

Solavita



SWH

5/8/10/12/15 kW

Three-phase Hybrid Inverter (High Voltage)

User Manual

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Notes on This Manual

Scope of Validity:

This manual is an integral part of the hybrid inverter. This manual describes the assembly, installation, commissioning, maintenance and troubleshooting of the following model(s) of products:

SWH005KH-T1

SWH008KH-T1

SWH010KH-T1

SWH012KH-T1

SWH015KH-T1

Note: Please keep this manual where it will be accessible at all times.

Target Group:

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

Keep the User Manual Properly:

This manual serves as an integral part of the device, and you may print out the electronic copy of the user manual on paper as needed, and keep the paper and electronic files in a safe place for subsequent reference. Anyone operating the device at any time must do so in accordance with the requirements of this manual.





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This manual may be updated based on user or customer feedback. Please visit our website at www.solavita-ess.com to view the latest version.

Symbols Used







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

	Danger! "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.
	Warning! "Warning" indicates a dangerous situation, which, if not avoided, may result in serious injury or death.
	Caution! "Caution" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	Note! "Note" provides tips that are valuable for the optimal operation of our product.










1. Important Safety Instructions

This chapter contains important safety and operating precautions. Read and save this manual for future reference. Before using this device, please read all instructions and warning signs on the device to understand the battery and all relevant sections of this manual.

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

	<p>Danger!</p> <p>Danger to life due to high voltages in the inverter!</p> <p>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.</p>
	<p>Caution!</p> <p>When the inverter is running, only the display and keys of the inverter can be touched.. The temperature of the shell is high and there is a risk of scalding.</p>
	<p>Caution!</p> <p>To reduce the risk of injury, charge only lifepo4 batteries. Other types of batteries may explode, causing personal injury and damage.</p>
	<p>Warning!</p> <p>Before performing maintenance, cleaning or operation on the circuit connected to the inverter, authorized maintenance personnel must first disconnect the AC and DC power supplies of the inverter.</p>
	<p>Warning!</p> <p>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.</p>
	<p>Note!</p> <p>Ground PV system. Finish PV modules and photovoltaic system grounding in accordance with local requirements to achieve optimal protection of systems and personnel.</p>

This section explains the symbols shown on the energy station and on the type label:

	Symbol Explanation CE mark. The energy station complies with the requirements of the applicable CE guidelines.
	UKCA mark. The inverter complies with the requirements of the applicable UKCA guidelines.
	Beware of hot surface. The energy station 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!
	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.
	Observe enclosed documentation.
	The inverter can not be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	PE conductor terminal.

2. Introduction

2.1 Basic Information

SWH005~015KH-T1 hybrid inverters are three-phase PV hybrid inverters that combine a grid-connected PV inverter with battery storage. It has built-in multiple operating modes to suit the diversified needs of users.

The SWH005~015KH-T1 hybrid inverters provide a complete solution for the rising cost of energy such as Gas and coal, the decreasing energy subsidy for grid-connected PV systems, mountainous areas or base stations without power grids, and the need for uninterruptible power supply and emergency power supply.

2.2 Basic Features

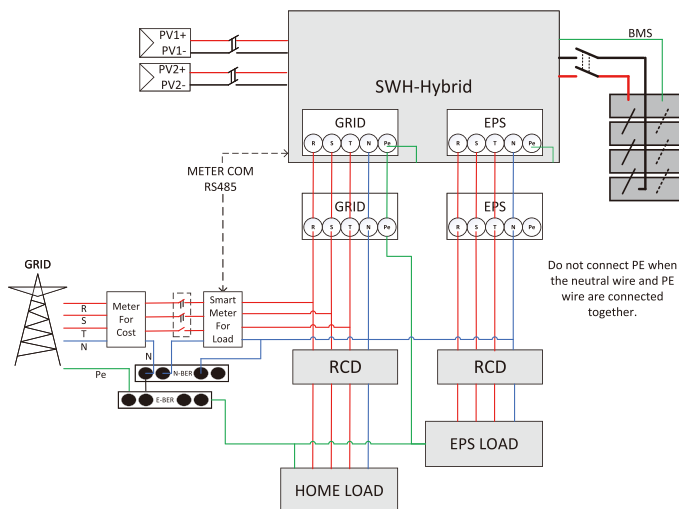
SWH005~015KH-T1 hybrid inverters allow up to 10% overload for maximum power output, and The uninterruptible power supply (UPS) mode can support inductive loads with an automatic switching time of less than 10 milliseconds.

- System advantages:
 - Advanced DSP control technology.
 - Utilizes the latest high-efficiency power component.
 - Advanced anti-islanding solutions.
 - IP66 protection level.
 - Max. Efficiency up to 98%. EU efficiency up to 97.3%. THD<3%.
 - Safety & Reliability: Transformerless design with software and hardware protection.
 - Export limitation (Meter/DRM0).
 - Power factor regulation. Friendly HMI.
 - LED status indications.
 - LCD display technical data, human-machine interaction through four touch keys.
 - PC remote control.

Note: In accordance with Australian safety standards, the neutral wires of the on-grid side and backup side must be connected together. Failure to do so will result in the backup function not operating correctly.

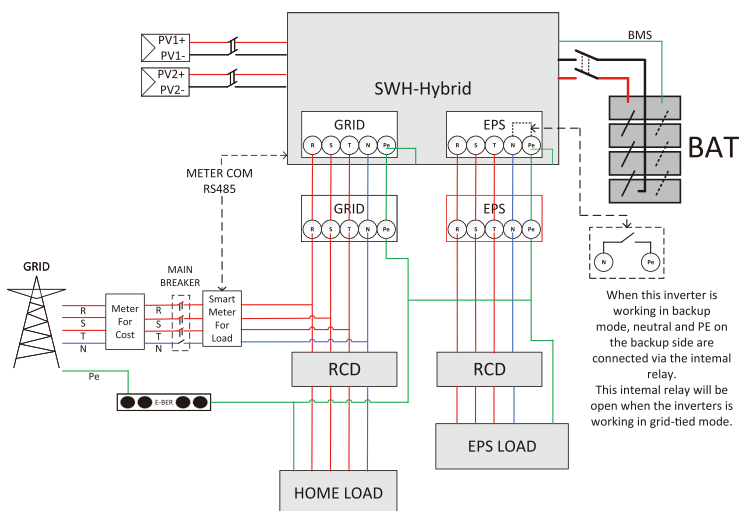
This diagram illustrates an example where the neutral is connected to the PE in a distribution box.

For countries like Australia, New Zealand, South Africa, etc., please follow local wiring regulations.



This diagram is an example for an application in which neutral is separated from the PE in the distribution box.

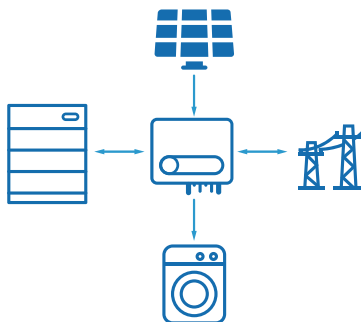
For countries such as China, Germany, the Czech Republic, Italy, etc, please follow local wiring regulations.



Work modes:**Mode 1: Self-Use Mode**

Supply Priority: PV > Battery > Grid

Load Priority: Household Loads > Battery > Grid



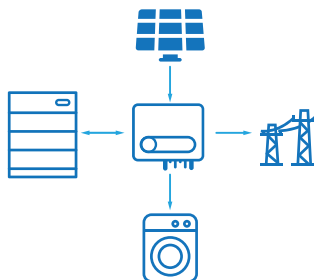
During daylight hours with sufficient sunlight (clear weather), solar photovoltaic (PV) power is first supplied to meet household loads. Any surplus PV energy is used to charge the battery. If there is excess electricity remaining, it is exported to the grid for power trading (with an export limit power value setting).

In the event of insufficient sunlight during the day (cloudy/rainy/snowy weather), electricity required beyond what the PV system can provide is primarily sourced from discharging the battery. If additional power is still needed, it is supplemented by purchasing electricity from the grid.

Mode 2: Feed in Grid Mode

Supply Priority: PV > Battery > Grid

Load Priority: Household Loads > Grid > Battery



During daytime with sufficient sunlight (clear weather), solar photovoltaic (PV) generation first supplies electricity to meet household loads. Any surplus PV energy is exported to the grid for power trading (with an anti-reverse power setting).

In case of insufficient sunlight during the day (cloudy/rainy/snowy weather), electricity needed for household loads beyond what the PV system can provide is primarily sourced from discharging

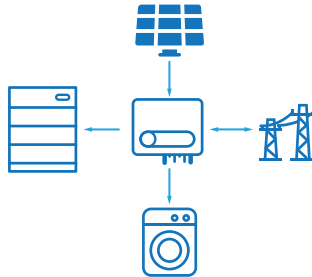
the battery. Surplus battery power is exported to the grid for power trading. If the battery discharge rate cannot meet load demands, electricity is then purchased from the grid to supplement.

The power generated by the PV system will first supply the loads. Any surplus will be fed into the grid, with the remaining power then used to charge the battery.

Mode 3: Back-Up Mode

Supply Priority: PV > Grid

Load Priority: Battery > Household Loads > Grid



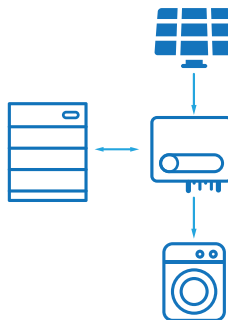
During daylight hours with sufficient sunlight (clear weather), solar photovoltaic (PV) generation first charges the battery up to its maximum charging capacity. Any surplus electricity after achieving maximum charge is then used to supply household loads. If the PV system cannot meet the full electricity demand of the loads, electricity is supplemented by purchasing from the grid.

In case of insufficient sunlight during the day (cloudy/rainy/snowy weather), all PV generation is directed towards charging the battery. Any shortfall in the required charging power for the battery is supplemented by purchasing electricity from the grid. Household loads are powered directly from the grid.

Mode 4: Off_Grid Mode

Application Scenario:

Ideal for areas with frequent grid fluctuations or power outages.



In the event of grid abnormalities or power outage, causing the inverter to enter Off_Grid mode:

EPS loads are powered by both solar PV and the battery simultaneously.

Solar PV generation first satisfies the load requirements. Any surplus solar energy is used to charge the battery.

If solar PV output fluctuates and is insufficient to support the load, the battery quickly discharges to support the load.

Tips:

A pure solar PV input system cannot enter Off_Grid mode. It requires a reliable battery connection with a minimum State of Charge (SOC) requirement for energy storage systems to operate in Off_Grid mode.

Different battery combinations provide varying EPS load capacities, with detailed information provided in the manual.

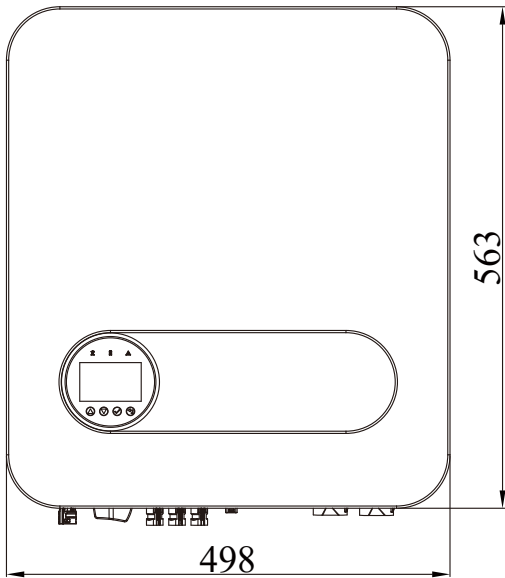
Notice:

In the power station state, if the battery power is too high or too low, the error of bat invalid will appear.

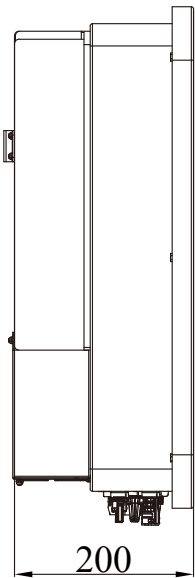
Note:

Charging time is when the battery is charged within the set time range. The setting of charging time can be used in the above work modes. The charging period is mainly used to set the charging time from the power grid to the battery.

2.3 Dimensions

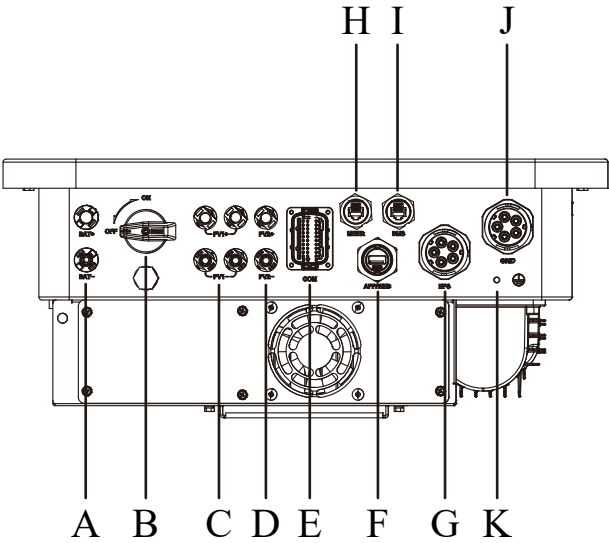


Front View



Side View

2.4 Terminals






Object	Description	Object	Description
A	Battery connection port	G	Eps port
B	DC switch	H	Meter port
C	PV1 connection port	I	BATTERY BMS port
D	PV2 connection port	J	Grid port
E	COM port	K	Grounding port
F	USB port		

Note : Only authorized personnel can set up a connection.

3. Installation

Note:

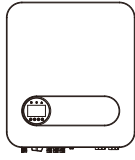
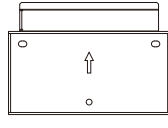
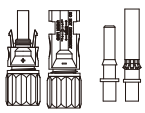
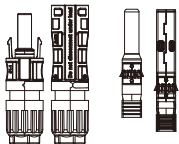


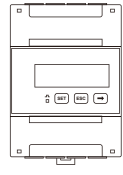



	Danger: Do not install SWH005~015KH-T1 on flammable materials. Do not install SWH005~015KH-T1 in a place where flammable or explosive materials are stored.
	The casing and heat sink of the inverter become extremely hot during operation. Avoid installing SWH005~015KH-T1 in areas where accidental contact may occur.
	Consider the weight of the inverter when transporting and moving it. Select a suitable mounting location and surface. Equip at least 2 persons to install the inverter.



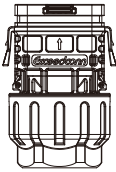



3.1 Check for Transport Damage

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

3.2 Packing List

Open the package and take out the product, please check the accessories first. The packing list is shown below.

				
Inverter*1	Bracket*1	PV connector*3	Battery connector*1	AC connector
				
AC connector (yellow)	Smart meter	User Manual	Certificate of conformity	Factory Inspection Report

				
Expansion tube*3 Expansion screw*3	Phillips screw*1	Communication connector	Data logger	OT terminal
				
RJ45*2				




Note:

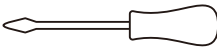
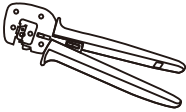
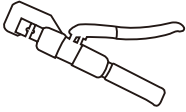
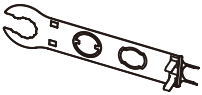
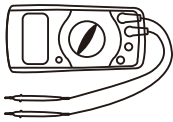
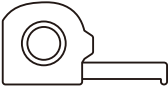
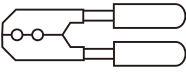
SWH005KH-T1, SWH008KH-T1 with two sets of PV connectors and PV pin contacts

SWH010KH-T1, SWH012KH-T1, SWH015KH-T1with three sets of PV connectors and

PV pin contacts

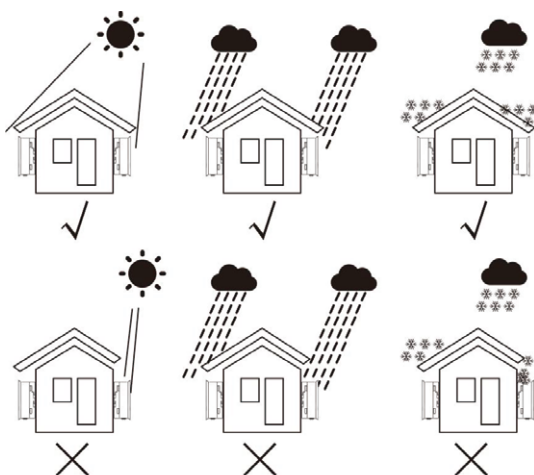
3.3 Tool Preparation

Number	Tool	Description	Function
1	Bit Φ8 	Hammer drill (Recommended 6mm drill bits)	Punching holes in the wall and installing the bracket
2		Spirit level	Ensure that the bracket is mounted horizontally
3		Marker pen	Marking of perforation positions

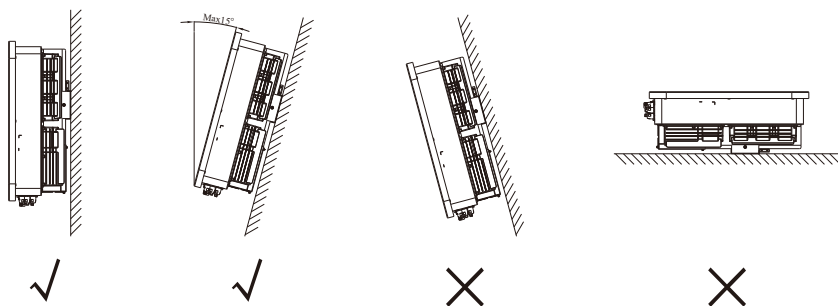
4		screwdrivers	Remove mounting screws and wiring
5		PV terminal crimping tool	Crimp PV
6		Wire stripper	wire stripping
7		PV Wrench	Remove PV terminal
8		Multimeter	Check that the PV± pole, AC wiring is correct and grounding is reliable.
9		tape rule	measuring distance
10		Network cable crimper	Tools for crimping network cables

3.4 Installation Environment


1. The hybrid inverter operates optimally when the ambient temperature is not higher than 45°C. The hybrid inverter is also designed for use in a wide range of applications.
2. The mounting height should preferably be parallel to the line of sight for ease of operation and maintenance.
3. The installation environment of the hybrid inverter should be far away from flammable and explosive materials and ensure that there is no strong electromagnetic interference equipment around.
4. The parameter labels and warning signs must be clearly visible after the hybrid inverter is installed.
5. When installing the hybrid inverter, ensure it is protected from sunlight, rain, and snow during operation.



Install the hybrid inverter at a maximum back tilt of 15 degrees, the hybrid inverter can not be tilted forward, inverted, excessive back tilted or side tilted.

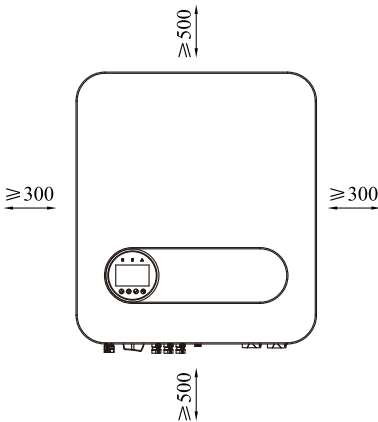


3.5 Installation Space Requirements



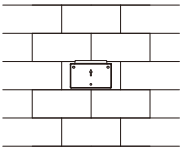
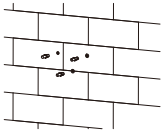
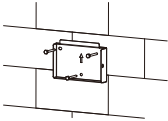
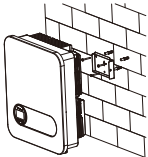
Danger!
Always ensure that the inverter cooling system or vents are unobstructed.

Considering heat dissipation and ease of disassembly, as well as ensuring sufficient space around the hybrid inverter for ventilation, the minimum distance around the hybrid inverter should not be less than the following values.





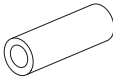
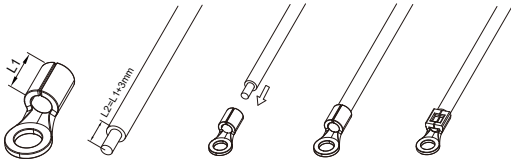
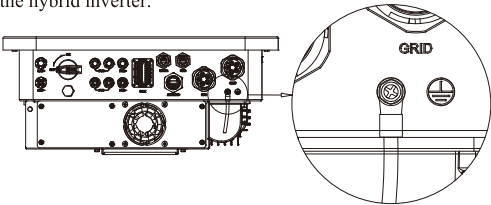
Position	Min Distance
Left	300mm
Right	300mm
Top	500mm
Bottom	500mm

3.6 Mounting

Procedure	
Step 1	<div>Place the bracket at the installation point and use a level to adjust it to a horizontal angle. Mark the drilling positions with a marker.</div> 
Step 2	<div>Drill holes in the wall using a hammer drill. Ensure the drill is held perpendicular to the wall, and make the holes slightly deeper than the length of the plastic expansion anchors.</div> 
Step 3	<div>Carefully hammer the expansion anchors into the drilled holes, and then secure the bracket with expansion screws.</div> 
Step 4	<div>Lift the hybrid inverter onto the bracket, ensuring the grooves align properly. Secure the hybrid inverter to the bracket with screws.</div> 

4. Electrical Connections

4.1 Grounding Connection

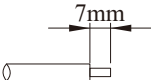
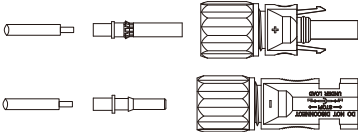
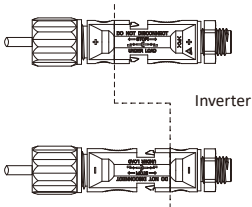
Procedure	
Step 1	<p>Prepare a one-core cable (4~6 mm²), and then find the ground terminal in the accessories.</p> <div></div> <p>one-core cable (4~6 mm²) Phillips screw OT terminal</p>
Step 2	<p>Strip the grounding cable insulation(length*L2), insert the stripped cable into the ring terminal, and then clamp it.</p> <div></div>
Step 3	<p>Find the ground connection port on the hybrid inverter, and screw the ground wire on the hybrid inverter.</p> <div></div>

4.2 PV Connection

Note:

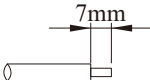
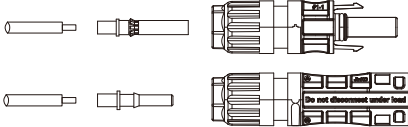
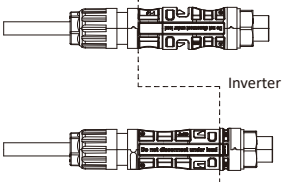
- 1) Before connecting the photovoltaic (PV) strings, ensure that the DC switch is in the off position.
- 2) Ensure that the polarity of the PV strings matches that of the DC connectors; otherwise, the hybrid inverter may be damaged.
- 3) Ensure that under no circumstances does the open-circuit voltage of the PV strings exceed the hybrid inverter's maximum input voltage of 1100V.
- 4) The positive and negative terminals of the PV strings must not be connected to the PE (ground) line, as this will cause damage to the hybrid inverter.

Inverter Model	SWH005KH-T1	SWH008KH-T1	SWH010KH-T1	SWH012KH-T1	SWH015KH-T1
Recommended Cable	4 mm ²	4 mm ²	4 mm ²	4 mm ²	4 mm ²

Procedure	
Step 1	<p>Turn off the DC switch, connect the PV module, prepare a 4 mm² PV cable, and trim 7mm of insulation from the wire end.</p> 
Step 2	<p>Separate the DC connector (PV) as below.</p> 
Step 3	<p>Insert the stripped cable into the pin contact, ensuring all conductor strands are fully enclosed within the pin contact.</p>
Step 4	<p>Use a crimping tool to crimp the pin contact. Place the pin contact with the stripped cable into the appropriate slot of the crimping tool and crimp it securely.</p>
Step 5	<p>Insert the pin contact through the cable nut to secure it into the back of the male or female plug. A “click” sound or tactile feedback indicates that the pin contact is properly seated.</p> 
Unlock	<p>Unlock the DC connector Use the specified wrench tool. When separating the DC + connector, push the tool down from the top When separating the DC - connector, push the tool down from the bottom. Separate the connectors by hand.</p>

4.3 Battery Connection

Inverter Model	SWH005KH-T1	SWH008KH-T1	SWH010KH-T1	SWH012KH-T1	SWH015KH-T1
Recommended Cable	6 mm ²	6 mm ²	6 mm ²	6 mm ²	6 mm ²

Procedure	
Step 1	<p>Turn off the DC switch, connect the PV module, prepare a 6 mm² BAT cable, and trim 7mm of insulation from the wire end.</p> 
Step 2	<p>Separate the DC connector (battery) as below.</p> 
Step 3	<p>Insert the stripped cable into the pin contact, ensuring all conductor strands are fully enclosed within the pin contact.</p>
Step 4	<p>Use a crimping tool to crimp the pin contact. Place the pin contact with the stripped cable into the appropriate slot of the crimping tool and crimp it securely.</p>
Step 5	<p>Insert the pin contact through the cable nut to secure it into the back of the male or female plug. A “click” sound or tactile feedback indicates that the pin contact is properly seated.</p> 
Unlock	<p>Unlock the DC connector Use the specified wrench tool. When separating the DC + connector, push the tool down from the top When separating the DC - connector, push the tool down from the bottom. Separate the connectors by hand.</p>

4.4 Grid and EPS(Off-grid) Connection

Inverter Type	SWH005KH-T1	SWH008KH-T1	SWH010KH-T1	SWH012KH-T1	SWH015KH-T1
Grid	4.0-6.0mm ²	4.0-6.0mm ²	4.0-6.0mm ²	6.0-10.0mm ²	6.0-10.0mm ²
EPS	4.0-6.0mm ²	4.0-6.0mm ²	4.0-6.0mm ²	6.0-10.0mm ²	6.0-10.0mm ²
Micro-Breaker	25A	25A	25A	40A	40A

Diagram A: N line and PE line together(Applicable to Australia)

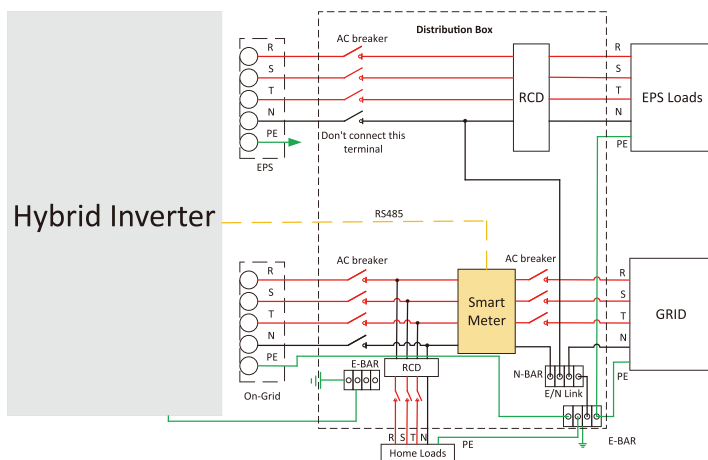
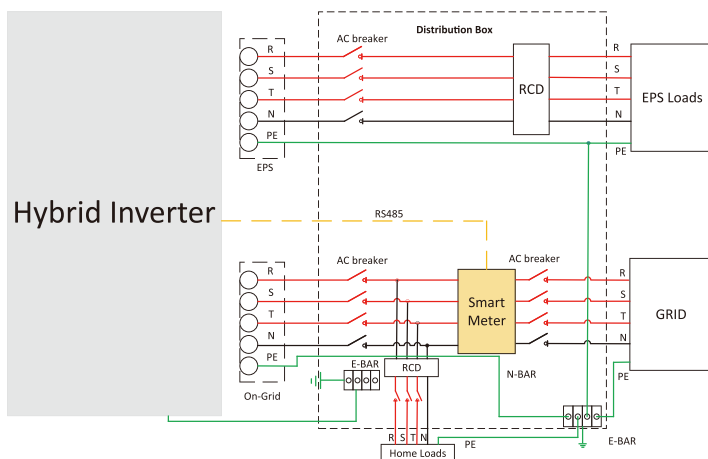
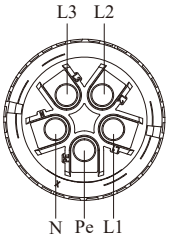
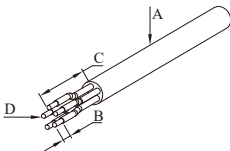
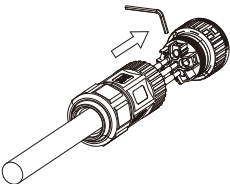
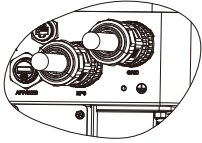
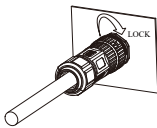
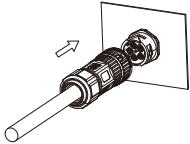


Diagram B: N line and PE line separate wiring(For most countries)



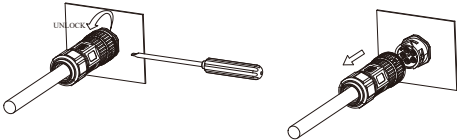


Procedure											
Step 1	Prepare a Grid cable and an EPS(Off-grid) cable.										
Step 2	<div>Strip the wires with wire strippers according to the diagram below.</div> <div><table><tr><th>Number</th><th>Requirement</th></tr><tr><td>A</td><td>15-20mm</td></tr><tr><td>B</td><td>16mm</td></tr><tr><td>C</td><td>50mm</td></tr><tr><td>D</td><td>4-10mm²</td></tr></table></div>	Number	Requirement	A	15-20mm	B	16mm	C	50mm	D	4-10mm ²
Number	Requirement										
A	15-20mm										
B	16mm										
C	50mm										
D	4-10mm ²										
Step 3	<div>Put the AC cable through the terminal nut and sheath, then insert it into the corresponding numbered terminal and secure it tightly.</div> <div></div>										
Step 4	<div>Align both ends of the terminal with the bayonet catch, then push them together and rotate clockwise. A clicking sound will indicate a successful connection.</div> <div></div>										

Step 5

Unlock AC connector

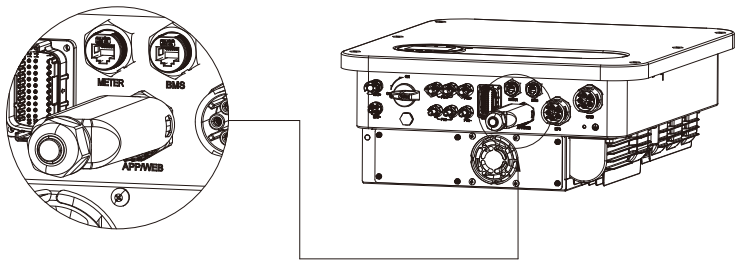
Push the button with a flat-head screwdriver and pull out the terminal by turning it counterclockwise.



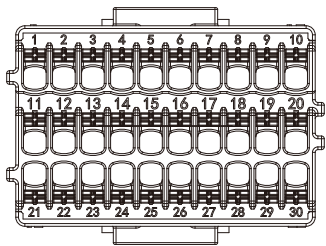
4.5 Communication Connection

4.5.1 APP/WEB Connection

The USB data interface is primarily used to connect a Data logger.



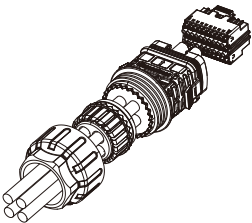
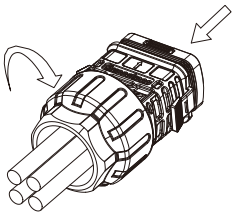
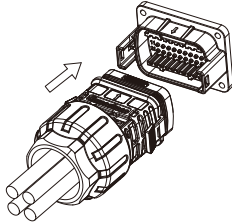
4.5.2 COM Definition



PIN	1	2	3	4	5	6
External interface	IL2+	IL2-	IL1-	IL3+	IL1+	IL3-
Definition	External CT sampling					

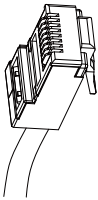
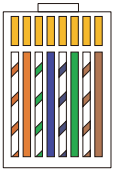
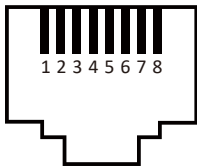
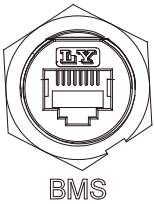
PIN	16	17	18	19	20
External interface	COM/LOAD0	DRM4/8	DRM3/7	DRM2/6	DRM1/5
Definition	DRM				

PIN	21	22	23	24
External interface	RS485+_Parallel	RS485+_Parallel	RS485-_Parallel	RS485-_Parallel
Definition	Inverter Parallel Interface			

Procedure	
Step 1	<div>COM port component is shown below.</div> 
Step 2	<div>Push the main component into the rubber core and assemble it into place when you hear a clicking sound.</div> 
Step 3	<div>Align the COM port slot at the bottom of the hybrid inverter and insert this terminal.</div> 

4.5.3 BMS Connection

The BMS (Battery Management System) communication interface is used for CAN communication between the hybrid inverter and the lithium battery BMS. If this wire is poor, the communication between the hybrid inverter and BMS will not work properly. The stable SOC value displayed on the hybrid inverter home page is a good performance of communication.



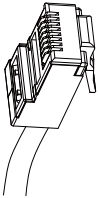
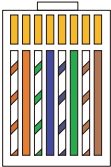
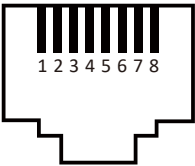
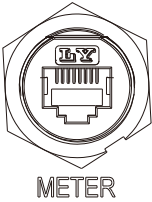
Pin \ Port	1	2	3	4	5	6	7	8
BMS	5V	/	GND	/	CANL	/	CANH	/

Procedure	
Step 1	<p>Prepare a standard network cable and cable connector, then insert the network cable through the cable connector.</p>
Step 2	<p>Crimp the cable with a RJ45 plug which is inside of the cable connector.</p>
Step 3	<p>Insert the communication cable into the RJ45 connector. Lock the connector by turning clockwise.</p>

4.5.4 Smart Meter Communication Interface

Meter Connection

The meter and RS485 should be connected to the hybrid inverter using the connector shown in the figure below. Each port on the connector must be connected to the corresponding port on the hybrid inverter.

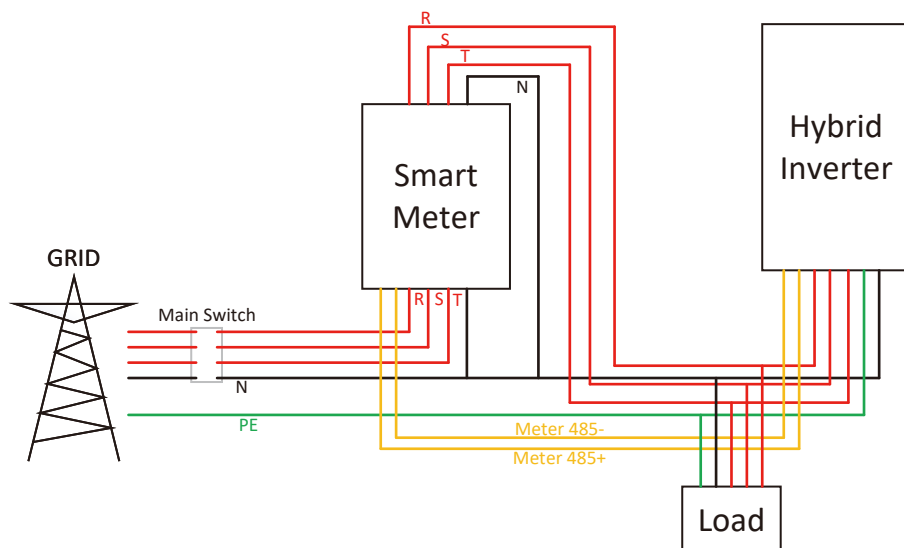


Pin	1	2	3	4	5	6	7	8
Port								
Meter	/	/	GND	/	485A	/	485B	/

Procedure	
Step 1	<p>Prepare a standard network cable and cable connector, then insert the network cable through the cable connector.</p>
Step 2	<p>Crimp the cable with a RJ45 plug which is inside of the cable connector.</p>
Step 3	<p>Insert the communication cable into the RJ45 connector. Lock the connector by turning clockwise.</p>

Note:

1. Compatible Meter type: DTSU666 (CHINT).
2. For other pin definitions, please refer to the user manual.
3. Communication A and B are marked on the side of the meter.
4. Please check and configure the meter before use:
Add: 1;Baud:9600
5. The Meter connections and grid connections are shown in the figure below.



4.5.5 Parallel Connection

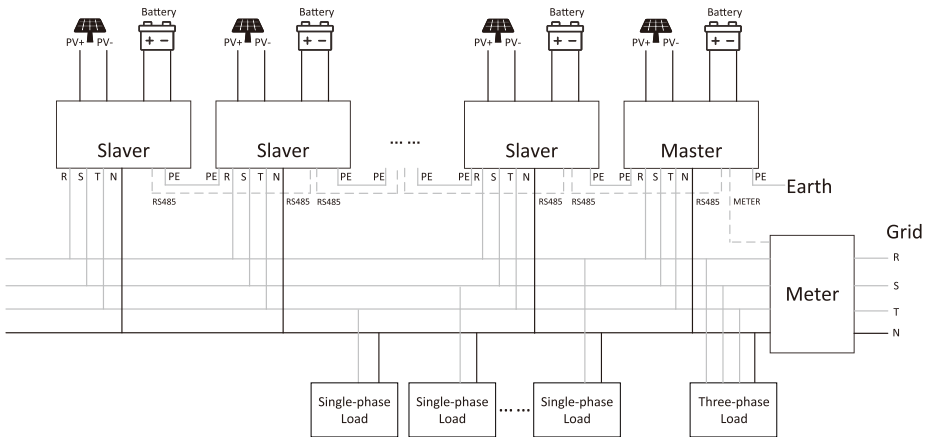
A. On-Grid Parallel Connection

SWH series hybrid inverter provides the parallel connection function which should make four hybrid inverters maximumly connected in one system when the grid is on. In this system, one inverter will be set as the "Master inverter" which will control every other inverter's energy management and dispatch control. Only one meter needs to be connected in this system and communicate with the "Master inverter", and all other slaver inverter communicate with "Master inverter" by RS485 communication parallel connection.

Please note the parallel connection function can only be used when the grid is on.

PIN	21	22	23	24
External interface	RS485+_Parallel	RS485+_Parallel	RS485-_Parallel	RS485-_Parallel
Definition	Inverter Parallel Interface			

The system diagram is as follows:



4.5.6 EPS Connection (Non-parallel State)

Common loads description

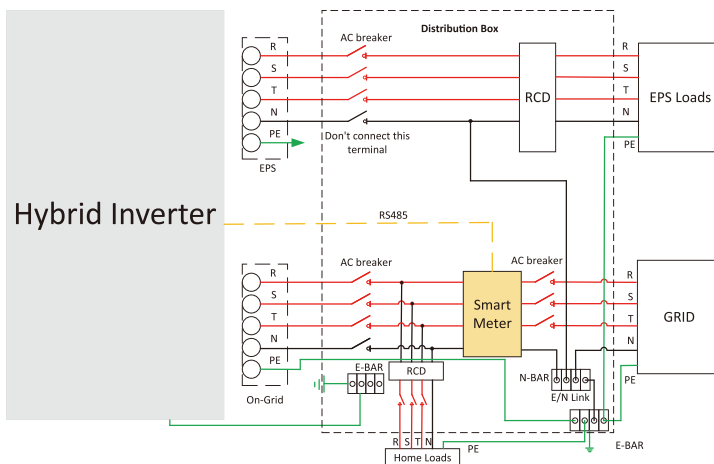
Under EPS mode, if need to connect the inductive load on EPS port, please ensure that the instantaneous power of the load at startup is lower than the maximum power of the EPS mode. Please refer to your loads' manual for the actual specs.

Unipolar load is not supported. Half-wave load is not supported.

For some motor loads, the starting current may be far more than 5 times the current, which is also not supported.

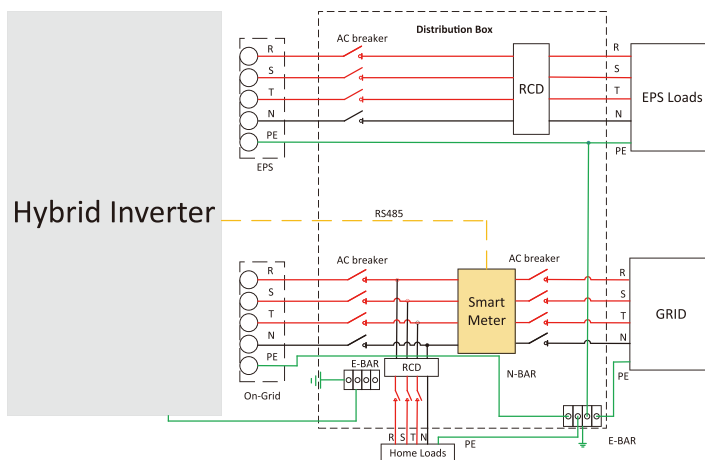
4.5.7 System Connection Diagrams

For countries such as Australia, New Zealand, South Africa, etc, please follow local wiring regulations. According to Australian safety requirements, the N cables of the GRID side and EPS side must be connected together. Otherwise, the EPS function will not work.



For countries such as China, Germany, the Czech Republic, Italy, etc, please follow local wiring regulations.

This diagram is an example for an application in which neutral is separated from the PE in the distribution box.



4.5.8 Inverter Start-Up

Please refer to the following steps to start up the inverter.

1. Ensure the inverter fixed well.
2. Make sure all the DC wiring and AC wiring are completed.
3. Make sure the meter is connected well.
4. Make sure the battery is connected well.

5. Make sure the external EPS contactor is connected well (if needed).
6. Make sure the BMS buttons and battery switches are off.
7. Turn on the PV/DC switch , AC breaker, EPS breaker and battery breaker.
8. Enter the settings page, use default password '8888' to select the Admin.
9. Enter the settings page, select "Power ON/OFF" and set it to "Power ON".

Note:

1. **When starting the inverter for the first time, the country code will be set by default to the local settings. Please check if the country code is correct.**
2. **Set the time on the inverter by using the APP.**

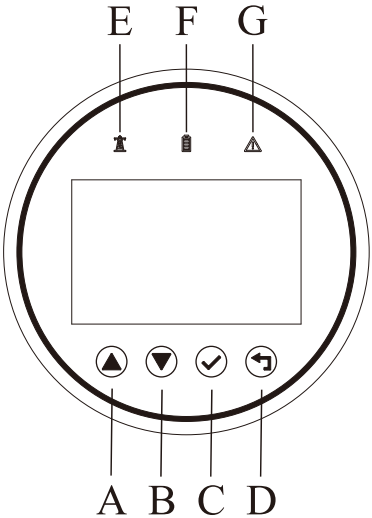
4.5.9 Inverter Switch Off

Please refer to the following steps to switch off the inverter.

1. Enter the settings page, select Power ON/OFF and set it to stop.
2. Turn off the PV/DC switch, AC breaker, EPS breaker and battery breaker.
3. Wait 5 min before you open the upper lid (if in need of repair)

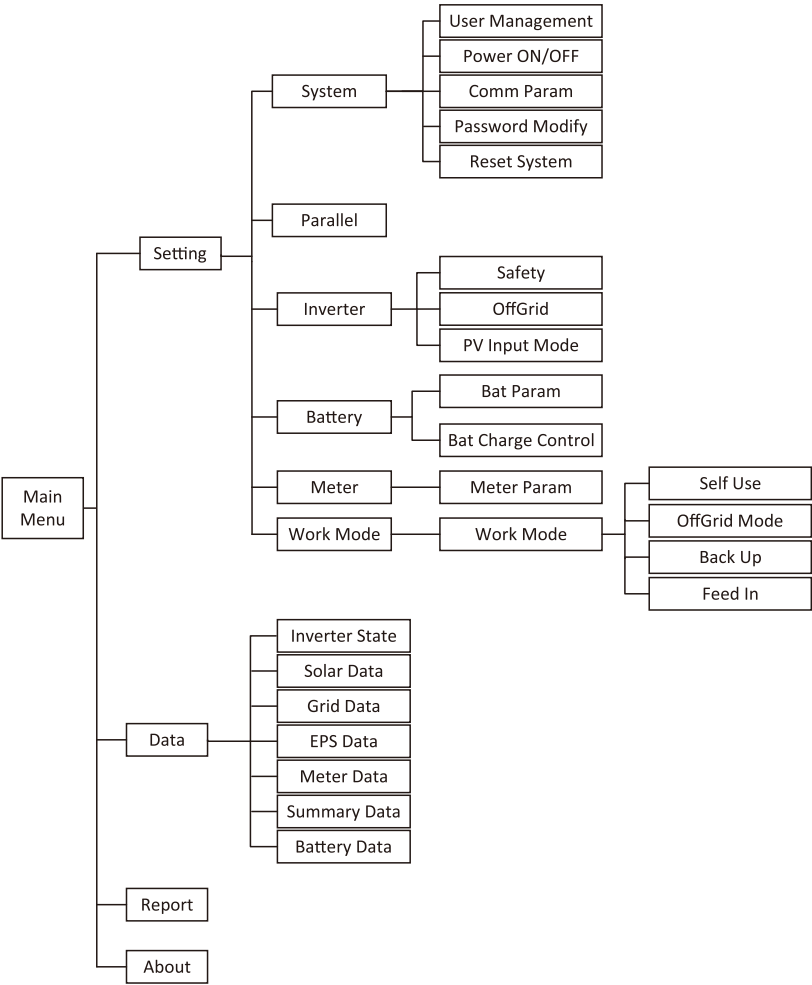
5. LCD Operation

5.1 Control Panel



Name	Number	Description
Button	A	Up
	B	Down
	C	Confirm
	D	Return
Indicator	E	Green light steady on: Normal operation Green light flashing: The smart meter is connecting to the inverter. Green light is not flashing: Smart meter not configured
	F	Green light steady on: The inverter is normally connected to the battery.
		Green light flashing: The inverter is connecting to the battery.
	G	Red light on: Device fault Yellow light on: Device warning

5.2 Menu Structure



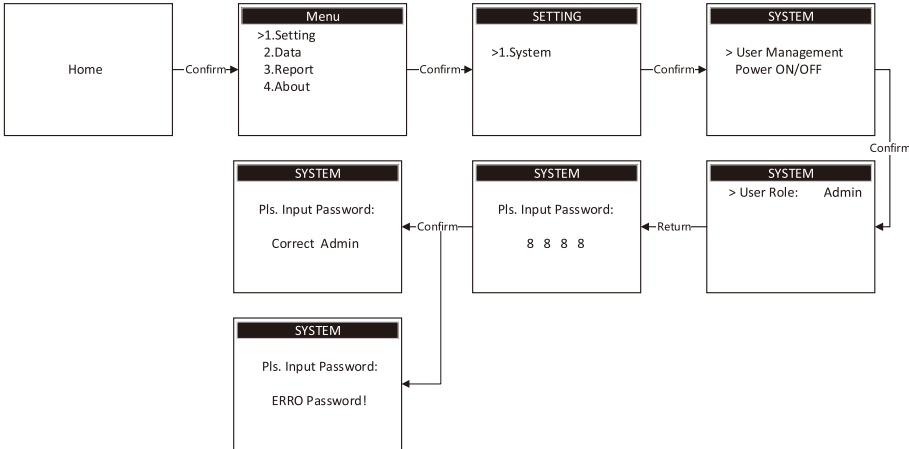
5.2.1 General setting

The following settings require the engineer user to set except for the first and second items.

1. Set user role

The setup user can select either an Admin or a Guest account.

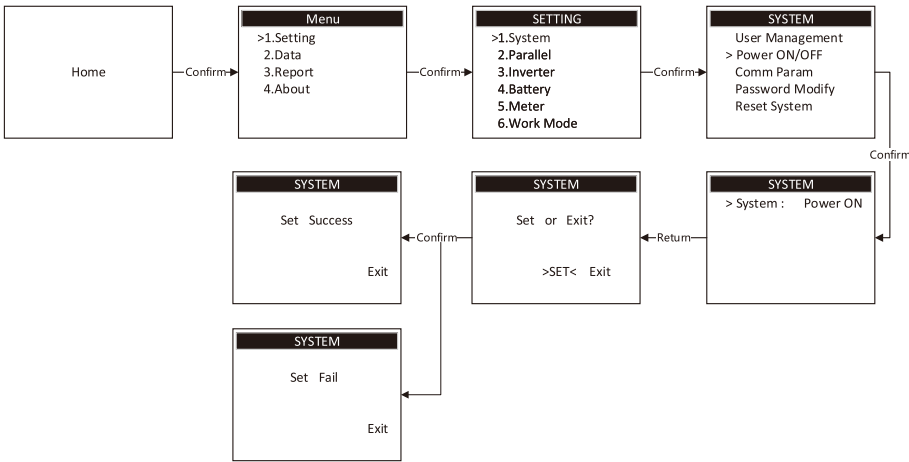
Set user role as described below:



2. Power On/OFF

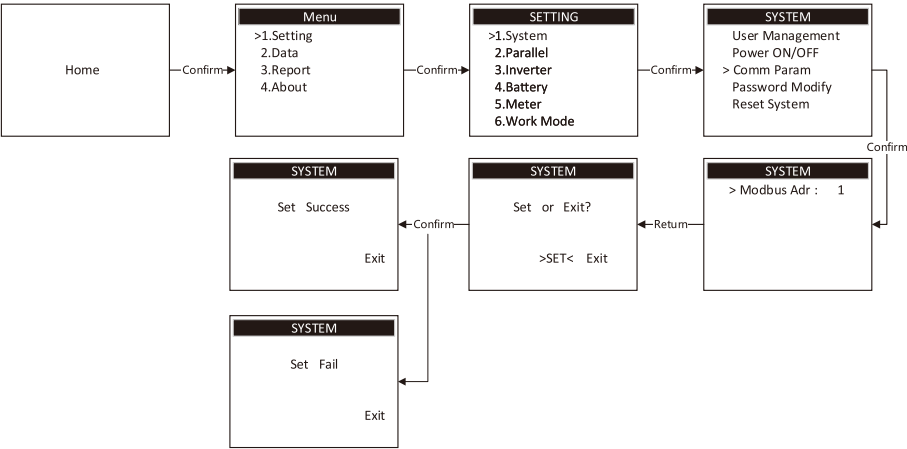
Run or stop the inverter by setting "Power On/OFF".

Set Power On/OFF as described below:



3. Set Modbus address (Admin role)

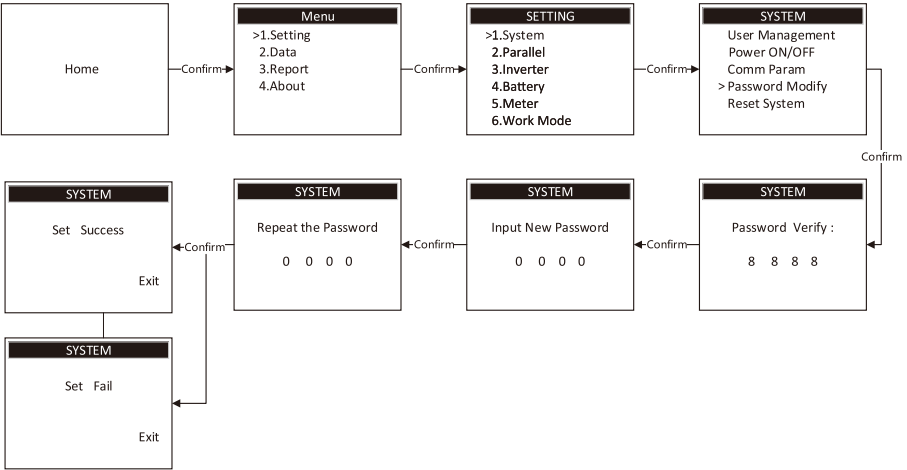
The inverter default Modbus address is 1.The Setting as described below:



4. Set password (Admin role)

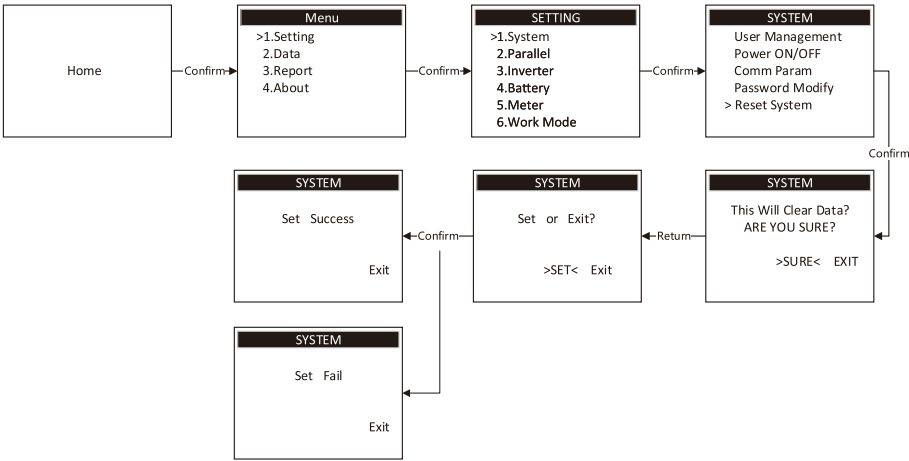
Engineer users can change the password.

The Setting as described below:



5. System reset (Admin role)

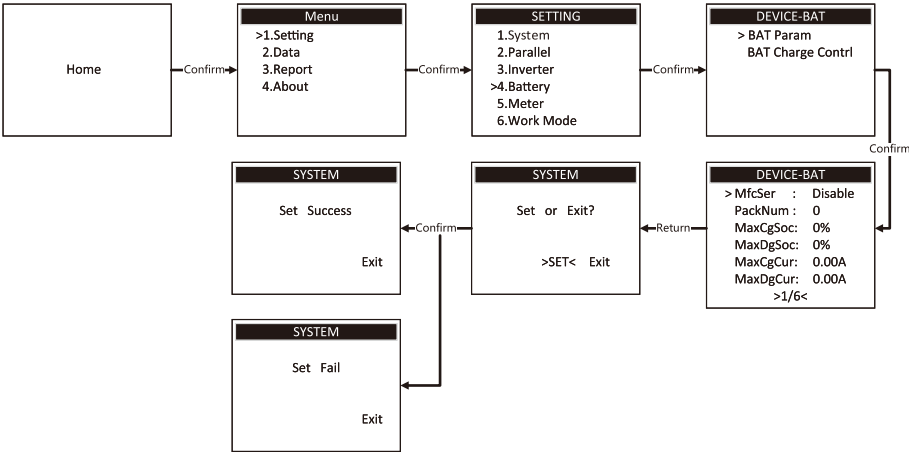
System reset will reset the inverter configuration and data, and set it up according to the steps below:



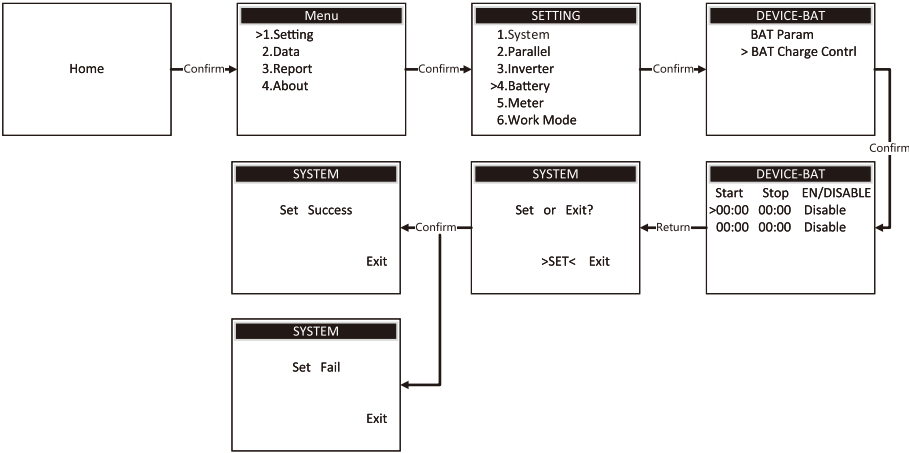
6. Battery configure (Admin role)

① Battery parameter settings

When the inverter configures the battery, you need to set the battery model and other parameters. The Setting as described below:

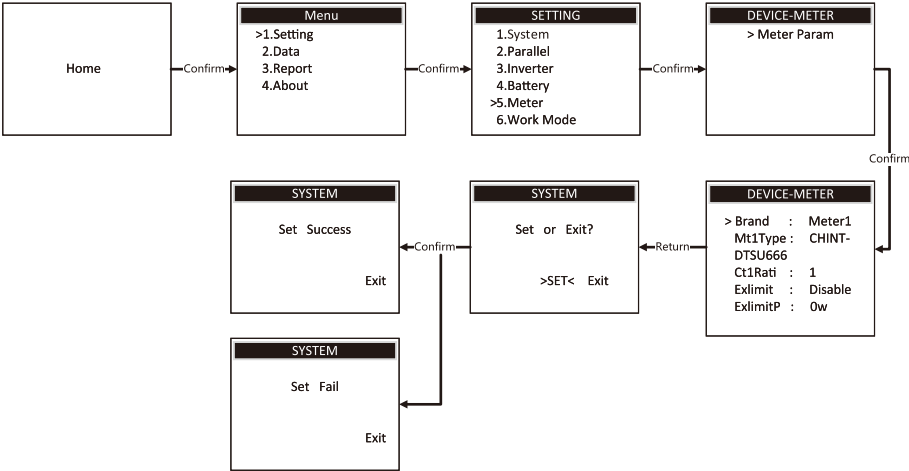


②Battery charging time period setting
To set the battery charging period, set it as follows:



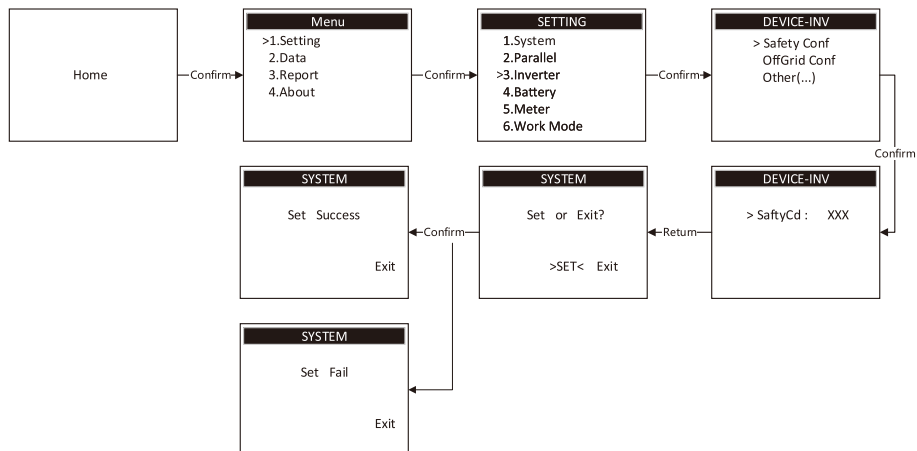
7. Meter configure (Admin role)

When configuring the inverter with a meter or CT, you need to set configuration information such as type and installation location, and set it according to the following steps.



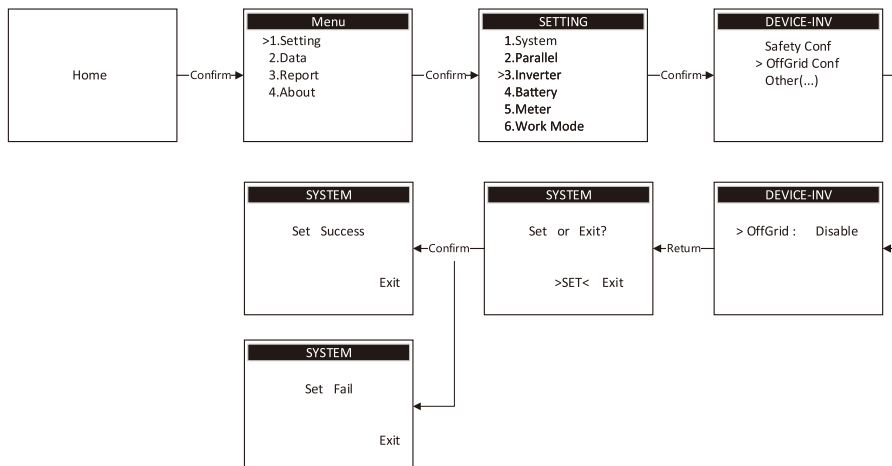
8. Inverter configure (Admin role)

Set safety as described below:



9. Off-grid configuration (Admin role)

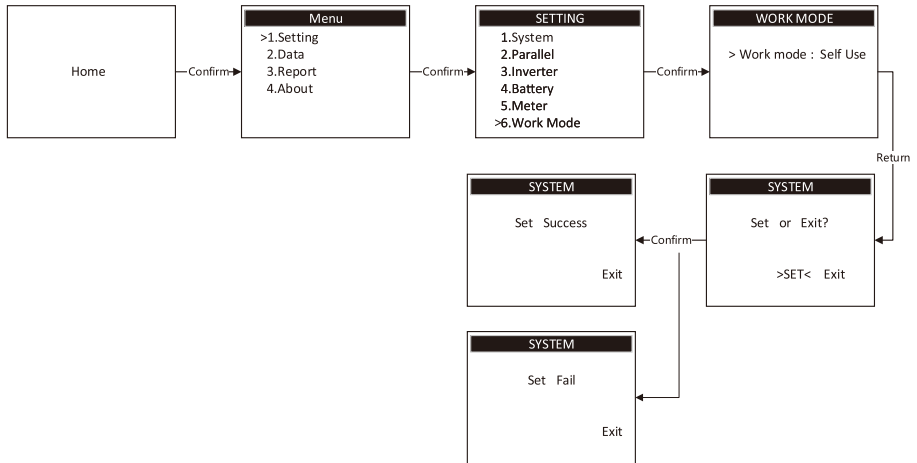
The off-grid configuration is set up as follows:



10. Set work mode (Admin role)

There are five working modes that can be set by the user, Self use, Feed in, Back up, Offgrid, Custom Def. Users can set the inverter to work in different modes.

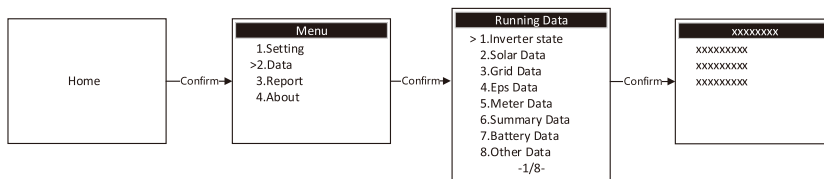
Set work mode as described below:



5.2.2 Inverter information

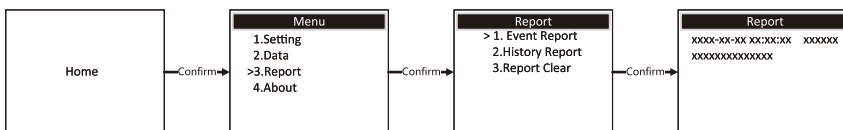
1. Inverter run data

We can view the inverter operation data, follow the steps below:

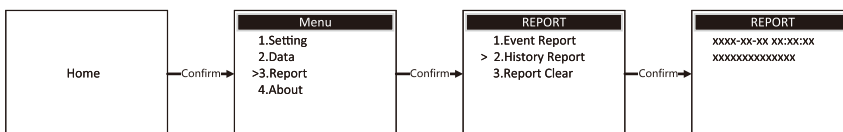


2. Error log

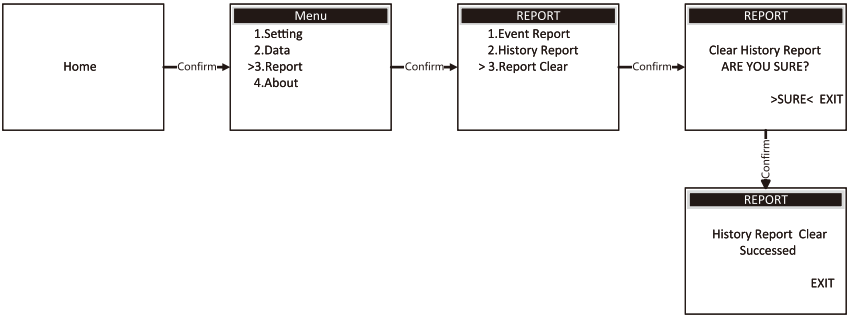
We can view the inverter operation error log, follow the steps below:



We can check the inverter historical fault information. Please follow the steps below:

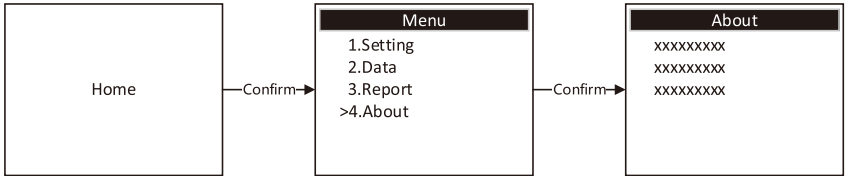


We can clear the inverter's historical fault information (Admin role) by following the steps below:



3. About

We can view the inverter device information by following these steps:



6. Solavita Cloud

The Solavita Cloud App is a mobile software application that communicates with the energy storage inverter via WiFi, GPRS, or WLAN modules. The app offers the following key functions:

- 1.View the operational data, software version, and alarm information of the energy storage inverter.
- 2.Configure grid parameters and communication settings of the energy storage inverter.
- 3.Perform device maintenance.
- 4.Upgrade the device's software version.

For more details, refer to the "Solavita Cloud App User Manual".

7. Troubleshooting

When the system is in alarm, please log into the Solavita Cloud App to review. The possible causes and their troubleshooting are detailed in the following table:

Display	Handling Suggestions
INV_OC_HW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
BAT_OC_HW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
PV_OC_HW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
INV_OC_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
BAT_OC_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
PV_OC_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
LOAD_OC_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
BAT_OV_HW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
BUS_OV_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
HALF_BUS_OV_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
UNBALANCE_BUS_SW	1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.

BAT_OV_SW	<p>1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
GRID_OF_SW	<p>1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
GRID_UF_SW	<p>1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
LINE_CONNECT TO_PE	<p>1.Check the cable connection.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
PV_REVERSE CONNECT_SW	<p>1. Check if the corresponding string has reverse polarity. If it does, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A.</p> <p>2. If the alarm continues, please contact us for assistance.</p>
BUS_UV_SW	<p>1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
ARM_SW	<p>1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
BUS_VOLT_OVE RSHOOT_SW	<p>1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again.</p> <p>2.If the alarm continues, please contact us for assistance.</p>
GRID_ZERO CROSS_LOSS_S W	<p>1.Check if there is a power outage in the grid. If power is available, proceed to the next step.</p> <p>2.Check whether the AC side circuit breaker or other protective switches are tripped. If the circuit breaker is functioning normally, proceed to the next step.</p> <p>3.Check if the external AC wire, neutral wire, and ground wire are correctly connected to the corresponding terminals.</p> <p>4.If the alarm continues, please contact us for assistance.</p>
PV_OV	<p>1.Check the specifications and number of corresponding string PV modules.</p> <p>2.If the alarm persists, please contact us for assistance.</p>

GRID_PH_OV	<ol style="list-style-type: none"> 1.Ensure the inverter's safety country setting is correct. 2.Verify that the grid voltage in your area is stable and within the normal range. 3.Check if the AC cable is securely in place. 4.If the alarm continues, please contact us for assistance.
GRID_PH_UV	<ol style="list-style-type: none"> 1.Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
ISLANDING	<ol style="list-style-type: none"> 1. Wait for the grid to restore power. 2.If the alarm continues, please contact us for assistance.
GRID_10MIN_OV	The inverter will reconnect to the grid once it stabilizes. If the alarm frequently occurs, please contact us for assistance.
ARM-S Hw ERR	<ol style="list-style-type: none"> 1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
MTR Comm Lost	<ol style="list-style-type: none"> 1.Check if the Meter communication cable and terminal are functioning properly. 2. Reconnect the Meter communication cable. 3. If the alarm persists, please contact us for assistance.
ARM comm Lost	<ol style="list-style-type: none"> 1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
RTC Fault	<ol style="list-style-type: none"> 1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.
BMS Lost	<ol style="list-style-type: none"> 1.Internal error of the inverter. Switch off the inverter, wait 5 minutes and then switch the unit on again. 2.If the alarm continues, please contact us for assistance.


Display	Handling Suggestions
BMS Hw ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS InWay Err	1.Check if the corresponding string has reverse polarity. If it does, disconnect the DC switch and adjust the polarity when the string current drops below 0.5 A. 2.If the alarm continue, please contact us for assistance.
BMS Check Err	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.C OV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.C LV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS LV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS OV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS Relay ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
Bms EMRG Stop	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
Bms InCmm ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
T.BMS High	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
T.BMS Low	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.

BMS OC	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS Safty ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
Cell.V IMB	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS ERRO	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.V SNR ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.T SNR ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.IV OV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.C ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS DCG LV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS CG OV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.STP CRERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS BMIC ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS InBus ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.

BMS CRT ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS T.V.D ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS PreCgERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS ISO ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS HiOutCtrl	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS LowIN OV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS LowIN LV	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS.C LV2	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS SR.NM ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS CP.SZ ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS INIT ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS L2&3.CM E	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS InL2Bus E	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.

BMS L2 LOST	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS LG.C ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.
BMS C.IC ERR	1.Internal error in the connected battery. Switch off the inverter and the battery, wait 5 minutes and then switch the components on again 2.If the alarm continues, please contact us for assistance.

8. Maintenance

	<ul style="list-style-type: none"> ● Incorrect maintenance may result in damage to the inverter or personal injury! ● Always keep in mind that the inverter PV string and the grid supply power in both directions, and follow these steps before performing any maintenance work: ● Disconnect the AC circuit breaker, then place the inverter's DC disconnect switch to OFF. ● Wait at least 5 minutes for the internal capacitors to fully discharge. ● Verify that there is no voltage or current before unplugging any connectors.
	<p>Caution!</p> <p>Restart the inverter only after troubleshooting faults that affect the safety performance. Do not replace any internal parts as there are no maintenance spare parts in the inverter package. Please contact us for any maintenance requirements. Otherwise, the Company is not liable for any damage caused.</p>

8.1 Daily maintenance


Maintenance parts	Operation	Cyclicity
System Cleaning	Check the temperature and dust condition of the inverter. Clean the inverter housing if necessary. Check the air inlet and outlet for proper functioning and clean the inlet and outlet if necessary.	Six months to one year (depending on the amount of dust in the air.)
Cable Connector	Check cable connections for inadequate sealing or excessive gaps, reseal connections if necessary	Once a year
Electrical Connection	Check that all cables are securely in place. Check that the cables are not damaged, especially where they come into contact with the metal casing	Six months to one year
Fan	Check for abnormal noises when the fan is rotating. Clean or replace the fan if necessary (see the following section)	Once a year

Maintenance Instructions:

Clean the air inlet and outlet.

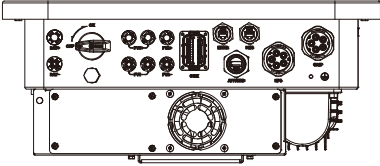
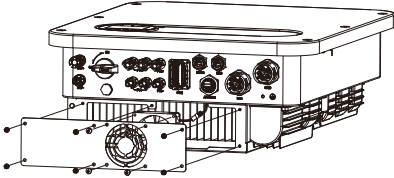
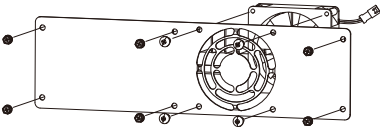
The inverter generates a lot of heat during operation. The inverter uses controlled forced air cooling. To maintain good ventilation, check to make sure that the air inlet and outlet vents are not blocked. Clean the air inlet and outlet with a soft brush or Hoover if necessary.

8.2 Fan maintenance



- Stop the inverter and disconnect all power connected to it before maintenance.
- Wait at least 5 minutes after disconnecting to make sure there is no power to the inverter before performing maintenance.
- Only a qualified electrician should service the fan.

The fan inside the inverter is used to cool the inverter during operation. If the fan is not functioning properly, the inverter may not be able to cool and the inverter efficiency may be reduced. Therefore, clean the dirty fan and replace the bad fan in time. The specific replacement procedure is as follows:

Procedure	
Step 1	<p>Stop the inverter (turn off the inverter's DC and AC switches and wait at least 5 minutes).</p> 
Step 2	<p>Unscrew the 6 screws of one fan baffle. Loosen the 4 screws on each fan module. Disconnect the fan cable, pull out the fan module, clean the fan with a soft brush or Hoover, and replace the fan if necessary.</p> 
Step 3	<p>Reinstall the fan back into the inverter in the reverse order and restart the inverter. Note that the fans must not be fitted in reverse.</p> 

9. Technical Data

Model	SWH005KH -T1	SWH008KH -T1	SWH010KH -T1	SWH012KH -T1	SWH015KH -T1
PV Input					
Recommended Max. PV Input Power [Wp]	6500	10400	13000	15600	18750
Max. Input Voltage [V]	1000				
MPPT Voltage Range [V]	180~950				
Rated Voltage [V]	600				
Start-up Voltage [V]	200				
No. of MPPT Trackers	2				
No. of PV Strings per MPPT	1/1		2/1		
Max. Input Current per MPPT [A]	15/15		30/15		
Max. Shor Circuit Current per MPPT [A]	18/18		36/18		
AC Output					
Rated Output Power [W]	5000	8000	10000	12000	15000
Rated Output Current[A]	7.2	11.6	14.5	17.4	21.7
Max. Output Current[A]	7.9	12.7	15.9	19.1	23.8
Max. Apparent Output Power [VA]	5500	8800	11000	13200	16500
Rated Output Voltage [V]	220/380;230/400				
Rated Grid Frequency [Hz]	50/60				
Power Factor [cos φ]	1/0.8(leading)~0.8(lagging)				
THDi (Rated Output Power)	< 3%				
AC Input (Grid)					
Max. Apparent Input Power [VA]	5500	8800	11000	13200	16500
Max. Input Current [A]	7.9	12.7	15.9	19.1	23.8
Rated Output Voltage [V]	220/380;230/400				
Rated Grid Frequency [Hz]	50/60				
Battery					
Battery Module Type	Lithium Iron Phosphate(LFP)				
Battery Voltage Range [V]	150-600				
Maximum Charge/Discharge Current [A]	25				
Battery Communication	CAN				
AC Output (Off-grid)					
Rated Output Power [W]	5000	8000	10000	12000	15000
Rated Output Voltage[V]	220/380;230/400				
Rated Output Frequency [Hz]	50/60				

Rated Output Current[A]	7.2	11.6	14.5	17.4	21.7
THDi (Rated Output Power)	< 3%				
Switch Time [ms]	< 10				
Peak Apparent Power , Duration[VA, s]	7500,30	12000,30	15000,30	18000,30	22500,30
Efficiency					
Max. Efficiency	98%				
Euro Efficiency	97.3%				
Battery Charged/Discharged to AC Max. Efficiency	98.5%@Charge/97.0%@Discharge				
Protection					
DC Switch	Integrated				
Insulation Resistance Detection	Integrated				
Input Reverse Polarity Protection	Integrated				
Anti-island Protection	Integrated				
Residual Current Monitoring	Integrated				
Overtemperature Protection	Integrated				
DC Surge Protection	Integrated (Type II)				
AC Surge Protection	Integrated (Type II)				
General Data					
Dimensions (W*H*D) [mm]	498*563*200				
Weight [kg]	28				29
Display	LCD/WEB/APP				
Communication	WIFI/RS485/LAN				
Operating Temperature Range [°C]	- 25 ~ + 60				
Relative Humidity	0%~100%, Non-condensing				
Operation Altitude[m]	0~4000; if ≥2000, Power Reduction Needed				
Self Consumption (night) [W]	< 15				
Topology	Transformerless				
Cooling Concept	Natural Convection				Smart fan-cooling
Protection level	IP66				

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