data connection: 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 by the Serial Number of the unit.
2. Connect to the Reserve unit network using the default password: 12345678.
3. Once connected, launch your 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. Tap 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 confirmation message stating ‚Connected OK.‘



By following these instructions, the SunPower Reserve can be effectively connected and configured for operation.

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.

8.2 Download and Install the SunPower One app

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

TIP

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

8.3 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.

8.4 Commissioning SunPower Reserve

Before commencing, ensure that the Reserve system is correctly installed and has a functional data 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 SunPower One username (email) and password.
2. On the home screen, tap „start“ to 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.

CAUTION

The safety standard/country code 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.

TIP

In step 4 of commission process, available parameters changes depending on configuration selected. It is important to check correct values are interested at this stage.

8.5 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.

CAUTION

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).

8.6 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.

TIP

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

9.0 Maintenance and Troubleshooting

9.1 Routine Maintenance

Normally, the energy storage system needs no maintenance or calibration.
However, in order to maintain the accuracy of the SOC, it is recommended the battery reach a full state of charge every two weeks otherwise the SOC can become inaccurate.
Before cleaning, ensure that the system is disconnected from all power sources. Clean the housing, cover and display panel with a soft cloth.
To ensure that the energy storage system can operate properly in the long term, it is advised to perform routine maintenance as described in this Section.

Maintenance checklist

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

CAUTION

Risk of burns due to hot enclosure of the inverter

The enclosure of the inverter can get hot during operation.

- Do not touch any parts other than the display panel during operation.
- Wait approximately 30 minutes for the inverter to cool down before cleaning.

9.2 Troubleshooting

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

9.2.1 Inverter Error Troubleshooting

The error codes can be accessed from SunPower Installer portal.

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, PV2 and PV3 exceeds 1000 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 1000 VDC, reduce the number of PV modules.
100021	MPPT2_OVP	Check the PV2 voltage. If it exceeds 1000 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_lost	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	1. Use a multimeter to test the impedance of the off grid output. If it is small, check whether the wiring is correct. 2. Restart the inverter to see if the fault still exists. If the issue 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	BMS lost 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 service center for further check. service center for further check.
60002	Circuit_Breaker_ Open	Try to switch on all batteries breakers, If the action cannot solve the problem, please contact customer service.

60004	Slave_Battery_ Communication_ Lost	Check the communication cables between batteries
60006	Master_Battery_ Communication_ Lost	
60008	Multi_Master_ error	
5	Energy meter reading lost-grid side	Grid side meter lost 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 service center for further check.
6	Energy meter reading lost-PV side	PV inverter side meter lost 1. Check whether the system configuration parameters are correct and whether 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 service center for further check.

9.2.2 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		1. Inverter lost
SYS red light is ON; METER light flashing quickly if Grid meter lost. SYS red light is ON;	5		Grid meter lost
METER light flashing slowly if PV meter lost; METER light is OFF if all meters lost;	6		PV meter lost
SYS red light is ON, bat is off	7		1. 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
	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

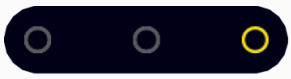
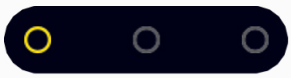
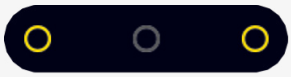
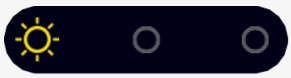
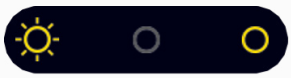
1. The four LEDs in the first row are system (SYS), battery (BAT), meter (METER), and communication (COM);
2. The five LEDs in the second row are divided into two functions:

- Battery SOC power display
- When a fault occurs, the corresponding fault code will be displayed.

9.2.3 Battery Protection Description

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

Symbol	Description
	Flashing yellow LED
	On yellow LED
	Off LED

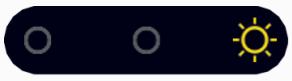
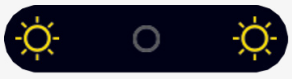
LED Display State	Description	Troubleshooting
	Temperature difference	Wait for automatic recovery. If this protection state persists, please call service.
	High temperature	Stop discharging and charging until this protection state disappears and wait for the temperature to drop.
	Low temperature discharge	Stop discharging until this protection state disappears and wait for the temperature to rise
	Over-current charge	Wait for automatic recovery. If this protection state hasn't be solved, please call service.
	Over-current discharge	
	Cell overvoltage	Wait for automatic recovery. If this protection state persists for a long time, please call service.
	Cell under voltage	Stop discharging and call service immediately
	Low temperature charge	Stop discharging until this display state is eliminated and wait for the temperature to rise.

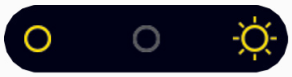
NOTICE	During work mode, if the protection status “Cell under voltage”  appears, please take the following action: first switch off the circuit breaker which is located at the lower left of the battery, switch on the circuit breaker and wait for 3~5S, switch off the circuit breaker, then switch on the circuit breaker and wait for 3~5S, switch off the circuit breaker, at last switch on the circuit breaker of the battery. The BMS will be forced to turn on the MOSFET of discharge so that the inverter can detect the battery’s open voltage and begin charging the battery.

9.2.4 Battery Error Description

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

Symbol	Description
	Flashing yellow LED
	On yellow LED
	Off LED

LED Display State	Description	Troubleshooting
	Hardware error	Wait for automatic recovery. If this error persists, please call service.
	Hardware error	
	Circuit breaker open	Switch on circuit breaker after powering off the battery.
	LMU disconnect (follower)	Reconnect the BMS communication cable.
	SN missing	Please call service.
	LMU disconnect (host)	Reconnect the BMS communication cable.
	Software version inconsistent	Please call service..
	Multi host	Restart all batteries.

	MOS over temperature	Power off the battery and power on the battery after 30 minutes.
	Insulation fault	Restart battery. In case this error persists, please call service.
	Total voltage fault	Restart battery. In case this error persists, please call service.
	Precharge failure	Restart battery. In case this error persists, please call service.

10.0 Uninstallation & Return

10.1 Removing the Product

To decommission the energy storage system completely upon completion of its service life, proceed as described in this Section, detailed procedure as follows.

1. Power OFF the energy storage system by following instructions in Chapter 7.2 Shutdown procedure of the System.
2. Remove the cable cover of the inverter.
   Remove the left side plates of the batteries
3. Wait 30 minutes for the enclosure of the inverter to cool down
4. Disconnect all cables from the system, including communication cables, PV power cables, battery power cables, AC cables, and PE cables.
5. Remove the Wi-Fi Module.
6. Remove the side cover of the inverter.
7. Remove the inverter from the top of the battery.
8. Remove the right side plates of the batteries.
9. Remove the batteries.
10. If the batteries have been mounted with system base unit,
    remove the wall connection plate of battery.
    remove the wall connection plate of system base unit.
    remove the system base unit.
11. Remove the wall brackets of the batteries if there is any.

10.2 Packing the Product

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

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

10.3 Disposing 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.

11.0 Technical Data

11.1 Datasheet of Inverter

Item	RESERVE-INV-1-P10-L3-INT
Input DC (PV side)	
Recommended max. PV power	20000 W
Max. PV input voltage	1000 V
Rated voltage	720 V
Start-up voltage	120 V
MPPT voltage range	140 to 950 V
Max. input current per MPPT	16 A / 16 A / 16 A
Max. short circuit current per MPPT	24 A / 24 A / 24 A
MPPT number	3
Surge category in accordance with IEC 62109-1	II
Battery	
Battery type	LFP (LiFePO4)
Battery voltage range	160 to 700 V
Max. charge power	10 kW
Max. discharge power	10 kW
Max. charge/ discharge current	40 A / 40 A
Communication	CAN
Output AC (Back-up, On Grid)	
Rated output power	10 kW
Rated apparent output power	10 kVA
Rated output current @ 230 V	14.5 A
Max. continuous output power	15 kW
Max. continuous output apparent power	15 kVA

Max. output current	21.7 A
Nominal output voltage	3L/N/PE, 380/400V
Rated frequency	50/60 Hz
Output AC (Back-up)	
Rated output power	10 kW
Rated apparent output power	10 kVA
Rated output current @ 230 V	14.5 A
Max. continuous output power	11 kW
Max. continuous output apparent power	11 kVA
Output power ≤ 30 s	15 kW
Output apparent power ≤ 30 s	15 kVA
Back-up switch time	<20 ms
Rated voltage	3L/N/PE, 380/400V
Rated frequency	50/60 Hz
Input AC (Grid side)	
Nominal output voltage	3L/N/PE, 380/400V
Rated grid frequency	50/60 Hz
Rated input power	10 kW
Max. input power	15 kW
Max. input current	21.7 A
Output AC (Grid side)	
Rated output power	10 kW
Rated apparent output power	10 kVA
Rated output current @ 230 V	14.5 A
Operation phase	Three phase
Nominal grid voltage	3L/N/PE, 380/400V
AC voltage range	150 to 288 V
Rated grid frequency	50 / 60 Hz

Power factor	>0.99 (0.8 leading to 0.8 lagging)
Protection class	I
Overvoltage category	III
Surge category in accordance with IEC 60664-1	II
Efficiency	
Max. efficiency, η_{max}	98.0%
European weighted efficiency, η_{EU}	97.2%
Protection	
Anti-Islanding protection	Integrated
Insulation resistor detection	Integrated
Residual current monitoring unit	Integrated
Output over current protection	Integrated
Output short protection	Integrated
Output overvoltage protection	Integrated
PV reverse polarity protection	Integrated
PV overvoltage protection	Integrated
PV switch	Integrated
Battery breaker	Integrated
General data	
Dimensions (W*H*D)	610*416*212.5 mm
Weight	29 kg
Topology	Transformer less
Operation temperature range	-25°C to +60°C
Max. permissible value for relative humidity (condensing)	100%
Ingress protection	IP65
Display	LED
Noise emission	<30 dB(A) @1m

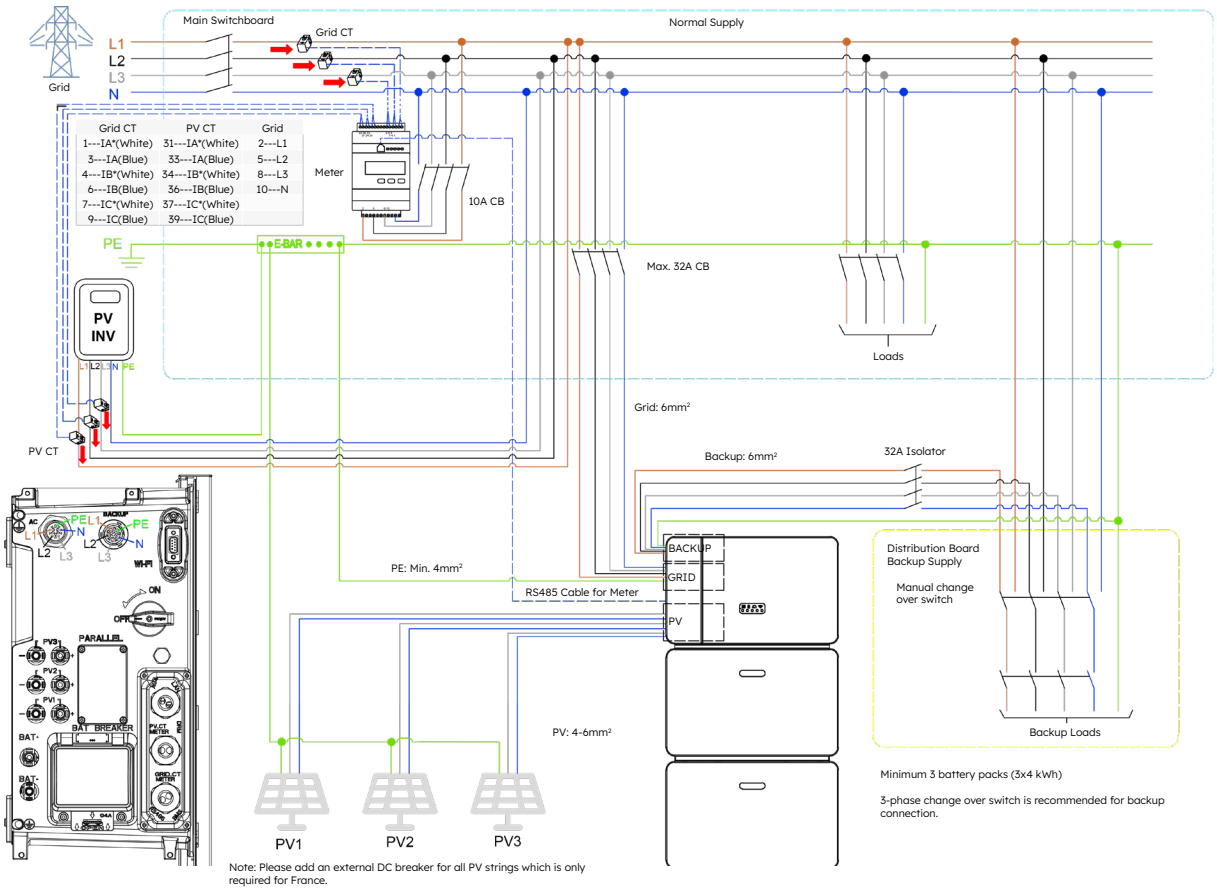
Cooling concept	Natural convection
Max. operating altitude above MSL	3000 m
Features	
PV connection	MC4 connectors
Grid connection	Plug in connector
Backup connection	Plug in connector
BAT connection	Amphenol H4 connectors
Communication	LAN, Wi-Fi, RS485

11.2 Datasheet of Battery

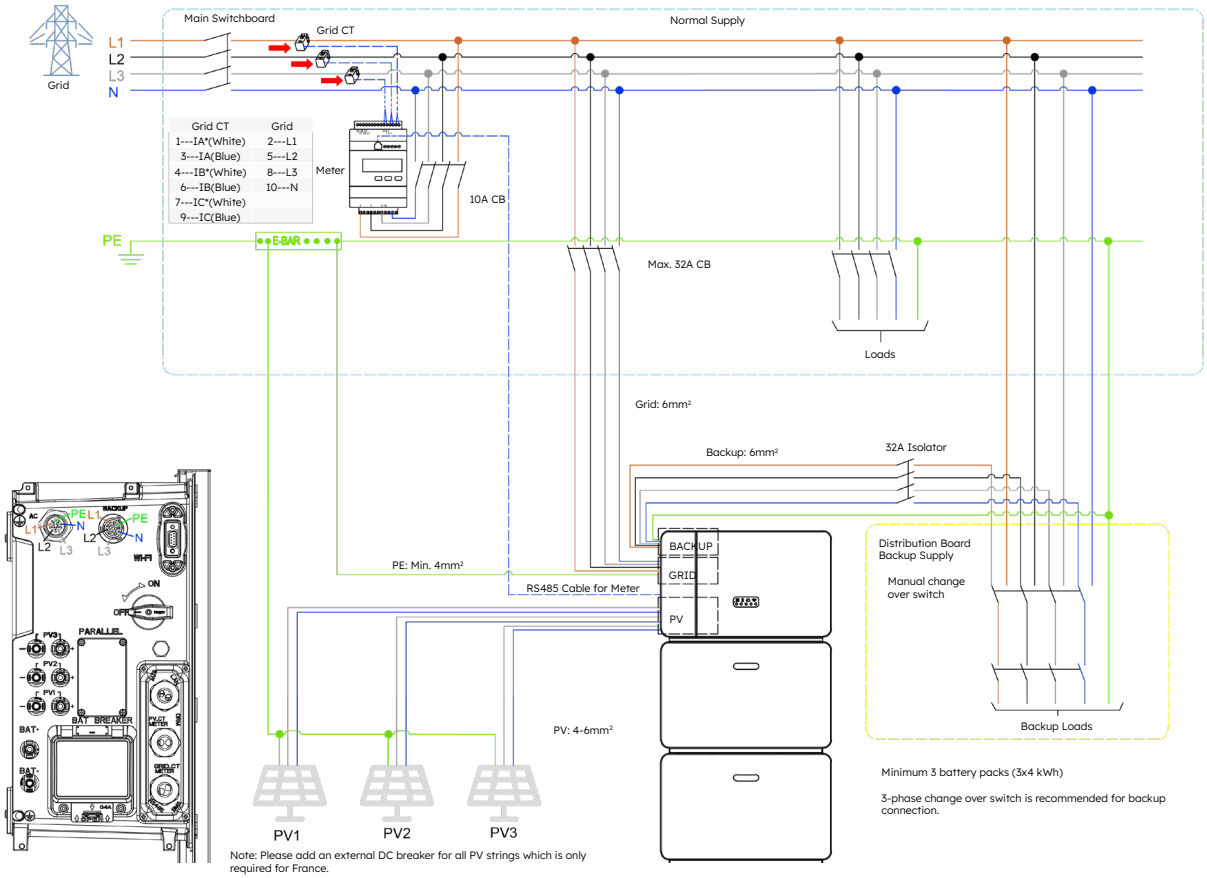
Item	RESERVE-BAT-1-DC-4-INT
General Data	
Battery type	LFP (LiFePO4)
Weight	44 kg
Dimension (W*H*D)	610*451*212.5 mm
Ingress protection	IP65
Installed energy	4.0 kWh
Usable energy	3.8 kWh
DoD	95%
Nominal voltage	96 V
Operating voltage range	90 to 108 V
Max. charge current*	42 A
Max. discharge current*	42 A
Operating temperature range	Charge : 0°C<T≤50°C Discharge : -10°C<T≤50°C
Monitoring parameters	System voltage, current, cell voltage, cell temperature
BMS communication	CAN
System	
Safety	IEC62619 / IEC63056 / IEC62040
Transportation	UN38.3

12.0 Appendix 1: System Wiring Diagram

12.1 3-phase Reserve including change over switch, hybrid coupled with 3-phase PV inverter and energy meter (EU)



12.2 3-phase Reserve, DC coupled and Energy meter (EU)



13.0 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/NZW 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
France	EN50549	France
Austria	TOR25	Austria