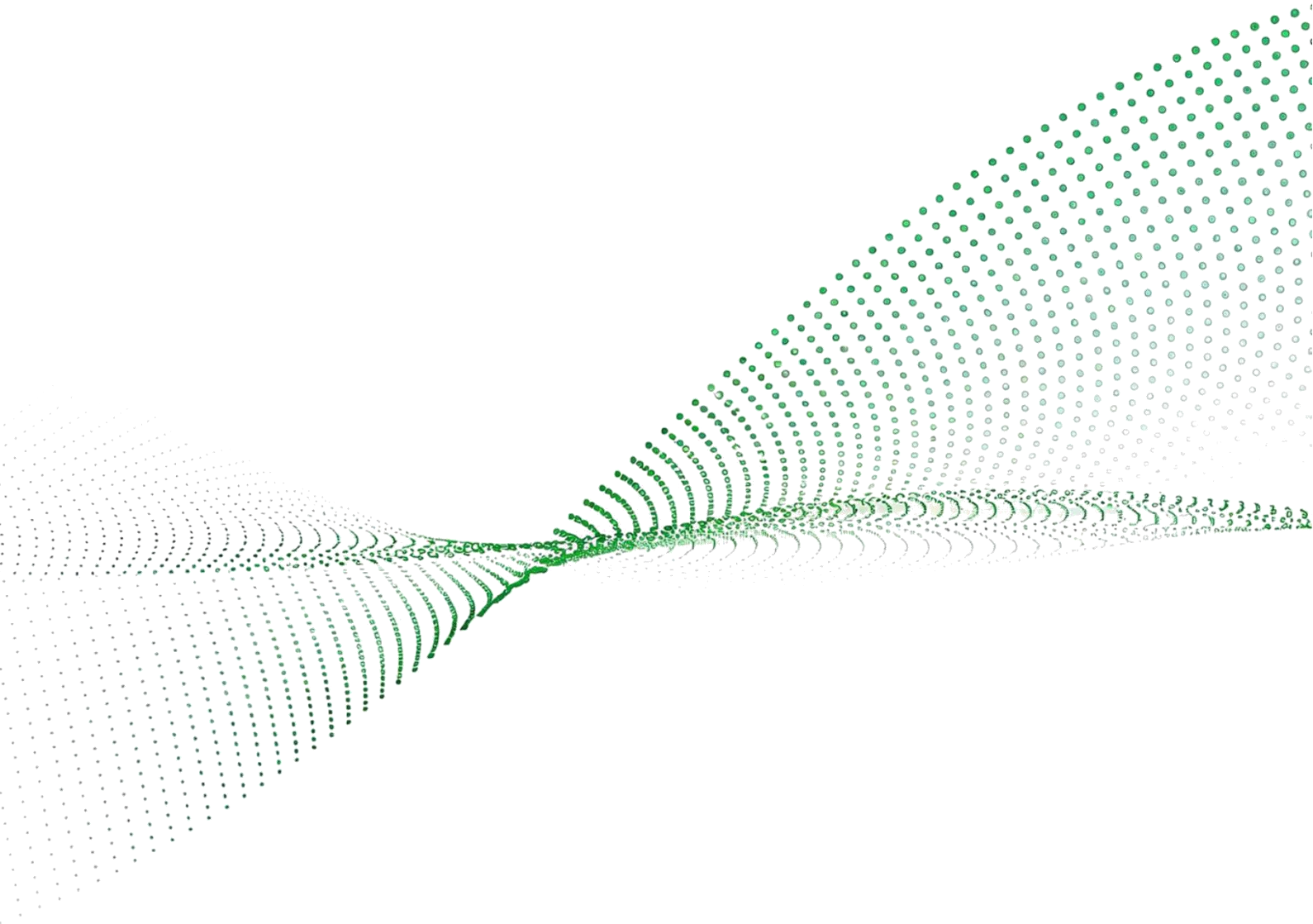


5kW All in one Energy Storage



This manual introduces 5kW All in one Energy Storage . Please read this manual before you install the battery and follow the instruction carefully during installation process. Please contact immediately for advice and clarification if you have any question.

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(Revision History)

[illegible]

1. Symbol Description

	Do not place near open fire or flammable materials.
	A potential hazard exists when the equipment is working. Wear personal protective equipment during operation.
	Warning electric shock. Power off the equipment before any operation.
	Grounding: indicate PE cable connection position.
	Do not place in areas accessible to children.
	Keep the battery away from open fire or ignition sources.
	Read the product and operation manual before operating the battery system.
	Label for Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU).
	The certificate label for CE.
	Recycle label.

2. Safety Precautions



Alert

- 1) It is important and necessary to read the user manual carefully (and attachment) before installing or using battery. Failure to do so or to follow any instruction or warning in this document can result in electrical shock, serious injury, and death, or damage battery, potentially rendering it unusable.
- 2) When battery is stored for a long time, it is required to charge once every 6 months, and the SOC should be no less than 50%.
- 3) After battery module cannot be discharged, it needs to be recharged within 12h.
- 4) Do not connect power terminal reversely.
- 5) All power supplies must be disconnected during maintenance.
- 6) Please contact the supplier within 24 hours if there is something abnormal.
- 7) Do not use any liquid to clean the battery.
- 8) Do not expose battery to flammable or irritating chemicals or vapor.
- 9) Do not paint any part of battery, including any internal or external components.
- 10) Do not connect battery with PV solar wiring directly.
- 11) Do not install or use this product beyond provisions of the manual.
- 12) Direct or indirect damages caused by the above reasons are not covered by warranty claim.



Warning

2.1 Before Connecting

- 1) Please check the external packaging condition before unpacking. If it is damaged, contact corresponding local retailer.
- 2) After unpacking, please check the products and spare parts according to spare parts list. If the product is damaged or missing, please contact your local retailer.
- 3) Before installation, be sure to cut off the grid power and make sure battery switch is on OFF mode.
- 4) It is prohibited to connect the battery and AC power directly.
- 5) All electrical wiring must be connected in accordance with local regulations.
- 6) Please ensure that electrical performance of battery system is compatible with the equipment.
- 7) The installation onsite shall be equipped with fire-fighting facilities that meet relevant requirements, such as fire sand, dry powder fire extinguisher, etc.

2.2 In Using

- 1) If battery system needs to be moved or repaired, power must be cut off and battery is completely shut down.

- 2) It is prohibited to connect battery with different types of battery.
- 3) Do not connect battery to faulty inverter.
- 4) Except for personnel from The Company or other authorized personnel, batteries shall not be opened, repaired or disassembled. The company shall not bear any liability or responsibility caused by violation of any safety operation or design standard, production standard, equipment safety standards or any other standards or requirements.

3. Introduction

This power lifepo4 lithium battery is a new energy storage product developed and produced by The Company, which can provide reliable power supply for all kinds of equipment or systems.



Figure 3-1

3.1 Features

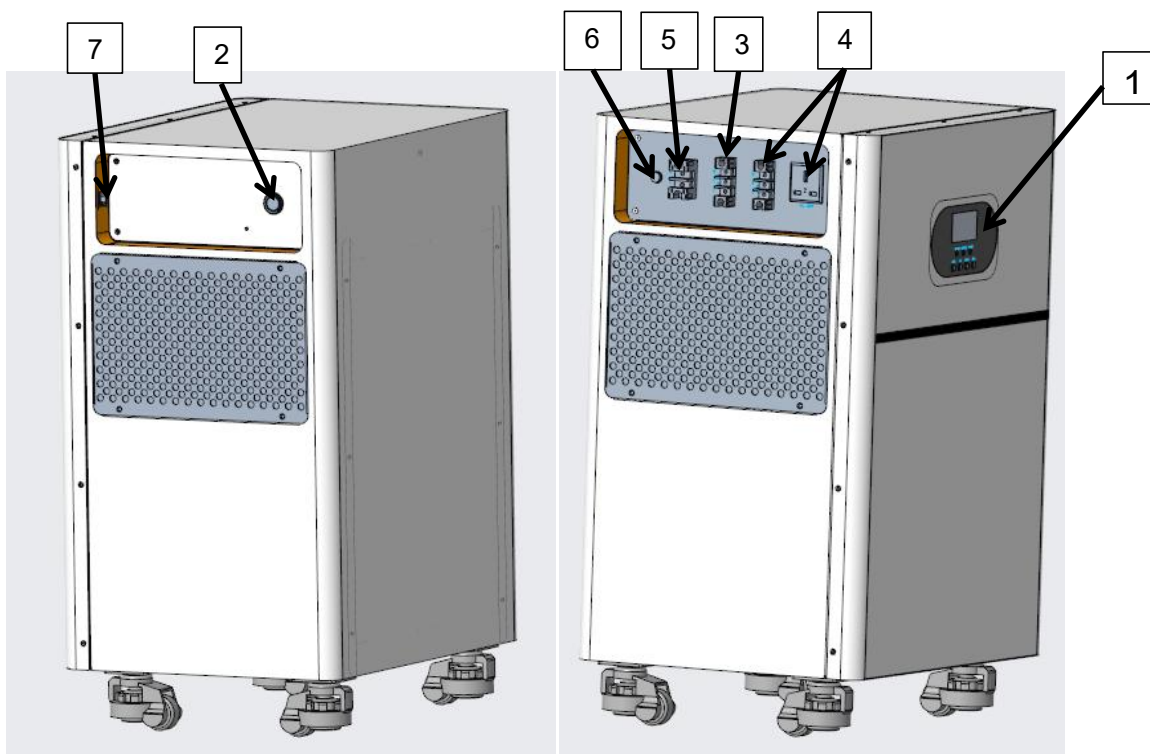
- 1) The module is non-toxic, non-polluting and environmentally friendly.
- 2) Cathode material is made from LiFePO_4 with safety performance and long cycle life.
- 3) Battery management system (BMS) has protection functions including over-discharge, over-charge, over-current and high/low temperature.
- 4) The system can automatically manage charge and discharge state and balance voltage of each cell.
- 5) Adopted self-cooling mode rapidly reduced system entire noise.
- 6) The module has less self-discharge, up to 6 months without charging it on shelf, no memory effect, excellent performance of shallow charge and discharge.
- 7) Multi-functional LED intelligent digital screen display.

3.2 Functions

Protection and Alarm	Management and monitor
Charge/Discharge End	Cell Balance
Over voltage Charging Protection	Intelligent Charge Model
Under Voltage Discharging Protection	Charge/Discharge Current Limit
Charge/Discharge Over current Protection	Capacity Retention Calculate
High/Low Temperature Protection	Short Circuit Protection
History Record	Adjustable parameter settings

Items	Specification
Product Name	5kW5.12kWhAll in one energy storage
Battery parameters	
Module Model	51.2V100Ah
Battery Type	LFP 1P16S
Nominal Capacity	5.12 kWh
Nominal Voltage	51.2V
Working Voltage	43.2-58.4V
VSOLAR CHARGER	
Maximum PV Array Open Circuit Voltage	500VDC
PV Array MPPT Voltage Range(TYP.)	60~450VDC
Maximum PV Array Power	7500W
Maximum Solar Charge Current	30A
AC INPUT	
Voltage	220VAC/230VAC/240VAC
Selectable Voltage Range	UPS mode:170~280Vac; APL mode:90~280Vac
Frequency Range	50Hz / 60Hz (Auto sensing)
Maximum AC Charge Current	30A
AC Output	
Rated Power	5000W
AC Voltage Regulation	200~240Vac
Inverter Efficiency	≥90%
Maximum output AC current	10A
Overall parameters	
Storage Temperature	-20°C ~ 55°C (Recommended)
Working Humidity	≤95% (RH) No Condensation
Working Temperature	0~55°C(Charging) -20-55°C(Discharge)
Working Altitude	≤2000m
Cooling method	Air-cooled
Installation method	On floor
Protective Class	IP20
Weight	~64kg
Dimension	671*450*350mm
Design Life	10 Years (25°C)
Cycle Life	> 6000 (25°C) ,80% DOD

3.3 Specification Parameters

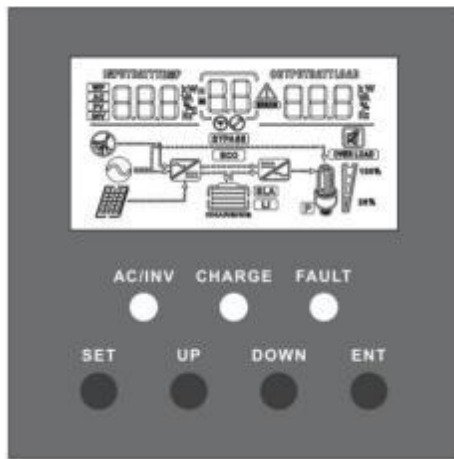


3.4 Equipment interface instruction

- 1 **Operation panel: LCD display, Status indicator, Function Keys**
- 2 **Start: Power switch**
- 3 **AC IN : AC input terminal**
- 4 **AC OUT: Power socket**
- 5 **PV: PV charging interface**
- 6 **overload protector: Overload protection button**
- 7 **WiFi port: WiFi interface**

➤ **Operation panel**

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



Function Key	Description
SET	Enter/exit setting menu
UP	Last option
DOWN	Next option
ENT	Confirm/enter option under setting menu

Indicator light	Color	Description
AC/INV	Yellow	Constant on: mains supply output
		Flashing: inverter output
CHARGE	Green	Flashing: battery in charge
		Constant on: charge completed
FAULT	red	Constant on: Fault status

➤ Start

When the battery is dormant, pressing the start button will open the battery module and inverter module.

Attention:

It is strictly prohibited to turn off the circuit start switch first when the inverter is charging and discharging the battery.

➤ AC OUT

The device has three 10A AC output socket. Do not use electrical appliances other than the power indicated on the device. Air conditioning and other electrical appliances need at least 2-3 minutes to restart, as they require sufficient time to balance the refrigerant gas in the circuit. If there is a power shortage and it is restored in a short period of time, it will cause damage to the connected devices. To prevent such damage, please check if the air conditioner has a delay function before installation and check the manufacturer. Otherwise, this inverter/charger will trigger an overload fault and cut off the output to protect your device, but sometimes it can still cause internal damage to the air conditioner.

➤ AC IN

Before connecting the AC input power, please install a separate AC circuit breaker between this device and the AC input power. This will ensure that the inverter can be safely disconnected during maintenance and fully protect it from the impact of AC input over current. The recommended specification for AC circuit breakers is 50A, suitable for 5.5KW.



Warning

All wiring must be operated by professional personnel

The use of appropriate cables for AC input connections is crucial for the safe and efficient operation of the system. To reduce the risk of injury, please use a 12AWG cable for connection.

➤ PV

Before connecting PV components, please install a separate DC circuit breaker between this device and the photovoltaic system.



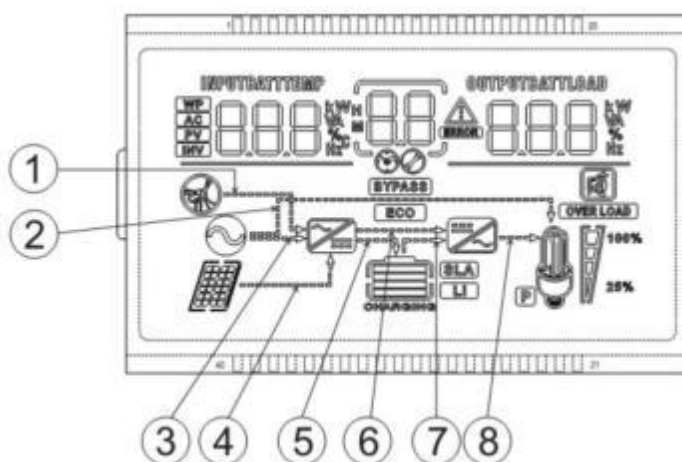
Warning

All wiring must be operated by professional personnel.

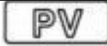
The use of appropriate cables to connect PV components is crucial for the safe and efficient operation of the system. To reduce the risk of injury, please use 12AWG cable to connect.

3. Inverter layer

3.1 LCD Display Icons



Icon	Function	Icon	Function
	Indicating that AC input end has been connected to power grid		Indicating that inverter circuit is in working.
	Indicates that the AC input mode in APL mode (wide voltage range)		Indicating that the machine is in mains supply bypass work mode
	Indicating that PV input end has been connected to solar battery panel		Indicating that AC output is in overload state
	Indicating that machine has been connected to battery,  indicating 0%~24% battery remaining capacity  indicating 25%~49% battery remaining capacity  indicating 50%~74% battery remaining capacity  indicating 75%~100% battery remaining capacity		Indicating percentage of AC output load,  indicating 0%~24% load percentage,  indicating 25%~49% load percentage,  indicating 50%~74% load percentage,  indicating ≥75% load percentage
	Indicating that present battery type of the machine is lithium battery		Indicating that buzzer is not enabled
	Indicating that current battery type of machine is lead-acid battery		Indicating alarm of machine
	Indicating that the battery is in charge state.		Indicating that the machine is in fault state.

	Indicating that AC/PV charge circuit is in working		Indicating that the machine is in setting mode.
	Indicating that AC output end has AC voltage output		Middle parameter display of screen, 1. In non-setting mode, displaying alarm or fault code; 2. In setting mode, displaying code of parameter item under current setting.
Parameter display at left side of screen: input parameter			
	Indicating AC input		
	Indicating PV input		
	Indicating inverter circuit		
	The icon is not displayed		
	Displaying battery voltage, total charge current of battery, charge power of mains supply, AC input voltage, AC input frequency, PV input voltage, temperature of internal radiator, software version		
Parameter display at right side of screen: output parameter			
	Indicating output voltage, output current, output active power, output apparent power, battery discharge current, software version; under setting mode, displaying the setting parameter under the parameter item code set currently		
Arrow display			
①	The arrow is not displayed	⑤	Indicating charge from charge circuit to battery end
②	Indicating power grid power supply to load	⑥	The arrow is not displayed
③	Indicating power grid power supply to charge circuit	⑦	Indicating power supply from battery end to inverter circuit
④	Indicating PV power supply to charge circuit	⑧	Indicating power supply from inverter circuit to load

3.2 Real-time data view method

In LCD main screen, press keys “UP” and “DOWN” to turn page and view different real time data of the machine.

Page	Left Parameter of Screen	Middle Parameter of Screen	Right Parameter of Screen
1	Battery input voltage	Fault code	Output voltage
2	PV temperature		PV output KW
3	PV input voltage		PV output current
4	Input battery current		Output battery current
5	Input battery KW		Output battery KW

6	AC input frequency		AC output load frequency
7	AC input voltage		AC output load current
8	Input V		Output load KVA
9	INV temperature		INV output load KW
10	APP software version		Boot loader software version
11	Model Battery Voltage Rating		Model Output Power Rating
12	Model PV Voltage Rating		Model PV Current Rating

3.3 Setting parameter

Key operation description: to enter setting menu and exit from setting menu, please press key“SET”. After entering the setting menu, parameter number **【00】** shall flash. At this time, press keys “ UP ”and “ DOWN ” to select the parameter item code to be set. Afterwards, press key“ ENT” to enter parameter editing state. At this moment, the parameter value can flash. The parameter values are adjusted through keys “UP” and “DOWN”. In the end, press key“ENT” to complete parameter editing and return to parameter selection state.

No. of Parameter	Name of Parameter	Setting Option	Description
00	Exit	[00] ESC	
01	Work priority mode	[01] SOL	At photovoltaic priority mode, when the photovoltaic is invalid or the battery values are lower than the parameter 【04】 setting value, it shall switch to AC power.
		[01] UTI default	At AC priority mode, it switches to inverter only when the AC power is invalid.
		[01] SBU	Inverter priority mode, switch to mains power only when the battery is under voltage or lower than the setting value of parameter [04]; Switch to battery discharge only when the battery is fully charged or higher than the setting value of parameter [05].
02	Output frequency	[02] 50.0 default	At bypass self-adaption, it automatically adapts to AC frequency in case of AC power; without AC power, the output frequency can be set via the menu. For 230V machine, it is 50Hz by default.
		[02] 60.0	
03	AC input Voltage range	[03] APL	90~280V wide range input AC voltage range of 230V machine
		[03] UPS default	170~280V narrow range input AC voltage range of 230V machine
04	Battery to bypass	[04] 43.6V default	When the parameter [01] = SBU, the battery voltage is lower than the set value, and the output is switched from the inverter to the mains, and the setting range is 40V~57.2V. (The maximum setting value cannot be higher than 05 items)

05	Bypass to battery	[05] 57.6V default	When the parameter [01]=SBU, the battery voltage is higher than the set value, and the output is switched from the mains to the inverter, and the setting range is 52.4V~60V. (The minimum value of this setting is affected by 08)
06	Charge mode	[06] CSO	For photovoltaic priority charge, the AC charge is started only when photovoltaic is invalid.
		[06] CUB	For AC priority charge, the photovoltaic charge is started only when AC is invalid.
		[06] SNU default	In case of mixed charge from photovoltaic and AC power, priority is given to photovoltaic charge. In case of insufficient photovoltaic energy, the AC charge is used for supplement. In case of sufficient photovoltaic charge, stop charge from AC power. Note: photovoltaic charge and AC charge can be performed at the same time only when AC bypass is output All-in-one solar charge inverter 22 under load. When inverter works, only photovoltaic charge can be started.
		[06] OSO	Only photovoltaic charge, no AC charge is started.
07	Maximum Charge current	[07] 60A default	Setting range 0~100A;
08	Battery type	[08] USE	For user-defined, all battery parameters can be set.
		[08] SLd	Sealed lead-acid battery, constant voltage charge voltage 57.6V, float charge voltage 55.2V.
		[08] FLd	For vented lead-acid battery, charge voltage at constant voltage is 58.4V and float charge voltage is 55.2V
		[08] GEL default	For gel lead-acid battery, charge voltage at constant voltage is 56.8V and float charge voltage is 55.2V.
		[08] L14/L15/L16	Lithium iron phosphate battery L14/L15/L16 corresponds to lithium iron phosphate battery 14 strings/15 strings/16 strings;16 string/15 string/14 string default constant The voltage charging pressure is 56.8V, 53.2V, 49.6V, which are adjustable.
		[08] N13/N14	Ternary lithium battery, adjustable. The default constant voltage charging voltage for N13 is 53.2V, and the default constant voltage charging voltage for N14 strings is 57.6V.
09	Boost charge voltage	[09] 56.8V default	The setting range of boost charge voltage is 48V~58.4V with 0.4V step. It is valid in case of a self-defined or a lithium battery.

10	Boost charge maximum time	[10] 120 default	Boost maximum charge time setting means setting of maximum charge time of voltage when the voltage reaches parameter 【09】 from 5min~900min at 5-minute step. It is valid in case of a self-defined or a lithium battery.
11	Float voltage	[11] 55.2V default	48V~58.4V setting range of float voltage at 0.4V step is valid in case of a self-defined battery.
12	Over discharge voltage	[12] 42V default	So as to over discharge voltage, when the battery voltage is lower than the judgement point, after delaying for the parameter 【13】 setting time, turn off the inverter output. 40V~48V voltage setting range at 0.4V step is valid in case of a self-defined battery and lithium battery.
13	Over discharge delay time	[13] 5S default	So as to over discharge delay time, when the battery voltage is lower than parameter 【12】 , the inverter output is turned off after delaying the time set with the parameter. 5S~50S setting range at 5S step is valid in case of a self-defined and lithium battery.
14	Battery under voltage alarm point	[14] 44V default	So as to battery under voltage alarm point, when the battery voltage is lower than the judgement point, an under voltage alarm is given out and no turnoff is output. 40V~52V setting range at 0.4V step is valid in case of a self-defined and lithium battery.
15	Battery discharge limiting voltage	[15] 40V default	So as to battery discharge limiting voltage, when the battery voltage is lower than the judgement point, the output is turned off immediately. 40V~52V setting range at 0.4V step is valid in case of a self-defined and lithium battery.
16	Equalizing charge	[16] DIS	No equalizing charge is permitted.
		[16] ENA default	When equalizing charge is enabled, only vented lead-acid battery and sealed lead-acid are valid.
17	Equalizing Charge voltage	[17] 56.8V default	So as to equalizing charge voltage, 48V~58.4V setting range at 0.4V step is valid in case of a vented lead-acid battery and sealed lead-acid battery.
18	Equalizing charge time	[18] 120 default	So as to equalizing charge time, 5min~900min setting range at 5min step is valid in case of a vented lead-acid battery and sealed lead-acid battery.
19	Equalizing charge delay	[19] 240 default	For equalizing charge delay, 5min~900min setting range at 5min step is valid in case of a vented lead-acid battery and sealed lead-acid battery.
20	Equalizing	[20] 30 default	For equalizing charge derating time,

	charge derating time		0~30days setting range at 1-day step is valid in case of a vented lead-acid battery and sealed lead-acid battery.
21	Equalizing charge enabling	[21] ENA	Start equalizing charge immediately.
		[21] DIS default	Stop equalizing charge immediately.
22	Energy saving mode	[22] DIS default	No energy-saving mode
		[22] ENA	After enabling the energy-saving mode, if the load is empty or less than 50W, the output of the inverter will be turned off after a period of delay. When the load is greater than 50W, the inverter will start automatically.
23	Automatic restart after overload	[23] DIS	When the automatic restart after overload is disabled, if the output is turned off upon overload, the machine shall not restore turn on.
		[23] ENA default	When the automatic restart after overload is enabled, if the output is turned off upon overload, output is restarted by the mains after 3min delay. The machine shall not restarted after 5 times of restarts.
24	Automatic restart after over temperature	[24] DIS	When automatic restart after over temperature is disabled, if the output machine is turned off upon over temperature, no output is turned on.
		[24] ENA default	When automatic restart after over temperature is enabled, if the output is turned off upon over temperature, the output can be turned on after the machine cools down.
25	Buzzer alarm	[25] DIS	Disabling alarm
		[25] ENA default	Enabling alarm
26	Mode conversion reminding	[26] DIS	No alarm prompt in case of any change in main input source
		[26] ENA default	Alarm prompt is enabled if state of main input source is changed.
27	Inverter overload to bypass	[27] DIS	No automatic switching to AC power in case of inverter overload
		[27] ENA default	Automatic switching to AC power in case of inverter overload
28	AC maximum charge current	[28] 60A default	AC Charging Maximum Charge Current Setting. Set the range 0~60A, the default is 60A.
30	Mailing address settings	[30] 1 default	The parallel mode needs to be set, and the setting range is 1-6, and it cannot be set in the parallel working state. Note: Parallel mode automatically assigns addresses and usually does not require manual setup.
32	RS485 communication	[32] SLA default	RS485 port for PC and remote monitoring protocol.
		[32] BMS	RS485 port for BMS communication.

		[32] CAN (customized)	CAN port for CAN communication.
33	BMS communication protocols	When [32] setting item = BMS, you need to select the corresponding lithium battery manufacturer's brand for communication AC=PACE, RDA=RITAR, AOG=ALLGRAND, OLT=OLITER, HWD=SUNWODA, DAQ=DYNESS, WOW=SRNE, PYL=PYLONTECH, UOL=VILION	
34	Hybrid power to load and on-grid setting	[34] DIS default	Disable this function.
		[34] Lod	Hybrid power to load mode, in which the PV is only charged first in utility mode and the remaining energy is supplied to the load and not fed into the grid.
		[34] Grid	On-grid function, in utility mode, the PV is charged first and the remaining energy is supplied to the load and fed into the grid.
35	Low-voltage disconnect battery voltage recovery point (fault 04)	[35] 52V default	When the battery low voltage disconnects the inverter output, the battery voltage needs to be greater than this setting to restore the battery inverter AC output.
36	Maximum PV charging current	[36] 80A default	Maximum PV charging current setting: 0~100A.
37	Battery fully charged recovery point	[37] 52V default	After the battery is fully charged, it needs to be lower than this set voltage before it can be recharged
38	AC output Voltage setting	[38]230Vac default	S series models: allow to set to 200 / 208 / 220 / 230 / 240Vac, default 230Vac. AC output power = (Rated Power)*(Setting voltage/230)
39	Charging current limiting method	[39] BMS default	This mode only takes effect when the inverter communicates successfully with the lithium battery BMS (Battery Management System), and the following options can be set: [SET] When this option is selected, the inverter charging current adopts the value set in item [07], in which case item [07] can be set to any value from 0 to the maximum charging current. [BMS] When this option is selected, the charging limit current transmitted by BMS and the value set in [07] will be compared, and the smaller value will be taken as the current charging current, in this case, the charging current that can be set in [07] can not be greater than the the charging limit current of BMS. After [INV] is selected, it will compare the inverter internal current limit value with the

			value set in item [07], and take the smaller of them as the current charging current. At this time, charging current can be set in item [07] can not be greater than the inverter internal current limit value, and the logic for the inverter internal current limit value is: 1. When the battery SOC>98%, the charging current is reduced to 1/16 of the rated charging current value of the inverter. 2. When the battery SOC>95%, the charging current is reduced to 1/8 of the rated charging current of the inverter. 3. When the battery SOC>90%, the charging current is reduced to the inverter rated charging current value 1/4. 4. When battery SOC>85%, the charging current is reduced to the inverter rated charging current 1/2.
57	Stop charging current	[57] 2A default	Stop charging when the charging current is less than the set value.
58	Discharging alarm SOC setting	[58] 15% default	SOC alarm when capacity is less than this setting. (Valid when BMS communication is normal)
59	Stop discharging SOC setting	[59] 5% default	Discharge stops when the capacity is less than this setting value. (Valid when BMS communication is normal)
60	Stop charging SOC setting	[60] 100% default	When the capacity is greater than this setting value, charging stops. (Valid when BMS communication is normal)
61	Toggle the mains SOC settings	[61] 10% default	When the capacity is less than this setting, switch to mains. (Valid when BMS communication is normal)
62	Toggle the inverter output SOC settings	[60] 100% default	When the capacity is greater than this setting value, switch to inverter output mode. (When BMS communication is normal.) Effective)

3.4 Fault Reference Code

Fault Code	Fault Name	Affecting output or not	Note
【01】	BatVoltLow	Yes	Battery under voltage alarm
【02】	BatOverCurrSw	Yes	Average over current software protection for battery discharge
【03】	BatOpen	Yes	No connection alarm of battery
【04】	BatLowEod	Yes	Stop discharge alarm for battery under voltage
【05】	BatOverCurrHw	Yes	Battery over current hardware protection
【06】	BatOverVolt	Yes	Charge over voltage protection
【07】	BusOverVoltHw	Yes	Bus over voltage hardware protection
【08】	BusOverVoltSw	Yes	Bus over voltage software protection
【09】	PV VoltHigh	No	PV over voltage protection
【10】	PV OCSw	No	PV over current software protection
【11】	PV OCHw	No	PV over current hardware protection
【12】	bLineLoss	No	AC power failure
【13】	OverloadBypass	Yes	Bypass overload protection
【14】	OverloadInverter	Yes	Inverter overload protection
【15】	AcOverCurrHw	Yes	Inverter over current hardware protection
【17】	InvShort	Yes	Inverter short-circuit protection
【19】	OverTemperMppt	No	PV radiator over temperature protection

【20】	OverTemperInv	Yes	Over temperature protection of inverter radiator
【21】	FanFail	Yes	Fan fault
【22】	EEPROM	Yes	Memory fault
【23】	ModelNumErr	Yes	Inaccurate model setting
【26】	RlyShort	Yes	Inverted AC Output Back feeds to Bypass AC Input
【29】	BusVoltLow	Yes	Bus under voltage protection
【30】	BatCapacityLow1	No	Battery capacity below 10% alarm (valid when BMS is enabled)
【31】	BatCapacityLow2	No	Battery capacity below 5% alarm (valid when BMS is enabled)
【32】	BatCapacityLowS _{top}	Yes	Battery low capacity shutdown (valid when BMS is enabled)
【58】	BMS communication error	No	Check whether the communication cable is connected correctly and whether item [33] is set to the corresponding lithium battery communication protocol
【60】	BMS battery low-temperature alarm	No	Li-ion battery BMS low-temperature alarm
【61】	BMS battery over-temperature alarm	No	Li-ion battery BMS over-temperature alarm
【62】	BMS battery over-current alarm	No	Li-ion battery BMS over-current alarm
【63】	BMS battery under-voltage alarm	No	Li-ion battery BMS under-voltage alarm
【64】	BMS battery over-voltage alarm	No	Li-ion battery BMS over-voltage alarm

4. Safe Handling of Lithium-iron ESS Batteries Guide

4.1 Solution Diagram

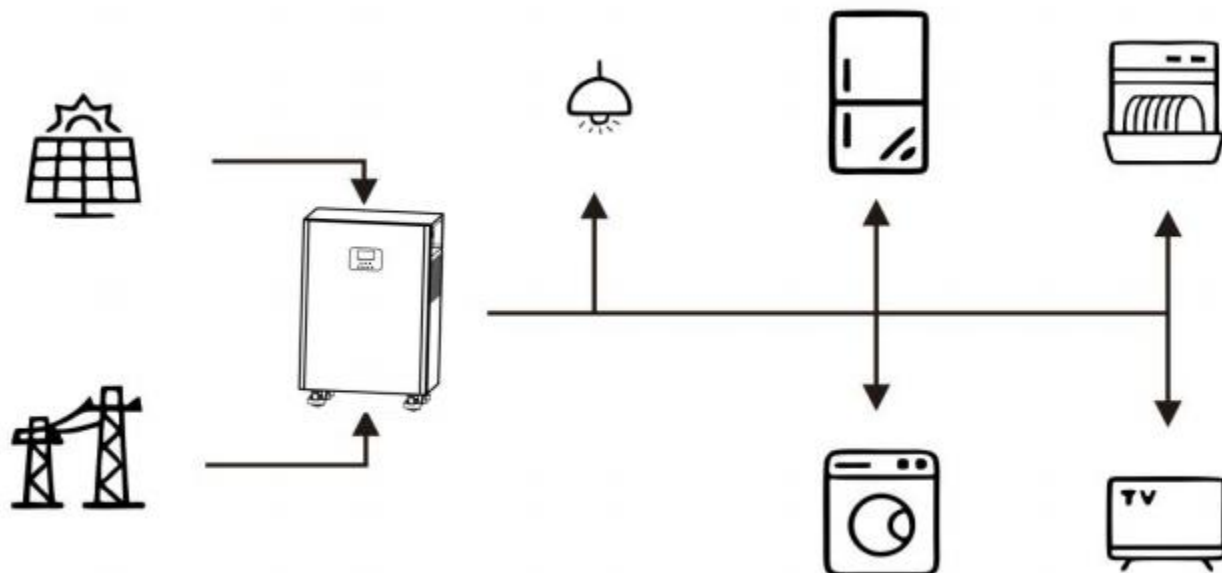


Figure 4-1

4.2 Danger Label



Figure 4-2

4.3 Tool



Wire Cutter



Modular Crimping Pliers



Screwdriver



Electric drill

Note :

Properly use insulated tools to prevent accidental electric shock or short circuits. If tools are not insulated, cover the entire exposed metal surfaces of available tools with electrical tape except their tips.

4.4 Safety Gear

It is recommended to wear the following safety gear when dealing with battery pack.



Insulated Gloves



Safety Goggles



Safety Shoes

5. Installation and operation

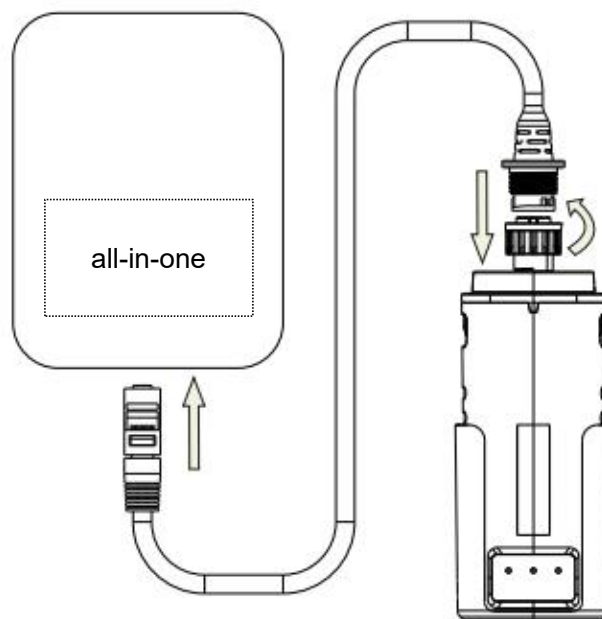
5.1 Installation Location

Make sure that installation location should meet the following condition:

- 1) The area should be completely water-proof.
- 2) The floor should be flat and level.
- 3) No flammable or explosive materials.
- 4) The ambient temperature is within the range from 0°C to 50°C.
- 5) The temperature and humidity are maintained at a constant level.
- 6) There is just a little dust and dirt in the area.
- 7) The distance from heat source should be more than 2 meters.
- 8) The distance between the air outlet of this device and the obstruction is greater than 0.5 meters.
- 9) This device should avoid direct sunlight as much as possible.
- 10) No forced ventilation requirement for battery module, but please avoid installing in a closed area.

5.2 Installation of LSW-5 module

Insert the LSW-5 module into the WiFi port of the all-in-one machine.



5.3 System turns on



Warning: Double check all the power cables and communication cables. Check all the power switches are OFF.

System turns on step:

- 1) Check all cables are connected correctly. Check grounding is connected.
- 2) If necessary, turn on the switch at battery. If possible, turn on AC or PV power source to wake up inverter.
- 3) If no alarm ,the battery system will be ready for charging and discharge with PCS.

5.4 System turns off

When failure or before service, must turn the battery storage system off:

- 1) Turn off the power supply of electrical appliances.
- 2) Turn off the battery button switch.
- 3) Remove the connecting cable between the battery and the electrical appliance.

6. Emergency Situations

6.1 Battery Leakage

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

- 1) Inhalation: Evacuate contaminated area and seek medical aid.
- 2) Contact with eyes: Rinse eyes with flowing water for 15 minutes and seek medical aid.
- 3) Contact with skin: Wash affected area thoroughly with soap water and seek medical aid.

Ingestion: Induce vomiting and seek medical aid.

6.2 On Fire

Dry powder fire or carbon dioxide extinguisher can be used; if possible, move the battery module to a safe area before it catches fire.

6.3 Wet Batteries

If the module is wet or submerged in water, do not let people access it, then contact us or an authorized dealer for technical support. Cut off all power switch .

6.4 Damaged Batteries

Damaged batteries are dangerous and must be handled with utmost care. They are not fit for use and may pose a danger to people or property. If the module seems to be damaged, pack it in its original container, then return it to authorized dealer.



Warning

Damaged batteries may leak electrolyte or produce flammable gas.

7. Remarks

7.1 Maintenance

Check installation environment such as dust, water, insect etc. Make sure it is suitable for IP20 battery system. Connection of power connector, grounding point, power cable and screw are suggested to be checked every year.

Parts List

Item	Part Name	Description	Unit	Quantity
1	Instructions		PCS	1
2	Certificate		PCS	1
3	WIFI module	WFBLE.DTU.PlugPro-22	PCS	1
4	Grounding wire	1.5 square 1.5 meters yellow-green grounding wire	PCS	1

Maintenance Record

Dear user.thank you for selecting our product,Please fill in and keep the warranty card for better services.

Attn:_____Product No.:_____

Tel:_____E-mail:_____

Purchase Date:_____

Address:_____

Maintenance Record			
Date of repair	Content	Maintenance Personnel	Note