All-In-One

Hybrid

Energy Storage System

PESS3W, PESS5W

User Manual

Table of Contents

1.Information

1.1 System Introduction

PESS3-5 can be used in DC coupled systems (mainly newly installed), Ac coupling system (mainly transformation) and off-grid system (mainly transformation, photovoltaic capacity increase), the scheme is as follows:

1.2 Application

PESS5W

Figure1 DC-coupled Storage System – Scheme

Solution	Configuration	
	Inverter	Battery
PESS3W	3 kW	2.56KWH
PESS5W	5 kW	5KWH

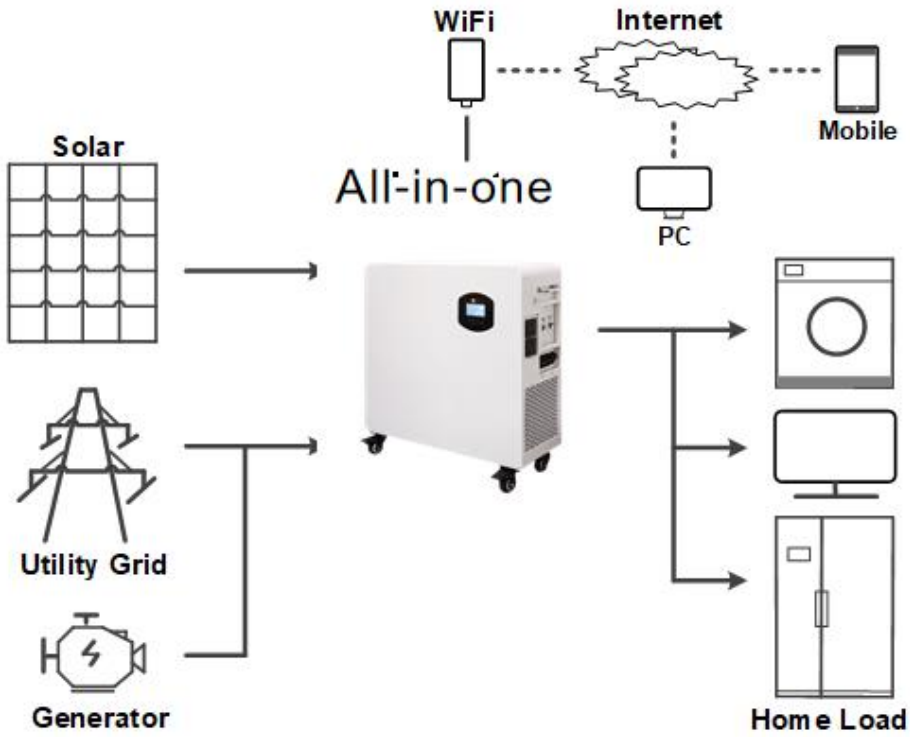


Figure2 PESSW Working Diagram

1.3 Safety Instructions

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

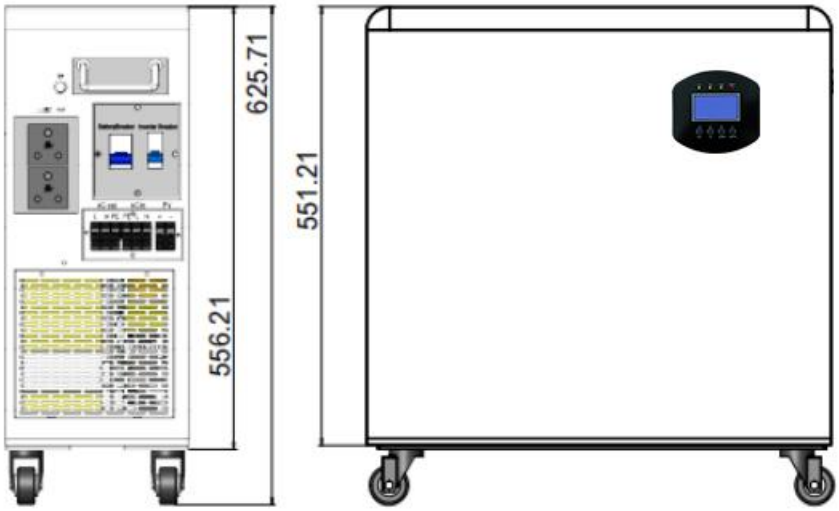
The PESS All-In-One must not be touched or put into service until 5 minutes after it has been switched off or disconnected to prevent an electric shock or injury.

This sign shows danger of hot surface.

CAUTION:

Risk of injury through lifting or dropping the system. The inverter and battery are heavy. There is risk of injury if the inverter or battery is lifted incorrectly or dropped during transport or when attaching to or removing from the wall.Lifting and transporting the inverter and battery must be carried out by more than 2 people.

1.4 Dimension

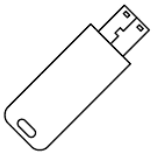


Warning: This chapter contains important safety and operating instructions.
Read and keep this manual for future reference. **NEVER** charge a frozen battery.

1. Please be clear which kind of battery system you want, lithium battery system or lead-acid battery system, if you choose the wrong system, energy storage system can't work normally.
2. Before using the unit, read all instructions and cautionary marking on the unit, the batteries and all appropriate sections of this manual. The company has the right not to quality assurance, if not according to the instructions of this manual for installation and cause equipment damage.
3. All the operation and connection please professional electrical or mechanical engineer.
4. All the electrical installation must comply with the local electrical safety standards.
5. When install PV modules in the daytime, installer should cover the PV modules by opaque materials, otherwise it will be dangerous as high terminal voltage of modules in the sunshine.
6. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
7. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
8. For optimum operation of this inverter, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter.
9. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
10. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
11. GROUNDING INSTRUCTIONS -This inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
12. **NEVER** cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
13. Make sure the inverter is completely assembled, before the operation

1.5 Components

After unpacking the package, please inspect the components based on the below table.

No.	Picture	Description	Quantity
1		PESS-All-In-One OFF-GRID Energy Storage System	1 pcs
2		WIFI module/USB	1 pcs
3		User manual	1 pcs
4		APP Operation Guide	1 pcs

2.Installation

2.1 Product Overview

No	Name	Silk-Screen	REMARK
1	Handle	Handle	/
2	WiFi Connector	WiFi Connector	
3	USB	USB	
4	Dry contact	Dry contact	
5	BMS	BMS	
6	FAN	FAN	
7	Battery Breaker	Battery Breaker	
8	Inverter Breaker	Inverter Breaker	
9	AC Input	AC Input	
10	AC Output	AC Output	
11	PV	PV	
12	Switch	Switch	
13	AC OUT	AC OUT	Load must be not more than 1.5KW
14	Wheels	Wheels	

2.2 System Operation

Switch On

When turning on the system, it is very important to follow the steps below to prevent damage to the system.

WARNING: Please check the installation again before turning on the system.

Step 1:

Turn on the external PV switch.

Step 2:

Turn on the external grid switch.

Step 3:

If backup load is applied, turn on the external Backup switch

NOTE:

the Backup switch is only used when a backup load is applied.

Step 4:

Open the outer shell of the cable box. Open the battery switch cover and turn on the battery switch on the cable box

Step 5:

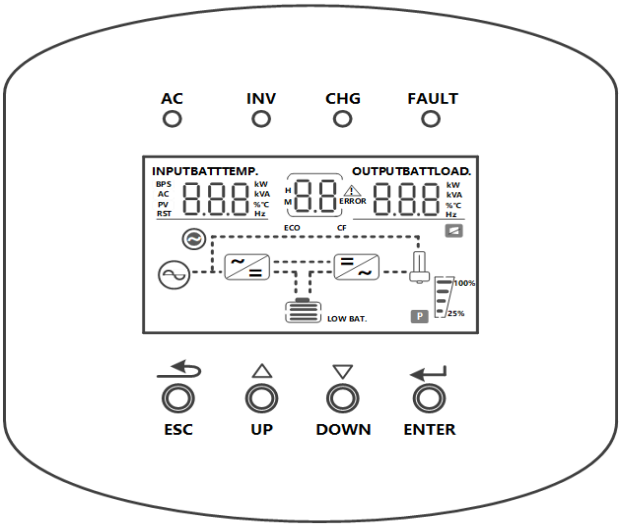
Press power button on all the batteries until the indicator lights turn on.

Step 6:

Close the battery switch cover and the outer shell of the cable box.

3.Operation

3.1 LCD Operation



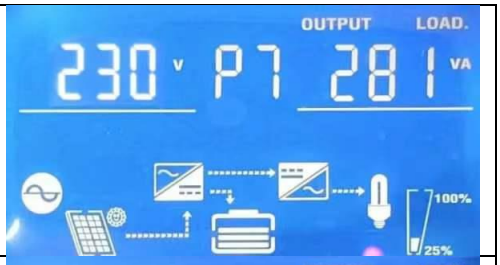
LED indicator			Messages
AC	Green	Solid on	Output is powered by utility in Linde mode
		Flashing	Output is powered by battery or PV in battery mode
INV	Yellow	Solid on	Inverter work in battery mode
		Flashing	Inverter work in the other mode
CHG	Yellow	Solid on	Battery is fully charged
		Flashing	Battery is charging
FAULT	Red	Solid on	Fault occurs in the inverter
		Flashing	Warning condition occurs in the inverter

Function Buttons

Button	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

In normal display mode, if there are 10 pages of information displayed, you can use the UP or DOWN button to flip through the pages by pressing and holding for around 0.2-1 second. The corresponding query contents for each page are shown below:			
Index	Function Code	Functionality	Function Display

1	P1	Inverter Input/Output Voltage	
2	P2	Inverter Input/Output Frequency	
3	P3	Battery Voltage and Charging Current	
4	P4	PV Voltage and PV Charging Current	
5	P5	PV Voltage and PV Power	
6	P6	AC Output Voltage and Active Power	

7	P7	AC output voltage and complex power.	
8	P8	AC output voltage and load power percentage.	
9	P9	Software version.	
10	10	PV generation.	
11	11	"SIG" displayed on the right indicates that the inverter is not parallel-connected. "PAR" displayed on the right indicates that multiple inverters are parallel-connected.	
12	12	"SIG" displayed on the right indicates that the lithium battery is running in a single group. "PAR" displayed on the right indicates that multiple lithium battery groups are parallel-connected.	
13	13	The voltage and current of a lithium-ion battery depend on its usage status and the type of connection.	

14	14	The temperature and State of Charge (SOC) of a lithium-ion battery have important effects on its performance and lifespan.	
15	15	The left side represents the rated capacity, while the right side displays the current remaining capacity of the lithium-ion battery.	
16	16	Constant voltage charging voltage of lithium battery	

Note: Any questions about communicating with BMS, please consult with WFSEnergy.

⚠	**WARNING:** Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

1. Then, insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor ⏚ first.
   ⏚ → Ground (yellow-green)
   L → LINE (brown or black)
   N → Neutral (Blue)

2. Make sure the wires are securely connected.

   CAUTION: Important
   Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

CAUTION: Appliances such as air conditioner are required at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check with manufacturer of air conditioner that if it's equipped with time-delay function before installation. Otherwise, this off grid solar inverter will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

3.2 LCD Display Icons

AC Input Information	
	AC input icon
	Indicate AC input power, AC input voltage, AC input frequency, AC input current
AC BYPASS	Indicate AC power loads in bypass
PV Input Information	
	PV input icon
	Indicate PV power, PV voltage, PV current, etc
Output Information	
	Inverter icon
	Indicate output voltage, output current, output frequency, inverter temperature
Load Information	
	Load icon
	Indicate power of load, power percentage of load
Battery Information	
	Indicate battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.
	Indicate battery voltage, battery percentage, battery current
SLA Li	Indication SLA battery and Lithium battery
CHARGING SOL UTI SOL+UTI Only SOL	Indicate charging source priority: solar first, Utility first, solar and utility, or only solar
Other Information	
SOL.FIRST BAT.FIRST UTI.FIRST	Indicate output source priority: solar first, utility first, SBU mode or SUB mode
	Indicate warning code or fault code
	Indicate a warning or a fault is happening
	Indicate it’s during setting values
	Indicate the alarm is disabled

3.3 Other feature descriptions.

Press ENTER for more than 2 seconds to enter the setting screen. Select a setting item through UP or DOWN. After selecting a setting item, press 0.1 to 2S to enter the setting state of the corresponding item			
1	01	"Output voltage (OPU) The default value for the output voltage is 230V, 208V, and 220V. It can be set to 230V and 240V, and can be set for all conditions, taking effect immediately. When the output voltage is 208V, the output power is reduced by about 90%."	
2	02	2 "Output frequency (OPF) The default is 50Hz, and 50Hz and 60Hz can be set. It can be set for all states, and the setting will take effect the next time the machine is restarted in battery mode, or immediately in mains mode. After the setting is completed, when the machine switches back to battery mode, the frequency will change slowly."	
3	03	"Output priority (OPP) Inverter output priority status setting. There are three priority options, with GRD being the default: GRD, priority for mains output. PU, priority for PV solar output. PBG, priority for PV solar, battery, and mains output at the same time. It can be set for all states, and the setting takes effect immediately."	
4	04	"Output mode (MOD) Inverter AC output mode selection. APP is the default mode: Mode 1 APP: Appliance mode for home appliances, with a typical switching time of 20ms. Mode 2 UPS: UPS mode for computers and other devices, with a typical switching time of 10ms. It can be set for all states, and the setting takes effect immediately."	
5	05	"Charging priority (CHP) Battery charging priority setting. There is one charging priority option, PNG being the default: PNG(PV and Grid): PV and Grid charging at the same time. OPV(Only PV): Only PV solar charging. GRD(Grid): Mains charging priority charging. PV: PV solar priority charging. It can be set for all states, and the setting takes effect immediately."	

6	06	"Mains charging current (RCC) Setting the maximum mains chargeable current for the inverter. RCC: Grid Charge Current, with the default maximum mains charging current being 40A. The setting range for 3KW is 2A-60A. The setting range for 5KW is 2A-80A. It can be set for all states, and the setting takes effect immediately."	
7	07	"Maximum charging current (MCC) Setting the maximum charge current for the inverter. MCC: Maximum Charge Current refers to the maximum value of PV and mains charging together. The setting range for 3KW is as follows: 2/10/20/30/40/50/60/70/80A/90/100/110/120A. The setting range for 5KW is as follows: 2/10/20/30/40/50/60/70/80A. It can be set for all states, and the setting takes effect immediately."	
8	08	"Menu default (MDF) Return to the main menu setting. The default setting is ON. During the function setting operation, if it is set to ON and the page is not on the main menu (P1), it will return to the main menu after 1 minute. If it is set to OFF, the LCD will stay on this screen if the page is not on the main menu (P1). It can be set for all states, and the setting takes effect immediately."	
9	09	"Overload restart (LrS) Setting for whether to restart after overload protection. The default setting for overload restart is ON. It can be set for all states, and the setting takes effect immediately."	
10	10	"Over-temperature restart (TrS) Setting for whether to restart after over-temperature protection. The default setting for over-temperature restart is ON. It can be set for all states, and the setting takes effect immediately."	

11	11	Main Input Power (MIP) Failure Alarm Setting for long alarm of power loss detection on mains or PV. MIP: Main Input Power Failure Alarm. Default setting is ON. When setting is ON, the buzzer will beep continuously for 3s after detecting power loss on the main input. When the setting is OFF, the buzzer will not beep after detecting main input power loss. All states can be set, and changes take effect immediately.	
12	12	Power Saving Mode (PWS) Setting for enabling low power mode in the inverter. PWS: Power Saving Mode. Default setting is OFF. When setting is ON, in battery mode, when the load is less than 25W, the system will briefly stop the output before continuing output. If the load exceeds 35W, the system will resume normal output. When the setting is OFF, this feature is not available. All states can be set, and changes take effect immediately.	
13	13	Overload to Bypass (OLG) Setting for automatically switching to mains mode when in battery mode and an overload is detected. OLG: Overload to Bypass. Default setting is OFF, and this feature is not available. When setting is ON, in a PV priority load situation, when an overload is detected, the system will immediately switch to bypass mode (i.e. mains output). All states can be set, and changes take effect immediately.	
14	14	Mute (MUE) Setting for disabling the buzzer. MUE: Mute. Default setting is OFF, and this feature is not available. When setting is ON, in any state such as alarm or fault, the buzzer will not sound. All states can be set, and changes take effect immediately.	
15	15	Back to Grid (BTG) Setting for switching to mains power when battery and mains are available, to prevent the battery from being discharged. BTG: Back to Grid. The initial default for 3KW is 23V, and for 5KW, it is 46V. For CUS mode batteries: 3KW can be set between [22,26].	

		5KW can be set between [44,52]. For AGM or FLD batteries: 3KW defaults to 23V, and can be set between [22,26]. 5KW defaults to 46V, and can be set between [44,52]. For LIB batteries: 3KW defaults to 23.8V, and can be set between [20,25]. 5KW defaults to 47.6V, and can be set between [40,50]. All states can be set, and changes take effect immediately.	
16	16	Back to Battery (BTB) Setting for the minimum battery voltage required to reactivate the battery mode after a low power shutdown. BTB: Back to Battery. The initial default for 3KW is 26V, and for 5KW, it is 52V. When set to FUL, the battery will be charged to full before reactivating the battery mode. For CUS mode batteries: 3KW range is [24,29]. When the setting value Vbtb>TCFV-1V, the voltage point for back to battery mode is kept at TCFV-1V. If the battery voltage is higher than TCFV-1V and it is not in battery mode when the PV priority output or PV and battery to grid (PBG) output, the system will switch back to battery mode. 5KW range is [48,58]. The logic is the same as for 3KW. For AGM or FLD batteries: Default setting for 3KW is 26V. Range is [24,29]. Same logic as CUS mode batteries. Default setting for 5KW is 52V. Range is [48,58]. Same logic as CUS mode batteries. For LIB batteries: Default setting for 3KW is 27.2V. Range is [23,29]. Same logic as CUS mode batteries. Default setting for 5KW is 54.4V. Range is [46,58]. Same logic as CUS mode batteries. All states can be set, and changes take effect immediately.	
17	17	Battery Type (BAT) Setting for the battery type. BAT: Battery Type. There are four battery types available: AGM, FLD, LIB, and CUS (custom set type). The default setting is AGM. When setting is LIB, the inverter will not turn off the screen while in standby mode after activation. All states can be set, and changes take effect immediately.	

18	18	Battery Low Point (BAL) Setting for the battery low point warning. BAL: Battery Low. This setting cannot be modified in AGM (lead-acid battery) and FLD (maintenance-free battery) modes. The initial default for 3KW is 21.6V, and for 5KW, it is 44V. When the battery type is set to CUS (custom set type), the battery low point can be modified. The range for 3KW can be set from [21,27]. The range for 5KW can be set from [42,54]. When the battery type is set to LIB (lithium battery type), the battery low point can be modified. The default setting for 3KW is 23.8V, and the range can be set from [20.6,25.0]. The default setting for 5KW is 47.6V, and the range can be set from [41.2,50.0]. 3. All states can be set, and changes take effect immediately.	
19	19	Battery Under Shut Off (BAU) Setting for the battery under shut off point. BAU: Battery Under. This setting cannot be modified in AGM (lead-acid battery) and FLD (maintenance-free battery) modes. The initial default for 3KW is 21V, and for 5KW, it is 42V. When the battery type is set to CUS (custom set type), the shut off point can be modified. The range of 3KW can be set from [20,24]. The range of 5KW can be set from [40,48]. When the battery type is set to LIB (lithium battery type), the shut off point can be modified. The default setting for 3KW is 23V, and the range can be set from [20,24]. The default setting for 5KW is 46V, and the range can be set from [40,48]. All states can be set, and changes take effect immediately.	

20	20	Battery Constant Voltage (BCV) Setting for the battery constant voltage for charging. BCV: Battery Constant Voltage. This setting cannot be modified in AGM (lead-acid battery) and FLD (maintenance-free battery) modes. The initial default for 3KW is 28.2V (AGM) and 29V (FLD). The initial default for 5KW is 56.4V (AGM) and 58V (FLD). When the battery type is set to CUS (custom set type), the constant voltage for charging can be modified. The range for 3KW can be set from [24,29]. The constant voltage should be greater than the floating voltage point. The range for 5KW can be set from [48,60]. The constant voltage should be greater than the floating voltage point. When the battery type is set to LIB (lithium battery type), the constant voltage for charging can be modified. The default setting for 3KW is 28.2, and the range can be set from [25,29]. The constant voltage should be greater than the floating voltage point. The default setting for 5KW is 56.4, and the range can be set from [48,60]. The constant voltage should be greater than the floating voltage point. 3. All states can be set, and changes take effect immediately.	
21	21	Battery Float Point (BFL) Setting for the battery float point. BFL: Battery Float. This setting cannot be modified in AGM (lead-acid battery) and FLD (maintenance-free battery) modes. The initial default for 3KW is 27V, and for 5KW, it is 54V. When the battery type is set to CUS (custom set type), the battery float point can be modified. The range for 3KW-24V can be set from [26.6,27.8]. The constant voltage should be greater than the float voltage point. The range for 5KW-48V can be set from [48,60]. The constant voltage should be greater than the float voltage point. When the battery type is set to LIB (lithium battery type), the battery float point can be modified. The default setting for 3KW-24V is 27.6V, and the range can be set from [24,28]. The constant voltage should be greater than the float voltage point. The default setting for 5KW-48V is 55.2V, and the range can be set from [50,58]. The constant voltage should be greater than the float voltage point. 3. All states can be set, and changes take effect immediately.	

22	22	"Fault information exists on the battery BMS Disable the BMS communication function or recover after the BMS fault is rectified Applicable model: 3KW/5KW"" mains low voltagepoint (LLV) 1. Set the mains low voltage protection point 2. Setting conditions: The inverter is in APP and UPS mode and can be set in any state. 3. LLV: Line Low Voltage In inverter mode Output mode: MOD needs to be set to APP, mains low voltage point setting, default setting is 154V, configurable range is [90,154]. Output mode: MOD needs to be set to UPS, and the mains low point is set. The default value is 185V. The value range is 170,200. 4. All states can be set and take effectimmediately after setting."	
23	23	Line High Voltage (LHV) Setting for the line high voltage protection point. LHV: Line High Voltage. In inverter mode (output mode: MOD needs to be set to APP), the line high voltage protection point can be set. The default setting is 264V, and the range can be set from [264,280]. Setting conditions: The inverter is in APP mode. All states can be set.	
24	24	Low Watt Discharge (LWD) The low watt discharge protection function is used so that when the battery is in a low load state, unlimited discharge time may cause the battery to discharge to a very low level, affecting the battery life. When the inverter is set to a low watt discharge time, the low voltage shutdown point for 3KW batteries is increased to 22V, and for 5KW batteries, it is increased to 44V. LWD: Low Watt Discharge. In inverter mode, the low watt discharge time can be set. The default is 8 (8 hours), and the range can be set from [1, 8]. In battery mode, if the discharge time exceeds 8 hours and has not reached the battery shutdown point, the battery voltage shutdown point will be changed to 11Vnumber of battery cells. When the battery continues to discharge to a voltage of 11Vnumber of battery cells, the system will sound an alarm for 1 minute and then shut down. When the battery voltage exceeds 13.2V*number of battery cells for more than 30 seconds, the battery discharge time will be reset. Setting conditions: The inverter is in APP mode. All states can be set.	

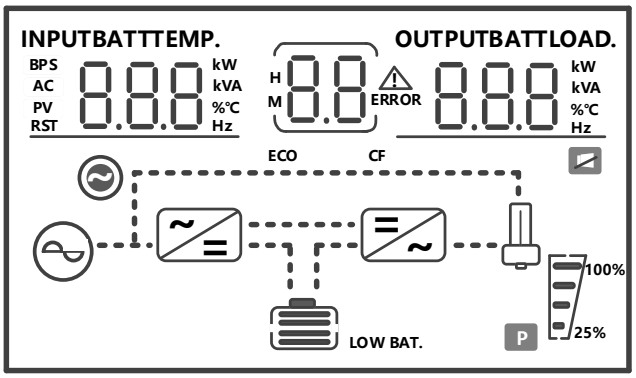
25	25	Soft Relay Enable (SRE) When this interface is turned ON, the inverter output gradually increases from 0 to the target voltage value. When this interface is turned OFF, the inverter output increases directly from 0 to the target voltage value. SRE: Soft Relay Enable. The default setting is OFF, and the inverter voltage only closes the output switch after rising to the rated output. If set to ON, the output switch will be closed before the inverter starts to voltage boost. Setting conditions: Can be set in standalone mode.	
26	26	Set Default (STD) Resets all settings to the default values. STD: Set Default. Before setting, this interface displays OFF. When set to ON, the system will restore default settings. After the setting is completed, this interface will show OFF again. Setting conditions: Available for setting in mains mode and standby (StandBy: no output but screen on) modes. Cannot be set in battery mode.	
27	27	Parallel Operation Mode (PAM) Set the parallel operation mode. PAM: Parallel operation mode. The default setting is SIG (single mode), which can be set to PAR (single-phase paralleling mode), 3P1 (R phase mode), 3P2 (S phase mode), or 3P3 (T phase mode). When using the parallel operation function, connect the parallel system in the correct way and set the parallel operation mode for each machine correctly. If there is a machine in the parallel system that is set to SIG, the machine will report a fault code 24. If there are machines set to 3P1, 3P2, or 3P3 in the parallel system, all machines must be set to at least one of these three modes, and there must be at least one machine for each mode, otherwise, all machines set to these three modes will report a fault code 24. Setting conditions: Can be set in mains mode and standby (StandBy: no output but screen on) modes for 5KW models. Cannot be set in battery mode or for other models.	

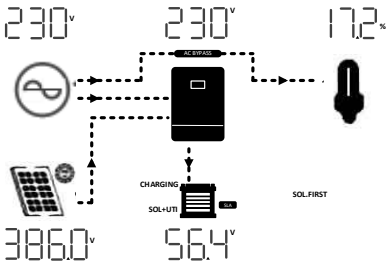
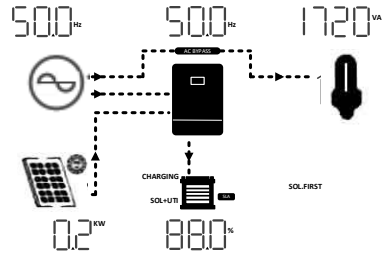
28	28	Set Battery Alarm (SBA) Set to enable the battery alarm for unconnected battery. SBA: Set battery alarm. The default setting is OFF. If set to OFF, there will be no battery alarm for unconnected battery, low voltage, or under-voltage. This can be set in standalone mode for 5KW models, but cannot be set for other models. Setting conditions: Can be set in all modes.	
35	35	Grid Tie Inverter (GTI) Set whether the inverter feeds power into the grid in PV priority mains mode or PBG mains mode. GTI: Grid Tie Inverter. The default setting is OFF, and the function is not enabled. When set to ON, the inverter performs maximum power point tracking and feeds excess energy into the grid. After the function is enabled, if a communication abnormality occurs, alarm code 56 will be generated, and the inverter will no longer operate according to BMS information. Setting conditions: Can be set in all modes.	
38	38	BMS Communication (BMS) Set whether the inverter communicates with the lithium battery BMS. BMS: Battery Management System. The default setting is OFF, and the function is not enabled. When set to ON, the inverter communicates with the lithium battery BMS through the central control panel and obtains battery information. After the function is enabled, if a communication abnormality occurs, alarm code 56 will be generated, and the inverter will no longer operate according to the BMS information. Setting conditions: Can be set in all modes.	
39	39	Low SOC Shutdown (SBU) Set whether the inverter shuts down when the battery SOC is low. SBU: Battery SOC under lock. The default setting is 20, and the adjustable range is [5,50]. When the lithium battery SOC reaches the set value in battery mode, the inverter will shut down and alarm code 68 will be generated. The alarm code will be cleared when the SOC reaches the set value + 5%. When in standby mode, the inverter can switch to battery mode only when the SOC is at the set value + 10%. Alarm code 69 will be generated when the SOC is not reached. After the function is enabled, alarm code 69 will be generated when the lithium battery SOC reaches the set value + 5%, and the alarm code will be cleared when the SOC reaches the set value + 10%.	

		The function can be set to OFF, in which case the inverter will not shut down, start up or generate alarms based on SOC conditions. After the function is enabled, if a communication abnormality occurs, the inverter will no longer operate according to SOC information, and the relevant alarms will be cleared. Setting conditions: Can be set in all modes.	
40	40	High SOC Turn to Battery Function (STB) Set the SOC value for the inverter to switch to battery mode. STB: Battery SOC turn to battery mode. The default setting is 90, and the adjustable range is [10,100]. When the lithium battery SOC reaches the set value in PBG priority mains normal mains mode, the inverter switches to battery mode. After the function is enabled, the inverter will only switch to battery mode when the SOC is higher than the set point and the battery voltage is higher than the voltage point for switching back to battery mode. The function can be set to OFF, in which case the inverter will no longer switch from mains mode to battery mode based on SOC conditions. After the function is enabled, if a communication abnormality occurs, the inverter will no longer operate according to SOC information and the relevant alarms will be cleared. Setting conditions: Can be set in all modes.	
41	41	Low SOC Turn to Grid Function (STG) Set the SOC value for the inverter to switch to mains mode. STG: Battery SOC turn to grid mode. The default setting is 50, and the adjustable range is [10,90]. When the lithium battery SOC reaches the set value in PBG priority mains normal battery mode, the inverter switches to mains mode. After the function is enabled, the inverter will switch to mains mode when the SOC is lower than the set point or the battery voltage is lower than the voltage point for switching back to mains mode. The function can be set to OFF, in which case the inverter will no longer switch from battery mode to mains mode based on SOC conditions. After the function is enabled, if a communication abnormality occurs, the inverter will no longer operate according to SOC information and the relevant alarms will be cleared. When the setting is higher than the STB point, STB and STG will no longer take effect after the next activation. Setting conditions: Can be set in all modes.	

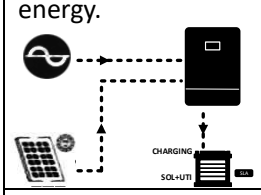
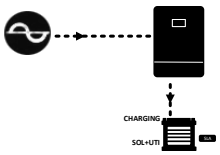
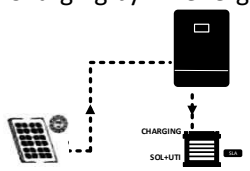
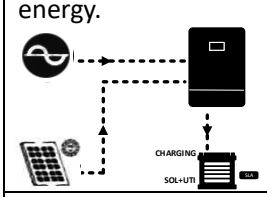
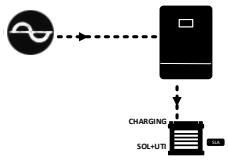
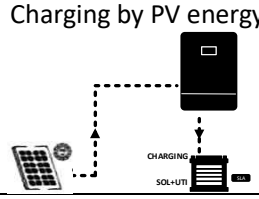
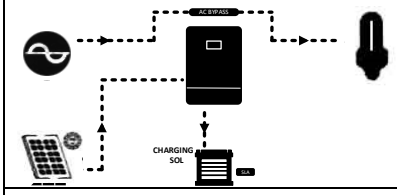
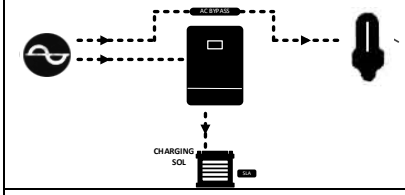
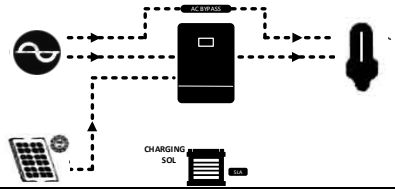
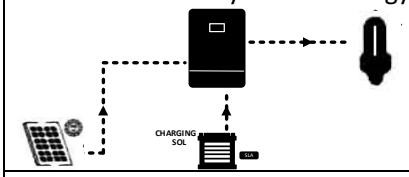
3.4 Display Information

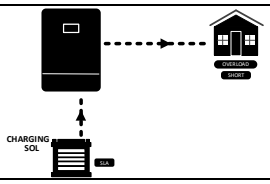
The LCD display information will be switched in turns by pressing “UP” or “DOWN” key. The selectable information is switched as below order: voltage, frequency, current, power, firmware version.



Setting Information	LCD display
① AC Input voltage ② Output voltage ③ Load percentage ④ PV input voltage ⑤ Battery voltage ⑥ Warning or Fault code (Default Display Screen)	
① AC Input frequency ② Output frequency ③ Load power in VA ④ PV energy sum in KWh ⑤ Battery percentage ⑥ Warning or Fault code	
① AC Input current ② Output current ③ Load percentage ④ PV input current ⑤ Battery charging current ⑥ Warning or Fault code	
① AC input power in Watts ② Inverter temperature ③ Load power in Watts ④ PV energy sum in KWh ⑤ Battery percentage ⑥ Warning or Fault code	
Firmware version (CPU1: 040-00-b21; CPU2:041-00-b21)	
Time (15:20:10, December 15, 2018)	

Operating Mode Description

<table>
<tr><th>Operation mode</th><th>Description</th><th colspan="2">LCD display</th></tr>
<tr><td rowspan="2">Standby mode / Power saving mode
Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output.
*Power saving mode: If enabled, the output of inverter will be off when connected load is pretty low or not detected.</td><td rowspan="2">No output is supplied by the unit but it still can charge batteries.</td><td>Charging by utility and PV energy.
  </td><td>Charging by utility
  </td></tr>
<tr><td>Charging by PV energy
  </td><td>No charging</td></tr>
<tr><td rowspan="2">Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.</td><td rowspan="2">PV energy and utility can charge batteries.</td><td>Charging by utility and PV energy.
  </td><td>Charging by utility
  </td></tr>
<tr><td>Charging by PV energy
  </td><td>No charging</td></tr>
<tr><td rowspan="3">Line Mode</td><td rowspan="3">The unit will provide output power from the mains. It can also charge the battery at line mode.</td><td colspan="2">Charging by PV energy
  </td></tr>
<tr><td colspan="2">Charging by Utility
  </td></tr>
<tr><td colspan="2">No battery connected
  </td></tr>
<tr><td rowspan="2">Battery Mode</td><td rowspan="2">The unit will provide output power from battery and PV power.</td><td colspan="2">Power from battery and PV energy
  </td></tr>
<tr><td colspan="2">Power from battery only
  </td></tr>
</table>

3.5 Fault Reference Code

Alarm code	Alarm name	Alarm description
50	Battery Open	"The battery voltage is below 8V/ knot The battery voltage can be recovered up to 10V/ knot Applicable model: 3KW/5KW"
51	Battery Under Voltage	"Battery voltage less than 10.5V/ knot (default) Battery voltage 10V/ knot +0.2*N recoverable Applicable model: 3KW/5KW"
52	Battery voltage low	"Based on the bAL set point unrecoverable Applicable model: 3KW/5KW"
53	Battery Charge Short	"The battery voltage is less than 5V and the charging current is greater than 4A unrecoverable Applicable model: 3KW/5KW"
54	Low Watt Discharge	"The battery discharge exceeds the set low-power discharge time The battery voltage higher than 13.2V/ node can be recovered Applicable model: 3KW/5KW"
55	Battery Over Charge	"The battery voltage is above the set value recoverable Applicable model: 3KW/5KW"
56	BMS Loss	"Communication failed after BMS communication was enabled recoverable Applicable model: 3KW/5KW"
57	Over Temperature	"The PFC or INV temperature sensor is higher than the set value The value below the set value can be restored Applicable model: 3KW/5KW"
58	Fan Lock	"No fan speed signal detected recoverable

		Applicable model: 3KW/5KW"
59	EEPROM Fail	"EEPROM read and write failed unrecoverable Applicable model: 3KW/5KW"
60	Over Load Warning	"The load is greater than 102% Recoverable (load less than 97%) Applicable model: 3KW/5KW"
61	Generator Waveform Abnormal	"Abnormal generator waveform detection recoverable Applicable model: 3KW/5KW"
62	PV Energy Weak	When the battery is not connected, the bus voltage is below the set value 10mins Recoverable Applicable model: 3KW/5KW"
63	Synchronization Signal Fail	"Parallel plate disconnected fault Switching to single machine mode can be recovered or line disconnection troubleshooting can be recovered Applicable model: 3KW/5KW"
64	Parallel configuration incompatible	"There is a lack of phase setting when the three phase is combined Restore when the three-phase Settings are correct Applicable model: 3KW/5KW"
65	Parallel version incompatible	"The parallel system has incompatible version numbers Restore when all machine versions in parallel system are compatible with each other Applicable model: 3KW/5KW"
66	Parallel Communication Fault	"Slave cannot be detected in parallel system In the parallel system, the recovery is detected after the slave is connected, and the recovery is set to the single machine mode Applicable model: 3KW/5KW"
67	Parallel Line Differ	"Parallel machine each machine mains voltage or frequency error is too large When the mains voltage and frequency error of each

		machine is detected, it will be restored Applicable model: 3KW/5KW"
68	Low SOC off	The lithium battery SOC is below the set value Disable low SOC shutdown function, disable BMS communication function, or restore when SOC returns to + 5% of set value Applicable model: 3KW/5KW"
69	Low SOC	When the lithium battery SOC is lower than the set value + 5% (in utility mode or battery mode) or lower than the set value + 10% (in standby mode), the Low SOC shutdown function will be activated. To resolve this, the Low SOC shutdown function can be disabled, or the BMS communication function can be disabled, or the SOC can be restored to the set value + 10%. This issue applies to the 3KW/5KW model.

4.Warning Indicator

Fault Code	Fault Event	Fault description
01	Bus soft start fail	During soft start of the bus, the set voltage cannot be reached and cannot be recovered. This issue applies to the 3KW/5KW model.
02	Bus voltage high	The bus voltage is higher than the set value and cannot be recovered. This issue applies to the 3KW/5KW model.
03	Bus voltage low	"The bus voltage is below the set value unrecoverable Applicable model: 3KW/5KW"
04	Battery Over Current	"Battery current transient value exceeds 580A, immediately protect unrecoverable Applicable model: 3KW/5KW" "The PFC or INV temperature sensor exceeds the temperature set value After the restart function is enabled, the fault cannot be recovered after six failed restarts Applicable model: 3KW/5KW"
05	Over Temperature	The PFC or INV temperature sensor is higher than the temperature set value After the restart function is enabled, the fault cannot be recovered after six failed restarts Applicable model: 3KW/5KW
06	Battery voltage high	The battery voltage is above the set value recoverable Applicable model: 3KW/5KW"
07	Bus softstart Fault	"The bus DC soft starting voltage does not reach the set value unrecoverable

		Applicable model: 3KW/5KW"
08	Bus Short Fault	When working normally, the bus bar is below the set value instantly unrecoverable Applicable model: 3KW/5KW
09	INV Soft Fault	"After a period of soft startup of the inverter, either cannot reach the rated output voltage unrecoverable Applicable model: 3KW/5KW"
10	INV Over Voltage	"In battery mode, the inverter voltage is above the set value unrecoverable Applicable model: 3KW/5KW"
11	INV Under Voltage	"In battery mode, the inverter voltage is below the set value unrecoverable Applicable model: 3KW/5KW"
12	INV Short	The inverter voltage is momentarily less than the set value, and the current is momentarily greater than the set value The fault cannot be recovered after six failed restarts Applicable model: 3KW/5KW"
13	Negative Power	"The inverter power is below the set value for a period of time unrecoverable Applicable model: 3KW/5KW"
14	Overload Fault	"Load is out of specification The fault cannot be recovered after six failed restarts Applicable model: 3KW/5KW"
15	Model Fault	Software identification machine type does not match hardware detection unrecoverable

		Applicable model: 3KW/5KW"
16	No Bootloader	No bootstrap unrecoverable Applicable model: 3KW/5KW
17	MPPT Programmer Burning	The machine is burning the PV control program Resume after burning Applicable model: 3KW/5KW
19	Same Serial	In parallel mode, multiple machines with the same serial number are detected unrecoverable Applicable model: 3KW/5KW
20	CAN Fault	"In parallel mode, CAN bus communication is abnormal unrecoverable Applicable model: 3KW/5KW"

5.Specifications

All-In-One PESS5

Item	Model	5KWh+5KW
Battery Module	Voltage	51.2V
	Battery capacity	100Ah
	Charge voltage	58V
	Discharge cut-off voltage	42V
	Charge current	50A
	Max charge current	100A
	Discharge current	100A
	Max discharge current	100A
	Max peak current	200A
	Communication method	RS485/CAN/WIFI
Hybrid Inverter	Power	5500W
	Output Voltage	230VAC
	Frequency	50Hz/60Hz
	Input power (PV)	5KW
	Input voltage range (PV)	120~430VDC
	Communication connect port	WiFi
Parameter	Protection Degree	IP21
	Material/Colour	Metal/White
	Size	585*230*630mm
	Weight	57Kg
	Temperature	Charge:0℃-50℃ Discharge:-15℃-60℃

Warranty Card

User Information

Company/User Name:

Address:

Telephone:

Email:

Project installation location:

Product Information

Battery Model:

Serial No:

Invoice Number:

Purchase Date:

Dealer:

Commission date:

Fault/Error Description: