

SINGL **PSE-DUAL-8KW** INVER **USER MANUAL** PHASE PRIMAX HYBRID 0000 **PSE-DUAL-8KW** 0 0 NEXA 6 Company: Primax Solar Energy Mail to: info@primaxsolarenergy.com Website: www.primaxsolarenergy.com/

Contents

Thank you for choosing Primax Hybrid inverter. In order to ensure your safety and proper use, please read the manual in details before using. Thanks for your cooperation!

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1 INTRODUCTION

Hybrid inverter series, also called hybrid or bidirectional solar inverters, apply to solar system with participation of PV, battery, loads and grid system for energy management.

The energy produced by PV system shall be used to optimize self-consumption, excess power charge battery and the rest power could be exported to the grid.

Battery shall discharge to support loads when PV power is insufficient to meet self-consumption. If battery power is not sufficient, the system will take power from grid to support loads.

Note: the introduction describes a general behavior of Hybrid inverter system. The operation mode can be adjusted on APP based on the system layout. Below are the general operation modes for system.

1.1 Safety & Warning



Please read and follow all the instructions and cautions on the inverter or user manual during installation, operation or maintenance, as any improper operation might cause personal or property damage.

• Symbols Explanation

	Caution! Failing to observe a warning indicated in this manual may result in injury.
4	DANGER High voltage hazard. Disconnect all incoming power and turn off the product before working on it.
	Danger of hot surface! High-temperature hazard. Do not touch the product under operation to avoid being burnt.
<u>†</u> †	This side up! The package must always be transported, handled and stored in such away that the arrows always point upwards.
	Product should not be disposed as household waste. Do not dispose of the inverter as household waste. Discard the product in compliance with local laws and regulations .or send it back to the manufacturer.
	Grounding point.
	Read through the user manual before any operations.
Ť	Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.
	Inverter will be touchable or operable after minimum 5 minutes of being turned off or totally disconnected, in case of any electrical shock or injury.

Safety Warning

Any installation and operation on inverter must be performed by qualified electricians, in compliance with standards, wiring rules or requirements of local grid authorities or companies.

Before any wiring connection or electrical operation on inverter, all DC and AC power must be disconnected from inverter for at least 5 minutes to make sure inverter is totally isolated to avoid electric shock.

The temperature of inverter surface might exceed 60 $^{\circ}$ during working, so please make sure it is cooled down before touching it, and make sure the inverter is untouchable for children.

Do not open inverter cover or change any components without authorization, otherwise the warranty commitment for the inverter will be invalid.

Usage and operation of the inverter must follow instructions in this user manual, otherwise the protection design might be useless and warranty for the inverter will be invalid.

Appropriate methods must be adopted to protect inverter from static damage. Any damage caused by static is not warranted by manufacturer.

PV negative (PV-) on inverter side is not grounded as default design.

The total open-circuit voltage of PV string/array is lower than the maximum rated DC input voltage of the inverter. Any damage caused by PV over-voltage is beyond warranty.

Leakage protection switches are not recommended between the inverter and the grid.

1.2 Product Overview



1	LED panel
2	Gen /Back Up2
3	Back Up1
4	On-Grid
5	DC Switch (Optional)
6	PV Terminals
7	Battery Terminals
8	CT Communication Cable
9	Wi-Fi
10	Led Indicators

Led Indicators

Indicator	Status	Explanation
-		On = system is ready
System		Blink = system is starting up
W		Off = system is not operating
Back-Up		On = back-up is ready /power available
		Blink=back-up is low
		Off = back-up is off/no power available

Indica	itor	Status	Explanation
			On = bms and meter communication ok
(co)) COM			Blink1 = meter communication ok, bms communication fail
1.1.5	14		Blink2 = bms communication ok, meter communication fail
			Off = bms and meter communication fail
Fault		I	On = fault has occurred
			Blink = overload of back-up outputireduce load
			Off = no fault



2.1 Unacceptable Installations

Please avoid the following installations, which will damage the system or the inverter.



2.2 Packing List

On receiving the inverter, please check to make sure all the components as below are not missing or broken.



2.3 Mounting

2.3.1 Select Mounting Location

For inverter's protection and convenient maintenance, mounting location for inverter should be selected carefully based on the following rules:

Rule1. Inverter should be installed on a solid surface, where is suitable for inverter's dimensions and weight.

Rule 2. Inverter installation should stand vertically or lie on a slope by max 15°.



Rule 3. Ambient temperature should be lower than 60°C

Rule 4. The installation of inverter should be protected under shelter from direct sunlight or bad weather like snow, rain, lightning etc.

Rule 5. Inverter should be installed at eye level for convenient maintenance.

Rule 6. Product label on inverter should be clearly visible after installation.

Rule 7. Leave enough space around inverter following the values on pic 3.



2.3.2 Mounting

The inverter is suitable for mounting on concrete or other non-combustible surface only.

Wallbacket Expansion pipe	 Step1: Please use the mounting bracket as a template to drill 2 holes on right positions (10mm in diameter, and 35mm in depth) Use expansion bolts in accessory box and fix the mounting bracket onto the wall tightly. NOTE: Bearing capacity of the wall must be higher than 20KG, otherwise may not be able to keep inverter from dropping.
	Step2: Carry the inverter by holding the heating sink on two sides and Place the inverter on the mounting bracket.NOTE: Make sure the heat sink on inverter is rightly joint with mounting bracket.
	Step3: Finally, screw fixation, both screws need to be fixed. Add anti-theft locks as needed. NOTE: Make sure the screws between the inverter and the fixing plate are fixed tightly shedding.
	Step4: Ground cable shall be connected to ground plate on grid side .

2.4 Electrical Wiring Connection

2.4.1 Pv Connection

Before connecting PV panels/strings to inverter, please make sure requirements are followed as below :

- The total short-circuit current of PV string must not exceed inverter's max DC current
- The minimum isolation resistance to ground of the PV string must exceed $33k\Omega$ in case of any shock hazard
- PV strings could not connect to earth/grounding conductor
- Use the DC plugs in the accessory box

NOTE: There will be MC4 or Amphenol DC plugs in accessory box, the detailed connection as below:



2.4.2 Battery Connection

For lithium battery (pack) the capacity should be50Ah or larger. Battery cable requirement as below.

	Grade	Description	Value
A B C	Α	OD	10-12mm
in the second	В	Isolation section	NA
	С	Conductor Core	16-25mm²

NOTE:

 Please be careful against any electric shock or chemical hazard

• Battery wiring connection steps as below:



For lead-acid batteries

Lead-Acid and other similar older-technology battery types require experienced and precisedesign, installation and maintenance to work effectively.

For lead-acid battery bank, the inconformity between battery cells might lead to battery cellover-charge or discharge, and further might damage battery cells and shorten battery bank life.

For this series inverters there is no temperature compensation, thus customers need dobattery settings based on the real working temperature of battery.

For lead-acid battery settings on App, please honestly refer to battery specifications and the actually battery work condition like work temperature and battery age. Unsuitable settings will lead to higher SOC deviation, weaker battery lifespan and further battery damage.

For lead-acid batteries, there is no communication with the inverter, and the SOC of the battery is not counted.

We will keep the right for explanation on all the settings suggested and all the problemshappened on lead-acid batteries or the whole system. And we are not responsible for any damage caused by unsuitable settings, battery beyond warranty or battery quality etc.

• Battery protection description

Battery will act a protective charge/discharge current limitation under any condition as below:

- Battery SOC is lower than I-DOD
- Battery voltage lower than discharge voltage
- Battery over temperature protection
- Battery communication abnormal for lithium battery
- BMS limitation for lithium battery

When charge/discharge current limitation protection happens:

- Under on-grid mode, battery charge/discharge operation could be abnormal
- Under off-grid mode, Back-Up supply will shut down

NOTE

Under off-grid mode, if Back-Up supply shuts off because of battery of low battery SOC PV power will all be used to charge battery till battery SOC reaches 10% (adjustable);

Under on-grid mode , battery is protected from over discharge by 40% less than SOC Protection, resume discharge by 50% more than SOC Protection; Battery is protected from over discharge by setting Cut-off Voltage, resume discharge by 52V (adjustable).

2.4.3 On-grid & Back-up Connection

An external AC switch (>32A) is needed for On-Grid connection to isolate from grid when necessary. Below are the require-ments on AC switch use:





2. On AC side, the individual switch should be connected before loads (between inverter and loads).

1. Use a separate AC switch for individual inverter.

• On-Grid wiring connection process is as below :



• Back-Up wiring connection process is as below:

An external AC switch (>32A) is needed for Back-Up connection to be isolated when necessary.



Intelligent management of back up

The inverter supports dual banck up output in off-grid mode, and you can remotely adjust the energy regulation of each back up; connecting with lead-acid battery, it supports remote voltage regulation.

Declaration For Back-Up Overload Protection

Inverter will restart itself as overload protection happens. The preparation time for restarting will be longer and longer (max one hour) if overload protection repeats. Take following steps to restart inverter immediately: Decrease Back-Up load power within max limitation.



1:Load is supplied from Back-Up side 2:Load is isolated

3:Load is supplied from grid side

GEN wiring connection process is as below:

An external AC switch (>32A) is needed for gen connection to be isolated when necessary.



•GS Indications

GS: dry contact signal for startup the diesel generator. When the "GEN signal" is active, the open contact (GS) will switch on (no voltage output).

Note: When the Smart Load Output function is turned on, the GEN port can be used as an output port to connect to the load. Smart load output or generator input functions cannot be set simultaneously.





(diesel generator startup signal)

• Ct indications

Since this product is a split type transformer, please pay attention to the cleanliness of themagnetic core surface during installation. If there is dirt on the core surface, the accuracy of the product will be deteriorated.

1. Before the transformer is connected to any equipment, please ensure that the circuit is powered off to prevent clicks.

2. Open CT, see figure 1.

3. Clip the CT on the cable under test. Make sure that the maximum current in the wiring does not exceed the maximum input current of the CT; The current flows in the direction of the arrow on the CT housing.

4. Fasten the CT again, the cable under test should be inside the CT window now (see figure 2)

5. Fix the CT on the cable under test with nylon cable ties to prevent the CT from sliding see figure 3)

6. Connect the CT output white wire to the positive terminal of the measuring device, and the CT output black wire to the negative terminal of the measuring device (see figure 4).

7. After checking that the circuit is correct, turn on the power and the CT starts to mea-sure the current in the circuit.





All work should be performed by trained and qualified operators using safe and suitable tools.

• Wiring system for hybrid inverter



• System connection diagrams





NOTE

Meter communication cable (RJ45) is attached on the inverter "To Meter" cable, could be extended to max 100m, and must use standard RJ45 cable and plug as below:



ø

Position	Colo	BMS(CAN)Function	BMS(485)Function	Meter Function
1	Orange&white	NC	485_B	NC
2	Orang	NC	485_A	NC
3	Green&white	NC	NC	485_BI
4	Blu	CAN_H	NC	NC
5	Blue&white	CAN_L	NC	NC
6	Gree	NC	NC	485_AI
7	Brown&white	NC	485_A	485_BI
8	Brown	NC	485_B	485_AI

2.5 Single Phase Parallel Connection Diagram



3 MANUAL OPERATION

3.1 Smart SetApp Operation

During the initial installation, you can download and install the Smart Set app on your smartphone, allowing you to

configure the installation of the hybrid inverter more easy.

- Edit system configuration to make the system work as customer needs
- · Monitor and check performance of the hybrid system
- Wi-Fi configuration

Please download Smart SetApp



iphone : Search "Smart Set App "in Apple Store



Android: Search "Smart SetApp" in Google Play

NOTE: You must install in an uninterrupted Wi-Fi environment.

3.2 Initial Installation Setup



3.3 Operation Modes Introduction

Hybrid inverter system normally has the following work modes based on your configuration and layout conditions.







(2) During the battery discharging period:

1. When PV power is available, PV power will provide power to the load first. If it's sufficient, PV power will feed-in to the grid directly.

- 2. When PV power is not available or not sufficient, the battery will provide power to the load.
- 3. When the battery voltage is under the cut-off voltage, the grid mains will provide power to the load.

3.4 Daily Operation and Maintenance



IPhone: Search "SOLARMAN Business "in Apple Store



Android: Search "SOLARMAN Business" in Google Play



4.1 Main Page

The LCD is a touchscreen, please touch the screen to operate.



This is the main page. Power on the LcD to show the flow chart on the main page. When powering on, data refreshing exists a dittle delay, so please wait for a few secondsbefore operation until the real time appears directly above on the screen. The main page displays PV, grid, battery, load power, battery voltage and SOc. At thesame time, the color of the inverter icon indicates the real time operation status. Based on the real-time power changes, the battery icon changes, and through the signal dots flowdirection to show the dynamic flow of power relationship.

• Description of Touch Functions

Lcons	Functions
	Click to enter the PV page, and view real-time data for the PV section.
	Click to enter the Grid page, and view real-time data for the Grid section.
	Click to enter the GEN page, and view real-time data for the GEN section.
	Click to enter the Battery page, and view real-time data for the Battery section.
	Click to enter the Load page, and view real-time data for the Load section.
···	Click to enter the Run page, and overview the basic information of each section. If the icon is orange, it indicates current normal operation.

[]	If the icon is red, it means current alarm faults.
i	Click to enter the Error Code page, and view the latest alarm records (up to 99). The content includes the number of messages, alarm time, and error code.
හු	Click to enter the Setting page, but you need to enter the password correctly at first.
*	Home-return button.
•	Back button.
	Page-up button.
	When the button turns transparent, it means untouchable.
	Page-down button.
	When the button turns transparent, it means untouchable.
×	Save button.
\checkmark	When the button turns transparent, it means untouchable.
Ð	It indicates that the password is correct, click to enter the Setting page.
Ð	It indicates the password is wrong and you need to re-enter, or it shows ERROR.
\bigcirc	It means unselected.
	It means selected.
	It means off.
\checkmark	It means on.

Click on the icons of each section to view real-time data, as shown in the table above.

Click on the gear icon in the upper right corner of the Main screen to enter the Setting interface. In order to protect the information security and prevent misuse, each time you enter the Setting interface, you need to enter the password once. The default password is 1234. There is a delay of a few seconds in the judgment of the password, please be patient and wait for the entry icon to turn on and change to green, click and enter Setting menu interface, select the system set, battery set, grid set, generator set, basic set, advanced setand others. Enter the sub-setting interface for parameter modification (If the password iswrong, the entry icon closes and turns red, you need to re-enter the correct password. If you click on the icon at this time, it will display "Error", you can only click on the home return button or back button to re-enter the password interface and enter the correct password).

In each sub-setting interface, the selection way is to click on the hollow circle to make it become a solid circle or click on the box to make the check mark appear, and the input way is to click on the rectangular input box to use the keyboard to input the numbers (there is no need to input the unit), and then click on save button to take effect. After successfu setting, it will return back to the previous interface automatically. Any parameter modification needs to click save to take effect, otherwise the modification will not work. LCD brightness and standby time are adjusted by clicking the plus/minus icon or dragging the slider, and system time is adjusted by clicking the plus/minus icon. Similarly, you need to save after modification. The parameter settings have limited the range of input values to protect against accidental touch, so you can operate with peace of mind.

• Operation Flow Chart



4.2 REAL-TIME INFORMATION PAGE

• PV PAGE

PV Info		
DC Voltage 1	0.0V	
DC Current 1	0.00A	
DC Voltage 2	0.0V	
DC Current 2	0.00A	
DC Power 1	0W	
DC Power 2	0W	
E-PV-Day	0.0kWh	

This is PV Page, one page in total.

(1) Real-time data: It can display the two-channel DC voltage, current, and power in real time, and simultaneously display the current day, current month, current year, and cumulatve power generation.

(2) Button: The right area of the screen is the button area, the top one to return to the home page, next to return to the previous page button, page-up button, page-down button, save button. When the button turns transparent, it means untouchable.

GRID PAGE

Gri	d Info			This is Grid Page, six pages in total. The number of
1/2	Grid Voltage Grid Current Grid Frequency Output Power Reactive Power Power Factor Grid Power Status Meter Power Meter COM Status	0.0V 0.00A 0.00Hz 0W 0W 0.000 Sell 0W Failure	 <	 pages is displayed in the lower left corner. (2) Real-time data: Real-time display of grid voltage, current, AC output power and reactive power, power factor, meter power, display of grid frequency, status and meter COM status, statistics of the day, month, year, and the cumulative amount of bought/sold energy. (2) Grid Power Status: Balance, Sell, Buy. (3) Meter COM Status: Failure, Ok.

Grid Info

E-Buy-Day	0.0kWh	
E-Buy-Month	0.0kWh	
E-Buy-Year	0.0kWh	
E-Buy-All	0.0kWh	
E-Sell-Day	0.0kWh	
E-Sell-Month	0.0kWh	
E-Sell-Year	0.0kWh	
E-Sell-All	0.0kWh	\checkmark
!/2		

BATTERY PAGE

Battery Info			Battery Info	
Battery Voltage Battery Current Battery Power Battery Capacity Battery working Status Battery Test Status BMS COM Status BMS Temperature	0.00V 0.00A 0W 0.0% Discharge Both allowed OK 0.0 °C		LLC Voltage 0.0V LLC Current 0.00 E- Charging-Day 0.0k E- Charging-Month 0.0k E- Charging-Year 0.0k E- Charging-All 0.0k E- Discharging - Day 0.0k E- Discharging - Month 0.0k	/ JA Wh Wh Wh Wh Wh Wh
BMS Max Charge Current BMS Max Discharge Current	0.00A 0.00A	\checkmark	E- Discharging - Year 0.0k E- Discharging - All 0.0k	:Wh :Wh

① Real-time data: Real-time display of battery voltage, current, power, working status, detection status, BMS COM status, temperature, maximum charging and discharging current, LLC voltage and current, and statistics of the day, month, year, and the cumulative amount of charged/discharged energy.

2 Battery Working Status: Standby, Charge, Discharge.

- ③ Battery Test Status: Disconnect, Charging allowed, Both allowed, Discharging allowed.
- (4) BMS COM Status: Failure, OK.

LOAD PAGE

Load Info		
Backup Voltage	0.0V	•
Backup Current	0.00A	
P Load	0W	
E Load Day	0.0kWh	
E Load Month	0.0kWh	
E Load Year	0.0kWh	
E Load All	0.0kWh	\checkmark

This is the Load Page, with two pages in total. The number of pages is displayed in the lower left corner. (1) Real-time data: Real-time display of three-phase load voltage, current, AC output power, statistics of total power consumption, and the day, month, year, and the cumulative amount of consumed energy.

GEN PAGE

Gen Info		A
Gen Voltage	0.0V	•
Gen Current	0.00A	
Gen Power	0W	
Gen Frequency	0.00Hz	✓

This is Gen Page, one pages in total. (1) Real-time data: Real-time display of the voltage, current, power frequency of the Gen.

RUN PAGE

Lo	ad	G	Grid	Inve	erter	
C	W		0W	C	W	
0.0V	0W	0.0V	0W	0.0V	0W	
Bat	tery	P	V 1	P	V 2	
C	W		0W	(W	
0.	00V	0	.0V	0.	0V	
0.	00A	0	.00A	0.	00A	

This is Run Page, one pages in total. ① Real-time data: Real-time display of the voltage, power and total power of the load, the grid, the inverter output, the battery, and the two PVs.

• ERROR CODE PAGE

Error	Code		
No	Time	Error Code	
01	20-00-00 00:00:00	W_1:1:Under Ugrid	
02	20-00-00 00:00:00	W_1:3:Under Fr	
03	20-00-00 00:00:00	F_1_15:Remote shutdown	
04	20-00-00 00:00:00	W_1:5:Under Upv	
05	20-00-00 00:00:00	W_1:1:Under Ugrid	
05	20-00-00 00:00:00	W_1:3:Under Fr	
07	20-00-00 00:00:00	W_1:5:Under Upv	
08	20-00-00 00:00:00	F_1_15:Remote shutdown	
09	20-00-00 00:00:00	W_1:1:Under Ugrid	
10	20-00-00 00:00:00	W_1:3:Under Fr	
1/9 11	20-00-00 00:00:00	W_1:5:Under Upv	

This is Error Code Page, nine pages in total. The number of pages is displayed in the lower left corner.

(1) Real-time data: Real-time display of latest alarms (up to 99, 1 page stores 11), the latest is displayed at the top, and it doesn't show if there is none. Specific contents include serial number, alarm time, and corresponding fault codes.

4.3 PASSWORD ENTER PAGE



This is Password Enter Page, you need to enter the password correctly before entering the Setting Page.

1 The default password is 1234.

(2) If the password is wrong, the entry icon in the lower right corner turns red, the door closes, and an "X" appears; if the password is correct, the entry icon in the lower right corner turns green and the door opens.

(3) If the password is correct, you can enter the setting page by clicking on the "door icon". If you click on the wrong password, "ERROR" will pop up, and you can only go back to the home page or the previous page by clicking on the button, and then go back to the password page to re-enter.

(4) When the settings are changed and you back out to the main page, the password will be cleared automatically.



This is Keyboard Input Page.

(1) "0-9" is used to input numbers, "." is used to input decimal, "+/-" is used to switch between positive and negative values, "<" is used to delete, "Esc" is used to quit or cancel input, "OK" is used to confirm.

4.4 SETTING PAGE



This is Setting Page, seven buttons in total.

(1) System set: switch on/off; anti-reflux source, max. power selling; PV energy mode, charging and discharg ing periods, power battery SOC, voltage settings.

(2) Battery set: protocol selection; discharge protection; BAT activation mode; equal charge configuration; float charge configuration.

③ Grid set: frequency selection; upper and lower limits of grid voltage; reconnection time.

(4) Basic set: language; time; standby; brightness; buzzer; LED.

(5) Advanced set: battery paralleling; forced off-grid mode; PCS paralleling address; PCS paralleling quantity; active/reactive power adjustment; power factor adjustment; PV shadow scanning; islanding protection; low voltage ride-through; clearing overload faults.

(6) System information: rated output power; FM version of LCD; program version of STM32, DSP slave/master, CPLD, startup countdown time.

4.5 SYSTEM INFORMATION PAGE

Sve	tem	Into	rmai	iion
- , -			intere	

FM Version of LCD	Xa106_P1_P
Rated Output Power	0W
FM Version of STM32	0
FM Version of DSP_master	0
FM Version of DSP_slave	0
FM Version of CPLD	0
Countdown Time	0S

This is System Information Page, one page in total. (1) Real-time data: Real-time display of rated output power; machine serial number, program version of STM32, DSP slave/master, CPLD; startup countdown time.

4.6 SYSTEM SET PAGE

System Settings		System Settings	
Switch OOFF OON		CHG EDC Time Power Battery	
O Selling First		○ ○ 0 : 0 ~ 0 : 0 0W 0.0% 0.0V	
O Anti-Reflux to Grid Solar Sell		○ ○ 0: 0 ~ 0: 0 0W 0.0% 0.0V	
○ Anti-Reflux to CT		○ ○ 0: 0 ~ 0: 0 0W 0.0% 0.0V	
Max Sell Power 0W Zero-export Power 0W		○ ○ 0: 0 ~ 0: 0 0W 0.0% 0.0V	
Energy Mode O Batt First O Load First		○ ○ 0: 0 ~ 0: 0 0W 0.0% 0.0V	
	_ ✓	○ ○ 0: 0 ~ 0: 0 0W 0.0% 0.0V	\mathbf{V}
1/2		2/2	

This is System Set Page, two pages in total. The number of pages is displayed in the lower left corner.

① Switch: controls the power on and off of the inverter. O means unselected, ③ means selected.

2 Work Mode:

i) Seling First: PV is used to power loads and battery, allowing the inverter to sell excess energy enerated by the solar panels back to the grid. If it is during a discharging period, energy of battery can also be sold back to the grid. Prioritization of power supply sources for loads: PV>Grid>Battery.

ii) Anti-reflux to grid: The inverter only supplies power to the connected backup load. it neither supplies power to household loads nor sells power to the grid. The built-in CT will detect the power flowing back to the grid and will reduce the power of the inverter, only to supply local loads and charge for battery.

iii) Anti-reflux to CT: The inverter supplies power to connected backup loads and household loads. If PV power and battery power are insuficient, they will be supplied with grid power. The inverter won't sell power to the grid. in this mode, a CT is required and an extermal CT will detect the power flowing back to the grid and wil reduce the power of the inverter, only to supply local and household loads, charge for battery.

(3) Solar Sell: it is a special pattern in the Anti-reflux to grid or Anti-reflux to CT mode. If this patiern is on, excess energycan can be sold back to the grid. At this time PV is prioritized for use as follows: loads, charging batiery, grid. \Box means off, ∇ means on.

(4) Max Sell Power: The maximum output power allowed to flow into the grid.

(5) Zero-export Power: The maximum amount of power flowing into the grid with the "Solar Sell" off.

6 Energy Mode: Priorizaon of PV energy supply.

i) Batt First: PV energy supply is first used to charge the battery and then used to power the load. If the PV energy is insufficient, the grid will supply both the battery and the load.

ii) Load First: PV energy supply is first used to power the load and then used to charge the battery. If the PV energy is insufficient, the grid will supply both the battery and the load.

Note: If operating on off-grid status, the PV energy mode is always load first.

(7) Charging and Discharging Periods: Up to six charging and discharging time periods can be set, click the circle to select charging (CHG) and discharging (EDC) mode, solid circle means selected. For convenience, hours and minutes are set separately, click on the input box and enter with the keyboard, set the start time first and then set the end time. Moreover, charge and discharge power can be set, as well as battery cut-off SOC and voltage. in order to avoid generating program conflicts, the two time periods front and rear are configured with a continuous relationship, where the end time of the previous period is the start time of the subsequent period. In addition, if the battery protocol is a Pb Acid, the battery cut-off SOC item can only be set to 0% or 100% when setting the period parameter. Charging needs to be set to 100% and discharging needs to be set to 0%.
 (8) GEN Charge: utilize diesel generator to charge the battery in a time period.

4.7 BATTERY SET PAGE

Protocol Setting	Pb A	cid		4
Discharging Prote	ection			
On-grid	SOC Off-grid	SOC	Voltage	
Cut-off 0%	0%		0.00V	
Restored 0%	0%		0.00V	
Discharge Max. C	urrent 0.00A	4		
O Active BAT I	Node enable			V
tery Settings				
b Acid O CAN	Bus Proto-P	YLON-v1	.3	4
				▲ ▼
				▲ ▼
				▲ ▼ √
ttory Sottings				▲ ▼ √
ttery Settings				▲ ▼ √
ttery Settings U-Equal Charge	a 0.00V			▲ ▼ √
t <mark>tery Settings</mark> U Equal Charge I - Equal Charge	 0.00V 0.00A 			▲ ▼ √
t <mark>tery Settings</mark> U Equal Charge I - Equal Charge U Float Charge	 0.00V 0.00A 0.00V 			▲ ✓ ≪
t <mark>tery Settings</mark> U Equal Charge I - Equal Charge U Float Charge I - Float Charge	 0.00V 0.00A 0.00V 0.00V 0.00A 			
t <mark>tery Settings</mark> U Equal Charge I - Equal Charge U Float Charge I - Float Charge T- Float Charge	 0.00V 0.00A 0.00V 0.00V 0.00A 0min 			

This is battery set page, two pages in total. The number of pages is displayed in the lower left corner. ① Protocol Settng: Select battery BMS protocol, currently supports Pb Acid and CAN-Bus-proto-PY-LON-v1.3. Click to sub-page to select, and click save, back to Battery set page.

(2) Discharging Protection: i) Cut-off: Set the battery discharge to stop only when it reaches the given conditions (battery SOC and voltage in on-grid/off-grid state). ii) Restored: Set the power supply to load to restore only when it reaches the given conditions (battery SOC and voltage in on-grid/off-grid state). iii) Discharge Max.Current: The maximum value of current allowed to be reached in the discharging state of the battery.

(3) Active BAT Mode Enable: Restore the battery from is over-discharged state by slowly charging it from the PV array or the grid. This feature needs to be set up when the inverter is down.

(4) Equal Charge: Battery equal charge voltage and current can be set.

(5) Float Charge: Battery float charge voltage, current and time (in minutes) can be set.

ⓒ Grid Charge : The inverter draws energy from the grid to charge the battery, allowing the battery's capacity to reach Reserver SOC.

4.8 GRID SET PAGE



This is Grid Set Page, one page in total. (1) Frequency select: please select your local grid frequency, you can choose 50Hz, 60Hz. (2) Grid Voltage: Upper and lower grid voltage limits can be set.

(3) Grid Frequency: Upper and lower grid frequency limitscan be set.

(4) Grid Reconnect delay: The reconnection time can be setin the on-grid state. The grid frequency needs to be selected when the inverter is down, and the inverter needs to be powered back on after the selection is completed.

(5) Grid Level: There're several voltage levels for the inverter output voltage.

LN:230VAC LL:400VAC

LN:133VAC LL:230VAC

Note: The grid frequency and grid level need to be selected when the inverter is down, and the inverter needs to be powered back on after the selection is completed.

4.9 ADVANCE SET PAGE

Advance Settings	Advance Settings
 Force Off - grid Mode Only PV Off - grid enable Gen Signal PCS Parallel address PCS Parallel quantity CT Ratio 	○ Overload Reset ○ Smart Load Output SOC Voltage Protection 0% 0.0V Restored 0% 0.0V Active Power 0.0 ▼ ○ Reactive Power 0.0 ▼ 2/3 ○ Power Factor 0.0
Advance Settings Advance Settings Advance Settings	
This is Advance Set Page, two pages in total. The number (1) Force Off-grid Mode: Use this function to force a switch load inthis mode. (2) Only PV Of-Grid Enable: Inverter in the off-grid state we machine can start to supply power to the load. This features If operating on off-grid status, the PV energy mode is alwa (3) GEN Signal: If this function is turned on, then when the a dry contact signal to control the generator to start running contact signal was disconnected and the generator stoppe (4) PCS Parallel: Support PCS parallel function, you can see (Multiple machines in parallel: the address of each maching to parallel quantity). This function needs to be set when the powered back on after the setup is completed. (5) Overload Reset: After an alarm occurs, while other king faults need to be cleared manually with this function, The it to a solid circle, click on the Save button, and return to the cleared successfully once. The next time you need to clear (6) Smart Load Output: This mode utilizes the Gen input of when the battery SOC and voltage is above a user program the inverter is down. (7) CT Ratio: Set CT Ratio. (8) Factory Reset: Reset all parameters of the inverter and (9) Default Reset: Reset all parameters of the inverter with (10) Active power:Active power which is used to adjust inv (11) Power Factor:Power factor which is used to adjust inv (12) Reactive Power:Reactive power which is used to adjust inv	of pages is displayed in the lower left corner. ch to the off-grid state, which prioritizes power to the with only PV input, if this function is enabled, the e needs to be set up when the inverter is down. Note: ys load first. e power grid suddenly disappears, the inverter will send ng, When the power grid returned to normal, the dry d working. et the address and quantity of parallel machine. the must start from 1, consecutive and less than or equal he inverter is down, and the inverter needs to be hds of fault can be cleared automatically, only overload operation way is to click on the hollow circle to change he Seting page automatically, then the overload fault is it, just repeat the operation above. connection as an output witch only receives power ma-ble threshold. This feature needs to be set up when I reset the power generation data to zero. hout clearing the power generation data. verter Active power. st inverter reactive power. st inverter reactive power.

4.10 BASIC SET PAGE

Basic Settings		This is Basic Set Page, six buttons in total.
Language Set RTC	LCD	between 中文 and English.
Settings		 Set RTC Time: The RTC time can be changed. LCD Standby: Screen standby time can be set, that
Brightenss Buzzer		 is to say, how long there is no touch to apply to the screen, it's brightness is automatically reduced to lowest. The settable range is 1~240s. ④ Brightness: The current brightness of the screen can beset. The settable range is 1~100%. powered back on after the selection is completed.
		 (5) Buzzer: Buzzer can be set to sound or not when touching. (6) LED: Support LED night mode funcon, you can set whether to enable or not and · me period
Language Settings English		 This is Language Page. ① The current language is displayed in real time by the color of the option block, blue is selected, white is not. ② When you change the language, you can judge whether the click is effective or not by whether the color of the option block changes to blue, and then click save. ③ After changing the language, it will take a few seconds for all the text to be changed to the new language, so please don't click it too often.
		L
Y M \bigcirc (2000) $\textcircled{\bullet}$ \bigcirc (12) $\textcircled{\bullet}$ \bigcirc (H M \bigcirc (23) $\textcircled{\bullet}$ \bigcirc (59) $\textcircled{\bullet}$ \bigcirc (D 31 ↔ ▲ 59 ↔ ✓	 This is Set Time Page. ① Time can be set to meet the needs of different areasof use. ② For ease of operation, the year, month, day, hour, minute, and second are added and subtracted respectively Y-MM-D H:M:S means Year-Month-Day Hour: Minute: Second. ③ After changing the time, you can return to the main page to see that the system time has been changed to the newly set time.
LCD Standby Time		 This is LCD Standby page. ① Screen standby time can be set, that is to say, how long there is no touch to apply to the screen, it's brightness is automatically reduced to lowest. ② There are two ways to adjust, clicking on the plus or minus icon or dragging the slider to adjust. ③ The settable range is 1~240s. The default value is 240s.

LCD Brightness



This is Brightness page.

 The current brightness of the screen can be set to be displayed as a percentage of the maximum brightness.
 There are two ways to adjust, clicking on the plus or minus icon or dragging the slider to adjust.

(3) The settable range is 1~100%. To protect the screen, upper and lower limits are set for the actual displa brightness. The default value is 64%.





5 TROUBLE SHOOTINGS

5.1 Warning List

System Warning Code 1	Warning Event	Description	Solutions	
0	Over Ugrid	The Grid Voltage is Higer than the setting value when the inverter is running	 Check the AC voltage is in the range of standard voltage inspecification; Check whether grid AC cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
1	Under Ugrid	The Grid Voltage is Lower than the setting value when the inverter is running	 Check the AC voltage is in the range of standard voltage inspecification; Check whether grid AC cables are firmly and correctly connected; If the error message still remains, please contact your installer 	
2	Over Fr	The Grid Frequency is Higer than the setting value when the inverter is running	 Check the frequency is in the range of specification or not; Check whether AC cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
3	Under Fr	The Grid frequency is Lower than the setting value when the inverter is running	 Check the frequency is in the range of specification or not; Check whether AC cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
4	Line Check	The Grid is Loss when the inverter is running	 Check whether grid AC cables are firmly and correctly connected; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
5	Under Upv	The PV voltage is lower than 120V when turn on the PV switch	 Check the PV is in the range of specification or not; Check whether PV cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
10	Reserved			
11	Reserved			
12	Reserved			
13	Reserved			
14	Reserved			
15	Reserved			

System Warning Code 2	Warning Event	Description	Solutions	
0	UBATTERY _LOW	The battery voltageis lower than 44V orlower than the SOCthat you setting	 Check the battery voltage; Check whether Battery cables are firmly and correctly connected; Restart the inverter 2-3 times; if the fault still existing, Please contact your installer. 	
1	UBATTERY _LOSS	The battery is lower than 25V	 Check the battery voltage; Check whether Battery cables are firmly and correctly connected; Restart the inverter 2-3 times; if the fault still existing, Please contact your installer. 	

2	Reserved		
3	Reserved		
4	Fault FAN	The FAN isn't working	 Restart the inverter 2-3 times; if the fault still existing, Please contact your installer.
5	Reserved		
6	Battery Transient under voltage	The battery voltage is lower than 40V at one moment	 Check the battery voltage; Check whether Battery cables are firmly and correctly connected; Restart the inverter 2-3 times; if the fault still existing, Please contact your installer.
7	Reserved		
8	Reserved		
9	DC Stop	The DC side isn't working	 The BUS voltage can't be built from PV or battery. Check whether Battery cables are firmly and correctly connected; Restart the inverter 2-3 times; If the fault still existing, Please contact your installer.
10	Reserved		
11	Reserved		
12	Reserved		
13	Reserved		
14	Reserved		
15	Reserved		

5.2 Fault Reference Codes

System Fault Code 1	Fault Event	Description	Solutions	
0	Under Upv1	The PV voltage is lower than 20V ,and the current is higher than 2A	 Check the PV is in the range of specification or not; Check whether PV cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
1	Over lpv1	The PV current is higher than 30A	DC side over current fault 1. Check PV module connect and battery connect; 2. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 3. If the error message still remains, please contact your installer.	
2	Over Upv1	The PV voltage is higher than 500V	 Check the PV is in the range of specification or not; Check whether PV cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
3	Over lpv2	The PV current is higher than 30A	DC side over current fault 1. Check PV module connect and battery connect; 2. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 3. If the error message still remains, please contact your installer.	
4	Over temp	The temperature is higher than 100℃	 Check whether the work environment temperature is too high; Turn off the inverter for 10mins and restart; if the fault still existing, please contact us for help. 	
5	Over lac	AC over current fault	AC side over current fault 1. Please check whether the backup load power and common load pow are within the range; 2. Restart and check whether it is in normal;	

		 Check the backup load connected, make sure it is in allowed power range. If the fault still exists, please contact us for help. If the error message still remains, please contact your installer. 		
6	Over Ugrid	The Grid Voltage is Higer than the setting value when the inverter isn't running	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage inspecification; 2.Check whether grid AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.	
7	Over Fr	The Grid Frequency is Higer than the setting value when the inverter isn't running	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer	
8	Under Backup	The backup is connected with the Grid	 Check the backup terminal; Detect the backup voltage with the multimeter; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
9	Over Ubus	The BUS Voltage is Higer than 560V	 check the total power of the inverter; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
10	Over Ileak	AC leakage current fault	Leakage current fault 1. Check the PV side cable ground connection; 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.	
11	Fault Relay	The Relay isn't working	 Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
12	Fault GFD	DC insulation failure	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and correctl 2. Check whether the PE cable of inverter is connected to ground; 3. If the error message still remains, please contact your installer.	
13	Over Backup Voltage	The Backup Voltage is high	 Check the backup terminal; Detect the backup voltage with the multimeter; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
14	XINT lac	The inverter current is high and touch the protection.	 check the power of the backup load; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
15	Remote Shutdown	Turn off the inverter	 Check the other fault code of the inverter and according to the solution to solve the problem. Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	

System Fault Code 2	Fault Event	Description	Solutions	
0	Fault SPI	The upper computer communicates with the lower computer fault	 Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
1	Under Ugrid	The Grid Voltage is Lower than the setting value when the inverter isn't running	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage inspecific 1't 2. Check whether grid AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.	

2	Under Fr	The Grid Frequency is Lower than the setting value when the inverter isn't running	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. If the error message still remains, please contact your installer.	
3	Under Upv2	The PV voltage is lower than 20V ,and the current is higher than 2A	 Check the PV is in the range ofspecification or not; Check whether PV cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
4	Over Upv2	The PV voltage is higher than 500V	 Check the PV is in the range of specification or not; Check whether PV cables are firmly and correctly connected; If the error message still remains, please contact your installer. 	
5	Reserved			
6	Under Ubus	The BUS Voltage is Lower than 300V	 check the total power of the inverter; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
7	Reserved			
8	Fault Temper	The Temper is fault	 Check whether the work environment temperature is too high or to low; Turn off the inverter for 10mins and restart; if the fault still existing, please contact us for help. 	
9	Over Load	1. check the total power of the inverter; The Relay isn't working 2. Restart the inverter 2-3 times; 3. if the fault still existing, please contact us for help.		
10	Reserved			
11	Parallel Data Loss	Parallel Data Loss	 When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; Restart the inverter 2-3 times; If the fault still exists, please contact us for help. 	
12	Parallel Phase Loss	Parallel Phase Loss	 When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; Restart the inverter 2-3 times; If the fault still exists, please contact us for help. 	
13	Parallel Stop	Parallel system stop	 Check the hybrid inverter work status. According to the fault code to solve the problem. if the fault still existing, please contact us for help. 	
14	XINT Ipv	The PV boost current is high and touch the protection.	 check the PV voltage and the power of the backup load; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
15	Reserved			

System Fault Code 3	Fault Event	Description	Solutions	
0	UBUS_OVER	The BUS Voltage is Higer than 560V	 check the total power of the inverter; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
1	UBUS_LOW	The BUS Voltage is Lower than 300V	 check the total power of the inverter; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	

2	UBATTERY _OVER	The Battery Voltage is Higer than 60V	 Check the battery voltage; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
3	Reserved			
4	ILLC_OVER	The LLC current is high	 check the total power of the inverter include the charging and the discharging current; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
5	IBuckBoost _OVER	The Buck-boost voltage is high and touch the protection	 check the total power of the inverter include the charging and the discharging current; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
6	ULLC_OVER	The LLC voltage is high and touch the protection	 check the total power of the inverter include the charging and t discharging current; Check the battery voltage; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
7	Fault data SPI	The upper computer communi- cates with the lower computer fault	 Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
8	Over time SPI	The upper computer communi- cates with the lower computer fault	 Restart the inverter 2-3 times; If the fault still existing, please contact us for help. 	
9	Over Ibat	The battery current is higher than 1.5 multiples of the setting value	 check the discharging current that you setting; check the total power of the inverter; if the fault still existing, please contact us for help. 	
10	Reserved			
11	Reserved			
12	Reserved			
13	Reserved			
14	ILLC_XINT	The LLC current is high and touch the protection	 check the total power of the inverter include the charging and the discharging current; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	
15	IBuckBoost _XINT	The Buck-boost current is high and touch the protection	 check the total power of the inverter include the charging and the discharging current; Restart the inverter 2-3 times; if the fault still existing, please contact us for help. 	

5.3 Troubleshootings

• Troubleshootings

Checking before starting up

- PV Input Connection: Confirm the connection between inverter and PV panels : polarity (+/-)not reversed.
- Battery Connection: Confirm the connection between inverter and battery : polarities (+/-) not reversed.
- On-Grid & Back-Up Connection: Confirm On-Grid connected to public grid and Back-Up to loads : polarity (L/N) not reversed.

Problems During Operation

Hybrid inverter not start up with only battery

Solution:

1. Make sure the voltage of battery is higher than 48V, otherwise battery cannot start Hybrid inverter up.

Hybrid inverter not start up with only PV

Solution:

1. Make sure the voltage of PV is higher than 150V.

2. Make sure that connection between Hybrid inverter and PV panels : polarities (+/-)not reversed.

No discharge or output from hybrid inverter at night without PV or PV power lower than load power:

Solution:

1.Communication between Hybrid inverter and Meter is OK or not.

- 2. Make sure load power is higher than 150W.
- a. battery will not discharge continuously unless load power is higher than 150W.

b. If battery still not discharge when Meter power is higher than 150W, then please check Meter connection and direction.

Battery not charge when pv power higher than load power:

Solution:

1.Check if charge voltage on App (Set->Basic Setting) is properly set (for lead-acid battery) as battery cannot charge if battery voltage reaches charge voltage.

2.Check if it is during discharge time set on App.

3. Check if battery is fully charged or not, or battery voltage reach "charge voltage" or not.

High power fluctuation battery charge or discharge:	Battery does not charge:
Solution:	Solution:
1. Check if there is a fluctuation on load power.	1. Make sure BMS communication is OK on App.
2.Check if there is a fluctuation on PV power.	2.Check if the total load power is much higher than PV power.

Questions & Answers (Q & A)

About Wi-Fi configuration

Q: Why cannot see Solar-WiFi signal on mobile devices?

A: Normally Solar-WiFi signal could be searched right after inverter powered up. But Solar-WiFi signal will disappear when Hybrid inverter connected to internet, If need change settings, can connect to the router to change. If cannot see WiFi signal even not connect to router, then please try to reload WiFi.

About battery operation

Q: Why battery does not discharge when grid is not available, while it discharge normally when grid is available?

A: On APP Of-Grid Output and backup function should be turned on to make battery discharge under off-grid mode.

Q: Why there is output on Back-Up side?

A: For Back-Up supply, the "Back-Up Function" on App must be turned on. Under off-gridmode or grid power is disconnected, "Off-Grid Out" function must be turned on as well.

NOTE: As turn "Off-Grid Output" on, don't restart inverter or battery, otherwise the function will switch off automatically.

Q: Why battery switch always trip when starts it up (Lithium battery)?

A: For lithium battery like BYD , normally the switch trips for flowing reason:

1.BMS communication fails, or battery SOC is so low to protect itself.

2.Battery SOC is too low, battery trips to protect itself.

3.An electrical short-cut happened on battery connection side.

Q: Which battery should I use for Hybrid inverter?

A: For Hybrid inverter, it could connect lithium or lead-acid batteries, with nominal voltage 48V, max charge voltage 60VCompatible lithium batteries for now: BYD B-Box 2.5/5.0/7.5/10 For lead-acid batteries: please contact us to confirm if it is suitable to use.

Q: How to set the battery charging and discharging current?

A: Inverter factory default battery charging current 10A and discharging current20A.You can adjust it according to the specifications of the battery used.

About SOLARMAN Business App operation and monitoring

Q: Why Cannot save settings on APP?

A: This could be caused by losing connection to WiFi.

1.Make sure you connected WiFi(make sure no other devices connected) or router (ifconnected WiFi to router) and on APP home page shows connection well.

2.Make sure Hvbrid inverter under waiting mode (on APP) before you change any setings on SOLARMAN Business disconnect grid/load/battery

only leave PV connected and then restart till see work mode as "wait" on APP.

Q: On App, some columns show NA, like battery SOH, etc. why is that?

A: NA means App does not receive data from inverter or server, normally it is because communication problem, such as battery communication, and communication between inverter and the APP.

About meter and power limit function

Q: How to Act Output Power Limit function?

A: For Hybrid Inverter system, the function could be realized by:

1. Make sure Meter connection and communication well;

2. Turn on Export Power Limit function and Set the max output power to grid on APP.

NOTE: If Out-put Power Limit set as 0W, then there might still have deviation max 100W . exporting to grid.

Q: Why there is still power exporting to grid after I set power limit as OW?

A: Export limit could theoretically to minimum 0W, but there will have a deviation of around 50-100Wfor Hybrid Inverter system.

Q: Can I use other brand Meter to take over Meter in Hybrid inverter system or change some settings on Meter?

A: Cannot, because there the communication protocol is inset between inverter and Meter, other brand Meter cannot communicate. Also any manual setting change could cause Meter communication failure.



6.1 Disclaimer

The hybrid inverters are transported, used and operated under environmental and electrical conditions. We have the right not providing after-sales services or assistance under following conditions:

- Inverter is damaged during transferring.
- Inverter is out of warranty year and extended warranty is not bought.
- Inverter is installed, refitted or operated in improper ways without authority from us.
- Inverter is installed or used under improper environment or technical condition mentioned in this user manual, without authority from us.
- Installation or configuration of the inverter does not follow requirements mentioned in this user manual.
- The inverter is installed or operated against the requirements or warnings that are mentioned in this user manual.
- Inverter is broken or damaged by any force majeure like lightening, earthquake, fire hazard, storm and volcanic eruption etc.
- Inverter is disassembled, changed or updated on software or hardware without authority from us.
- Inverter is installed, used or operated against any related items in international or local policies or regulations.
- Any non-compatible batteries, solar panels, loads or other devices connected to Hybrid inverter system.



We will keep right to explain all the contents in this user manual.

Maintenance

The inverter requires periodically maintenance, details as below:

Heat sink: please use clean towel to clean up heat sink once a year.

Torque: please use torque wrench to tighten AC and battery wiring connection once a year.

DC switch: check DC switch regularly, active the DC switch 10 times in a row once a year. Operating DC switch will clean contacts and extend lifespan of DC switch.

contacts and extend mespan of De switch.

Make sure inverter is totally isolated from all DC and AC power for at least 5 mins before maintenance.

Appendix: Protection category definition

Overvoltage Category Definition

Category I	Applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level.
Category	Applies to equipment not permanently connected to the installation.Examples are applianc-
	es, portables tools and other plug-connected equipment.
Category	Applies to a fixed equipment downstream of and including the main distribution board.
III	Examples are switchgear and other equipment in an industrial installation.
Category VI	Applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board), Example are electricity meters, primary over-current protection equipment and other equipment connected directly to outdoor open lines.

Moisture Location Category Definition

Moisture Parameters		Level	
	3K3	4K2	4K4H
Temperature Range	0~+40 °C	-33~+40 °C	-20∼+55 ℃
Humidity Range	5%~85%	15%~100%	4%~100%

Environment Category Definition

Environment Condition	Ambient Temperature	Relative Humidity	Applied to
Outdoor	-20~+50 °C	4%~100%	PD3
Indoor Unconditioned	-20~+50°C	5%~95%	PD3
Indoor Conditioned	0~+40 °C	5%~85%	PD2

Pollution Degree Definition

Pollution Degree I	No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
Pollution Degree II	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conduc- tivity caused by condensation must be expected.
IPollution Degree III	Conductive pollution occurs, or dry, non-conductive pollution occurs, which becomes conductive due to condensation which is expected.
Pollution Degree IV	Persistent conductive pollution occurs, for example, the pollution caused by conductive dust, rain and snow.

6.2 Technical Parameters

Model

PSE-DUAL-8KW

PV Input		
Max. DC input power(W)	12000	
Max. DC input voltage(V)	500	
MPPT voltage range(V)	150-450	
Starting voltage(V)	125	
Max. input current(A)	30/18	
Max. short circuit current (A)	37.5/22.5	
Number of MPP trackers	2	
Strings per MPP tracker	1	
AC Output (Grid)		
Rated output power (W)	8000	
Max. output apparent power(VA)	8800	
Rated output voltage(V)	220/230	
Rated output frequency(Hz)	50/60(±0.2%)	
Max. output current(A)	40	
THDi	<3%	
Output power factor	~1 (-0.8 leading~+0.8 lagging)	
AC Output (Two Backup)		
Full Max. output power(W)	8000	
Max. output apparent power(VA,sec)	16000,15	
Rated output voltage(V)	220/230	
Rated output frequency(Hz)	50/60(±0.2%)	
Back up1 Max. output power(W)	8000	
Back up2 Max. output power((W)	8000	
Output Power Factor(off grid)	1~(0.8 leading to 0.8 lagging)	
Output Current Harmonic Distortion	THD<3%(Nonlinear load); THD<1.5%(Linear load)	
Max. output current(A)	40	

Battery Parameters		
Battery Type	Lithium or lead acid battery	
Rated battery voltage(V)	48	
Voltage range(V)	44-57	
Max. charge/discharge current(A)	190	
BMS communication	CAN/RS485	
Efficiency		
Max. efficiency(PV)	97.6%	
Max. efficiency(cell)	94.5%	
European efficiency	97%	
Protection		
PV input reverse polarity protection	Yes	
PV insulation resistance detection	Yes	
Residual current detection	Yes	
Output over current protection	Yes	
Output short circuit protection	Yes	
Output over voltage protection	Yes	
Others		
Operating temperature range(°C)	-25~60	
Storage temperature range(°C)	-30~65	
Humidity range	0~95%	
Operating altitude (m)	≤4000	
Communication	RS485/CAN/WiFi/Ethernet/4G	
Noise (db)	<25	
Size (W×H×D mm)	427*554*198	
Weight (kg)	19	
Standard		

EN 62109-1/2,IEC 62109-1/2,EMC 61000,EN50549,VDE 4105/0124,NRS 097-2-1,IEC61727/62116/61683

