

# USER MANUAL



HYBRID INVERTER

7.6K/8K/9K/10K/11K/12K



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# 1. Safety

## 1.1 Safety Instruction

### General Safety Instructions

The inverter has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the inverter. The operator must be qualified personnel and the installation must be capable with relevant national or international standards or regulations.

Incorrect operation or work may cause:

- injury or death to the operator or a third party; or
- damage to the inverter and other properties belonging to the operator or a third party.

### Important Safety Notifications

There are many safety issues need to be carefully notified before, during and after the installation, and also in future operation and maintenance, following is important safety notifications to operator, owner and user of this product in appropriate usage.

#### **DANGER** Dangers of High Voltages and Large Current

- Beware of high PV voltage. Please turn-off the DC switch of PV Panel output before and during the installation to avoid electric shock.
- Beware of high grid voltage. Please turn-off the AC switch of grid connection before and during the installation to avoid electric shock.
- Beware of large current of the battery output. Please turn-off the battery module before and during the installation to avoid electric shock.
- Do not open the inverter when it's working to avoid electric shock and damages from live voltage and current from the system.
- Do not operate the inverter when it's working, only the LCD and buttons can be touched in limited cases by qualified personnel, other parts of the inverter can be touched when the inverter is under a safe state(e.g. fully shut-down).
- Do not connect or disconnect any connections (PV, battery, grid, communication etc.) of the inverter when it's working.
- Make sure the inverter is well grounding, an operator should make sure itself is good protected by reasonable and professional insulation measurements (e.g. personal protective equipment (PPE)).
- Inspect relevant existed wiring on-site of the installation is under good condition before installation, operation or maintenance.
- Inspect the connections are good between inverter and PV, battery and grid during installation to prevent damages or injuries caused by bad connections.

#### **WARNING** Avoid misoperation and Inappropriate Usage

- All the work of this product (system design, installation, operation, setting and configuration, maintenance etc. must be carried out by qualified personnel as required.
- All connections must be in accordance with local and national regulations and standards.
- Only when permitted by utility grid, the inverter and system can interconnected with the utility grid.
- All the warning table or nameplate on the inverter must be clearly visible and must not be removed, covered or pasted.
- The installation should choose a right position and location as required in this manual with consideration to safety of users' in future operation.
- Please keep the children away from touching or misoperation the inverter and relevant system.
- Beware of burning hurt, the inverter and some parts of the system could be hot when working, please do not touch the inverter surface or most of the parts when they are working. During inverter working states, only the LCD and buttons could be touched.

#### **NOTICE**

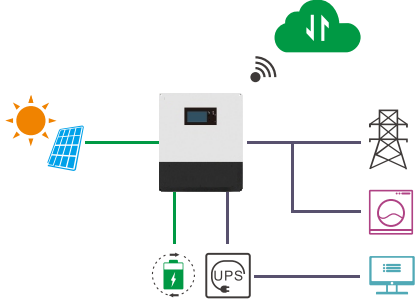
- Please carefully read this manual before any work carried out on this inverter, after the installation, please keep this manual carefully stored and easy to access at any time.
- The qualified personnel should have had training in the installation and commissioning of the electrical system as well as dealing with hazards, also they should have the knowledge of the manual and other related documents. As the installer or operator they are required to be familiar with local regulations and directives.

## 2. Brief Introduction

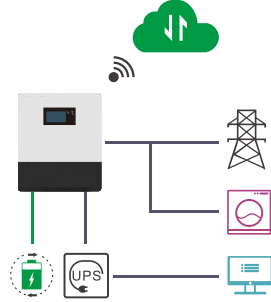
### 2.1 System Solution

This product and relevant system is suitable for following system applications (system diagram):

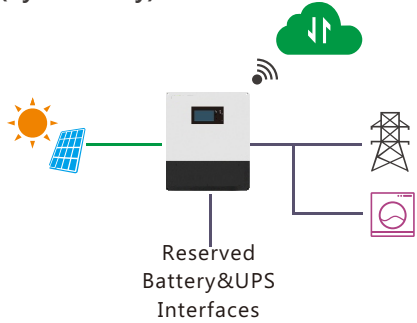
#### A. Solar and energy storage hybrid system



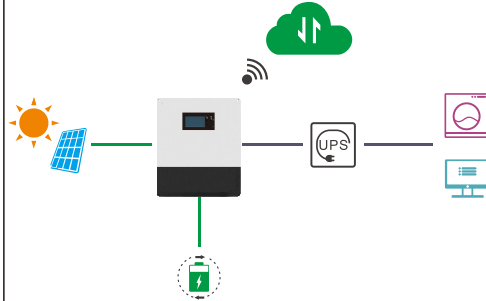
#### B. Energy storage system without solar



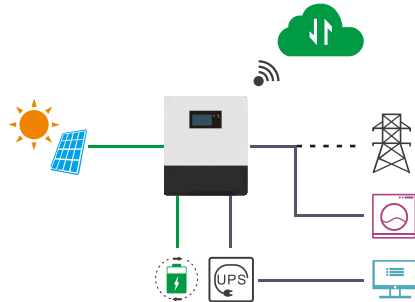
#### C. On-grid solar system without battery (hybrid ready)



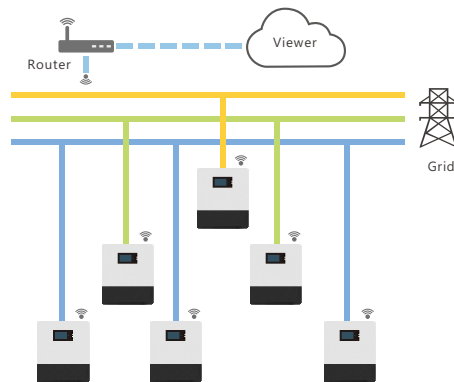
#### D. Off-grid and back-up applications



#### E. Hybrid system with zero export function



#### F. Parallel system for Hybrid



## 3. Installation

### 3.1 Packaging List & Storing

#### Packaging List

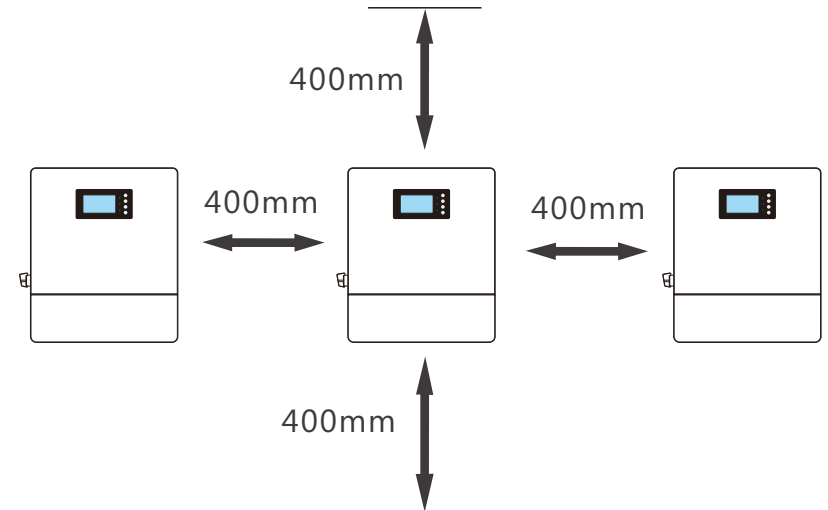
When the packaging is unpacked, the inner components should be the same as described in below packaging list.

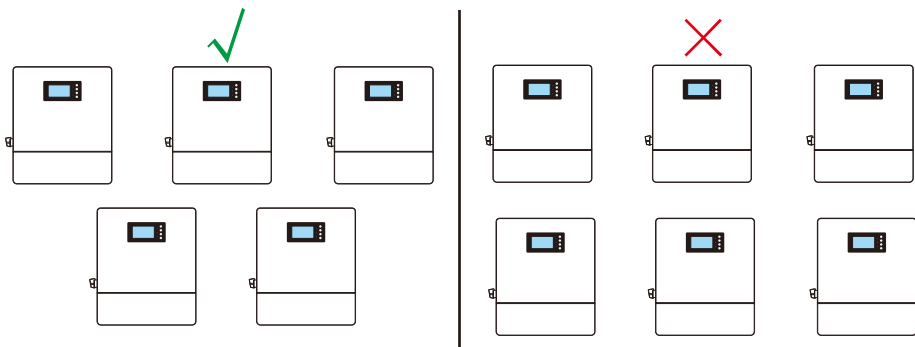


### 3.2 Select Location

#### Suggestions and Requirements

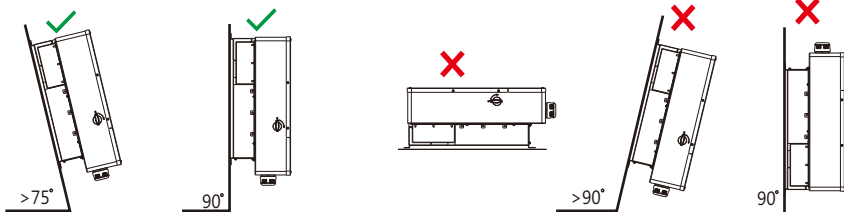
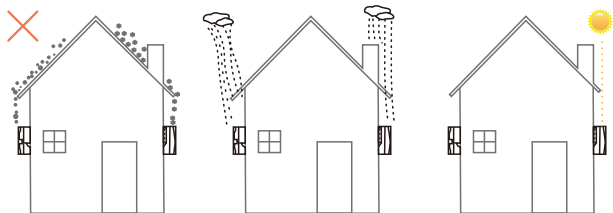
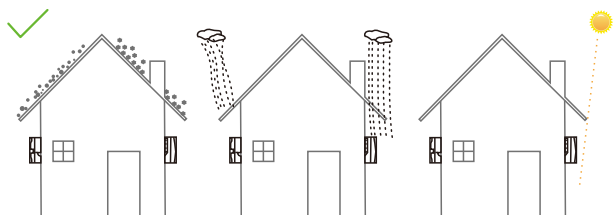
- The wall for mounting should be strong enough to bear the weight of inverter .
- To ensure the heat dissipation efficiency and inverter lifespan, do not install the inverter enclosed.





c) The structure of the wall where inverter mounted should not be flammable, or make sure the inverter is not surrounded by flammable or corrosion materials and is away from the gas.

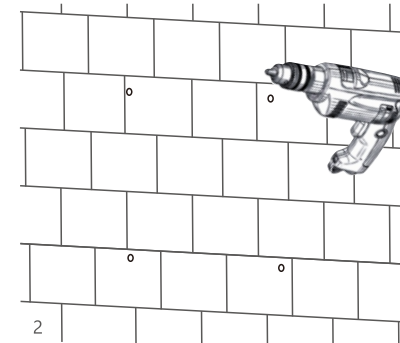
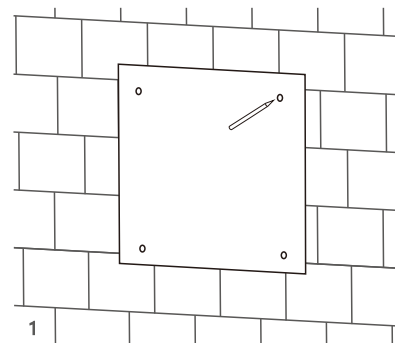
d) Never install the inverter exposed to directly sunshine, rain and snow. Please refer to below figure and select a well shaded place or install a shell to protect the inverter from directly sunshine, rain and snow etc.



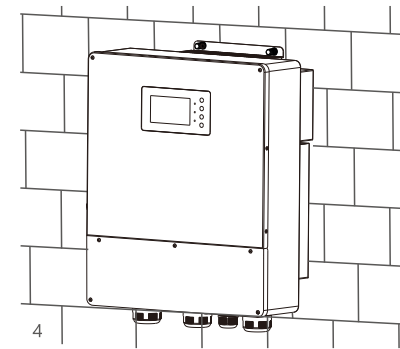
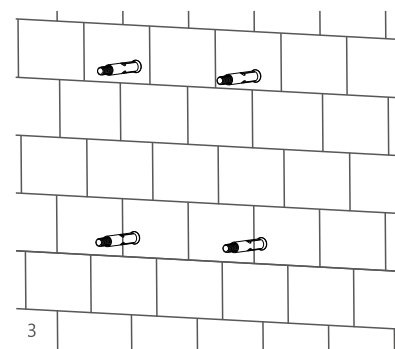
### 3.3 Install the Inverter

The inverter is wall-mounted installed, steps shows below:

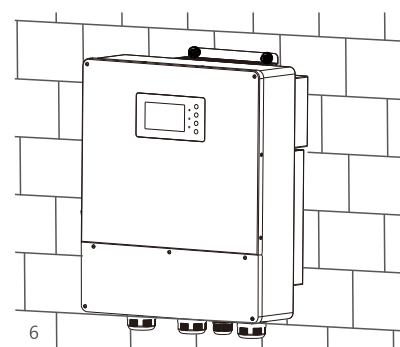
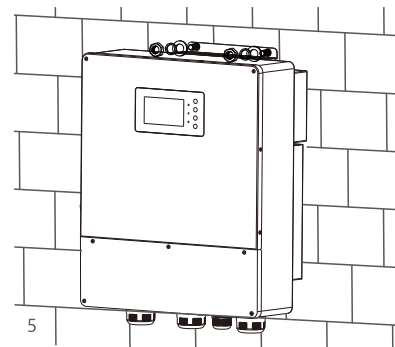
**Step1.** Use the cardboard as the template to mark the position of the 4 holes, then drill 8 mm holes and make sure the depth of the holes is deeper than 50mm.



**Step2.** Install the expansion tubes into the holes and tight them, then use the expansion screws (packaged together with the expansion tubes) to install and fix the wall-mounting bracket on the wall.



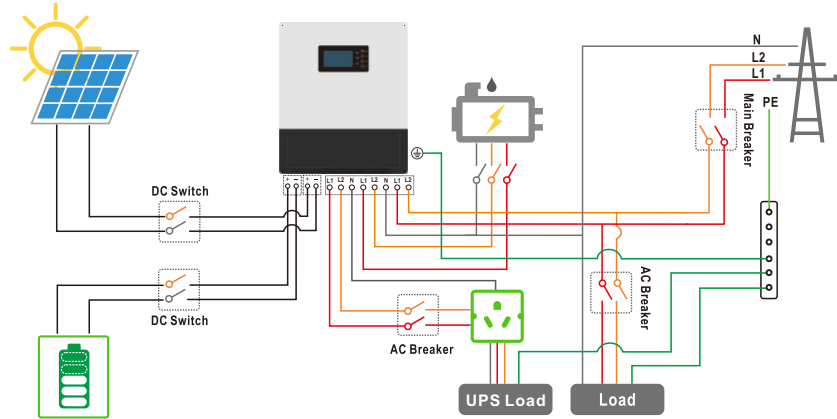
**Step3.** Install the inverter on the wall-mounting bracket and lock the inverter using the security screws.



## 3.4 Connection

### 3.4.1 Connection Overview

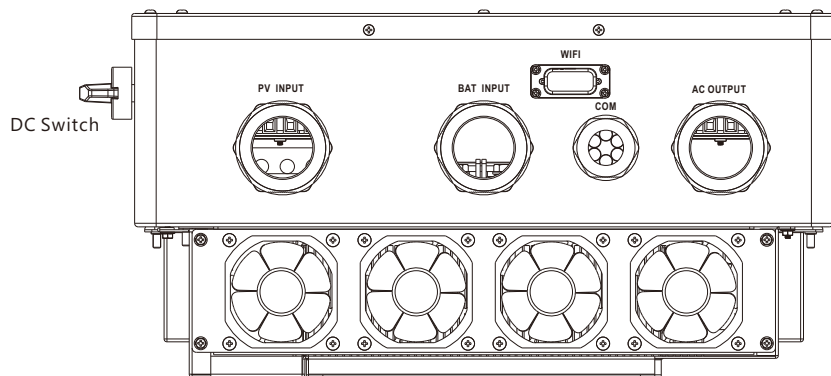
The system connection diagram is as below( for US version):



Please prepare the breakers before connection, breakers selection recommendation for both DC and AC

Hybrid	12K	9K/10K/11K	7.6K/8K
DC Breaker selection(6 poles)	600V/40A	600V/40A	600V/40A
DC Breaker selection(2 poles)	100V/300A	100V/300A	100V/300A
AC Breaker selection(2 poles) AC Breaker with RCD	63A/230Vac Type AC, >0.3A	50A/230Vac Type AC, >0.3A	40A/230Vac Type AC, >0.3A
UPS Breaker selection(2 poles)	63A/240Vac	50A/230Vac	40A/230Vac

### Connection Terminals and Interfaces Overview



### 3.4.2 PV Connection

The PV connection of hybrid inverter is the same to traditional on-grid solar inverter (string inverter).

#### NOTICE

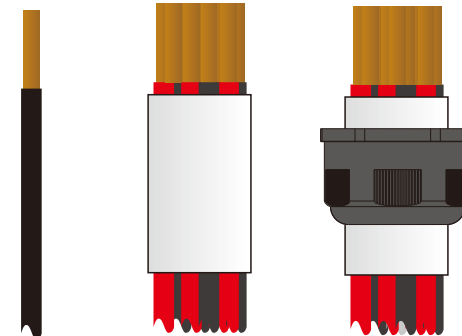
- Before connection the PV, please use the multi-meter to measure the PV array voltage to verify if PV array is working normally, if not, please fix the PV array to normally working states before connection
- When your PV panel ambient temperature could possibly be lower than 0°C, then please check the PV array voltage up ceiling and if you are not sure please ask your system or panel provider for further assistance. As when temperature is extremely low the PV panel voltage will increase by a certain percentage.
- Turn off or disconnect the PV switch(DC witch). Then keep this switch always open during the connection

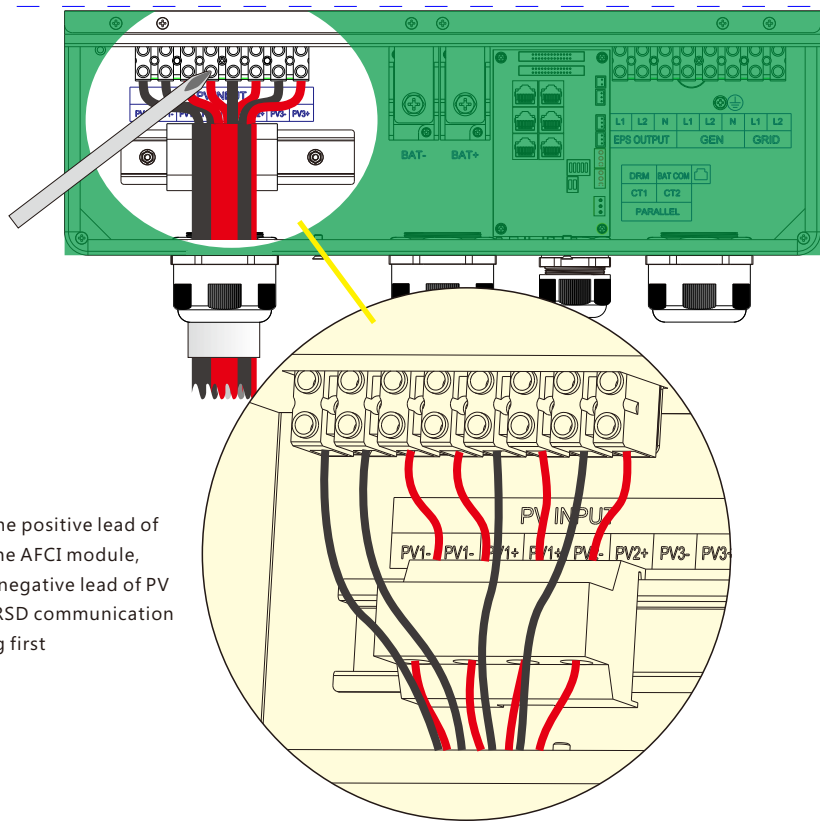
#### Cable Requirement:

Cross-section	Cable Diameter	Minimum Voltage
4 - 6 mm <sup>2</sup>	2.5-4mm	600V

#### Assemble the PV connector

- Strip 6~8mm insulation from the cable end.
- Assemble the cable ends to crimp contacts.
- Secure the pipe fitting to the enclosure using the nut provided with the pipe.
- Route the PV input power cable through the conduit and then fitting of the pipe.
- Connect the PV input power cable to the terminal block. Connect positive pole(+) of connection cable to positive pole(+) of PV input terminal block, connect negative pole(-) of connection cable to negative pole(-) of PV input terminal block.
- Secure the fitting to the conduit.
- Checks that the cables are connected correctly and securely. Then take appropriate measures to ensure that the pipe conduit and fittings are secured reliably, and seal the cable holes.





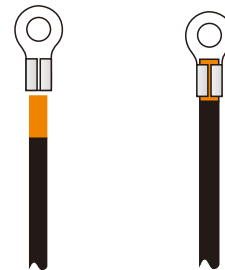
Please pass the positive lead of PV through the AFCI module, and pass the negative lead of PV through the RSD communication magnetic ring first

### 3.4.3 Battery Connection

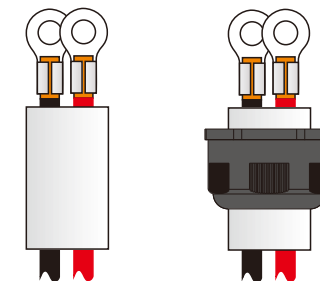
Cable Requirement:

Model	Cross-section	Cable Diameter	Minimum Voltage
5-8K	50-60 mm <sup>2</sup>	15-25mm	600V
9-10K	60-85 mm <sup>2</sup>	15-25mm	600V
11-12K	85-100 mm <sup>2</sup>	15-25mm	600V

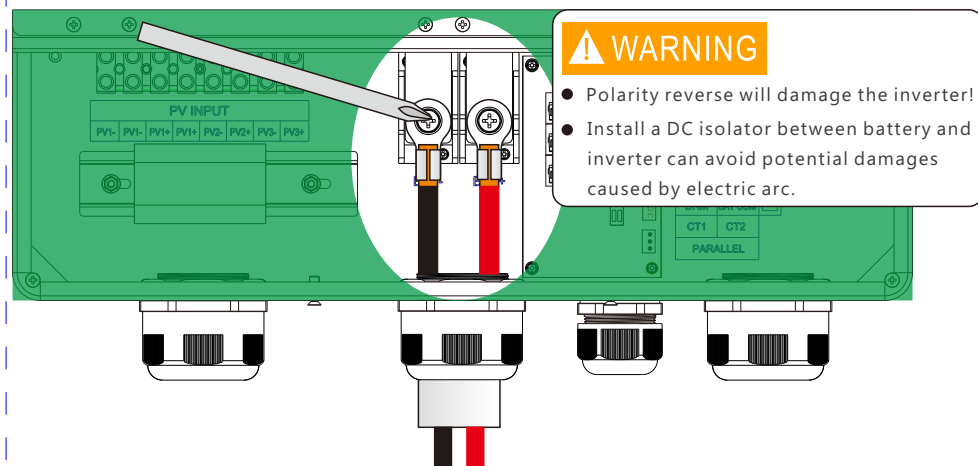
Step 1: Strip 6-8mm insulation from the cable end and Assemble the cable ends to crimp contacts.



Step 2: Route the battery power cable through the conduit and then fitting of the pipe.

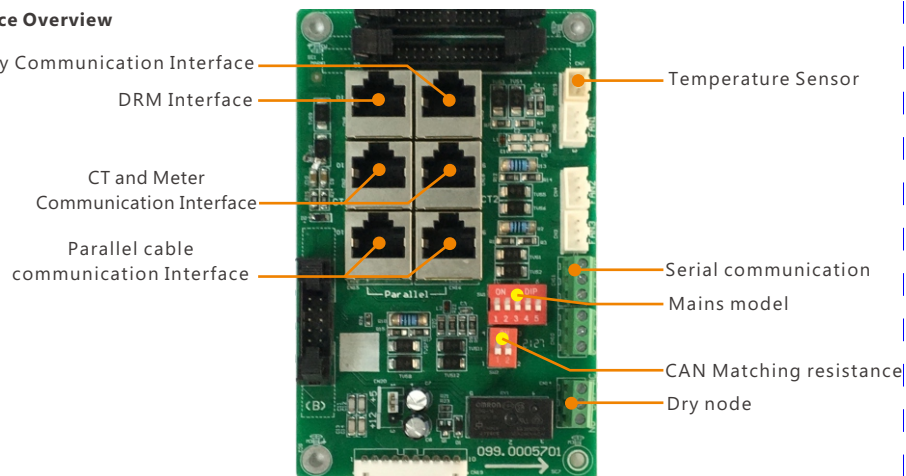


Step 3: Secure the pipe fitting to the enclosure using the nut provided with the pipe.



### 3.4.4 Communication Connection

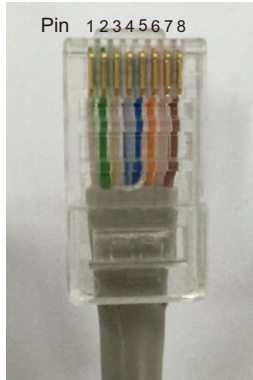
Interface Overview



## Battery Communication Connection

If the battery type is lithium-ion or ternary battery which need communication between the inverter and battery management system (BMS), the communication connection must be installed.

### RJ45 Terminal Configuration of Battery Communication



Pin	Function Description
1	BAT 485 B
2	BAT 485 A
3	BAT CAN L
4	BAT CAN H
5	NC
6	BAT NTC
7	
8	GND-S

Make the RJ45 terminal based on above introduction of each Pin definition, you could either make RS485 connector or CAN connector based on the best support connection way of your battery packs. For Lead acid battery temperature sensor, please connect signal to Pin6 and Pin8, the other pins are not connected. (External temperature sensor is needed, the sensor is 15KΩ thermistor for typical, or consult Luxpowertek)

### NOTICE

#### For Li-ion battery

1. If work with lithium battery, please make sure it is compatible with the units. Now inverter is compatible with Pylontech, Dyness, Aoboet, Weco, Murata. Please contact your distributor for updated compatible list.
2. After battery power cable and communication cable connection, users need to choose battery brand by LCD.
3. Please remember to connect Master battery to inverter if you have battery group, and set the Master battery for the battery group. (Please contact battery manufacture for battery group setup).

#### For Lead-acid battery

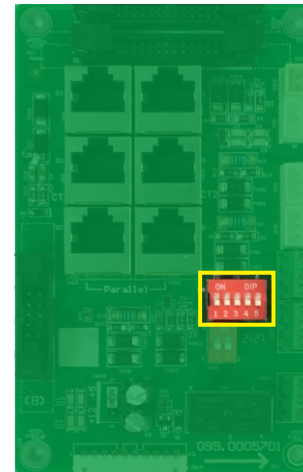
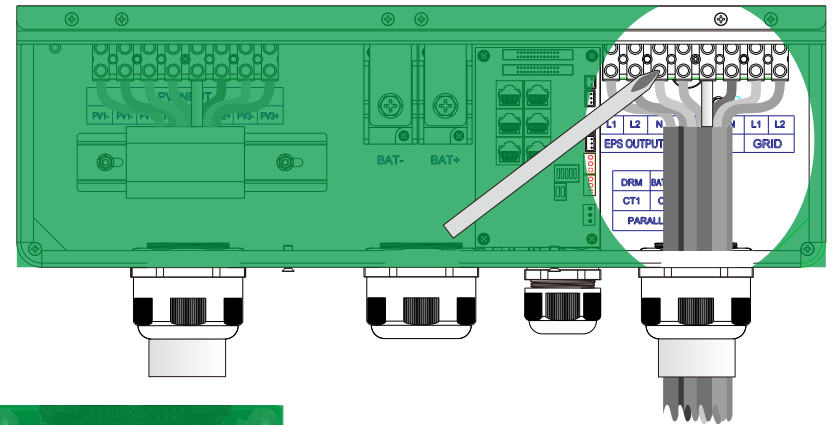
1. The lead acid battery temperature sensor cable is optional, if required, please request the temperature sensor cable from your supplier.
2. There are three stages for lead acid battery charge. For charge part, please set CV voltage and floating voltage. For discharge part, please set the discharge cut off voltage for on grid and off grid.

## 3.4.5 US Model Grid/UPS Connection

### Cable Requirement:

Cross-section	Cable Diameter	Minimum Voltage
8 - 10 mm <sup>2</sup>	5-10mm	600V

- a) Strip 8~10mm insulation from the cable end.
- b) Assemble the cable ends to crimp contacts.
- c) Secure the pipe fitting to the enclosure using the nut provided with the pipe.
- d) Secure the fitting to the conduit.
- e) Checks that the cables are connected correctly and securely, then take appropriate measures to ensure that the pipe conduit and fittings are secured reliably, and seal the cable holes.



### Grid Type Configuration - SW2

By configuring the DIP switch the inverter could comply with different grid system.

### Sw2 Safety Standard Configuration Switch Overview

Note: The DIP switch is composed of five-digit binary number PINs. Each PIN has two status, when set upward to "ON", its value turns to "1", when set downward, its value turns to "0".

### Voltage standards Configuration Guidance



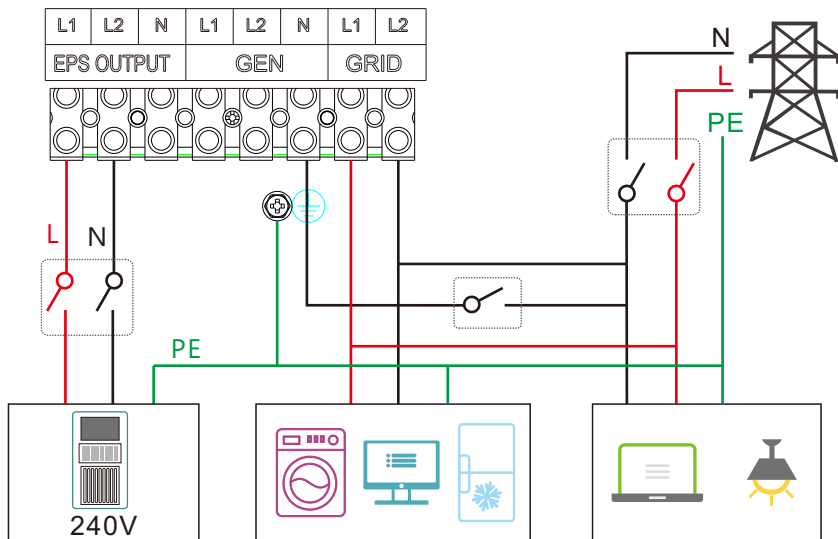
Grid type	Voltage	Sw2 Configuration
	240V single phase	
	240V split phase	
	208V split phase	

### 3.4.5.1 240V Single-phase Connection 240V Grid Connection

Mains L is connected to terminal L1, mains N is connected to terminal L2, and the machine output N is connected with air switch and mains N; the schematic reference is as shown in the picture below

#### EPS Connection

Connect the power L line of the important load or equipment to the UPS port output L1, the N line to the UPS port output L2, and the PE line to the inverter and other equipment. Schematic reference is as follows.

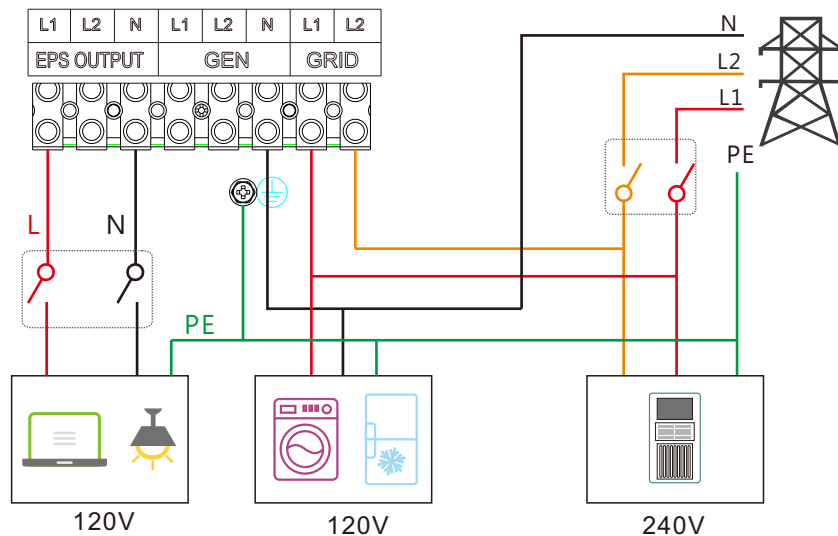


### 3.4.5.2 240V/208V Split phase Connection 240V/208V Split phase Grid Connection

The split-phase system applicable to this series of Hybrid products includes 240V mains power with a phase angle difference of 180 degrees and 208V mains power with a phase angle difference of 120 degrees. For split-phase systems, please connect L1 to the inverter Grid port L1, L2 to the inverter Grid port L2, and N to the inverter port N. Schematic reference is as follows.

### EPS Connection for Split phase

For 240V or 208V loads or equipment, please connect the power supply L1 and L2 to the UPS output L1 and L2 respectively, and the PE wire to the inverter and the equipment used. For 120V loads or equipment, please connect the L line of its power supply to L1 or L2 of the UPS output, and connect the N line of the equipment power supply to the N of the UPS output. Schematic reference is as follows.



### 3.4.6 Work with Gen set

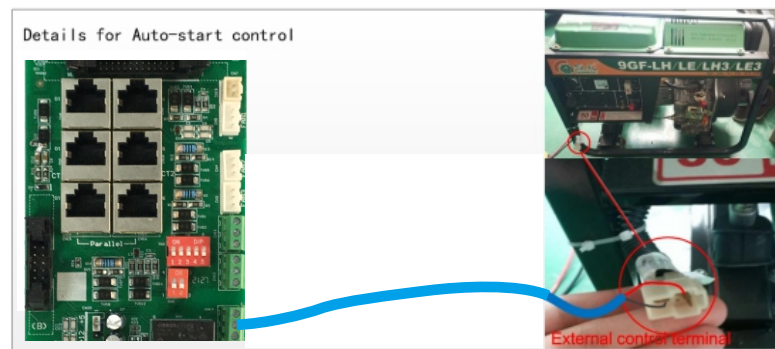
This hybrid inverter can work with generator.

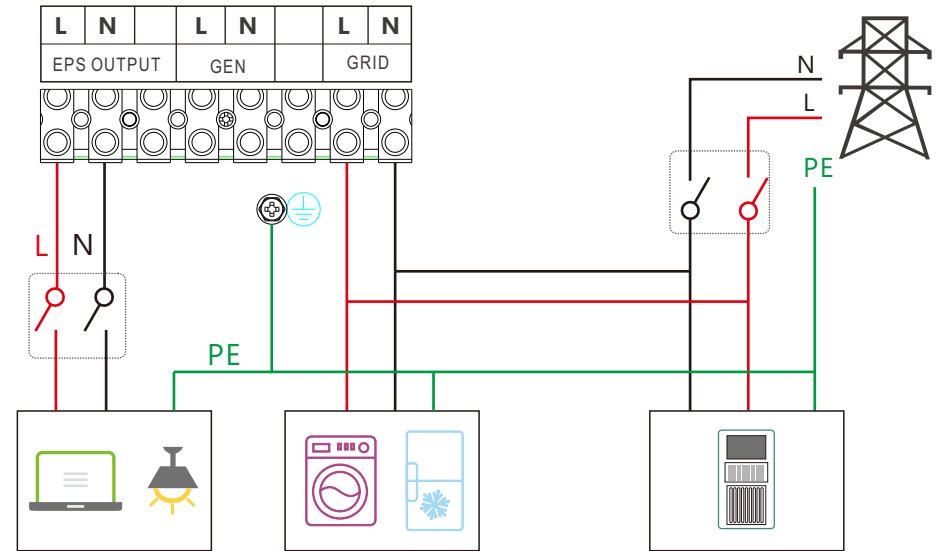
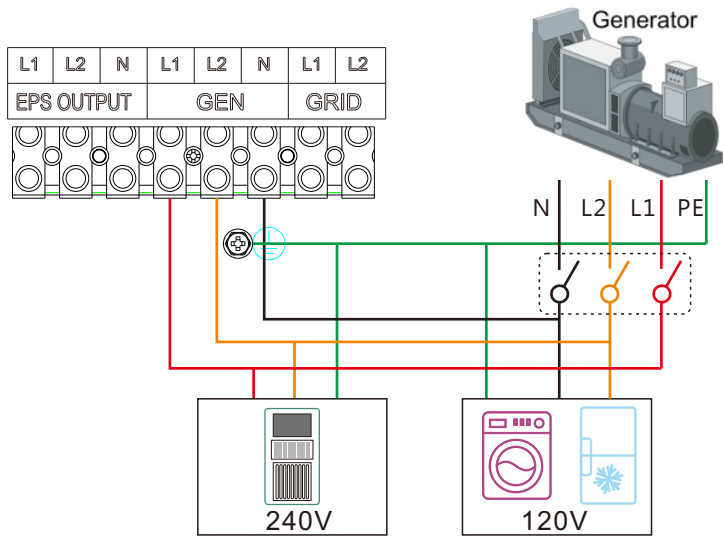
Users can connect the generator output to inverter GEN terminal.

Please purchase an external control box to remote turn on/off the generator(which support dry contact function).

The generator will be automatically started when battery cannot discharge or there is charge request from battery. When battery can discharge and SOC is higher than AC charge SOC setting, generator will be stopped.

Battery will get charged when the generator is turned on, and the generator is bypassed to take all loads in UPS terminal.

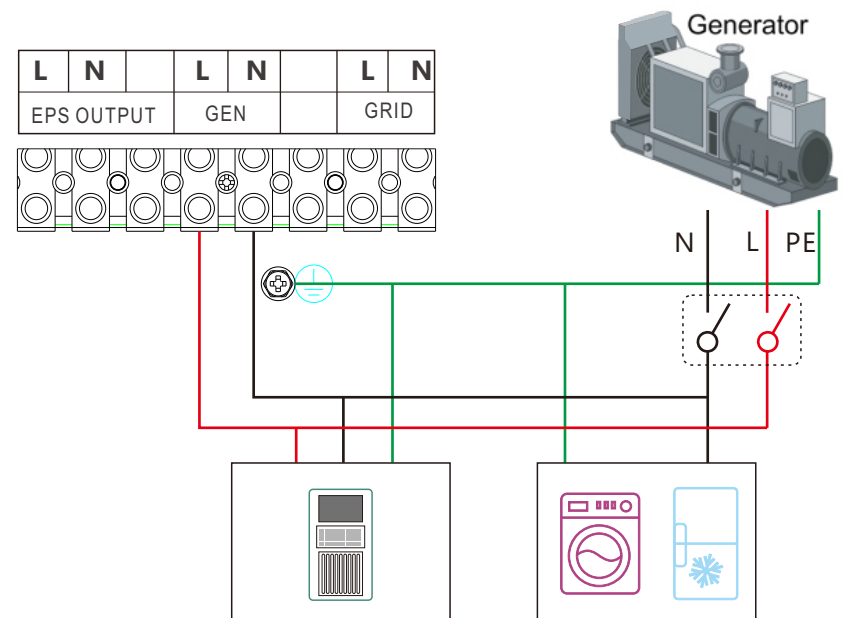
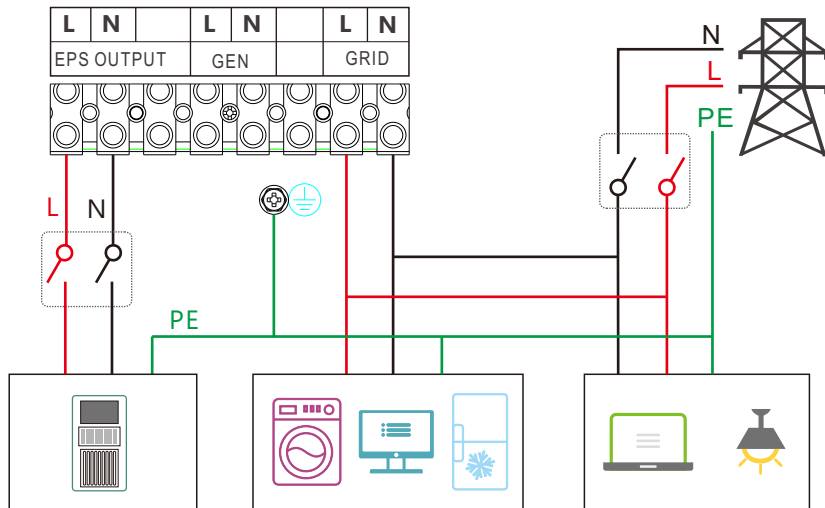




### 3.4.7 European Model Wiring Diagram

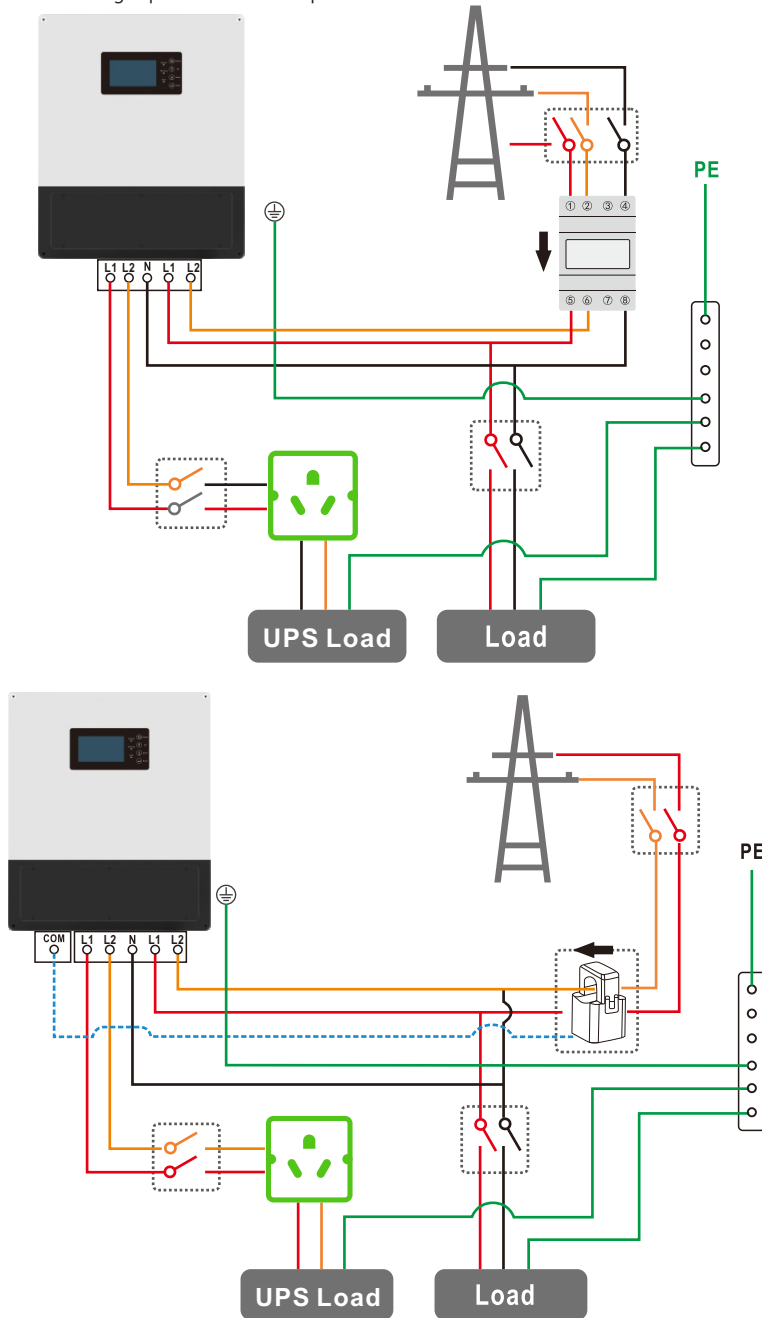
Grid type	Voltage	Sw2 Configuration
	230V single phase	 1 0 0 0 0

Single-phase wiring



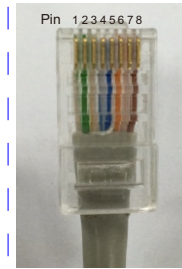
### 3.4.8 Meter and CT Connection

In a completed installed on-grid energy storage system, the CT or Meter should be installed. The CT or Meter should be installed in the right position as below picture

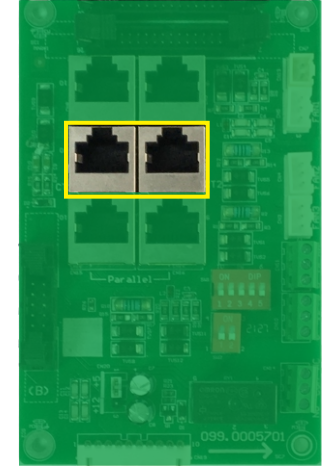


#### RJ45 Terminal Configuration of Meter/CT Communication

The communication port for communicate with meter or CT clamp is as below:



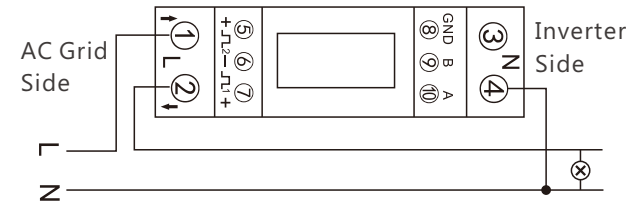
Pin	Function Description
1	METER 485 B
2	METER 485 A
3/4	NC
5/6	Reserved
7	CTN
8	CTP



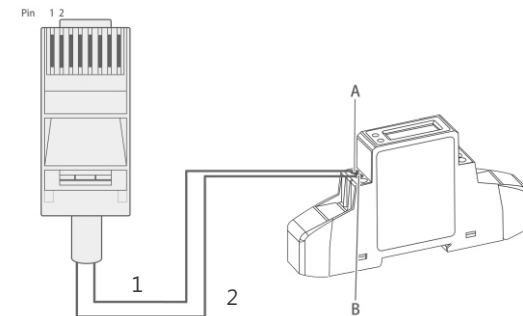
#### 3.4.8.1 Connect the Meter

The functional interfaces overview of the meter is shown in below figure. Now Luxpower only support EASTRON SDM120 and SDM630- Modbus Modbus model meter.

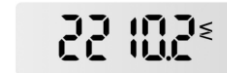
Step1. Connect the meter in the LN line as below



Step2. Connect the communication cable between inverter and meter, and plug the RJ45 to communication port



Step3. Check the connection. When the meter displays -xxxxW as below figure shows, the hybrid inverter is feeding power to the grid. and when it displays xxxxW, it means the house load is using energy from grid.

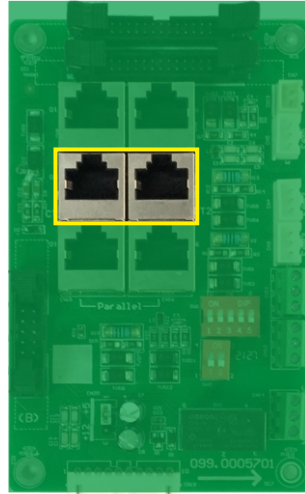
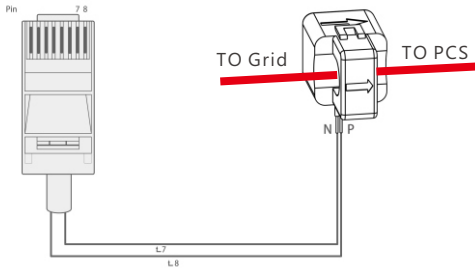


### 3.4.8.2 Connect the CT

For the CT clamp connection, we need to put the CT clamp in the L cable and the arrow printed on the CT should point to inverter.

Now Luxpower support two ratio **1000:1** and **3000:1** CT clamps. For default, the ratio is **1000:1**, if you install another CT clamp, please set it in the monitor system or LCD.

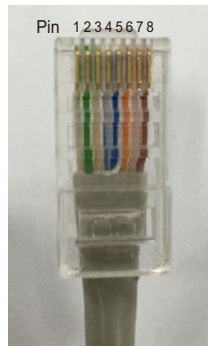
For the CT clamp cable, users can use the normal net cable to extend the length if the original length is not enough. The longest distance can be 100m.



### 3.4.8.3 DRMs Connection

DRMs is short for 'inverter demand response modes', and it is a mandatory requirements for inverters in Australia

**RJ45 Terminal Configuration of DRM**



Pin	Function Description
1	DRM15
2	DRM26
3	DRM37
4	DRM48
5	RefGen
6	DRM0
7	+12V
8	GND-S

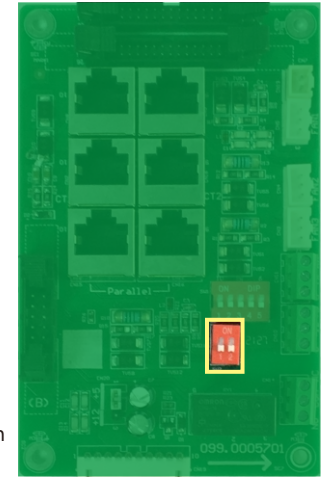
**DRM Communication Interface Overview**



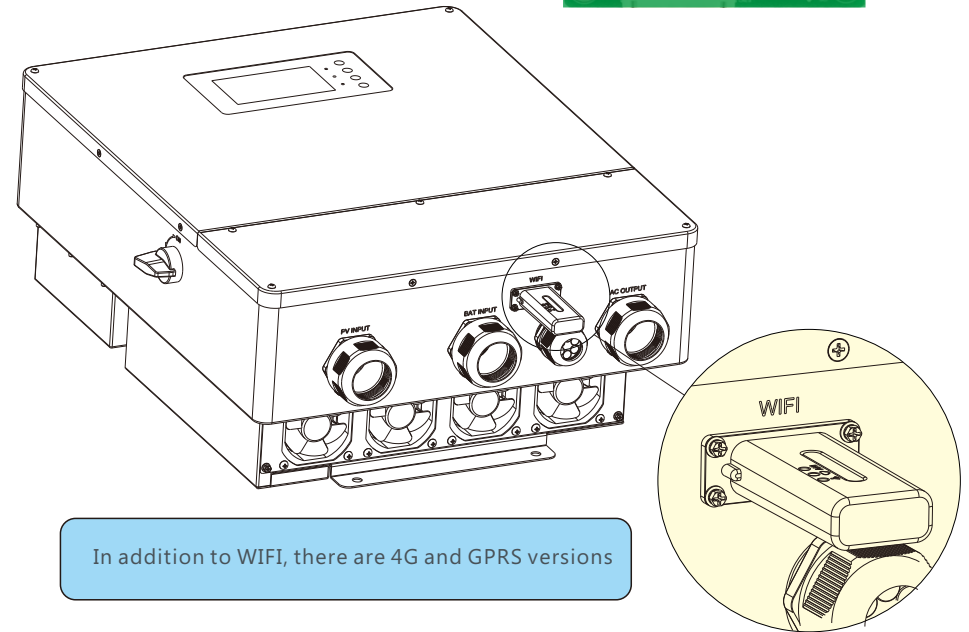
### 3.4.8.4 Balancing Resistor Configuration - SW1

By configuring the SW1 balancing resistor configuration switch, you could configure the balancing resistors of parallel CAN communication. This Function is used for multiple inverter paralleling operation.

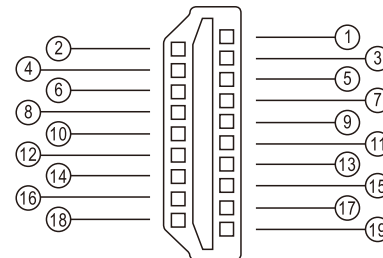
Please turn on the DIP in the first and last inverter in the inverter loop. For more info, please check the parallel connection part.



### 3.4.8.5 Wireless Communication Module Connection



**The Wireless Communication Interface Details**



Pin	Function Description
1 & 2	VCC
3 & 4	GND
5	RS485-A
6	RS485-B
Others	Reserved

# 4. Operation Guide

## 4.1 Operation Mode

Users can have different settings to satisfy their demands, the working modes is as below:

Mode	Explanation	Related Settings	Application Notes
Self usage (Default mode)	The priority of the PV energy will be Load > battery > grid, which means the energy generated by PV will be mainly used by local loads, and rest will be stored in the battery, excessive power will be feed back into the grid.	Effective when charge priority and force time charge/discharge are disable	increase the self consumption rate and reduce the energy bil significantly
Charge priority	The priority of the PV energy will be battery > Load > grid, which means the energy generated by PV will be used to charge the battery first, and then used by local loads, excessive power will be feed back into the grid.	Charge Priority and related time, SOC	When the load shedding always happens, users need to charge battery first
Force time	User can set the charging and discharging time and priority of energy use under Force Time Use mode. This is also used to flexibly make use of your system by customized settings by the users.	Force charge/discharge enable and disable, and related time SOC	This mode suits for situation where the price difference of energy is big under Time of Use (To U)
Micro Grid mode(Genset)	When used in pure off grid application, users may connect the Gen set output to grid input , when battery SOC is low. Inverter will use generator to take the load and charge the battery.	Micro grid enable /disable	Area where is no grid and there is utility

## 4.2 LCD settings

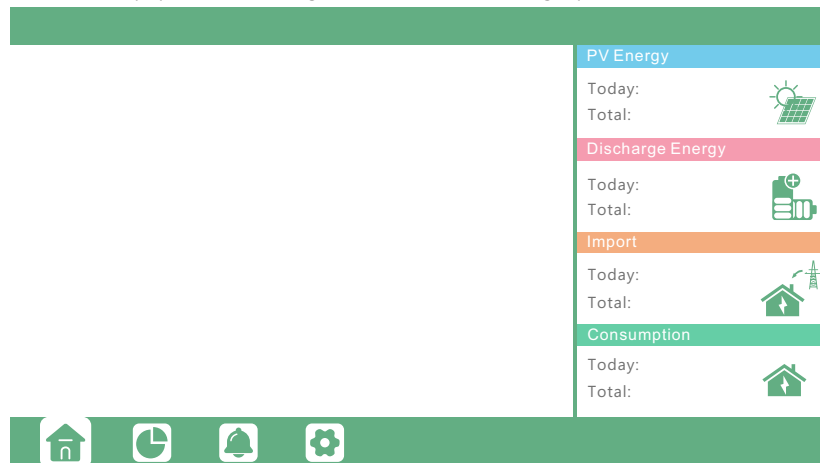
### 4.2.1 Information Searching

Refer to below flow chart which shows the information option interfaces and interconnection.

Operator can search target information by following below directions.

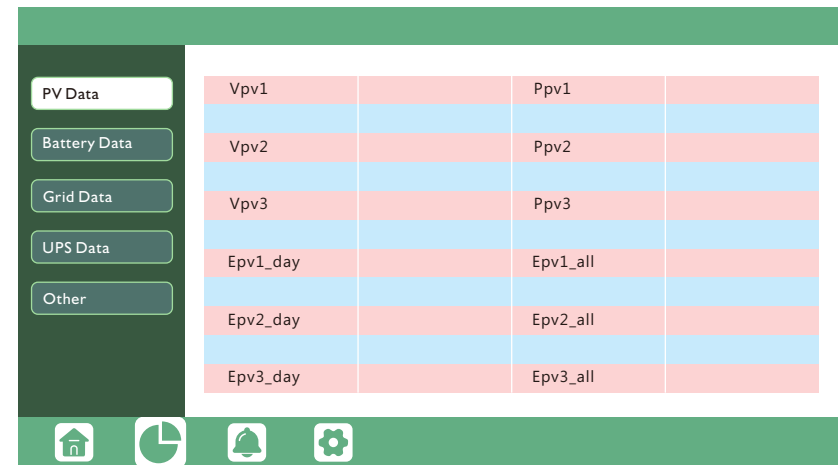
#### a) Enter into Display Menu Interface

Touching the screen to light it up when it goes into sleeping mode. We can read the current information of the equipment, including its current status, voltage, power etc.



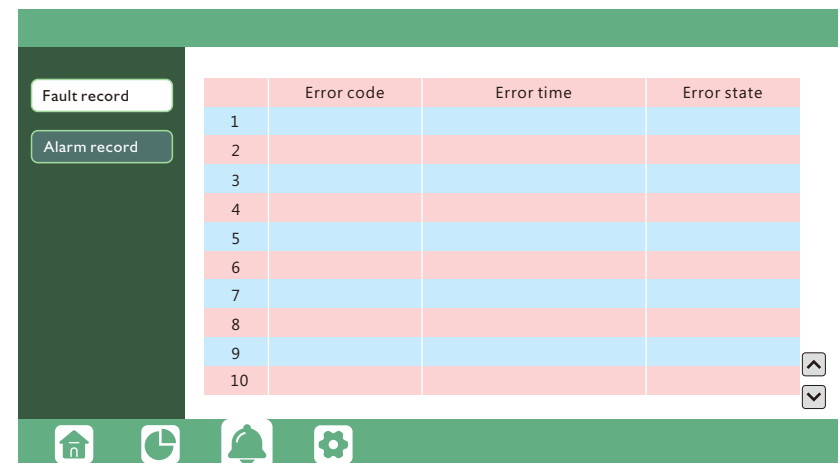
#### b) Search History Information

Touching the label of the present menu to enter into the equipment's interface, we can read the real-time information of PV, Battery Grid, UPS etc.



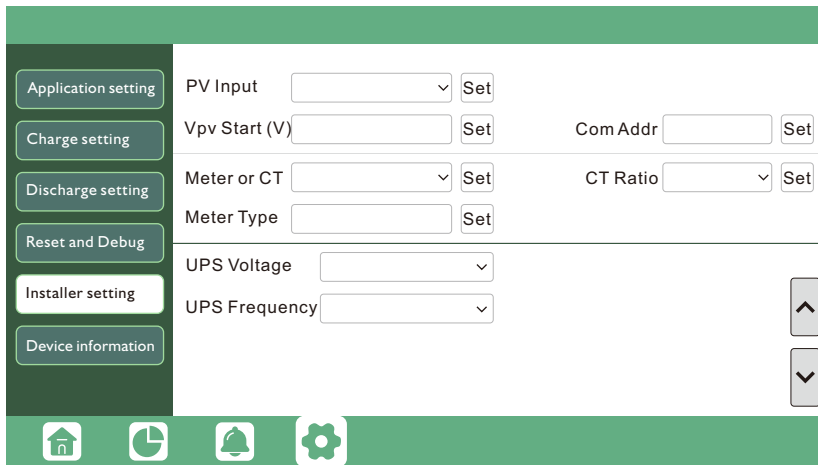
#### c) Search fault/alarm Information

Touching the warning label under the present menu to enter into the fault information interface, we can read the current and historical fault & warning information.



#### d) Search setting information

Touching the setting label under the present menu to enter into the equipment's setting interface, we can read the equipment's current setting information.



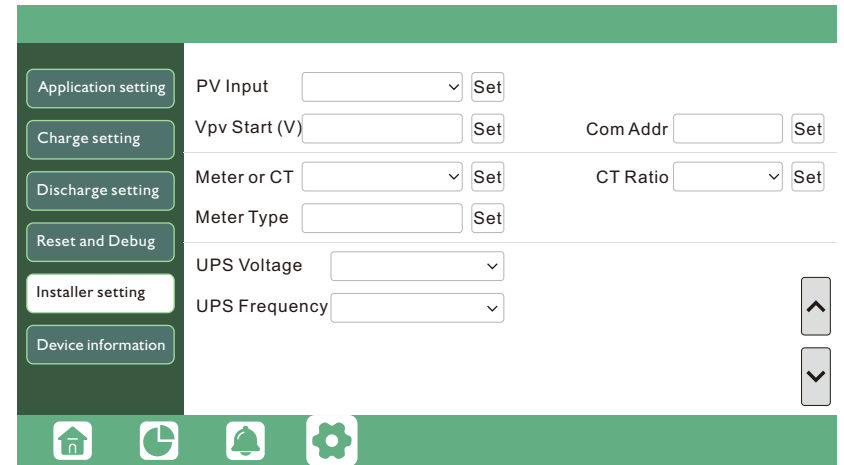
#### 4.2.2 Settings Guidance

All setting items can be input or selected by the way of touching, just like the way of operating a smart phone.

##### a) Common Setting

Common setting is the regular setting item. We can set the information of time, communication terminal, start voltage of PV, as well as choosing the ratio of CT, type of meter, type of battery, batter brand & capacity etc.

- ▶ 1. Notice that the setting range of the RS485 communication address is from 000 to 255, and it's set to be 001 by default when manufactured.
- ▶ 2. In order to the correct type of meter, we should confirm if the meter we are going to install is a single phase meter or a three phase meter while setting the meter mode.
- ▶ 3. Setting the CT mode: In order to set a correct CT proportion, we need to inspect the marked proportion on the CT. We don't need to set the type of CT.
- ▶ 4. Selecting the battery mode: we don't need to set the battery type and battery capacity.
- ▶ 5. Selecting the lead-acid battery mode: we need to select the lead-acid battery capacity according to its real capacity, and don't need to choose the battery brand.
- ▶ 6. Selecting the Lithium mode: we need to choose it based on the real brand, and ignore the setting of lead-acid battery capacity.

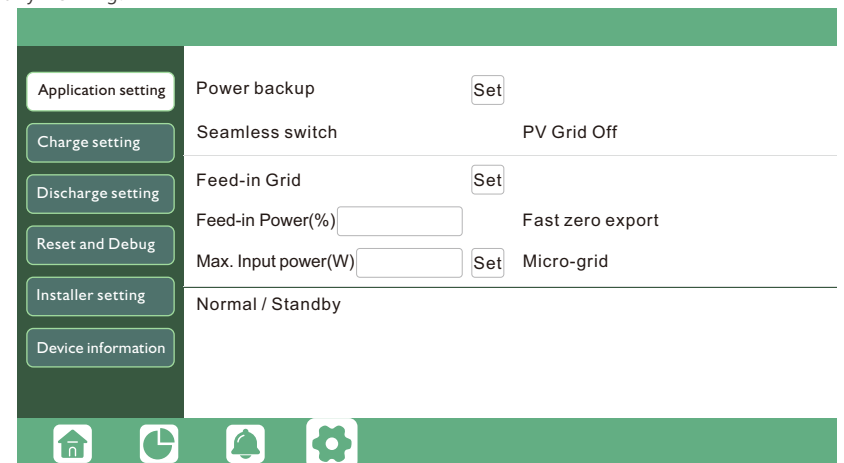


##### b) Application Setting

Enter into Application Setting interface:

- ▶ 1. UPS function can continually power the essential house loads in the case of blackout. We should set the output voltage, Frequency and to enable seamlessly switch function.
- ▶ 2. The anti-backflow function can prevent energy feed into the grid. Since in some countries, users can not feed energy into grid, so they are able to disable energy export function in the LCD, or set power percent which can feed into grid.
- ▶ 3. Setting the max. input power to prevent input power overload.
- ▶ 4. When connect the generator to inverter AC terminal, users need to enable mirco grid function so the inverter will use generator to charge battery and will not export any power by AC terminal.
- ▶ 5. Switching on or off the equipment to turn it into the standby mode from the quitting of normal status.

**Noted:** In the case of battery being turned off, we have to make it sure that the capacity of the UPS port loads should smaller than the capacity of PV output, and the enable PV grid off function will be normally working.



### c) Charge Setting

Setting the battery charging parameters:

- ▶ 1. Setting the charging power & current.
- ▶ 2. Setting the AC charging, we have three non-overlapping period of time to be set, and the charging power, cut off soc etc.
- ▶ 3. Setting the equalization voltage, equalization period, equalization time etc.

Application setting Charge power(%)  Set Charge last  
Charge setting Charge current(A)  Set  
Discharge setting AC Charge  Set  
Reset and Debug Time Range 1     AC Charge power(%)   
Time Range 2     AC Charge SOC(%)   
Installer setting Time Range 3      
Device information Equalization Voltage(V)  Set  
Equalization period(day)  Equalization time(hour)

### d) Discharge Settings

Discharge Setting is used to set the relevant parameters of battery discharge, including:

- ▶ 1. Setting the output power, output current, and stop the discharging SOC both in case of having grid and without grid.
- ▶ 2. Setting the force discharging function, we need to set the discharging time periods (three non-overlapping period of time can be set), output power, discharge cut-off SOC etc.
- ▶ 3. Setting the cut-off voltage, start derate voltage, discharge temp low(°C) discharge temp high(°C) etc.

Application setting Discharge power(%)  Set Discharge current(A)  Set  
Charge setting On-grid EOD(%)  Off-grid EOD (%)  Set  
Discharge setting Discharge start power(W)  Set  
Reset and Debug Forced diacharge  Set  
Installer setting Time Range 1     Forced discharge power(%)   
Time Range 2     Forced discharge SOC(%)   
Device information Time Range 3      
Cut-off Voltage(V)  Set Start derate Voltage (V)  Set

### e) Reset and Debug

In case of receiving fault notification from the machine, we can restart the inverter to eliminate the report of abnormal event.

Application setting Restart inverter   
Charge setting FAQ:  
Discharge setting Why do not discharge?  
Reset and Debug Why do not charge?  
Installer setting Why is there no output power from AC terminal?  
Device information Why is there no output from EPS terminal?

### f) Device information

We can set the standby time after the inverter has been powered on, and we can check the equipment's factory default information.

Application setting Standby time (s)  Set  
Charge setting Model   
Discharge setting Serial number   
Reset and Debug Firmware version   
Installer setting Build version   
Device information Time         Set yyyy-mm-dd hr:mi:se

## 4.3 Monitor System

Users can use wifi dongle/WLAN dongle/4G dongle(Available from 2021 March for some countries) to monitor the energy storage system, The monitor website is: [server.luxpowertek.com](http://server.luxpowertek.com)

The APP is also available in the google play and apple APP store(Scan two code bar to download the APP).

Please download the introduction of guidance by website: <https://www.luxpowertek.com/download/>

Document Reference:

### 1. Wifi Quick Guidance

Quick guidance for setting password for wifi module, the paper is also available in the wifi box

### 2. Monitor system setup for Distributors and Monitor system setup for endusers

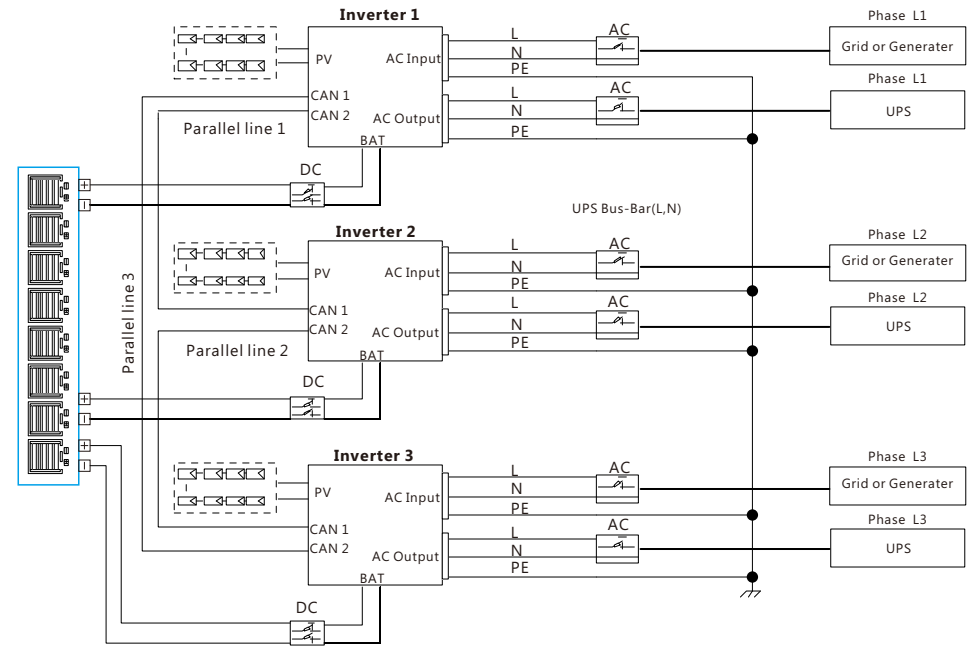
Monitor system registration ,wifi password setting, and wifi local monitor and setting

### 3. Lux\_Monitor\_UI\_Introduction

Introduction of monitor interface

### 4. WebsiteSettingGuidance

Introduction of website settings for hybrid inverter



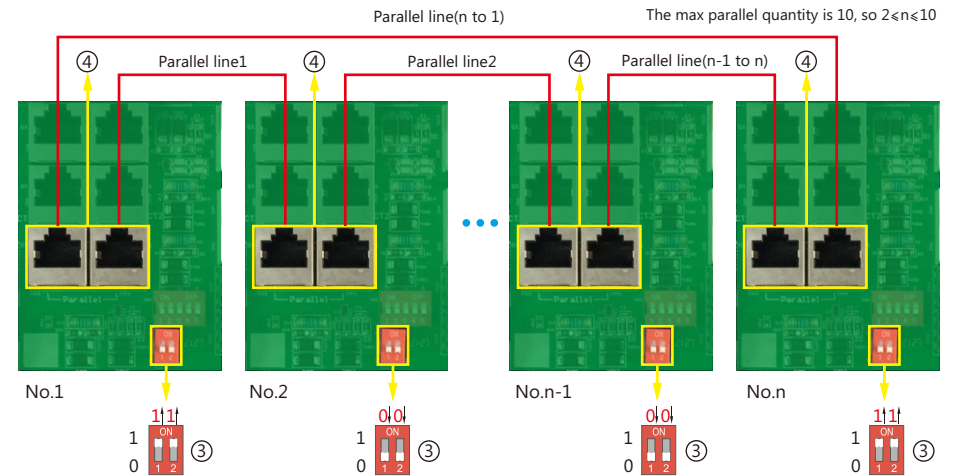
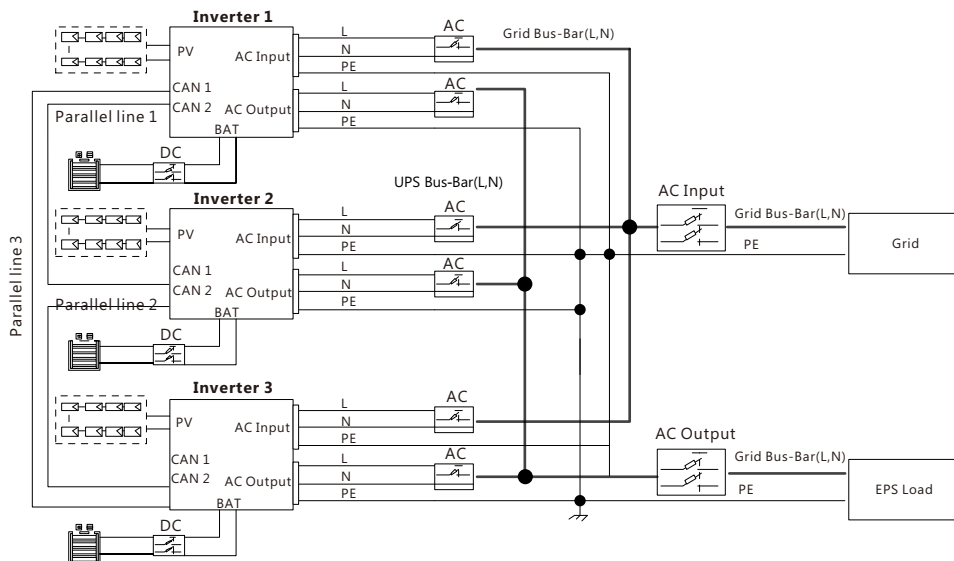
Please put the CAN communication PIN to on status for the first and the end inverter

## 4.4 Parallel system setup guidance

Please note that the parallel model is different from standard model, if users need to connect the UPS together, they need to buy parallel model from distributors.

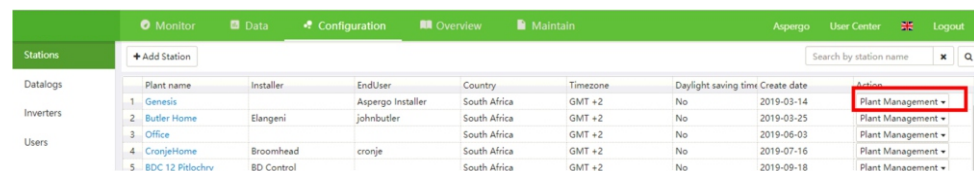
For parallel system setup,

Step1. Cable connection :the system connection for single phase paralleling is as below:  
the system connection for threephase paralleling is as below:

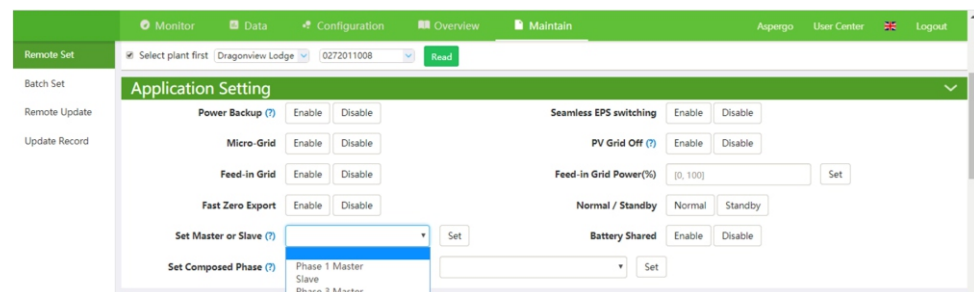




Step2. Setup the monitor for the system,add all datalogs in one station. Users can login the visit the monitor system, Configuration->station->Plant Management->add datalog to add the datalogs.



Step3. Setup Master and Slave for Parallel system. There should be only one master in the system. Set one inverter as master and the others as slave



Step4. Enable share battery for the system if the system share one battery bank, otherwise disable the shared battery function

Step5. Set the system as a parallel group in the monitor system



Please contact your distributor for more detailed guidance for paralleling system

## 5. Start-up and shut down the inverter

### 5.1 Start up the inverter

Step1. Turn on the battery breaker , then turn on "UPS Output" switch and check if the inverter works in battery back-up mode.

Step2. Make sure the PV voltage of the strings are higher than 120V ,and check if the inverter works in PV charge or PV charge back-up mode.

Step3. Make sure step1and 2 above work properly before turning the grid power or generator, and check if the inverter can go to bypass mode and on-grid mode normally.

### 5.2 Shut down the inverter

Danger: Do not disconnect the battery , PV and AC input power under load.

If there is emergency issue , and you have to shut down the inverter ,please follow the steps as below,

Step1. Cut off AC input breaker of inverter side

Step2. Cut off the breaker of load side





Step3. Cut off PV breaker and then cut off the battery ,and waiting for the LCD goes off

Step4. Turn off "Power" switch on the inverter if needed.

## 6. Troubleshooting & Maintenance

### 6.1 Troubleshooting

#### 6.1.1 Introduction to LED Displays

LED	Display	Description	Suggestion
Green LED	Long light 	Working normally	
	Flashing 	Firmware upgrading	Wait till upgrading complete
Yellow LED	Long light 	Warning, inverter working	Need troubleshooting
Red LED	Long light 	Fault, inverter stop work	Need troubleshooting

#### 6.1.2 Maintenance

Every segment of the system need to be check monthly/quarterly/yearly according to the detailed requirements of each segment.

##### Inverter Maintenance

- Check the inverter every 6 months or 1 year to verify if there are damages on cables, accessories, terminals and the inverter itself.
- Check the inverter every 6 months to verify if the operating parameter is normal and there is no abnormal heating or noise from the inverter.
- Check the inverter every 6 months to confirm there is nothing covers the inverter heat sink, if there is, shut-down the inverter and clear the heat sink.

## Battery Maintenance

As per different types battery, from the original manufacturer's requirements on maintenance, when you carried out these works on batteries, please make sure to fully shut-down the inverter for safety consideration.

### 6.1.3 Troubleshooting Based On LCD Displays

Once there are any warning or fault occurred, the LED and LCD will displays information to remind the operator, the LCD will display relevant error code and short description.

Code	Description	LCD Display	Troubleshooting
E000	Battery communication fault 1	E000	Restart inverter, if the error still exist, please contact us
E001	Battery over temperature	E001	
E002	Low battery	E002	
E003	Meter communication fault	E003	
E004	Battery cannot be charged and discharged	E004	Restart inverter, if the error still exist, please contact us
E005	Auto test fault	E005	
E006	RSVD	E006	
E007	LCD communication fault	E007	
E008	Parallel CAN fault	E008	Check the parallel CAN cables between inverters, and balance resistor is in the right place
E009	The fan does not turn	E009	Restart inverter, if the error still exist, please contact us
E010	Multiple master	E010	1.Check if the parallel system have two masters at less. 2.Only allow one master, reconfigure the others to slaves.
E011	Parallel AC inconsistent	E011	Check the AC connection between parallel inverters
E012	UPS short circuit	E012	1.Check UPS L,N connection 2.Disconnect the UPS connector, if the error still exist, contact us.
E013	UPS power reversed	E013	Restart the inverter, if the error still exist, contact us.
E014	BUS short circuit	E014	Contact us
E015	Parallel phase abnormal	E015	Check parallel connection and setting
E016	Relay fault	E016	Restart the inverter, if the error still exist, please contact us.
E017	Internal communication fault 2	E017	

E018	Internal communication fault 3	E018	Restart the inverter, if the error still exist, please contact us.
E019	Bus voltage high	E019	Wait for the inverter automatically restart complete, if this error repeats for several times, please contact us
E020	UPS connection fault	UPS CN Fault	Check UPS and AC connections
E021	PV voltage high	PV voltage high	Check PV input connection and If PV voltage is in range
E023	Neutral fault	Neutral fault	Check neutral connection
E024	Both PV short circuit	E024	Disconnect both PV connection, if the error still exist, contact us
E025	Temperature over range	NTC Open	Check NTC Connection
E026	Internal fault	E026	Restart inverter, if the error still exist, please contact us
E027	Sampling inconsistent between main and slave CPU	E027	
E028	Sync signal lost in parallel system	E028	Check CAN cable connection
E029	Sync trigger signal lost in parallel system	E029	
E031	Internal communication fault 4	E031	Restart inverter, if the error still exist, please contact us
W000	Communication failure with battery	Bat Com Fault	Check if communication cable is right and have choose the right battery brand, if the warning still exist, contact us
W001	AFCI communication fault	W001	Check PV input connection and restart inverter, if the error still exist, please contact us
W002	AFCI High	W002	
W003	Communication failure with meter	Meter Com Fault	Fix communication cable, if the warning still exist, contact us
W004	Battery failure	Battery failure	Restart battery, if the warning still exist, please contact us and battery manufacture
W005	Auto Test failure	Auto Test failure	Restart inverter, if the warning still exist, please contact us
W007	LCD communication Fault	W007	Restart inverter, if the error still exist, contact us
W008	Software mismatch	W008	
W009	Fan Stuck	W009	
W010	Same para address	W010	
W011	Slave overflow	W011	Check parallel number

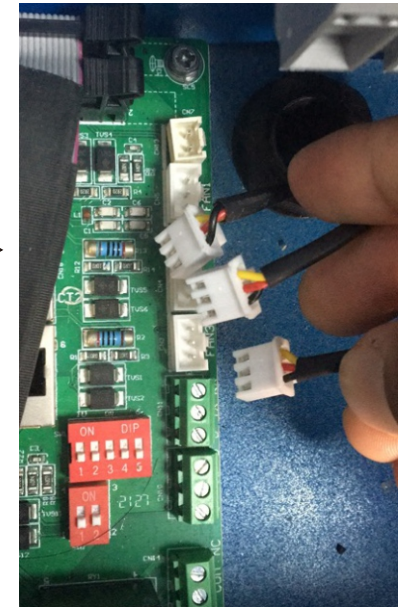
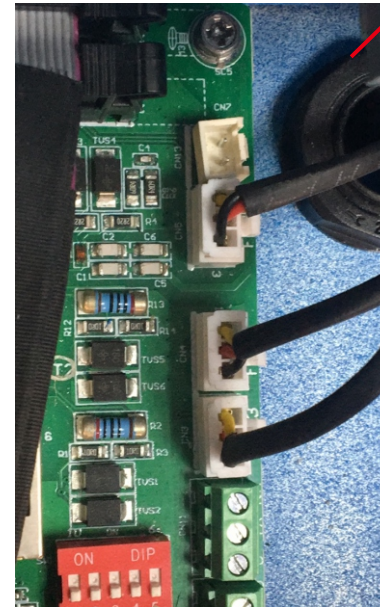
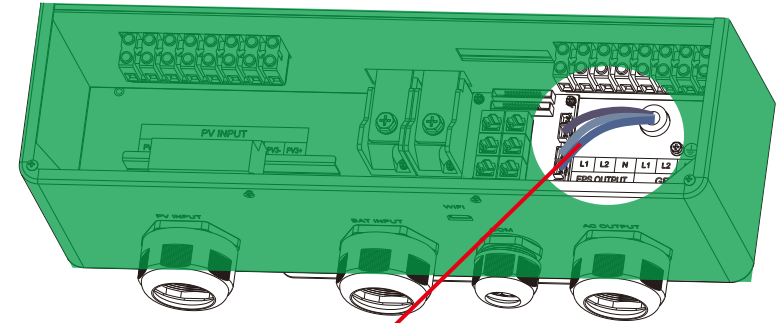
W012	Same para address	W012	Restart inverter, if the error still exist, contact us
W013	Overtemperature	W013	Restart inverter, if the error still exist, contact us
W015	Battery Reverse	W015	Check battery power connect
W016	No AC Connection	No AC Connection	Check AC Connection
W017	AC voltage out of range	AC V Outrange	Check AC voltage
W018	AC frequency out of range	AC F Outrange	Check AC frequency
W019	AC inconsistent in parallel system2	W019	Check parallel connection or contact us
W020	PV Isolation low	PV Isolation low	Restart inverter, if the error still exist, contact us
W021	Leakage I high	Leakage I high	Reset model, check if safety standard switch is at the right place
W022	DC injection high	DC Injection high	Check the parallel CAN cables between inverters, and balance resistor is in the right place
W023	PV short circuit	PV short	Check and fix PV input connection
W025	Battery voltage high	Bat Volt High	Check and fix battery connection
W026	Battery voltage low	Bat Volt Low	
W027	Battery open	Battery open	
W028	UPS Over load	UPS Over load	Check and adjust UPS load
W029	UPS voltage high	W029	Restart inverter, if the error still exist, contact us
W030	Meter Reversed	W030	Check meter connection
W031	UPS DCV high	W031	Restart inverter, if the error still exist, contact us

## 7. Fan replace

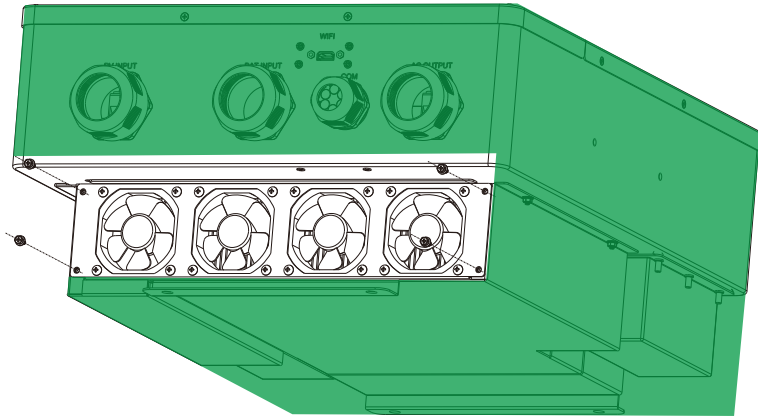
Please check and clean the fan regularly. The recommended period is 6 months. Please replace the fan by following up the below diagram if there is troublesome with the fans.

Turn off the system and wait for more than 5 minutes before disassembling the machine.

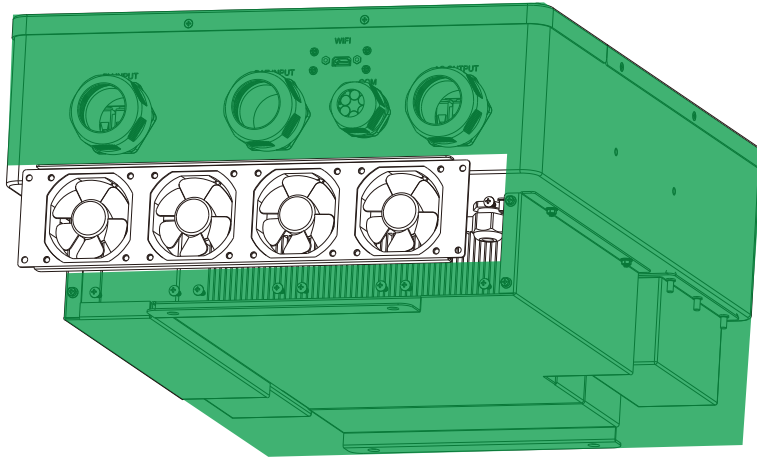
1. Open the wiring cover
2. Unplug the fan cable



3. Loosen the screws and remove them



4. Remove the fan fixing



5. Loosen the waterproof connector

6. Remove the fan and replace it

7. After the fan is installed, follow the steps just now to push back and assemble it back

**PV Input data**      **LXP5K**    **LXP7.6K/8K**    **LXP9K**    **LXP10K**    **LXP11K**    **LXP12K**

Max. usable input current(A)	15/15/15			25/15/15		
Max. short circuit input current(A)	17/17/17			34/17/17		
Start input voltage(V)				100		
Startup voltage(V)				140		
Full power MPPT voltage range(V)	150-550	170-480	190-480	210-480	210-480	230-480
DC nominal voltage(V) MPPT tracker				360		
DC voltage range(V)				100-600		
MPP operating voltage range(V)				60-480		
Max. power(W)	8000	10000	14000	16000	16000	18000
Number of MPPT				3		
Inputs per MPPT				2/1/1		

**AC Grid output data**

Nominal Output Current(A)	21	31.6/33.3	37.5	41.6	44	50
Max. Output Current(A)	24	37	41	46	48	50
Rated voltage(V)				240		
Operating voltage range(V)				180-270		
Nominal power output(W)	5000	8000	9000	10000	11000	12000
Max. apparent AC power(VA)	5500	8900	9900	11000	11500	13200
Operating frequency(Hz)				50/60		
Operating frequency range(Hz)				45-55/55-65		
Phase shift				0.99@full load		
Reactive power adjust range				-0.8~+0.8 leading Adjustable		
THDI				<3%		
Output inrush current(A)				TBD		

**UPS AC output data**

Nominal output current(A)	21	33.3	33.7	41.6	44	50
Nominal output voltage(V)				240		
Rated output power(VA)	5000	8000	9000	10000	11000	12000
Operating frequency(Hz)	60			50/60		
Peak power(VA)				1.1xPn, 5min/1.25xPn, 1min/1.5xPn, 1s/2xPn, 0.1s		
THDV				<3%		
Switching Time				<20		

**Efficiency**

Europe Efficiency	96%
Max. Efficiency @ PV to grid	97.5%
Max. Efficiency @ battery to grid	94%
MPPT Efficiency	99.9%

**Battery data**

Type	Lead-acid battery/Lithium battery					
Max. charge current(A)	110	160/167	190	210	230	250
Max. discharge current(A)	110	160/167	190	210	230	250
Nominal voltage(V)				48		
Voltage range(V)				40-60		

**General Data**

Integrated disconnect	DC switch
Reverse polarity protection	Yes
DC switch rating for each MPPT	Yes
Output over-voltage protection varistor	Yes
Output over current protection	Yes
Ground fault monitoring	Yes
Grid monitoring	Yes
Pole sensitive leakage current Monitoring unit	Yes
AFCI	OPT
RSD	OPT
Dimensions(mm)	580*490*240mm(22.8*19.3*9.4inch)
Weight(kg)	44kg(96.8 lbs)
Degree of protection	NEMA4X / IP 65
Cooling concept	Natural convection
Topology	Transformer-less
Relative humidity	0-100%
Altitude(m)	<2000m
Noise emission(dB)	<50dB
Internal consumption(W)	<15W
Display	Touch color screen
Communication interface	Rs485/Wi-Fi/CAN
Standard warranty	5years