SOFAR

USER MANUAL

HYD 3-6K-EP



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Preface

Notice

This manual contains important safety instructions that must be followed during installation and maintenance of the equipment.

Save this Instruction

This manual must be considered as an integral part of the equipment. The manual must always accompany the equipment,even when it is transferred to another user or field.

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Outline

Please read the product manual carefully before installation, operation or maintenance. This manual contains important safety instructions and installation instructions that must be followed during installation and maintenance of the equipment.

Scope

This product manual describes the installation, electrical connections, commissioning, maintenance and troubleshooting of HYD 3000/3600/5000/6000-EP inverters:

HYD 3000-EP HYD 3600-EP HYD 5000-EP HYD 6000-EP

Keep this manual where it will be accessible at all times.

Target Group

This manual is intended for qualified electrical technical personnel who are responsible for inverter installation and commissioning in the PV power system and PV plant operator.

Symbols used

This manual provides safety operation information and uses the symbol in order to ensure personal and property security and use inverter efficiently when operating the inverter. You must understand these emphasized information to avoid the personal injury and property loss. Please read the following symbols used in this manual carefully.

DANGER

- Danger indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

- Warning indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

- Caution indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

- Attention indicates potential risks which, if not avoided, may lead to equipment fault or property damage.

- Note provides tips that are valuable for the optimal operation of the product.

1 Basic safety information

1.1 Safety instructions

Read and understand the instructions of this manual, and be familiar with relevant safety symbols in this chapter, then start to install and troubleshoot the equipment.

According to the national and state requirements, before connecting to the electrical grid, you must get permission from the local untility company. The operation can only be performed by qualified electrical engineer.

Please contact the nearest authorized service center if any maintenance or repair is needed.Contact your distributor for the information of the nearest authorized service center. Do NOT repair it by yourself, it may cause injury or property damage.

Before installing and maintaining the equipment, you should turn the DC switch OFF to cut off the high voltage DC of the PV array. You can also turn the switch in the PV combiner box off to cut off the high voltage DC. When the battery needs to be installed, please confirm the positive and negative terminals of the battery and turn off the battery. Otherwise, serious injury may be caused.

1.1.1 Qualified persons

The customer must make sure the operator has the necessary skill and training to do his/her job. Staff in charge of using and maintaining the equipment must be skilled, aware and mature for the described tasks and must have the reliability to correctly interpret what is described in the manual. For safety reason only a qualified electrician, who has received training or has demonstrated skills and knowledge in construction and in operation of this unit, can install this inverter. Shenzhen SOFARSOLAR Co., Ltd. does not take

any responsibility for the property destruction and personal injury because of any incorrect use.

1.1.2 Installation requirements

Please install inverter according to the following section. Fix the inverter on an appropriate object with enough load bearing capacity (such as walls, PV racks etc.), and ensure that inverter is vertical placed. Choose a place suitable for installing electrical devices. And assure there is enough fire exit space, convenient for maintenance. Maintain proper ventilation to ensure enough air cycle to cool the inverter.

1.1.3 Transport requirements

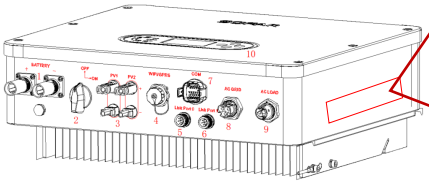
If you find packing problems that may cause the damage of the inverter, or find any visible damage, please immediately notice the responsible transportation company. You can ask solar equipment installation contractor or Shenzhen SOFARSOLAR Co.Ltd. for help if necessary.

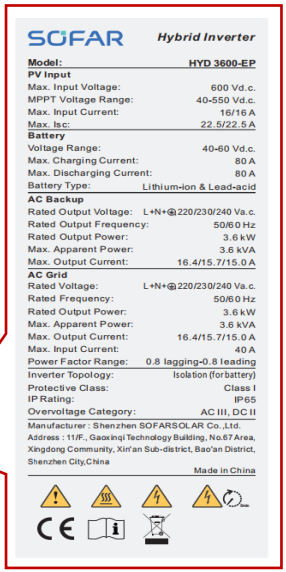
Transport of the equipment, especially by road, must be carried out by suitable ways and means for protecting the components (in particular, the electronic components) from violent shocks, humidity, vibration, etc.

1.1.4 Labels on the equipment



The labels must NOT be hidden with objects and extraneous parts (rags, boxes, equipment, etc.); they must be cleaned regularly and kept visible at all times.





- The picture is only for reference, please make the object as the standard.

1.1.5 Electric connection

Please comply with all the current electrical regulations about accident prevention in dealing with the SOFAR inverter.

DANGER

- Before the electrical connection, make sure to use opaque material to cover the PV modules or to disconnect PV array DC switch. Exposure to the sun, PV array will produce a dangerous voltage!

⚠ WARNING

- All installation accomplished only by professional
- electrical engineer!
- Must be trained!
- Completely read the manual operation and understand relevant matter.

NOTICE

- Get permission from the local electrical gird operator, complete all electrical connections by professional electrical engineer, then connect inverter to electrical grid.

- It's forbidden to remove the tamper evident label, or open the inverter. Otherwise SOFAR will not provide warranty or maintenance!

1.1.6 Operation

⚠ DANGER

- Touching the electrical grid or the terminal of the equipment may lead to electrocution or fire!
- Don't touch the terminal or conductor connected to the electrical grid.
- Pay attention to any instructions or safety documents related to grid connection.

NOTICE

- Some internal components will be very hot when inverter is working. Please wear protective gloves!

1.1.7 Maintenance and repair

⚠ DANGER

- Before carrying out any repair work, first switch off the AC circuit breaker between the inverter and power grid, and then the DC switch.
- After turning off the AC circuit breaker and DC switch, wait for 5 minutes at least before carrying out any maintenance or repair work.

NOTICE

- Inverter should work again after removing any faults. If you need any repair work, please contact with the local authorized service center.
- Do not open the internal components of inverter without authorization, otherwise Shenzhen SOFARSOLAR Co., Ltd. does not take any responsibility for the property destruction and personal injury.

1.1.8 EMC / noise level of inverter

Electromagnetic compatibility (EMC) refers to that one electrical equipment functions in a given electromagnetic environment without any trouble or error, and impose no unacceptable effect upon the environment. Therefore, EMC represents the quality characters of an electrical equipment. The inherent noise-immune character: immunity to internal electrical noise. External noise immunity: immunity to electromagnetic noise of external system. Noise emission level: influence of electromagnetic emission upon environment.

⚠ DANGER

Electromagnetic radiation from inverter may be harmful to health!

- Please do not continue to stay around the inverter in less than 20 cm when inverter is working.

1.2 Symbols and signs

⚠ CAUTION

- Caution of burn injuries due to hot enclosure!
- You can only touch the screen and pressing key of the inverter while it's working.

NOTICE

- PV array should be grounded in accordance to the requirements of the local electrical grid operator!
- We suggest that all PV module frames and inverter are reliably grounded to protect the PV system and personnel security.

⚠ WARNING

- Ensure input DC voltage < Max. DC voltage. Over voltage may cause permanent damage to inverter or other losses, which will not be included in warranty!

1.2.1 Signs on the inverter

There are some symbols which are related to security on the inverter. Please read and understand the content of the symbols, and then start the installation.

	This symbol indicates a hazardous situation which could result in injuries, if not avoided.
	There is a residual voltage in the inverter! Before opening the equipment, operator should wait for five minutes to ensure the capacitor is discharged completely.
	Caution, risk of electric shock.
	Caution hot surface.
	Comply with the Conformité Européenne (CE marking) certification.
	Grounding point.
	Please read this manual before install HYD 3000/ 3600/5000/6000-EP.
	Positive pole and negative pole of the input voltage (DC).
IP66	This indicates the degree of protection of the equipment according to IEC standard 70-1(EN 60529 June 1997)
	Temperature conditions.
	This side up, HYD 3000/3600/5000/6000-EP inverter must always be transported, handled and stored in such a way that the arrows always point upwards.

2 Product characteristics

2.1 Product informations

HYD 3000/3600/5000/6000-EP inverter is a single-phase photovoltaic energy storage inverter integrating grid-connected photovoltaic inverter and battery energy storage.

The HYD 3000/3600/5000/6000-EP inverter has a variety of built in operating modes to suit the diverse user needs.

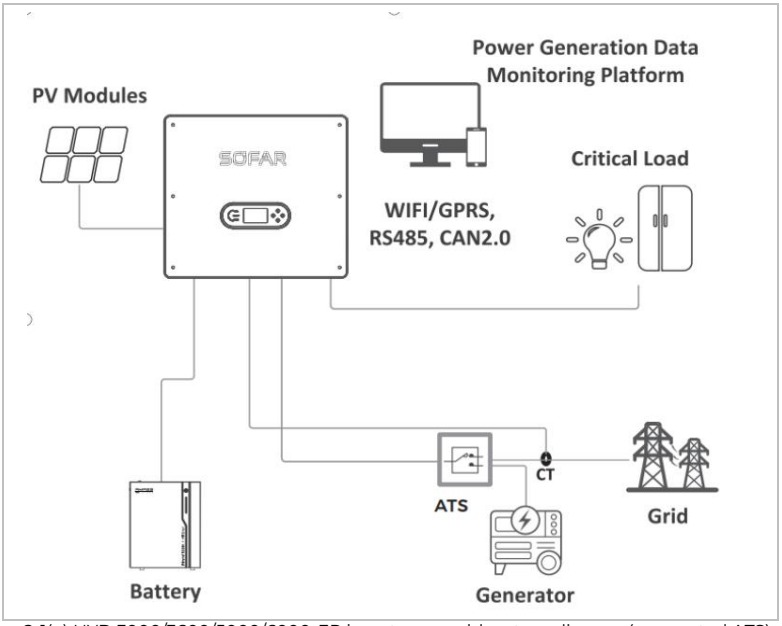


Figure 2-1(a) HYD 3000/3600/5000/6000-EP inverter on-grid system diagram(connected ATS)

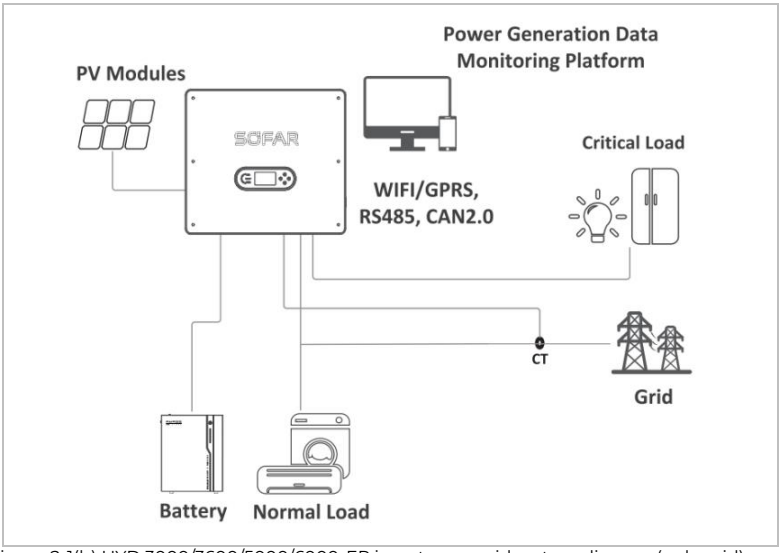


Figure 2-1(b) HYD 3000/3600/5000/6000-EP inverter on-grid system diagram(only grid)

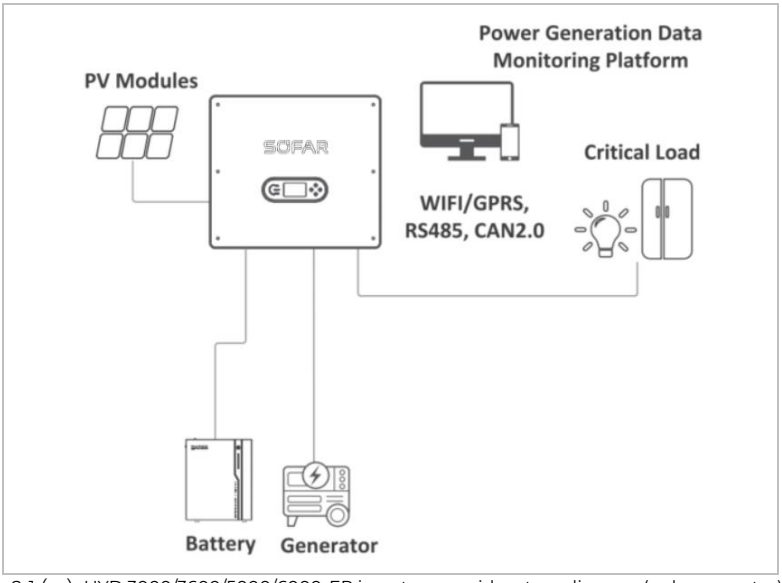


Figure 2-1 (c) HYD 3000/3600/5000/6000-EP inverter on-grid system diagram.(only generator)

The HYD 3000/3600/5000/6000-EP inverter can provide a complete solution in the period of rising energy costs such as oil and coal, the energy subsidy of photovoltaic grid-connected system keeps falling. In the period of continuous power supply and emergency power supply demand in mountainous areas or base stations without power grid.

The HYD 3000/3600/5000/6000-EP inverter can also be connected to a generator. There are two types of systems with generators. In Fig 2-1(a), the generator and the grid are automatically switched by an ATS to provide power to the system. If the power grid fails or the local power grid is unstable, the generator and power grid can automatically switch with the system status to meet the normal power supply of the system. In Figure 2-1(c), the grid is not available and the generator is connected to the AC Grid, which individually provide power to the system.

2.2 Size description

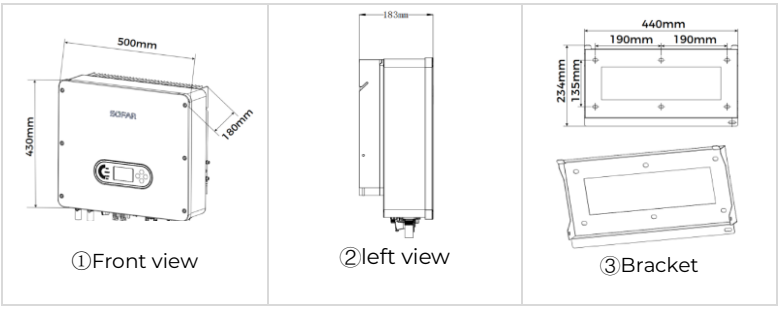


Figure 2-2 Size chart

2.3 Function characteristics

The HYD 3000/3600/5000/6000-EP energy storage inverters allow up to 200% overloading to maximize power output, and the Emergency Power Supply (EPS) mode can support inductive loads, such as, air-conditioners or refrigerators with an automatic switching time of less than 4ms.

1. Dual MPP trackers with 1.5* DC overload.
2. Flexible switching between grid-tied mode and energy storage mode.
3. Max. battery charge and discharge efficiency 94.6%.
4. 1 strings of battery input with maximum 100A charge and discharge current.
5. Wide MPPT voltage range(40-550V).
6. AC Multi-parallel function, more flexible system solution.
7. Smart monitoring, RS485/WiFi/Bluetooth/GPRS(Optional).

2.4 Electrical block diagram

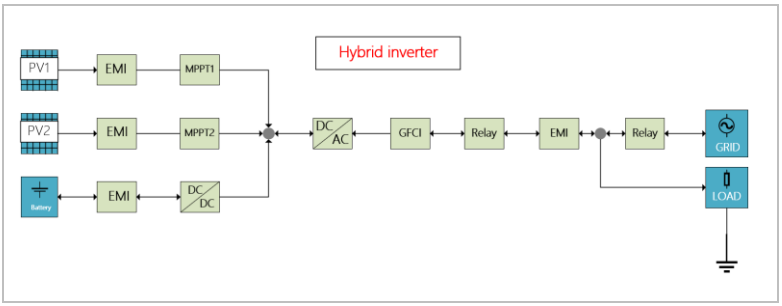


Figure 2-3 Electrical block diagram

3 Installation

Installation notes

DANGER

- Do not install the HYD 3000/3600/5000/6000-EP on flammable material.
- Do not install the HYD 3000/3600/5000/6000-EP in an area used to store Flammable or explosive material.

CAUTION

- The enclosure and heat sink are very hot while the inverter is working, therefore do not install the HYD 3000/3600/5000/6000-EP in places where you might touch them inadvertently.

NOTICE

- Consider the weight of HYD 3000/3600/5000/6000 EP when transporting and moving the inverters.
- Choose an appropriate mounting position and surface.
- Assign at least two persons to install the inverter.

3.1 Checking Before Installation

3.1.1 Checking Outer Packing Materials

Packing materials and components may be damaged during transportation. Therefore, check the outer packing materials before installing the inverter. Check the outer packing materials for damage, such as holes and cracks. If any damage is found, do not unpack the HYD 3000/3600/5000/6000-EP and contact the dealer as soon as possible. You are advised to remove the packing

materials within 24 hours before installing the HYD 3000/3600/5000/6000-EP inverter.

3.1.2 Checking Deliverable

After unpacking the inverter, check whether deliverable are intact and complete. If any damage is found or any component is missing, contact the dealer.

- Please see the packing list for components and mechanical parts that should be delivered.

3.2 Product Overview

HYD 3000/3600/5000/6000-EP inverter is 100% strictly inspected before package and delivery. It is forbidden to put the HYD 3000/3600/5000/6000-EP inverter upside down during delivery.

⚠ CAUTION

- Please check the product package and fittings carefully before installation.

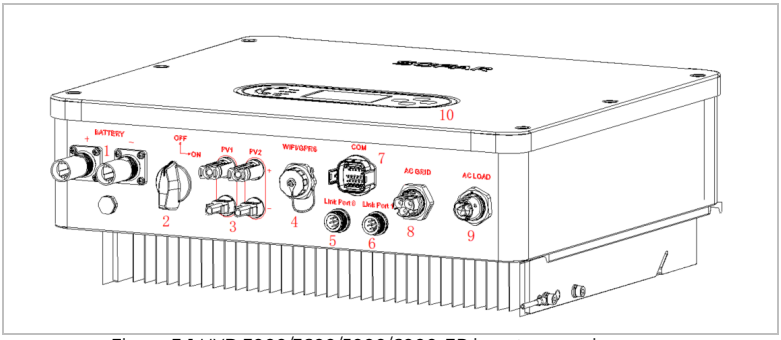


Figure 3-1 HYD 3000/3600/5000/6000-EP inverter overview

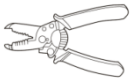
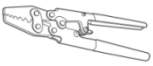
Table 3-1 HYD 3000/3600/5000/6000-EP inverter overview

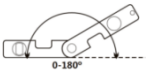
1	Battery input terminals	6	Link Port 1
2	DC switch	7	COM
3	PV input terminals	8	Grid connection port/Generator connection port
4	USB/Wi-Fi	9	Load connection port
5	Link Port 0	10	LCD

3.3 Tools

Prepare tools required for installation and electrical connections.

Table 3-2 Tools required for installation and electrical connections.

NO.	Tool	Model	Function
1		Hammer drill Recommend drill diameter 10mm	Used to drill holes on the wall.
2		Screwdriver	Wiring
3		Cross screwdriver	Remove and install AC terminal screws
4		Removal tool	Remove PV terminal
5		Wire stripper	Strip wire
6		5mm Allen Wrench	Turn the screw to connect rear panel with inverter.
7		Crimping tool	Used to crimp power cables

8		Multi-meter	Used to test electrical polarity and voltage
9		Adjustable wrench(Max. 3/4 inch open end)	Used to tighten expansion bolts
10		Marker	Used to mark signs
11		Measuring tape	Used to measure distances
12		Level	Used to ensure that the rear panel is properly installed
13		Gloves	Personal protective equipment
14		Safety goggles	Operators wear
15		Anti-dust respirator	Operators wear

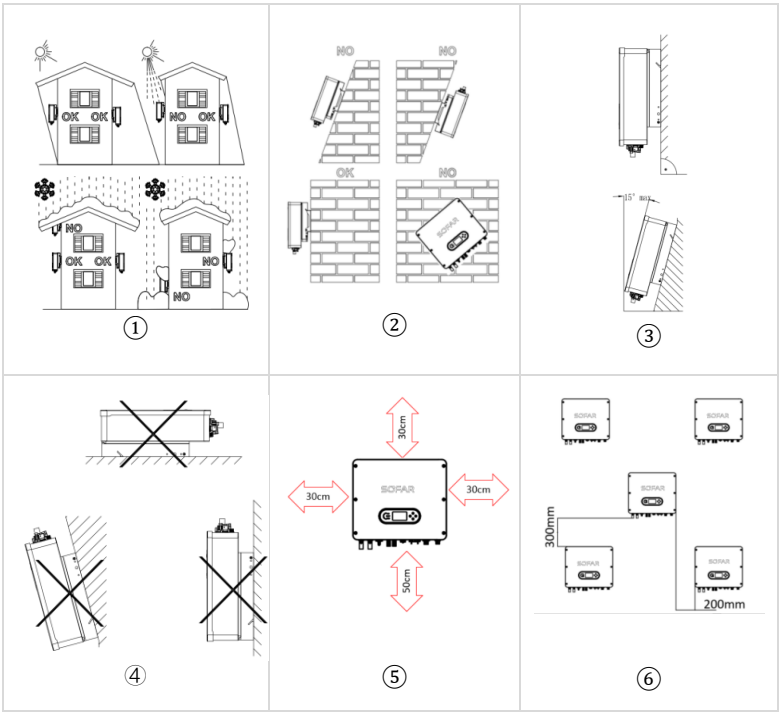
3.4 Installation Environment

1. Choose a dry, clean, and tidy place, convenient for installation.
2. Ambient temperature range: -30℃ ~ 60℃.
3. Relative humidity: 0 ~ 100% (non-condensed).
4. HYD 3000/3600/5000/6000-EP inverter shall be installed in a well- ventilated place.
5. No flammable or explosive materials close to HYD 3000/3600/5000/6000-EP inverter.

6. The AC overvoltage category of HYD 3000/3600/5000/6000-EP inverter is category III.
7. Maximum altitude: 4000m.

3.5 Determining the Installation Position

Determine an appropriate position for installing the HYD 3000/3600/5000/6000-EP inverter. Comply with the following requirements when determining the installation position.



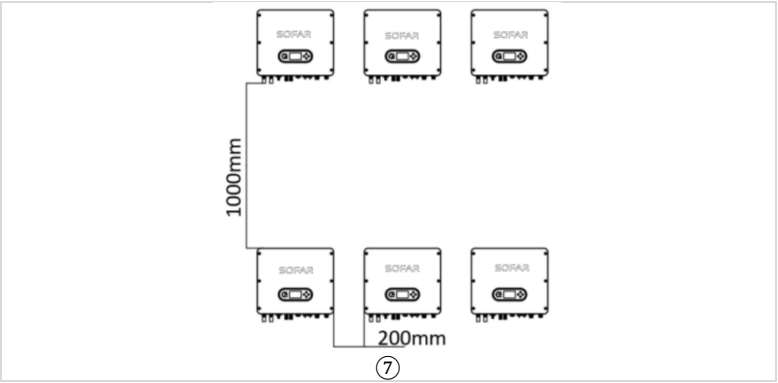


Figure 3-2 Installation Position of HYD 3000/3600/5000/6000-EP inverter

3.6 Unpacking the inverter

Step 1 Open the packaging, insert hands into the slots on both sides of the inverter and hold the handles, as shown in Figure.3-3.

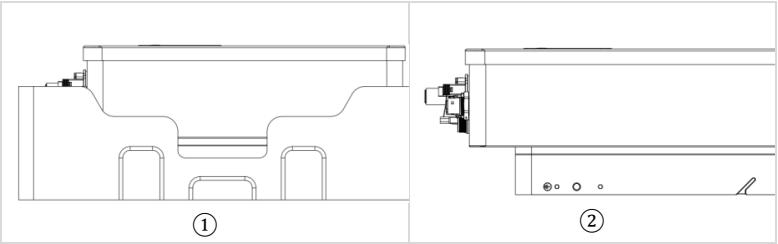


Figure 3-3 Moving the inverter

Step 2 Lift the inverter from the packing case and move it to the installation position.

NOTICE
▸ To prevent device damage and personal injury, keep balance when moving the inverter because the inverter is heavy. ▸ Do not put the inverter with its wiring terminals contacting the floor because the power ports and signal ports are not designed to support the weight of the inverter. Place the inverter horizontally. ▸ When placing the inverter on the floor, put foam or paper under the inverter to protect its shell.

3.7 Installation of the inverter

Step 1 Determine the positions for drilling holes, ensure the hole positions are level, then mark the hole positions using a marker pen, as shown in Figure 3-4①.

Step 2 Use the hammer drill to drill holes on the wall(Aperture Φ10 mm). When drilling, keep the hammer drill perpendicular to the wall and drill slightly deeper than the length of the expansion pipe. After drilling, please check whether the hole position is suitable with the back plate. If the error is too large, please reposition the hole,as shown in Figure 3-4②.

Step 3 Slowly hammer the expansion screw into the drilled hole. Position the back plate well, place the shrapnel and flat pad, and fix the back plate with hexagon nut, as shown in Figure 3-4③.

Step 4 Hang the inverter on the back plate, as shown in Figure 3-4④.

Step 5 Lock the inverter and the back plate with M6 hex screw, you can secure the inverter to the rear panel and protect it from stealing by installing an anti-theft lock (this action is optional), as shown in Figure 3-4⑤.

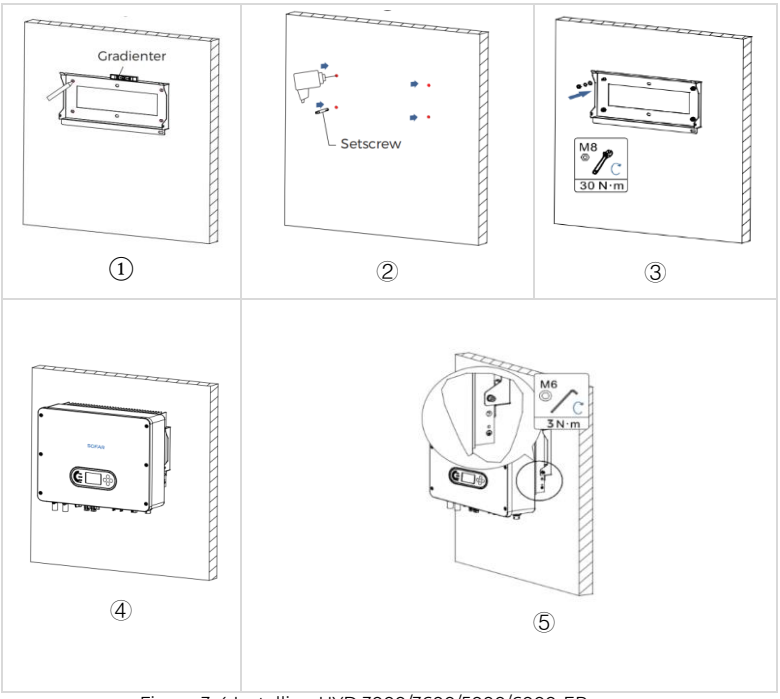


Figure 3-4 Installing HYD 3000/3600/5000/6000-EP

4 Electrical Connections

Before performing electrical connections, ensure that the DC switch is off. Since the stored electrical charge remains in a capacitor after the DC switch is turned off, it's necessary to wait for at least 5 minutes for the capacitor to be electrically discharged.

HYD 3000/3600/5000/6000-EP inverter is intended to be used in PV system with battery storage. If not used as intended, the protection provided by the equipment may be impaired.

NOTICE

- Installation and maintenance of inverter, must be operated by professional electrical engineer.
- Wear rubber gloves and protective clothing (protective glasses and boots) when working on high voltage/high current systems such as inverter and battery systems.

⚠ DANGER

- PV modules will generate electric energy when exposed to sunlight and may cause electrical shock hazard. Therefore, before connecting DC input power cable, make sure to use opaque material to cover the PV modules.

- For HYD 3000/3600/5000/6000-EP,open-circuit voltage (Voc) of module arrays connected in series must be ⩽600V.

The connected PV modules must have an IEC 61730 Class A rating.

Table 4-1 Relevant current parameters of each model

Model	Isc PV(absolute maximum)	Maximum output over current protection
HYD 3000-EP	22.5A/22.5A	15A
HYD 3600-EP		16.4A
HYD 5000-EP		22.7A
HYD 6000-EP		30A

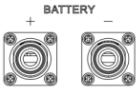
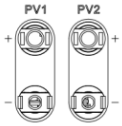
- The DVC is the voltage of a circuit which occurs continuously between any two live part in the worst case rated operating condition when used as intended.

Table 4-2 The decisive voltage class(DVC)

Interface	DVC
PV input port	DVCC
Grid connection port	DVCC
Battery input port	DVCC
Load connection port	DVCC
USB/WiFi interface	DVCA
COM interface	DVCA
Link Port 0 and Link Port 1	DVCA

4.1 Wire instructions

Table 4-3 Cable description

Component	Description		Recommended cable type	Recommended cable specifications
	+: Connect the positive electrode of battery (Orange terminal)		Outdoor multi-core copper cable	Conductor cross-sectional area:22mm² ~ 26mm²
	-: Connect the negative electrode of battery (Black terminal)			
	+: Connect the positive electrode of photovoltaic cell		Industry common outdoor photovoltaic cable	Conductor cross-sectional area:4mm² ~ 6mm²
	-: Connect the negative electrode of photovoltaic cell			
	AC LOAD	L	Outdoor multi-core copper cable	Conductor cross-sectional area:4mm² ~ 6mm²
		N		
		PE		
	AC GRID	L	Outdoor multi-core copper cable	Conductor cross-sectional area:6mm² ~ 10mm²
		N		
		PE		

4.2 Connecting PGND Cables

Connect the inverter to the grounding electrode using protection ground (PGND) cables for grounding purpose.

NOTICE

- The inverter is transformer-less, requires the positive pole and negative pole of the PV array are not grounded. Otherwise it will cause inverter failure. In the PV power system, all non current carrying metal parts (such as: PV module frame, PV rack, combiner box enclosure, inverter enclosure) should be connected to earth.
- The protective grounding of the chassis shell cannot replace the PGND cable of the AC LOAD Port. Ensure that the two PGND cables are reliably connected.
- When multiple inverters are deployed, ensue that the protective ground points of all inverters are equipotential connected.

The PGND cables are prepared ($\geqslant 4mm^2$ outdoor power cables are recommended for grounding purposes), the color of cable should be yellow-green.

Procedure:

Step 1

Remove the insulation layer with an appropriate length by using a wire stripper, as shown in Fig.4-1①.

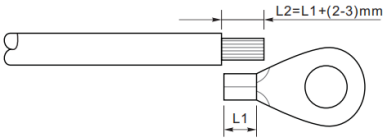
Step 2

Insert the exposed core wires into the OT terminal and crimp them by using a crimping tool, as shown in Fig.4-1②.

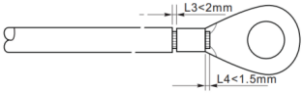
Step 3

Install the crimped OT terminal, flat washer and M6 screw. Tighten the screw to a torque of 3 N.m by using an Allen wrench, as shown in Fig.4-1③.

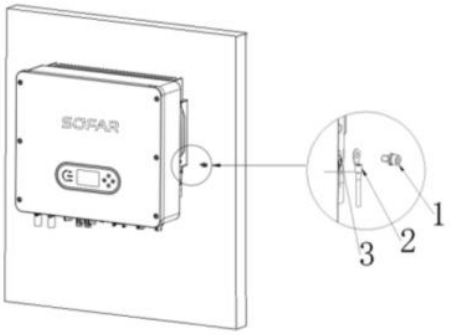
- L3 is the length between the insulation layer of the ground cable and the crimped part. L4 is the distance between the crimped part and core wires protruding from the crimped part.
- The cavity formed after crimping the conductor crimp strip shall wrap the core wires completely. The core wires shall contact the terminal closely.



①L2 is 2 to 3mm longer than L1



②



③1.Screw; 2.OT Terminal;3.Tapped hole

Figure 4-1 Connecting PGND cable

4.3 PV Connection

Procedure:

Step 1

Select the appropriate cable type and specifications according to the table4-3. Remove cable glands from the positive and negative connectors.(It is recommended that the positive and negative be distinguished by different colors)

Step 2

Remove the insulation layer with an appropriate length from the positive and negative power cables by using a wire stripper as show in Figure4-2①.

Step 3

Insert the stripped positive and negative power cables into the positive and negative metal terminals respectively and crimp them using a crimping tool. Ensure that the cables are crimped until they cannot be pulled out by force less than 400 N, as shown in Figure 4 2②.

Step 4

Insert crimped power cables into corresponding housings until you hear a "click" sound. The power cables snap into place, as shown in Figure 4 2③.

Step 5

Reinstall cable glands on positive and negative connectors and rotate them against the insulation covers, as shown in Figure 4 2④.

Step 6

Use the multi-meter, measure the PV port voltage Uoc, and then make the connection with the inverter to prevent live operation, as shown in Figure 4 2⑤

Step 7

Insert the positive and negative connectors into corresponding PV terminals of the inverter until you hear a "click" sound, as shown in Figure 4 2⑥⑦.

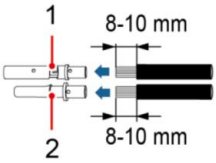
To remove the PV connector, you need to press the grooves on both sides of the terminal to apply force outward.

- The HYD 3-6K-EP inverter has two MPPTs, which can operate independently or in parallel. The inverter can automatically identify the MPPT operating mode.

⚠ DANGER

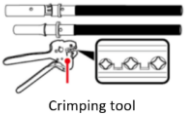
- Before removing the positive and negative connectors, ensure that the DC switch is off.

- The system has PV anti-reverse connection function, which can protect the device from being damaged when the input is reversed. Therefore, in order to ensure the safe operation of the inverter, the PV positive and negative poles cannot be reversed, otherwise the inverter will report the PV reverse connection failure, and the buzzer will ring.
- If the PV input cable is reversed by mistake and the “DC switch” is set to “ON”, do not perform any operations on the positive or negative connectors of the DC switch and PV terminals immediately. Otherwise, the device may be damaged. You need to wait until the solar irradiance decreases at night. When the photovoltaic module current is reduced to below 0.5A, set the “DC switch” to "OFF", and remove the positive and negative connectors of the PV end to correct the polarity of the input line.

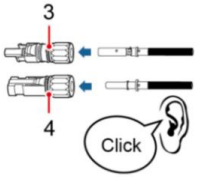


1: Positive metal contact
2: Negative metal contact
（Copper wire:4~6mm²）

①

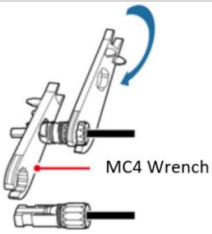


②

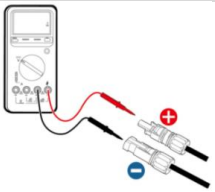


3: Positive connector
4:Negative connector

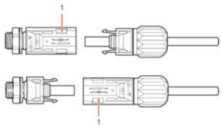
③



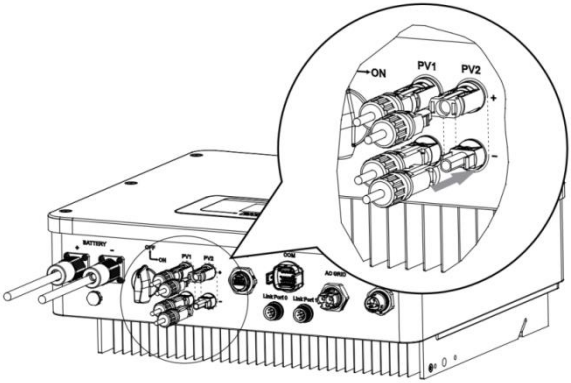
④



⑤



⑥



⑦

Figure 4-2 Connect PV

4.4 Battery Connection

Procedure:

Step 1

Select proper battery cable types and specifications based on Table 4-3. Remove cable glands from the positive and negative connectors.

Step 2

Remove the insulation layer of the positive and negative battery cables by using a cable stripper, as shown in the figure. Insert the stripped positive and negative power cables into the positive and negative metal terminals respectively and crimp them using a crimping tool, as shown in Figure4-3(a)②.

Step 3

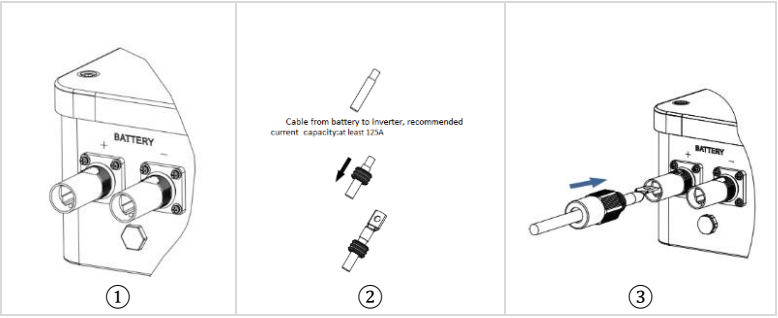
Insert the cable input terminal into the cable, insert the power cable into the battery wiring port on the inverter, and ensure that the power cable is fixed in place, as shown in Figure4-3(a)③.

Step 4

Use a screwdriver to secure the cable, as shown in Figure4-3(a)④.

Step 5

Align the terminal housing with the battery port on the inverter and tighten it at a torque of 2 N·m with a wrench to prevent electric shock caused by manual removal, as shown in Figure 4-3(a)⑤⑥⑦.



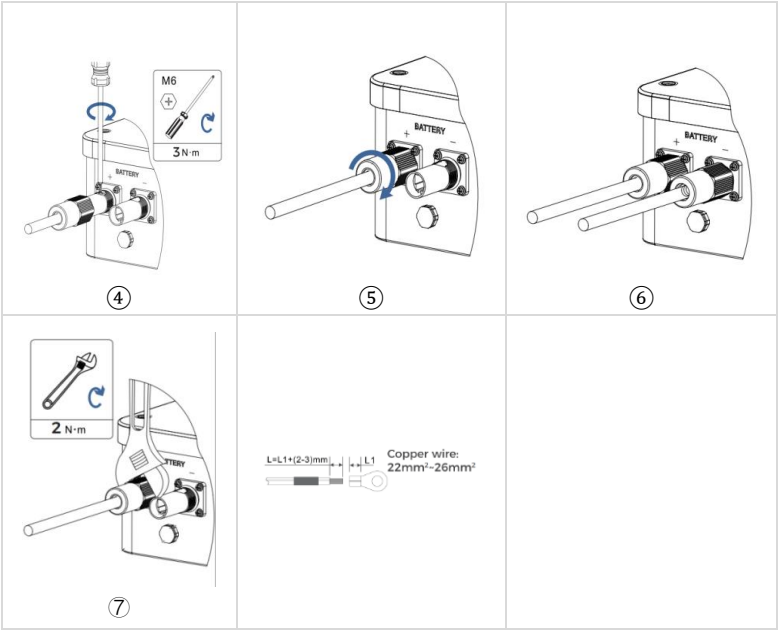


Figure 4-3 (a) Install battery connection

When the lead-acid battery is connected, its temperature sensor needs to be connected to the 7pin and 12pin of the COM port, so as to realize the real-time monitoring of lead-acid battery temperature. The actual wiring diagram is shown in Figure 4-3(b). Connect one end of the temperature sensor cable plug to the COM interface, and the NTC is placed on the surface of the lead-acid battery housing.

DANGER

- When using lead-acid batteries, a temperature sensor must be connected in order to prevent danger from excessive temperatures.

- In order to ensure the safe operation of the inverter, it is necessary to carefully check that the positive and negative cables of the battery port cable, they cannot be reversed.

- NTC wiring has no polarity.

- It is recommended to add an external DC Switch for turning off batteries.

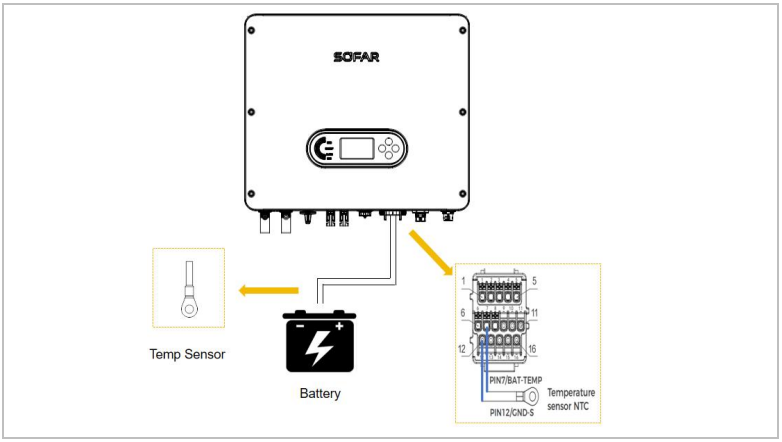


Figure 4-3(b) Temperature Sensor Connection for Lead-Acid Battery

4.5 Load connection

Procedure:

Step 1

Select appropriate cables according to Table 4-3, Remove the insulation layer of the load output cable using a wire stripper according to the Figure4-4①shown below: A:15~25mm B:6~8mm.

Step 2

Disassemble the load connector according to the Figure4-4① shown below: insert the load output cable (with its insulation layer stripped according to **step 1** through the waterproof locking cable gland.

Step 3

Connect load output cable as per the following requirements, as shown in the Figure4-4①:

Connect the yellow-green wire to the hole labelled "PE", fasten the wire using a cross screwdriver;

Connect the brown wire to the hole labelled "L", fasten the wire using a cross screwdriver;

Connect the blue wire to the hole labelled "N", fasten the wire using a cross screwdriver.

Step 4

Insert the load connector and hear "click", then tighten the waterproof nut, as shown in the Figure4-4② below. Ensure that the cable is firmly connected.

Step 5

Connect the load connector of the cable to the load connector of the inverter. Turn the ac connector knob to lock until you hear a "click" and the clasp is in place, as shown in the Figure4-4③④.

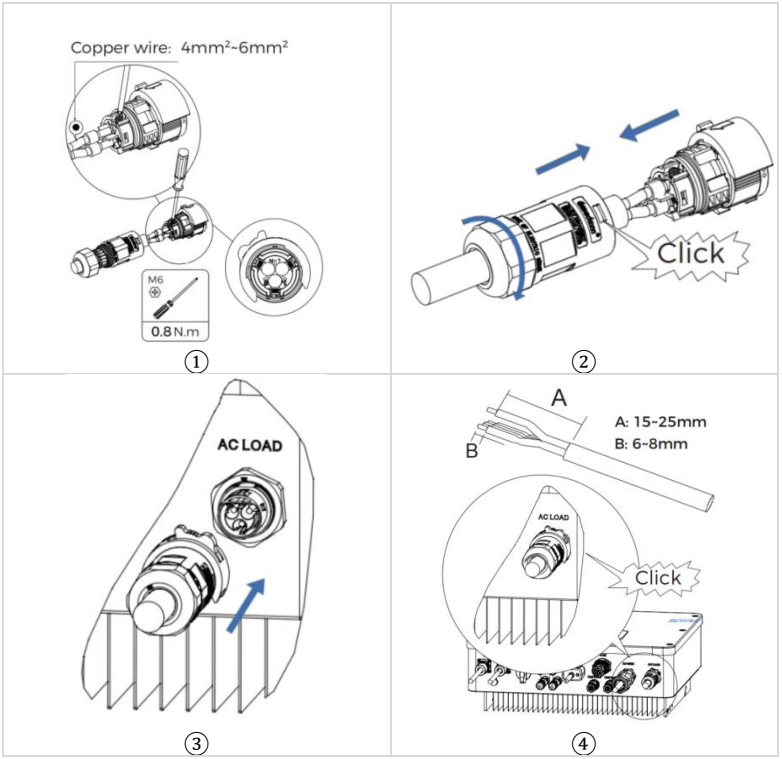
Step 6

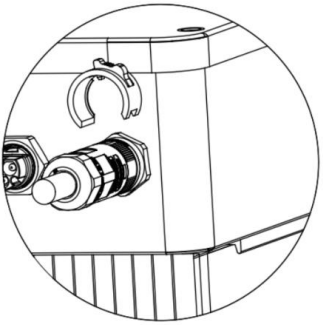
After installation, you need to remove the unlocking tool to prevent accidental disassembly, as shown in the Figure4-4⑤.

Removing the load connector

Hold the button to unlock and rotate the knob counterclockwise to the unlock position, then pull out the load connector. Make sure the grid is disconnected before removing the load connector.

- Do not remove the AC Load plug from the inverter when it is working.





After installation, remove the unlocking tool to prevent disassembly.
⑤

Figure 4-4 Load connection

4.6 Grid connection

The inverter is equipped with an integrated residual current monitoring unit. When the inverter detects that the residual current exceeds limitation, the connection to the power grid will be quickly disconnected.

If the external ac switch has leakage protection function, its rated leakage action current is required to be ⩾ 300mA.

Procedure:

Step 1 Select the appropriate cable type and specifications according to the table4-3. Refer to Figure4-5① for processing wire.

Step 2 Pass the wire through the terminal, as shown in Figure4-5①.

Step 3 According to the mark, lock the wire into the terminal and tighten it with the hexagon socket wrench, as shown in Figure4-5②.

Step 4 Push the terminal forward until the sound of "click" is heard, as shown in Figure4-5③.

Step 5 Connect the connected grid terminal to the inverter grid port, and push the terminal forward until the sound of "click" is heard, as shown in Figure4-5④⑤.

If you need to remove the terminals from the inverter, use the tool to press on the direction indicated by the arrow in the figure and pull the terminals out.

If you need to dismantle the end connection, please use the tool, as shown in Figure4-5⑥⑦.

- When the generator is supplied only , the generator can be directly connected to the grid port, and the connection operation can be referred to grid connection.

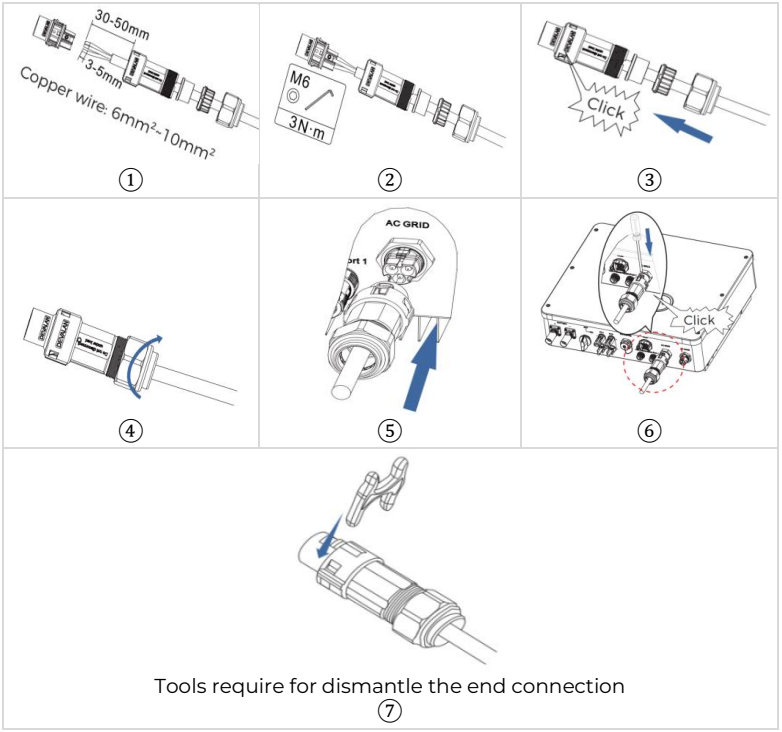


Figure 4-5 Grid connection

4.7 System electrical topology

EP series residential storage system is mainly composed of PV modules, battery modules, inverters, load modules, grid modules, generator modules, and smart meters/CT.

The system electrical topology varies depending on the legal requirements of different countries and regions. For Australia, New Zealand and most of the Middle East and Africa, please follow the electrical topology in Figure 4-6, where N and PE are connected together in the distribution box. For other countries and regions, please follow local requirements and regulations.

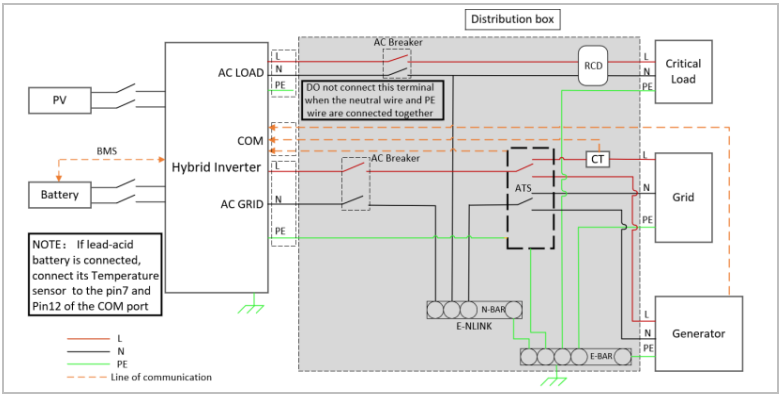


Figure 4-6(a) On-Grid system Electrical Topology
(N and PE wires are connected together)

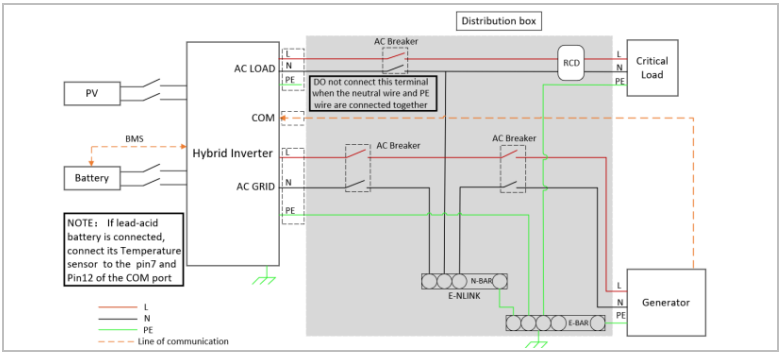


Figure 4-6(b) Off-Grid system Electrical Topology
(N and PE wires are connected together)

DANGER

Install Residual current device (RCD)in front of the load

- RCD is necessary for critical load, but optional for normal load.
- In off-grid mode, the Entry master switch is unprotected and load leakage could lead to shock danger.
- All RCDs connected to Loads are Type B and its rated earth leakage action current <30mA.

- In the menu of the inverter, Neutral Point Grounding function is unavailable.

4.8 External communication interface

4.8.1 4.8.1 USB/WIFI communication interface

Step1 Remove the protective cover from the USB/Wi-Fi port of the inverter.

Step2 Install the capture stick on the USB/Wi-Fi port.

Step3 Tighten the connecting nut on the capture stick.

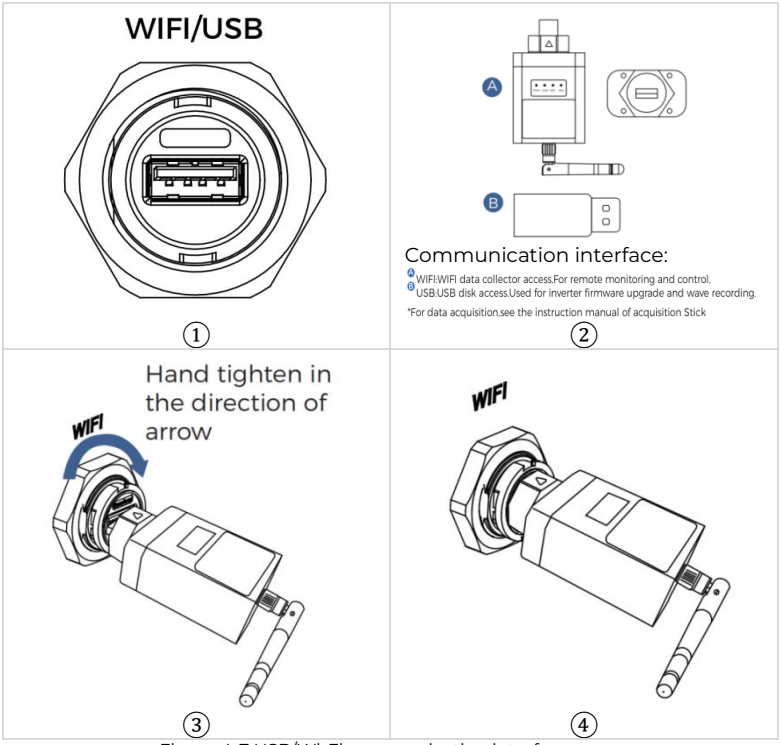


Figure 4-7 USB/Wi-Fi communication interface

Table 4-4 Interface description

PIN	Definition	Function	Note
1	GND.S	USB power -	The USB power supply is 5V/1A, it Cannot be used for external device charging
2	DP	USB data +	
3	DM	USB data -	
4	VBUS	USB power +	



Figure 4-8 Collects information about single inverter

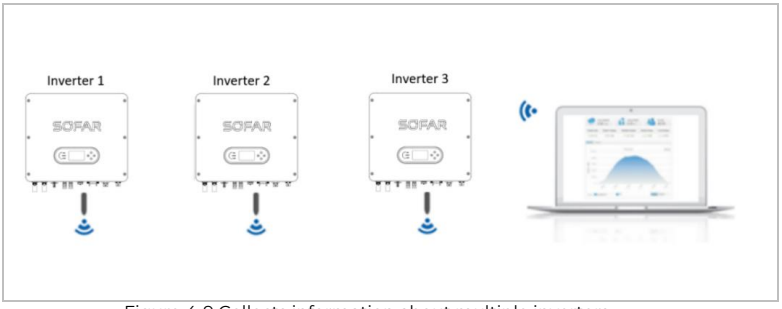


Figure 4-9 Collects information about multiple inverters

The operation information (generated energy, alert, operation status) of the inverter can be transferred to PC or uploaded to the server via WiFi/GPRS Users can choose to use web or APP for monitoring and viewing according to their needs. The collected information is shown in Figure4-8 and Figure4-9. You need to register an account and bind the device with the WiFi/GPRS SN number. The SN number of the WiFi/GPRS shall be affixed to the package box and the WiFi/GPRS.

Web: https://global.sofarcloud.com/

APP: Android: Go to Android Market and search “SOFAR Cloud”.

IOS: Go to App Store and search “SOFAR Cloud”.

- **SOFAR Cloud**

4.8.2 COM-Multifunction communication interface

Table 4-5 Interface description

PIN	Definition	Function	Note
1	CANH	CAN high data	Communication with lithium battery BMS, the inverter CAN be adaptive to lithium battery BMS to provide CAN communication and RS485 communication
2	CANL	CAN low data	
3	485-2TX+	RS485 differential signal +	
4	485-2TX-	RS485 differential signal –	
5	485-1TX+	RS485 differential signal +	

6	485-1TX-	RS485 differential signal –	Wired monitoring or inverter cascade monitoring
7	BAT_TEMP	Lead-acid battery: temperature sensor	It is used with PIN12 for lead-acid battery temperature sampling and has no polarity
8	DI1	Digital input signal	Used to receive the signal from ATS
9	DI2	Digital input signal	It can be used for rapid shutdown
10	DO1+	Dry contact+	Used to start the diesel generators
11	DO1-	Dry contact-	
12	GND-S	Ground of BAT-TEMP/DI1/DI2	Used to connect to the ground of signal BAT-TEMP/DI1/DI2
13	CT-	The current sensor outputs a negative electrode	Connect current sensor of power grid
14	CT+	The current sensor outputs a positive electrode	
15	RS485-B	RS485 differential signal –	Meter communication
16	RS485-A	RS485 differential signal +	

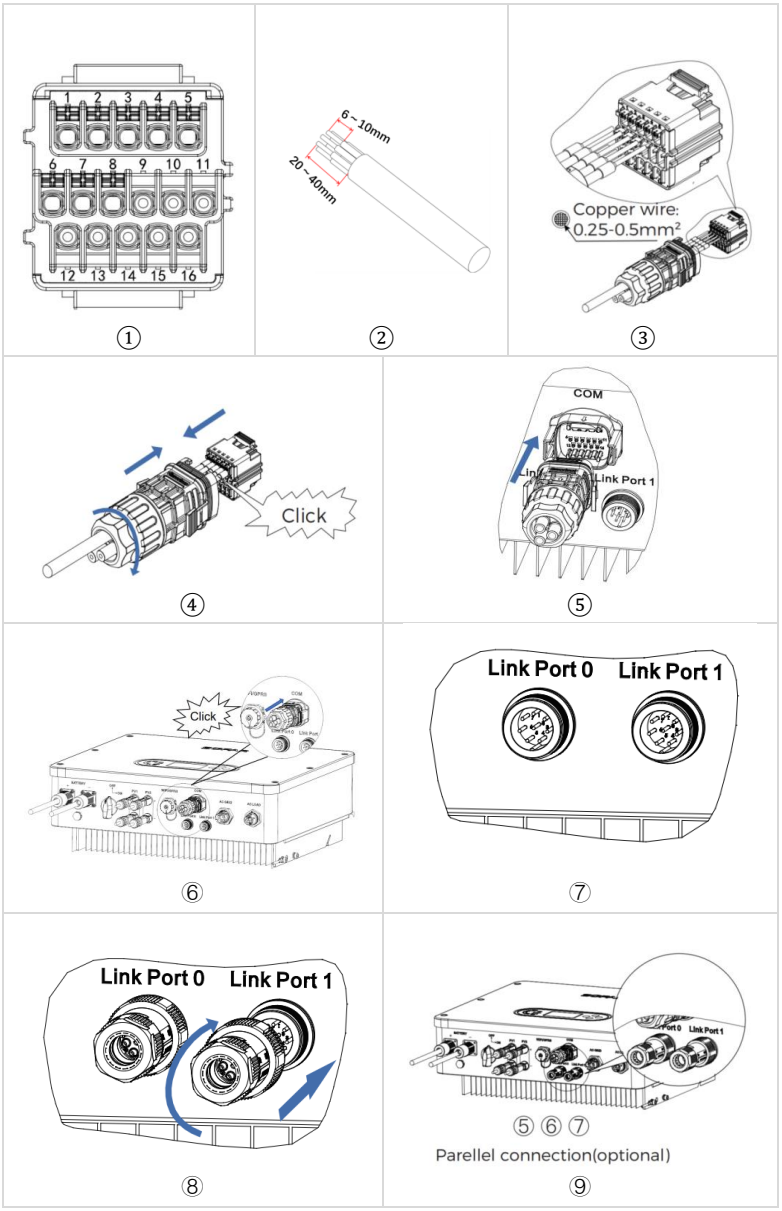


Figure 4-10 COM interface

1. **RS485**（Wired monitoring or inverter cascade monitoring）

Refer to the figure shown below, connect the RS485+ and RS485- of the inverter to the TX+ and TX- of the RS485→USB adapter, and connect the USB port of the adapter to the computer.

- The length of the RS485 communication cable should be less than 1000m.

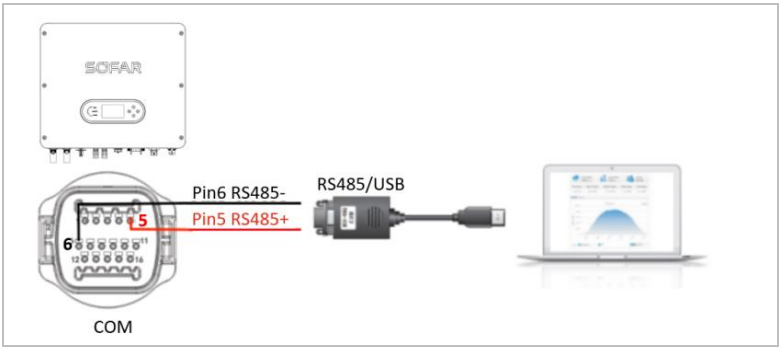


Figure 4-11 RS485 connection (wired monitoring)

RS485 wires are connected in parallel between inverters, when multiple inverters are connected via RS485 wires, set communication address to differentiate the inverters, please refer to this manual<6.3.1System Setting→6.Communication Addr>.

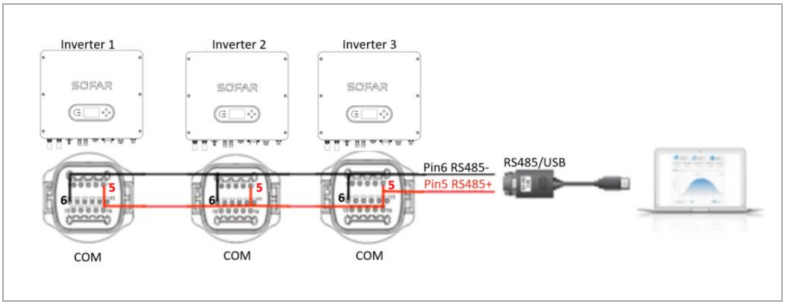


Figure 4-12 RS485 connection(cascade of monitoring between inverters)

2. **Meter/CT**

PIN15 and PIN16 are used for meter communication, the electricity meter is shown in the Figure4-13①, PIN15 and PIN16 correspond to 7,8 respectively on the electricity meter, as shown in Figure4-13③.

The connection mode is shown in Figure4-13②. The 1/2 and 3/4 on the electricity meter are connected to voltage signals L and N respectively. And the current needs to be connected through the current transformer,5,6 correspond to the current transformer.

The direction of the current transformer is shown in Figure4-13④.

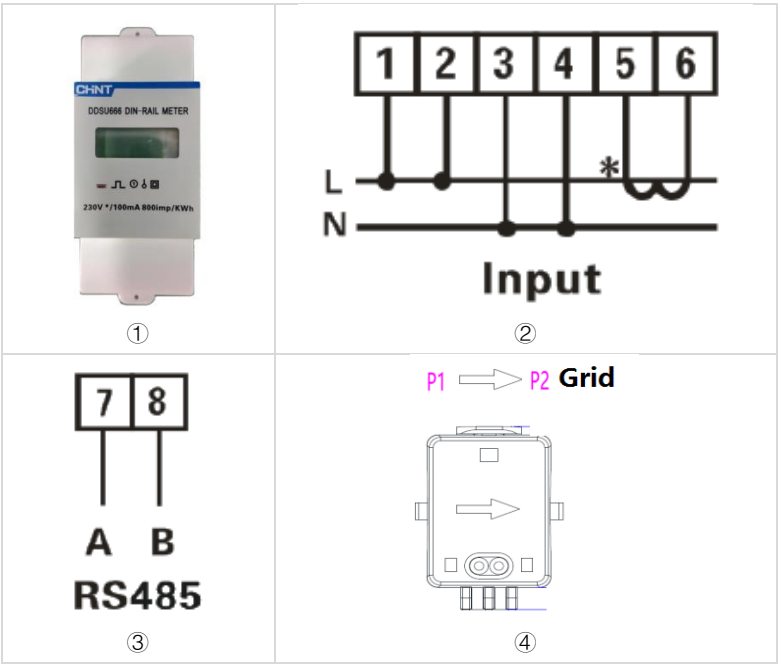
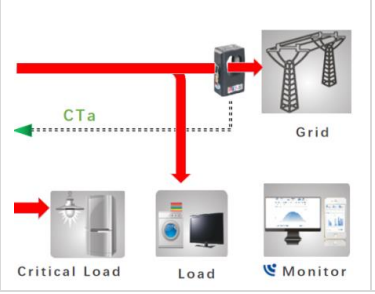
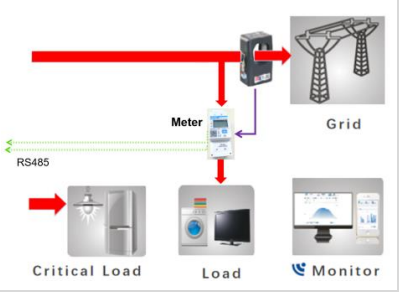


Figure 4-13 Meter

If you need to use the CT alone, attach the CT to PIN13 and PIN14.

There are two ways to get grid current information :

Plan A:CT Plan B:Meter +CT

Plan A：CT	Plan B：Meter +CT
CT（3000:1）120A/40mA Pin13--Pin14	Meter: DDSU666 DIN-RAIL METER 230V*/100mA CT
	

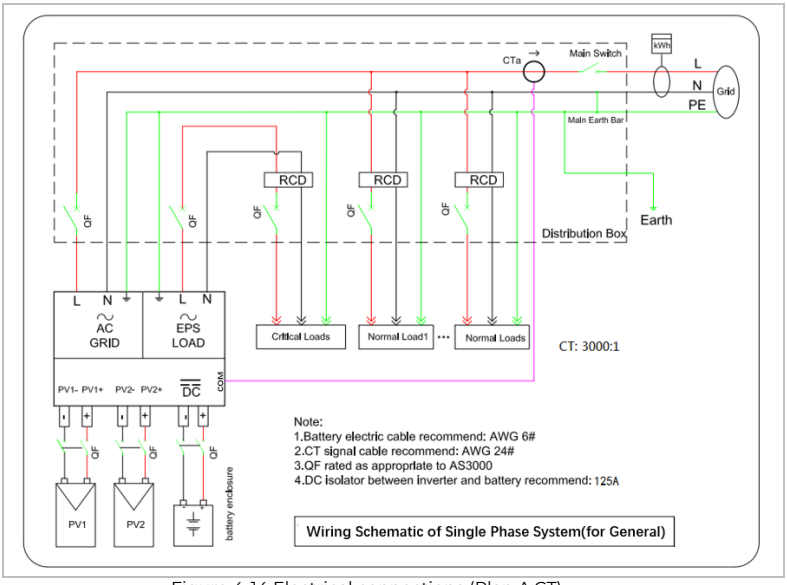


Figure 4-14 Electrical connections (Plan A:CT)

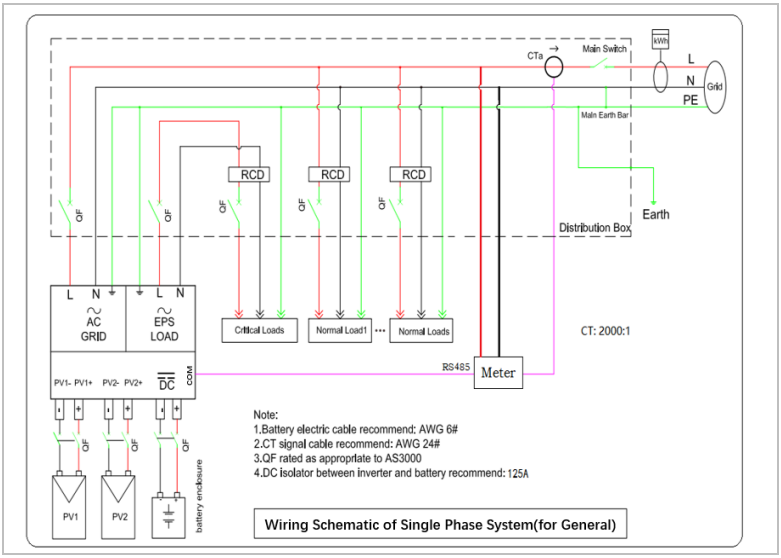


Figure 4-15 Electrical connections (Plan B:Meter +CT)

3. **Feed-in limit function**

The feed-in limit function can be used to limit the power fed back into the grid. In order to achieve this function, power measurement devices must be installed according to the system.

Single-phase limit: The power output of the inverter to the power grid does not exceed the set power limit value.

- For the Single-phase limit Setting, the current sensor must be properly connected to the L line on the meter. The meter wiring is shown in Figure 4-145. In addition, refer to 6.3.2(2) for feed-in limit Settings.
- If communication with the smart meter is interrupted, the inverter limits its output power to the set power limit value.

4. **Dry contact function**

HYD 3000/3600/5000/6000-EP inverter has three dry contacts, which can achieve three different functions:

(1) DI1: Dry contact 1 is used to receive the information from the ATS. Its function is realized by connecting PIN8 and PIN12 of the COM end to the ATS communication port. When the system is connected to a power grid, the dry contact 1(DI1) is disconnected from GND-S. When there is no power grid in the system, there is a short-circuit state between dry contact 1(DI1) and GND-S. The wiring of DI1 is shown in Figure 4-16(a).

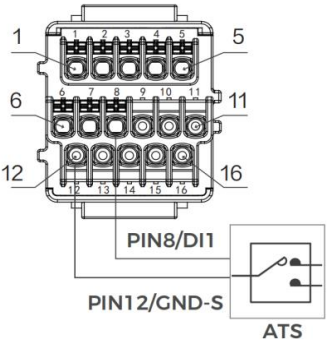


Figure 4-16(a) DI1 wiring diagram

(2) DI2: Dry contact 2 is used for rapid shutdown. When using emergency shutdown, the customer needs an external emergency switch. In emergency situations, pressing this switch will shut down the inverter. In normal operation of the inverter, the switch must be normally open. The wiring diagram is shown in Figure 4-16(b).

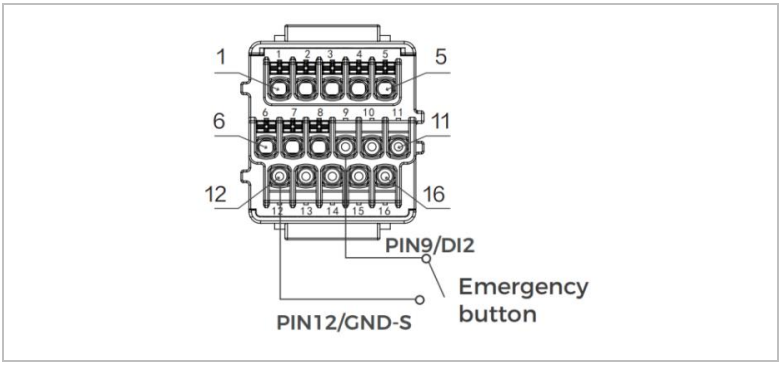


Figure 4-16(b) DI2 wiring diagram

(3) DO: Dry contact is used to start and stop the generator. Its function is realized by connecting the PIN10(DO+) and PIN11(DO-) of the COM end to the start port of the generator. The wiring of DO is shown in Figure 4-16(c).

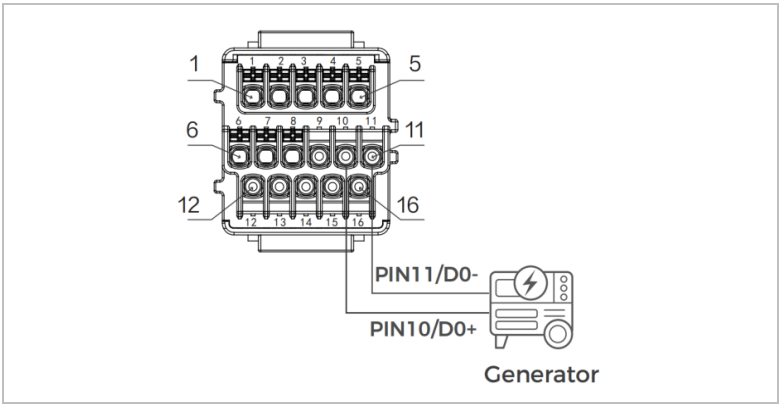


Figure 4-16(c) DO wiring diagram

- The wiring of the three dry contact are no polarity.

4.8.3 Link Port 0 and 1-Cascade communication interface

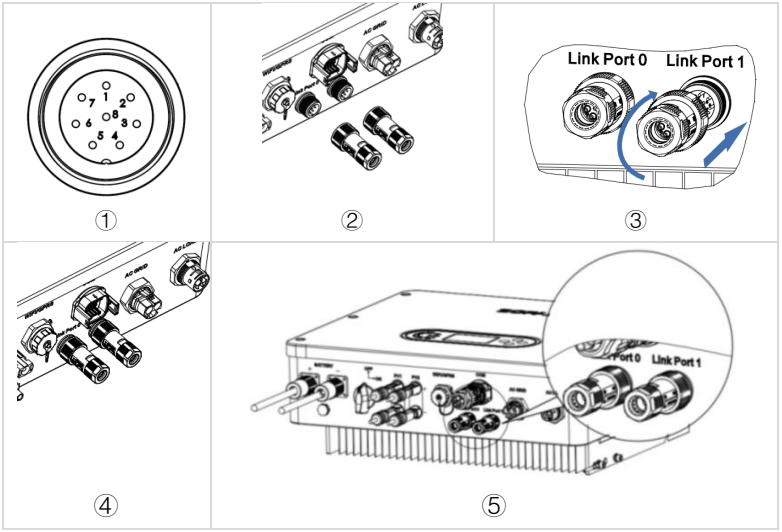


Figure 4-17 Link Port

When using the parallel system, the inverter Settings and notes please refer to this manual<6.3.2 Advanced Setting→6.Parallel Setting>.

- **AC LOAD is also parallel for parallel machines:**

1. The first and last inverters need to be connected with 8Pin connection terminals.
2. The cable length of the AC LOAD terminal connected from the LOAD terminal to each machine shall be consistent with the specification of the cable length, so as to ensure that the loop impedance is consistent and the current of the LOAD current diverted to each machine is nearly equal.
3. When inverters in parallel, All AC gird should be Shared a total air switch; All AC LOAD should be Shared another total air switch.

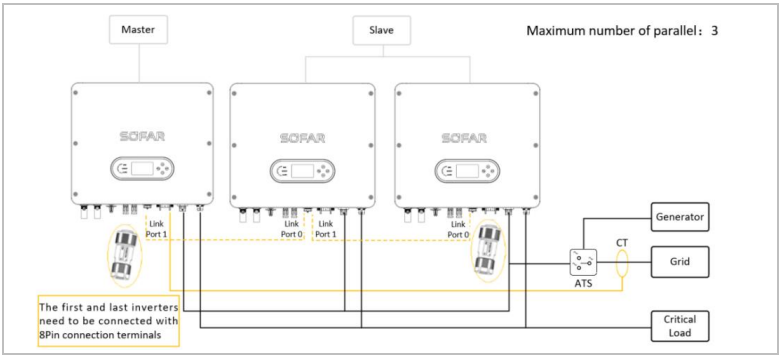


Figure 4-18(a) parallel system (On-Grid)

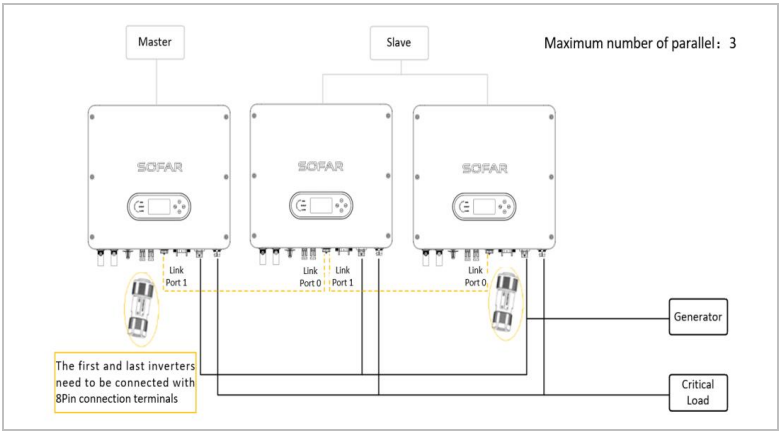


Figure 4-18(b) parallel system(Off-Grid)

5 Buttons and indicator lights

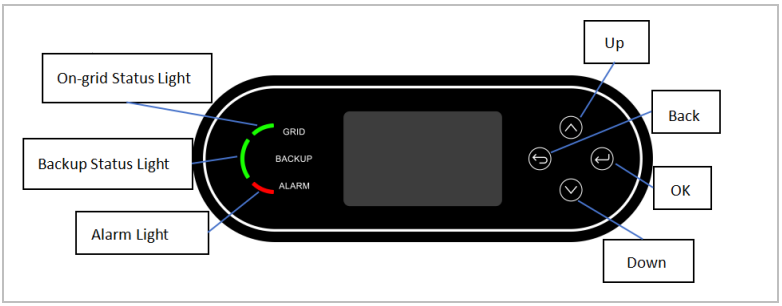


Figure 5-1 Buttons and indicator lights

5.1 Buttons

- Press “Back” to the previous screen or enter the main interface.
- Press “Up” to the upper menu option or value plus 1.
- Press “Down” to the lower menu option or value minus 1.
- Press “OK” to select the current menu option or switch to the next digit.

5.2 Indicator lights and status

Status	On Grid Green light	Off-Grid Green light	Alarm Red light
On-grid	ON		
Standby (On-Grid)	Flashing		
Off-Grid		ON	
Standby (Off-Grid)		Flashing	
Alarm			ON

6 Operation

6.1 Double Check

Please double check the following before operation.

1. Inverter is firmly fastened to the mounting bracket on the wall.
2. PV+/PV- wires are firmly connected, polarity and voltage are correct.
3. BAT+/BAT- wires are firmly connected, polarity and voltage are correct.
4. DC isolator is correctly connected between battery and inverter, DC isolator: OFF.
5. GRID / LOAD cables are firmly / correctly connected.
6. AC circuit breaker is correctly connected between inverter GRID port and GRID, circuit breaker: OFF.
7. AC circuit breaker is correctly connected between inverter LOAD port and critical load, circuit breaker: OFF.
8. For lithium battery, please ensure that the communication cable has been correctly connected.

6.2 First Time Setup (IMPORTANT!)

IMPORTANT: Please follow the following procedure to switch ON inverter.

1. Make sure there's no power generation in inverter's phase.
2. Turn ON DC switch.
3. Switch ON the battery. Turn ON DC isolator between battery and inverter.
4. Turn ON AC circuit breaker between the inverter LOAD port and critical load.
5. Turn ON AC circuit breaker between the inverter GRID port and GRID.
6. Inverter should start to operate now.

You need to set the following parameters before inverter starts to operate.

Table 6-1 Set the parameters

Parameter	Note
1.OSD Language Option	The default English.
2.System Time Setting and Confirmation	If you are connected to the host computer such as collector or mobile phone APP, the time should have been calibrated to the local time.
*3.Safety Parameter Import	Refer to the grid code table 6-2 below and select country and code.
4.Setting Input Mode	You can select the PV input mode as required.
*5.Set Battery Parameters	Default values can be displayed according to the input channel configuration.
6. Setup is complete	

Table 6-2 List of regulated countries

Code		Region	Grid Code	Description
000	000	Germany	VDE-AR-N 4105	Germany low-voltage
001	000	Italy	CEI 0-21 In.	Italy low-voltage ≤11kVA
	002		CEI 0-21 Ex.	Italy low-voltage >11kVA
	003		CEI 0-21 Areti	CEI 0-21 Areti
002	000	Australia	Australia-A	New South Wales、Victoria、Queensland、south Australia、Australian Capital Territory、Jervis Bay Territory
	008		Australia-B	Western Australia，Northern Territory
	009		Australia-C	Tasmania
003	002	Spain	NTS 631-BCD	Spain NTS typeB/C/D

Code		Region	Grid Code	Description
	003		UNE 217002 RD647	Spain UNE+RD
	004		Spain island	Spain island
	006		NTS 631-A	Spain NTS typeA
004	000	Turkey	EN 50549-1	Turkey
005	000	Denmark	Denmark	Denmark
	001		DK-TR 322	DK-TR 322
	002		Western Denmark	Western Denmark
	003		Eastern Denmark	Eastern Denmark
006	000	Greece	GR-Continent	GR-Continent
	001		GR-Island	GR-Island
007	000	Netherland	EN 50549-1	Netherland low-voltage
008	000	Belgium	C10/11	Belgium
	002		Belgium-LV	Belgium-LV
009	000	UK	G99	UK output current ＞16A
	001		G98	UK output current≤16A
	002		G99/NI	Nor Ireland output current＞16A
	003		G98/NI	Nor Ireland output current≤16A
010	000	China	NB/T 32004-B	NB/T 32004-B
	009		NB/T 32004-A	NB/T 32004-A
011	000	France	France	France
	001		FRArrete23	FRArrete23
	003		France VFR 2019	France VFR 2019
	004		VDE 0126 Enedis	VDE 0126 Enedis
	006		VFR 2019 Enedis	VFR 2019 Enedis
	007		EN 50549-1	EN 50549-1
012	000	Poland	Poland-A	Poland-A:≤0.2MW
013	000	Austria	TOR Erzg.-A cosφ	Austria TOR A＜ 250kW and nominal voltage＜ 110kV

Code		Region	Grid Code	Description
	001		TOR Erzg.-A Q-U	Austria TOR A< 250kW and nominal voltage< 110kV
015	000	Switzerland	NA/EEA NE7-A	Switzerland-A
018	001	EN 50549	EN 50549-1	EN 50549-1 230V 50Hz
019	000	IEC 61727	IEC 61727	IEC61727 230V 50Hz
021	000	Sweden	Sweden	EN 50549-1
	001		EIFS 2018:2-A	Sweden typeA
022	000	User defined-50 Hz	User def.-50 Hz	User defined-50 Hz
024	000	Cyprus	Cyprus	Cyprus
	001		CY-LV-RES	CY-LV-RES
	002		CY-LN/MV-COM	CY-LN/MV-COM
	003		CY-LV/MV-UT	CY-LV/MV-UT
027	000	New Zealand	New Zealand	New Zealand
029	000	Slovakia	SK-VSD	SK-VSD
	001		SK-SSE	SK-SSE
	002		SK-ZSD	SK-ZSD
030	000	Czechia	EN 50549-1	EN 50549-1
	002		PPDS 2023-A1	AC ≤16A,typeA1
	003		PPDS 2023	AC> 16A,typeA2/B/C/D
031	000	Slovenia	SIST EN 50549-1	Slovenia
039	001	Ireland	EN 50549-1 Micro	sigle phase inverter≤6KVA; three phase inverter ≤11KVA
044	000	South Africa	NRS 097-2-1	South Africa-A
0123	000	Romania	ANRE Nr.208	Romania
0125	000	Finland	Finland	Finland

⚠ CAUTION

- It's very important to make sure that you have selected the correct country code according to requirements of local authority.
- Please consult qualified electrical engineer or personnel from electrical safety authorities about this.
- Shenzhen SOFARSOLAR Co., Ltd. is not responsible for any consequences arising out of incorrect country code selection.

Table 6-3 Default values for other Settings

Item	The default state
Energy Storage Mode	Self-use mode
EPS Mode	Disable
Feed-in Limit	Disable
IV Curve Scan	Disable
Logic interface	Disable

6.3 Menu

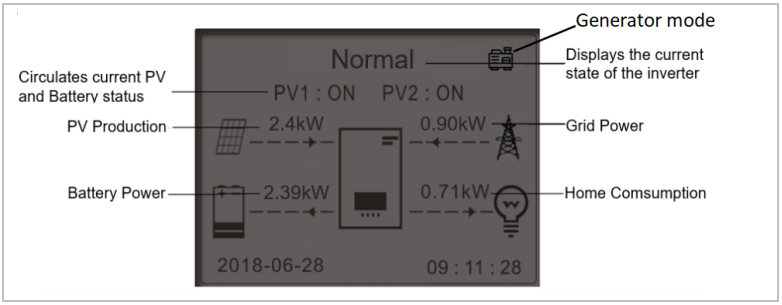


Figure 6-1 Main interface

- The generator icon is displayed on the LCD only when in generator mode.

In the main interface, press “Down” button to enter grid or EPS parameters page/lithium battery or lead-acid battery parameters page.

Main interface	Down↓	**Grid Output Information**
		Grid(V) .....***.*V
		AC Power.....**.**kW
		Frequency.....**.**Hz
	Down↓	**Battery Information**
		Batt(V).....****.*V
		Batt Chrg Curr.....**.**A
		Batt DisChrg Curr.....**.**A
		Batt Power.....**.*kW
		Batt Temp.....*℃
		Batt SOC.....**%
	(Lead-acid）	Batt SOH.....**%
	(Lithium)	Batt Cycles.....**%

Main interface	Down ↓	EPS Output Information
		EPS(V) .....***.*V
		AC Power.....**.**kW
		Apparent Power.....**.**VA
		Power Factor.....**.**
		Frequency.....**.**Hz
	Down ↓	**Battery Information**
		Batt(V).....****.*V
		Batt Chrg Curr.....**.**A
		Batt DisChrg Curr.....**.**A
		Batt Power.....**.*kW
		Batt Temp.....*℃
		Batt SOC.....**%
	(Lead-acid）	Batt SOH.....**%
	（Lithium）	Batt Cycles.....**%

In the main interface, press “UP” button to enter PV parameters page.

Main interface	Up ↑	PV Information
		PV1 Voltage.....****.*V
		PV1 Current.....**.**A
		PV1 Power.....**.**KW
		PV2 Voltage.....****.*V
		PV2 Current.....**.**A
		PV2 Power.....**.**KW
		Inverter Temp.....*℃

- When the system is connected to the lead-acid battery, the battery capacity value, max charge voltage value, float charge voltage value and min Discharge voltage value of the lead-acid battery should be set on the LCD according to the actual battery parameters. Otherwise, the accuracy of Battery SOC information calculation will be affected. Please

refer to 6.3.2 for lead-acid battery parameter settings. After setting, the inverter must be restarted.

NOTICE

- When the machine reports ID124 Low battery Alarm failure, please be sure to charge the battery in time. Otherwise, the resulting machine damage or other losses, Shenzhen SOFARSOLAR Co., Ltd. is not responsible for them.

In the main interface, press “back” button to enter main menu. The main menu has the following six options.

Main interface	Back	1.System Settings
		2.Advanced Settings
		3.Energy Statistic
		4.System Information
		5.Event List
		6.Software Update

6.3.1 System Settings

1. System Settings	OK	1.Language Settings
		2.Time
		3.Safety Param.
		4.Energy Storage Mode
		5.EPS Mode
		6.Communication Addr.
		7.Generator Control

1. **Language Settings**

Used to set the menu display language.

1.Language Settings	OK	1.中文	OK
		2.English	
		3.Italiano	
		.....	

2. **Time**

Set the system time for the inverter.

2.Time	OK	Time 2020-05-13 17:07:00

3. **Safety Param**

3.Safety Param.	OK	1.Select safety regulations	OK
		2.Select USB file	OK

User can modify the Safety Param of the machine through the usb flash disk, and the user needs to copy the parameter information that needs to be modified into the usb flash disk card in advance.

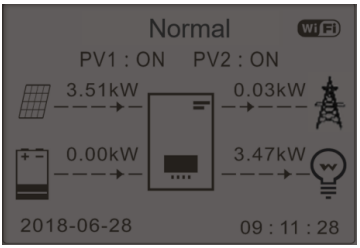
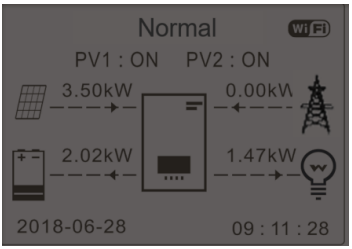
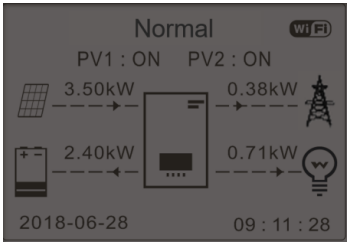
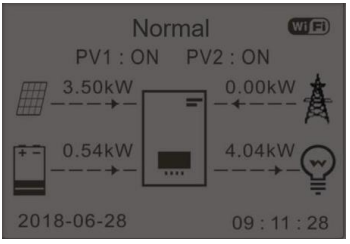
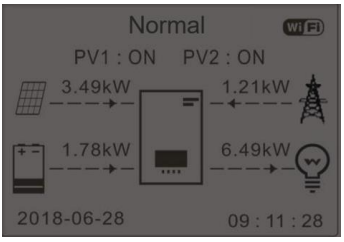
- To enable this feature, please contact the SOFAR technical support

4. **Energy Storage Mode**

4.Energy Storage Mode	OK	1.Self-use Mode
		2.Time-of-use Mode
		3.Timing Mode
		4.Passive Mode
		5.Peak Shaving Mode

- Self-use Mode

In Self-use mode, inverter will automatically charge and discharge the battery.

1)If PV generation = LOAD consumption (ΔP < 100W) inverter won't charge or discharge the battery. 	2)If PV generation > LOAD consumption, the surplus power will be stored in the battery. 
3)If the battery is full(or already at Max Charge Power), excess power will be exported to the grid. 	4)If PV generation < LOAD consumption, it will discharge the battery to supply power to load. 
5)If PV generation + Battery < LOAD consumption, inverter will import power from the grid. 	

- Time-of-use Mode

If electricity is more expensive in high demand time (peak rate) and electricity is much cheaper in low demand time (off-peak rate).

You can select an off-peak period to charge your battery. Outside the off-peak charge period, inverter is working in Auto Mode.

If your family normally go to work/school on weekdays and stay at home on weekends, which means the home electricity consumption is much higher on weekends. Thus, you need to store some cheap electricity on weekends only. This is possible using our Time-of-use mode.

In summer, if your PV system can produce more electricity than your home electricity consumption. Then you don't need to set an off-peak charge period to charge your battery in summer at all. You can select an effective date (normally winter) for Time-of-use mode in this case. Outside the effective date, inverter is working in Auto Mode.

You can set multiple Time-of-use rules to meet your more complex requirement. Right now we support 4 rules maximum (rule 0/1/2/3).

2.Time-of-use Mode	OK	Set Time-of-use Mode

Rules. 0:	Enabled/Disabled		
From	To	SOC	Charge
02h00m -	04h00m	070%	01000W
Effective	date		
Dec. 22	-	Mar. 21	
Weekday	select		
Mon. Tue. Wed. Thu. Fri. Sat. Sun.			

- Timing Mode

With the Timing Mode you can define fixed times of the day to charge or discharge the battery with a certain power.Right now we support 4 rules maximum (rule 0/1/2/3).

3.Timing Mode	OK	Timing Mode	
		Rules.0:Enabled/Disabled	
		Charge Start	22 h 00 m
		Charge End	05 h 00 m
		Charge Power	02000 W
		DisCharge Start	14 h 00m
		DisCharge End	16 h 00m
		DisCharge Power	02500 W

- Passive Mode

The passive mode is used in systems with external energy management systems. The inverter's operation will be controlled by the external controller using the Modbus RTU protocol. For more detailed information, please ask representative of SOFAR to get a copy of passive mode communication protocol.

4.Passive Mode	OK	Success

- Peak shaving mode

Used to limit the maximum power priority purchased from the grid. The maximum purchasing power can be set in this mode (such as 1000W). When the system preferentially buys more power from the grid than the set value, The battery starts discharging and stabilizes the system power at the set value.

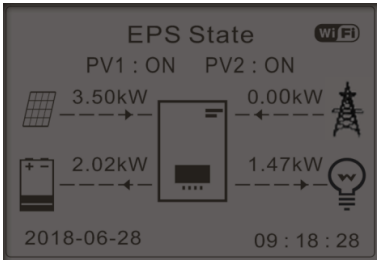
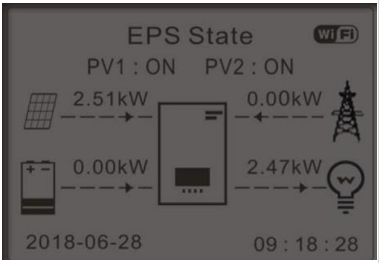
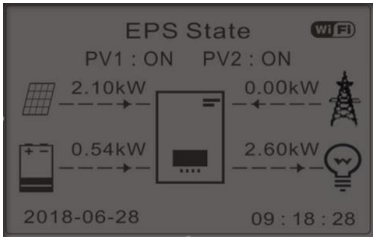
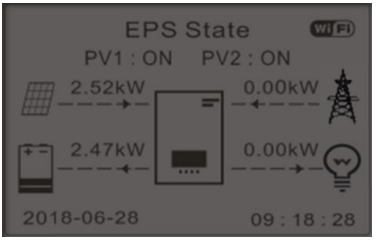
Suitable for gradient tariff scenes, where the grid charges according to electricity consumption, and electricity is cheaper within a certain range of consumption.

Suitable for scenes where the grid is weak and the grid company expects distributed energy storage devices to perform peak shaving functions.

5.Peak Shaving Mode	OK	Peak Shaving Mode	
		Priority Buy Power 1000W	

5. **EPS Mode**

5.EPS Mode	OK	1.EPS Mode Control	OK	1.Enable	OK
				2.Disable	

1)If PV generation > LOAD consumption (ΔP > 100W), inverter will charge battery. 	2)If PV generation = LOAD consumption, inverter wont' charge or discharge battery. 
3)If PV generation < LOAD consumption (ΔP > 100W), inverter will discharge battery. 	4) If PV generation is normal,but LOAD consumption=0, the surplus power will be stored in the battery. 

6. Communication Addr

6.Communication Addr.	OK	1.Communication Addr.	OK	01	
		2.Baud Rate	OK	9600bps	

7. Generator Control

In the generator control function, you can select the control mode, generator lock setting and the peak power.

- After starting the generator, it is necessary to leave the heat engine idle for 3 minutes. Before the generator is shut down, dissipate heat without load for 3 minutes.

7.Generator Control	OK	1.Control Mode	OK	Manual/Auto	
		Auto/ Manual control	OK		
		3.Peak power	OK	Set generator power	00.1KW
		4.Gen lock setting	OK	Enable/Disable	
		5.Save			

- Gen lock setting-Enable

When only generator connected to the AC GRID port, the Gen lock setting function should be enabled firstly. Then press Control Mode to select manual control or automatic control.

Control Mode option is “Manual” by default, which means the generator is in manual control mode. Users can start generator manually by enable the “Manual Control” option or stop it by disable the “Manual Control” option.

2.Manual control	OK	Start/off	OK

When control Mode is selected to “Auto”, users can set some parameters in “Automatic control” option. When the system connects to the lithium battery, the start SOC and stop SOC of the battery need to be further set in the automatic mode. If the start SOC value is greater than the current SOC value of the battery, the generator will start and charge the battery. If the stop SOC value is lower than the current SOC value of the battery, the generator will stop and battery will discharge(EPS Mode).
When the lead-acid battery is connected to the system, set the start voltage of the battery by referring to lead-acid battery parameters.

2.Automatic control	OK	1.start SOC/start voltage	OK	40%/47.2V

- Gen lock setting-Disable

When only grid connected to the AC GRID port, the Gen lock setting function should be disabled firstly, and then user must ensure that the manual control is disabled.
When the generator is connected to the AC GRID port through the ATS, Gen lock setting option should be disabled firstly, By accepting the single of ATS, inverter will judge the status of grid and select grid or generator as the power of system. If the generator is providing power for system, users can also select Automatic or Manual Mode to control it. The control method is the same as the off-grid mode.

- Peak power

Peak power can be set to limit the the sum of the charging power and load power of the system. When a single inverter is connected to the system, the user is allowed to set the maximum peak power of 10kW on the LCD display. When multiple inverters are connected to the system in parallel mode, the user only needs to set the peak power on the LCD display of the master. At this time,

the total power that the generator can provide to the system is N*peak power (N is the total number of inverters).

- The peak generator power set on the LCD cannot exceed the rated power of the actual generator.

NOTICE

- Please follow the above methods for setting the inverter in different scenarios.
- Shenzhen SOFARSOLAR Co., Ltd. is not responsible for any consequences arising out of incorrect settings.

6.3.2 Advanced Settings

2.Advanced settings	OK	**Input 0001**
		1.Battery Parameter
		2. Feed-in Limitation
		3.IV Curve Scan
		4.Logic Interface
		5.Factory Reset
		6.Parallel settings
		7.Reset Bluetooth
		8.CT Calibration
		9.Battery Active
		10.Set PCC Meter

1. **Battery Parameter**

1.Battery Parameter	OK	1.SOFAR AMASS
		2.LG
		3.CATL
		4.PYLON
		5.Alpha. ESS
		6.GENERAL
		7.Lead acid
		8.Fronus
		9.Dowell

- Max charge (A)

2.Max charge (A)	OK	100A

- Max Discharge (A)

3.Max Discharge (A)	OK	100A

- Depth of Discharge

1.SOFAR	OK	1.Max Charge（A）
		2.Max Discharge（A）
		3.Discharge Depth
		4.Set ForceChargeTime
		5.Save

3.Discharge Depth	OK	Discharge Depth 80%
		Discharge DeptEPS 80%
		EPS Safety Buffer 20% （Note：This parameter setting is only displayed in the lithium battery mode）

For example: if Discharge Depth=50% and Discharge Depth（EPS）=80%.

While grid is connected: Inverter won't discharge the battery when its SOC is less than 50%.

When using lead-acid batteries,,you can set the following parameters.

Lead acid	OK	1.Battery Cell Type
		2.Parameter setting
		3.SOC control
		4.SOC force calibration
		5.Save

Recommended battery settings（There are two default parameters）

1.Battery Cell type	OK	1.Lead Acid Custom
		2.AGM
		3.GEL
		4.Flooded

One default parameter：

1.Lead Acid Custom	OK	Success

（Return to the previous page display）

2.Parameter setting	OK	Battery Capacity	100Ah
		Max Charge（V）	57.6V
		Float Charge（V）	55.2V
		Max Charge（A）	030.00A
		Max Discharge（A）	100.00A
		Min Discharge（V）	46.0V
		Recovery Buffer（V）	2.5V

Another default parameter：

AGM/GEL/Flooded	OK	Success

（Return to the previous page display）

2.Parameter setting	OK	Battery Capacity	0100Ah
		Max Discharge（A）	100.00A
		Min Discharge（V）	46.0V

- Lithium battery related parameters need to be set according to its voltage parameters

- Do not alter these settings too often on the same battery, as it may damage the battery.

2. **Feed-in Limitation**

The user can enable “Limitation” to limit the max export power to grid. Reflux Power set is desired max export power to grid. Refer to 4.8.2 for connection of the system when using Feed-in Limit function.

2.Feed-in Limitation	OK	1.Feed-in Limitation	OK	Enable
				Disable
		2.Feed-in Power	OK	***kW
		3.Hard Limit Control	OK	Enable
				Disable

3. **IV Curve Scan**

The user can enable “IV Curve Scan”(MPPT scan) to make inverter to find the global max power point periodically to deliver max power from a partially shaded PV array.

The user can input scan period or make inverter to perform a scan right away.

3.IV Curve Scan	OK	1.Scan Control	OK	Enable
				Disable
		2.Scan Period	OK	***min(s)
		3.Force Scan	OK	

4. **Logic Interface**

The logical interface function is “disabled” by default.

5. **Factory Reset**

5.Factory Reset	OK	1.Clear Energy Data	OK
		2.Clear Events	OK
		3.Factory Reset	OK

- Clean the inverter of the total power generation.

1.Clear Energy Data	OK	Please confirm!	Cancel	OK
			Clear	OK

- Clean up the historical events recorded in the inverter.

2.Clear Events	OK	Please confirm!	Cancel	OK
			Clear	OK

- The inverter is restored to factory Settings.

3.Factory Reset	OK	Are You Sure?	OK

6. **Parallel Settings**

Please refer to <4.8.3 Link Port 0 and 1-Cascade communication interface> for the connection method of the parallel system.

6.Parallel Settings	OK	1.Parallel Control
		2.Parallel Primary-Replica
		3.Parallel Address
		4.Save

- Parallel Control: Enable or disable parallel functions. Both the master and the slave must enable this function.
- Parallel Primary-Replica: Set up the Primary and Replica.Select one inverter as the Primary and set the others to Replica.
- Parallel Address: Set the parallel address.Each inverter needs to set a parallel address, and the parallel address in a parallel system cannot be repeated.
- Save: Save after the setup is complete.

> - The parallel address is different from the communication address used for monitoring

7. **Reset Bluetooth**

7.Reset Bluetooth	OK	Please confirm!	OK	Success

8. **CT Calibration**

To calibrate the direction and phase of the CT, the battery should be charged or discharged when using this function.

8.CT Calibration	OK	Start CT Calibration	Calibrating	Success/ Fault

Check if the battery is charging or discharging when calibration fails.

9. **Battery Active**

The user can enable “Battery Active” to make the battery active.

9.Battery Active	OK	1.Auto Active Control	OK	Enable
				Disable
		2.Force Active	OK	

10. **Set PCC Meter**

The user can enable “Set PCC Meter” to enable the meter to be switched on and off.

10.Set PCC Meter	OK	Enable	OK
		Disable	OK

The following situations may occur after PCC is enabled or disabled:

1. Set "Enable". If the PCC is not connected, "ID105" will appear;
2. Set "Enable", connect PCC. If the communication is not properly set, an "ID105" fault will occur. Therefore, the user needs to set the communication protocol of the PCC to n.1 or n.2, and the communication address to 1.
3. Set "Disable", connect PCC, no fault report. If CT is connected, the PPC power is the power calculated by the CT sampling current. If CT is not connected, the PCC power is the power output by the inverter to the grid.

6.3.3 Energy Statistic

3.Energy Statistic	OK	Today
		PV .....***kWh
		Load .....***kWh
		Export .....***kWh
		Import.....***kWh
		Charge.....***kWh
		Discharge.....***kWh
	Down ↓	Month
		PV .....***kWh
		Load .....***kWh
		Export .....***kWh
		Import.....***kWh
		Charge.....***kWh
		Discharge.....***kWh
	Down ↓	Year
		PV .....***kWh

	Load .....***kWh
	Export .....***kWh
	Import.....***kWh
	Charge.....***kWh
	Discharge.....***kWh
Down ↓	Lifetime
	PV .....***kWh
	Load .....***kWh
	Export .....***kWh
	Import.....***kWh
	Charge.....***kWh
	Discharge.....***kWh

6.3.4 System information

4.System information	OK	1.Inverter Info
		2.Battery Info
		3.Safety Param.
		4.Debug info
		5.BMS Info

1. **Inverter Info**

1.Inverter Info	OK	Inverter Info (1)
		Product SN
		Hardware Version
		Power Level
		Safety Firmware Version
	Down ↓	Inverter Info (2)
		Software Version
		Country
		Safety param version
	Down ↓	Inverter Info (3)

	PV Input Mode
	Energy Storage Mode
	RS485 Address
	EPS Mode
Down ↓	Inverter Info (4)
	IV Curve Scan
	Logic Interface
Down ↓	Inverter Info (5)
	Power Factor
	Feed-in Limitation
	Insulation resistance

2. **Battery Info**

2.Battery Info （Lead-acid）	OK	Bat1 Information(1)
		Battery Type
		Battery Cell Type
		Battery Capacity
		Float Discharge
	Down ↓	Batl1 Information(2)
		Max Charge (A)
		Max Charge (V)
		Max Discharge (A)
		Min Discharge (V)
	Down ↓	Batl1 Information(3)
		Recovery Buffer（V）
		SOC control

2.Battery Info （Lithium）	OK	Bat1 Information(1)
		Battery Type
		Battery Capacity
	Down ↓	Batl1 Information(2)
		Max Charge (A)

		Max Charge (V)
		Max Discharge (A)
		Min Discharge (V)

3. **Safety Param**

3.Safety Param	OK	Safety Param.(1)
		OVP 1
		OVP 2
		UVP 1
		UVP 2
	Down ↓	Safety Param. (2)
		OFP 1
		OFP 2
		UFP 1
		UFP 2
	Down ↓	Safety Param. (3)
		OVP 10mins

4. **debug info**

4.debug info	OK	debug info
		Dsp1 version
		Stat1
		Stat2
		Stat3

5. **BMS Info**

5.BMS Info	OK	BMS Info(1)
		BMS Software Version

6.3.5 Event List

Event List is used to display the real-time event records, including the total number of events and each specific ID No. and happening time. User can enter Event List interface through main interface to check details of real-time event records, Event will be listed by the happening time, and recent events will be listed in the front.

5.Event List	OK	1.Current Event List 2.History Event List	OK	ID042 IsoFault

- History Event List

2.History Event List	OK	1.ID001 2020-4-3 14:11:45 2.ID005 2020-4-3 11:26:38	OK	1.ID001 GridOVP 2.ID005 GFCI

6.3.6 Software Update

HYD 3000/3600/5000/6000-EP inverters offer software upgrade via usb flash drive to maximize inverter performance and avoid inverter operation error caused by software bugs.

Upgrade file folder name is firmware HYD-EP. The three upgrade file names are HYD-EP_ARM.bin, HYD-EP_DSPM.bin, HYD-EP_DSPS.bin.

Step 1 Insert the usb flash drive into the compute.

Step 2 SOFAR will send the Software code to the user who needs to update. After user receive the file,please decompressing file and cover the original file in usb flash drive.

Step 4 Insert the usb flash drive into the USB/Wifi interface.

Step 5 Then turn on DC switch.

Step 6

6.Software Update	OK	Input password	**Input 0715**
			Start Update
			Update （PCS）
			Update （BMS）
			Update safety package

Step 7 If the following errors occur, please upgrade again.If this continues many times, contact technical support for help.

USB Fault	MDSP File Error	SDSP File Error
ARM File Error	Update DSP1 Fail	Update DSP2 Fail
Update ARM Fail		

Step 8 After the update is completed, turn off the DC breaker, wait for the LCD screen extinguish, then restore the WiFi connection and then turn on the DC breaker and AC breaker again,the inverter will enters the running state. User can check the current software version in System Information>>Inverter Info>>Input 0715>>SoftVersion.

6.4 Power-On Step

Step1 Turn ON DC switch.

Step2 Switch ON the battery.

Step3 Turn ON DC isolator between battery and inverter.

Step4 Turn ON AC circuit breaker between the inverter GRID port and GRID.

Step5 Turn ON AC circuit breaker between the inverter LOAD port and critical load.

（Open it in a standard order. If this operation cannot be performed normally, all problems caused will be borne by the user, nothing to do with the company）

6.5 Power-off Step

Step1 Turn Off AC circuit breaker between the inverter LOAD port and critical load.

Step2 Turn Off AC circuit breaker between the inverter GRID port and GRID.

Step3 Turn Off DC isolator between battery and inverter.

Step4 Switch Off the battery.

Step5 Turn Off DC switch.

（Close it in a standard order. If this operation cannot be performed normally, all problems caused will be borne by the user, nothing to do with the company）

7 Troubleshooting

This section contains information and procedures for solving possible problems with the inverter.

- This section help users to identify the inverter fault. Please read the following procedures carefully:

1. Check the warning, fault messages or fault codes shown on the inverter screen, record all the fault information.
2. If there is no fault information shown on the screen, check whether the following requirements are met:
   - Is the inverter mounted in a clean, dry place with good ventilation?
   - Is the DC switch turned ON?
   - Are the cables adequately sized and short enough?
   - Are the input and output connections and wiring in good condition?
   - Are the configuration Settings correct for the particular installation?
   - Are the display panel and the communication cables properly connected and undamaged?

- Follow the steps below to view recorded problems: Press "Back" to enter the main menu in the normal interface. In the interface screen select "Event List", then press "OK" to enter events.

1. Earth Fault Alarm

   This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring.

   If an Earth Fault Alarm occurs, the fault will be displayed on the LCD screen, the red light will be on, and the fault can be found in the history of the fault. For the machine installed with WiFi/GPRS, the alarm information can be seen on the corresponding monitoring website, and can also be received by the APP on the mobile phone.

2. EventList information

Table 7-1 Eventlist

Code	Name	Description	Solution
ID001	Grid overvoltage	The grid voltage is too high	If the alarm occurs occasionally, the possible cause is that the electric grid is abnormal occasionally. Inverter will automatically return to normal operating status when the electric grid's back to normal. If the alarm occurs frequently, check whether the grid voltage/frequency is within the acceptable range. If yes, please check the AC circuit breaker and AC wiring of the inverter. If the grid voltage/frequency is NOT within the acceptable range and AC wiring is correct, but the alarm occurs repeatedly, contact technical support to change the grid over-voltage,under-voltage, over-frequency, under-frequency protection points after obtaining approval from the local electrical grid operator.
ID002	Grid undervolt	The grid voltage is too low	
ID003	Grid overfreq	The grid frequency is too high	
ID004	Grid underfreq	The grid frequency is too low	
ID005	GFCI Fault	Charge Leakage Fault	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID006	OvrtHigh	OVRT function is faulty	
ID007	LvrtLow	LVRT function is faulty	
ID008	IslandFault	Island protection error	
ID009	GridOVPInstant1	Transient overvoltage of grid voltage 1	
ID010	GridOVPInstant2	Transient overvoltage of grid voltage 2	
ID011	VGridLineFault	Power grid line voltage error	
ID012	InvFault	Inverter voltage error	
ID013	RefulxOverload	Feed-in limitation overload	
ID017	HwADFaultIGrid	Power grid current sampling error	
ID018	HwADFaultDCI	Wrong sampling of dc component of grid current	
ID019	FaultVGrid(DC)	Power grid voltage sampling error (DC)	

ID020	FaultVGrid(AC)	Power grid voltage sampling error (AC)	
ID021	GFCIFault(DC)	Leakage current sampling error (DC)	
ID022	GFCIFault(AC)	Leakage current sampling error (AC)	
ID023	HwADFaultDCV	Error in dc component sampling of load voltage	
ID024	HwADFaultIdc	Dc input current sampling error	
ID029	GFCI Inconsist	Leakage current consistency error	
ID030	Vgrid Inconsist	Grid voltage consistency error	
ID031	DCI Inconsist	DCI consistency error	
ID032	OffgridGroundFault	Off-grid ground fault	
ID033	Spi Fault(DC)	SPI communication error (DC)	
ID034	Spi Fault(AC)	SPI communication error (AC)	
ID035	SChip_Fault	Chip error (DC)	
ID036	MChip_Fault	Chip error (AC)	
ID037	HwAuxPowerFault	Auxiliary power error	
ID041	RelayFail	Relay detection failure	
ID042	IsoFault	Low insulation impedance	Check the insulation resistance between the photovoltaic array and ground (ground), if there is a short circuit, the fault should be repaired in time.
ID043	PEConnectFault	Ground fault	Check ac output PE wire for grounding.
ID044	PvConfigError	Error setting input mode	Check the PV input mode (parallel/independent mode) Settings for the inverter. If not, change the PV input mode.
ID045	CTDisconnect	CT error	Check whether the CT wiring is correct.
ID046	PVReversal Connect	PV reverse connection	Please check whether the positive negative pole of the PV on the inverter is reversed. If yes, wait until the PV end current is lower than 0.5A, set the "DC Swith" to the "OFF" position and adjust the string polarity.

ID047	Parallel Fault	Parallel error	1. Please check whether the parallel cable is correctly connected;2. Please check whether the parallel setting on the LCD is correct.
ID049	TempFault_Bat	Battery temperature protection	1.Please check whether the lead-acid battery temperature sensor is installed; 2. Please check whether the connection of the temperature sensor is loose or falls off; 3. If both conditions are normal, check whether the battery temperature is too high or too low. If the fault information still exists, please contact technical support.
ID050	TemFaultRadiat1	Radiator 1 temperature protection	Make sure the inverter is installed where there is no direct sunlight. Please ensure that the inverter is installed in a cool/well ventilated place. Ensure the inverter is installed vertically and the ambient temperature is below the inverter temperature limit.
ID051	TemFaultRadiat2	Radiator 2 temperature protection	
ID052	TemFaultRadiat3	Radiator 3 temperature protection	
ID053	TemFaultRadiat 4	Radiator 4 temperature protection	
ID054	TemFaultRadiat5	Radiator 5 temperature protection	
ID055	TemFaultRadiat6	Radiator 6 temperature protection	
ID056	NTCConnectFaul t	NTC error	Please check whether the NTC is properly connected.
ID057	TempFault_Env1	Ambient temperature 1 protection	Make sure the inverter is installed where there is no direct sunlight. Please ensure that the inverter is installed in a cool/well ventilated place. Ensure the inverter is installed vertically and the ambient temperature is below the inverter temperature limit.
ID058	TempFault_Env2	Ambient temperature 2 protection	
ID059	TempFault_Inv1	Module 1 temperature protection	
ID060	TempFault_Inv2	Module 2 temperature protection	
ID061	TempFault_Inv3	Module 3 temperature protection	
ID065	VbusRmsUnbala nce	Unbalanced bus voltage RMS	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID066	VbusInstantUnb alance	The transient value of bus voltage is unbalanced	

ID067	BusUVP	Busbar undervoltage during grid-connection	
ID068	BusZVP	Bus voltage low	
ID069	PVOVP	PV over-voltage	Check whether the PV series voltage (Voc) is higher than the maximum input voltage of the inverter. If so, adjust the number of PV modules in series and reduce the PV series voltage to fit the input voltage range of the inverter. After correction, the inverter will automatically return to its normal state.
ID070	BatOVP	Battery over-voltage	Check whether the battery overvoltage setting is inconsistent with the battery specification.
ID071	LLCBusOVP	LLC BUS overvoltage protection	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID072	SwBusRmsOVP	Inverter bus voltage RMS software overvoltage	
ID073	SwBusInstantOVP	Inverter bus voltage instantaneous value software overvoltage	
ID081	SwBatOCP	Battery overcurrent software protection	
ID082	DciOCP	Dci overcurrent protection	
ID083	SwOCPInstant	Output instantaneous current protection	
ID084	SwBuckBoostOCP	BuckBoost software flow	
ID085	SwAcRmsOCP	Output effective value current protection	
ID086	SwPvOCPInstant	PV overcurrent software protection	(Note：ID086-Ipv is unbalanced, you can check whether the PV mode in the following settings is parallel mode, if not, select it)
ID087	IpvUnbalance	PV flows in uneven parallel	
ID088	IacUnbalance	Unbalanced output current	
ID094	LoadShortCircuit	EPS short circuit protection	If the fault has been detected for three times, wait 30 minutes before entering the off-grid working mode again. Please

			check whether the AC LOAD port is connected correctly.
ID097	HwLLCBusOVP	LLC bus hardware overvoltage	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID098	HwBusOVP	Inverter bus hardware overvoltage	
ID099	HwBuckBoostOCP	BuckBoost hardware overflows	
ID100	HwBatOCP	Battery hardware overflows	
ID102	HwPVOCP	PV hardware overflows	
ID103	HwACOCP	Ac output hardware overflows	
ID105	Meter Comm Lose	Meter communication error	Please check whether the meter is connected and whether the meter parameters are set correctly.
ID107	HwVerError	Hardware version mismatch	Contact for technical support and software upgrades.
ID108	GenStartupFail	Generator startup failure	1.Check whether the generator is in good condition; 2. Check whether the generator and inverter are properly connected.
ID109	GeneratorOverload	Generator overload	Please check whether the generator is working under overload condition.
ID110	Overload1	Overload protection 1	Please check whether the inverter is operating under overload.
ID111	Overload2	Overload protection 2	
ID112	Overload3	Overload protection 3	
ID113	OverTempDerating	Internal temperature is too high.	Make sure the inverter is installed where there is no direct sunlight. Please ensure that the inverter is installed in a cool/well ventilated place. Ensure the inverter is installed vertically and the ambient temperature is below the inverter temperature limit.
ID114	FreqDerating	AC frequency is too high	Please make sure the grid frequency and voltage is within the acceptable range.
ID115	FreqLoading	AC frequency is too low	
ID116	VoltDerating	AC voltage is too high	
ID117	VoltLoading	AC voltage is too low	
ID124	Low batteryAlarm	Battery low voltage shutdown	

ID125	Battery prohibition discharge	Battery do not discharge protection	Please check whether the battery voltage of the inverter is too low.
ID129	HwAcOCP	Output hardware overcurrent permanent failure	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID130	BusOVP	Permanent Bus overvoltage failure	
ID131	HwBusOVP	Permanent Bus hardware overvoltage failure	
ID132	IpvUnbalance	PV uneven flow permanent failure	
ID133	EPSBatOCP	Permanent battery overcurrent failure in EPS mode	
ID134	AcOCPInstant	Output transient overcurrent permanent failure	
ID135	IacUnbalance	Permanent failure of unbalanced output current	
ID137	PvConfigError	Input mode setting error permanent failure	Check the PV input mode (parallel/independent mode) Settings for the inverter. If not, change the PV input mode.
ID138	PVOCPInstant	Input overcurrent permanent fault	
ID139	HwPVOCP	Input hardware overcurrent permanent failure	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID140	RelayFail	Permanent relay failure	
ID141	VbusUnbalance	Bus voltage unbalanced permanent failure	
ID144	PermGridRlyFail	Power grid relay failure	
ID145	USBFault	USB fault	Check the USB port of the inverter.
ID146	WifiFault	Wifi fault	Check the Wifi port of the inverter.
ID147	BluetoothFault	Bluetooth fault	Check the bluetooth connection of the inverter.
ID148	RTCFault	RTC clock failure	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID149	CommEEPROM Fault	Communication board EEPROM error	
ID150	FlashFault	Communication board FLASH error	
ID151	BatPartOffline	The battery is partially disconnected	

ID152	SafetyVerFault	Safety version error	
ID153	SciCommLose(DC)	SCI communication error (DC)	
ID154	SciCommLose(AC)	SCI communication error (AC)	
ID155	SciCommLose (Fuse)	SCI communication error (Fuse)	
ID156	SoftVerError	Inconsistent software versions	Contact for technical support and software upgrades.
ID157	BMSCommunicatonFault	Communication failure of lithium battery	Make sure your battery is compatible with the inverter. CAN communication is recommended. Check the communication line or port of the battery and inverter for faults.
ID158	BatLowVolt	Battery low voltage warning	
ID161	ForceShutdown	Force shutdown	The inverter is performed a forced shutdown.
ID162	RemoteShutdown	Remote shutdown	The inverter is performed a remote shutdown.
ID165	RemoteDerating	Remote derating	The inverter is performed for remote load reduction.
ID166	LogicInterfaceDerating	Logic interface derating	The inverter is loaded by the execution logic interface.
ID167	AntiRefluDerat	Feed-in Limitation derating	The inverter is implemented to prevent countercurrent load drop.
ID169	FanFault1	Fan 1 fault	Check if the corresponding fan of the inverter is running normally.If the problem is not solved, please contact technical support.
ID170	FanFault2	Fan 2 fault	
ID171	FanFault3	Fan 3 fault	
ID172	FanFault4	Fan 4 fault	
ID173	FanFault5	Fan 5 fault	
ID174	FanFault6	Fan 6fault	
ID177	BMS OVP	BMS over-voltage alarm	Internal failure of lithium battery, close inverter and lithium battery, and wait 5 minutes to open inverter and lithium battery. Check that the problem is resolved. If not, please contact technical support.
ID178	BMS UVP	BMS under-voltage alarm	
ID179	BMS OTP	BMS high temperature warning	
ID180	BMS UTP	BMS low temperature alarm	
ID181	BMS OCP	Warning of overload in charge and discharge of BMS	
ID182	BMS Short	BMS short circuit alarm	

ID183	BMS VerFault	BMS version is inconsistent	Contact for technical support and software upgrades. Make sure your battery is compatible with the inverter.
ID184	BMS CAN VerFault	BMSCAN version is inconsistent	
ID185	BMS CAN VerLow	BMS CAN version is too low	
ID186	BatDischargeHTP	Battery discharge over temperature protection	Make sure the battery is operating within its normal temperature range. Power off and wait for 2 hours. If the problem is not solved, please contact technical support.
ID187	BatDischargeLTP	Battery discharge low temperature protection	
ID188	BatChargeHTP	Battery charge over temperature protection	
ID190	BatChargeLTP	Battery charge low temperature protection	

Maintenance

Inverters generally do not need any daily or routine maintenance. Heat sink should not be blocked by dust, dirt or any other items. Before the cleaning, make sure that the DC switch is turned OFF and the circuit breaker between inverter and electrical grid is turned OFF. Wait at least for 5 minutes before the Cleaning.

- Inverter cleaning

Please clean the inverter with an air blower, a dry and soft cloth or a soft bristle brush. Do NOT clean the inverter with water, corrosive chemicals, detergent, etc.

- Heat sink cleaning

For the long-term proper operation of inverters, ensure there is enough space around the heat sink for ventilation, check the heat sink for blockage (dust, snow, etc.) and clean them if they exist. Please clean the heat sink with an air blower, a dry and soft cloth or a soft bristle brush. Do not clean the heat sink with water, corrosive chemicals, detergent, etc.

8 DataSheet

- The following parameters may change without notice, please refer to the User Manual and DataSheet on our website.

Battery Parameters

Datasheet	HYD 3000-EP	HYD 3600-EP	HYD 5000-EP	HYD 6000-EP
Battery type	Lithium-ion and Lead-acid			
Number of Battery Input Channels	1			
Battery voltage range	40-60Vd.c.			
Max charging power	3000W	3600W	5000W	5000W
Max. Discharging Power	3000W	3600W	5000W	5000W
Maximum charging current	75A	80A	100A	100A
Maximum discharging current	75A	80A	100A	100A
BMS Communication	CAN/RS485			

PV Input

Datasheet	HYD 3000-EP	HYD 3600-EP	HYD 5000-EP	HYD 6000-EP
Recommended Max. PV input power (Wp)	4500Wp	5400Wp	7500Wp	9000Wp
Max. input voltage	600Vd.c.			
Rated input voltage	360Vd.c.			
Start-up voltage	50Vd.c.			
MPPT voltage range	40-550Vd.c.			
Number of MPPT	2			
Max. Number of Input Strings per MPPT	1/1			
Max. Input Current	16/16A			
Max. Isc	22.5/22.5A			

AC Grid

Datasheet	HYD 3000-EP	HYD 3600-EP	HYD 5000-EP	HYD 6000-EP
Rated Output Power	3000W	3600W	5000W	6000W
Rated Output Current	13.6/13.0/ 12.5A	16.4/15.7/ 15.0 A	22.7/21.7/ 20.8A	27.3/26.1/ 25.0A
Rated Apparent Power	3000VA	3600VA	5000VA	6000VA
Max. Apparent Power	3300VA	3600VA	5000VA	6600VA
Max. Output Current	15.0/14.3/ 13.8A	16.4/15.7/ 15.0 A	22.7/21.7/ 20.8A	30.0/28.7/ 27.5A
Max. Input Current	40A	40A	50A	50A
Rated Output Voltage	L+N+PE, 220/230/240 Va.c.			
Rated Output Frequency	50/60Hz			
Power Factor Range	0.8 lagging-0.8 leading			
THDi	<3%			

AC Backup

Datasheet	HYD 3000-EP	HYD 3600-EP	HYD 5000-EP	HYD 6000-EP
Rated Output Power	3000W	3600W	5000W	6000W
Rated Output Current	13.6/13.0/ 12.5A	16.4/15.7/ 15.0 A	22.7/21.7/ 20.8A	27.3/26.1/ 25.0A
Rated Apparent Power	3000VA	3600VA	5000VA	6000VA
Max. apparent power	3300VA	3600VA	5000VA	6600VA
Max. output current	15.0/14.3/ 13.8 A	16.4/15.7/ 15.0 A	22.7/21.7/ 20.8A	30.0/28.7/ 27.5 A
Peak Output Apparent Power	6000VA,3s	7200VA,3s	10000VA,3s	12000VA,3s
Rated Output Voltage	L+N+PE,220/230/240 Va.c.			
Rated Output Frequency	50/60 Hz			
THDv (@Liner load)	<3%			
Switch time	4ms(default)			

Efficiency And Protection

Datasheet	HYD 3000-EP	HYD 3600-EP	HYD 5000-EP	HYD 6000-EP
Max. MPPT Efficiency	99.9%			
European Efficiency	97.2%	97.2%	97.3%	97.5%
Max. Efficiency	97.6%	97.6%	97.8%	98.0%
Max. Efficiency of Charging/Discharging	94.6%			
DC Switch	Yes			
PV Reverse Connection Protection	Yes			
Output Short Circuit Protection	Yes			
Output Overcurrent Protection	Yes			
Output Overvoltage Protection	Yes			
Insulation Impedance Detection	Yes			
Residual Current Detection	Yes			
Anti-island Protection	Yes			
Surge Protection	PV:Type III, AC:Type III			

9 Quality Assurance

Standard warranty period

The standard warranty period of inverter is 60 months (5 years). There are two calculation methods for the warranty period:

1.Purchase invoice provided by the customer: the first flight provides a standard warranty period of 60 months (5 years) from the invoice date;

2.The customer fails to provide the invoice: from the production date (according to the SN number of the machine) Our company provides a warranty period of 63 months (5.25 years).

3.In case of any special warranty agreement, the purchase agreement shall prevail.

Extended warranty period

Within 12 months of the purchase of the inverter (based on the purchase invoice) or within 24 months of the production of the inverter(SN number of machine, based on the first date of arrival),Customers can apply to buy extended warranty products from the company's sales team by providing the product serial number, Our company may refuse to do not conform to the time limit extended warranty purchase application. Customers can buy an extended warranty of 5, 10, 15 years.

If the customer wants to apply for the extended warranty service, please contact the sales team of our company. to purchase the products that are beyond the purchase period of extended warranty but have not yet passed the standard quality warranty period. Customers shall bear different extended premium.

During the extended warranty period, PV components GPRS, WIFI and lightning protection devices are not included in the extended warranty period. If they fail during the extended warranty period, customers need to purchase and replace them from our company.

Once the extended warranty service is purchased, our company will issue the extended warranty card to the customer to confirm the extended warranty period.

Invalid warranty clause

Equipment failure caused by the following reasons is not covered by the warranty:

The "warranty card" has not been sent to the distributor or our company;

Without the consent of our company to change equipment or replace parts;

Use unqualified materials to support our company's products, resulting in product failure;

Technicians of non-company modify or attempt to repair and erase the product serial number or silk screen;

Incorrect installation, debugging and use methods;

Failure to comply with safety regulations (certification standards, etc.);

Damage caused by improper storage by dealers or end users;

Transportation damage (including scratches caused by internal packaging during transportation). Please claim directly from the transportation company or insurance company as soon as possible and obtain damage identification such as container/package unloading;

Failure to follow the product user manual, installation manual and maintenance guidelines;

Improper use or misuse of the device;

Poor ventilation of the device;

The product maintenance process does not follow relevant standards;

Failure or damage caused by natural disasters or other force majeure (such as earthquake, lightning strike,aware fire, etc.).

Statement

If you have purchased this product in Australia, you should be aware that this warranty is provided in addition to other rights and remedies held by a consumer at law.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Version 1.2



ENERGY TO POWER YOUR LIFE

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