



# SE1-SPT User Manual 3.0kW - 7.0kW



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# 1 Notes on this Manual

## 1.1 Scope of Validity

This manual is an integral part of SE1-SPT, It describes the assembly, installation, commissioning, maintenance and failure of the product. Please read it carefully before operating.

SE1-SPT-3K	SE1-SPT-3.6K	SE1-SPT-6K	SE1-SPT-7K
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Note: “SE1-SPT Series refers to the energy storage inverter that supports photovoltaic grid-connected.

“3k” means 3.0kW.


Keep this manual available at any time.


## 1.2 Target Group


This manual is for qualified electricians. The tasks described in this manual only can be performed by qualified electricians.


## 1.3 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

	<p><b>Danger!</b></p> <p>“Danger” refers to a dangerous situation that, if not avoided, will result in a high level of risk such as serious injury or even death.</p>
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	<p><b>Warning!</b></p> <p>“Warning” indicates a hazardous situation which, if not avoided, could result in serious injury or death.</p>
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	<p><b>Caution!</b></p> <p>“Caution” indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</p>
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	<p><b>Notice!</b></p> <p>“Notice” provides tips that are valuable for the optimal operation of our product.</p>
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### 1.3.1 Important Safety Instructions

#### Danger!



#### Danger to life due to high voltages in the inverter!

The personnel responsible for the installation, electrical connection, debugging, maintenance and fault handling operation of this product need to be trained, master the correct operation method, have the corresponding electrician qualification and safety operation knowledge.

#### Caution!



When the inverter is working, it is strictly forbidden to touch the shell. The temperature of the shell can be high and there is a risk of scalding.

#### Caution!



#### Radiation may be harmful to health!

Do not stay for a long time and keep at least 20 cm away from the inverter.

#### Notice!



#### Ground PV system.

Finish PV modules and photovoltaic system grounding in accordance with local requirements to achieve optimal protection of systems and personnel.

#### Warning!



Ensure that the input DC voltage is below the inverter limit. Excessive DC voltage and current may cause permanent damage or other losses to the inverter, which is not covered by the warranty.



#### Warning!

Authorized service personnel must disconnect the AC and DC power supply of the inverter before performing any maintenance, cleaning or operation of any circuit connected to the inverter.



#### Warning!

The inverter can not be operated when it is running.



#### Warning!

Risk of electric shock!

Strictly follow relevant safety specifications for product installation and testing. During installation, operation or maintenance, please read carefully and follow the instructions and precautions on the inverter or user manual. If the operation is incorrect, it may cause personal and property losses. Please keep the user manual properly after use.

This inverter can only use the accessories sold and recommended by Solarever, otherwise it may cause fire, electric shock or casualties. Without the authorization of our company, you may not open the inverter cover or replace the inverter parts, otherwise the warranty promise of the inverter will be invalid.

The use and operation of the inverter must be carried out in accordance with the instructions in this manual, otherwise this protection will fail and the warranty of the inverter will also fail. During working, the inverter surface temperature may exceed 60°C, please make sure the inverter cools down before touching, and make sure children can not touch.

When exposed to sunlight, photovoltaic arrays generate dangerous high DC voltages. Please follow our instructions, otherwise it will be life-threatening.

All DC and AC power sources must be disconnected from the inverter for at least 5 minutes before any wiring or electrical operation is performed on the inverter to ensure complete isolation of the inverter and avoid electric shock.

A photovoltaic module used on the inverter must have a IEC61730A rating, and the total open circuit voltage of the photovoltaic string / array is lower than the maximum rated DC input voltage of the inverter. Any damage caused by photovoltaic over voltage is not covered by warranty.

Installation position should be away from wet environment and corrosive substances.

After the inverter and power grid cut off the PV power supply, there will be a certain amount of residual current in a short time, be cautious or it may lead to serious personal injury and even high risk of death. Use a multimeter (impedance at least 1 M $\Omega$ ) to measure the voltage between the UDC + and the UDC- to ensure that the inverter port is discharged below the safe voltage before starting operation (35 VDC).

#### ➤ Surge protection devices (SPDs) for PV installation



Warning!

Over-voltage protection with surge arresters should be provided when the PV power system is installed. The grid connected inverter is fitted with SPDs in both PV input side and MAINS side.

Direct or indirect lightning strikes can cause failures. Surge is the main cause of lightning damage to most devices. Surge voltage may occur at photovoltaic input or AC output, especially in remote mountain areas where long distance cable is supplied.

Please consult professionals before installing SPDs.

The external lightning protection device can reduce the influence of direct lightning strike, and the lightning protection device can release surge current to the earth.

If the building installed with external light protection device is far away from the inverter location, in order to protect the inverter from electrical and mechanical damage, the inverter should also install an external lightning protection equipment.

In order to protect DC system, two-stage surge protection equipment is needed between DC cable of inverter and photovoltaic equipment module.

In order to protect the AC system, the level 2 surge protection equipment should be installed at the AC output, located between the inverter and the grid. Installation requirements must comply with IEC61643-21 standard.

All DC cables shall be installed in a distance as short as possible, and the positive and negative cables of the same input need to be bundled together to avoid causing loops in the system. Minimum distance installation and binding requirements also apply to auxiliary grounding and shielding grounding conductors.

### ➤ Anti-Islanding Effect

The islanding effect means that when the power grid is cut off, the grid-connected power generation system fails to detect the power outage and still supplies power to the power grid. This is very dangerous for the maintenance personnel and the power grid on the transmission line.

SE1-SPT series inverters use active frequency offset method to prevent islanding effect.

### ➤ PE Connection and Leakage Current

• All inverter's incorporate a certified internal Residual Current Monitoring (RCM) in order to protect against possible electrocution and fire hazard in case of a malfunction in the PV array, cables or inverter. There are 2 trip thresholds for the RCM as required for certification (IEC 62109-2:2011). The default value for electrocution protection is 30mA, and for slow rising current is 300mA.



#### **Warning!**

High leakage Current!  
Earth connection essential before connecting supply.

- A faulty ground connection can result in equipment failure, personal and death injuries, and electromagnetic interference.
- Ensure correct according to grounding to IEC62109 and conductor diameter according to STANDARD specification.
- Do not connect the grounding end of the equipment in series to prevent multi-point grounding.
- Electrical appliances must be installed in accordance with the wiring rules of each country.

For United Kingdom

- The installation that connects the equipment to the supply terminals shall comply with the requirements of BS 7671.
- Electrical installation of PV system shall comply with requirements of BS 7671 and IEC 60364-7-712.
- All protective devices cannot be changed.
- User shall ensure that equipment is so installed, designed and operated to maintain at all times compliance with the requirements of ESQCR22(1)(a).

### ➤ Battery Safety Instructions




Solarever SE1-SPT Series inverter should pair with high voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to section 3.3.

Please refer to the matching battery specification for details.







### 1.3.2 Explanation of Symbols








This section gives an explanation of all the symbols shown on the inverter and on the type label.

• Symbols on the Inverter

Symbol Explanation	Explanation
	Operating Display
	Battery status
	An error has occurred, please inform your installer immediately

• Symbols on the Type Label

Symbols	Explanation
	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	UKCA mark. The inverter complies with the requirements of the applicable UKCA guidelines.
	UKNI mark. The inverter complies with the requirements of the applicable UKNI guidelines.
	TUV certified.
	RCM remark.
	ETL certification.

	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.
	Danger of high voltages. Danger to life due to high voltages in the inverter!
	Danger. Risk of electric shock!
	Observe enclosed documentation.
	The inverter can not be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	Do not operate this inverter until it is isolated from battery, mains and on-site PV generation suppliers.
	Danger to life due to high voltage. There is residual voltage existing in the inverter after powering off, which needs 5 min to discharge. Wait 5 min before you open the upper lid or the DC lid.

### 1.3.3 EC Directives

This chapter describes the requirements of the European low voltage regulations, including safety instructions and system licensing conditions, the user must comply with these regulations when installing, operating, and maintaining the inverter, otherwise it will cause personal injury or death, and the inverter will cause damage.

Please read the manual carefully when operating the inverter. If you do not understand "danger", "warning", "caution" and the description in the manual, please contact the manufacturer or service agent before installing and operating the inverter.

Grid-connected inverter comply with low voltage directive (LVD) 2014/35/EU and Electromagnetic compatibility directive (EMC) 2014/30/EU. Detection of components is based on:  
 UL 1741;  
 IEC 62109-1(ed.1);  
 IEC 62109-2(ed.1);  
 EN 61000-6-3:2007+A:2011;  
 EN 61000-6-1:2007;  
 EN 61000-6-2:2005;

For installation in photovoltaic module system, it is necessary to make sure that the whole system complies with the requirements of EC(2014/35/EU, 2014/30/EU, etc.) before starting the module (i.e. to start the operation). The assembly shall be installed in accordance with the statutory wiring rules. Install and configure the system in accordance with safety rules, including the use of specified wiring methods. The installation of the system can only be done by professional assemblers who are familiar with safety requirements and EMC. The assembler shall ensure that the system complies with the relevant national laws.

The individual subassembly of the system shall be interconnected by means of the wiring methods outlined in national/international such as the national electric code (NFPA) No. 70 or VDE regulation 0107.

## 2 Introduction

### 2.1 Basic Features

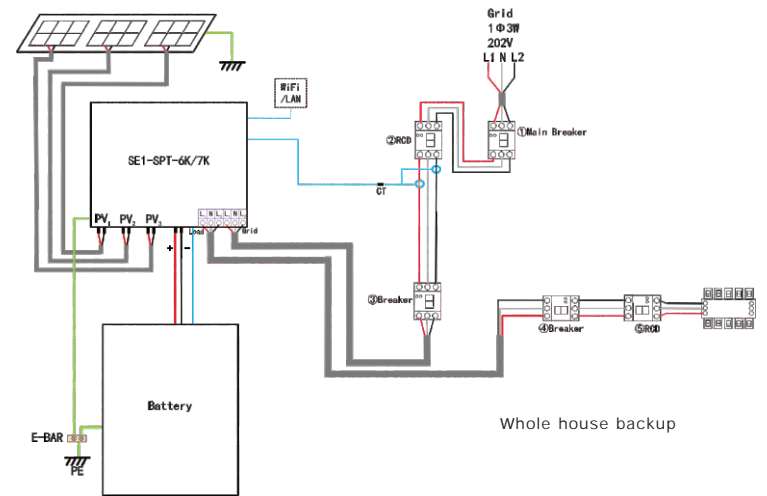
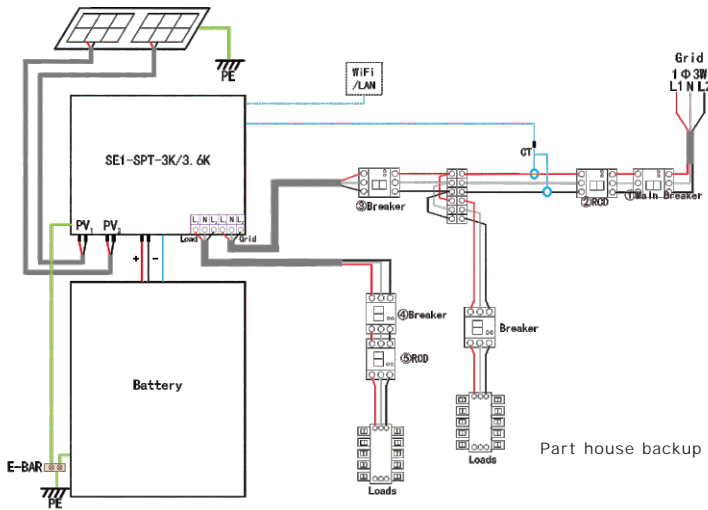
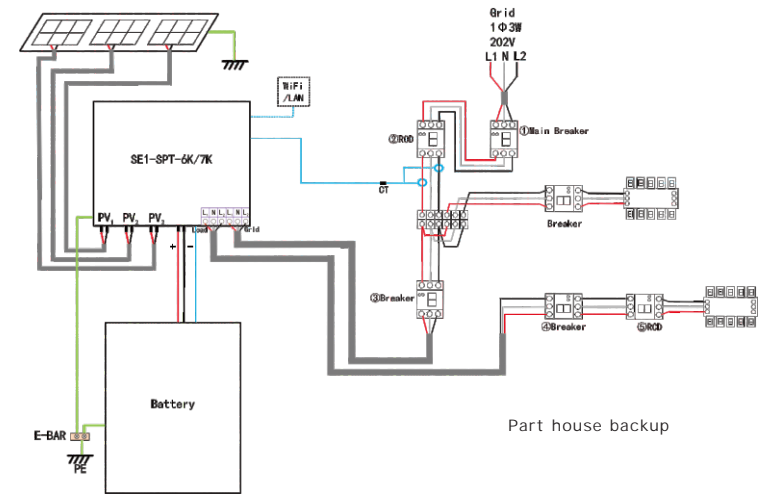
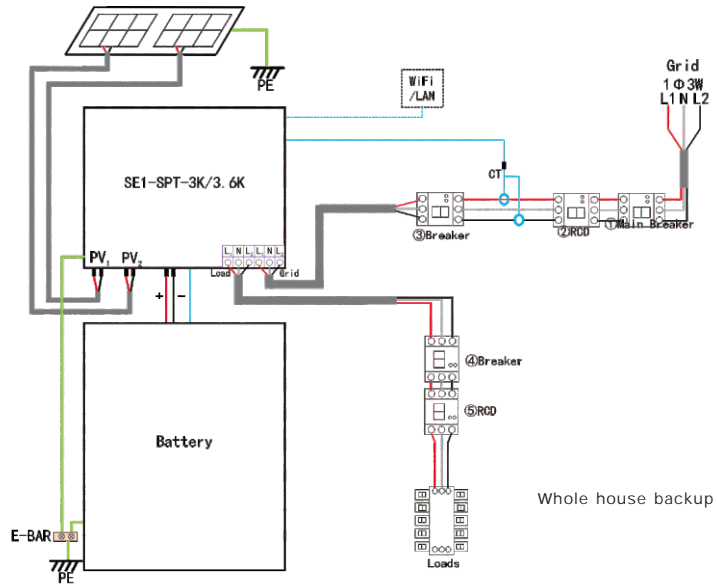
SE1-SPT series is a high-quality inverter that can convert solar energy into alternating current and store energy into batteries. The inverter can be used to optimize self-consumption, stored in batteries for future use or fed into the public grid. The way it works depends on user preferences. It can provide emergency power during power outages.

### 2.2 System Diagram

SE1-SPT series are designed to have Load wiring scheme, customers can choose Load compatible parts Load compatible with all load use.

**Diagram : Neutral line and PE line are separated from each other, and the common load is connected to the Load port; (For most countries)**



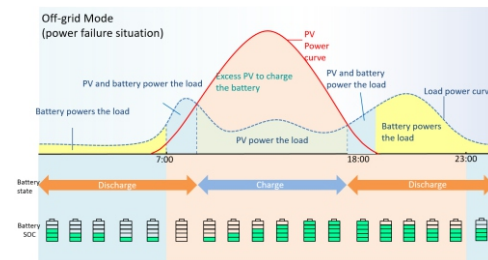


## 2.3 Work Modes

SE1-SPT has multiple working modes.

### ① Off-grid Mode

In the event of a power outage, the system will automatically switch to power outage mode. If a specific load is overloaded, the error "independent operation load protection" will be displayed. In this case, check whether the specific load is within the possible range, if it is overloaded, reduce some load, and then click the button of "standalone load protection" displayed in the current error in the error history to clear it and restart normally system



### ② Eco-friendly Mode

In the daytime, the power generated by the photovoltaic power generation panel is supplied to the household load, Charge the surplus in the storage battery and use it during peak hours at night and in the morning.

It is an eco-friendly mode that emphasizes the environment. Power generation of photovoltaic power generation panel

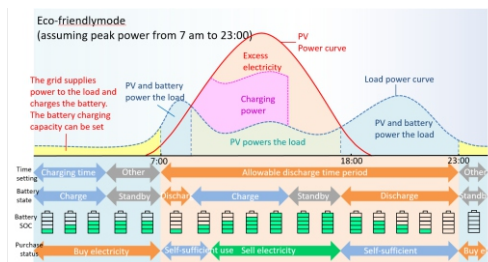
If there is insufficient power or there is no generated power, start with the storage battery.

Discharge. If the storage battery is fully charged, the surplus power will be sold.

In addition, charging from the system is performed at midnight when electricity charges are cheap, and it is released.

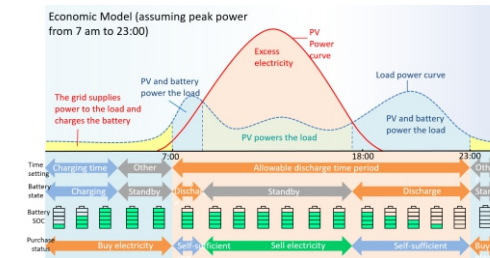
Electricity is installed during the time when electricity charges are high during the day and electricity usage is at its peak.

By setting it, you can save on electricity charges.



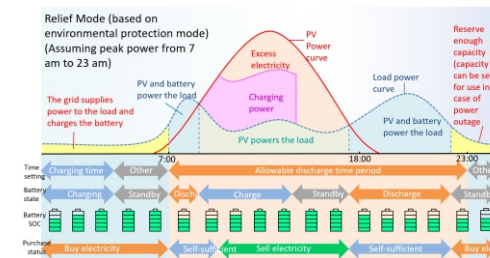
### ③ Economic Model

In economic model, you can save electricity bills by charging the storage battery at night when the electricity bill is cheap and discharging it from the storage battery during the daytime when the electricity bill is expensive. If the surplus power of solar power generation is sold in the daytime, the storage battery will not be discharged. The storage battery will be charged within the set time zone. (charging time zone can be set).



### ④ Relief Mode

In the relief mode, a certain amount of remaining battery power is secured so that you can use it with peace of mind in an emergency. The basic operation is the same as in green mode.



### ⑤ Manual Mode

The manual mode has three functions: forced charge, forced discharge, and forced charge / discharge stop. Manual mode is basically available only to maintenance personnel.

#### Manual charging:

This mode charges the storage battery regardless of the time of day. For manual charging, the system charges the battery with maximum power. The battery is charged until it is fully charged, and after the battery is fully charged, the storage battery is in a charge / discharge stop state.

#### Manual discharge:

This mode discharges the storage battery to the household load regardless of the time of day. In the case of manual discharge, the system discharges from the battery with maximum power. After full discharge, the storage battery will be in the charge / discharge stop state.

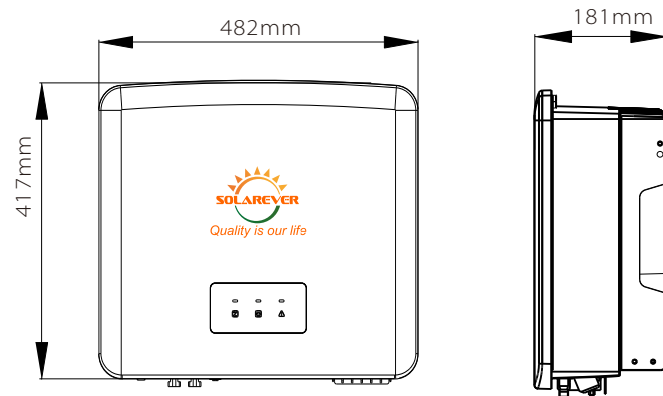
#### Charge / discharge stop:

This mode does not charge or discharge the storage battery regardless of the time of day. Solar power is still in operation. Operate each solar power generation other than this product.

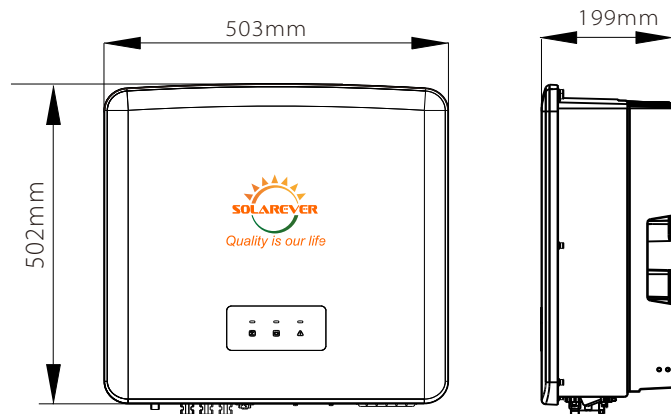
Note: If you set the manual operation mode and there is no operation for 6 hours, it will automatically switch to the operation mode (economic mode, safe mode, or green mode) that was used before setting the manual operation mode.

## 2.4 Dimension

SE1-SPT3K&SE1-SPT3.6K

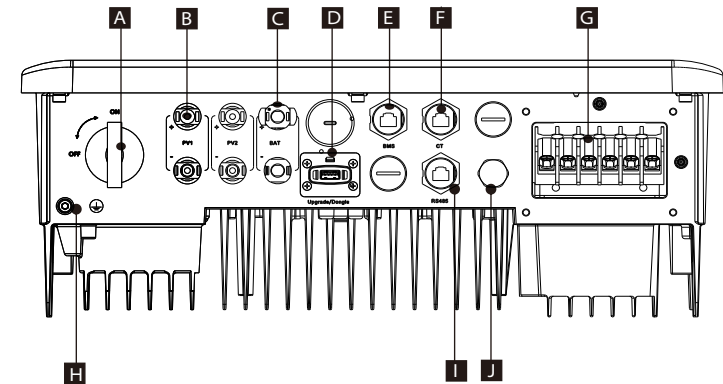


SE1-SPT6K&SE1-SPT7K



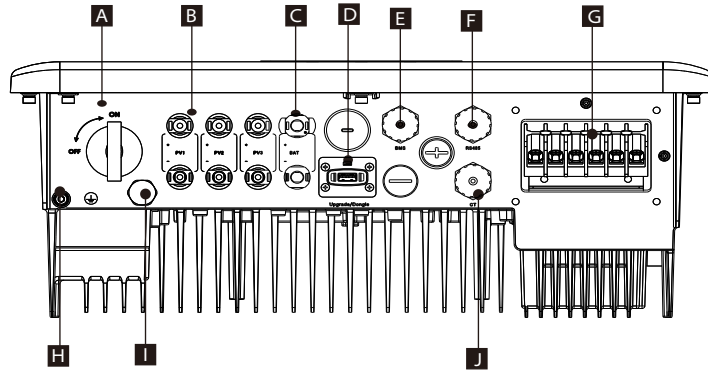
## 2.5 Terminals of Inverter

SE1-SPT3K&SE1-SPT3.6K



Object	Description
A	DC switch
B	PV connection port
C	Battery connection port
D	USB port for upgrading/ External monitoring connection port
E	Battery communication port
F	CT Port
G	Load Output port/Grid Output port
H	Ground connection port
I	Rs485 port
J	Waterproof valve

SE1-SPT6K&amp;SE1-SPT7K



Object	Description
A	DC switch
B	PV connection port
C	Battery connection port
D	USB port for upgrading/ External monitoring connection port
E	Battery communication port
F	Rs485 Port
G	Load Output port/Grid Output port
H	Ground connection port
I	Waterproof valve
J	CT Port



**Warning!**  
Qualified electrician required for the installation.

## 3 Technical Data

### 3.1 Input PV

Module	SE1-SPT-3K	SE1-SPT-3.6K	SE1-SPT-6K	SE1-SPT-7K
Max.recommended PV panel power[W]	4500	5400	9000	10500
Max.DC voltage[V]	500	500	500	500
Normal DC operating voltage[V]	390	390	390	390
Max. input current(per mppt)[A]	14/14	14/14	14/14/14	14/14/14
Max. short circuit current(per mppt)[A]	16/16	16/16	16/16/16	16/16/16
MPPT voltage range[V]	70-480	70-480	70-480	70-480
Start output voltage[V]	90	90	90	90
No. of MPP trackers	2	2	3	3
Strings per MPP tracker	1	1	1	1

### 3.2 Output / Input AC

Module	SE1-SPT-3K	SE1-SPT-3.6K	SE1-SPT-6K	SE1-SPT-7K
Rated grid voltage(AC voltage range)[V]	1Φ 3W 120/240	1Φ 3W 120/240	1Φ 3W 120/240	1Φ 3W 120/240
Rated grid Frequency[Hz]	50/60	50/60	50/60	50/60
Normal AC output power[W]	3000	3600	6000	7000
Max. apparent AC output power[VA]	3000	3600	6000	7000
Normal AC current[A]	12.5	15	25	29.2
Max. AC current[A]	14	16.5	29.5	29.5
Max. apparent AC input power[VA]	7000	7000	9300	9300
Max. AC input current[A]	29.2	29.2	39	39
Displacement power factor	0.8 leading to 0.8 lagging			
Total harmonic distortion (THDi, rated power)	<5%	<5%	<5%	<5%

### 3.3 Battery

Module	SE1-SPT-3K	SE1-SPT-3.6K	SE1-SPT-6K	SE1-SPT-7K
Battery voltage range[V]	100-480	100-480	100-480	100-480
Max.charge/discharge current[A]	30	30	30	30
Max. discharge power[W]*	3000	3600	6000	7000
Max. charge power[W]*	3000	3600	6000	7000
Communication interfaces	CAN/ RS485	CAN/ RS485	CAN/ RS485	CAN/ RS485
Reverse connect protection	YES	YES	YES	YES

### 3.4 Load output (with battery)

Module	SE1-SPT-3K	SE1-SPT-3.6K	SE1-SPT-6K	SE1-SPT-7K
Load rated voltage[V]	1Φ 3W 120/240	1Φ 3W 120/240	1Φ 3W 120/240	1Φ 3W 120/240
Load rated Frequency[Hz]	50/60	50/60	50/60	50/60
Load rated power[VA]	3000	3600	6000	7000
Load rated current	12.5	15	25	29.2
Load peak power[VA]	100%~110%,10min;110%~120%, 1min;cannot exceed 120%			
Total harmonic distortion (THDv, linear Load)	<5%	<5%	<5%	<5%

### 3.5 Efficiency, standard, environment limit and others

Module	SE1-SPT 3-3.6k	SE1-SPT 6-7k
MPPT efficiency	99.9%	99.9%
Max efficiency from PV to AC	97.0%	96.5%
Max efficiency from PV to Battery	97.0%	97.4%
Max efficiency from Battery to AC	96.0%	96.0%
Max efficiency from AC to Battery	96.0%	96.0%
Safety	UL1741	
IP class	Ip65	
Protection class	Class	
Operating temperature range[°C]	-25°C~+60°C(derating at +45°C)	
Storage temperature[°C]	-25°C~+60°C	
Humidity[%]	0-100(condensing)	
Altitude[m]	<2000	
Noise emission(typical)[dBI]	<30	
Over voltage category	III (AC) ,II (DC)	
Cooling concept	Nature cooling	
Topology	Transformerless	
Communication	RS485 CT*2 Dry contact(both for input and output)	
Dimension[mm]	482*417*181	502*503*199
Net weight[kg]	24	31

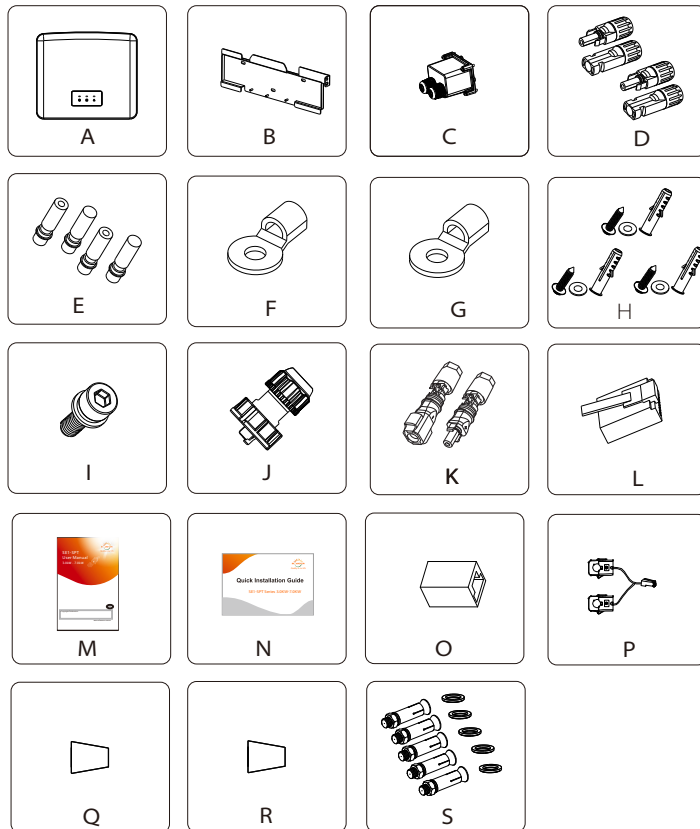
## 4 Installation

### 4.1 Check for Transport Damage

Ensure that the inverter is in good condition via transportation. If there is any visible damage such as cracks, please contact the dealer immediately.

### 4.2 Packing List

Open the package and check the materials and accessories according to the following list.



Number	Quantity	Description
A	1	SE1-SPT series inverter
B	1	Bracket
C	1	Waterproof connector
I	2	M5 inner hexagon bolt
J	3	Waterproof connector with RJ45 (COM/CAN/CT)
K	2	Battery connection terminals(positive*1, negative*1 )
L	3	RJ 45 terminals
M	1	Manual
N	1	Quick Installation Guide
O	1	Rj45 connector
P	1	CT

These are differences between SE1-SPT 3-3.6k and SE1-SPT 6-7k

#### SE1-SPT 3-3.6K

Number	Quantity	Description
D	4	PV terminal (positive*2 , negative*2 )
E	4	PV pin angle(positive*2, negative*2)
F	7	10AWG terminals
H	5	(Expansion bolt, Gasket, Self-tapping bolt)*5
Q	7	10AWG Protective line casing

#### SE1-SPT 6-7K

Number	Quantity	Description
D	6	PV terminal (positive*3 , negative*3 )
E	6	PV pin angle(positive*3, negative*3)
F	4	10AWG terminals
G	3	8AWG terminals
Q	4	10AWG Protective line casing
R	3	8AWG Protective line casing
S	5	(Expansion bolt, Gasket, Self-tapping bolt)*5

### 4.3 Installation Precautions

The protection level of SE1-SPT series inverters is IP 65, so that the inverter can be installed outdoors.

Check the installation environment and pay attention to the following conditions when installing:

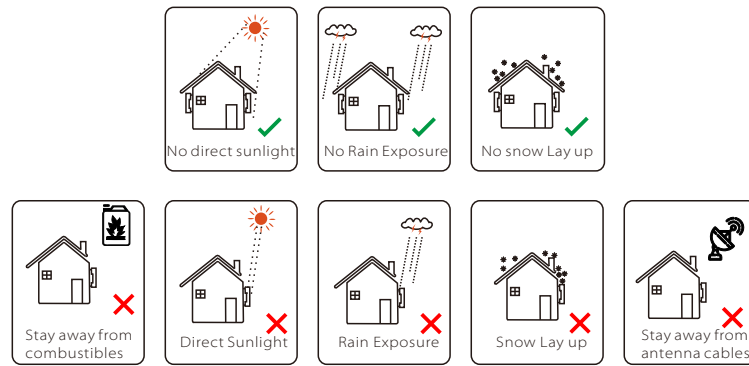
- Do not expose to strong light.
- Do not touch flammable building materials.
- Do not approach flammable and explosive gases or liquids (e.g. where chemicals are stored).
- Do not touch cold air directly.
- Do not approach TV antenna or cable.
- Do not place in areas above 2000 meters above sea level.
- Do not install in precipitation or high humidity, which may cause corrosion or damage Internal devices.

If the inverter is installed in a narrow area, be sure to reserve appropriate space for heat dissipation.



















The ambient temperature of the installation site is -25°C~60°C.

The maximum angle range of wall tilt  $\pm 5^\circ$ .







Avoid direct sunlight, rain and snow weather.



### 4.4 Tool preparation

Tool equipment					
Type	Name	Image	Name	Image	
Machine Installation Tools	Hammer drill	Bit $\Phi 10$ 	Multimeter	DC Voltage Range $\geq 1100$ V.DC 	
	Torque screwdriver	Crosshead M5 	Socket wrench set (Hexagon)		
	OT terminals press clamp	0.5mm <sup>2</sup> ~6mm <sup>2</sup> 	Diagonal pliers		
	Utility knife		Multifunction terminal crimping tool (RJ45)		
	Diagonal poliers		Marker		
	Rubber hammer		Tape measure		
	Crimping Tool		Hexagon keys		
	European terminal crimping tool		Spirit level		
	Individual Protection Tools	Dustproof Cover		Protective glasses	

Tool equipment				
Type	Name	Image	Name	Image
Individual Protection Tool	Safety gloves		Safety shoes	

Type	Name	Image	Requirement
Equipment Preparation	Breaker	Use local model standard air switch	Grid port and Load port wiring section (4.5.2)
Cable Preparation	PV end wire		Dedicated PV wire, line number #12 AWG withstand voltage 1000V, temperature resistance 105°C fire resistance grade VW-1
	Load end wire		Triple Core Cables
	Grid end wire		Triple Core Cables
	Communication lines		Twisted pair with shield
	Battery Cable		Conventional wire
	PE Cable		Conventional wire

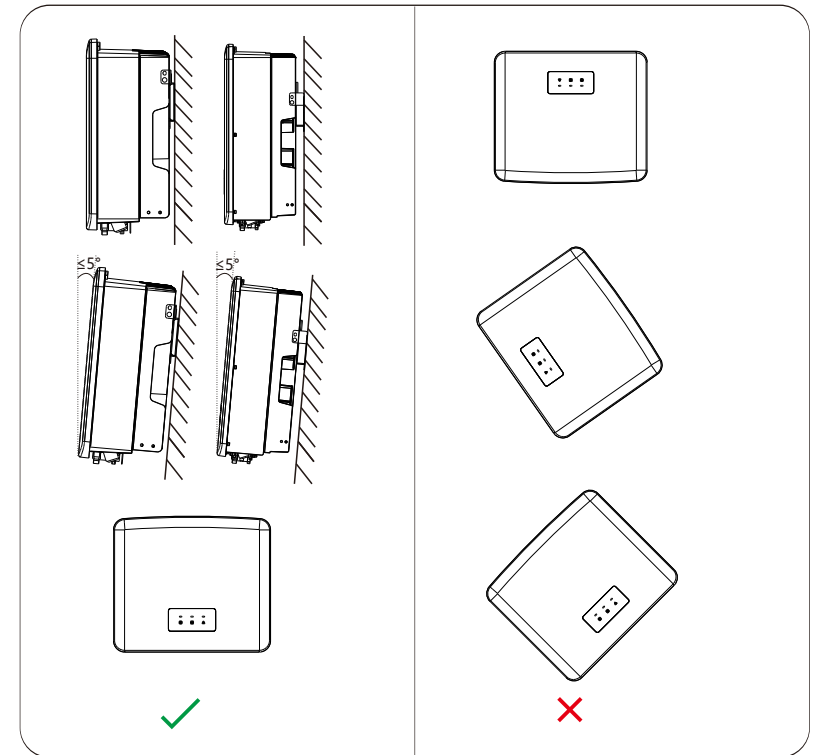
### 4.5 Installation Site Conditions

#### 4.5.1 Installation Carrier Requirements

Do not install the inverter near flammable materials. Please install the inverter on a solid object that can withstand the weight requirements of the inverter and energy storage system. Please be careful not to install the inverter in the plasterboard wall or similar to the residential places with poor sound insulation, so as not to work with noise and interfere with the residents' life in the morning.

#### 4.5.2 Installation Requirements

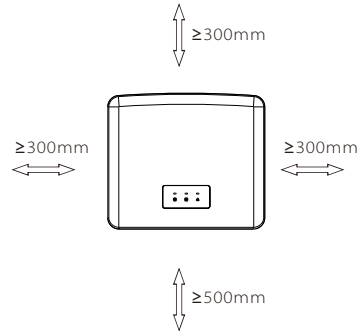
Install the inverter at a maximum back tilt of 5 degrees, the inverter can not be tilted forward, inverted, excessive back tilted or side tilted.





### 4.5.3 Installation Space Requirements

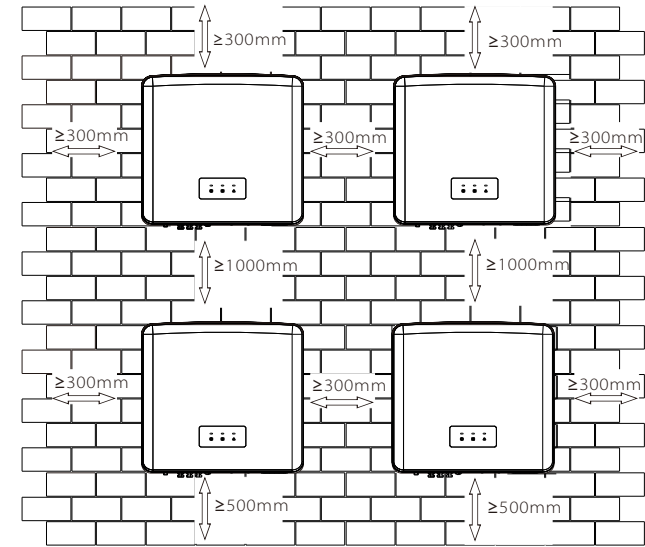
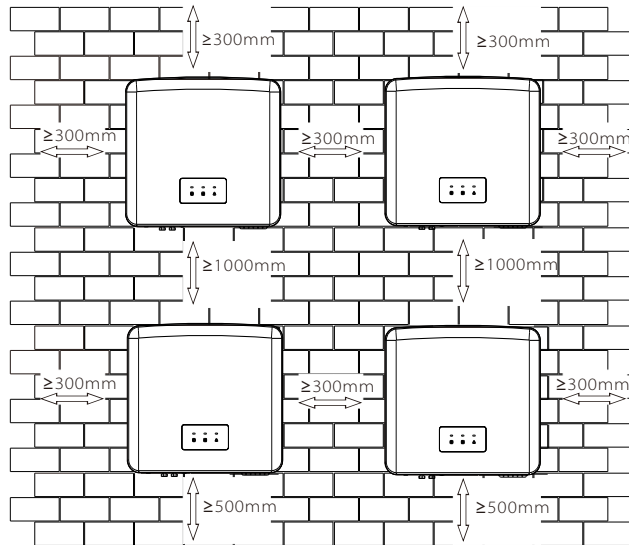
Reserve enough space when installing inverter (at least 300mm) for heat dissipation.



Reserved space dimensions of installation

Position	Min Distance
Left	300mm
Right	300mm
Up	300mm
Down	500mm

For multi-inverter installation scenarios, the inline installation method is recommended; when the space is insufficient, the recommended method of installation in the form of "products"; it is not recommended to install multiple inverters in stacks. If you choose stack installation, please refer to the installation separation distance below.



### 4.6 Mounting

#### ➤ Preparation

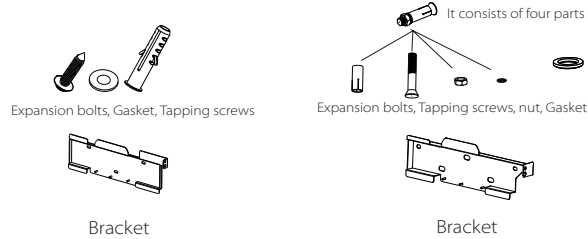
Please prepare the following tools before installation.



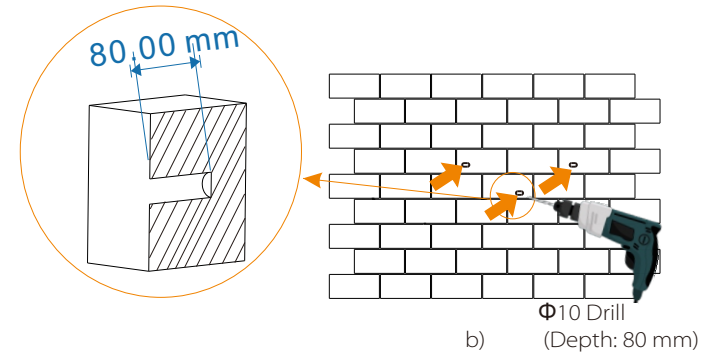
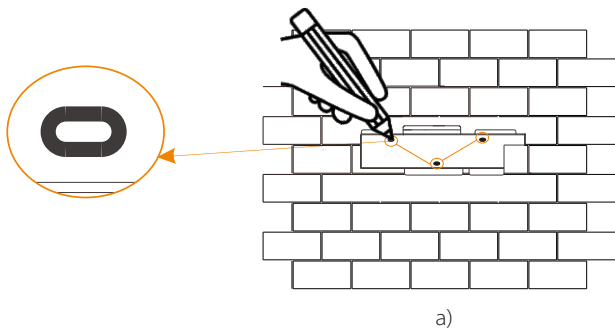
Installation tools: screwdriver, wrench,  $\Phi 10$  drill, rubber hammer, socket wrench set and Hexagon keys.

#### ➤ Step 1: Fix the wall bracket to the wall

First find the expansion screw and the wall bracket in the accessory bag, as shown below:

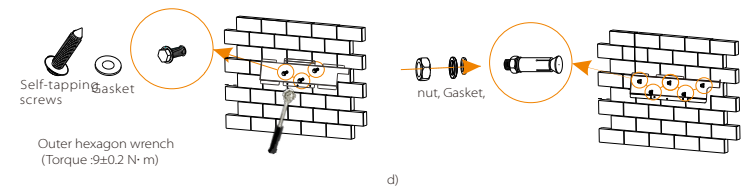
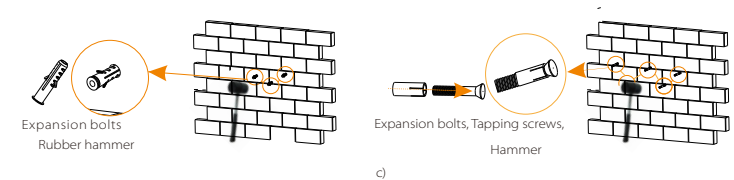


- a) Use a marker to mark drilling holes of the bracket on the wall .
- b) Drill holes at marked spots with depth of 80mm.(SE1-SPT 6-7K need 5 holes).



#### ➤ Step 2: hang the inverter on the bracket

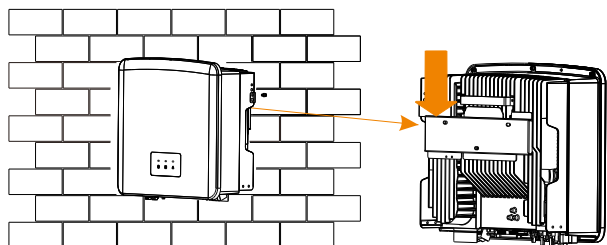
- c) Insert expansion bolt into the hole, use rubber hammer to knock the expansion screw bolt into the wall;
- d) The bracket is aligned with the screw uses the inner hexagonal wrench to screw the tapping screw until the expansion bolt "bang" is heard.



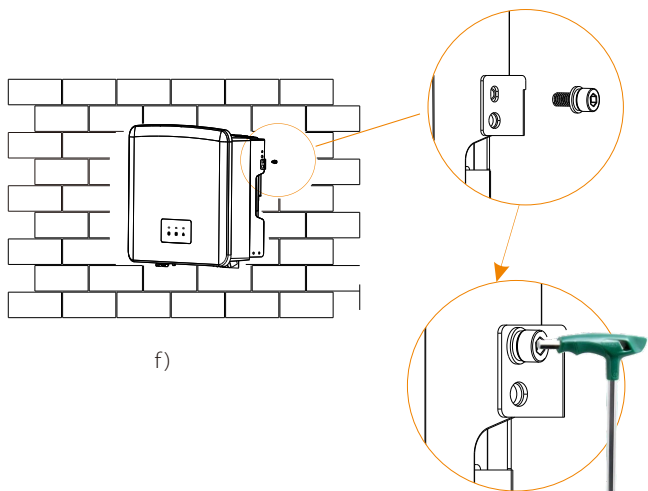
➤ **Step 3: Tighten the inverter and bracket**

e) Hang the buckle on the inverter to the corresponding position of the backplane;

f) Use the inner hexagonal wrench to tighten the inner hexagonal screw on the right side of the inverter.

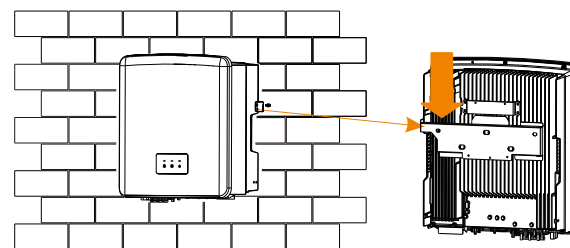


e)

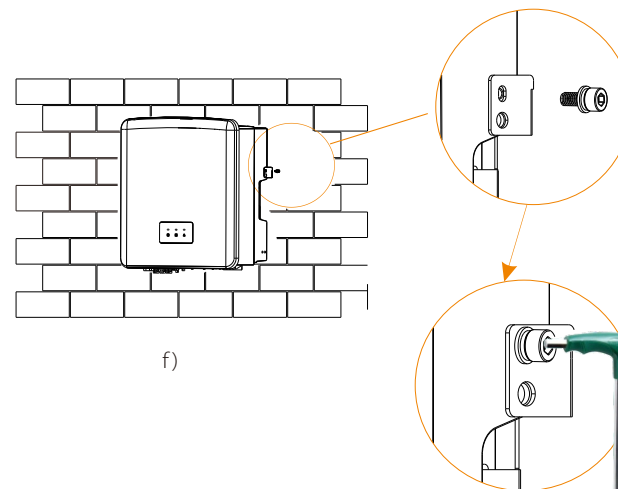


f)

Inner hexagonal wrench  
(Torque :1.2±0.1 N· m)



e)



f)

Inner hexagonal wrench  
(Torque :1.2±0.1 N· m)

## 5 Electrical Connections

### 5.1 PV Connection

Please select photovoltaic modules with good performance and quality assurance. The open circuit voltage of the module array should be less than the maximum PV input voltage specified by the inverter, and the working voltage should be within the MPPT voltage range.

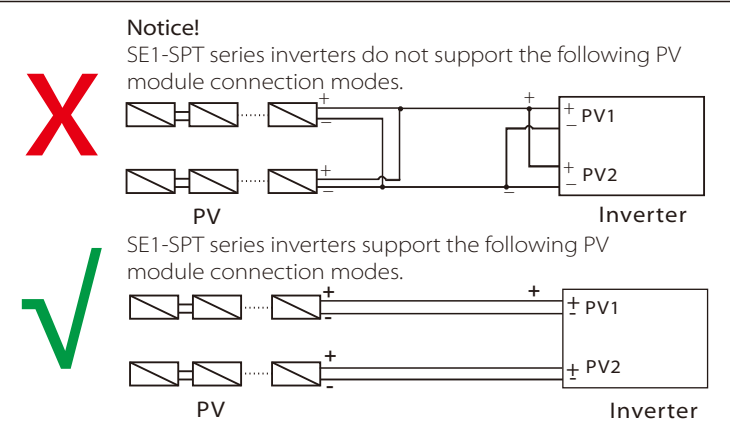
Table 1: Maximum input voltage limit

Model	SE1-SPT 3k	SE1-SPT 3.6k	SE1-SPT 6k	SE1-SPT 7k
Max. DC input voltage	500V			

**Warning!**  
The voltage of photovoltaic modules is very high, and is dangerous voltage. When wiring, please follow the safe electricity regulations.

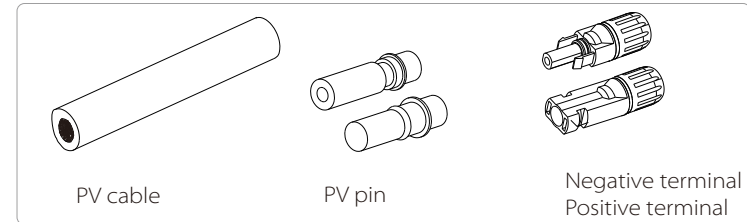
**Notice!**  
Do not ground the positive or negative pole of the photovoltaic module!

**Notice!**  
The following PV module requirements need to be applied to each input range:  
1. Same model  
2. Same quantity  
3. The same queue  
4. The same angle

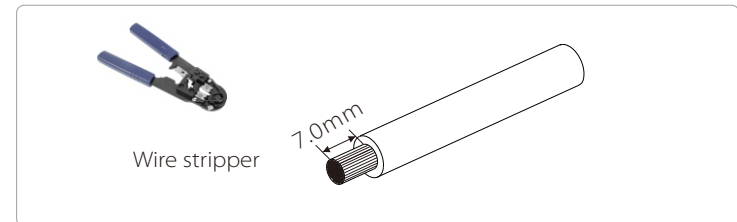


### ➤ Connection step

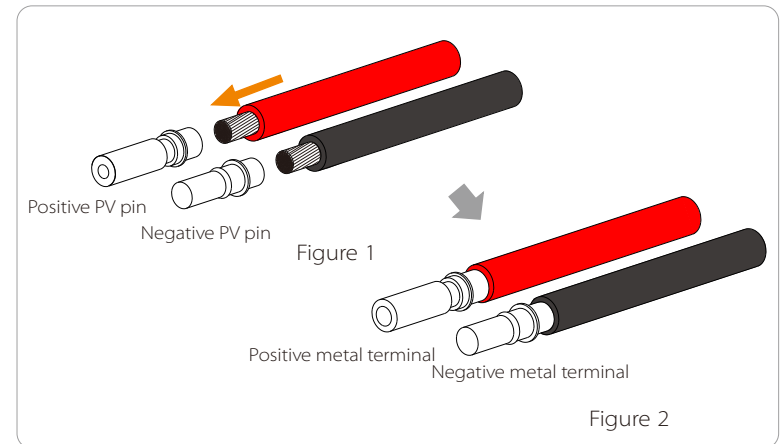
**Step 1.** Turn off the DC switch, connect the PV module, prepare a 12AWG PV cable, and find the PV (+) terminal and PV (-) terminal in the package.



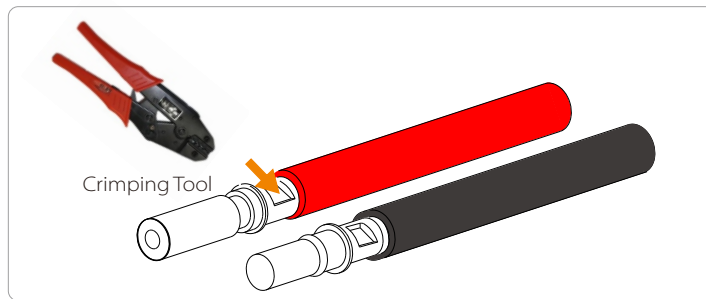
**Step 2.** Use a wire stripper to strip the 7mm insulation layer of the wire end.



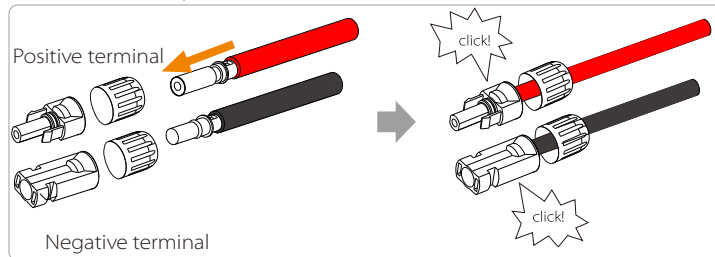
**Step 3.** Tighten the cable with the insulation layer stripped and insert it into the metal terminal (see Figure 1), make sure all wires are inserted into the metal terminal (see Figure 2).



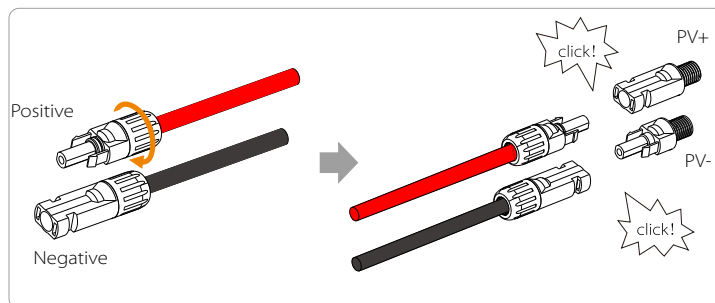
**Step 4.** Tighten the PV pin needle and the wiring harness to make the connection tight without looseness



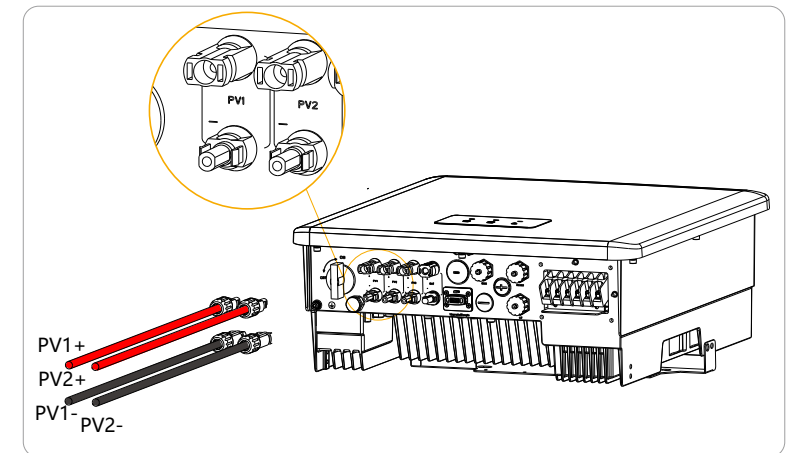
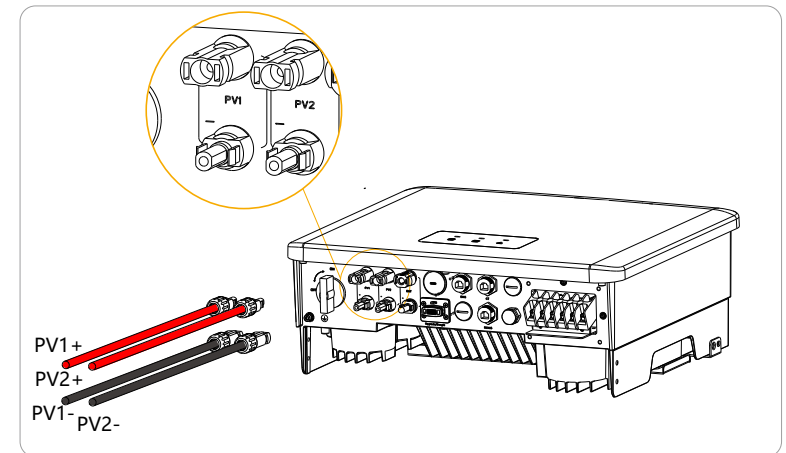
**Step 5.** The PV joint is divided into 2 parts - the plug and the fastening head. Insert the cable through the fastening head and the opposite plug. Notice that the red and black lines correspond to different of plugs. Finally, force the cable pair into the plug, will a "click" sound, which indicates that the connection is complete.



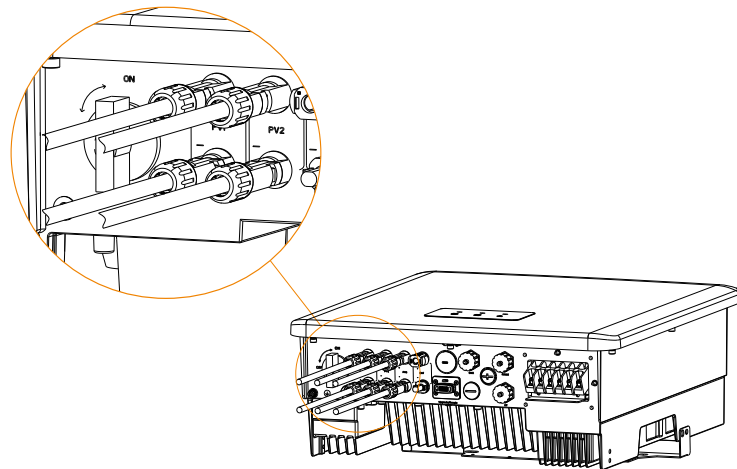
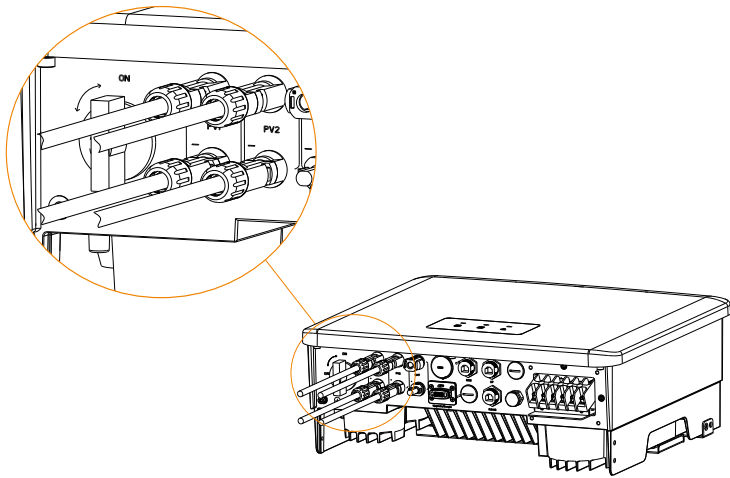
**Step 6.** Tighten the fastening head and into insert the corresponding positive and negative (PV-/PV+) ports of the inverter.



The following is the location of the inverter positive and negative (PV-/PV+) ports.



Schematic diagram of the inverter PV connected.



## 5.2 Grid Port and Load Output Connection

SE1-SPT series inverter are single-phase inverter . Suitable for rated voltage 120/240V, frequency 50/60Hz. For more technical requirements, please consult the requirements of the local public grid.

### ➤ Grid port connection

Grid Cable and Micro-breaker recommended

Module	SE1-SPT 3-3.6k	SE1-SPT 6-7k
Cable(copper)	5.5mm <sup>2</sup>	8mm <sup>2</sup>
Micro-Breaker	40A	50A

Load Cable and Micro-breaker recommended

Module	SE1-SPT 3-3.6k	SE1-SPT 6-7k
Cable(copper)	5.5mm <sup>2</sup>	5.5mm <sup>2</sup>
Micro-Breaker	20A	30A

The circuit breaker should be installed between the inverter and the mains, and the load should not be directly connected to the inverter.

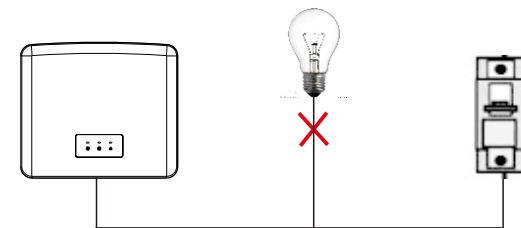



Figure: Wrong connection of load and inverter

➤ Load requirements

**Warning!**  
 Ensure that the Load rated power is within the Load rated output power range, otherwise, the inverter will report an "overload" warning.








When "overload" occurs, adjust the load power to make sure it is within the Load rated output power range, and the inverter will automatically return to normal.

For non-linear loads, ensure that the inrush current power is within the Load rated output power range. When the configuration current is less than the maximum DC input current, the capacity and voltage of lithium battery and lead acid battery will decrease linearly.

The following table shows some common loads for your reference.

Notice: Please check with the manufacturer for high-power inductive loads.

Content	Power		Common equipment	Instance		
	Start	Rated		Equipment	Start	Rated
Resistive load	X 1	X 1	 Incandescent lamp	 100W Incandescent lamp	100VA (W)	100VA (W)
Inductive load	X 3~5	X 2	 Fan  Fridge	 150W Fridge	450 - 750VA (W)	300VA (W)

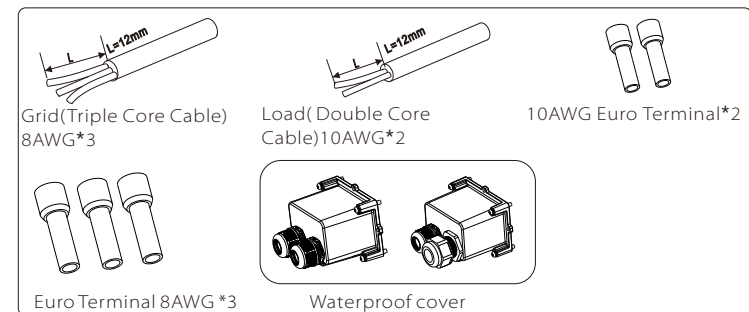
➤ Grid and Load connection steps

• Connection requirements

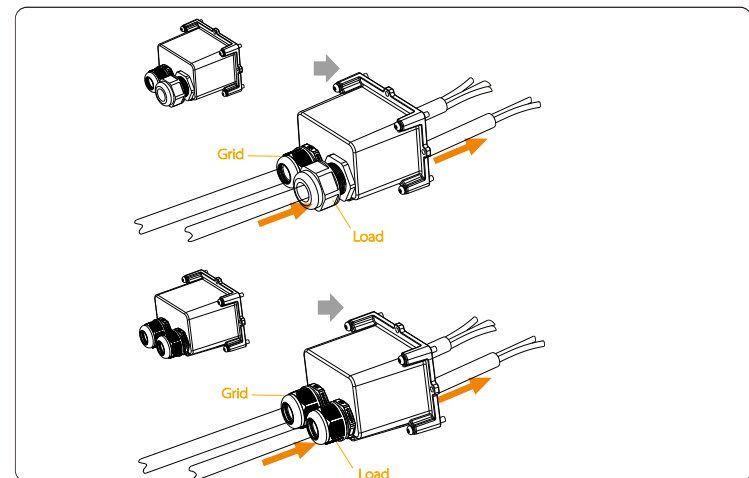
**Notice:** Check the grid voltage and compare the voltage range (see technical data).

Disconnect the circuit board from all power sources to prevent electric shock.

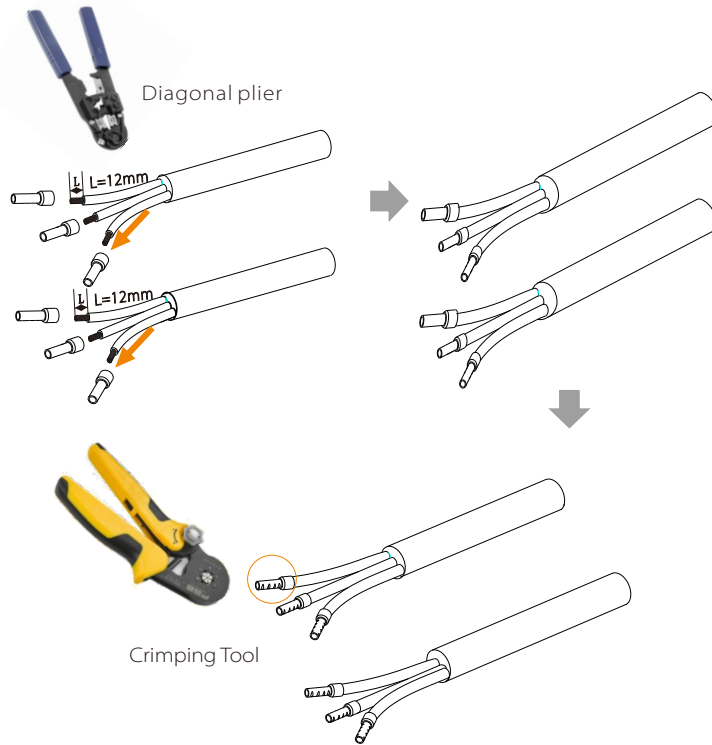
**Step 1.** Prepare a Grid cable (three-core wire) and an Load cable (two-core wire), and then find the European terminal and waterproof cover in the accessory bag.



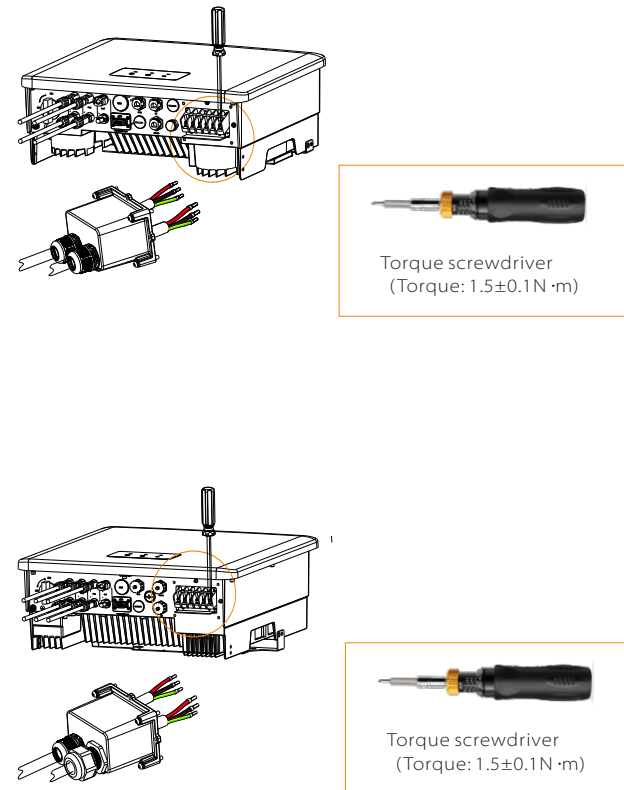
**Step 2:** The Grid and Load cables go through the corresponding Grid and Load ports of the waterproof cover.



**Step 3.** Remove the 12mm insulation layer at the end of the wire. Insert the European-style terminals respectively, and make sure that the stripped ends are inserted into the European-style terminal, and finally use crimping pliers to press tightly.

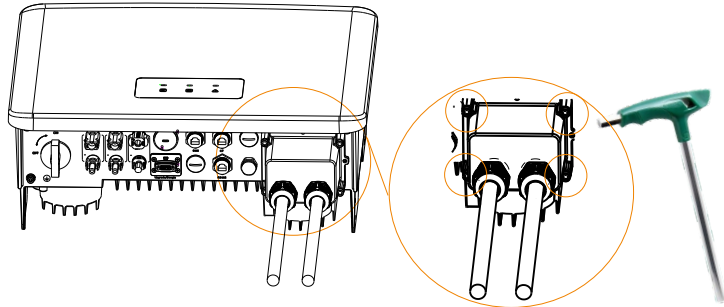


**Step 4.** Find the location of the AC interface on the inverter, insert the crimped terminals into the UW10 terminals L, N, and P according to the wire sequence, and use a flat-blade screwdriver to tighten the screws. (Torque:  $0.2 \pm 0.1 \text{ N} \cdot \text{m}$ )

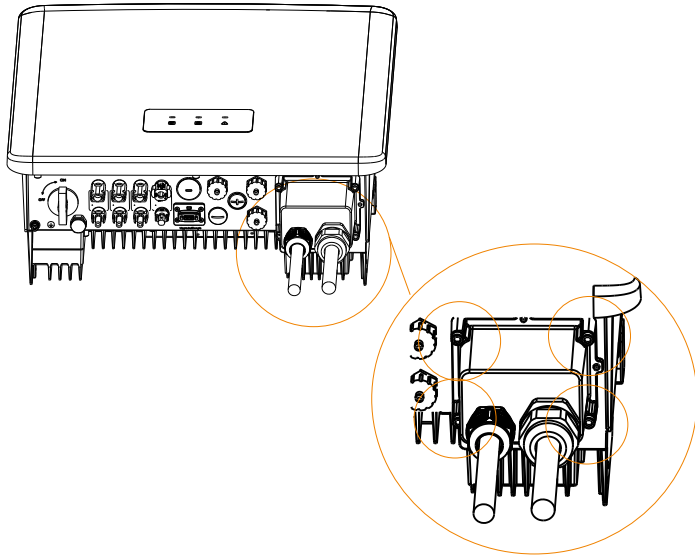




**Step 5.** Install the AC waterproof cover, and tighten the screws on the four sides of the waterproof cover with an Allen wrench.

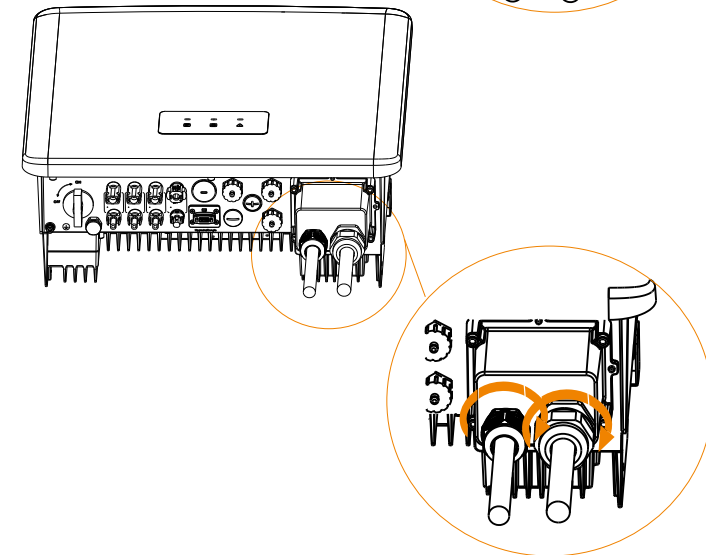
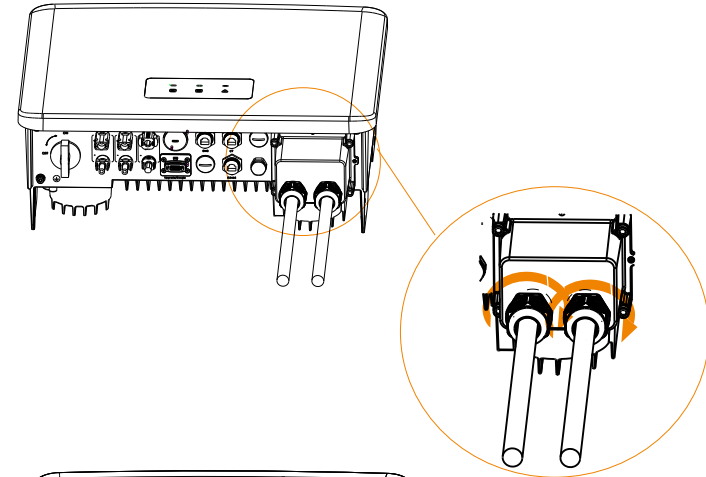


Hexagon keys  
(Torque:  $0.8 \pm 0.1 \text{ N} \cdot \text{m}$ )



Hexagon keys  
(Torque:  $0.8 \pm 0.1 \text{ N} \cdot \text{m}$ )

**Step 6.** Tighten the waterproof fastening head.



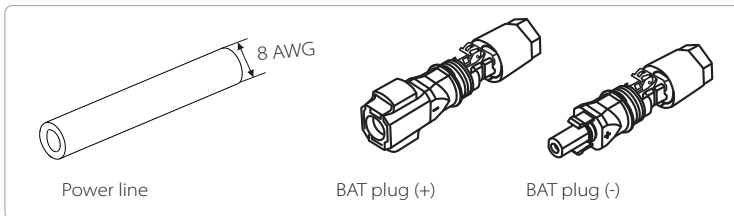
### 5.3 Battery Connection

➤ **Connection requirements**

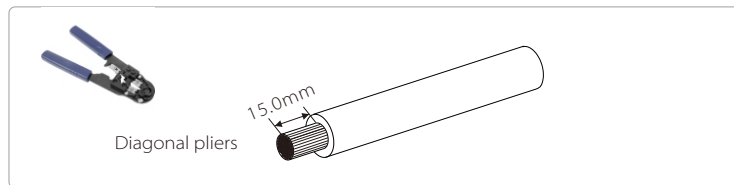
SE1-SPT series inverter charge and discharge system can be equipped with high voltage lithium battery and lead acid battery.  
Please note that the maximum voltage of the battery should not exceed 480 V, battery communication should be compatible with the SE1-SPT inverter.

➤ **Battery connection steps**

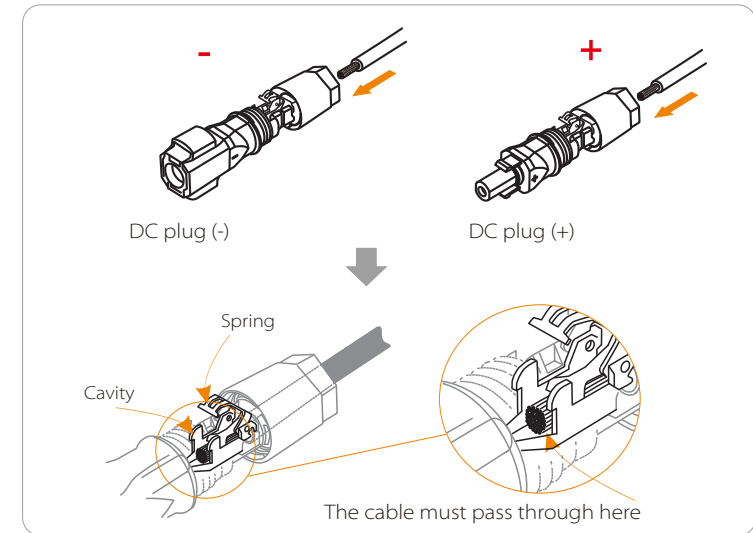
**Step 1.** Prepare 8 AWG battery power line, find the DC plug (+), DC plug (-) in the accessory bag.



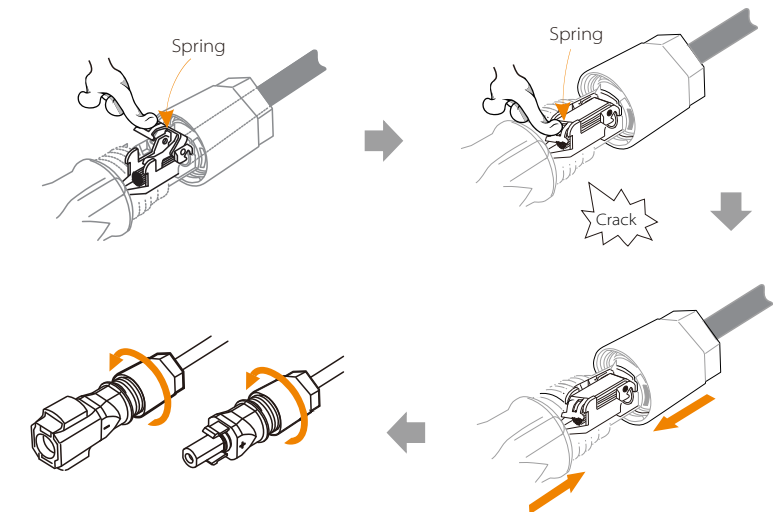
**Step 2.** Strip the insulation layer (length:15mm) at one end of the power line.



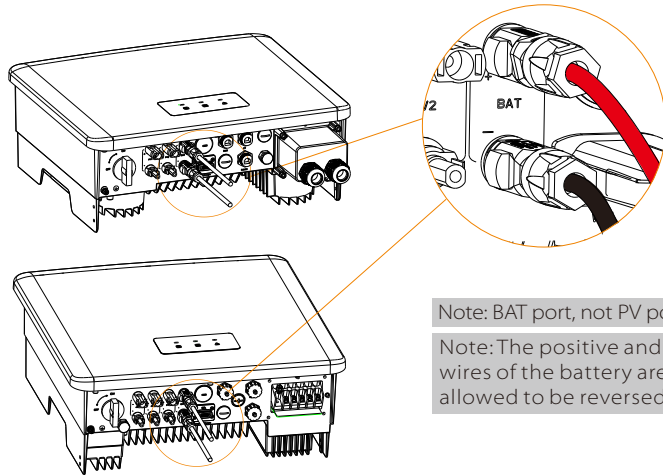
**Step 3.** Insert the striped cables into the DC plug (-) and DC Plug (+) respectively.



**Step 4.** Press down on the spring by hand, you can hear a click sound, then push the ends together, and tighten the screw joints.



**Step 5.** Insert the battery power lines into the corresponding BAT port (+), (-) of the inverter.

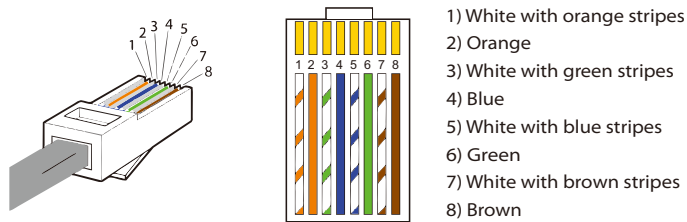


Note: BAT port, not PV port!  
 Note: The positive and negative wires of the battery are not allowed to be reversed!

➤ **Communication connection**

BMS port definition

The communication interface between the inverter and the battery uses the waterproof connector with RJ45.



PIN	1	2	3	4	5	6	7	8
Definition	BAT_TEMP	GND	GND	BMS_CANH	BMS_CANL	X	BMS_485A	BMS_485B

**Notice!**  
 After the BMS communication between the battery and the inverter is finished, the battery will work normally.

**5.4 Communication Connection**

**5.4.1 Introduction to CT Communication**

SE1-SPT inverter should work with an electric meter or current sensor (CT for short) to monitor household electricity usage. The electricity meter or CT can transmit the relevant electricity data to the inverter or platform, which is convenient for users to read at anytime.

Users can choose to use electric meters or CTs according to demand.

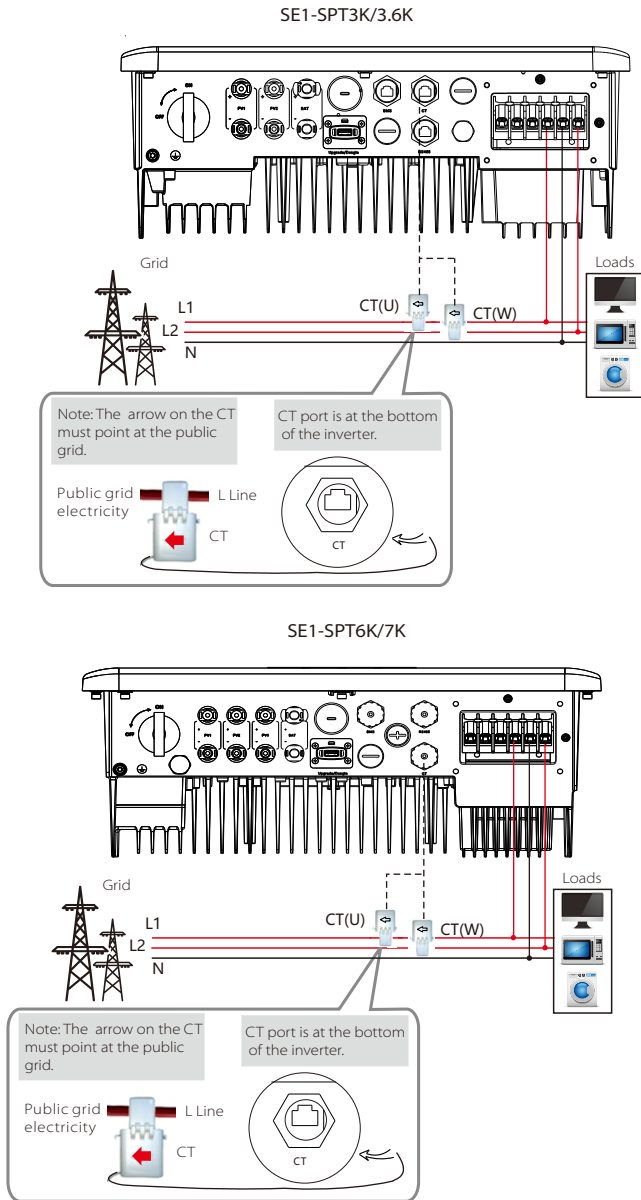
Please Notice that the meter/CT brand required by Solarever must be used.

**Notice!**  
 The meter or CT must be connected to the inverter, otherwise the inverter will shut down and alarm Solarever "meter failure"alarm.  
 Smart meters must be authorized by Solarever, third party or other companies, Unauthorized meter may be incompatible with the inverter.  
 Solarever will not be responsible for the impact caused by the use of other appliances.

➤ **CT Connection**

The current sensor measures the current on the live wire between the inverter and the public grid.

• CT connection diagram



• Notice for CT connection:

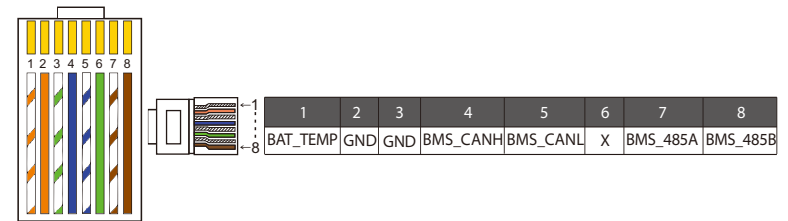


**Notice!**

- Do not place the CT on the N wire or ground wire.
- Do not put CT on the N line and L line at the same time.
- Do not place the CT on the side where the arrow points to the inverter.
- Do not place the CT on non-insulated wires.
- The cable length between CT and inverter should not exceed 100 meters.
- After CT is connected, prevent the CT clip from falling off. It is recommended to wrap the CT clip around in circles with insulating tape.

➤ BMS communication cable

The BMS pin is defined as follows:



**Notice!**

The BMS port on the inverter is the communication port for connecting the battery. The communication port on the lithium battery must be consistent with the definition of pins 4, 5, 7, and 8 above;

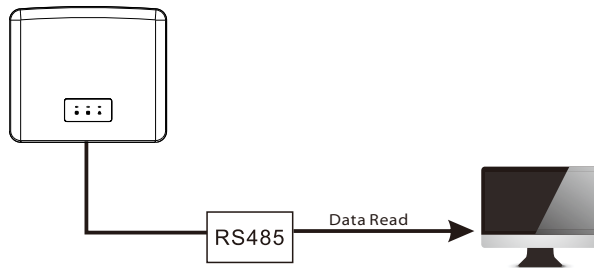
### 5.4.2 COM Communication

COM communication interface is mainly provided for customization the second step of development use. The inverter supports the control of external equipment or external equipment control through communication. For example, the inverter adjusts the working mode of the heat pump and so on.

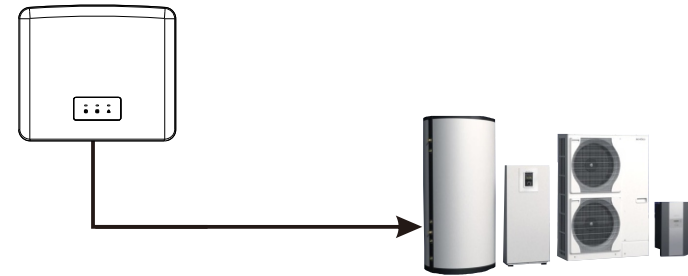
#### ➤ Application occasion

COM is a standard communication interface, through which the monitoring data of the inverter can be directly obtained. Also, external communication devices can be connected to carry out the secondary development of the inverter. For specific technical docking, please contact Solarever.


#### • External communication equipment controls the inverter



#### • Inverter communication control external equipment



#### ➤ COM PIN Definition

	1	2	3	4	5	6	7	8
	+5V_COM	Drycontact_(input)	GND	485A	485B	GND	Drycontact_B(out)	Drycontact_A(out)

#### Notice!

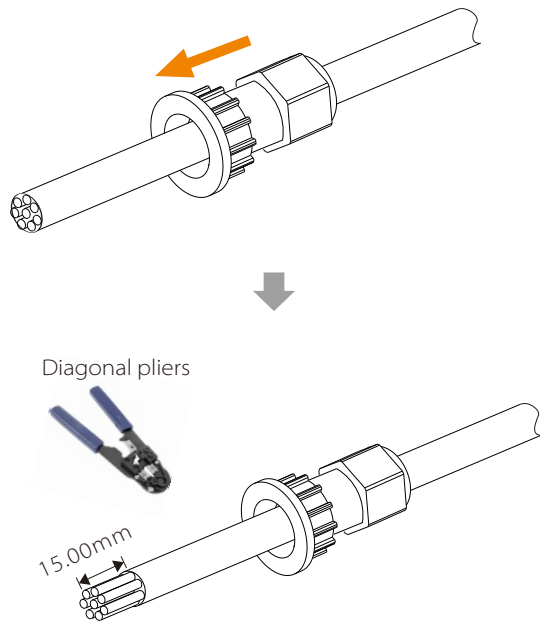
Customers can communicate or control the inverter and external devices through the COM interface. Professional users can use pins 4 and 5 to realize data acquisition and external control functions. The communication protocol is Modbus RTU. For details, please contact Solarever. If the user wants to use the inverter dry contact to control external equipment (such as a heat pump), it can be used with Solarever's Adapter Box. For details, please refer to the Quick Installation Manual of the Adapter Box.

### 5.4.3 Communication Connection Steps

**Step 1.** Prepare a communication cable, and then find the communication adapter in the accessory bag.



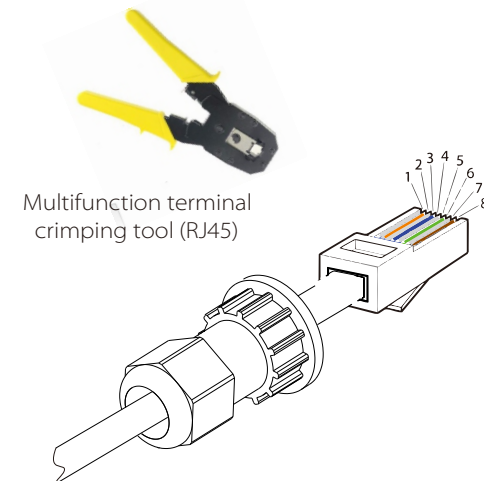
**Step 2.** Insert the communication cable through the communication adapter, and peel off the outer insulation layer of 15 mm.



**Step 3.** Insert the prepared communication cables into the RJ45 terminals in sequence, and then use network cable crimping pliers to press them tightly.

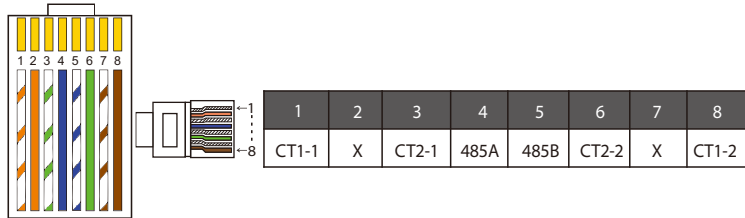


- 1) White with orange stripes
- 2) Orange
- 3) White with green stripes
- 4) Blue
- 5) White with blue stripes
- 6) Green
- 7) White with brown stripes
- 8) Brown



➤ **CT communication cable**

CT pin is defined as follow:

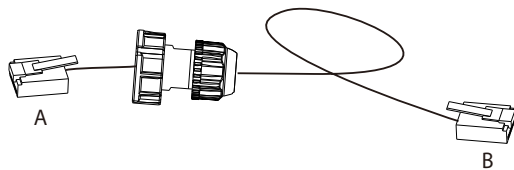


**Notice!**

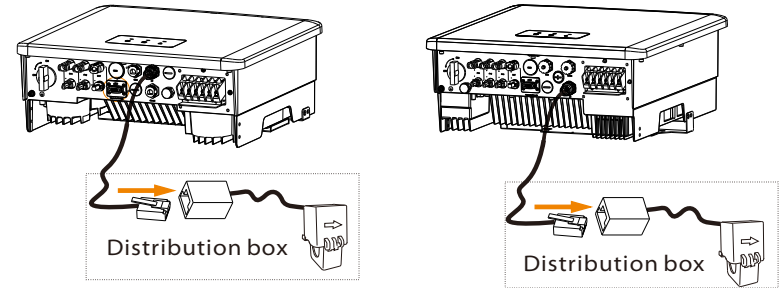
Only one of the CT connections can be selected. Meter cable goes to pin terminal 4 and 5; CT cable goes to pin terminal 1 and 8; CT2 cable goes to pin terminal 3 and 6.

1) Users can customize the length of the CT communication cable. The accessory package provides 1\* RJ45 and 1\* waterproof connector with RJ45 terminals.

When the CT cable is completed, connect the A terminal to the "CT" port of the inverter and tighten the waterproof screw, and connect the B terminal to the RJ45 coupler.



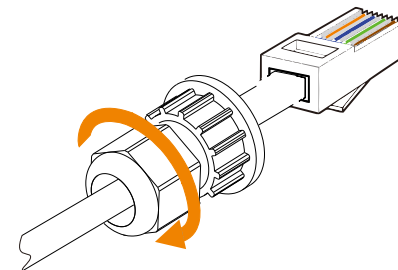
2) One side of the finished cable, Waterproof connector with RJ45 is inserted into the inverter, and one side of the RJ45 terminal is inserted into the CT connection.



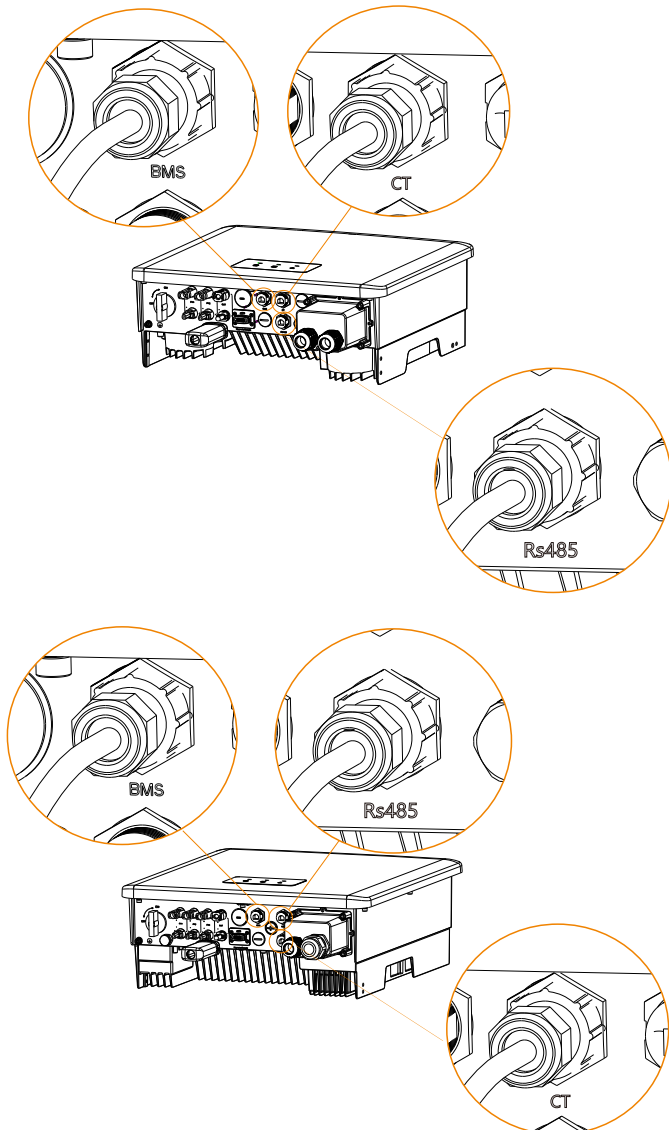
**Notice!**

When installing, pay attention to water resistance. All the connected parts of CT must be put into the distribution cabinet.

**Step 4.** Tighten the completed Meter/CT/BMS communication line and tighten the waterproof plug.



**Step 5:** Finally, find the corresponding COM, METER, CT, DRM, LCD ports on the inverter and insert the communication cable into the corresponding ports.



### 5.5 Grounding Connection (Mandatory)

The user must make two ground connections :one shell grounding, and one equipotential grounding. This prevents electric shock.

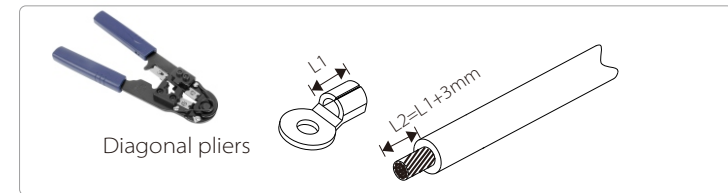
Notice: If the PV end of the inverter is not connected with earth , the inverter will turn on a red light Inspect and report ISO Fault .This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring.

#### ➤ Ground connection steps

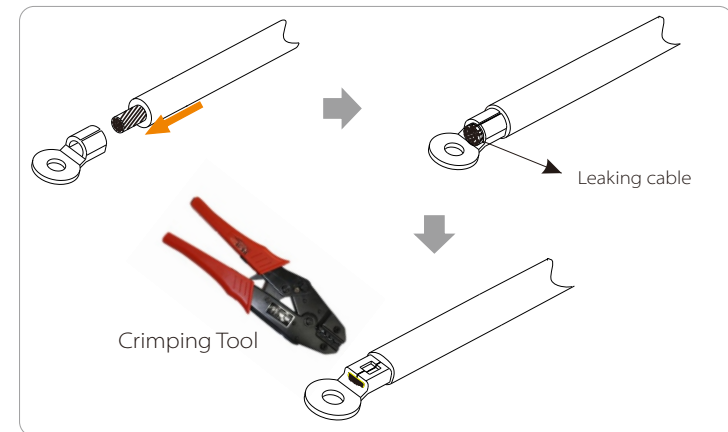
**Step 1.** Prepare a one-core cable (10AWG), and then find the ground terminal in the accessories.



**Step 2.** Strip the grounding cable insulation(length"L2), insert the striped cable into the ring terminal, and then clamp it.

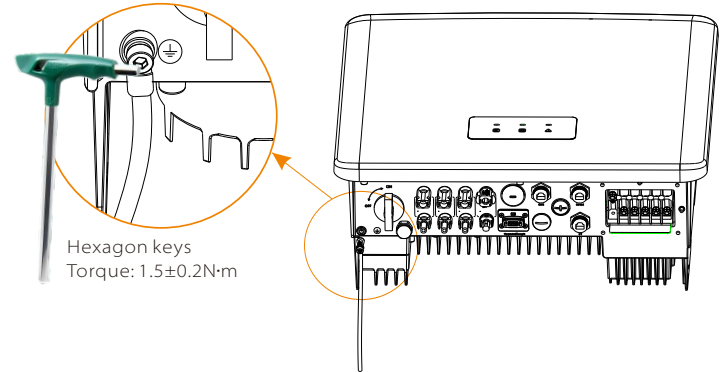
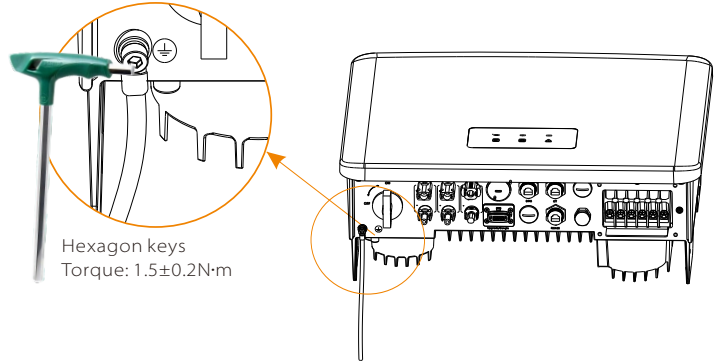
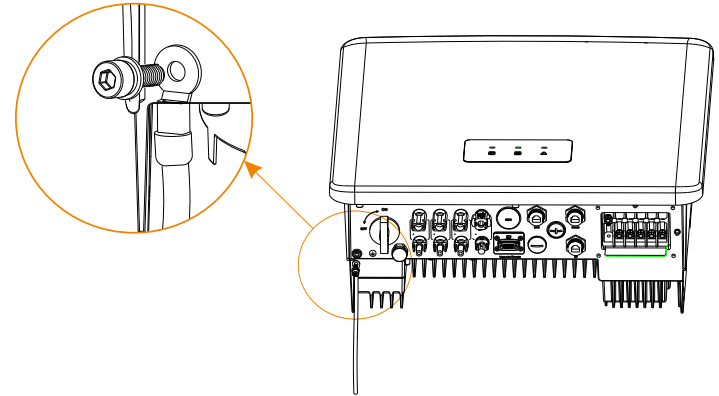
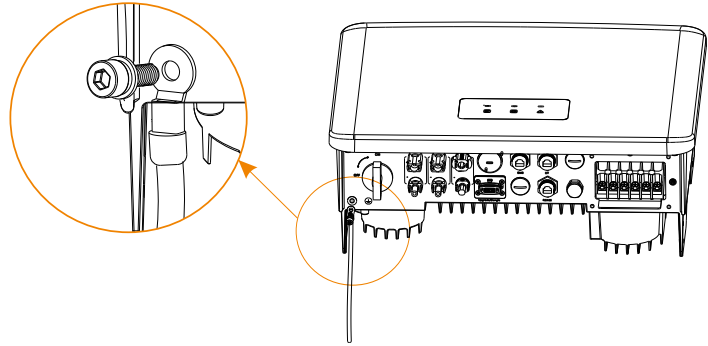


**Step 3.** Insert the stripped cable into OT terminal and tighten the terminal with a terminal crimping tool.





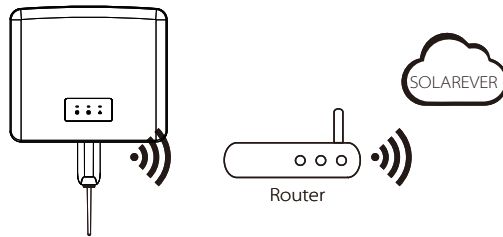
**Step 4.** Find the ground connection port on the inverter, and screw the ground wire on the inverter with an M5 Hexagon keys.



## 5.6 Monitoring Connection (Accessories)

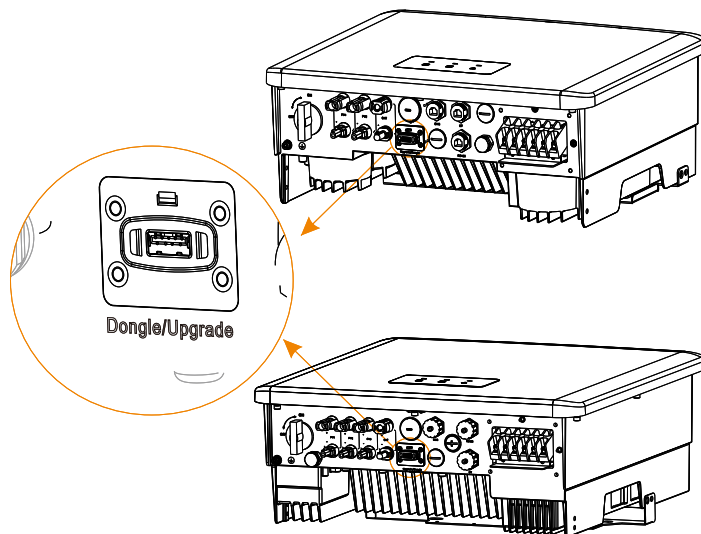
The inverter provides a DONGLE port, which can transmit data of the inverter to the monitoring website via Pocket WiFi Plus, Pocket 4G, Pocket GPRS, and Pocket LAN. (If necessary, purchase products from Solarever)

### ➤ WiFi connection diagram

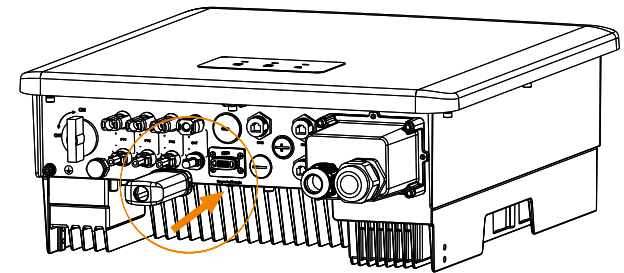
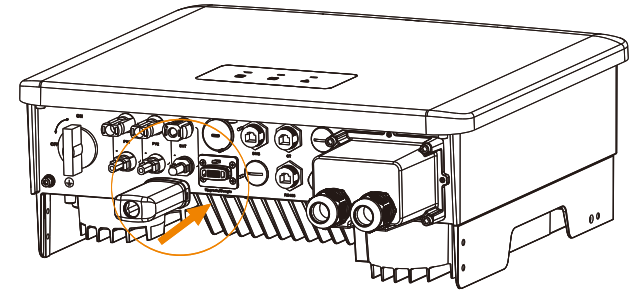


### ➤ Wireless monitoring accessories connection steps

**Step 1.** First find the DONGLE port of the inverter.



**Step 2.** Plug Pocket WiFi into the DONGLE port.



*Please check the Pocket wifi user manual/Pocket LAN user manual/4G user manual.*

## 5.7 Check All Below Steps Before Starting Inverter

➤ After the inverter is checked, then conduct the following steps

- ➊ Make sure that the inverter is fixed on the wall.
- ➋ Ensure that all ground wires are grounded.
- ➌ Confirm that all DC lines and AC lines are connected.
- ➍ Make sure the CT is connected.
- ➎ Make sure the battery is well connected.
- ➏ Turn on the Load switch and Load switch.
- ➐ Turn on the battery switch.

Long press the "Enter" key for 5 seconds to exit the Off mode.  
(The mode is factory defaulted as Off Mode)

□

## 5.8 Inverter Operation

➤ Before operation, check the inverter according to the following steps

- a) Check that the inverter is well fixed on the wall.
- b) Ensure that all ground wires are well tightened.
- c) Ensure that all DC and AC circuit breakers are disconnected.
- d) Ensure that all ground wires are well tightened.
- e) The AC output terminal is correctly connected to the mains.
- f) Ensure that all photovoltaic panels and inverter are properly connected. Unused DC connectors should be blocked with caps.

➤ Start the inverter

- Steps to start the inverter
  - Turn on the AC switch between the SE1-SPT and the power grid.
  - (Optional) Remove the locking screw from the DC switch.
  - Turn on the DC switch between the PV string and the SE1-SPT if there is any.
  - Turn on the DC switch at the bottom of the SE1-SPT.
- When the photovoltaic panel generates enough power, the inverter will start automatically.
- Check the status of the LED and LCD screen, the LED is green, and the LCD screen displays the main interface.
- If the LED is not green, please check the following:
  - All connections are correct.
  - All external disconnect switches are closed.
  - The DC switch of the inverter is set to the "ON" position.

The following are 3 different states of inverter operation, which means that the inverter starts successfully.

*Waiting:* When the DC output voltage of the photovoltaic panel is higher than 70V (lowest starting voltage) and lower than 90V (lowest working voltage), the inverter waits for checking.

*Checking:* The inverter will automatically detect the DC input. When the DC input voltage of the photovoltaic panel is higher than 90V and the photovoltaic panel has enough energy to start the inverter, the inverter will enter the checking state.

*Normal:* When the inverter is working normally, the green light is always on. At the same time, the power is fed back to the grid, and the LCD displays the output power.

If it is the first time to boot, please follow the prompts to enter the setting interface.



### Warning!

The input terminal of the inverter can be opened only when all the installation work of the inverter has been completed. All electrical connections must be performed by professionals in accordance with local regulations.




### Notice!

If it is the first time to operate the inverter, the system will automatically display setup guide. Please follow the setup guide to complete the basic inverter settings.


## 6 Firmware Upgrading

### ➤ Upgrade Notices

Please read the following precautions before upgrading.




**Warning!**  
 -In order to upgrade the firmware smoothly, if the DSP and ARM firmware need to be upgraded, please note that ARM firmware must be upgraded first, then DSP firmware!  
 -Please make sure that the category format is correct, do not modify the firmware file name, Otherwise, the inverter may not work!



**Warning!**  
 -For SE1-SPT, ensure that the PV input voltage is greater than 100V (upgrade on sunny days). please ensure that the battery SOC is greater than 20% or the battery input voltage is greater than 90V. Otherwise, it may cause serious failure during the upgrade process!




**Caution!**  
 -If the ARM firmware upgrade fails or stops, please do not unplug the U disk power off the inverter and restart it, Then repeat the upgrade steps.



**Caution!**  
 -If the DSP firmware upgrade fails or stops, please check whether the power is off. If it is normal, plug in the U disk again and repeat the upgrade.

### ➤ Upgrade preparation

1) Please check the inverter version and prepare a U disk (USB 2.0/3.0) and personal computer before upgrading.



**Caution!**  
 -Please make sure that the size of the U disk is smaller than 32G, and the format is fat16 or fat 32.

2) Please contact our service support through [contacto@solarever.com.mx](mailto:contacto@solarever.com.mx) to obtain the firmware, and store the firmware in the U disk according to the following path.

### ➤ Upgrade steps

**Step 1.** Please save the "Upgrade" firmware in your U disk , and insert the USB flash drive.

**Step 2.** Observe the LED indicator light.

**Note:** The upgrade sequence is: DSP program, battery master control, battery slave control (twice), ARM program.

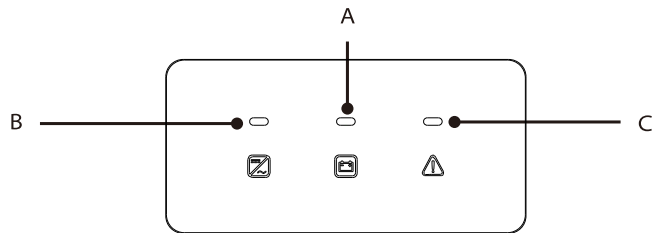
(SE1-SPT 3-3.6k)

Upgrade progress	Indicator
0%-33%	Blue flashing, Green off, Red off
33%-66%	Blue on, Green flashing, Red off
66%-99%	Blue on, Green on, Red flashing
Current object upgrade complete	Blue on, Green on, Red on
All objects upgrade complete	Blue flashing, Green flashing, Red flashing
Upgrade failed	Blue flashing, Green flashing, Red off
Battery upgrade failed	Blue off, Green flashing, Red flashing

(SE1-SPT 6-7k)

Upgrade progress	Indicator
33%	Green flashing, Blue off, Red off
33%-66%	Green on, Blue flashing, Red off
66%-99%	Green on, Blue on, Red flashing
Current object upgrade complete	Green on, Blue on, Red on
All objects upgrade complete	Green flashing, Blue flashing, Red flashing
Upgrade failed	Green flashing, Blue flashing, Red off
Battery upgrade failed	Green off, Blue flashing, Red flashing

## 7 LED Indicator



Object	Name	Description
A	LED Indicator light	Blue light: The inverter is in normal state or Load mode. Blue flashing: The inverter is in the waiting, checking state or the system switch is off. Off: The inverter is in a fault state.
B		Green: The battery communication is normal but the battery MCB is disconnected, and the battery communication is normal and working normally. Green flashing: The battery communication is normal and in an idle state. Off: The battery does not communicate with the inverter.
C		Red light on: The inverter is in a fault state. Off: The inverter has no error.

## 8 Troubleshooting

### 8.1 Troubleshooting

This section contains information and procedures for resolving possible problems with SE1-SPT, and provides you with troubleshooting tips to identify and solve most problems that may occur in SE1-SPT. This section will help you narrow down the source of any problems you may encounter. Please read the troubleshooting steps below. Check the warning or fault information on the system control panel or the fault code on the inverter information panel. If a message is displayed, log it before doing anything further.

Try the solutions indicated in the table below.

Number	Faults	Diagnosis and solution
IE 001	TZ Protect Fault	Overcurrent fault. • Wait for a while to check if you're back to normal. • Disconnect PV+ PV- and batteries, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 002	Grid Lost Fault	• Check battery input voltage if it's within normal range • Or ask the installer for help.
IE 003	Grid Volt Fault	Power grid voltage overrun • Wait a moment, if the utility returns to normal, the system will reconnect. • Please check if the grid voltage is within normal range. • Or ask the installer for help.
IE 004	Grid Freq Fault	Electricity frequency beyond range • If the utility returns to normal, the system reconnects. • Or ask the installer for help.
IE 005	PV Volt Fault	PV voltage out of range • Check the output voltage of the PV panel • Or ask the installer for help.
IE 006	Bus Volt Fault	• press the "ESC" key to restart the inverter. • Check that the PV input open circuit voltage is in the normal range. • Or ask the installer for help.
IE 007	Bat Volt Fault	Battery voltage fault • Check battery input voltage if it's within normal range • Or ask the installer for help.
IE 008	AC10M Volt Fault	• The grid voltage was out of range in the last 10 minutes. • The system will return to normal if the grid returns to normal. • Or ask the installer for help.

Number	Faults	Diagnosis and solution
IE 009	DCI OCP Fault	DCI overcurrent protection fault. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 010	DCV OVP Fault	DCV EPS(Off-grid) overvoltage protection failure. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 011	SW OCP Fault	Software Detection of Overcurrent Fault. • Wait for a while to check if it's back to normal. • Shut down photovoltaic, battery and grid connections • Or ask the installer for help.
IE 012	RC OCP Fault	Overcurrent protection fault. • Check the impedance of DC input and AC output. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 013	Isolation Fault	Insulation Fault • Please check the wire insulation for damage. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 014	Temp Over Fault	Temperature beyond limit • Check if ambient temperature exceeds the limit. • Or ask the installer for help.
IE 015	Bat Con Dir Fault	EPS(Off-grid) mode current is too strong. • Ensure that the load power is within the EPS(Off-grid) power range. • Check for any non-linear load connections on the EPS(Off-grid). • Move this load to check for recovery. • Or ask for help from the installer if it can not return to normal.
IE 016	EPS(Off-grid) Overload Fault	EPS(Off-grid) over load fault. • Shutdown the high-power device and press the "ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 017	OverLoad Fault	On-grid mode over load • Shutdown the high-power device and press the "ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 018	BatPowerLow	• Close the high-power device and press the "ESC" key to restart the inverter. • Please charge the battery to a level higher than the protection capacity or protection voltage
IE 019	BMS Lost	Battery communication loss • Check that the communication lines between the battery and the inverter are properly connected. • Or ask for help from the installer if it can not return to normal.
IE 020	Fan Fault	Fan Fault • Check for any foreign matter that may have caused the fan not to function properly. • Or ask for help from the installer if it can not return to normal.
IE 021	Low Temp	Low temperature fault. • Check if the ambient temperature is too low. • Or ask for help from the installer if it can not return to normal.

Number	Faults	Diagnosis and solution
IE 022	ARM Unmatched	ARM software version mismatch Fault • update the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal .
IE 023	Other Device Fault	Other device Fault • update the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal .
IE 025	InterComms Error	Mgr InterCom Fault • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal .
IE 025	InterComms Error	• Internal communication errors • Shut down photovoltaic, battery and grid connections. • Or ask for help from the installer if it can not return to normal.
IE 026	Inv EEPROM Fault	Inverter EEPROM Fault. • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 027	RCD Fault	Fault of Residual Current Device • Check the impedance of DC input and AC output. • Disconnect PV + PV - and batteries, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 028	Grid Relay Fault	Electrical relay failure • Disconnect PV+ PV- grid and batteries and reconnect. • Or ask for help from the installer if it can not return to normal.
IE 029	EPS(Off-grid) Relay Fault	EPS(Off-grid) relay failure • Disconnect PV+, PV-, grid and batteries and reconnect. • Or ask for help from the installer if it can not return to normal.
IE 030	PV ConnDirFault	PV direction fault • Check if the PV input lines are connected in the opposite direction. • Or ask for help from the installer if it can not return to normal.
IE 031	ChargerRelayFault	Charge relay fault • Press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.
IE 032	EarthRaleyFault	EPS(Off-grid) earth relay fault • Press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.
IE 101	PowerTypeFault	Power type fault • Upgrade the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 102	Port OC Warning	EPS(Off-grid) port over current fault • Check that the EPS(Off-grid) load does not exceed the system requirements, and press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.

Number	Faults	Diagnosis and solution
IE 009	DCI OCP Fault	DCI overcurrent protection fault. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 010	DCV OVP Fault	DCV Load overvoltage protection failure. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 011	SW OCP Fault	Software Detection of Overcurrent Fault. • Wait for a while to check if it's back to normal. • Shut down photovoltaic, battery and grid connections • Or ask the installer for help.
IE 012	RC OCP Fault	Overcurrent protection fault. • Check the impedance of DC input and AC output. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 013	Isolation Fault	Insulation Fault • Please check the wire insulation for damage. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IE 014	Temp Over Fault	Temperature beyond limit • Check if ambient temperature exceeds the limit. • Or ask the installer for help.
IE 015	Bat Con Dir Fault	Load mode current is too strong. • Ensure that the load power is within the Load power range. • Check for any non-linear load connections on the Load. • Move this load to check for recovery. • Or ask for help from the installer if it can not return to normal.
IE 016	Load Overload Fault	Load over load fault. • Shutdown the high-power device and press the "ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 017	OverLoad Fault	On-grid mode over load • Shutdown the high-power device and press the "ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 018	BatPowerLow	• Close the high-power device and press the "ESC" key to restart the inverter. • Please charge the battery to a level higher than the protection capacity or protection voltage
IE 019	BMS Lost	Battery communication loss • Check that the communication lines between the battery and the inverter are properly connected. • Or ask for help from the installer if it can not return to normal.
IE 020	Fan Fault	Fan Fault • Check for any foreign matter that may have caused the fan not to function properly. • Or ask for help from the installer if it can not return to normal.
IE 021	Low Temp	Low temperature fault. • Check if the ambient temperature is too low. • Or ask for help from the installer if it can not return to normal.

Number	Faults	Diagnosis and solution
IE 022	ARM Unmatched	ARM software version mismatch Fault • update the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal .
IE 023	Other Device Fault	Other device Fault • update the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal .
IE 025	InterComms Error	Mgr InterCom Fault • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal .
IE 025	InterComms Error	• Internal communication errors • Shut down photovoltaic, battery and grid connections. • Or ask for help from the installer if it can not return to normal.
IE 026	Inv EEPROM Fault	Inverter EEPROM Fault. • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 027	RCD Fault	Fault of Residual Current Device • Check the impedance of DC input and AC output. • Disconnect PV+ ,PV- and batteries, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 028	Grid Relay Fault	Electrical relay failure • Disconnect PV+ ,PV- grid and batteries and reconnect. • Or ask for help from the installer if it can not return to normal.
IE 029	Load Relay Fault	Load relay failure • Disconnect PV+ ,PV-, grid and batteries and reconnect. • Or ask for help from the installer if it can not return to normal.
IE 030	PV ConnDirFault	PV direction fault • Check if the PV input lines are connected in the opposite direction. • Or ask for help from the installer if it can not return to normal.
IE 031	ChargerRelayFault	Charge relay fault • Press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.
IE 032	EarthRaleyFault	Load earth relay fault • Press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.
IE 101	PowerTypeFault	Power type fault • Upgrade the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 102	Port OC Warning	Load port over current fault • Check that the load does not exceed the system requirements, and press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.

Number	Faults	Diagnosis and solution
IE 103	Mgr EEPROM Fault	Manager EEPROM Fault. <ul style="list-style-type: none"> <li>• Shut down photovoltaic, battery and grid, reconnect.</li> <li>• Or seek help from the installer if it can not return to normal.</li> </ul>
IE 104	DSPUnmatched	DSP version error. <ul style="list-style-type: none"> <li>• Check that the DSP1 version matches</li> <li>• Or seek help from the installer if it can not return to normal.</li> </ul>
IE 105	NTC Sample Invalid	NTC invalid <ul style="list-style-type: none"> <li>• Make sure the NTC is properly connected and the NTC is in good condition.</li> <li>• Please confirm that the installation environment is normal</li> <li>• Or ask for help from the installer, if it can not return to normal.</li> </ul>
IE 106	Bat Temp Low	Battery temp low <ul style="list-style-type: none"> <li>• Check the battery installation environment to ensure good heat dissipation.</li> <li>• Or ask for help from the installer, if it can not return to normal.</li> </ul>
IE 107	Bat Temp High	Battery temp high <ul style="list-style-type: none"> <li>• Check the battery installation environment to ensure good heat dissipation.</li> <li>• Or ask for help from the installer, if it can not return to normal.</li> </ul>
IE 109	Meter Fault	Meter error <ul style="list-style-type: none"> <li>• Please check that the instrument is working properly.</li> <li>• Or seek help from the installer if it can not return to normal.</li> </ul>
IE 110	BypassRaleyFault	Bypass relay fault <ul style="list-style-type: none"> <li>• Press the ESC" key to restart the inverter. .</li> <li>• Or ask for help from the installer if it can not return to normal.</li> </ul>
BE 001	BMS_External_Err	Battery Error - External Communication Fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 002	BMS_Internal_Err	Battery Error - Internal Communication Fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 003	BMS_OverVoltage	Over voltage in battery system <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 004	BMS_LowerVoltage	Low voltage in battery system <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 005	BMS_ChargeOCP	Battery fault - over charge fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 006	BMS_DischargeOCP	Battery fault-discharge over current fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 007	BMS_TemHigh	Over temperature in battery system <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 008	BMS_TempSensor Fault	Battery temperature sensor malfunction <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>

Number	Faults	Diagnosis and solution
BE 009	BMS_CellImblance	Battery Unbalanced Failure <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 010	BMS_Hardware Protect	Battery hardware protection failure <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 011	BMS_Circuit_Fault	Battery circuit failure <ul style="list-style-type: none"> <li>• Restart the battery .</li> <li>• Please contact the battery supplier.</li> </ul>
BE 012	BMS_ISO_Fault	Battery insulation failure <ul style="list-style-type: none"> <li>• Check that the battery is properly grounded and restart the battery.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 013	BMS_VolSen_Fault	Battery voltage sensor fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 014	BMS_TemppSen_Fault	Temperature sensor failure <ul style="list-style-type: none"> <li>• Restart the battery .</li> <li>• Please contact the battery supplier.</li> </ul>
BE 015	BMS_CurSensor Fault	Battery current sensor fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 016	BMS_Relay Fault	Battery relay failure <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 017	BMS_Type_Unmatch	Battery type failure <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 018	BMS_Ver_ Unmatch	Battery version mismatch failure <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 019	BMS_MFR_ Unmatch	Battery manufacturer did not match the fault <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 020	BMS_SW_ Unmatch	Battery hardware and software mismatch failure <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 021	BMS_M&S_ Unmatch	Battery master slave control mismatches <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 022	BMS_CR_ NORespond	Battery charging request does not respond to a fault <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 023	BMS_SW_ Protect	Battery slave software protection failure <ul style="list-style-type: none"> <li>• Upgrade the battery BMS software.</li> <li>• Please contact the battery supplier.</li> </ul>
BE 024	BMS_536_Fault	Battery fault-discharge over current fault <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>
BE 025	BMS_SelfcheckErr	Over temperature in battery system <ul style="list-style-type: none"> <li>• Please contact the battery supplier.</li> </ul>



Number	Faults	Diagnosis and solution
BE 026	BMS_TempdiffErr	Battery temperature sensor malfunction • Please contact the battery supplier.
BE 027	BMS_BreakFault	Battery Unbalanced Failure • Please contact the battery supplier.
BE 028	BMS_Flash_Fault	Battery hardware protection failure • Please contact the battery supplier.
BE 029	BMS_Precharge_Fault	Battery precharge failure • Please contact the battery supplier.
BE 030	BMS_AirSwitch_Fault	Battery air switch failure • Check that the battery breaker is off. • Please contact the battery supplier.

• If the information panel of your inverter does not show the fault light, check the following list to ensure the current installation status, correct operation.

- Is the inverter located in a clean, dry and well-ventilated place?
- Is the DC input circuit breaker open?
- Is the specification and length of the cable adequate?
- Are the input and output connections and wiring in good condition?
- Is the configuration set correct for your particular installation?

Please contact Solarever customer service for further assistance. Please be prepared to describe the details of your system installation and provide the inverter serial number.

## 8.2 Routine Maintenance

Inverter do not require any maintenance or correction in most cases, but if the inverter often loses power due to overheating, this can be attributed to the following reason:

- heat sink behind the inverter is covered with dirt.  
If necessary, clean the cooling heat sink with a soft dry cloth or brush.

Only trained and authorized professionals familiar with safety requirements can perform maintenance and maintenance work.

### ➤ Safety inspections

Safety checks should be conducted at least every 12 months, please contact the manufacturer to arrange for appropriate training, expertise, and practical experience in performing these tests. (Please note that this action is not covered by warranty). These data should be recorded in the device log. If the equipment is not running properly or any test fails, the equipment must be repaired for details of safety inspections, refer to section 2 of this manual for safety instructions and european commission instructions.

### ➤ Regular maintenance

Only qualified people can do the following work.

In the process of using frequency converter, the manager should check and maintain the machine regularly. The specific operation is as follows.

1. Check whether the heat sink is covered with dirt, clean the inverter and absorb dust if necessary. This work should be performed from time to time.
2. Check whether the frequency converter indicator is normal, check whether the frequency converter button is normal, check whether the frequency converter display is normal. This inspection should be conducted at least every 6 months.
3. Check the input and output lines for damage or aging. This inspection should be conducted at least every 6 months.
4. Cleaning and safety inspection of PV modules should be carried out at least once every 6 months.

## 9 Decommissioning

### 9.1 Disassemble of Inverter

- Remove DC input line and AC output line of inverter.
- Wait for at least 5 minutes to power off.
- Remove all cable connections from the inverter.
- Remove inverter from finger support the bracket.
- Remove the bracket if necessary.

### 9.2 Packing

Load the inverter into the original package if possible.

- If the original package can not be found, you can also use the following requirements of the carton packaging:  
Bearing capacity of more than 30kg.  
Easy to carry.  
Can completely seal the cover.

### 9.3 Storage and Transportation

Store the inverter in a dry, temperature  $-40^{\circ}\text{C}\sim 65^{\circ}\text{C}$  environment.  
Pay attention to less than four inverter on each stack board during storage and transportation.

### 9.4 Waste Disposal

If it is necessary to scrap the inverter or other related parts, be sure to send the waste inverter and packaging materials to the designated location for recycling by the relevant department.

## 10 Disclaimer

The SE1-SPT series hybrid inverters are transported, used and operated under limited condition, such as environmental, electrical etc. Solarever shall not be liable to provide the service, technical support or compensation under conditions listed below, including but not limited to :

- Inverter is damaged or broken by force majeure (such as earthquake, flooding, thunderstorm, lighting, fire hazard, volcanic eruption etc).
  - Inverter's warranty is expired and doesn't buy extended warranty.
  - Can't provide the inverter's SN, warranty card or invoice.
  - Inverter is damaged by man-made cause. Inverter is used or operated against any items in local policy.
  - Inverter's installation, configuration, commissioning doesn't follow the requirements mentioned in this manual.
  - Inverter is installed, refitted or operated in improper ways mentioned in this manual without authority from Solarever.
  - Inverter is installed, operated under improper environment or electrical condition mentioned in this manual without authority from Solarever.
  - Inverter is changed, updated or disassembled on hardware or software without authority from Solarever.
  - Obtain the communication protocol from other illegal channels.
  - Build monitoring, control system without authority from Solarever.
  - Connect to other brands batteries without authority from Solarever.
- Solarever will keep right to explain all the contents in this user manual.

## 11 APP User Guide

**Step 1:** Use a laptop/smartphone to search for WiFi signal from the inverter system and connect it. (SSID:WiFi\_SXxxxxxxx)

**Step 2:** Scan the QR code in the upper left corner to download the SOLAREVER APP and open it. Touch the local button on the login interface or on the account page to enter local mode.

**Step 3:** Download the instruction manual and follow the instructions.



# Warranty Registration Form



### For Customer (Compulsory)

Name ..... Country .....

Phone Number ..... Email .....

Address .....

State ..... Zip Code .....

Product Serial Number .....

Date of Commissioning .....

Installation Company Name .....

Installer Name ..... Electrician License No. ....

### For Installer

#### Module ( If Any )

Module Brand .....

Module Size(W) .....

Number of String ..... Number of Panel Per String .....

#### Battery ( If Any )

Battery Type .....

Brand .....

Number of Battery Attached .....

Date of Delivery ..... Signature .....

Please visit our warranty website: <https://www.solarever.com.mx/#/warranty> to complete the online warranty registration or use your mobile phone to scan the QR code to register.

For more detailed warranty terms, please visit Solarever official website: [www.solarever.com.mx](http://www.solarever.com.mx) to check it.

