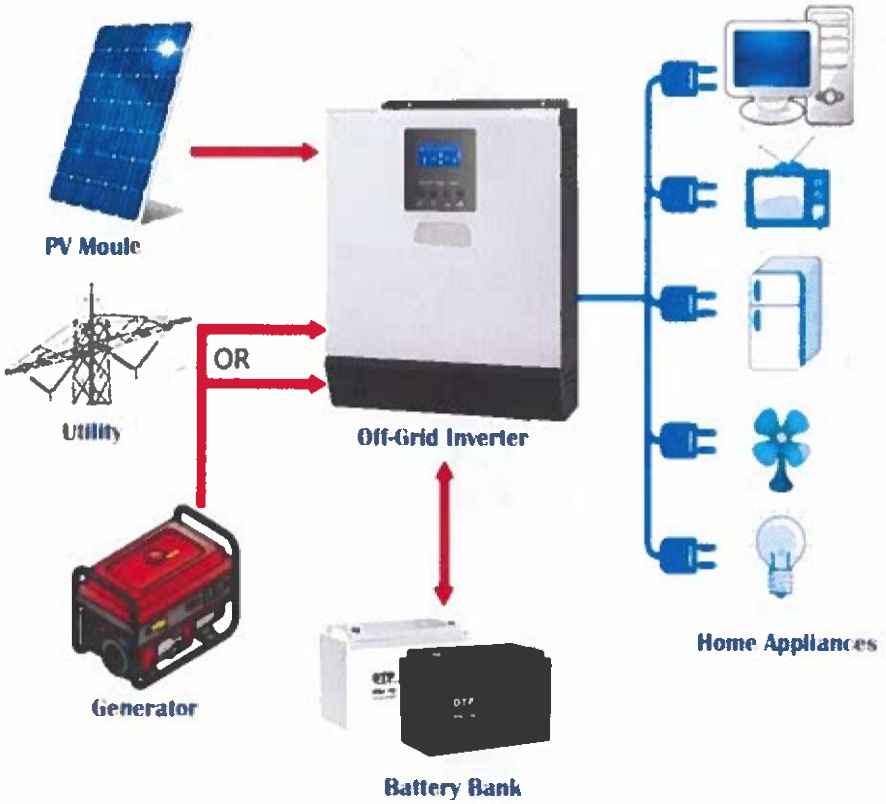
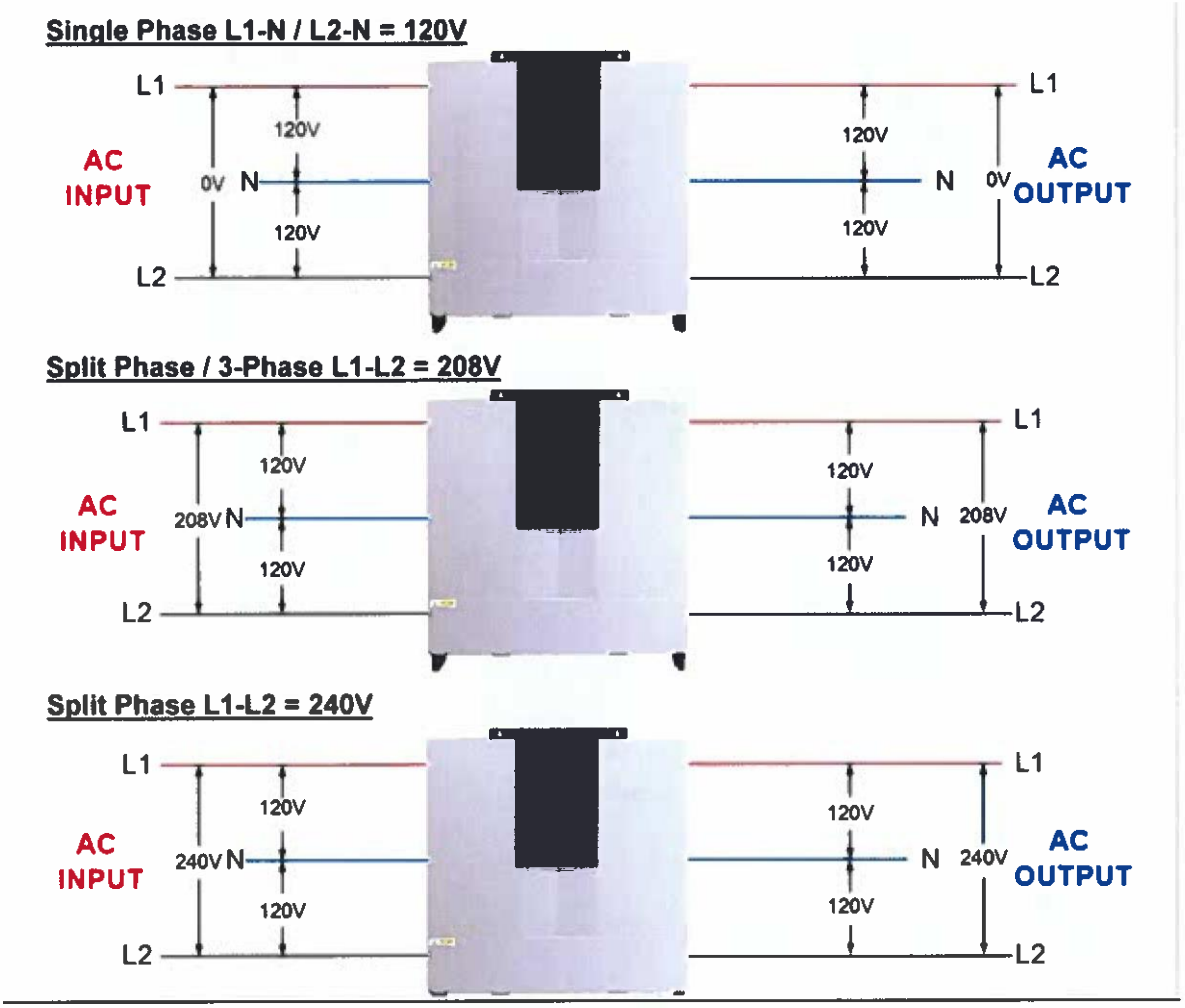
OFF Grid System Summary:



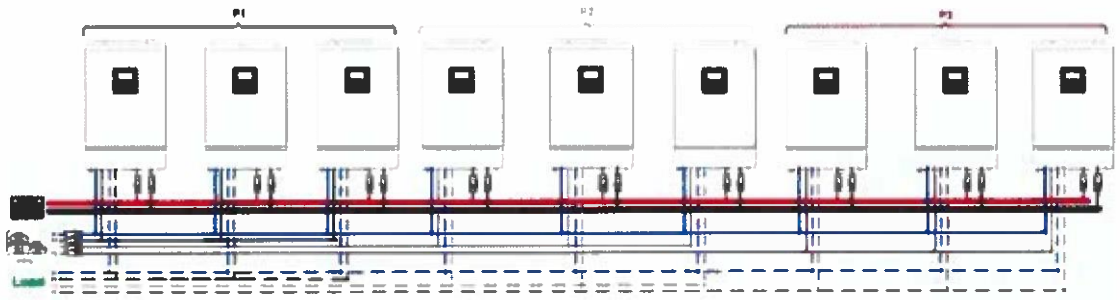
Current power consumption setup New Mexico:
Main Breaker: 100Amp
Greenhouse Line: 3 Pole (phase) **10Amp** 240V AC
Number of greenhouses: 21

Single Phase: 120V
Split Phase: 240V
3 Phase: 208V ←

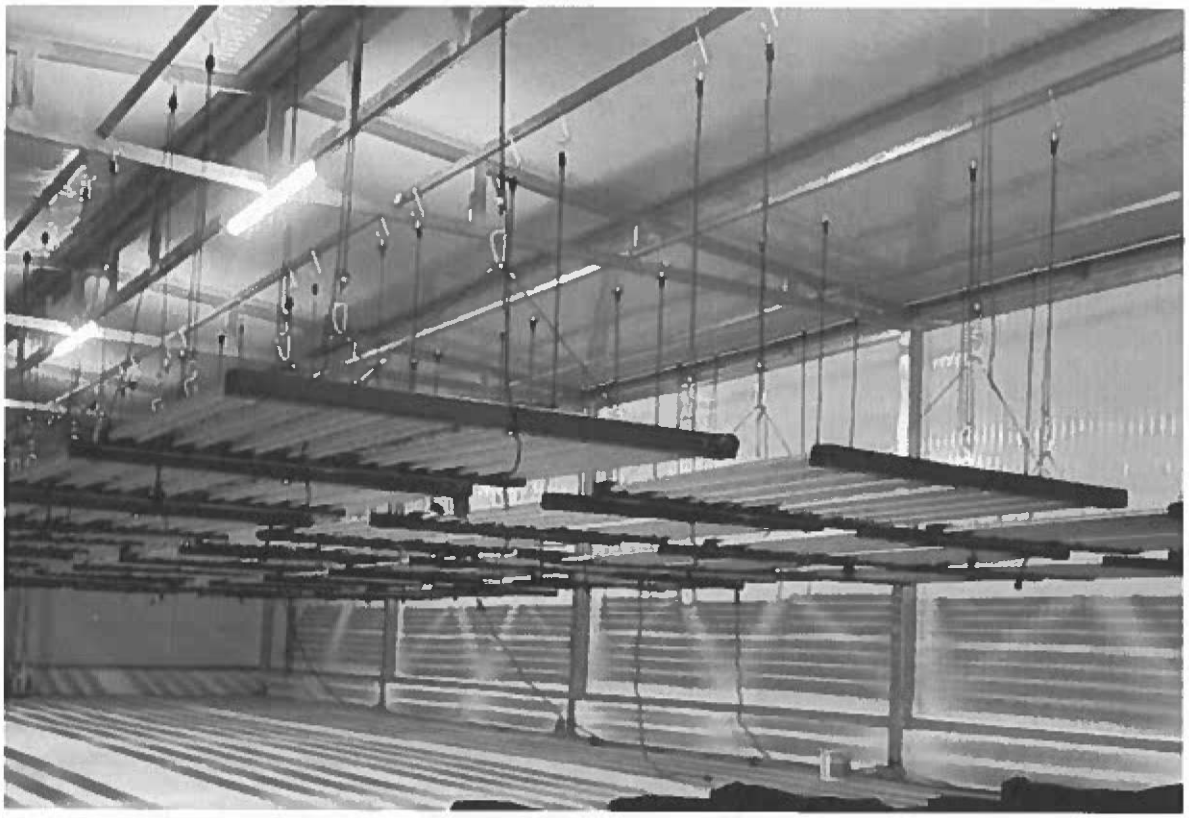
Inverter Wiring Configuration Options:



(3 Phase multiple inverters in array. If we don't choose individual buildings. Or one large unit).



Load Setup:



Estimated power consumption of the Building: ~1000W = 1kW
(Other devices listed: Fans, Pump, Lights)

Growing lights:
Number of Lights: 24 / Building
Amperage rating: 4.8A / Lights
Voltage rating: 3 phase 208V AC
Lights Total: 4.8A x 208V = 998W = 1kW

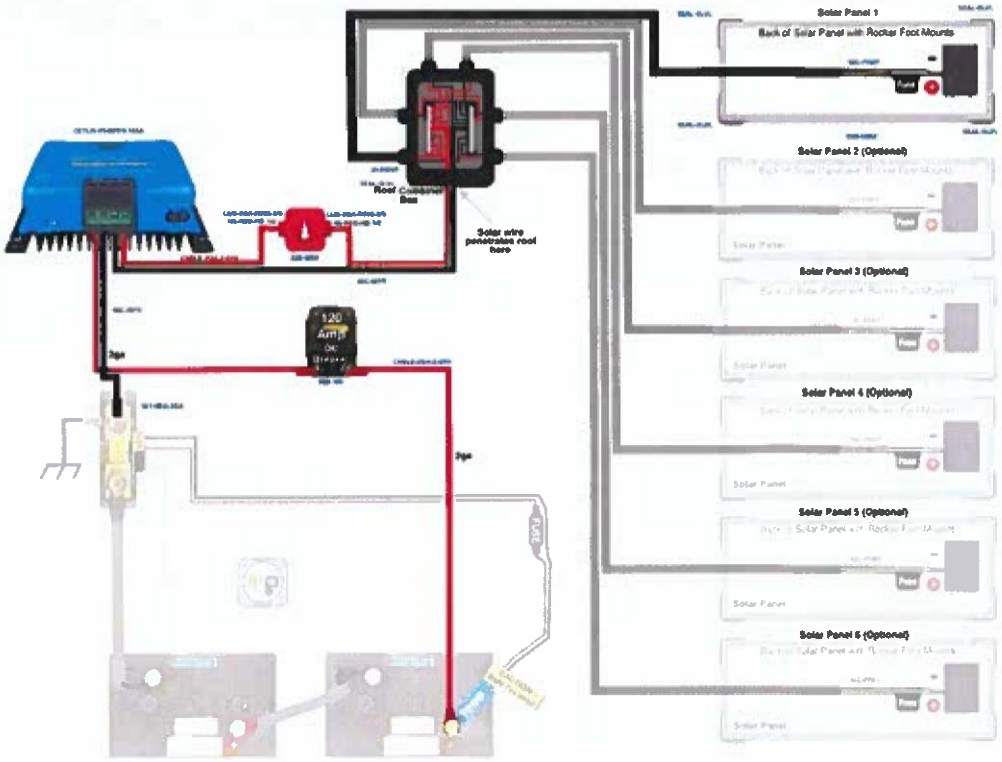
Fans, Pumps:
Amperage rating: 2A / Lights
Voltage rating: Single phase 115V AC
Total: 2A x 120V = 300W

For 21 buildings it would be 21 x 1kW = 21kW
Customer has interest of 100kW
(Noted that 21kW wouldn't tun on a 10Amp breaker so it's probably a planned expansion.)

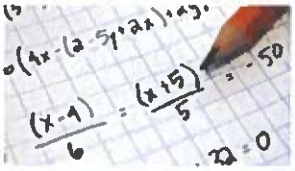
Pros & Cons:

[Please note that alternating AC current and DC direct is not the same. Although the unit generates AC as a final result. The solar panels, battery generate DC. The best description is that AC creates a spark. DC is pure lightning which can travel over 10+ ft easily without touching! Also, battery storages may vary on technology. But as we increase the size only Lithium based batteries can handle the large output for longer time. They can be stable like LifePo4 Sulphur. However, on single cell failure can cause larger damage than most hazardous items. The technology of all of these items listed (DC/Battery/Solar) rarely passed 2 digits. 3 digits are extreme. 4 digits are industrial. 5 digits DC have no solution to handle or needs to be isolated with distance! (10V,10A,10W/100V,100A,100W/1000V,1000A,1000W). Smaller systems are recommended and overall can bypass 5 digits. Also easier to extend (pay as it returns investment) and maintenance. Each building would have an inverter.

Market reasearch says: Solar power is becoming an increasingly popular and affordable way to power homes and businesses around the world. A 100 kw solar system is rather large, requiring up to 6,500 square feet of storage space. A 100 kw solar system produces 100,000 watts of DC direct current power. It can also generate approximately 12,000-kilowatt hours of AC power per month. When it comes to price, a 100kw off-grid solar system cost is much greater than an on-grid system that uses solar panels. That's because an off-grid system requires several other components including solar storage batteries and an inverter with high-voltage capacity. An on-grid system only requires panels that are installed directly on the roof of most buildings. A complete 100kw solar system price varies, however a commercial 100 kw solar plant cost can average around $500,000. (Electric bill is cheaper).]
Exact outline of technology:



Mathematical calculations:



Single Phase 2 wires: 10A x 115V = 1150 = 1.1KW
Split Phase 3 wires: 10A x 230V = 2300 = 2.3KW
3 Phase 4 wires: 10A x 208V x 1.732 = 3.6KW

Solar panels:
1 KW = 2x500W panels. (115V)
1 KW = 4x500W panels. (230V)
1 KW = 8x500W panels. (208V)

Battery:
100A x 48V = 4800W=5KW
So a 100KW system requires 20 batteries.

See Calculator Chart.xls attached.

Recommend to use: Watts to Amps (A) conversion calculator (rapidtables.com)

Please not the main breaker on a power box is a flood gate... Which means it's manly there to avoid other breakers and wires to melt. Cannot design a system to the size of the flood breaker. Even the power company doesn't allow max power of the grid. If we would get close to it the power bill would be extreme. Either add up each braker to get to the total usage. Or look at the electric bill. Or turn on everything full blast for an hour and calculate the meter reading. Need to know what's 115V/230V/208V (Single/Split/3phase).

Important to know that these calculations expect 100% sunshine and quality and no wire resistance and majorly ignoring many other factors such as snow, night and it's simplified for human understanding!

See: Calculating Single- and 3-Phase Parameters | EC&M (ecmweb.com)

KW=(V*I*PF)/1000

There are many Cell phone apps available to size and calculate. I recommend to calculate everything in KW as global standard.

The answer to all of these is that the current Solar technology has jumped from 10V 5W to 230V 5KW which is significant and danger. Anything above is extreme on panel count and price and danger and designed not to return investment. The 5KW systems usually return investment in ~2 years. Anything above is exponential and outdated in a short period of time. In a good way sometimes as devices becoming power savers.

"Off gridders did it": Yes on a trailer they might have a 115V system sometimes less. Heating, cooking is done by propane. Washing is done outside. So it's only a TV and 5 light bulbs. But solar can do 230! So some may add a 230V heater or AC, etc...

Most solar homes only run certain services from solar and most is shared with grid on load.
Electris car charging, AC, Water heater, cooking... Usually separate circuits. But no extremes as welder and even the neighbor... The 115V and 230V systems cannot be mixed! On real 3 wire situation it can. But on off grid solar inverters can't. The reason is DC is a straight line. AC is a sign wave which is a perfect distorted circle. If we put load on each wire different than the inverter circle doesn't exist properly which can lead to damages. That is why on grid is simple... Just unloads.

(Historical fact that the first solar power plants with thousands of solar panels and wind power combined with billions invested only powered a burger place at it's corner.)

The world is not broken! Off grid works greater than grid. It's cheaper. If we consider load sharing with grid or batteries. On grid solar might have more dangers, restrictions and standards to protect line workers and other properties. So Off grid is real and returns every penny. Daily finding 100KW and above devices surfacing for public on affordable levels. It can provide safety net for every situation as long as we consider designs that work.

Quality:

The carefully selected parts are selected parts are US certified. Tested by many Internet communities. The Inverter unit can operate without Battery or Solar or Grid. It can also load balance with the grid if required. The unit can be monitored by computer. Extra safety measures have been implemented. Also planning to add bypass and mobility options. US based technical support is available to all the units.

Parts:

1. Solar Panel Mount 4 panels $300:

https://signaturesolar.com/eg4-brightmount-solar-panel-ground-mount-rack-kit-4-panel-ground-mount-adjustable-angle/?ref=countrylivingexperience
Or
https://eg4electronics.com/categories/ground-mounts/

Video:
https://www.youtube.com/watch?v=RX6kdvptl6s

2. Solar ECO-WORTHY 6 String Combiner Box Fuses $150

Amazon.com: ECO-WORTHY Upgraded 6 String Solar PV Combiner Box, Upgraded 25A Current Fuse, 125A Circuit Breakers with Max Support Up to 6480W Solar System, Better ABS Waterproof Case and Surge Protective : Patio, Lawn & Garden

3. Soar connectors with tool $40:

Amazon.com: Nixesky Solar Crimping Tool for Solar Panel Cable with 30 Pairs Solar Connectors, 1PCS Solar Crimper, 2 PCS Spanner Wrench, Crimper Tool for 2.5/4/6mm² Solar cable Wire,1PCS cable stripper : Patio, Lawn & Garden

4. Ferrule with tool $26

TICONN Ferrule Crimping Tool Kit with 1200PCS Ferrules Insulated Wire Terminals, Self-adjustable Ratchet Wire Crimper for AWG 23–7 Electrical Wire Connectors - Amazon.com

5. Battery disconnect $30

Amazon.com: 12-48V Battery Switch with 2 AWG Gauge Cable, 4 Position Heavy Duty Battery Isolator Disconnect Switch, Waterproof Battery Power Cut Master Switch Disconnect Isolator for Car, Vehicle, RV and Boat : Automotive

6. Solar entry $9:

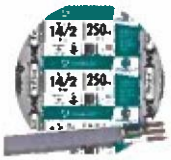
Amazon.com: Link Solar Weatherproof ABS Solar Double Cable Entry Gland for All Cable Types 2mm² to 6mm² for Solar Project on Rv, Campervan, Boat : Patio, Lawn & Garden

7. Battery 4 Gauge wire with connectors (2 gauge can be better) $50.
Amazon.com: GearIT 4 Gauge Wire CCA Kit (25ft Each- Black/Red Translucent | 15 Lugs | 20 Heat Shrink Wrap) Copper Clad Aluminum - Primary Automotive Wire Power/Ground, Battery Cable, Car Audio Speak : Electronics
Or
Amazon.com: NOONE 2 Gauge Jumper Cable Heavy Duty Car Battery Clamps, for Jump Starting Dead or Weak Batteries Booster Cables with S7 Reverse Polarity Protection and Carry (2 Gauge 20 Feet) : Automotive
Connector:
10pcs 2 Awg - 3/8" (M10) Sanuke Wire Lugs Ring Terminal Connectors Ends Heavy Duty for Battery Cable Lug Wire Electrical Eyelets with 3:1 Dual Wall Adhesive Heat Shrink: Amazon.com: Industrial & Scientific

8. SJOOW Jacket insulated wire $40 (optional):

100 Foot of 12/3 Electrical Wire - SJOOW Jacket, 20 Amp Rating - Amazon.com
(For internal wiring AWG varies by inverter documentation)

9. Romex Underground waterproof wire $125 (Optional):



SOUTHWIRE COMPANY LL 13054255 14-2 Underground Feeder Cable, 250' - Electrical Wires - Amazon.com

10. Cable shielding $30 (Optional)
Amazon.com: Kanayu Flame Retardant Wire Loom High Temperature Cable Conduit Split Cable Sleeves Split Wire Loom Tubing Auto Wire Conduit for Industrial Electrical Wires Automotive Marine (1/2"-25 Ft) : Everything Else

11. Flexible Conduit $30 (Optional)
Woods 55082121 25-Feet 1/2-Inch Alflex-Type RWA Reduced Wall Metal Aluminum Flexible Conduit - Electrical Conduit - Amazon.com

12. Wire Splices $8

Amazon.com : Extreme Consumer Products Waterproof Outdoor Wire Splices (10 Pk) - Install, Repair or Expand Any Irrigation Wiring, Landscape Lighting, Sprinkler System Up to 12 Gauge Wire : Patio, Lawn & Garden

13. 3 Phase power connector $ 50 (Optional):

Industrial Socket Plug Connector , Electrical Plugs IP67 Waterproof 3 Phase Power Plug 4Pin 63A 3P+E 380-415V - Amazon.com

Marinco Power Products CS8165N 50A 3 Phase 480V 3P4W Locking Plug: Amazon.com: Tools & Home Improvement

14. Storage Cabinet $130 (Optional):

Amazon.com: Craftsman Garage Storage, 28-Inch Wide Wall Cabinet (CMST22800RB) : Tools & Home Improvement

15. Inverter
    sales@mppsolar.com.
    https://www.mppsolar.com/
    MPP Solar Inc » Inverter Selection Guide

    2KW ($600)

    MPP Solar Inc » SPLIT PHASE LV SERIES – LV2424 / LV5048 / LV6048

    6KW ($800)

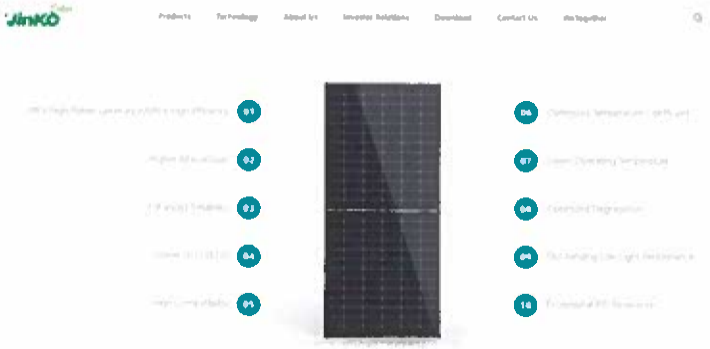
    "V6048, rated 6KW/48V, is a model capable of creating split phase output without the use of parallel. These models can parallel up to 3 units, and from which one can configure system as 3-phase output 208V (phase to neutral). LV5048 has been discontinued and replaced by LV6048." MPP Solar Inc » SPLIT PHASE LV SERIES – LV2424 / LV5048 / LV6048

    25KW inverter ($3000):
    MPP Solar Inc » PIP-HS Series

    30KW Inverter ($6000):

    MPP Solar Inc » Hybrid V3 30KW (Industrial)

16. Solar Panel:



JKM565-585N-72HL4-(V)-F3-EN.ai (shwebspace.com)

17. Battery:
    MPPSOLAR 100AH = 5KW. ($800)
    MPP Solar Inc » Lithium Battery / ESS

    Pylontech 2-5KW:
    Pylontech-Pylon Technologies Co., Ltd.

For 3 Phase 208V 5KW Estimated Total: $2500

Inverter Control All-in-one Machine

TEZE-AO-MB-10KW Series

Long life and safety

Vertical industry integration ensures more than 6000 cycles with 80% DOD

Easy to install and use

Integrated inverter design, easy to use and quick to install.small size, minimizing installation time and cost compact and stylish design suitable for your sweet home environment

Multiple working modes

The inverter has a variety of working modes. Whether it is used for main power supply in the area without electricity or backup power supply in the area with unstable power to deal with sudden power failure, the system can respond flexibly.

Fast and flexible charging

A variety of charging methods, which can be charged with photovoltaic or commercial power, or both at the same time.

Scalability

3 units can be paralleled for 3-phase output maximum support for

Parameters

MODEL BATTERY TECHNICAL SPECIFICATION	TEZE-AO-MB51200-10KW	TEZE-AO-MB51300-10KW	TEZE-AO-MB51400-10KW
Battery Model	TEZE-MB51300-200A-HWB	TEZE-MB51300-200A-HWB	TW-MB51400-200A-HWB
Number of batteries	1	1	1
Battery Energy	10.24kWh	15.36kWh	20.48kWh
Battery Capacity	200AH	300AH	400AH
Weight	131kg	161.5kg	233kg
Dimension L× D× H(mm)	600 x 660 x 470	700 ×660 ×470	900 ×600×470
Battery Type	LiFePO4		
Battery Rated Voltage	51.2V		
Battery Working Voltage Rang	44.8 ~ 57.6V		
Maximum Charging Current	200A		
Maximum Discharging Current	200A		
DOD	80%		
Designed Life-span	>6000 Cycles @ 0.2C/25℃ Charging/Discharging at 80%DOD,Until 80% Capacity.		
INVERTER TECHNICAL SPECIFICATION			
Inverter model	TEZE-ASF48100S200-H		
PV CHARGE			
Solar Charge Type	MPPT		
Maximum Output Power	5500W+5500W		
PV Charging Current Range	22A+22A		
PV Operating Voltage Range	500Vdc+500Vdc		
MPPT Voltage Range	125 ~425Vdc		
AC CHARGE			
AC Charging Current Range	0~120A		
Frequency Range	50/60Hz		
Input Voltage Range	90~270Vac		
Bypass Overload Current	32A		
AC OUTPUT			
Rated Output Power	10000W		
Max.Peak Power	20000W		
Rated Output Voltage	230Vac (single phase L/N/PE)		
Load Capacity of Motors	6HP		
Rated AC Frequency	50/60Hz		
Waveform	Pure Sine Wave		
Switch Time	10ms (typical)		
Parallel capacity	-		
BATTERY INVERTER OUTPUT			
Rated Output Power	10000W		
Maximum Peak Power	20KVA		
Power Factor	1		
Rated Output Voltage (Vac)	230Vac		
Frequency	50Hz ± 0.3Hz/60Hz ± 0.3Hz		
Auto Switch	< 15ms		
THD	< 3%		
GENERAL DATA			
Protection Degree	IP20, indoor only		
Operating Temperature Range	- 15 ~ 55℃ , >45℃ de rated		
Noise	<60dB		
Cooling Method	Internal Fan		
Warranty	10 Years		
COMMUNICATION			
Embedded Interfaces	RS485 / CAN / USB / Dry contact		
External Modules (Optional)	Wi- Fi / GPRS		
CERTIFICATION	UN38.3,MSDS		

TezePower 51.2V 400Ah All in One 20kWh LiFePO4 Battery Mobile ESS with Active Balancer, Built-in BMS, MPPT, 10kw Hybrid Inverter

New Upgrade.
Single Phase/ Three Phase
Built-in 10kw inverter. Directly supply power.
Built-in active balancer module+external physical switch.
Built-in professional LiFePO4 temperature-sensitive Fire Extinguisher.
100% Grade A cells, Full Capacity.
Sturdy Welding Technology.
Four Wheels easy movement.
Auto-trip device to prevent electric shock.
6000+Cycles, 90% DOD, Built-in BMS, 10-year Lifetime

$5,159.99 USD ~~$7,299.99 USD~~ Save $2,140.00 USD

SRNE

ASF series

Solar Storage Inverter

ASF4880SH3 ASF48120SH3
ASF48100SH3

Efficient

- Advanced MPPT technology with up to 99.9% efficiency
- Up to 900V PV input voltage, ideal for high power

Reliable

- Outputs high quality pure sine wave AC power
- 8-12kW load power to meet the needs of most households

User-friendly

- Industrial design with a modern aesthetic look
- Wall-mounted installation saves home space

Safety

- 360 degrees of security from hardware to software
- IEC、FCC and other safety approvals

All-in-one

- The 400V three-phase system is efficient, reliable and ideal for large equipment, providing energy and cost saving

Intelligent

- Exclusive Li-ion battery BMS dual activation
- Time-slot function to save cost with peak-valley tariffs

www.srnesolar.com

SRNE

MODEL	ASF4880SH3	ASF48100SH3	ASF48120SH3	Can Be Set
INVERTER OUTPUT				
Rated Output Power	8,000W	10,000W	12,000W	
Max. Peak Power	16,000W	20,000W	24,000W	
Rated Output Voltage		230/400Vac(three-phase)		✓
Capacity of Motor Load	5HP	6HP	6HP	
Rated Frequency		50/60Hz		✓
Output Waveform		pure sine wave		
Switching Time		10ms (typical)		
BATTERY				
Battery Types		Li-ion / Lead-Acid / User Defined		✓
Rated Battery Voltage		48Vdc		
Voltage Range		40~60Vdc		✓
Max. PV Charging Current	180A	220A	260A	✓
Max. Utility / Generator Charging Current	100A	120A	120A	✓
Max. Hybrid Charging Current	180A	220A	260A	✓
PV INPUT				
No. of MPPT		2		
Max. Input Power	6,000W/6,000W	7,500W/7,500W	9,000W/9,000W	
Max. Input Current		22A/22A		
Max. Open-circuit Voltage		800Vdc/800Vdc		
MPPT Operating Voltage Range		200~650Vdc/200~650Vdc		
UTILITY / GENERATOR INPUT				
Input Voltage Range		phase voltage 170~280V, line voltage 305~485V		
Input Frequency Range		50/60Hz		
Bypass Overload Current		63A		
EFFICIENCY				
MPPT Tracking Efficiency		99.9%		
Max. Battery Inverter Efficiency		≥92%		
European Efficiency	97.2%	97.5%	97.5%	
GENERAL				
Dimensions		620*445*130mm (2.03*1.46*0.43ft)		
Weight		27kg (59.52lb)		
Protection Degree		IP20, indoor only		
Ambient Temp		-10~55℃, >45℃ derated		
Noise		<60dB		
Cooling Method		air cooling		
Warranty		2 years		
COMMUNICATION				
Internal Interface		RS485 / CAN / USB / Dry contact		✓
External Module (optional)		Wi-Fi / GPRS		✓
CERTIFICATION				
Safety		IEC62109-1, IEC62109-2,UL1741		
EMC		EN61000-6-1,EN61000-6-3,FCC15 classB		
RoHS		Yes		





$1,472.53 ~~$1,937.54~~ -24%

Wholesale 3+ pieces, extra 1% off

SRNE 12KW Three-Phase Hybrid Solar Inverter 48VDC To 230/400VAC Built-in Dual MPPT 260A Charger Controller PV 800VDC Max

★★★★★ 5.0 2 Reviews | 7 sold

Coupon & Discount

$30.00 off
On orders over $1,199....

Color: 12KW with WIFI

12KW | 12KW with WIFI

Input Voltage: 48V

48V

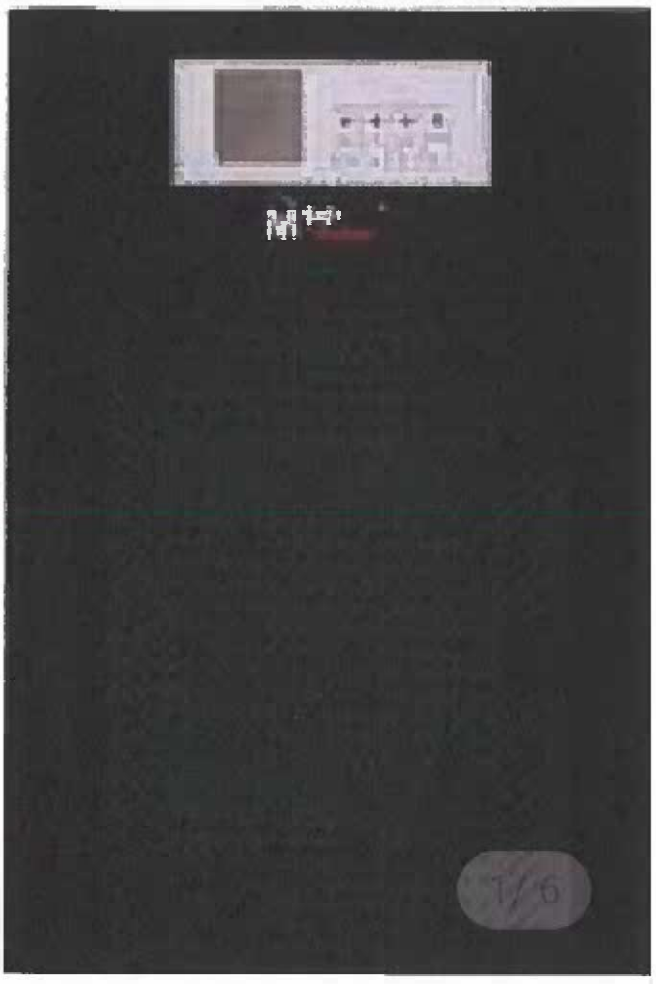
Related items

SRNE 8/10KW Max PV...	SRNE 10KW single/thr...	SRNE 8/10KW On-grid...	SRNE 5KW Hybrid Sol...	SRNE 5000W 48V Hyb...	Getemete 10KW 48V ...
33 sold	3 sold	9 sold	13 sold	27 sold	2 sold
$1,403.17	$1,496.44	$1,310.98	$662.92	$588.15	$1,346.92
Free shipping	Free shipping	Free shipping	Free shipping	Free shipping	Free shipping

Description Specifications Customer Reviews (2) You may also like

Description

Report Item / Suspicious Activity



Send Inquiry

able low frequency inverter

US$ 4350

Min. Order:≥1 Yard

MPPSOLAR INC.

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Quick Details

Model Number:	HV V3 30K

Product information

Output Type	Three Phase
Type	DC/DC Converters, DC/AC Inverters, AC to AC
Inverter Efficiency	98%
Place of Origin	Taiwan
Brand Name	MPP SOLAR
Model Number	HV V3 30K
Input Voltage	230VAC (P-N) / 400VAC (P-P)
Output Voltage	230VAC (P-N) / 400VAC (P-P)
Output Current	75a

Certificate	CE
Weight	221KG
Packaging Details	pallet
Port	Taiwan

Products Description

Place Of Origin	Taiwan
Brand	MPP SOLAR
Special Features	* Industrial grad 30KW SOLAR INVERTER* LOW FREQUENCY INVERTER* High PV input design, 950V (Voc) 45KW max input* Batteryless operation (single unit mode only)*** Hybrid Mode, Off-Grid Mode available* Parallel up to 4 units* =

Main Features	phase* Max 6kVA output, pure sine wave* 384V system voltage* Max charging current 80A* Supports generator use + genset starter dry contact (grid-tie disabled)* Adjustable bulk/float/low cut off setting* Programmable parameters* Indoor installation only* LCD + LED indicators* FREE monitoring software* USB, RS232 communication interface

HYBRID 3-PHASE
SOLAR INVERTER

HV V3 30KW

WARNING: must remain in UPRIGHT position at all times.

- ☑ 3-Phase 400Vac Output
- ☑ Industrial Grade Power
- ☑ High 384Vdc System
- ☑ 950V Max PV Input
- ☑ Max 45KW PV Support

*Specification may change without prior notice

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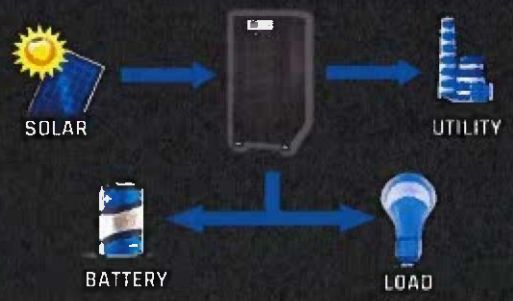
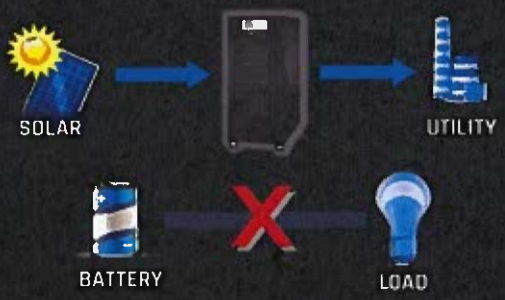
MPP Solar
Buying Solar should be this easy

HYBRID 3-PHASE
SOLAR INVERTER

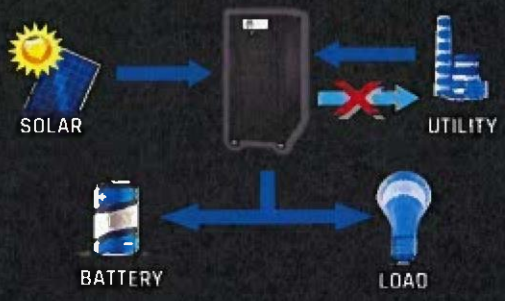
GRID-TIE WITH BACKUP



GRID-TIE ONLY



OFF-GRID ONLY



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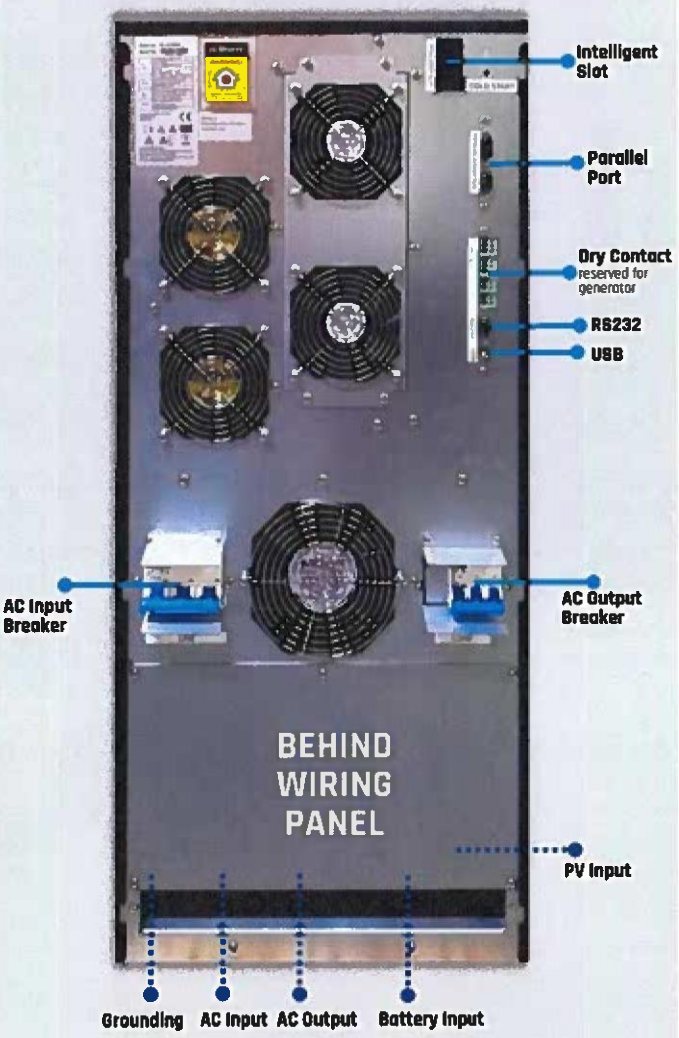

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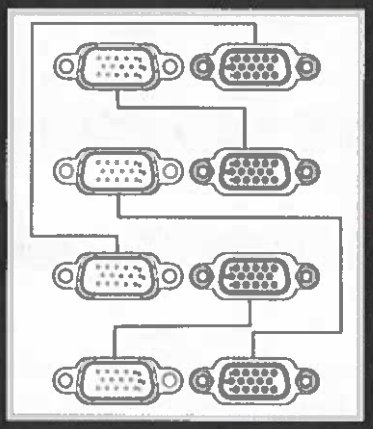
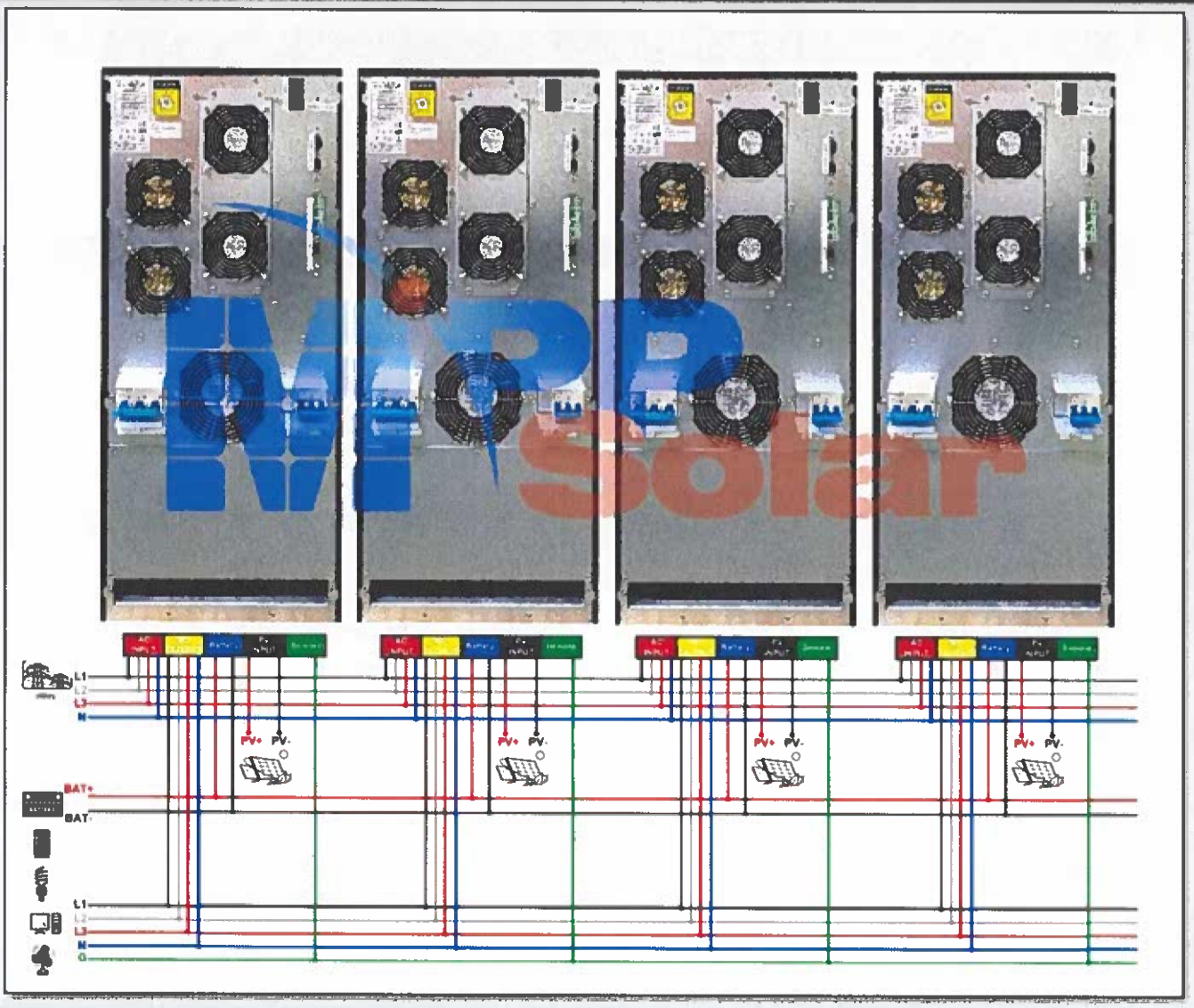
HYBRID 3-PHASE
SOLAR INVERTER

COM PORT CONNECTION:



PARALLEL UP TO 4 UNITS MAX (120KW)



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HYBRID 3-PHASE SOLAR INVERTER

HV V3 3-Phase Series	HV V3 30KW
Rated Power	
Continuous Output	30,000W
Parallel-Ready	Yes, up to 4 units
PV Input Rating (GRID-TIE)	
Max PV Input Power	45,000W
Max PV Input Voltage	950V
Start-up / Initial Feeding Voltage	500 / 550 VDC
PV MPPT Range	460 - 900 VDC
Max PV Input Current	72A
MPPT Tracker	1
AC Input	
Start-up / Auto Restart Voltage	150 - 170 / 180VAC, per phase
Input Voltage Range	170 - 280VAC per phase
Max AC Input Power	30,000W
Nominal Frequency	50 / 60 Hz
Max AC Input Current	43.5A per phase
AC Output	
Nominal AC Output Voltage	230VAC (P-N) / 400VAC (P-P)
Output Voltage Range	195.5 - 253Vac per phase
Output Frequency (GRID-TIE)	49 - 51Hz / 59.3 - 60.5 Hz
Output Frequency (OFF-GRID)	50 / 60Hz, auto-sensing
Output Waveform	Pure Sine Wave
Max Output Power (battery mode)	30,000W
Max DC/AC Conversion Efficiency	91%
Battery Charger	
DC Working Range	320 - 512VDC
DC Charging Range	384-480VDC
Nominal DC Voltage	384VDC
Max Charging Current	80A
Environmental / Mechanical Specification	
Ingress Protection Rating	IP20
Communication Port	RS232, USB
Certifications	CE
Operating Temp.	-10 to 55°C (power derating starts >50°C)
Operating Humidity	0 - 900% RH (No condensing)
Operating Altitude	max 2000m (power derating 1% per 100m beyond 1000m)
Dimension	1021 x 715 x 430mm
Net Weight	221KG

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

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WDYK Store





$39.68 ~~$80.18~~ -50%

Extra 2% off with coins

Choice
- **Free shipping** over $10.00
- **Fast delivery** by Mar 17 - 20
- **Free returns** within 90 days, no questions asked

Tuya WiFi Three Phase 4P 100A Auto-Reclosing Over Under Voltage Protector Prepaid Meter Timer Switch Voice Remote Control

4.5 244 Reviews | 1,000+ sold

Voltage: 380V

380V

Related items

Upholstered Full Size ...	Tuya Smart WiFi RS48...	Tuya WiFi Single Phas...	Tuya WiFi ZigBee Thre...	Greenworks 48V (2 x ...	12V 200AH 120Ah LiF...
5 sold	104 sold	87 sold	10 sold	1 sold	3 sold
$163.72	$45.86 ~~$92.69~~	$20.97 ~~$42.37~~	$95.19 ~~$172.73~~	$191.69	$208.09
Extra 5% off with coins	Extra 2% off with coins...	Extra 2% off with coins...	Extra 2% off with coins...		
Free shipping	Choice Free shipping over $10	Choice Free shipping over $10	Choice Free shipping over $10	Free shipping	Free shipping

Description | Specifications | Customer Reviews (244) | You may also like

Description

Report Item / Suspicious Activity

Overview

This all-in-one design smart IOT device applied to AC 230V/400V, 50/60Hz, rated current up to 63A/100A single or three phase circuits in resident, commercial and industrial buildings with 2.4G WiFi, to measure electricity consumption and offer prepayment as option; to remote control and set protections against over/under voltage, overcurrent, residual current(leakage), high temperature via mobile App anytime anywhere; and auto reclosing after protected conditions recovery to achieve non-attended

management; programmable timing control to make your scheduled life efficiently and save electricity, and sharing device with your family or persons concerned in your team. It also supports local manual control without WiFi, and voice control through AI speaker, such as Amazon Alexa, Google Assistant, Yandex Alice, and etc.

Main specifications

Poles: single phase 2P, three phase 4P available;
Rated voltage: 2P AC230V, 4P AC3x230V/400V (over/under voltage protection adjustable);
Rated current: 1~63A/100A adjustable;
Frequency: 50/60Hz;
Capacity: resistive load≤13kW, inductive load≤6kW;
Self-consumption: <2W;
Mounting: 35mm din-rail;

Functional features

01. Four options on control:
- Remote control anytime anywhere (mobile app, Tuya Smart, Smart Life)
- Voice control (AI speaker, Alexa, Google, Alice, ...)
- Timing control (programmable Schedule)
- Manual control (by keys and handle)

02. Monitor real-time electricity consumption and statistics on phone (A, V, mA, kW, kW/h, ℃);
03. Prepaid metering mode available as option by switch;
04. Adjustable protections against over/under voltage, overcurrent, residual current(leakage), high temperature;
05. Overcurrent protection: 1~63A/100A adjustable, 63A as default;
06. Over voltage protection: 250~400V adjustable, 275V as default;
07. Under voltage protection: 150~190V adjustable, 170V as default;
08. Residual current(leakage) protection: 10~100mA adjustable, 50mA as default;
09. Alarm temperature protection: 50~90℃ adjustable, 60℃ as default;
10. Tripping temperature protection: 60~100℃ adjustable, 70℃ as default;
11. Recovery on-delay time: 5~90s adjustable, 30s as default (manual setting on device by keys, not in app);
12. 2P ground wiring for surge protection, 4P three phase four wire solve three phase unbalance;
13. Local manual setting on device (no need WiFi support);
14. Auto-reclosing after protected conditions recovery;
15. Timing schedule programmable on App;
16. Device sharing among family or your team;

Note: If the protector trips 3 times due to leakage, it will not auto-reclosing until the fault fixed by user to ensure safety!

Download User manual from this link https://www.smtonoff.com/download/User_Manual_Auto-reclosing_Protector.pdf

View more

Specifications

Brand Name	smartmcb	Origin	Mainland China
Certification	CE		

Pelio-L-5.12

Pelio was specifically developed for modern residential properties...

Force-L1

Pylontech Force L1 is inherit with our modular design concept, com...

Force L2

Pylontech Force L2 is the latest version of HESS (home energy stor...

US5000

US5000 is the latest Pylontech 48V LFP battery with bigger capacit...

US3000C

US3000C our is the latest HESS battery system provided by Pylontec...

US2000C

EG4® 18KPV-12LV

Hybrid Inverter/Charger

The EG4® 18KPV is a 48V split phase, hybrid inverter/charger capable of utilizing 18kW of PV and efficiently outputting 12kW of power while charging your battery bank. You can parallel up to 10 units for 120kWs of AC power and control multiple stations and units using the new EG4® monitoring software.

AC Coupling Capability

Remote Adjustments via EG4® Software

10-Year Warranty

All-In-One Hybrid Inverter

Capable of running entirely off the grid, using grid electricity, or selling power back to the grid.

600VDC Max

The extra high voltage enables lower cable sizing for the 3 MPPTs and a maximum recommended PV input of 21,000W. Eliminating the need for a combiner box.

Mountable Wi-Fi Device

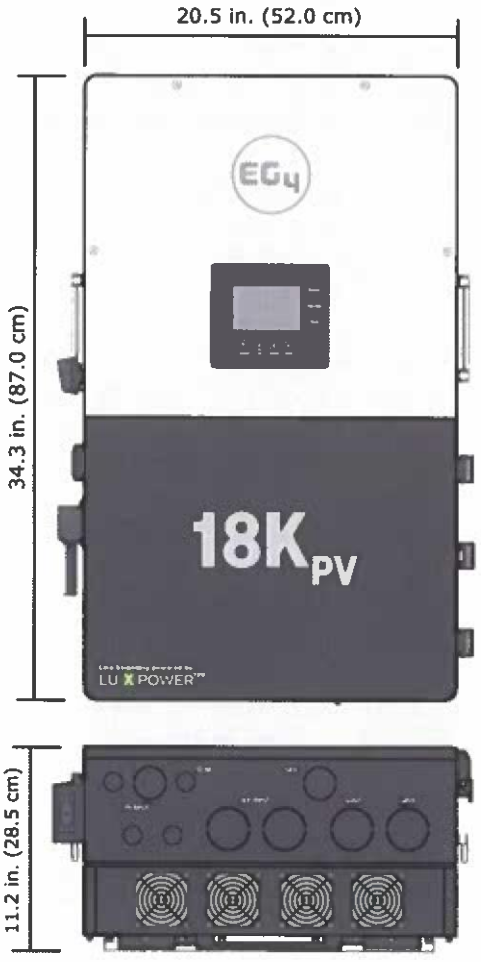
Enables wireless connection between our new monitoring platform and the 18KPV through the app or online website.

Closed-Loop Communications

Able to communicate with EG4® 48V batteries and other battery brands. *A firmware update is required for closed-loop communications with LifePower4 batteries.

High Frequency, Split Phase Output

Allows for 120/240V with a single unit or 120/208VAC service operation.



EG4® 18KPV-12LV

Hybrid Inverter/Charger

AC Input Data	
Nominal AC Voltage	240 | 208VAC
Frequency	50/60Hz
Max. Continuous AC Current	50A
AC Grid Output Data	
Max. Continuous Output Current	50A
AC Bypass (Grid)	200A
Rated Voltage	240VAC
Operating Voltage Range	180–270VAC
Nominal Power Output (W)	@240V 12kW/@208V 10.4kW
Operating Frequency	50/60Hz
Phase Shift	0.99@ full load
Reactive Power Adjust Range	(-0.8) – (+0.8) leading adjustable
Sync Inrush Current	35A
Backup/UPS AC Output Data	
Rated Output Current (240V/208V)	50A
AC Bypass (Generator)	90A
Nominal Output Voltage (V)	240 | 120/240 | 120/208 VAC
Rated Output Power (W)	@240VAC 12kW/@208VAC 10.4kW
Max Cont. Line Wattage	8kW per 120V
Peak Power (W)	With PV: 14.7kW (10 min), 15.5kW (5 min) Without PV: 13.5kW (10 min)
Operating Frequency	50/60Hz
THDV (Total Harmonic Distortion Voltage)	<5%
Switching Time	10ms
PV Input Data	
Number of MPPTs	3
Inputs per MPPT	2/1/1
Max. Usable Input Current	25/15/15A
Max. Short Circuit Input Current	31/19/19A
DC Input Voltage Range	100–600 VDC
Unit Startup Voltage	100 VDC
Load Output Minimum Voltage	>140 VDC
MPP Operating Voltage Range	120–500 VDC
Full Power MPPT Voltage Range	230–500 VDC
Nominal MPPT Voltage	360 VDC
Maximum Utilized Solar Power	18kW
Recommended Maximum Solar Input	21kW

EG4® 18KPV-12LV

Hybrid Inverter/Charger

Efficiency	
Max. Efficiency @ PV to Grid	97.5%
Max. Efficiency @ Battery to Grid	94%
MPPT Efficiency	99.9%
Battery Charging Efficiency	95%
Battery Discharging Efficiency	94.5%
Idle Consumption (Normal mode)	≈70W
Idle Consumption (Standby mode)	≈18W
Battery Data	
Type	Lead-acid battery/Lithium battery
Max. Charge/ Discharge Current	250A
Nominal Voltage	48 VDC
Voltage Range	40–60 VDC
General Data	
Integrated Disconnect	DC switch
PV Reverse Polarity Protection	Yes
DC Switch Rating for each MPPT	Yes
Output Over-Voltage Protection Varistor	Yes
Output Over-Current Protection	Yes
Grid Monitoring	Yes
Anti-islanding Protection (Fast Zero Export)	Yes
Pole Sensitive Leakage Current Monitoring Unit	Yes
Surge Protection Device	Yes
Dimensions H×W×D	34.3×20.5×11.2 in. (87×52×28.5 cm)
Weight	121.25 lbs (55kg) 132.28 lbs (60kg) with the packaging
Cooling Concept	Fan
Topology	TL (Transformerless)
Relative Humidity	0-100%
Altitude	<2,000m
Operating Temperature Range	-25~60°C, >45° derating
Noise Emission	68dB @3ft
Display	Color touchscreen
Communication Interface	RS485/Wi-Fi/CAN
Standard Warranty	10* year standard warranty
	*See EG4® Warranty Registration for terms and conditions

EG4® 18KPV-12LV

Hybrid Inverter/Charger

Standards and Certifications	
Safety	
UL1741SB Rule 21	Yes
Rapid Shut Down (RSD) NEC 2020:690.12	Yes
Arc-Fault Circuit Interrupter (AFCI) NEC 2020:690.11 / UL1699B	Yes
Ground Fault Monitoring (GFDI) NEC 2020:690.41(B)	Yes
CSA 22.2.107.1	Yes
CSA 22.2.330	Yes
Grid Connection	
IEEE 1547.1:2020; IEEE 1547:2018	Yes
Hawaii Rule 14H	Yes
California Rule 21 Phase I, II, III	Yes
EMC	
FCC Part 15 Class B	Yes
Outdoor Rating	
NEMA 4X / IP65	Yes





EG4 6000XP Off-Grid Inverter | 8000W PV Input | 6000W Output | 480V VOC Input | 48V 120/240V Split Phase | All-In-One Solar Inverter

★★★★★ 4 reviews

Quantity: 1

$1,499.00
Starting at $94/mo with affirm.
Prequalify now

ADD TO CART

SKU:	1511090
Rated Output Power:	6000W
Max PV Input:	10,000W
Max Charging Current:	125A
Paralleling:	16 units for 96kWs

$1,315.12 ~~$2,087.50~~ -37%

Wholesale 3+ pieces, extra 1% off

SRNE 8/10KW Hybrid Solar Inverter Max PV 500V 48V To 220/230V Dual MPPT Max 22A Charge Current Time-slot charging and discharge

★★★★★ 5.0 | 1 Review | 4 sold

Coupon & Discount

$35.00 off
On orders over $1,199...

Color: ASFS 10KW with wifi

ASFS 8KW | ASFS 8KW with wifi | ASFS 10KW | ASFS 10KW with wifi

Input Voltage: 48V

48V

Related items

SRNE 10KW 48V To 23... 3 sold

SRNE 12KW Three-Ph... 7 sold

SRNE Hybrid Solar Inv... 1 sold

Getemete 10KW 48V ... 2 sold

SRNE 10KW single/thr... 3 sold

SRNE 5KW Hybrid Sol... 13 sold

SRNE

NEW
BEST QUALITY

ASF series

Hybrid Solar Charge Inverter

ASF4880U180-H ASF48100U200-H

Efficient

- Dual MPPT with up to 99.9% efficiency
- Up to 22A PV input current perfect for high power modules

Reliable

- Outputs high quality pure sine wave AC power
- 8-10kW load power to meet the needs of most households

User-friendly

- Industrial design with a modern aesthetic look
- Easy to install and simple to use

Safety

- 360 degrees of security from hardware to software
- EU and North American safety approvals

All-in-one

- Solar Charger Controller up to 200A charging current
- Support for Li-ion battery BMS communication

Intelligent

- Exclusive Li-ion battery BMS dual activation
- Time-slot function to save cost with peak-valley tariff

www.srnesolar.com

SRNE

MODEL	ASF4880U180-H	ASF48100U200-H	CAN BE SET
INVERTER OUTPUT			
Rated Output Power	8,000W	10,000W	
Max.Peak Power	16,000W	20,000W	
Rated Output Voltage	120Vac (single phase L+N+PE) / 240Vac (split phase L1+L2+N+PE)		✓
Load Capacity of Motors	5HP	6HP	
Rated AC Frequency	50/60Hz		✓
Waveform	Pure Sine Wave		
Switch Time	10ms (typical)		
Parallel capacity	/		
Output Mode	Off-grid (default) / Hybrid		
BATTERY			
Battery Type	Li-ion / Lead-Acid / User Defined		✓
Rated Battery Voltage	48Vdc		
Voltage Range	40~60Vdc		✓
Max.MPPT Charging Current	180A	200A	✓
Max.Mains/Generator Charging Current	100A	120A	✓
Max.Hybrid Charging Current	180A	200A	✓
PV INPUT			
Num. of MPP Trackers	2		
Max.PV array power	5,500W + 5,500W		
Max.input current	22A + 22A		
Max.Voltage of Open Circuit	500Vdc + 500Vdc		
MPPT Voltage Range	125~425Vdc		
MAINS / GENERATOR INPUT			
Input Voltage Range	90~140Vac		
Frequency Range	50/60Hz		
Bypass Overload Current	63A		
EFFICIENCY			
MPPT Tracking Efficiency	99.9%		
Max. Battery Inverter Efficiency	92%		
GENERAL			
Dimensions	620*445*130mm (2*1.46*0.4ft)		
Weight	27kg (59.5lb)		
Protection Degree	IP20, Indoor Only		
Operating Temperature Range	-15~55°C,>45°C derated (5~131°F, >113°F derated)		
Noise	<60dB		
Cooling Method	Internal Fan		
Warranty	2 Years		
COMMUNICATION			
Embedded Interfaces	RS485 / CAN / USB / Dry contact		✓
External Modules (Optional)	Wi-Fi / GPRS		✓
CERTIFICATION			
Safety	IEC62109-1, IEC62109-2,UL1741		
EMC	EN61000-6-1, EN61000-6-3, FCC 15 class B		
RoHS	Yes		

PIP-GK *PF1.0* SERIES

Off-Grid Solar Inverter

MAIN FEATURES

- **NEW! Batteryless Operation Support**
- **NEW! Improved Monitoring Features (Removable USB / RS232, RS485, Bluetooth)**
- **NEW! Removable LCD Control Display (20m)**
- **NEW! Reserved BMS port for Pylontech battery only (select models)**
- Max 3KW, 24V/ 5KW, 48V model
- High frequency pure sine wave design
- High PV Input up to 500V open circuit
- Max 80A MPPT solar charging (up to 5KW PV max)
- Equalization Charging
- Max charging voltage 31.5V @ 24V, or 61V @ 48V
- Suitable for Off-Grid or with Grid backup
- Generator starter dry contact port
- Programmable parameters on LCD
- Max up to 60A utility charging
- Lightweight, easy to install
- FREE monitoring software
- LCD Display + LED indicators

REMOVABLE DISPLAY

MOBILE MONITORING VIA BLUETOOTH

EQUALIZATION CHARGING

BATTERYLESS SUPPORT

PIP-GK SERIES	3024GK	5048GK
ELECTRICAL SPECIFICATION		
Continuous Output	3KW	5KW
Surge Rating	6KVA	10KVA
Input Power Factor	1	
Input Voltage Range	90~280VAC (Appliance), 170~280VAC (UPS)	
Input/Output Frequency	50Hz / 60Hz	
Output Voltage	230VAC±5%	
Output Waveform	Pure Sine Wave	
Output Short Circuit	Circuit Breaker	
Peak Efficiency	93%	
Nominal DC Voltage	24V	48V
Max DC Input	33V	63V
Transfer Time	<10ms (UPS mode), <20ms (Appliance mode)	
Charging Mode	3-stage	
Max AC Charging Current	60A	
Equalization Charge	31.5V	61V
SOLAR CHARGER SPECIFIATIONS		
Charging Algorithm	MPPT	
Max PV Array	4000W	5000W
Max Charging Current	80A	
Max PV Input Voc	500VDC	
MPPT Range	120 - 450VDC	
ENVIRONMENTAL / MECHANICAL SPECIFICATIONS		
Certification	CE	
Communication Interface	Removable USB, RS232/RS485, Bluetooth, Dry Contact	
Operating/Storage Temp.	0°C ~ 50°C / -15°C~ 60°C	
Operating Humidity	20~90%RH Non-Condensing	
Dimension	400*300*115mm	
Net Weight	11KG	13KG

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Sumry 5500W 48V Solar Hybrid Inverter Pure Sine Wave 110A MPPT Controller
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PowMr 5000W Solar Inverter Charger POW-LVM5.0K-48V-H Off Grid UNTESTED
$399.99
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5000W Solar Inverter Hybrid 48V DC to 110V AC Pure Sine Wave 80A MPPT Controller
$577.79
~~$641.99~~
Free shipping




5000w 48v 240v pure sine wave MPP solar inverter 50A PWM solar charger UPS

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Condition: **New**

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Make offer
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Additional service available
☐ 3-year protection plan from Allstate - $31.99

Breathe easy. Returns accepted.

SINGLE PHASE			
AMP	VOLT	WATT	KILO WATT
10	115	1150	1.15
20	115	2300	2.3
30	115	3450	3.45
40	115	4600	4.6
50	115	5750	5.75
60	115	6900	6.9
70	115	8050	8.05
80	115	9200	9.2
90	115	10350	10.35
100	115	11500	11.5
110	115	12650	12.65
120	115	13800	13.8
130	115	14950	14.95
140	115	16100	16.1
150	115	17250	17.25
160	115	18400	18.4
170	115	19550	19.55
180	115	20700	20.7
190	115	21850	21.85
200	115	23000	23

SPLIT PHASE			
AMP	VOLT	WATT	KILO WATT
10	230	2300	2.3
20	230	4600	4.6
30	230	6900	6.9
40	230	9200	9.2
50	230	11500	11.5
60	230	13800	13.8
70	230	16100	16.1
80	230	18400	18.4
90	230	20700	20.7
100	230	23000	23
110	230	25300	25.3
120	230	27600	27.6
130	230	29900	29.9
140	230	32200	32.2
150	230	34500	34.5
160	230	36800	36.8
170	230	39100	39.1
180	230	41400	41.4
190	230	43700	43.7

200	230	46000	46

3 PHASE			
AMP	VOLT	FACTOR SQRT2	KW
10	208	1.732	3.60256
20	208	1.732	7.20512
30	208	1.732	10.80768
40	208	1.732	14.41024
50	208	1.732	18.0128
60	208	1.732	21.61536
70	208	1.732	25.21792
80	208	1.732	28.82048
90	208	1.732	32.42304
100	208	1.732	36.0256
110	208	1.732	39.62816
120	208	1.732	43.23072
130	208	1.732	46.83328
140	208	1.732	50.43584
150	208	1.732	54.0384
160	208	1.732	57.64096
170	208	1.732	61.24352
180	208	1.732	64.84608
190	208	1.732	68.44864
200	208	1.732	72.0512

SOLAR PANEL AMOUNT 115V Inverter			
KW	500W PANELS	WATTS	NO OF PNL
1	500	1000	2
2	500	2000	4
3	500	3000	6
4	500	4000	8
5	500	5000	10
6	500	6000	12
7	500	7000	14
8	500	8000	16
9	500	9000	18
10	500	10000	20
11	500	11000	22
12	500	12000	24
13	500	13000	26
14	500	14000	28
15	500	15000	30
16	500	16000	32
17	500	17000	34
18	500	18000	36
19	500	19000	38

20	500	20000	40
21	500	21000	42
22	500	22000	44
23	500	23000	46
24	500	24000	48
25	500	25000	50
26	500	26000	52
27	500	27000	54
28	500	28000	56
29	500	29000	58
30	500	30000	60
31	500	31000	62
32	500	32000	64
33	500	33000	66
34	500	34000	68
35	500	35000	70
36	500	36000	72
37	500	37000	74
38	500	38000	76
39	500	39000	78
40	500	40000	80
41	500	41000	82
42	500	42000	84
43	500	43000	86
44	500	44000	88
45	500	45000	90
46	500	46000	92
47	500	47000	94
48	500	48000	96
49	500	49000	98
50	500	50000	100

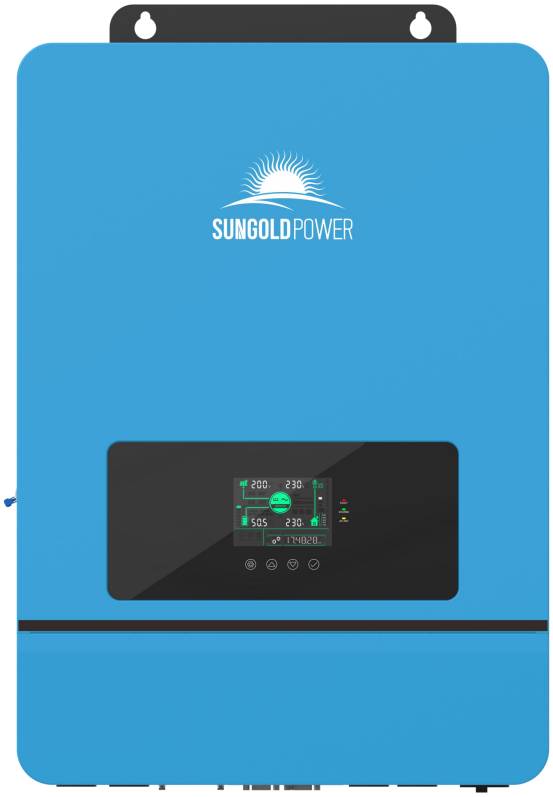
230V Inverter			
KW	500W PANELS	WATTS	NO OF PNL
1	500	1000	4
2	500	2000	8
3	500	3000	12
4	500	4000	16
5	500	5000	20
6	500	6000	24
7	500	7000	28
8	500	8000	32
9	500	9000	36
10	500	10000	40
11	500	11000	44
12	500	12000	48

13	500	13000	52
14	500	14000	56
15	500	15000	60
16	500	16000	64
17	500	17000	68
18	500	18000	72
19	500	19000	76
20	500	20000	80
21	500	21000	84
22	500	22000	88
23	500	23000	92
24	500	24000	96
25	500	25000	100
26	500	26000	104
27	500	27000	108
28	500	28000	112
29	500	29000	116
30	500	30000	120
31	500	31000	124
32	500	32000	128
33	500	33000	132
34	500	34000	136
35	500	35000	140
36	500	36000	144
37	500	37000	148
38	500	38000	152
39	500	39000	156
40	500	40000	160
41	500	41000	164
42	500	42000	168
43	500	43000	172
44	500	44000	176
45	500	45000	180
46	500	46000	184
47	500	47000	188
48	500	48000	192
49	500	49000	196
50	500	50000	200

SOLAR PANEL AMOUNT A1183Phase 208V Inverter			
KW	500W PANELS	WATTS	NO OF PNL
1	500	1000	8
2	500	2000	16
3	500	3000	24
4	500	4000	32

5	500	5000	40
6	500	6000	48
7	500	7000	56
8	500	8000	64
9	500	9000	72
10	500	10000	80
11	500	11000	88
12	500	12000	96
13	500	13000	104
14	500	14000	112
15	500	15000	120
16	500	16000	128
17	500	17000	136
18	500	18000	144
19	500	19000	152
20	500	20000	160

User Manual



All-in-one solar charge inverter

SPH8048P

SPH10048P

Contents

1. Safety

1.1 About this Manual

- This Manual contains important information, guiding principles, operation, and maintenance of the product, and applies to the model: SPH U series
- Users must follow the instructions in this Manual during installation, use, and maintenance

1.2 Symbols and description

Symbol	Description
⚠ DANGER	Dangerous situations that will lead to death or serious injury when ignored
⚠ WARING	Dangerous situations that may lead to death or serious injury when ignored
⚠ CAUTION	Dangerous situations that may lead to mild or moderate injury when ignored
ⓘ NOTICE	Operation tips

1.3 Safety matters

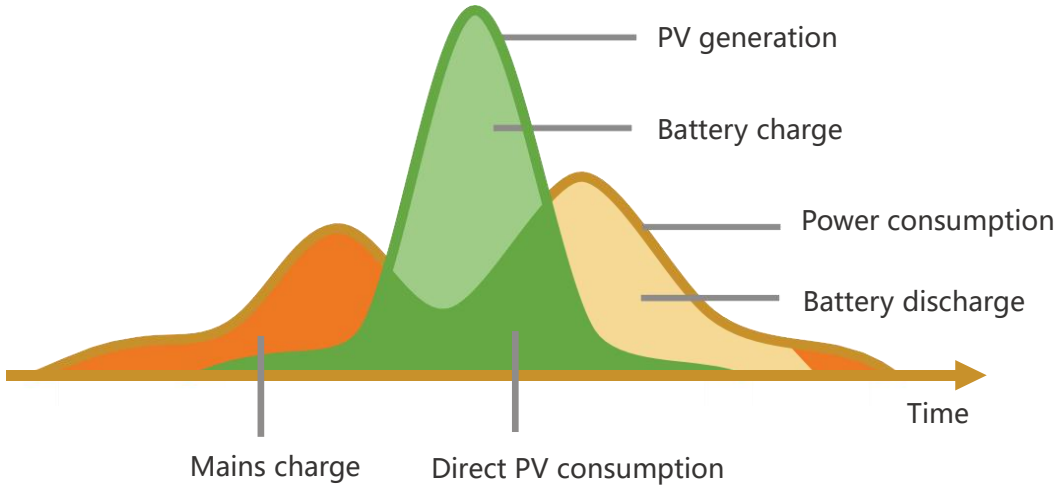
⚠ DANGER

- This chapter contains important safety matters. Please read and keep this Manual for future reference.
- Please make sure to comply with local requirements and regulations when installing the inverter.
- Be careful of high voltage. Before and during installation, please turn off the switch of each power supply to avoid electric shock.
- In order to achieve optimal operation of the inverter, please select the appropriate cable size and necessary protective devices according to regulations.
- Do not connect or disconnect any connections when the inverter is working.
- Do not open the terminal cover when the inverter is working.

2. About the Product

2.1 Description

SPH series is a new type of solar storage inverter that integrates PV storage, mains charge, and energy storage and outputs sinusoidal AC. Equipped with DSP control and advanced control algorithm, it has high response speed and good reliability, and applies to industrial scenarios.



2.2 Features

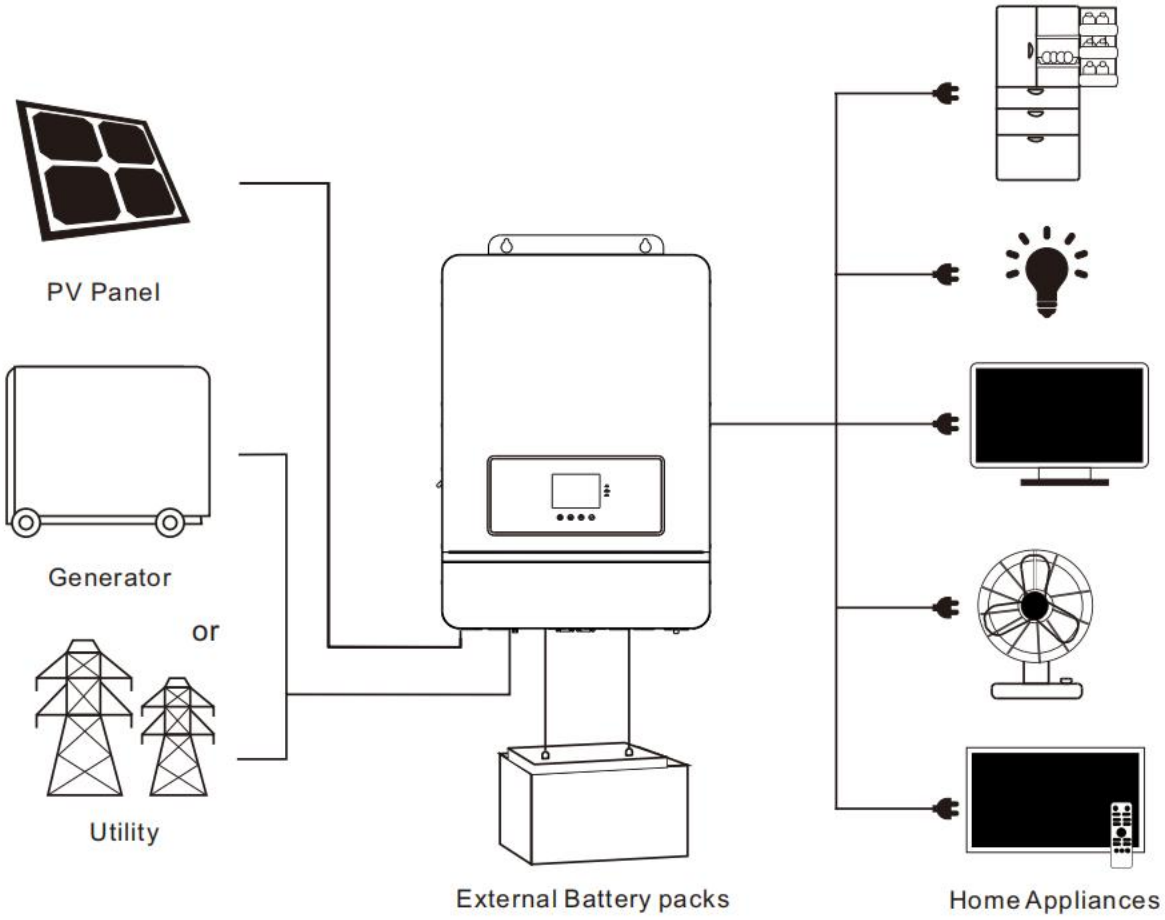
- Support the connection of various types of energy storage batteries such as lead-acid battery and lithium-ion battery
- Have the dual activation function during lithium-ion battery sleep, that is, access to mains/PV power can activate the lithium-ion battery
- Support split-phase/single-phase pure sine wave output
- Support adjusting the voltage of each phase within the range of 100 VAC, 105 VAC, 110 VAC, and 120 VAC
- Support two-channel PV input and have the function of simultaneous two-channel maximum power point tracking (MPPT) for charging/carrying capacity
- Support two-channel MPPT, with an efficiency of up to 99.9% and a maximum single-channel current of 22 A, perfectly fitting high-power modules
- Provide four charge modes: only PV, mains first, PV first, and mains + PV
- Have the timed charge and discharge function, that is, users can set the charge and discharge time according to the time-of-use price to save electricity costs
- Have the energy-saving mode, reducing no-load energy losses
- Provide two output modes: mains bypass output and inverter output, achieving uninterrupted power supply
- Support LCD display of dynamic flowchart, updating system data and operating status at any time
- Provide 360 ° protection, including short circuit protection, overcurrent protection, overvoltage and undervoltage protection, and overload protection
- Support CAN, USB, RS485 communication

2.3 System connection diagram

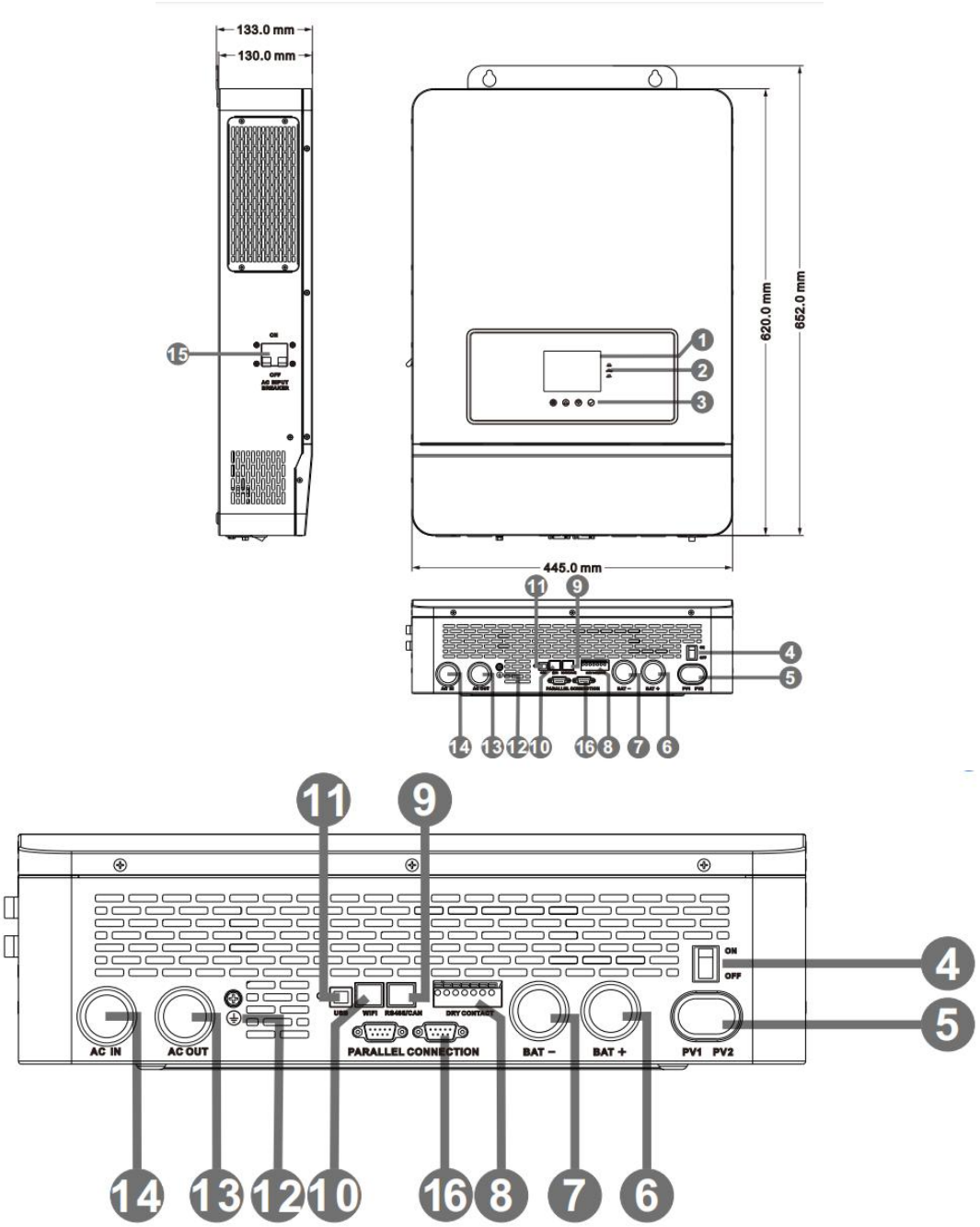
The following figure shows the system application scenario of the product. A complete system consists of the following parts:

1. **PV module:** It converts solar energy into DC to charge batteries or into AC to supply power to loads.
2. **Mains or generator:** Connected to AC input, it can charge batteries while supplying power to loads. When the battery and PV module supply power to the load, the system can generally operate without mains or generator.
3. **Battery:** The function of a battery is to ensure normal power supply for the system load when there is insufficient PV power and no mains.
4. **Household load:** It can connect various household and office loads, including refrigerators, lighting fixtures, TVs, fans, air conditioners, and other AC loads.
5. **Inverter:** It is the energy conversion device of the entire system.

- **The actual application scenario determines the specific system wiring mode**



2.4 Product overview



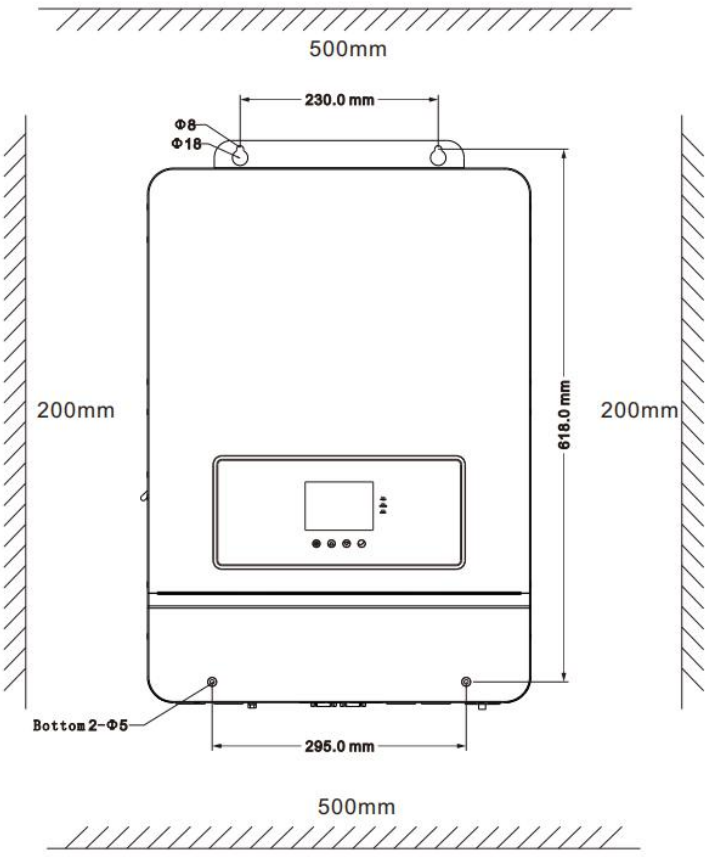
1	LCD screen	2	LED indicator	3	Physical button
4	ON/OFF rocker switch	5	PV input (1/1)	6	Battery (positive electrode)
7	Battery (negative electrode)	8	Dry contact	9	RS485/CAN port
10	WIFI port	11	USB-B port	12	Grounding screw
13	AC output (L1+L2+N)	14	AC input (L1+L2+N)	15	AC input circuit breaker
16	Parallel communication port				

3. Installation

3.1 Installation location

SPH series is only for indoor use **(protection level: IP20).** Before selecting the installation location, users should consider the following factors:

- A solid wall
- Installation height: flush with the line of sight
- Sufficient heat dissipation space
- Ambient temperature: -10°C–55°C (14°F–131°F), to ensure optimal operation



⚠ DANGER

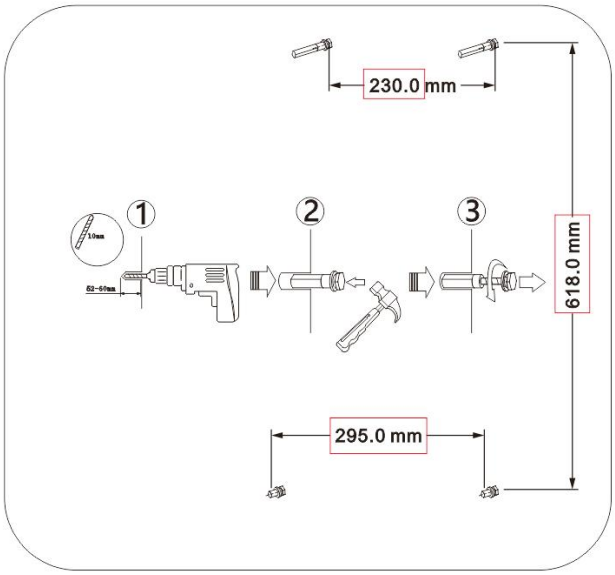
- Do not install the inverter near highly flammable materials
- Do not install the inverter in potentially explosive areas
- Do not install the inverter and lead-acid battery in enclosed spaces

⚠ CAUTION

- Do not install the inverter in direct sunlight
- Do not install or use the inverter in damp environments

3.2 Inverter installation

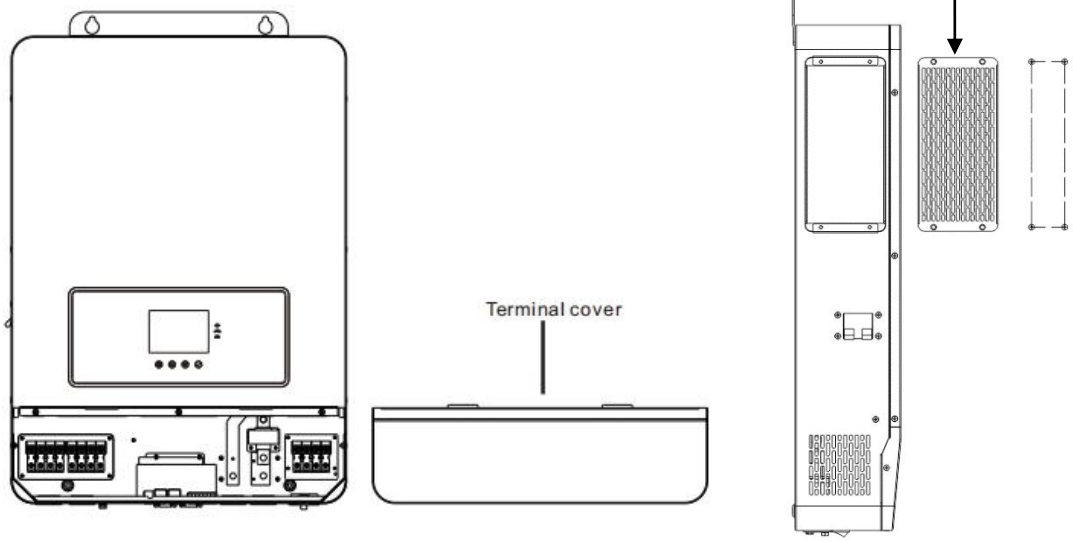
Drill 4 installation holes of the specified sizes on the wall with an electric drill, insert 2 expansion screws above, and fix the inverter with 2 M5 screws below.



3.3 Removal of terminal cover and insect-proof net

Remove the terminal cover and insect-proof net with a screwdriver

Remove the insect-proof net when cleaning



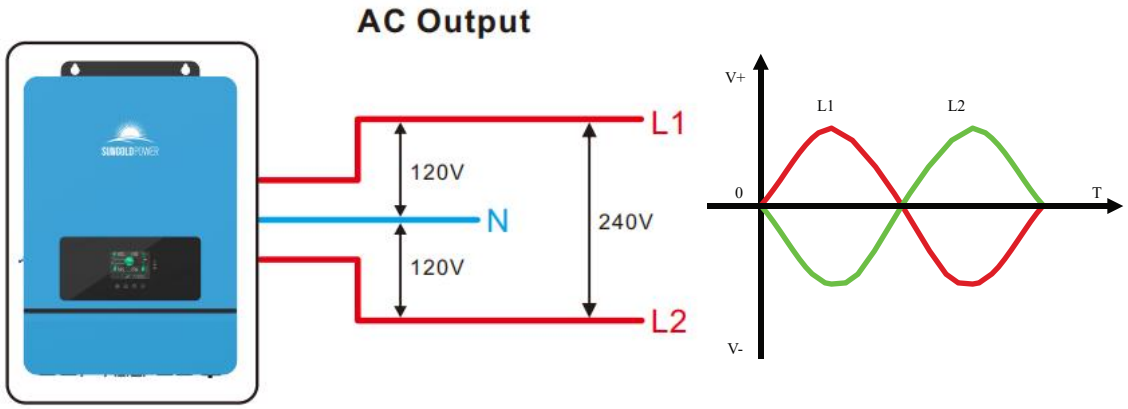
NOTICE

- When using the inverter in areas with poor air quality, the dustproof net is easily blocked by air particles. Please regularly remove and clean it to avoid affecting the air flow rate inside the inverter; otherwise it may cause inverter overheating (19/20 fault), and affect power supply and the service life of the inverter

4. Wiring

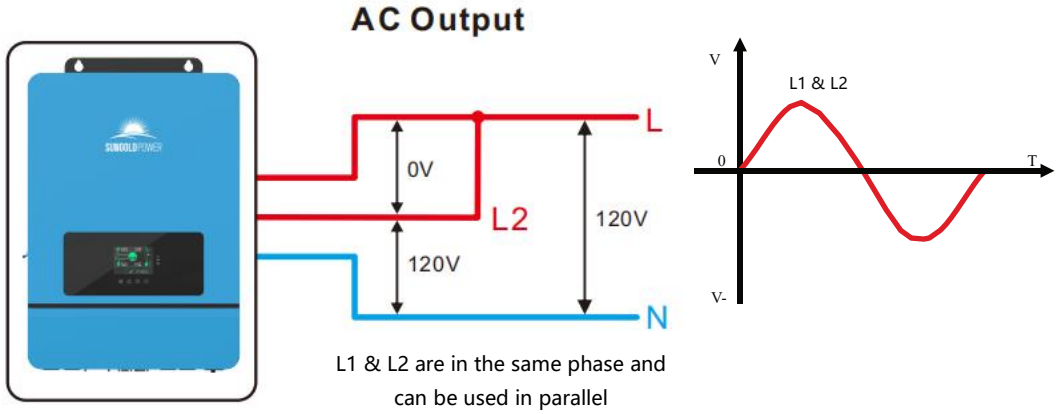
4.1 Wiring mode (depends on the output mode)

- **Split-phase mode (default)**



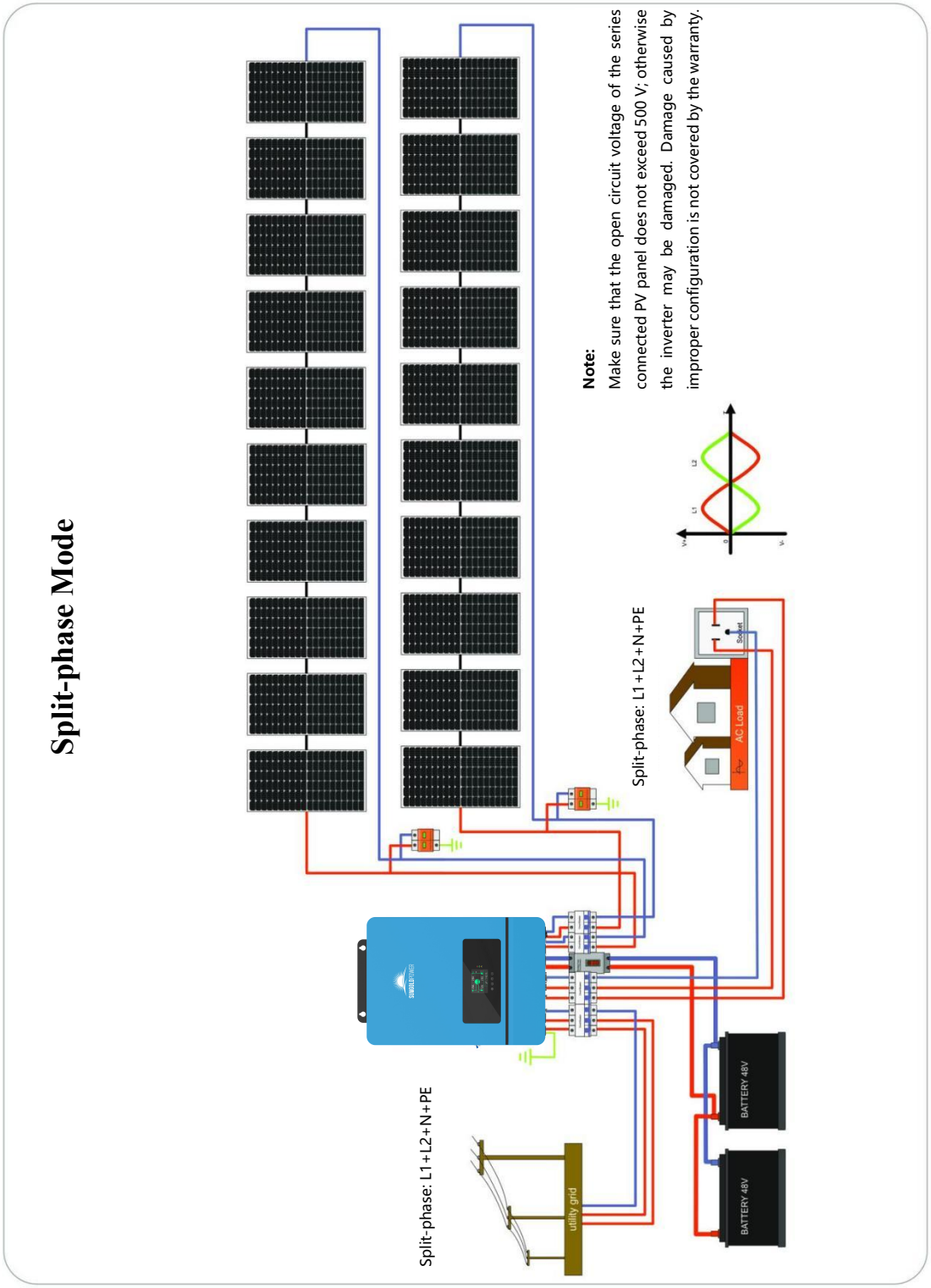
Item	Description
Applicable model	SPH series U model
AC output phase voltage (L-N)	100 VAC~120 VAC, 120 VAC (default)
AC output line voltage (L-L)	200 VAC~240 VAC, 240 VAC (default)

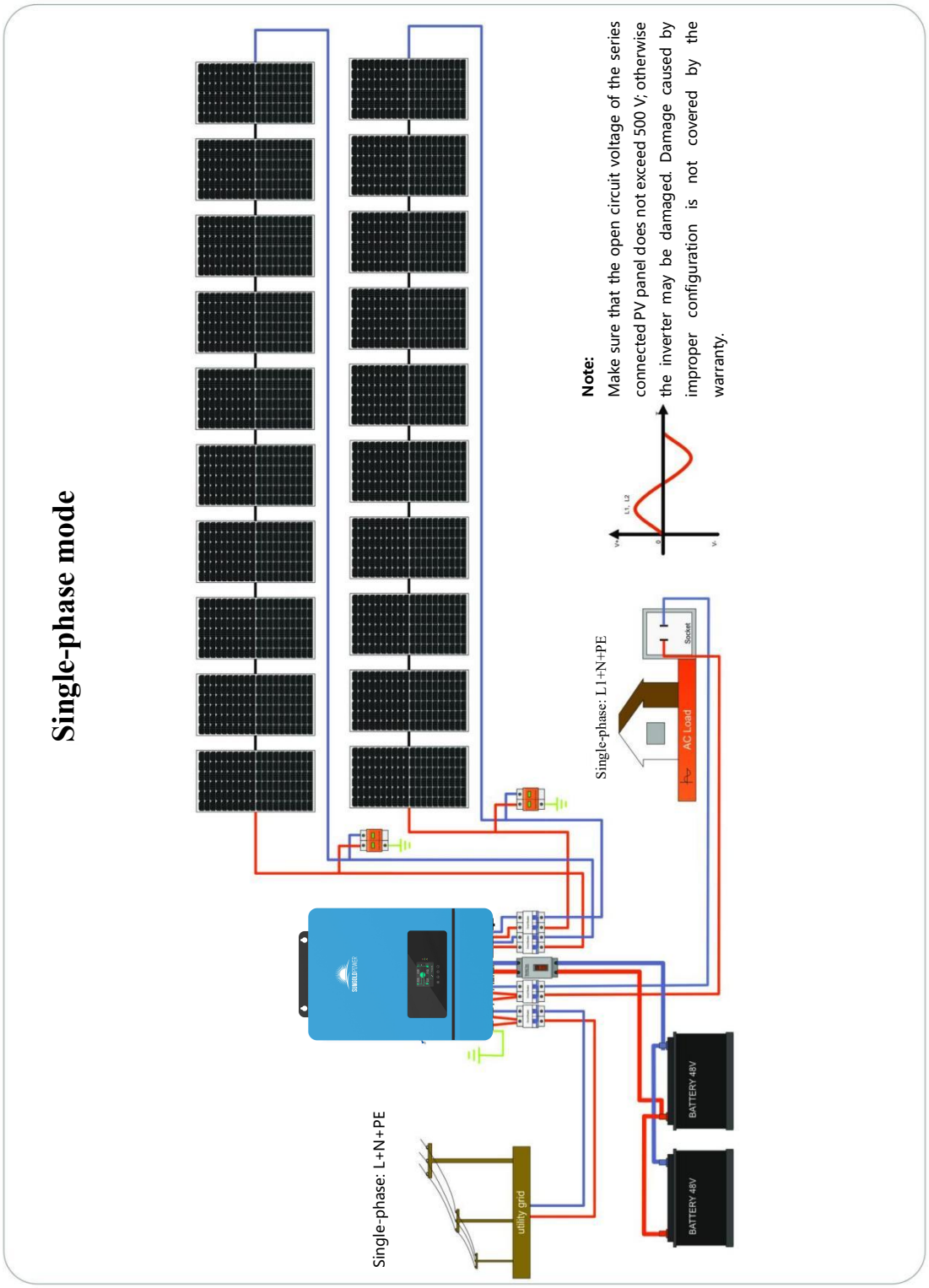
- **Single-phase mode**



L1 & L2 are in the same phase and can be used in parallel

Item	Description
Applicable model	SPH series U model
AC output phase voltage (L-N)	100 VAC~120 VAC, 120 VAC (default)


Split-phase Mode
Note:
Make sure that the open circuit voltage of the series connected PV panel does not exceed 500 V; otherwise the inverter may be damaged. Damage caused by improper configuration is not covered by the warranty.
Split-phase: L1+L2+N+PE
Split-phase: L1+L2+N+PE
AC Load
Socket
utility grid
BATTERY 48V
BATTERY 48V

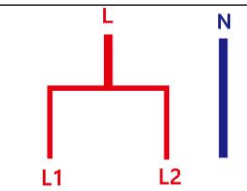
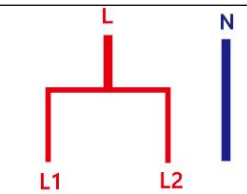

Single-phase mode
Note:
Make sure that the open circuit voltage of the series connected PV panel does not exceed 500 V; otherwise the inverter may be damaged. Damage caused by improper configuration is not covered by the warranty.
L1, L2
Single-phase: L1+N+PE
Socket
AC Load
BATTERY 48V
BATTERY 48V
Single-phase: L+N+PE
utility grid

4.2 Cable and circuit breaker model

- **PV INPUT**

Inverter Model	Cable Size	Maximum Input Current	Circuit Breaker Model
SPH8048P	5 mm² /10 AWG	22 A	2P-25A
SPH10048P	5 mm² /10 AWG	22 A	2P-25A

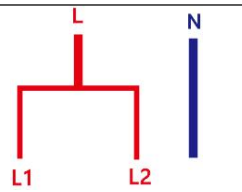
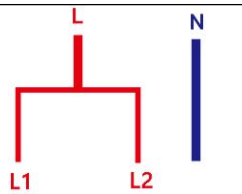
- **AC INPUT**

Inverter Model	Output Mode	Diagram	Maximum Current	Cable Size	Circuit Breaker Model
SPH8048P	Split-phase mode		63A (L1/L2/N)	13mm²/6 AWG (L1\L2\N)	3P-63A
	Single-phase mode	 L1 and L2 in same phase	63A (L1/L2) 126 A (N)	13mm²/6 AWG (L1/L2) 26 mm²/3 AWG (N)	2P-125A
SPH10048P	Split-phase mode		63A (L1/L2/N)	13mm²/6 AWG (L1\L2\N)	3P-63A
	Single-phase mode	 L1 and L2 in same phase	63A (L1/L2) 126 A (N)	13mm²/6 AWG (L1/L2) 26mm²/3 AWG (N)	2P-125A

- **Battery**

Inverter Model	Cable Size	Maximum Current	Circuit Breaker Model
SPH8048P	85 mm²/3/0 AWG	180 A	2P-200A
SPH10048P	107 mm²/4/0 AWG	220 A	2P-250A

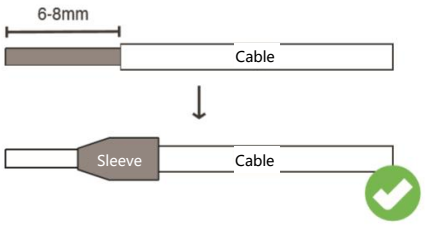
- **AC output**

Inverter Model	Output Mode	Diagram	Maximum Current	Cable Size	Circuit Breaker Model
SPH8048P	Split-phase mode		42A (L1/L2/N)	13mm²/6 AWG (L1\L2\N)	3P-63A
	Single-phase mode	 L1 and L2 in same phase	42A (L1/L2) 84 A (N)	13mm²/6 AWG (L1\L2) 26mm²/3 AWG (N)	2P-125A
SPH10048P	Split-phase mode		63A (L1/L2/N)	13mm²/6 AWG (L1\L2\N)	3P-63A
	Single-phase mode	 L1 and L2 in same phase	63A (L1/L2) 126 A (N)	13mm²/6 AWG (L1\L2) 26mm²/3 AWG (N)	2P-125A

NOTICE

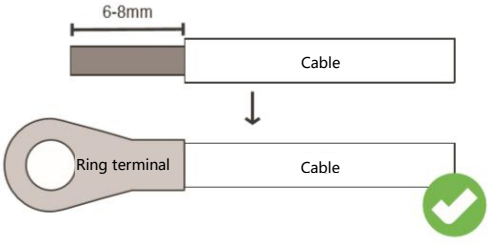
- **PV input, AC input, and AC output terminals**

1. Use a wire stripper to strip off 6 mm–8 mm long insulation layer of the cable.
2. Fix a sleeve at the end of the cable (the sleeve is to be prepared by the user)



- **Battery terminal**

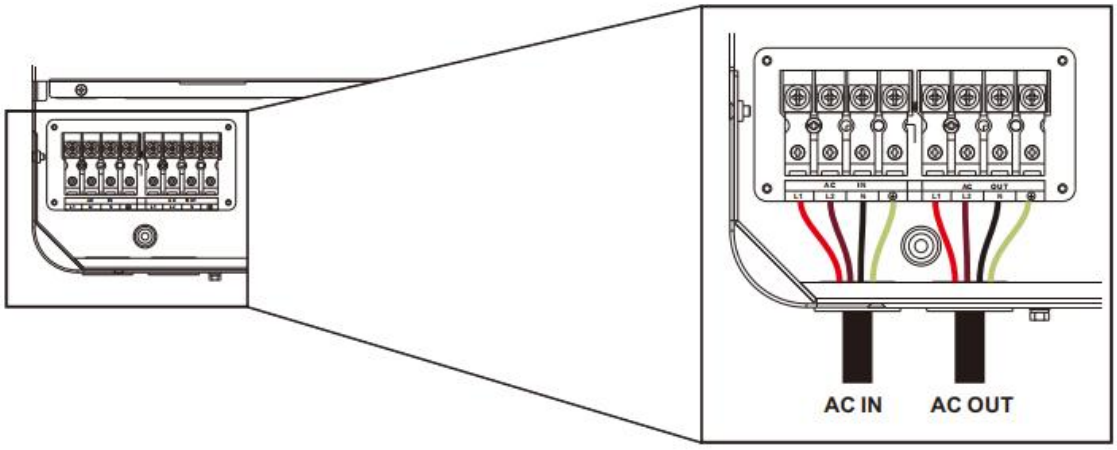
1. Use a wire stripper to strip off 6 mm–8 mm long insulation layer of the cable.
2. Fix a ring terminal (attached) at the end of the cable



The cable size is for reference only. If the distance between the PV array and the inverter or between the inverter and the battery is long, using thicker cables will reduce voltage drop and improve system performance.

4.3 AC input and output wiring

Connect the live wire, neutral wire, and ground wire according to the cable position and sequence shown in the following figure.

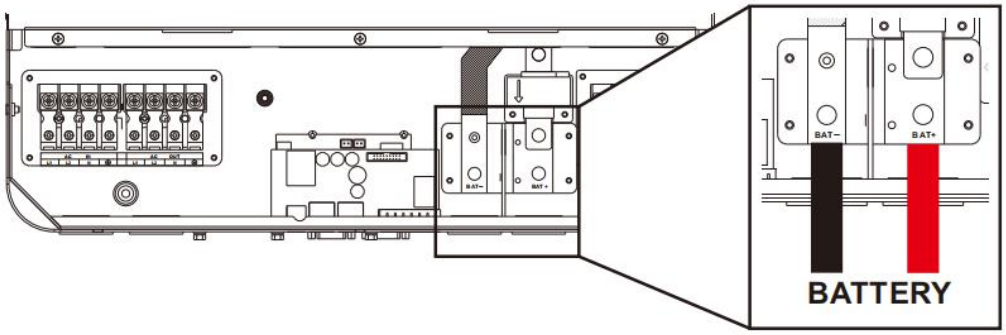


⚠ DANGER

- Before connecting AC input and output, be sure to disconnect the circuit breaker to avoid the risk of electric shock. Do not conduct live operation.
- Please check whether the cables used are sufficient to meet the requirements. Cables that are too thin or of poor quality may pose serious safety hazards.

4.4 Battery wiring

Connect the positive and negative cables of the battery according to the cable position and sequence shown in the following figure

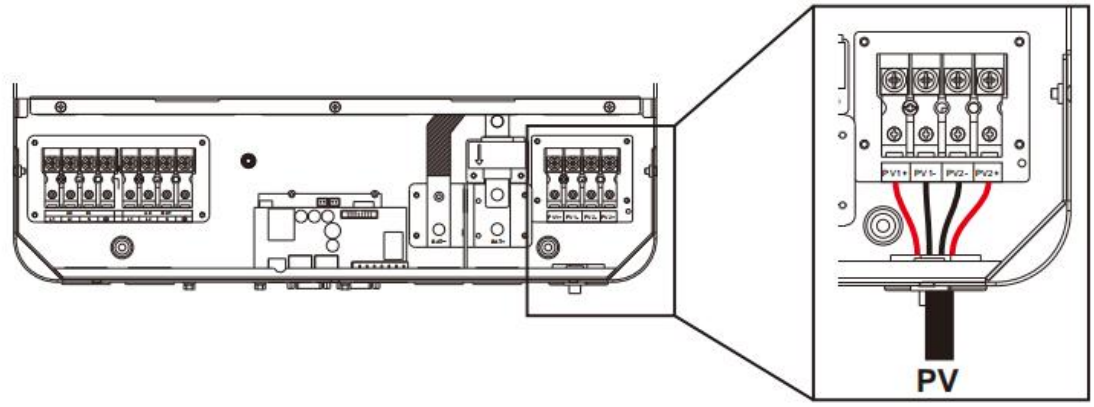


⚠ DANGER

- Before connecting the battery, be sure to disconnect the circuit breaker to avoid the risk of electric shock. Do not conduct live operation.
- Please check the positive and negative terminals of the battery for correct connection and no reverse connection; otherwise it may damage the inverter.
- Please check whether the cables used are sufficient to meet the requirements. Cables that are too thin or of poor quality may pose serious safety hazards.

4.5 PV wiring

Connect the positive and negative terminals of the two-channel PV modules according to the cable position and sequence shown in the following figure.

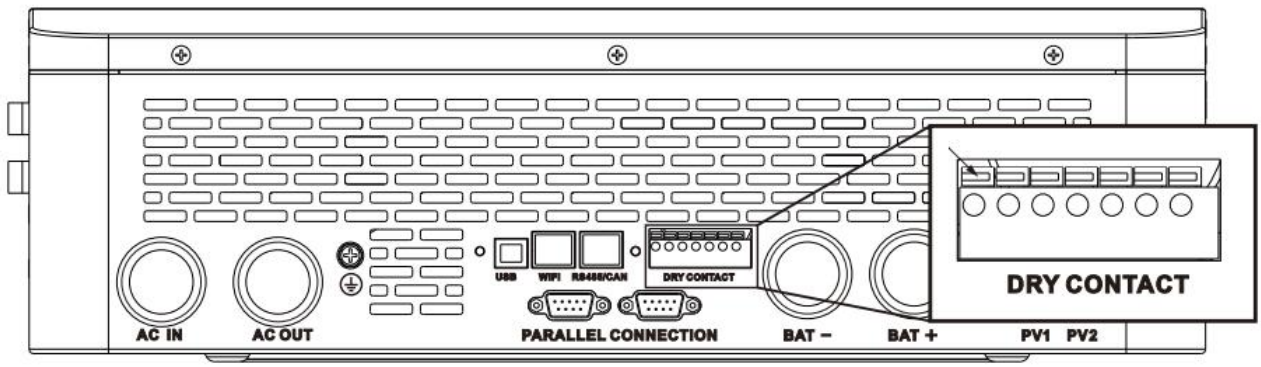


⚠ DANGER

- Before connecting PV modules, be sure to disconnect the circuit breaker to avoid the risk of electric shock. Do not conduct live operation.
- Please make sure that the open circuit voltage of the series connected PV modules does not exceed the maximum open circuit voltage of the inverter (in SPH series, this value is 500 V); otherwise the inverter may be damaged.

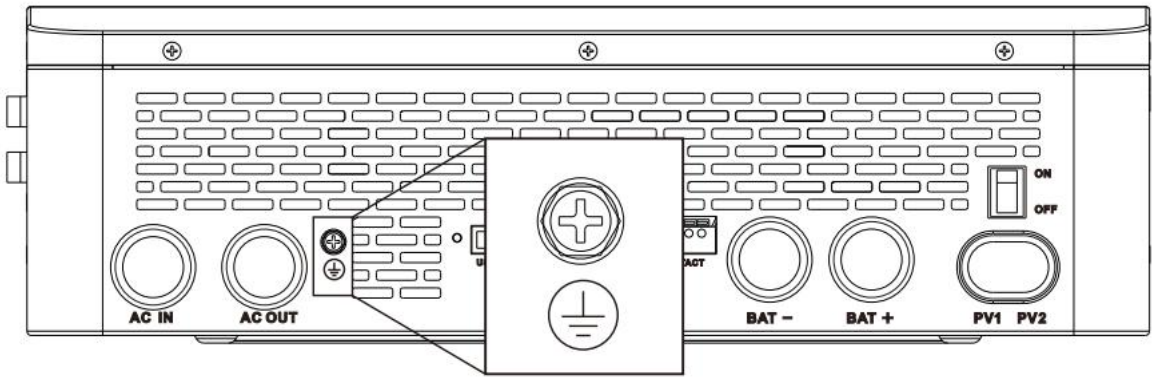
4.6 Dry contact wiring

Use a small-sized screwdriver to push back in the direction indicated by the arrow, and then insert the communication cable into the dry contact port. (Communication cable section: 0.2 mm^2–1.5 mm^2)



4.7 Grounding

Please ensure that the grounding terminal is reliably connected to the grounding busbar.



NOTICE

- The grounding cable size shall not be less than 4 mm² and shall be as close as possible to the grounding point

4.8 Inverter start

After confirming reliable wiring and correct wiring sequence, restore the terminal cover to its original position

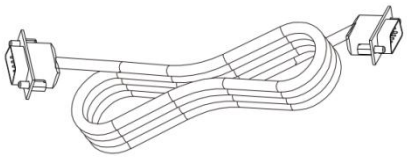
- Step 1: Close the circuit breaker of the battery
- Step 2: Press the rocker switch at the bottom of the inverter, and the screen and indicator will light up, indicating that the inverter is enabled
- Step 3: Close the circuit breakers for PV input, AC input, and AC output in sequence
- Step 4: Start loads one by one in order of power from small to large

4.9 Parallel wiring

4.9.1 Parallel operation

1. The parallel operation supports up to six solar storage inverters.
2. When using the parallel function, it is necessary to connect the parallel communication cable in a correct and reliable manner. See the figure blow for the communication cable (packaging accessory):

Parallel communication cable*1



4.9.2 Cautions for parallel connection

Warning:

1. **PV wiring:**

   In parallel connection, the PV array of each inverter must be independent, and the PV array of PV1 and PV2 for one inverter must also be independent.

2. **Battery wiring**

   In single-phase or three-phase parallel connection, all solar storage inverters must be connected to the same battery, with BAT+ connected to BAT+ and BAT- to BAT-, and before power on and start-up, it is necessary to check and ensure correct connection, wiring length, and cable size, so as to avoid the abnormal operation of parallel system output caused by wrong connection.

3. **AC OUT wiring:**

   In single-phase parallel connection, all solar storage inverters must be connected in the manner of L-to-L, N-to-N, and PE-to-PE, and before power on and start-up, it is necessary to check and ensure correct connection, wiring length, and cable size, so as to avoid the abnormal operation of parallel system output caused by wrong connection.

   In three-phase parallel connection, all solar storage inverters must be connected in the manner of N-to-N and PE-to-PE. The L lines of all inverters in the same phase shall be connected together, but the AC output L lines of different phases shall not be connected together. Other cautions are the same as those for single-phase parallel connection.

4. **AC IN wiring:**

   In single-phase parallel connection, all solar storage inverters must be connected in the manner of L-to-L, N-to-N, and PE-to-PE, and before power on and start-up, it is necessary to check and ensure correct connection, wiring length, and cable size, so as to avoid the abnormal operation of parallel system output caused by wrong connection. Meanwhile, it is not allowed to have multiple different AC source inputs to avoid damage to the external equipment of the inverter. The AC source input shall be consistent and unique.

   In three-phase parallel connection, all solar storage inverters must be connected in the manner of N-to-N and PE-to-PE. The L lines of all inverters in the same phase shall be connected together, but the AC output L lines of different phases shall not be connected together. Other cautions are the same as those for single-phase parallel connection.

5. **Communication wiring:**

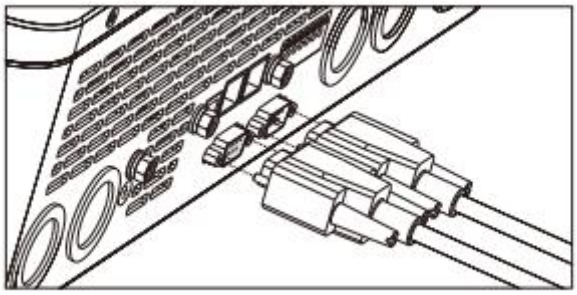
   Our company's communication cable for parallel operation is a DB15 standard computer cable with shielding function, and it is used for single-phase or three-phase parallel connection. Each inverter shall be connected with one out and one in, that is, the male connector (out) of the inverter is to be connected to the female connector (in) of the parallel inverter, not the one of the inverter. In addition, DB15 terminal screws will be used to tighten the communication cable of each parallel inverter to avoid falling off or poor contact of the communication cable, followed by abnormal operation or damage of the system output.

6. Before and after connecting the system, please carefully refer to the following system wiring diagrams to ensure that all wiring is correct and reliable before power on.

7. After the system is correctly wired, powered on, and in normal operation, if a new inverter needs to be connected, make sure to disconnect the battery input, PV input, AC input and AC output, and that all solar storage inverters are powered off before reconnecting into the system.

4.9.3Wiring diagram for single-phase parallel connection (phase difference between L1 and L2: 0°)

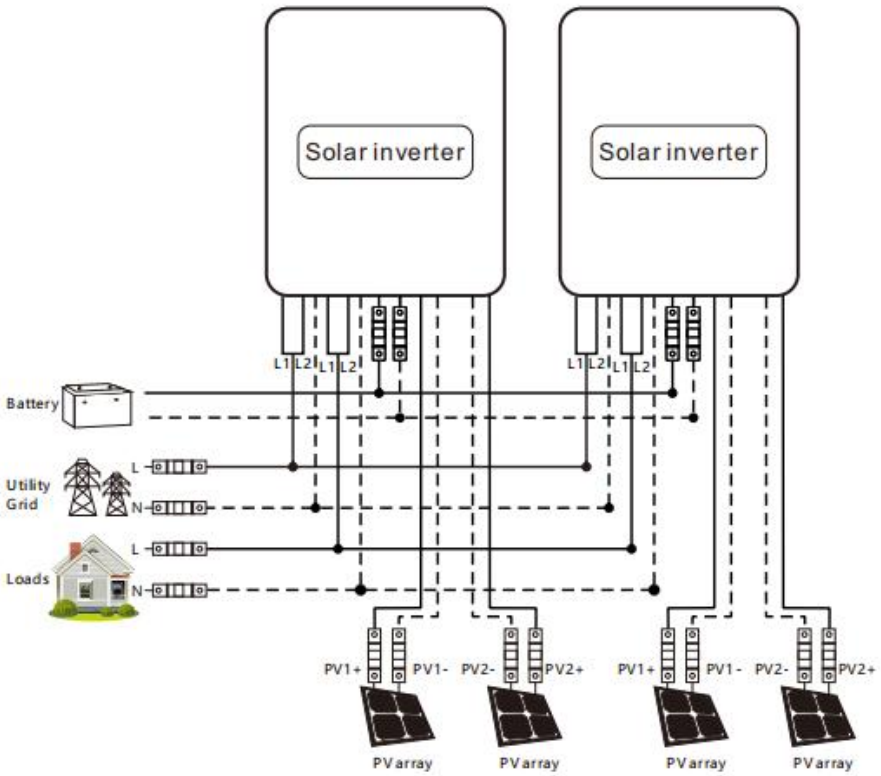
- The communication cable of parallel solar storage inverter is to be locked with screws after connecting. See the diagram below:

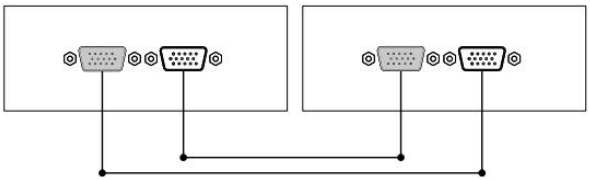


- See the diagram below for parallel connection

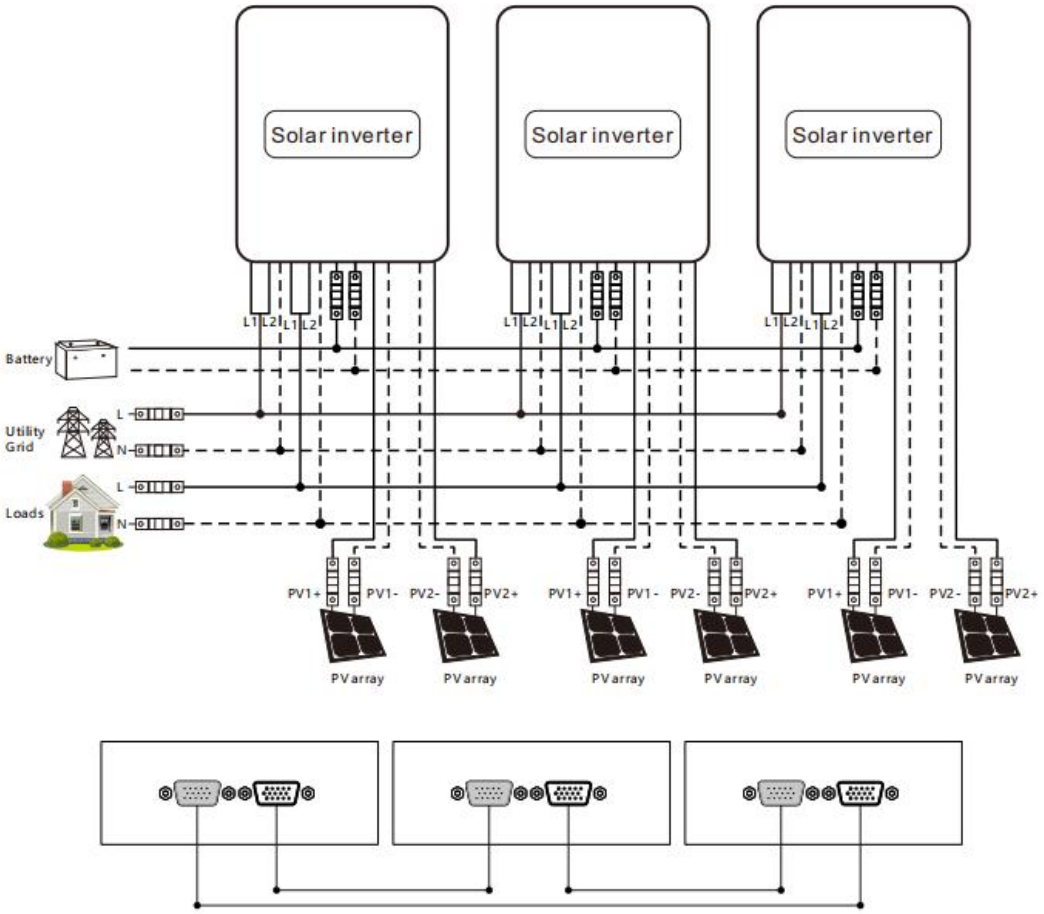
  Set the item [31] to "PAL" and the item [68] to "0°." When setting the item [38] to "120 V," the output L-N voltage is 120 V

1. **Two parallel-connected solar storage inverters:**

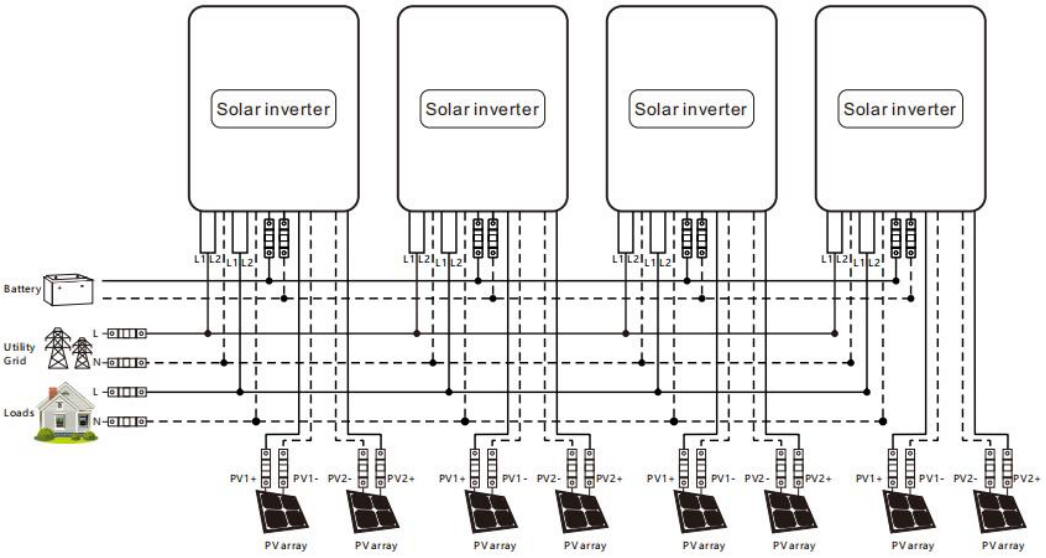


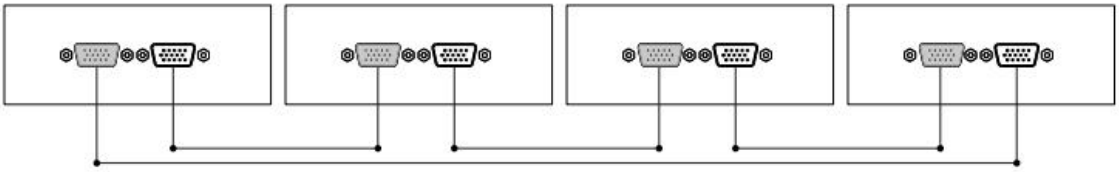


2. **Three parallel-connected solar storage inverters:**

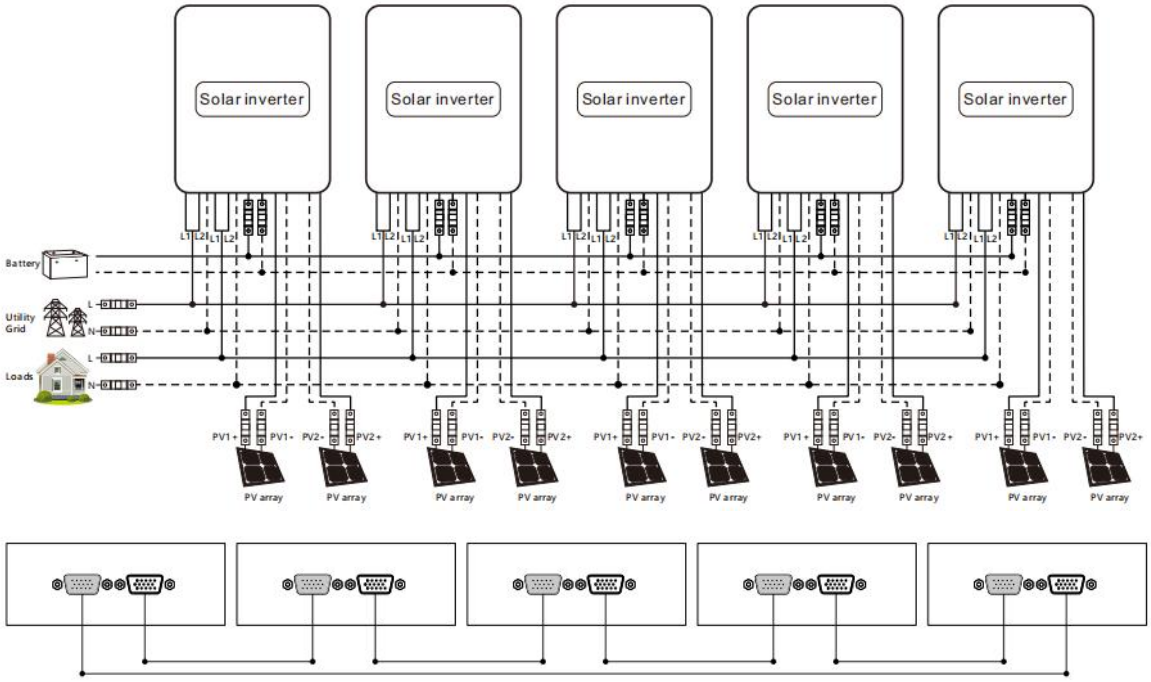


3. **Four parallel-connected solar storage inverters:**

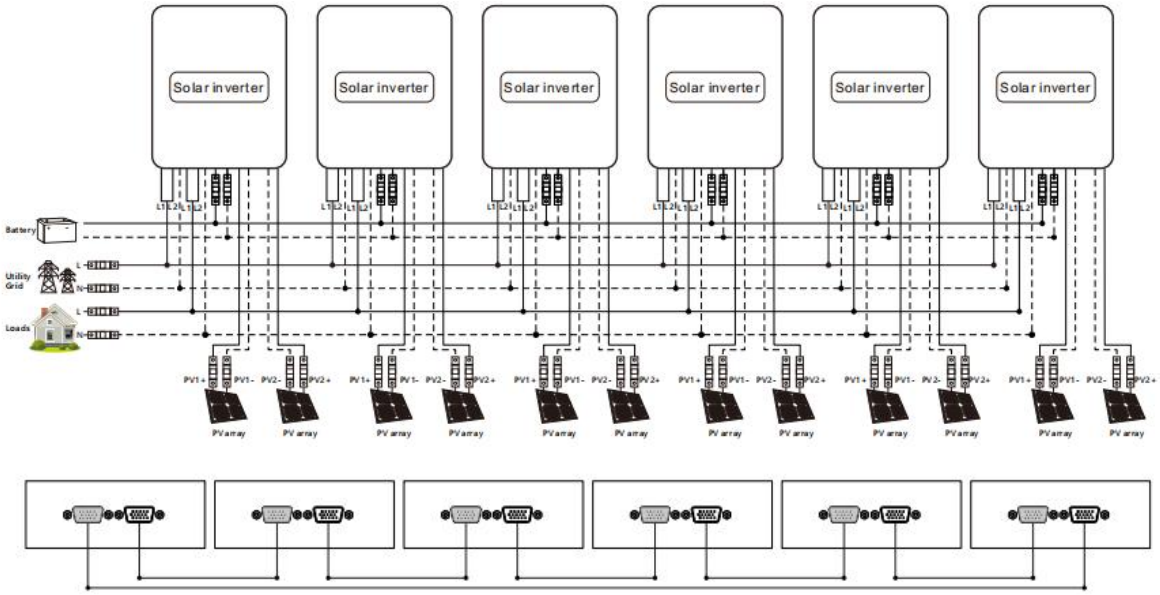




4. **Five parallel-connected solar storage inverters:**



5. **Six parallel-connected solar storage inverters:**



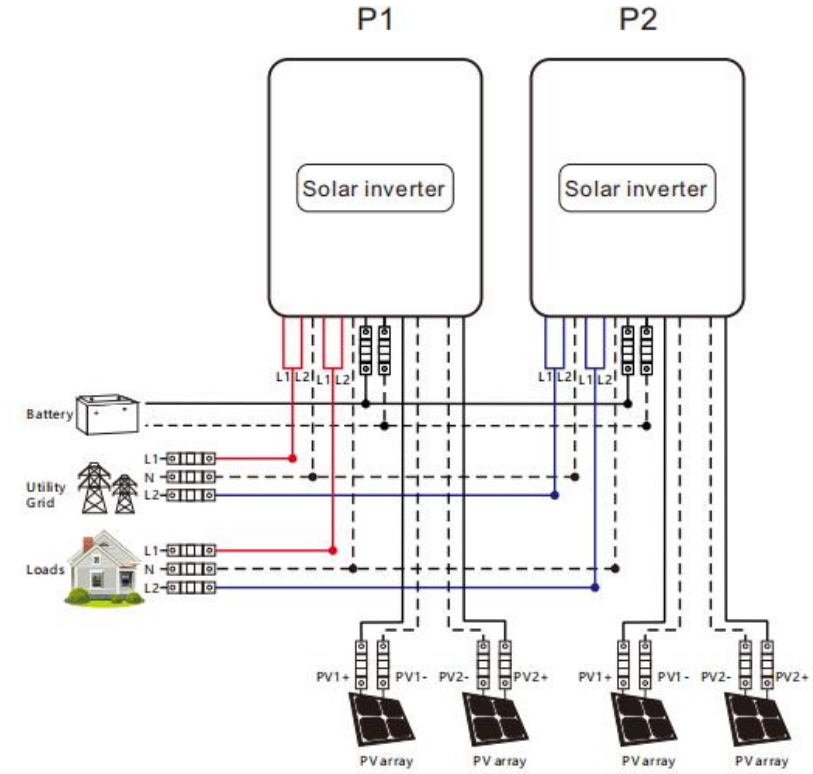
4.9.4 Wiring diagram for two-phase parallel connection (phase difference between L1 and L2: 0°)

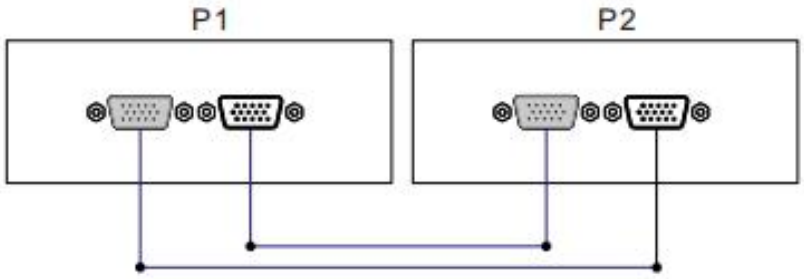
(1) P1: Set the item [31] to "2P0;" P2: Set the item [31] to "2P1," all of the P1/P2 inverter item [68] can not be set, it is default "0°" and the phase difference between P1 and P2 is 120°. When setting the item [38] to "120 V," the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 208 V, and the L1-N voltage is 120 V

(2) P1: Set the item [31] to "2P0;" P2: Set the item [31] to "2P2," all of the P1/P2 inverter item [68] can not be set, it is default "0°" and the phase difference between P1 and P2 is 180°. When setting the item [38] to "120 V," the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 240 V, and the L1-N voltage is 120 V, L2-N voltage is 120V

a. Split-phase system (two inverters)

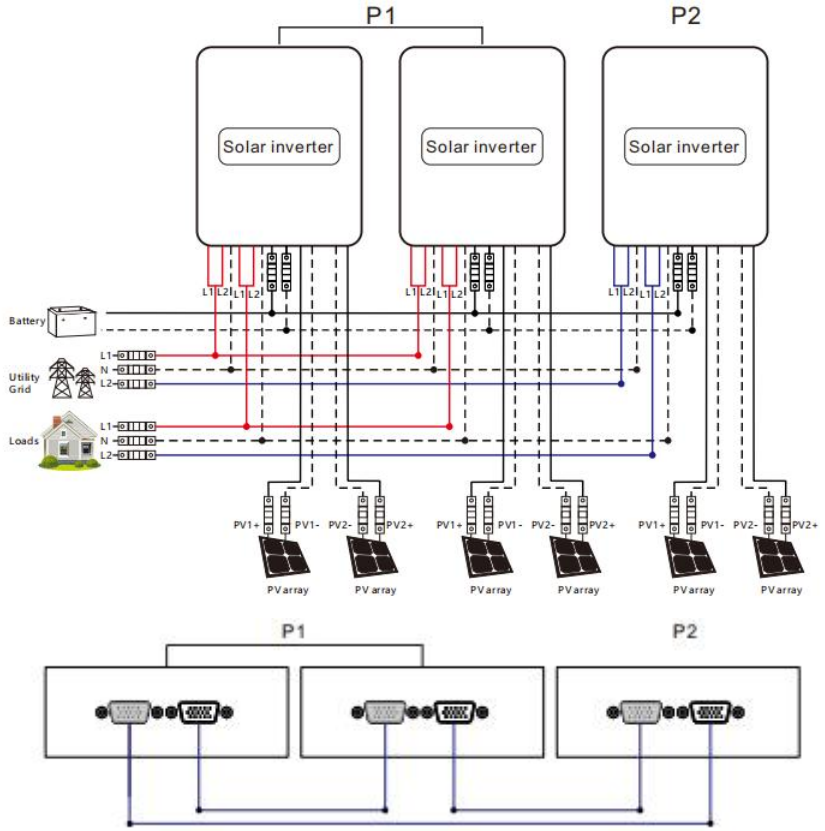
1+1 system:





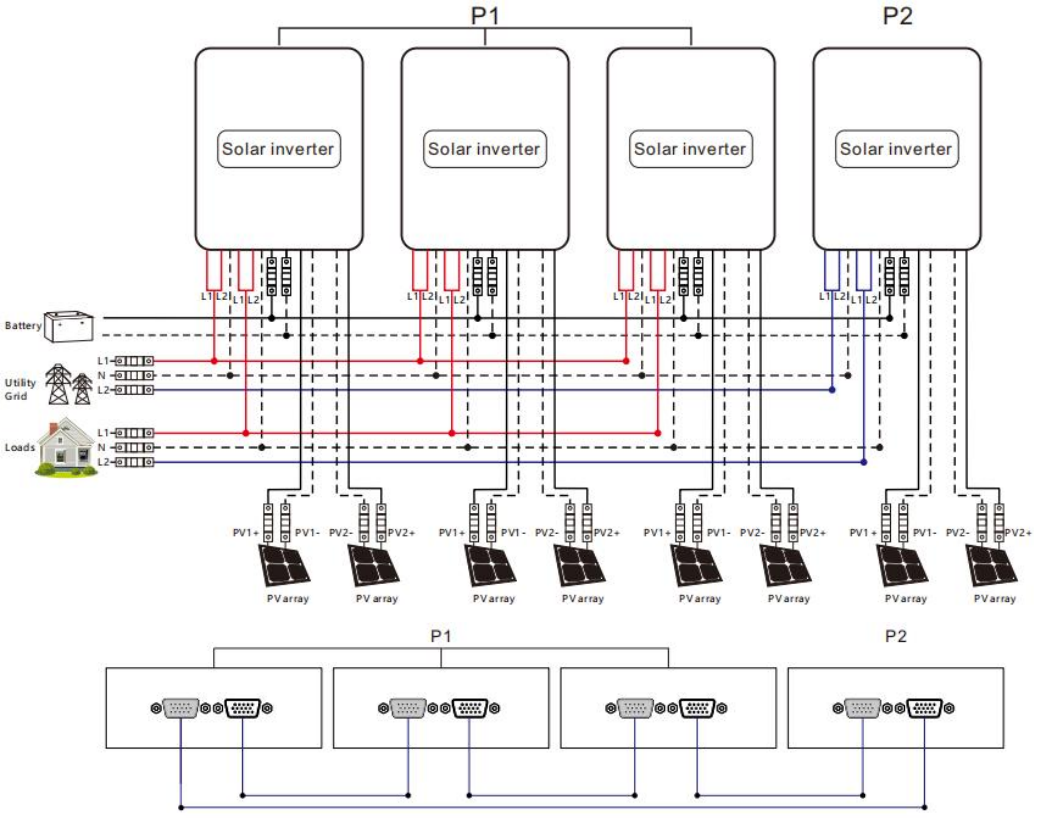
b. Split-phase system (three inverters)

2+1 system

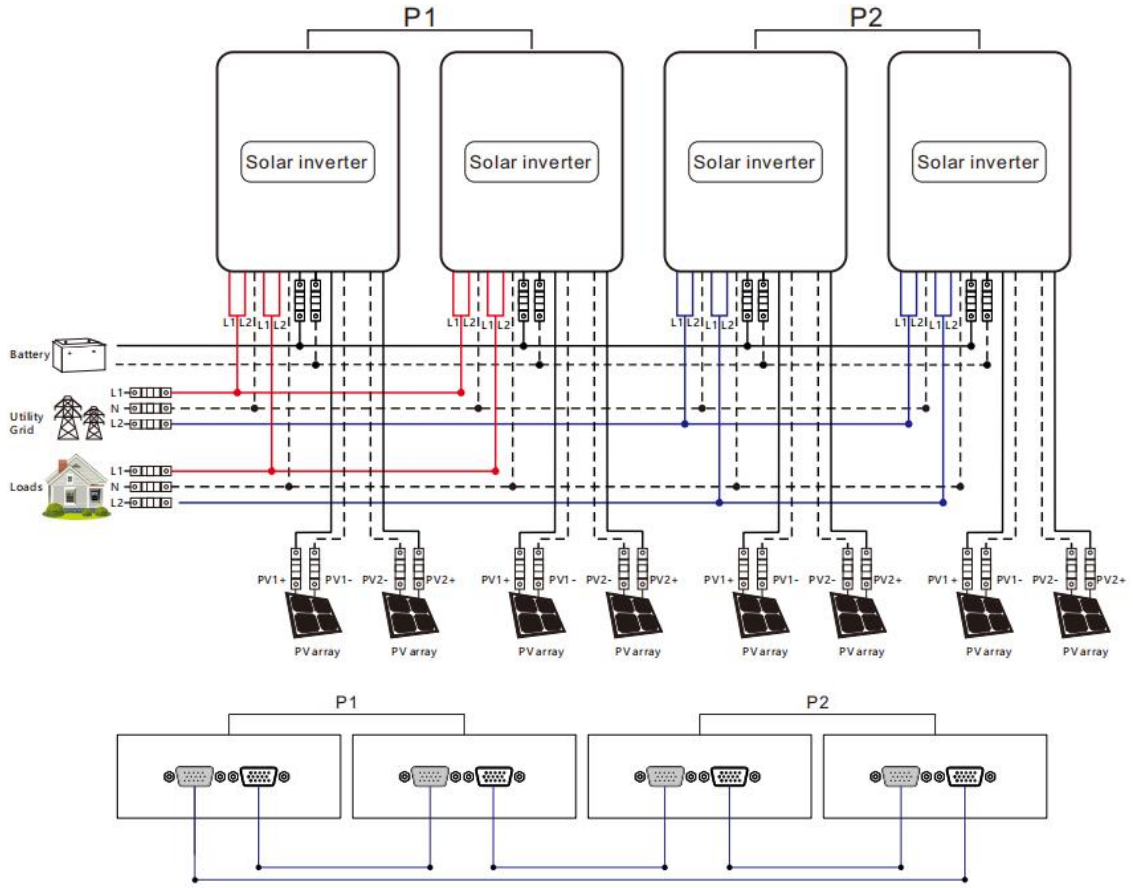


c. Split-phase system (four inverters)

3+1 system:

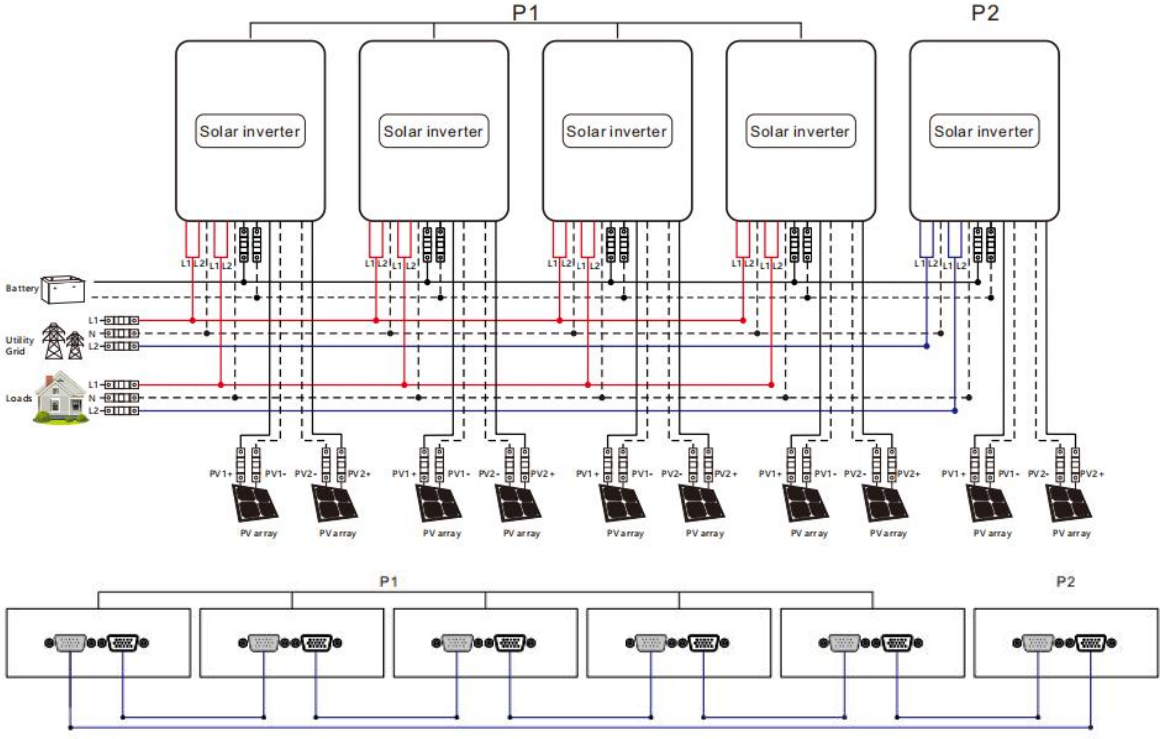


2+2 system:

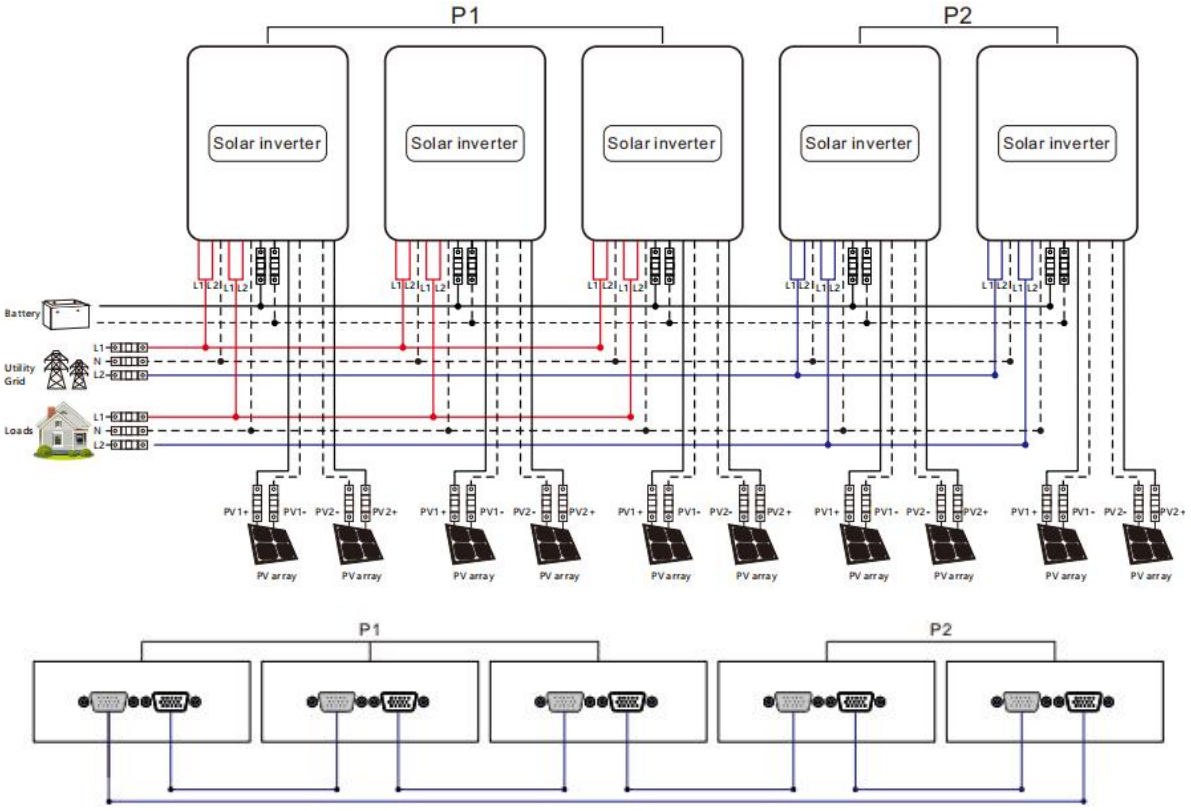


d. Split-phase system (five inverters)

4+1 system:

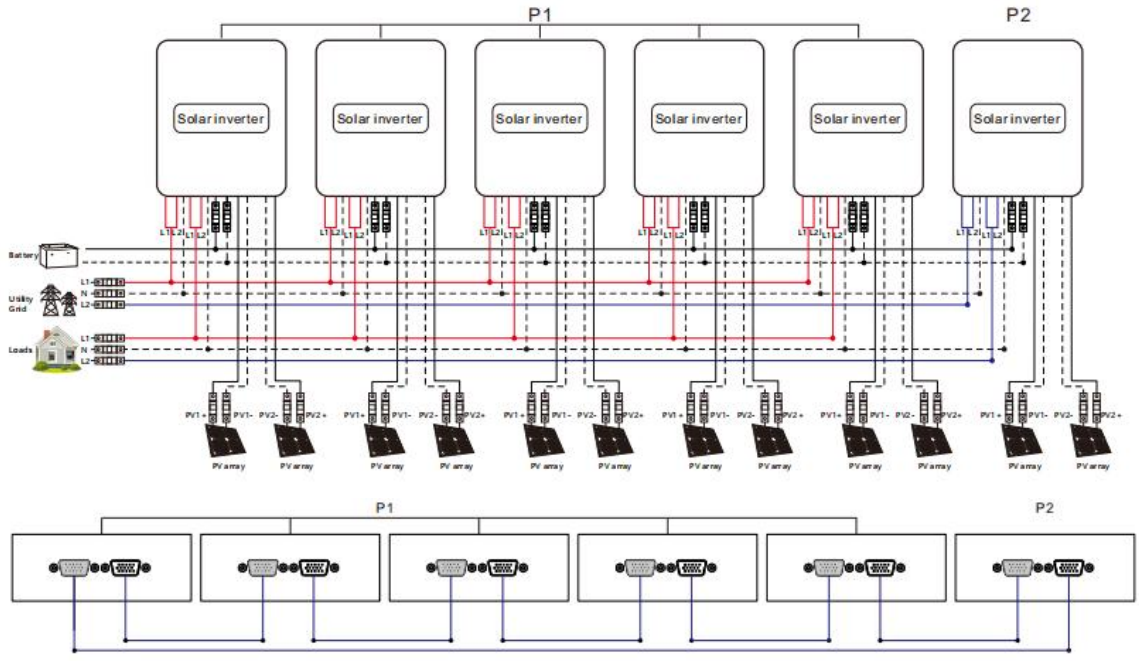


3+2 system:

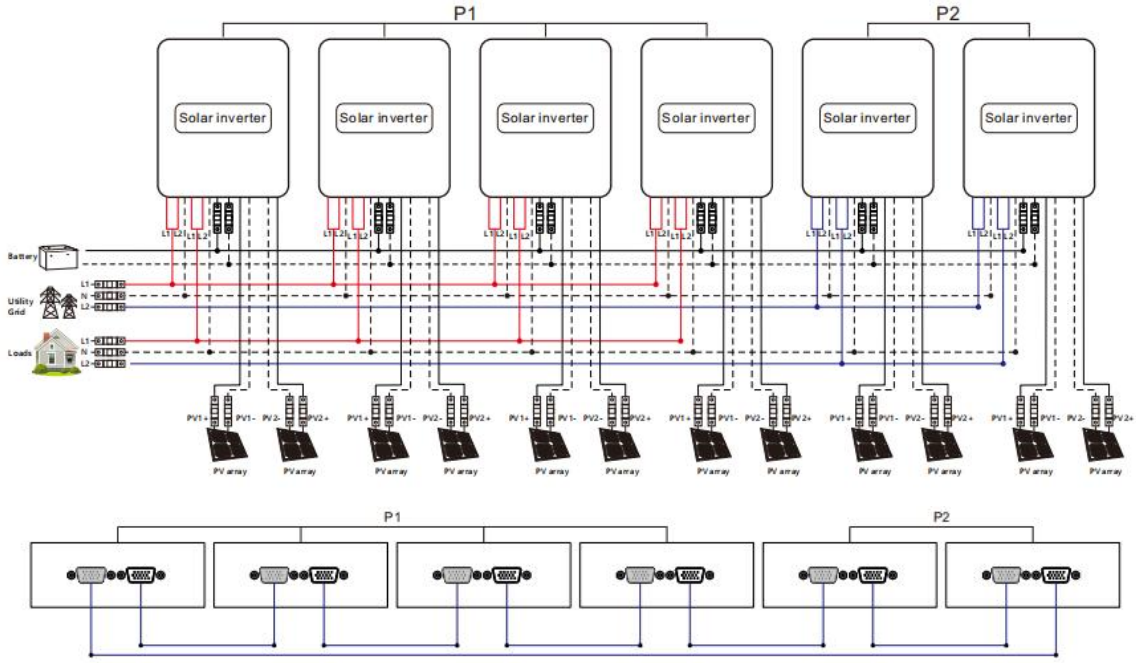


e. Split-phase system (six inverters)

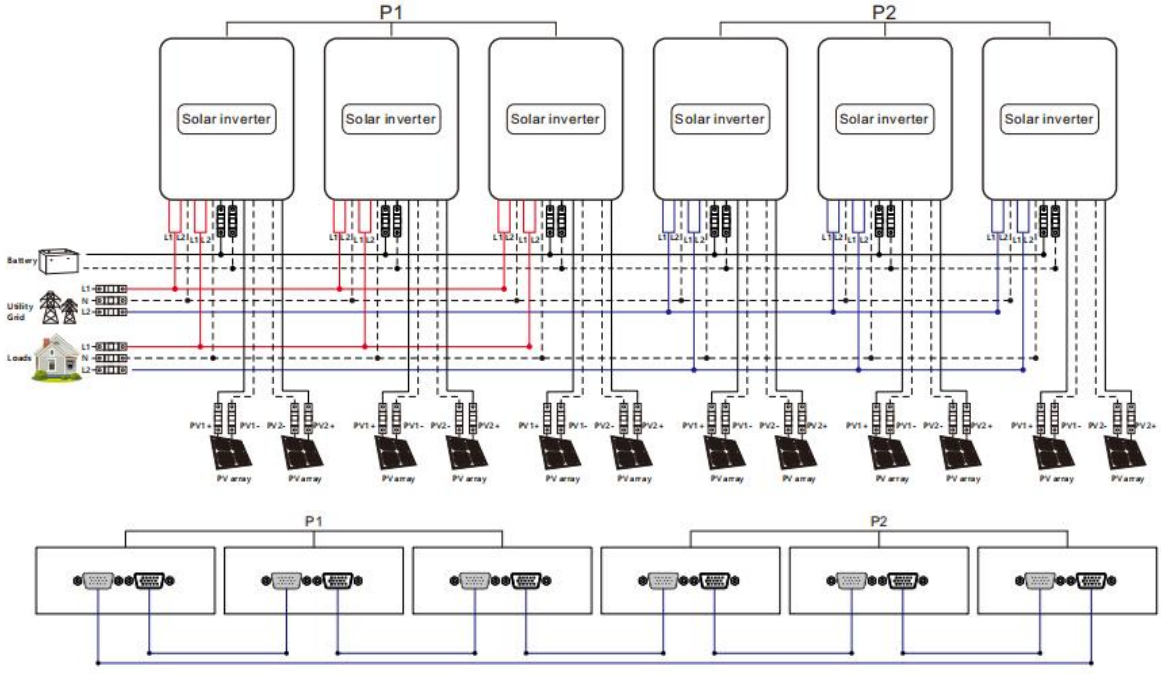
5+1 system:



4+2 system:



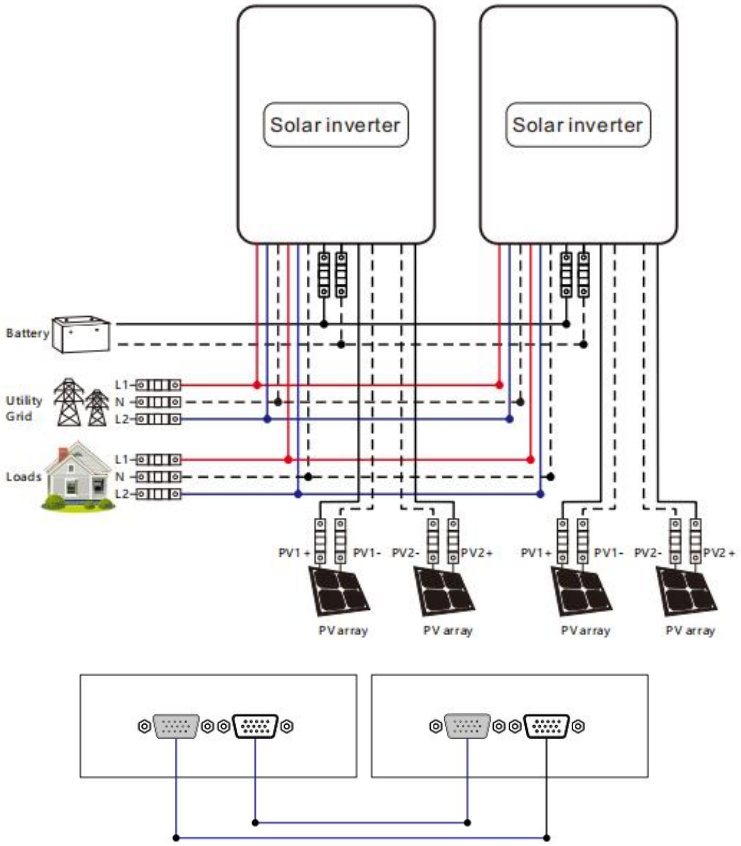
3+3 system:



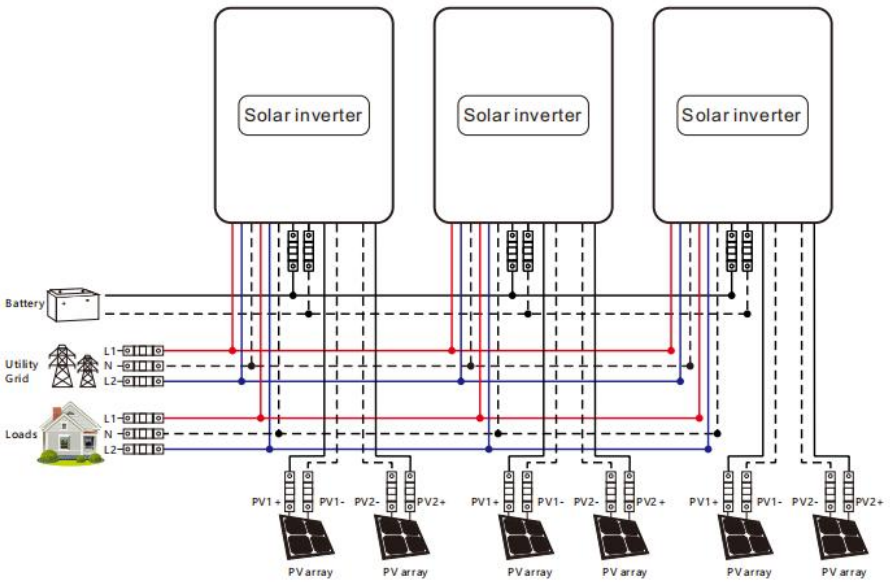
4.9.5 Wiring diagram for split-phase parallel connection (phase difference between L1 and L2: 180°)

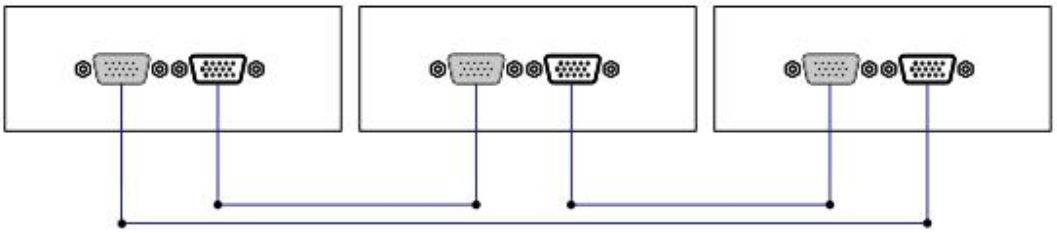
Set the item [31] to PAL, and set the item [68] to 180°. When setting the item [38] to "120 V," the L1-L2 voltage is 240 V, and the L1-N voltage is 120 V, L2-N voltage is 120V

a. Two parallel-connected solar storage inverters:

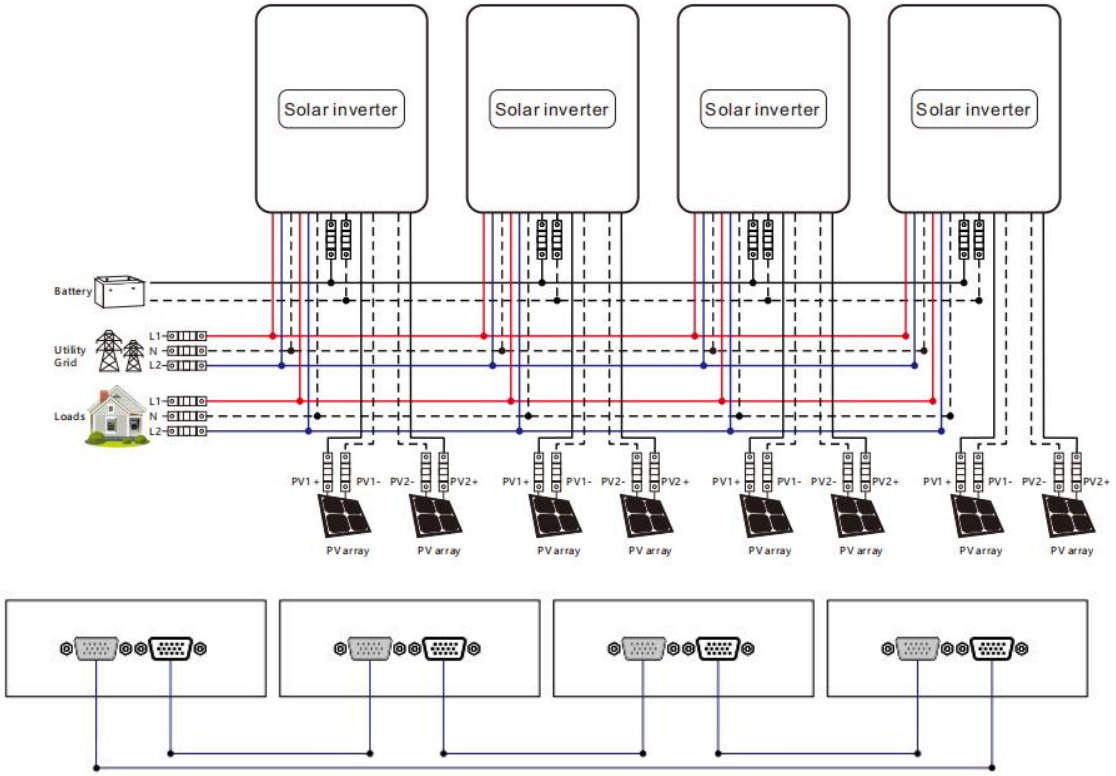


b. Three parallel-connected solar storage inverters:

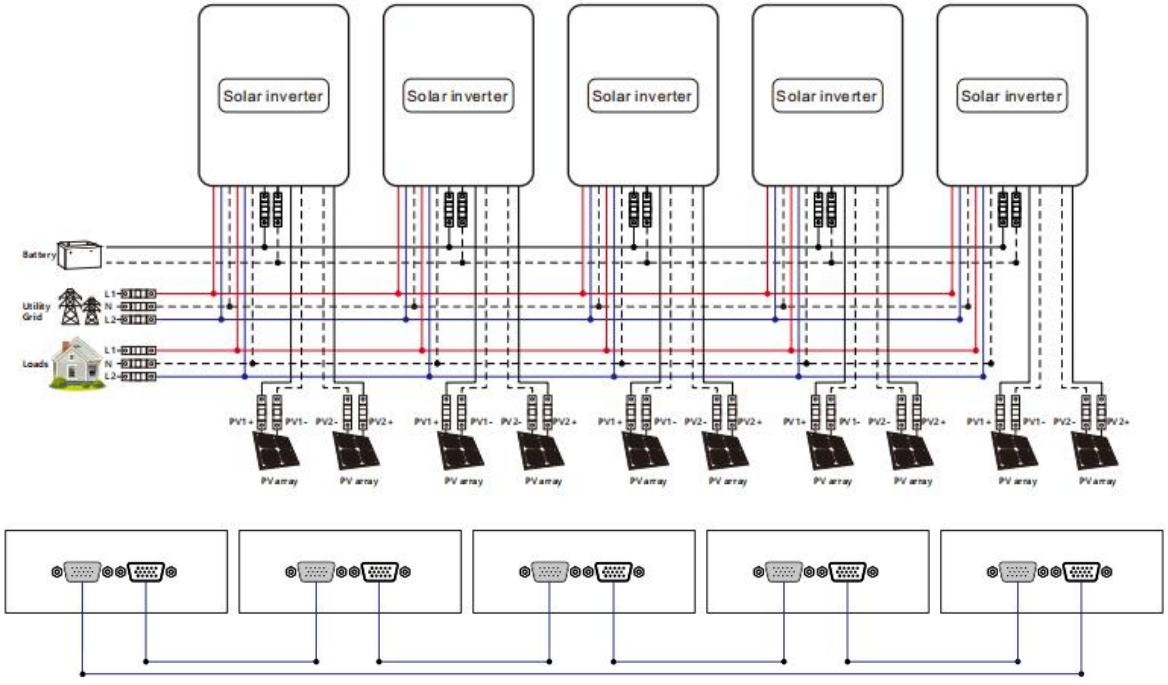




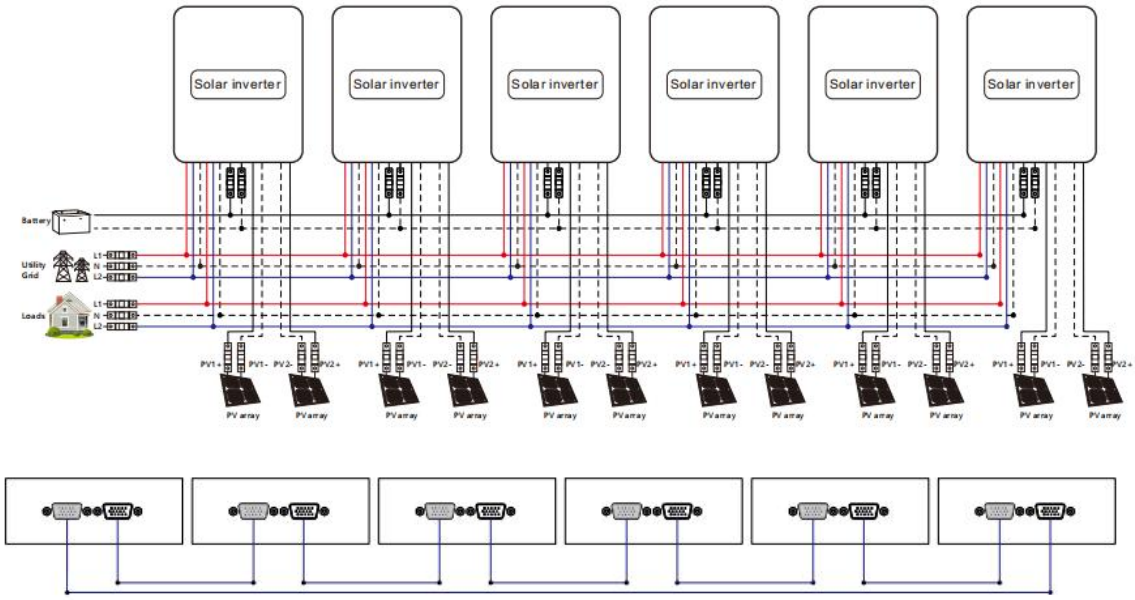
c. Four parallel-connected solar storage inverters:



d. Five parallel-connected solar storage inverters:



e. Six parallel-connected solar storage inverters:



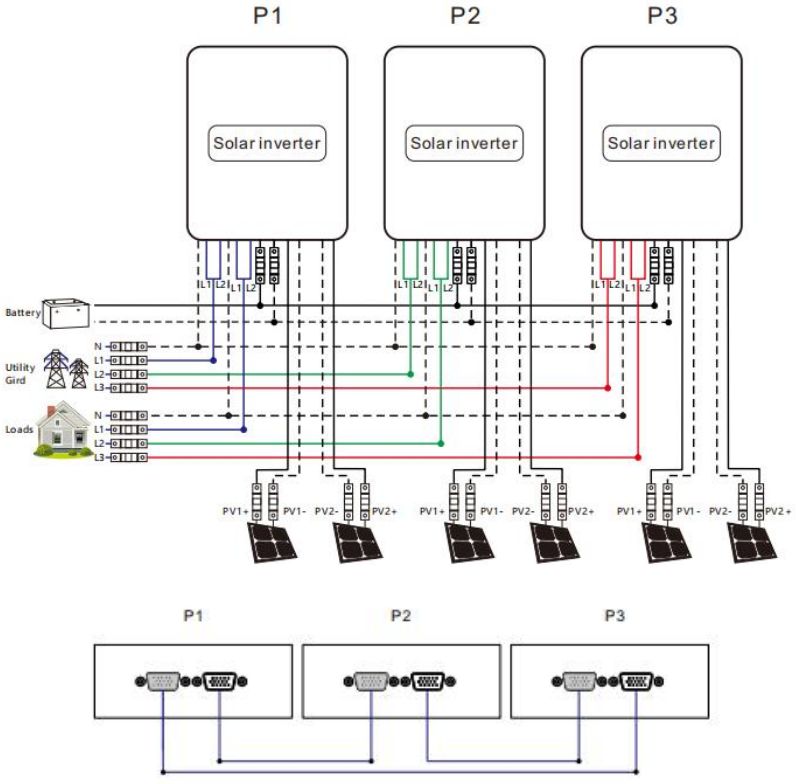
4.9.6 Wiring diagram for three-phase parallel connection

P1: Set the item [31] to "3P1;" P2: Set the item [31] to "3P2;" P3: Set the same to "3P3", all of P1/P2/P3 inverters item [68] can not be set, it is default "0°"

At this point, the P1-P2, P1-P3, and P2-P3 phase difference is 120°. When setting the item [38] to "120 VAC," the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 230*1.732=208 VAC. Similarly, the L1-L3 and L2-L3 voltage is 208 VAC:

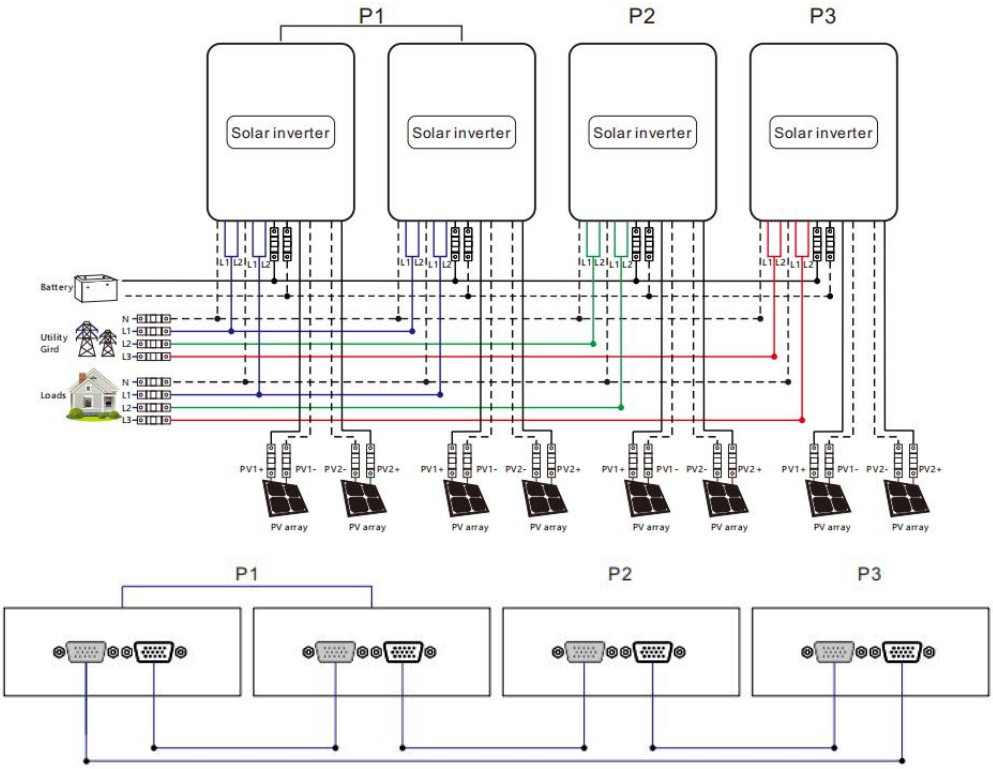
a. Three-phase system (three inverters)

1+1+1 system:



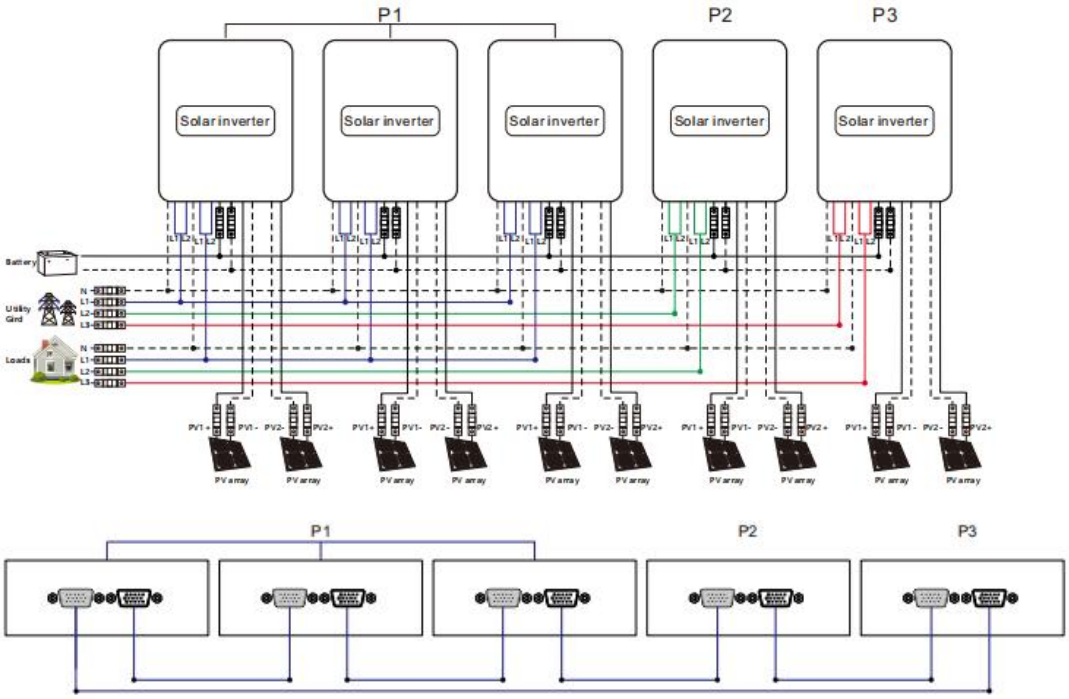
b. Three-phase system (four inverters)

2+1+1 system:

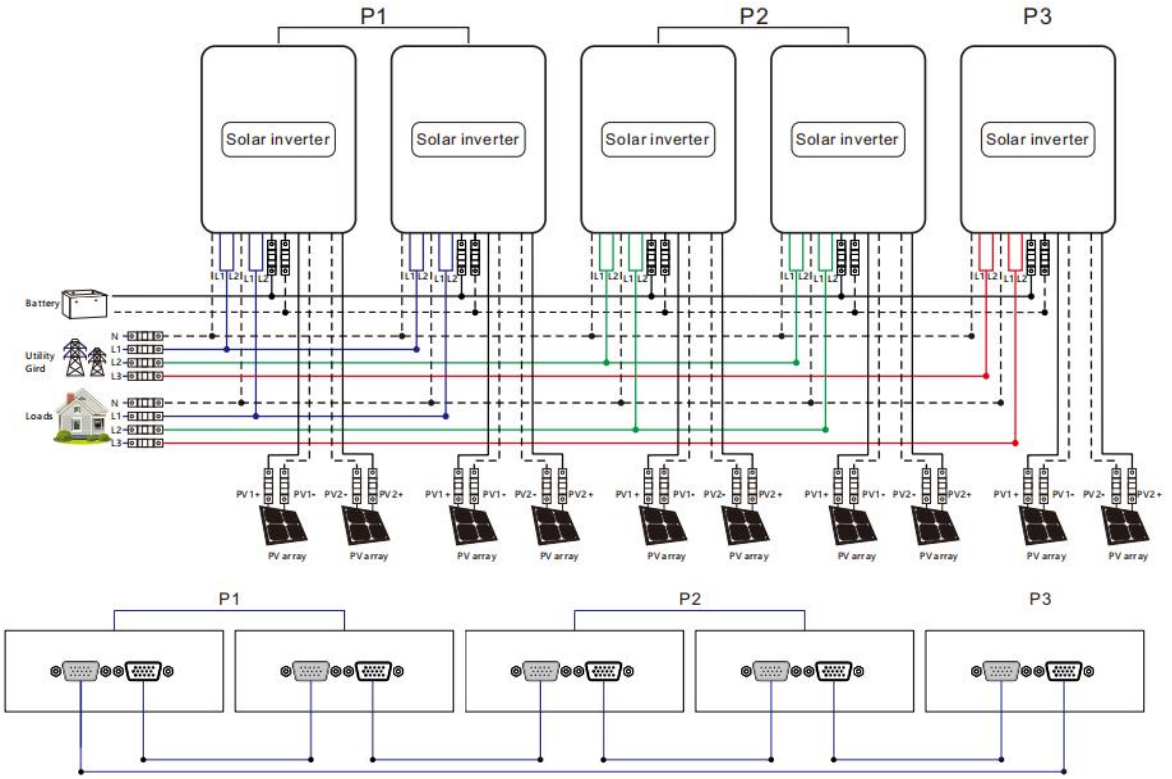


c. Three-phase system (five inverters)

3+1+1 system:

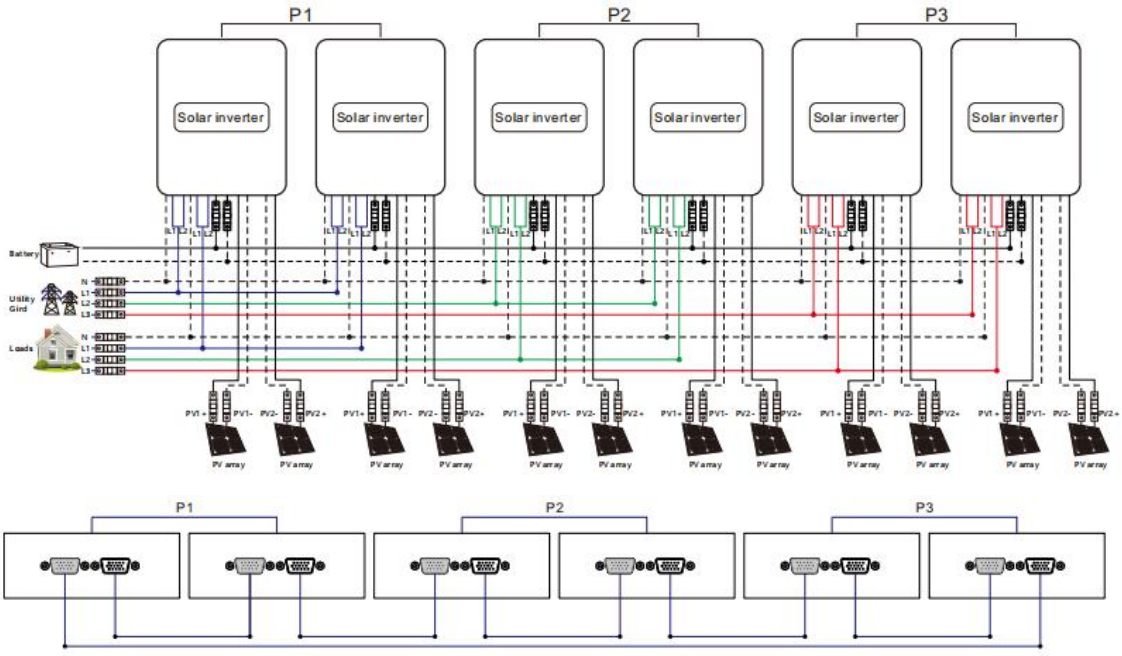


2+2+1 system:

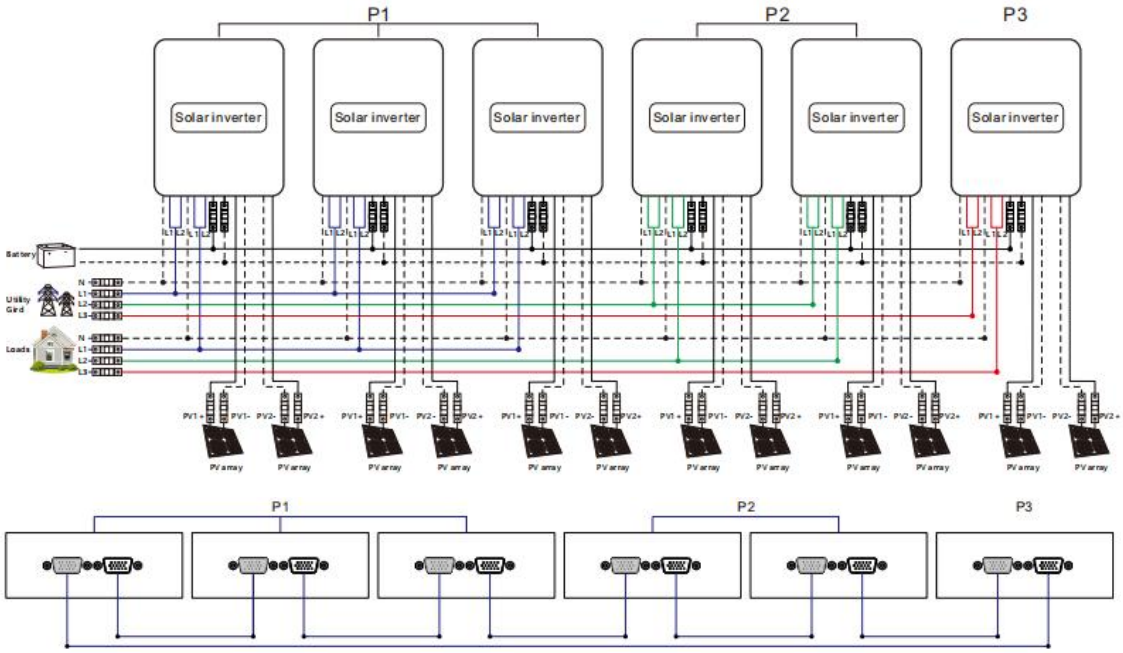


d. **Three-phase system (six inverters)**

2+2+2 system:



3+2+1 system:



Note:

1) Before powering on and lighting up the screen, check for correct wiring according to the above wiring diagrams to avoid system problems.

2) Check all connections for firm fixing to avoid detachment and abnormal system operation.

3) When connecting the AC output to the load, complete wiring according to the requirements of the electrical load to avoid damage to the load.

4) Set the item [38] to the same parameter, or only set it in the host inverter. During parallel operation, the voltage set in the host shall prevail, so the host inverter will forcibly set the item to the value for slave inverters. Only in standby mode can the item be set.

5) The inverter defaults to single mode at the factory. If using the parallel or three-phase function, set the item [31] on the screen as follows:

Power on one inverter each time, turn off the other inverters, and then set the item [31] according to the on-site system operation mode. After setting the inverter,

turn off the inverter, and set the other inverters one by one. After all are set, power on all inverters at one time to enter the working state.

In single-phase parallel operation:

Set the item [31] to "PAL" and the item [68] to "0°." When setting the item [38] to "120 V," the output L-N voltage is 120 V

In two-phase parallel operation:

(1) P1: Set the item [31] to "2P0;" P2: Set the item [31] to "2P1," all of P1/P2 inverters item [68] can not be set, it is default "0°" and the phase difference between P1 and P2 is 120°. When setting the item [38] to "120 V," the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 208 V, and the L1-N voltage is 120 V

(2) P1: Set the item [31] to "2P0;" P2: Set the item [31] to "2P2," all of P1/P2 inverters item [68] can not be set, it is default "0°" and the phase difference between P1 and P2 is 180°. When

setting the item [38] to "120 V," the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 240 V, and the L1-N voltage is 120 V

In split-phase parallel operation:

Set the item [31] to PAL, and set the item [68] to 180°. When setting the item [38] to "120 V," the L1-L2 voltage is 240 V, and the L1-N voltage is 120 V

In three-phase parallel operation:

P1: Set the item [31] to "3P1;" P2: Set the item [31] to "3P2;" P3: Set the same to "3P3" all of P1/P2/P3 inverters item [68] can not be set, it is default "0°"

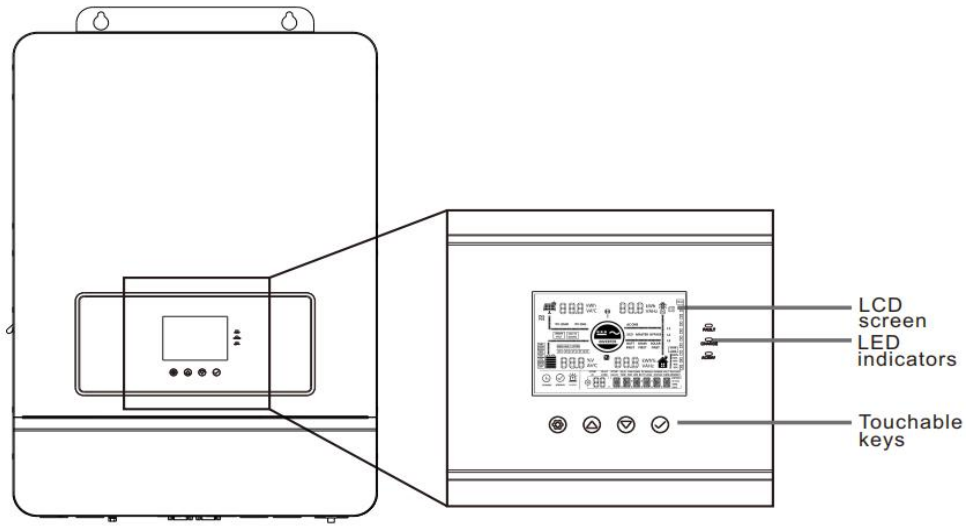
At this point, the P1-P2, P1-P3, and P2-P3 phase difference is 120°. When setting the item [38] to "120 VAC," the voltage between the live wire L1 of P1 phase and the live wire L2 of P2 phase is 230*1.732=208 VAC. Similarly, the L1-L3 and L2-L3 voltage is 208 VAC:

6) After the system runs, measure the correct output voltage before connecting to loads.

5. Operation

5.1 Operation and display panel

The operation and display panel of the inverter includes one LCD screen, three indicators, and four physical buttons



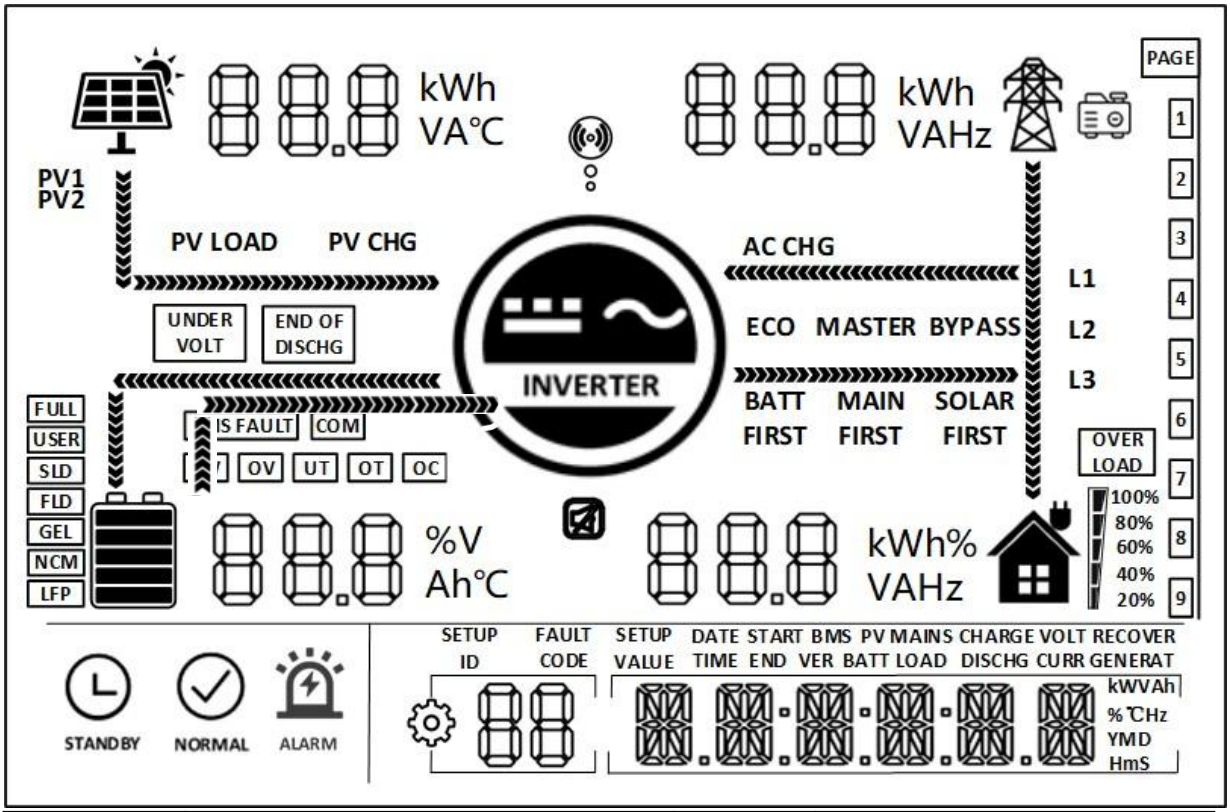
- **Physical button**

Physical button	Description
	Enter/Exit the setup menu
	Go to the next option
	Go to the previous option
	Confirm/Enter the option in setup menu

- **LED indicator**

Indicator	Color	Description
AC/INV	Green	Normally ON: mains bypass output
		Flash: inverter output
CHARGE	Yellow	Normally ON: charging completed
		Flash: charging
FAULT	Red	Normally ON: level-1 fault Flash: level-2 fault OFF: level-3 or level-4 fault

- **Display screen**



Icon	Description	Icon	Description
	PV panel		Mains
	Battery		Generator
	The inverter is working		Load
	The inverter is communicating with the data collector		The buzzer is in mute mode
	Power flow direction		
	The inverter is in standby mode		The inverter is working normally
	There is a fault		Settings
	Load power: 80%–100%		SOC: 80%–100%
	Load power: 60%–79%		SOC: 60%–79%
	Load power: 40%–59%		SOC: 40%–59%
	Load power: 20%–39%		SOC: 20%–39%

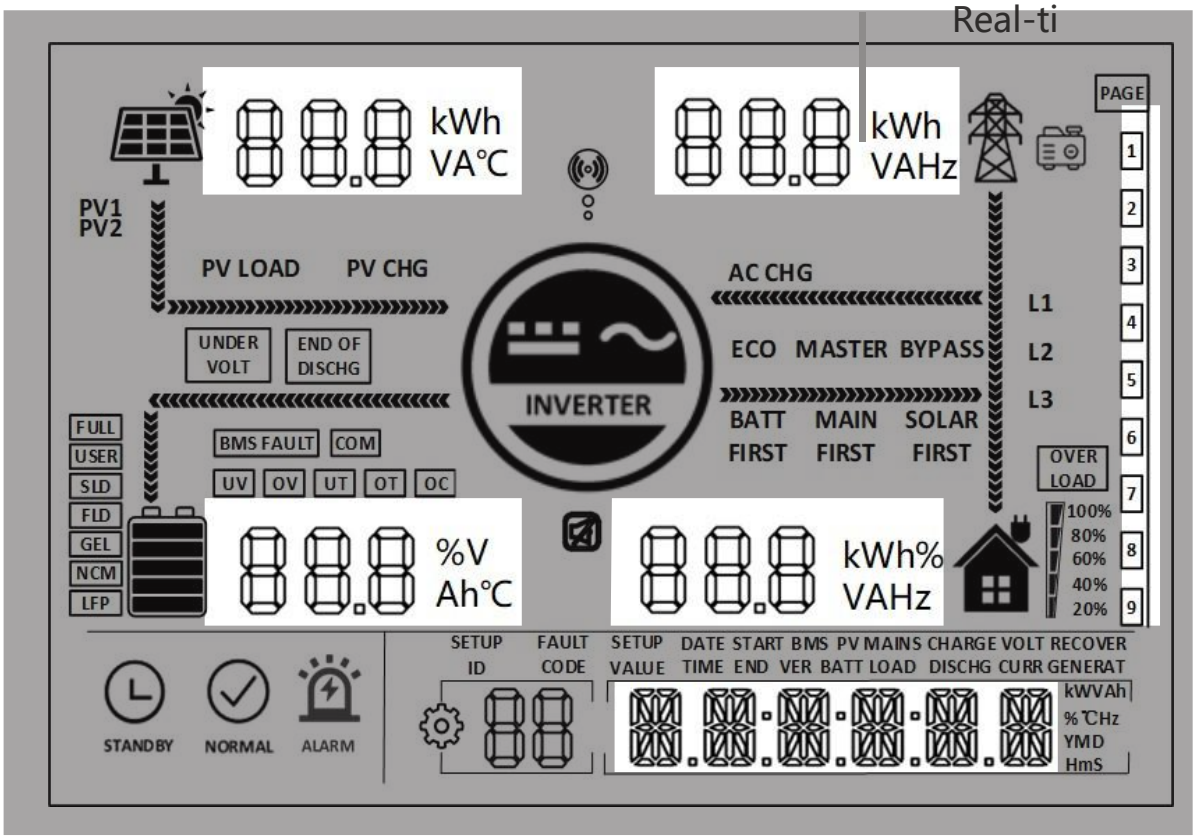
Icon	Description	Icon	Description
	Load power: 5%–19%		SOC: 5%–19%
UNDER VOLT	Battery under-voltage	END OF DISCHG	Battery over-discharge
OVER LOAD	Overload	BMS FAULT	BMS fault
COM	System communication error	UV	System under-voltage
OV	System overvoltage	UT	Too low system temperature
OT	Too high system temperature	OC	System overcurrent
FULL	Battery full power	USER	User-defined battery
SLD	Sealed lead-acid battery	FLD	Flooded lead-acid battery
GEL	Gel lead-acid battery	NCM	Ternary Li-ion battery
LFP	LFP Li-ion battery	ECO	Energy-saving mode
PVLOAD	PV power is loading	PVCHG	PV power is charging the battery
ACCHG	AC input power is charging the battery	MAINS FIRST	The output mode of the inverter is mains first
BYPASS	The output mode of the inverter is mains bypass	SOLAR FIRST	The output mode of the inverter is PV first
BATT FIRST	The output mode of the inverter is battery first		

- **Real-time parameters view**

On the screen, press the UP/DOWN button to view real-time data of the inverter in operation

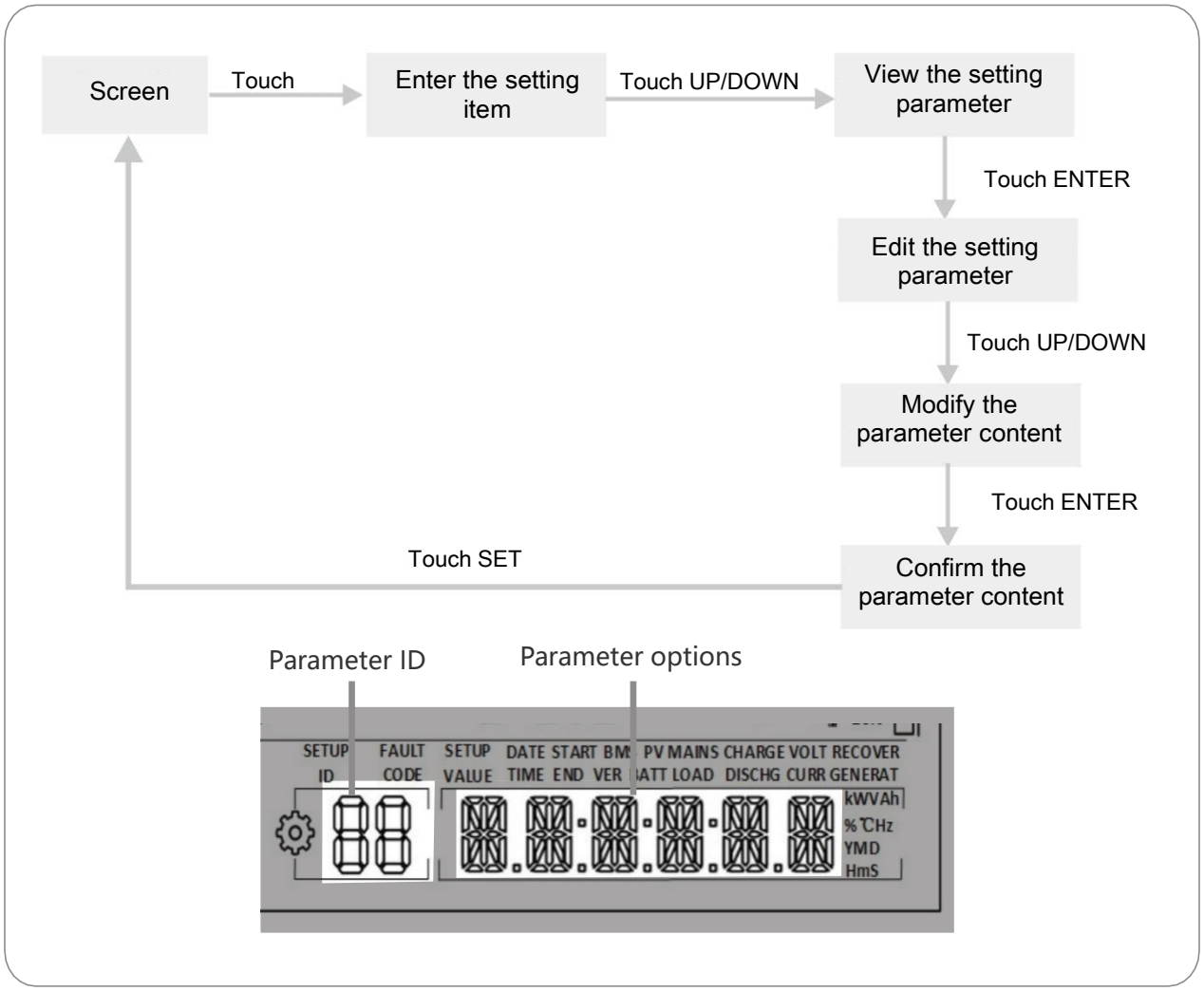
NOTICE

Screen → Touch UP/DOWN → Real-time parameters view



Page	PV	Battery	AC input	Load	General
1	PV input voltage	Battery voltage	Mains input voltage	Single-phase voltage	Current time
2	PV input current	Battery current	Mains input current	Single-phase current	Current date
3	PV input power	Battery voltage	Mains total input power	Single-phase active power	PV gross generation
4	PV generation for the day	Battery current	Mains charging capacity for the day	Single-phase apparent power	Total load consumption
5	PV heat sink temperature	Heat sink temperature	Mains frequency	Inverter output frequency	RS485 address
6	Rated open circuit voltage	Rated battery voltage	Bus voltage	Rated output frequency	Software version
7	Maximum PV charge current	Maximum battery charge current	Maximum mains charge current	Total output active power	/
8			/	Total output apparent frequency	/

5.2 Setting


Screen
Touch
Enter the setting item
Touch UP/DOWN
View the setting parameter
Touch ENTER
Edit the setting parameter
Touch UP/DOWN
Modify the parameter content
Touch ENTER
Confirm the parameter content
Touch SET
Parameter ID
Parameter options
SETUP ID
FAULT CODE
SETUP VALUE
DATE TIME
START END
BMS VER
PV BATT
MAINS LOAD
CHARGE DISCHG
VOLT CURR
RECOVER GENERAT
kWVAh
%℃Hz
YMD
HmS

ID	Parameter	Option	Description
00	Exit	ESC	Exit the setup menu
01	AC output mode	UTI (default)	Mains first. Grid power supply is to be applied first. When the PV power is available, and the item 34 is set to "MIX LOD," both the mains and PV power supply power to the load, while the battery only supplies power to the load when the mains is not available.
		SBU	Inverter first. The PV mode is to be applied first for loading, and only when the battery voltage is lower than the set value in the item 4, it will switch to the mains mode for loading. When the battery voltage is higher than the set value in the item 5, it will switch back to the PV mode from the mains mode.
		SOL	The PV mode is to be applied first and when the PV power is unavailable or the battery voltage is lower than the set value in the item 4, it will switch to the mains mode
02	AC input frequency	50.0	In bypass mode, the AC output frequency will adapt to the mains frequency, and in other cases, the output will follow the preset value.
		60.0 (default)	
03	AC input voltage range	UPS (default)	When the output voltage is 120/110 V, the input voltage range is 90 V−140 V
		APL	When the output voltage is 100/105 V, the input voltage range is 85 V−140 V
04	Battery to mains voltage threshold	43.6 (default)	When the parameter item 01 is SBU or SOL and the battery voltage is lower than the threshold, the output switches from inverter to mains. Setting range: 40 V−52 V
05	Mains to battery voltage threshold	57.6 (default)	When the parameter item 01 is SBU or SOL and the battery voltage is higher than the threshold, the output switches from mains to inverter. Setting range: 48 V−60 V
06	Battery charge mode	SNU (default)	When both PV power and mains are used to charge the battery at one time, the PV charge first and when the PV power is insufficient, the mains tags in. Only in bypass mode can both PV power and mains be used to charge the battery at one time, and only the PV charge mode can be enabled during inverter operation.
		CUB	Mains charge first, and enable the PV charge mode only when mains is unavailable
		CSO	PV charge first, and enable the mains mode only when PV power is unavailable
		OSO	Do not enable the mains charge mode when in only PV charge mode

ID	Parameter	Option	Description
07	Battery charge current	60	SPH8048P, setting range: 0 A–180 A
			SPH10048P, setting range: 0 A–200 A
08	Battery type	USER	User-defined, and in this type, you can set all battery parameters
		SLD	Sealed lead-acid battery
		FLD	Flooded lead-acid battery
		GEL (**default**)	Gel lead-acid battery
		L14/L15/L16	LFP battery L14/L15/L16, corresponding to 14, 15, and 16 series of LFP batteries
		N13/N14	Ternary Li-ion battery N13/N14, corresponding to 13 and 14 series of ternary Li-ion batteries
		NOb	No battery
09	Battery boost charge voltage	57.6	Setting range: 48 V–58.4 V, with a step of 0.4 V, available for user-defined and lithium-ion battery types
10	Boost charge duration	120	The continuous charging time when the voltage reaches the set voltage during constant voltage charging, with a setting range of 5 min–900 min and a step of 5 min
11	Battery floating charge voltage	55.2	Setting range: 48 V – 58.4 V, with a step of 0.4 V. This parameter cannot be set after successful BMS communication
12	Battery over-discharge voltage (delayed shutdown)	42	When the battery voltage is lower than the voltage and triggers the set value in the item 13, it will turn off the inverter output. Setting range: 40 V–48 V, with a step of 0.4 V
13	Battery over-discharge delay time	5	When the battery voltage is lower than the set value in the item 12 and triggers the delay time set in this parameter item, it will turn off the inverter output. Setting range: 5s–50s, with a step of 5s
14	Battery under-voltage alarm threshold	44	When the battery voltage is lower than the threshold, it will give an under-voltage alarm and the output will not shut down. Setting range: 40 V–52 V, with a step of 0.4 V
15	Battery discharge limit voltage	40	When the battery voltage is lower than the value, the output immediately shuts down. Setting range: 40 V–52 V, with a step of 0.4 V, available for user-defined and Li-ion batteries
16	Battery equalizing charge	DIS	Disable equalizing charge
		ENA (**default**)	Enable equalizing charge, but only available for flooded lead-acid batteries, sealed lead-acid batteries, and

ID	Parameter	Option	Description
			user-defined ones
17	Equalizing charge voltage	58	Setting range: 48 V－58 V, with a step of 0.4 V, but only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
18	Equalizing charge duration	120	Setting range: 5 min－900 min, with a step of 5 min, but only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
19	Equalizing charge delay time	120	Setting range: 5 min－900 min, with a step of 5 min, but only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
20	Equalizing charge interval	30	Setting range: 0 day－30 days, with a step of 1 day, but only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
21	Equalizing charge Enable/Disable	DIS (**default**)	Start equalizing charge immediately
		ENA	Stop equalizing charge immediately
22	Energy-saving mode	DIS (**default**)	Disable energy-saving mode
		ENA	Enable energy-saving mode, and when the load power is below 50 W, it will turn off the inverter output after a 5-minute delay. When it exceeds 50 W, the inverter will automatically restart.
23	Overload auto restart	DIS	Disable overload auto restart and when overload occurs, it will turn off the output and the inverter will no longer resume startup
		ENA (**default**)	Enable overload auto restart, and If overload occurs, the output will be turned off, and after a delay of 3 min, the output will restart. After 5 cumulative attempts, the inverter will no longer resume startup
24	Over-temperature auto restart	DIS	Disable over-temperature auto restart and when over-temperature occurs, it will turn off the output and the inverter will no longer turn on the output
		ENA (**default**)	Enable over-temperature auto restart and when over-temperature occurs, it will turn off the output and the output will restart when the temperature drops
25	Buzzer alarm	DIS	Disable buzzer alarm
		ENA (**default**)	Enable buzzer alarm
26	Mode switch prompt	DIS	Disable prompt when the status of the main input source changes
		ENA (**default**)	Enable prompt when the status of the main input source

ID	Parameter	Option	Description
			changes
27	Inverter to bypass switch	DIS	Disable auto switch to mains for loading in case of inverter overload
		ENA (**default**)	Enable auto switch to mains for loading in case of inverter overload
28	Mains charge current	60 (**default**)	SPH8048P, setting range: 0 A-100 A
			SPH10048P, setting range: 0 A-120 A
30	RS485 communication address	ID: 1	Setting range: 1-254
31	Parallel mode	SIG (**default**)	Single inverter operation
		PAL	Parallel operation
		2P0/2P1/2P2	Two-phase parallel operation
		Set to "2P0" for the machine screens connected to P1 Assuming that the output voltage of the setting item [38] is set to 120 VAC 1) When all the inverters connected to P2 are set to "2P1" on the screen, the voltage phase difference between P1 and P2 is 120°, the voltage between the live wire L1 of phase-P1 and the live wire L2 of phase-P2 is 120*1.732=208 VAC, and the voltage of L1-N and L2-N is 120 VAC. 2) When all the inverters connected to P2 are set to "2P2" on the screen, the voltage phase difference between P1 and P2 is 180°, the voltage between the live wire L1 of phase-P1 and the live wire L2 of phase-P2 is120*2=240 VAC, and the voltage of L1-N and L2-N is120 VAC.	
		3P1/3P2/3P3	Three-phase parallel operation
		Set to "3P1" on the screen for all the inverters connected to P1; set to "3P2" on the screen for all the inverters connected to P2; and set to "3P3" on the screen for those connected to P3. 1) Assuming that the output voltage of the setting item [38] is set to 120 VAC: then the voltage phase difference of P1-P2, P1-P3, and P2-P3 is 120°, the voltage between the live wire L1 of phase-P1 and the live wire L2 of phase-P2 is 120*1.732=208 VAC, and similarly the voltage of L1-L3 and L2-L3 is 208 VAC; the voltage of L1-N, L2-N, and L3-N is 208 VAC.	
32	RS485 communication function	SLA (**default**)	Enable PC and Remote Monitoring Protocol
		485	Enable the BMS communication function based on RS485 communication
		CAN	Enable the BMS communication function based on CAN communication
33	BMS	Select the corresponding communication protocol in item 33 when you set it	

ID	Parameter	Option	Description
	communication	to 485 or CAN in item 32	
		PAC = PACE, RDA = Ruida, AOG = Aoguan, OLT = Oliter, HWD = Sunwoda, DAQ = Daqin, WOW = SRNE, PYL = Pylontech, UOL = Vilion	
34	Grid connection and mix loading function	DIS (**default**)	Disable the function
		MIXLOD	When item 01 is set to UTI, PV is used first to charge the battery, and then to supply power to the load in case of superfluous energy. Thanks to the anti-reverse current function, PV power will not be fed back into the grid
		ONGRD	When item 01 is set to UTI, PV is used first to supply power, and then fed back into the grid after satisfying the power demand of the load
35	Battery under-voltage recovery threshold	52	When the battery is under voltage, the battery voltage needs to be greater than the threshold to restore the AC output of the battery inverter. Setting range: 44 V−54.4 V
37	Recharge voltage threshold for fully charged battery	52	After the battery is fully charged, the inverter stops charging, and recovers charging when the battery voltage is lower than the threshold. Setting range: 44 V−54 V
38	AC output voltage	120	Setting range: 100/105/110/120 VAC
39	Charge current limit (when BMS works)	LCSET	The maximum battery charge current is not greater than the set value of [item 07]
		LCBMS (**default**)	The maximum battery charge current is not greater than the maximum value of BMS
		LCINV	The maximum battery charge current is not greater than the logical judgment value of inverter
40	Period-1 battery charge start time	00:00:00	Setting range: 00:00:00−23:59:00
41	Period-1 battery charge end time	00:00:00	Setting range: 00:00:00−23:59:00
42	Period-2 battery charge start time	00:00:00	Setting range: 00:00:00−23:59:00
43	Period-2 battery charge end time	00:00:00	Setting range: 00:00:00−23:59:00
44	Period-3 battery charge start time	00:00:00	Setting range: 00:00:00−23:59:00
45	Period-3 battery charge end time	00:00:00	Setting range: 00:00:00−23:59:00

ID	Parameter	Option	Description
46	Timed battery charge function	DIS (default)	Disable the function
		ENA	After the timed mains charge/loading function is enabled, the power supply mode will turn into SBU, where mains is available for power supply in the set period or after battery over-discharge. If the timed discharge function is enabled at the same time, the power supply mode of the system will be changed into UTI, where mains is only available for power supply in the set charge period, and the system only switches to the power supply of battery inverter during the set discharge period or mains failure
47	Period-1 battery discharge start time	00:00:00	Setting range: 00:00:00-23:59:00
48	Period-1 battery discharge end time	00:00:00	Setting range: 00:00:00-23:59:00
49	Period-2 battery discharge start time	00:00:00	Setting range: 00:00:00-23:59:00
50	Period-2 battery discharge end time	00:00:00	Setting range: 00:00:00-23:59:00
51	Period-3 battery discharge start time	00:00:00	Setting range: 00:00:00-23:59:00
52	Period-3 battery discharge end time	00:00:00	Setting range: 00:00:00-23:59:00
53	Timed battery discharge function	DIS (default)	Disable the function
		ENA	After the timed battery discharge function is enabled, the power supply mode will be changed into UTI, where the system only switches to the power supply of battery inverter during the set discharge period or mains failure
54	Current date	00:00:00	Year/Month/Day Setting range: 00:01:01-99:12:31
55	Current time	00:00:00	Setting range: 00:00:00-23:59:59
57	Charge stop current	3	The charge stops when the charge current is less than the set value (unit: A)
58	SOC setting for discharge alarming	15	When the capacity is less than the set value, the SOC alarms (unit: %, only available during normal BMS communication)

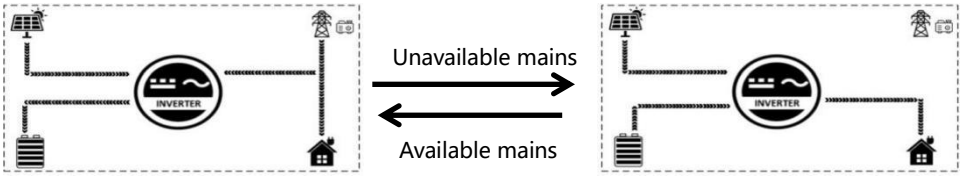
ID	Parameter	Option	Description
59	SOC setting for discharge cutoff	5	When the capacity is less than the set value, the discharge stops (unit: %, only available during normal BMS communication)
60	SOC setting for charge cutoff	100	When the capacity is greater than the set value, the charge stops (unit: %, only valid during normal BMS communication)
61	SOC setting for switching to mains	10	When the capacity is less than the set value, it switches to mains (unit: %, only available during normal BMS communication)
62	SOC setting for switching to inverter output	100	When the capacity is greater than the set value, it switches to the inverter output mode (unit: %, only available during normal BMS communication)
63	Auto N-PE connection switch function	DIS (**default**)	Disable auto N-PE connection switch
		ENA	Enable auto N-PE connection switch
67	Power sales setting	0 (**default**)	Setting range: 0–rated power
68	AC output phase mode	0	0 represents the single-phase mode Assuming that the AC output voltage of item 38 is 120 V, the phase difference of L1-L2 is 0°, and L1/L2 can be connected in parallel, the phase voltage of L1-N/L2-N is 120 V
		180 (**default**)	180 represents the split-phase mode Assuming that the AC output voltage of item 38 is 120 V, the phase difference of L1-L2 is 180°, the phase voltage of L1-N/L2-N is 120 V, and the voltage of L1-L2 is 240 V
71	PV energy priority	Charge (**default**)	PV power is first used to charge the battery
		Load	PV power is first used for the load

5.3 AC output mode

The AC output mode corresponds to parameter setting items of 01 and 34, allowing users' manual setting

- **Mains first 01 UTI (default)**

The mains first supplies power. When PV is available, mains and PV can supply power to the load at the same time. The battery only powers the load during unavailable mains (**priority: mains > PV > battery**)

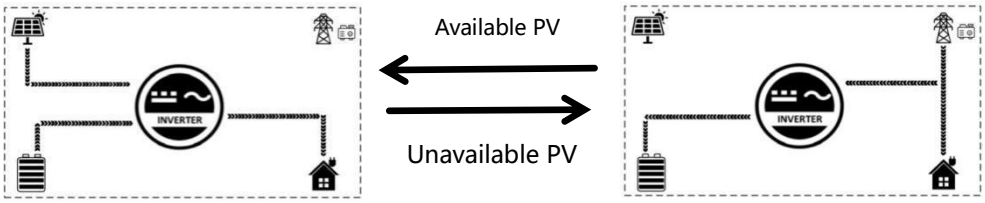


- **Mix loading of PV and mains 34 MIX LOD**

In the UTI mode, when the battery is not connected, or fully charged, PV and mains supply power to the load at the same time (**priority: PV > mains > battery**).

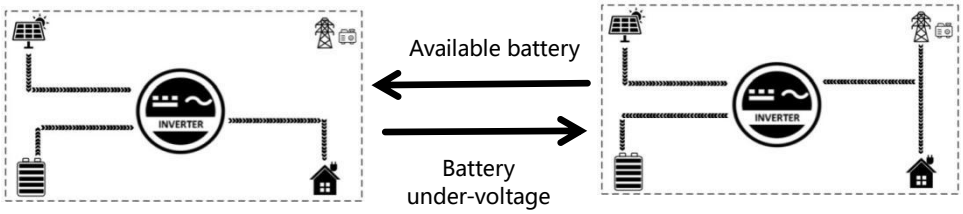
- **PV-first output 01 SOL**

PV first supplies power to the load. If PV power is insufficient, mains is used as a supplement to power the load. The mode uses PV power to the maximum extent while maintaining the battery power, suitable for areas with relatively stable power grids. (**Priority: PV > mains > battery**)



- **Inverter output mode 01 SBU**

PV will first supply power to the load. If PV power is insufficient or unavailable, mains will be used as a supplement to power the load. When the battery voltage reaches the value of the parameter item 04 (battery to mains voltage threshold), it will switch to mains to power the load. The mode maximizes the use of DC power, suitable for areas with suitable power grids. (**Priority: PV > battery > mains**)

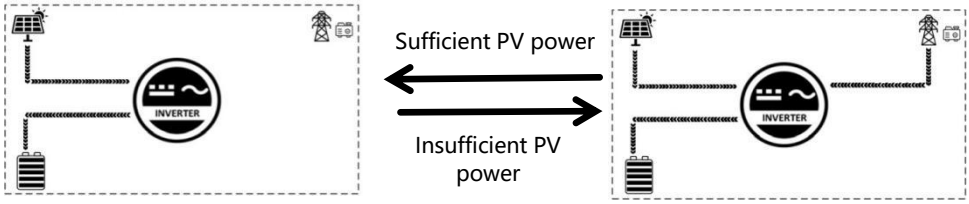


5.4 Battery charge mode

The charge mode corresponds to the parameter setting item 06, allowing users' manual setting.

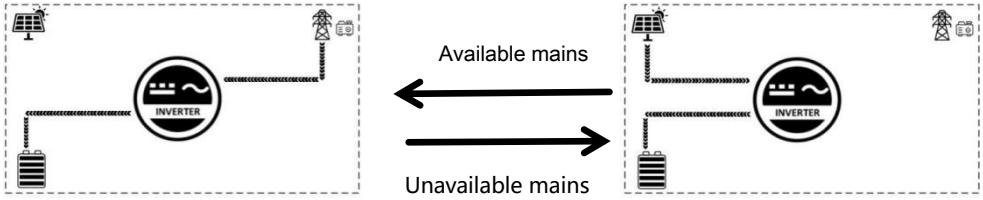
- **Mix charge SNU (default)**

Both PV and mains charge the battery, with PV used first, and mains as a supplement during insufficient PV power. This is the fastest charge method, suitable to provide users with sufficient backup power in areas where the power supply is insufficient. (**Priority: PV > mains**)



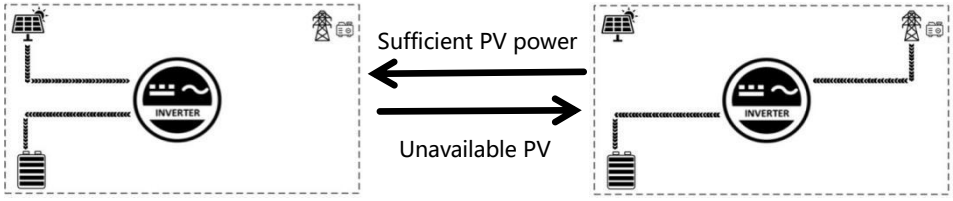
- **Mains-first charge CUB**

Mains first charges the battery, and only when mains is unavailable, PV charge is to be started (**priority: mains > PV**).



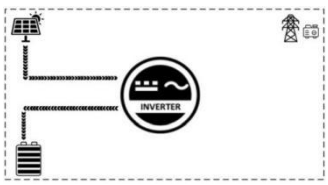
- **PV-first charge CSO**

PV first supplies power, and only when PV charge is failed, mains charge is enabled. By making full use of PV during the day and switching to mains in the evening, the mode can maintain the battery power, suitable for applications in areas with relatively stable power grids and expensive electric charges. (**Priority: PV > mains**)



- **Only-PV charge OSO**

Only PV power is used to charge the battery, with mains not used for charge. This is the most energy-saving method, by which the battery power comes from solar energy, usually used in areas with good radiation conditions.



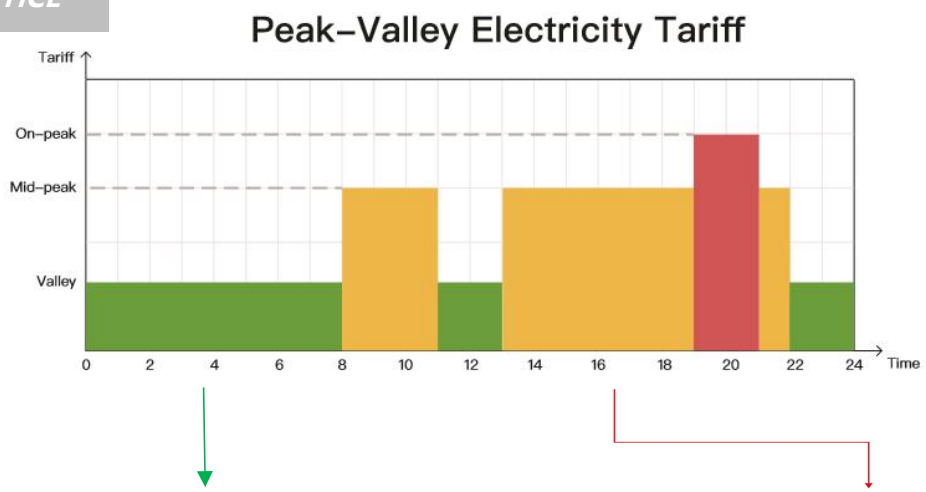
5.5 Timed charge/discharge function

SPH series has the timed power charge/discharge function. Users can set different charge and discharge periods according to the local time-of-use price, thus reasonably using mains and PV power. When mains is expensive, the battery inverter is used to supply power to the load; when mains is cheap, it can be used to supply power to and charge the load, thus helping users reduce electricity expenses to the full extent. Users can turn on/off the timed charge/discharge function in items 46 and 53 in the setup menu, and set charge and discharge periods in parameters 40–45 and 47–52.

The following is an example to help users understand the function.

Before using the function for the first time, please set the local time and date in parameters 54 and 55, and then you can set corresponding periods based on the local time-of-use price.

NOTICE



Timed charge and loading function

With 3 definable periods, users can freely set the mains charge/loading period in the range of 00:00–23:59. During the period set by the user, in case of PV energy output, it will be used first; in case of no PV energy output or lack of PV energy, mains will be used as a supplement.

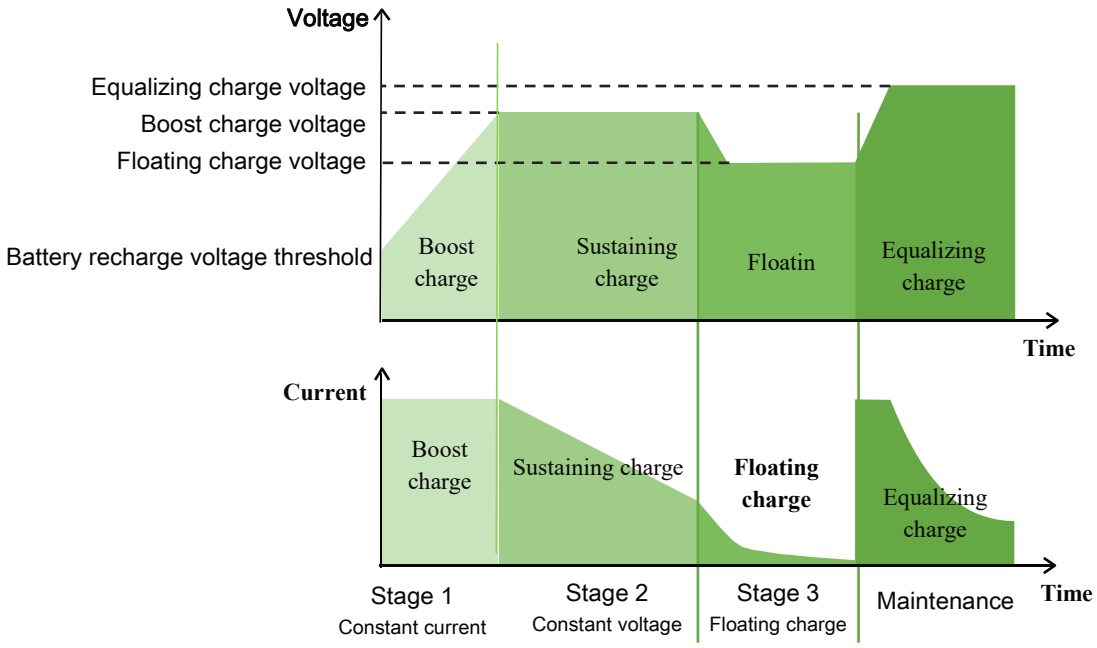
Timed battery discharge function

With 3 definable periods, users can freely set the battery discharge period in the range of 00:00–23:59. During the period set by the user, the inverter will first use the battery inverter to load; if the battery power is insufficient, the inverter will automatically switch to mains to ensure stable operation of the load.

5.6 Battery parameters

- **Lead-acid battery**

Parameter/Battery Type	Sealed Lead-acid Battery	Gel lead-acid battery	Flooded Lead-acid Battery	User-defined Battery
	SLD	GEL	FLD	USE
Overvoltage disconnect voltage	60 V	60 V	60 V	60 V
Equalizing charge voltage	58 V	56.8 V	58 V	40 V–60 V (settable)
Boost charge voltage	57.6 V	56.8 V	57.6 V	40 V–60 V (settable)
Floating charge voltage	55.2 V	55.2 V	55.2 V	40 V–60 V (settable)
Under-voltage alarm voltage	44 V	44 V	44 V	40 V–60 V (settable)
Under-voltage disconnect voltage	42 V	42 V	42 V	40 V–60 V (settable)
Discharge limit voltage	40 V	40 V	40 V	40 V–60 V (settable)
Over-discharge delay time	5s	5s	5s	1s–30s (settable)
Equalizing charge duration	120 min	-	120 min	0 min–600 min (settable)
Equalizing charge cycle	30 d	-	30 d	0 d–250 d (settable)
Boost charge cycle	120 min	120 min	120 min	10 min–600 min (settable)

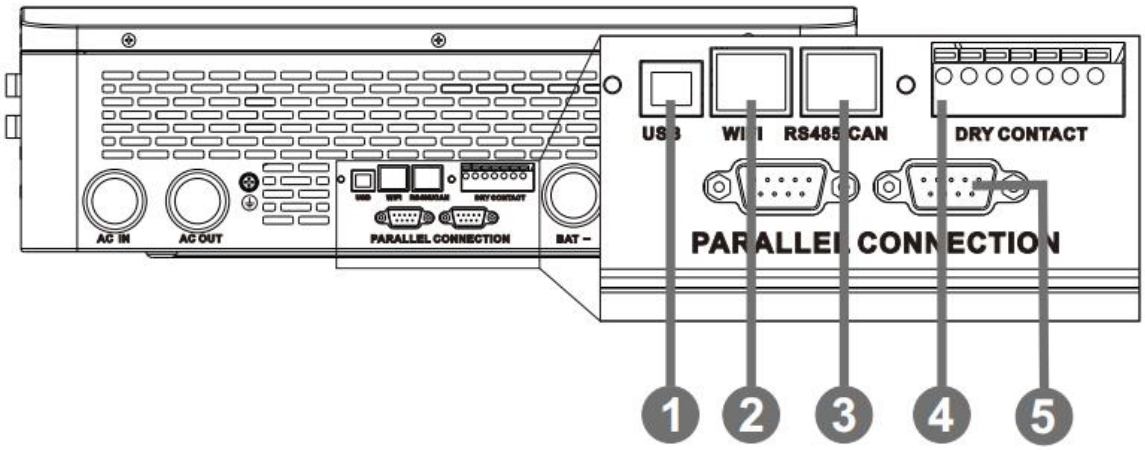


- **Li-ion battery**

Parameter/Battery Type	Ternary Li-ion Battery		LFP Battery			User-defined Battery
	N13	N14	L16	L15	L14	USE
Overvoltage disconnect voltage	60 V	60 V	60 V	60 V	60 V	60 V
Equalizing charge voltage	-	-	-	-	-	40 V–60 V (settable)
Boost charge voltage	53.2 V	57.6 V	56.8 V	53.2 V	49.2 V	40 V–60 V (settable)
Floating charge voltage	53.2 V	57.6 V	56.8 V	53.2 V	49.2 V	40 V–60 V (settable)
Under-voltage alarm voltage	43.6 V	46.8 V	49.6 V	46.4 V	43.2 V	40 V–60 V (settable)
Under-voltage disconnect voltage	38.8 V	42 V	48.8 V	45.6 V	42 V	40 V–60 V (settable)
Discharge limit voltage	36.4 V	39.2 V	46.4 V	43.6 V	40.8 V	40 V–60 V (settable)
Over-discharge delay time	30s	30s	30s	30s	30s	1s–30s (settable)
Equalizing charge duration	-	-	-	-	-	0 min–600 min (settable)
Equalizing charge cycle	-	-	-	-	-	0 d–250 d (settable)
Boost charge cycle	120 min (settable)	120 min (settable)	120 min (settable)	120 min (settable)	120 min (settable)	10 min–600 min (settable)

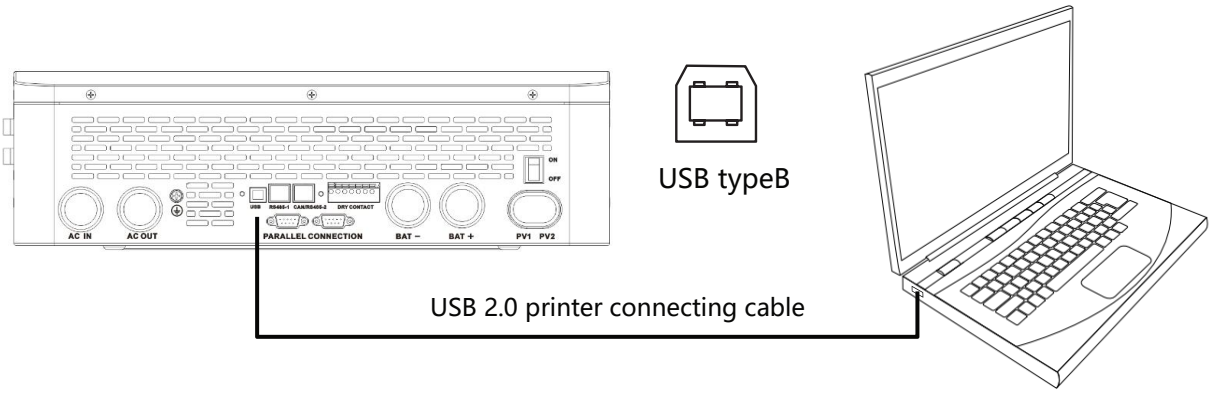
6. Communication

6.1 Overview



1	USB-B port	2	WIFI port	3	RS485/CAN port
4	Dry contact port	5	Parallel port		

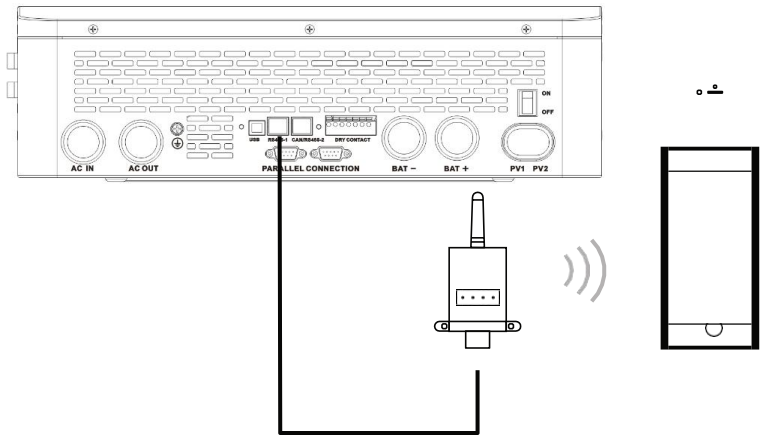
6.2 USB-B port



Users can use the upper computer software through the port to read and modify device parameters. If needing the installation package for the upper computer software, you can download it from the official website of SRNE, or contact us to get it.

6.3 WIFI port

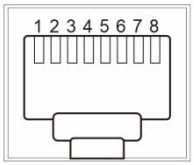
The WIFI port is used to connect to the Wi-Fi/GPRS data acquisition module, and then users can view the operation status and parameters of the inverter via the mobile APP.



RJ45	Definition
Pin 1	5 V
Pin 2	GND
Pin 3	/
Pin 4	/
Pin 5	/
Pin 6	/
Pin 7	RS485-A
Pin 8	RS485-B

6.4 RS485/CAN port

The RS485/CAN port is used to connect to the BMS of the Li-ion battery.



RS485/CAN

RJ45	Definition
Pin 1	RS485-B
Pin 2	RS485-A
Pin 3	/
Pin 4	CANH
Pin 5	CANL
Pin 6	/
Pin 7	RS485-A
Pin 8	RS485-B

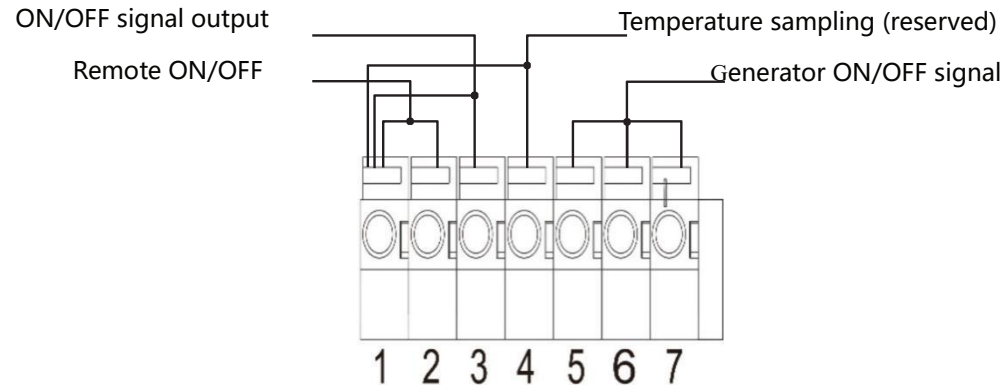
NOTICE

If you need the communication between the inverter and the BMS of the Li-ion battery, please contact us to understand the communication protocol, or upgrade the inverter to the corresponding software program.

6.5 Dry contact port

The dry contact port has 4 functions:

1. Remote ON/OFF
2. ON/OFF signal output
3. Battery temperature sampling
4. Remote generator start/stop



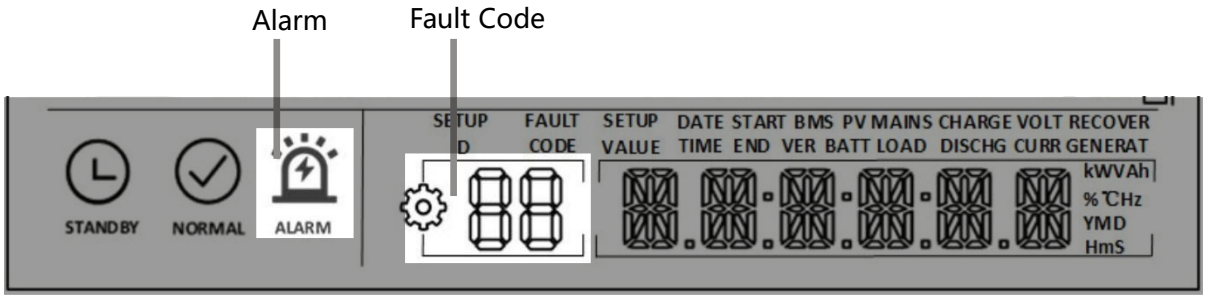
Function	Description
Remote ON/OFF	When pin 1 is connected to pin 2, the inverter will turn off the AC output. When disconnected, the inverter is in normal output.
ON/OFF signal output	When the battery voltage reaches the discharge limit voltage (parameter 15), the voltage between pin 3 and pin 1 is 0 V. When the battery is in normal charge or discharge status, the voltage between pin 3 and pin 1 is 5 V.
Temperature sampling (reserved)	Pins 1 and 4 can be used for battery temperature sampling compensation.
Remote generator start/stop	When the battery voltage reaches the under-voltage alarm voltage (parameter 14) or the voltage threshold for mains to switch to the battery (parameter 04), pins 6 to 5 are normally open, and pins 7 to 5 are normally closed. When the battery voltage reaches the voltage threshold for the battery to switch to mains (parameter 05), or the battery is fully charged, pins 6 to 5 are normally closed, and pins 7 to 5 are normally open. (5/6/7 pin output: 125 VAC/1 A, 230 VAC/1 A, and 30 VDC/1 A)

NOTICE

If you need to use the remote start/stop function of the generator with dry contact, please ensure that the generator has an ATS and supports remote start/stop.

7. Fault Codes and Response Measures

7.1 Fault codes



Fault Code	Meaning	Affect Output or Not	Description
01	BatVoltLow	Yes	Battery under-voltage alarm
02	BatOverCurrSw	Yes	Overcurrent software protection for average battery discharge current
03	BatOpen	Yes	Disconnected battery alarm
04	BatLowEod	Yes	Under-voltage battery discharge stop alarm
05	BatOverCurrHw	Yes	Battery overcurrent hardware protection
06	BatOverVolt	Yes	Charge overvoltage protection
07	BusOverVoltHw	Yes	Bus overvoltage hardware protection
08	BusOverVoltSw	Yes	Bus overvoltage software protection
09	PvVoltHigh	Yes	PV overvoltage protection
10	PvBoostOCSw	No	Boost overcurrent software protection
11	PvBoostOCHw	No	Boost overcurrent hardware protection
12	SpiCommErr	Yes	SPI communication fault of master and slave chips
13	OverloadBypass	Yes	Bypass overload protection
14	OverloadInverter	Yes	Inverter overload protection
15	AcOverCurrHw	Yes	Inverter overcurrent hardware protection
16	AuxDSpReqOffPWM	Yes	Slave chip OFF request fault
17	InvShort	Yes	Inverter short-circuit protection
18	Bussoftfailed	Yes	Bus soft-start failure
19	OverTemperMppt	No	PV heat sink over-temperature protection
20	OverTemperInv	Yes	Inverter heat sink over-temperature

			protection
21	FanFail	Yes	Fan fault
22	EEPROM	Yes	Memory fault
23	ModelNumErr	Yes	Model setting error
24	Busdiff	Yes	Positive and negative bus voltage imbalance
25	BusShort	Yes	Bus short-circuit
26	Rlyshort	Yes	Inverter AC output backward to bypass AC output
28	LinePhaseErr	Yes	Mains input phase error
29	BusVoltLow	Yes	Bus low-voltage protection
30	BatCapacityLow1	Yes	Alarm of battery capacity rate below 10% (taking effect after BMS communication is successful)
31	BatCapacityLow2	No	Alarm of battery capacity rate below 5% (taking effect after BMS communication is successful)
32	BatCapacityLowStop	Yes	Battery low-capacity OFF (taking effect after BMS communication is successful)
34	CanCommFault	Yes	Parallel can communication fault
35	ParaAddrErr	Yes	Parallel ID (communication address) setting error
37	ParaShareCurrErr	Yes	Parallel current sharing fault
38	ParaBattVoltDiff	Yes	Large battery voltage difference in parallel mode
39	ParaAcSrcDiff	Yes	Inconsistent mains input source in parallel mode
40	ParaHwSynErr	Yes	Hardware synchronization signal error in parallel mode
41	InvDcVoltErr	Yes	Inverter DC voltage error
42	SysFwVersionDiff	Yes	Inconsistent system firmware version in parallel mode
43	ParaLineContErr	Yes	Parallel connection fault
44	Serialnumbererror	Yes	Failure to set the serial number before leaving factory
45	Errorsettingofsplit-phasemode	Yes	Setting error of setting items in parallel mode
56	Lowinsulation	No	Abnormally low earth impedance of PV1+, PV2+, and PV-

	resistancefault		
57	Leakagecurrent overloadfault	Yes	System current leakage out of the standard
58	BMSComErr	No	BMS communication fault
60	BMSUnderTem	No	BMS under-temperature alarm (taking effect after BMS communication is successful)
61	BMSOverTem	No	BMS over-temperature alarm (taking effect after BMS communication is successful)
62	BMSOverCur	No	BMS overcurrent alarm (taking effect after BMS communication is successful)
63	BMSUnderVolt	No	BMS under-voltage alarm (taking effect after BMS communication is successful)
64	BMSOverVolt	No	BMS overvoltage alarm (taking effect after BMS communication is successful)

7.2 Troubleshooting

Fault Code	Meaning	Cause	Solution
/	No screen display	There is no power input, or the device switch at its bottom is not turned on	Check if the battery air-switch or PV air-switch has been closed; check if the switch is in "ON"; press any button on the screen to exit the screen sleep mode.
01	Battery under-voltage	The battery voltage is lower than the value set in parameter [14]	Charge the battery until the battery voltage exceeds the value set in parameter [14].
03	Disconnected battery	The battery is not connected, or the BMS of the lithium-ion battery is in the discharge protection state	Check if the battery is reliably connected; check if the circuit breaker of the battery is off; ensure that the BMS of the lithium-ion battery can communicate normally.
04	Battery over-discharge	The battery voltage is lower than the value set in parameter 12	Manual reset: Turn off the power, and restart Automatic reset: Charge the battery until the battery voltage is higher than the value set in parameter [35]
06	Rechargeable battery overvoltage protection	The battery is in the overvoltage state	Manually turn off the power, and restart Check if the battery voltage exceeds the limit. If the limit is exceeded, discharge the battery until the voltage is below the overvoltage recovery threshold of the battery
13	Bypass overload (software detection)	The output power or current of the bypass is overloaded within a certain period	Reduce the load power, and restart the device. For more details, please refer to item 11 in *Protection Function*
14	Inverter overload (software detection)	The output power or current of the inverter is overloaded within a certain period	
19	Over-high temperature of the heat sink for PV input (software detection)	The temperature of the heat sink for PV input exceeds 90°C for 3s	Wait until the temperature of the heat sink is below the over-temperature recovery temperature, when charge and discharge return to normal
20	Over-high	The temperature of the	

	temperature of the heat sink for inverter output (software detection)	heat sink for inverter output exceeds 90°C for 3s	
21	Fan fault	Software detection founds the fan has a fault	Shut down, manually flick the fan, and check if any foreign objects are blocking it
26	AC input relay short-circuit	Stuck relay for AC output	Manually shut down, and restart. If the fault occurs again after restarting, contact the after-sales service personnel to repair the machine
28	Mains input phase fault	The phase of AC input is inconsistent with that of AC output	Ensure that the phase of AC input is the same as that of AC output. For example, if the output is in the split-phase mode, the input shall also be in the split-phase mode.

NOTICE

If you encounter product faults that cannot be solved by the methods listed in the above table, please contact our after-sales service department for technical support, and do not disassemble the device by yourself.

8. Protection Function and Product Maintenance

8.1 Protection function

No	Protection Function	Description
1	PV current-limiting protection	When the charge current or power of the configured PV array exceeds the rated current and power of the inverter, it will charge at the rated current and power
2	PV overvoltage protection	If the PV voltage exceeds the maximum allowable value of hardware, the machine will report the fault, and stop the step-up of PV to output sine AC waves
3	Reverse charge protection at night	At night, as the battery voltage is greater than that of the PV module, it will prevent the battery from discharging to the PV module
4	mains input overvoltage protection	When the mains voltage of each phase exceeds 140 VAC, it will stop mains from charging, and switch it to inverter output

5	Mains input under-voltage protection	When the mains voltage of each phase is lower than 90 VAC, it will stop mains from charge, and switch it to inverter output
6	Battery overvoltage protection	When the battery voltage reaches the overvoltage disconnect voltage threshold, it will automatically stop PV and mains from charging the battery, thus preventing damage to the battery due to overcharge
7	Battery under-voltage protection	When the battery voltage reaches the low-voltage disconnect voltage threshold, it will automatically stop discharging the battery, thus preventing damage to the battery due to overdischarge
8	Battery overcurrent protection	When the battery current exceeds the allowable range of hardware, the machine will turn off the output, and stop discharging the battery
9	AC output short-circuit protection	When a short-circuit fault occurs at the load output terminal, it will immediately turn off the output of AC voltage. Only after manually powering on the device, normal output restores
10	Heat sink over-temperature protection	When the internal temperature of the inverter is too high, the inverter will stop charging and discharging; when the temperature returns to normal, the inverter will charge and discharge again
11	Overload protection	After overload protection is triggered, the inverter output will be restored after 3 min, and after 5 times of overload, the output will be off until the frequency changer is restarted. (102%< load <110%): An error will be reported, and the output will be turned off after 5 min. (110%< load <125%): An error will be reported, and the output will be turned off after 10s. Load >125%: An error will be reported, and the output will be turned off after 5s.
12	AC backward protection	Prevent the mains of battery inverter backward to bypass AC input
13	Bypass overcurrent protection	Built-in circuit breaker for AC input overcurrent protection
14	Bypass wiring error protection	When the phase of the two bypass inputs is different from that of the inverter split-phase, the machine will prohibit connecting to the bypass, thus preventing the power failure or short circuit of load when connecting to the bypass

8.2 Maintenance

In order to maintain the best long-term performance, it is recommended to conduct following checks twice a year.

1. Make sure that the airflow around the inverter is smooth, and remove any dirt or debris from the heat sink.
2. Check whether the insulation of all exposed wires is damaged by exposure to sunlight, friction with other objects around them, dryness, bite by insects or rodents, etc. Repair or replace wires if necessary.
3. Verify the consistency of the indication and display with the device operation. Please pay attention to any faults or errors, and take corrective actions if necessary.
4. Check all wiring terminals for corrosion, insulation damage, and signs of high temperature or burning/discoloration, and tighten the terminal screws.
5. Check for dirt, nesting insects, and corrosion, clean up as required, and clean the insectproof net regularly.
6. If the arrester fails, replace it in time against lightning damage to the inverter or even other devices of the user.

> ⚠ ***DANGER***
>
> ● Before conducting any inspection or operation, please ensure that the inverter is disconnected from all power sources and that the capacitor is fully discharged to avoid the risk of electric shock.

Our company will not be held responsible for damage due to the following reasons:

1. Damage caused by improper use or use in the wrong location.
2. The open circuit voltage of the PV module exceeds the maximum allowable voltage.
3. The operating temperature exceeds the limited operating temperature range.
4. Unauthorized personnel dismantle, and repair the inverter.
5. Force majeure: damage during transportation or handling of the inverter

9. Parameter Table

Inverter Model	SPH8048P	SPH10048P	Settable
Inverter output			
Rated output power	8,000 W	10,000 W	
Maximum peak power	16,000 W	20,000 W	
Rated output voltage	120/240 VAC (single-phase/split-phase)		Y
Loading motor capacity	5 HP	6 HP	
Rated frequency	50/60 Hz		Y
Output wave	Pure sine wave		
Switching time	10 ms (typical value)		
Parallel number	6		
Overload protection	After overload protection is enabled, the inverter output will be restored after 3 min, and after 5 times of overload, the output will be off until the inverter is restarted. (102%< load <110%): An error will be reported, and the output will be turned off after 5 min. (110%< load <125%): An error will be reported, and the output will be turned off after 10s. Load >125%: An error will be reported, and the output will be turned off after 5s.		
Battery			
Battery type	Lithium-ion battery/lead-acid battery/user-defined battery		Y
Rated battery voltage	48 Vdc		
Voltage range	40 Vdc–60 Vdc		Y
Maximum PV charge current	180 A	200 A	Y
Maximum mains/generator charge current	100 A	120 A	Y
Maximum mix charge current	180 A	200 A	Y
PV input			
MPPT channel number	2		

Maximum input power	11,000 W	
Maximum Input Current	22/22 A	
Maximum open circuit voltage	500 Vdc	
MPPT operating voltage range	125 Vdc–425 Vdc	
Mains/generator input		
Input voltage range	90 VAC–140 VAC	
Input frequency range	50/60 Hz	
Bypass overload current	63 A	
Efficiency		
MPPT tracking efficiency	99.9%	
Maximum efficiency of battery inverter	92%	
General		
Dimension	620 mm*445 mm*130 mm	
Weight	27 kg	
Protection level	IP20, for indoor use only	
Ambient temperature	–10°C–55°C, >45°C derating	
Noise	<60 dB	
Cooling mode	Intelligent fan	
Communication		
Built-in interface	RS485/CAN/USB/dry contact	Y
External module (optional)	Wi-Fi/GPRS	Y
Certification		
Safety	IEC62109-1, IEC62109-2, and UL1741	
EMC	EN61000-6-1, EN61000-6-3, and FCC 15 class B	
RoHS	Yes	

V2312-JC-11131-1246

51.2V
LiFePO4 Battery

LFP48100P~48230P

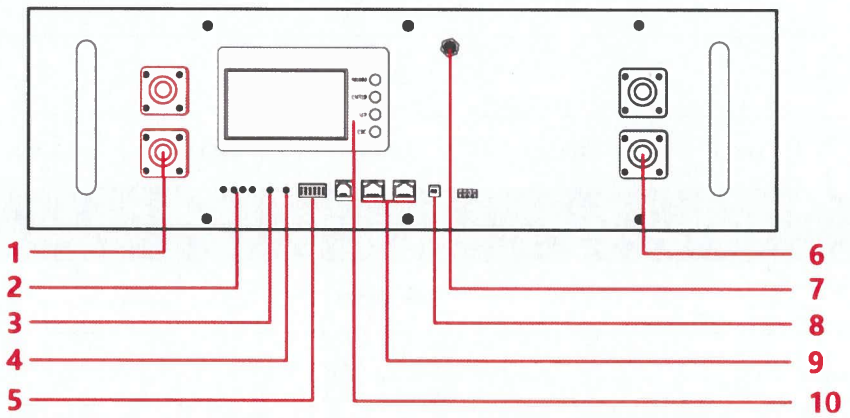
USER MANUAL

CONTENT

1. Safety Instructions

1. Please confirm the package is in good condition after getting the product. If there is any damage, please take photos to record and contact the supplier in time.
2. Because this is an electronic energy storage product, please handle it gently, and please pay attention to safety when moving products.
3. After unpacking, please check whether the product appearance is intact, press the ON/OFF switch to start the battery, confirm whether it can be turned on normally, and whether the LCD screen is displayed normally.
4. Please connect to other devices in the correct way with the battery power off.
5. After devices connected, before turning on the battery, please turn off the loads (including the inverter). If it is turned on with loads, it may trigger the BMS short-circuit protection mechanism.
6. Charge as required, take 51.2V products as an example: normal charging voltage is 57.6V-58.4V, recommend current 0.2C. Mismatched current and voltage will cause damage to the circuit system, shorten the service life of the battery, and even bring safety hazards.
7. Charge rate should not exceed 0.5C, discharge rate should not exceed 0.7C.
8. Avoid using it in humid environments and in areas where it will be exposed to sunlight.
9. When not in use for a long time, it should be charged regularly, and it is best to keep half-charged storage (40%-60%).
10. Battery should be recharged within 12 hours after being fully discharged.
11. When different batches of batteries are installed in the same system, all batteries should be balanced to the same voltage (the voltage difference within 0.3V) by charging and discharging individually.
12. Do not disassemble the equipment without professional assistance.
13. Do not connect batteries with different brands or different capacities.

2. Product Overview



No.	Item	Function
1	Positive Terminal	Charge & Discharge
2	SOC	Indicators for Capacity
3	ALM	Indicator for Alarms
4	RUN	Indicator for Running Status
5	ADD	DIP Switch of Communication
6	Negative Terminal	Charge & Discharge
7	Power Switch	ON/OFF Switch
8	Reset	Activate/Hibernate BMS
9	RS485A, RS485B/CAN	Communication Interface
10	LCD Screen	Display Battery Information

3. Battery Specifications

Nominal Parameters					
Model No.	LFP48100P	LFP48120P	LFP48150P	LFP48200P	LFP48230P
Nominal Voltage	51.2V	51.2V	51.2V	51.2V	51.2V
Nominal Capacity	100Ah	120Ah	150Ah	200Ah	230Ah
Energy	5.12KWh	6.14KWh	7.68KWh	10.24KWh	11.78KWh
Dimensions (L * W * H mm)	480*440*160	480*440*200	480*440*200	480*440*255	480*440*255
Weight (KG)	Approx 45	Approx 52	Approx 55	Approx 70	Approx 80
Built-in BMS	16S 100A	16S 100A	16S 200A	16S 200A	16S 200A
Electrical Parameters					
Overall Over Voltage Alarm Value	58.2VDC				
Overall Under Voltage Alarm Value	44VDC				
Overall Over Voltage Protection Value	58.4VDC ✓				
Overall Under Voltage Protection Value	42VDC				
Recommend Charge & Discharge Current	0.2~0.5C				
Max. Cont. Discharge Current	100A	100A	150A	200A	200A
Basic Parameters					
Life Time(25°C)	10+ years				
Communication Interface	RS485 / CAN				
Display Method and Language	LCD, English				
Life Cycles (80% DOD, 25°C)	≥6000 times Cycles				
Charge Temperature Range (Cell)	0℃~50℃				
Discharge Temperature Range (Cell)	-15℃~55℃				
Environmental Temperature Range	-15℃~55℃				

4. List of Accessories

No.	Item	Picture	Qty	Remarks
1	Parallel Power Cable		2	For 51.2V 100AH/120AH: 6 AWG cable 0.3M For 51.2V 150AH/200AH/230AH: 4 AWG cable 0.4M
2	Parallel Communication Cable		1	RJ45 cable 0.5M
3	Upper computer Connecting Cable		1	RJ45 to USB cable 2M
4	Screws		4	M8

5. Connection

5.1. Battery module

If there are multiple batteries to be connected in parallel, ensure that the voltage difference of all batteries is within 0.3V before proceeding. If the voltage difference is over 0.3V, discharge all batteries until the low voltage alarm and discharge stops. Confirm the voltage difference is within 0.3V, then ensure all battery modules are turned off. Connecting each battery module "+" (positive) and "-" (negative) terminal to "+" (positive) and "-" (negative) busbar. Connect all sources and loads to the busbar, observing proper polarity. Note: There may be fuses, contactors, switches, etc. between the busbar and the connected sources and/or loads.

5.2. Communication cable

If a single battery is used, skip this step.

When multiple batteries are connected in parallel, set the battery module Address (or ID) of each battery module according to page 9~10 (also ensure no duplicate address codes are used). Then connect one end of the provided RJ45 communication cable into a battery module front panel "RS485A" or "RS485B" interface and connect the remaining end of the RJ45 communication cable into another battery module front panel "RS485A" or "RS485B" interface. Continue connecting communication cables until all battery modules are connected.

6. Working Mode

6.1. Basic Mode

6.1.1. Charging Mode

The BMS turns on the charging MOSFET for charging when it detects an external charging voltage, and the cell voltage and temperature are within the chargeable range. When the charging current reaches the effective charging current, it enters the charging mode. Both charging and discharging MOSFETs are on in charge mode.

6.1.2. Discharging Mode

The BMS enters the discharge mode when it detects that the load is connected and the cell voltage and temperature are within the dischargeable range and the discharge current reaches the effective discharge current.

6.1.3. Hibernation and Wake Up Mode

The system enters hibernation mode when the following conditions are met:

1. Individual low-voltage protection or overall low-voltage protection has not been released within 60 minutes;
2. Press the power switch button for 3 seconds and then release the button;
3. The minimum cell voltage is lower than the dormancy set voltage (default value 3300mV), and the duration reaches the delay time (the default value is 1440min, which meets the requirements of no communication and no charging and discharging current at the same time);
4. Compulsory shutdown through the upper computer software.

Before entering hibernation, make sure that the negative terminal is not connected to external voltage, otherwise it will not be able to enter the low power consumption mode.

5. The wake-up conditions of hibernation mode:

1) Connect to the charger, and the input voltage of the charger must be greater than 48V;
2) Wake up by pressing the power switch button for 1S and releasing the button.

6.2. Description of Reset Button

When the BMS is dormant, press the button for 1S and then release it, the BMS will be activated and the LEDs will light on sequentially for 0.5 seconds starting from the "SOC4".

When the BMS is in the working state, press the button for 3S~6S and then release it, the BMS will enter dormant and the LEDs will go off sequentially for 0.5S starting from "RUN".

When the BMS is in the working state, press the button for ⩾6S and then release it, the BMS will be reset, and the LEDs will display according to the current electricity level.

7. LED Indicator Description

7.1. LED Indicator Description

Four green capacity indicators, one red alarm indicator, one green running indicator

SOC4 ●	SOC3 ●	SOC2 ●	SOC1 ●	●	●
SOC				ALM	RUN

7.2. SOC Capacity Indicator

Status	Charge				Discharge			
SOC Indicator	SOC4●	SOC3●	SOC2●	SOC1●	SOC4●	SOC3●	SOC2●	SOC1●
0～25%	Flash 2	OFF	OFF	OFF	ON	OFF	OFF	OFF
25～50%	ON	Flash 2	OFF	OFF	ON	ON	OFF	OFF
50～75%	ON	ON	Flash 2	OFF	ON	ON	ON	OFF
75～100%	ON	ON	ON	Flash 2	ON	ON	ON	ON
RUN Indicator●	ON				Flash 3			

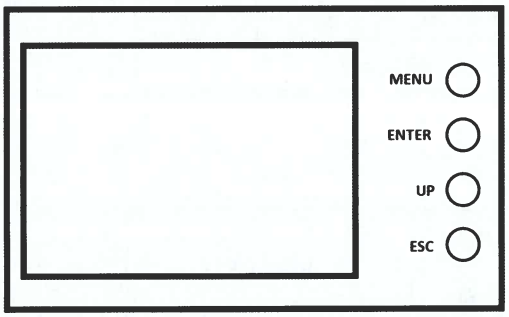
7.3. Status Indicator

Status	Normal / Alarm / Protection / Fault	SOC ● ● ● ●	ALM ●	RUN ●	Remark
OFF	OFF	ALL OFF			1. There are only normal and alarms in standby mode. Protection and faults are reported as charging and discharging status. 2. Alarms include: over voltage difference alarm, low capacity alarm, over voltage and low voltage alarm of single cell or whole battery, temperature alarms. 3. When charging over current protection occur, it will enter current limited charging. If there is charging current, it will displayed as normal state; if no charging current, it will displayed as fault state, ALM ON and others OFF.
Standby	Normal	ON according to battery capacity	OFF	Flash 1	
	Alarm		Flash 2	Flash 1	
Charge	Normal	ON according to battery capacity (The largest SOC LED Flash 2)	OFF	ON	
	Alarm		Flash 2	ON	
	Over Voltage Protection	ON according to battery capacity	OFF	ON	
	Over Current Protection (Enter current limit charging)	ON according to battery capacity (When there is charging current, the largest SOC LED Flash 2)	OFF	ON	
	Temperature Protection	ALL OFF	ON	OFF	
Discharge	Normal	ON according to battery capacity	OFF	Flash 3	
	Alarm		Flash 2	Flash 3	
	Low Voltage Protection		Flash 2	OFF	
	Over Current Protection, Short Circuit Protection	ALL OFF	ON	OFF	
	Temperature Protection	ALL OFF	ON	OFF	
Fault	NTC fault, MOS fault, reverse polarity, differential voltage protection, ultra-low voltage protection	ALL OFF	ON	OFF	

7.4. Flash Instruction of LED Indicators

Flash Types	ON	OFF
Flash 1	0.25 S	3.75 S
Flash 2	0.5 S	0.5 S
Flash 3	0.5 S	1.5 S

8. LCD Display Introduction



Button description:

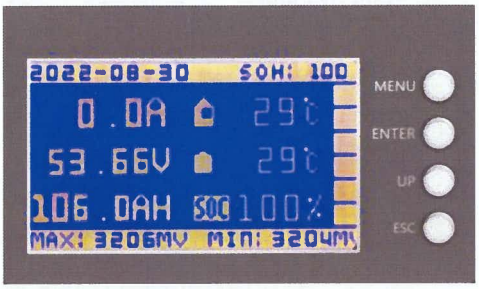
MENU: Enter the main menu.

ENTER: Enter to the sub-menu.

UP: Move to next page.

ESC: Return to the previous menu.

8.1. Power-on screen



System Date	SOH
Charging/Discharging Current	Environmental Temperature
Total Voltage	Max. Temperature of Battery Cell
Remaining Capacity	SOC
Max. Voltage of Single Cell	Min. Voltage of Single Cell

Battery protection status:

Over Voltage: OV

Low Voltage: LV

Over Temp: OT

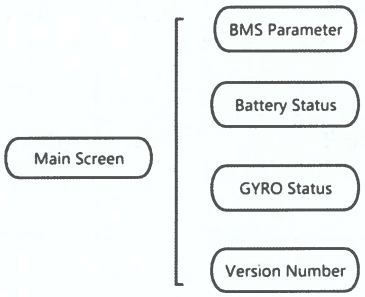
Low Temp: LT

Over Current: OC

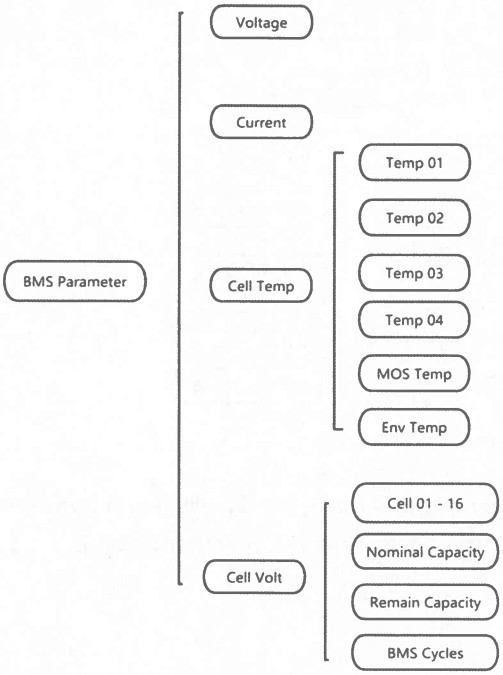
Short Circuit: SC

Note: When there is protection situation of the battery, there will show the corresponding protection status, otherwise, the protection status will not be showed.

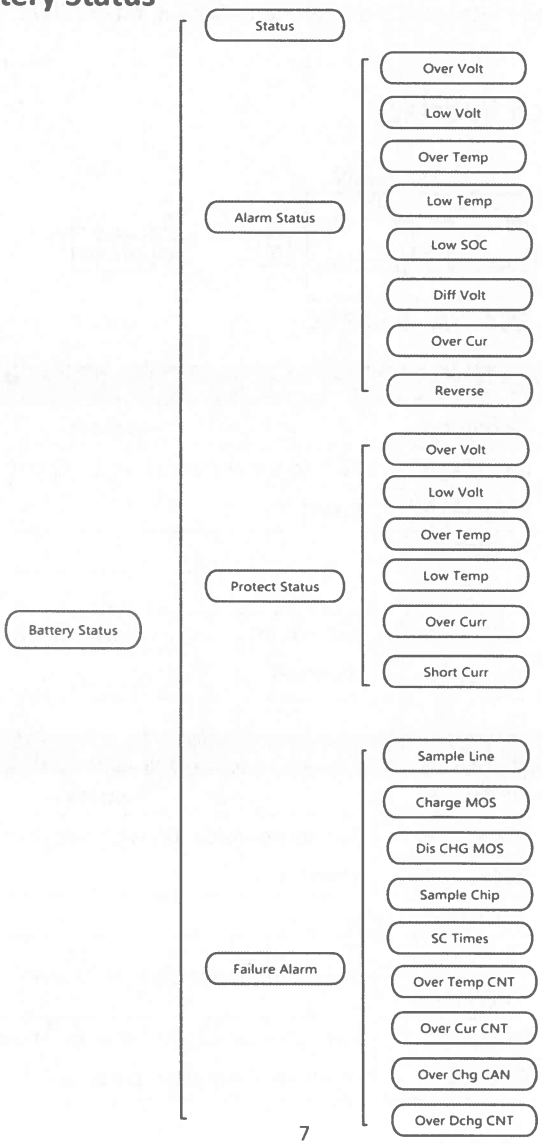
8.2. Main menu



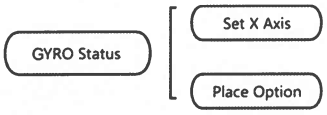
8.3. Sub-menu 1: BMS Parameter



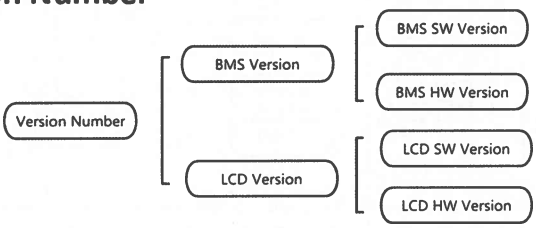
8.4. Sub-menu 2: Battery Status



8.5. Sub-menu 3: GYRO Status



8.6. Sub-menu 4: Version Number



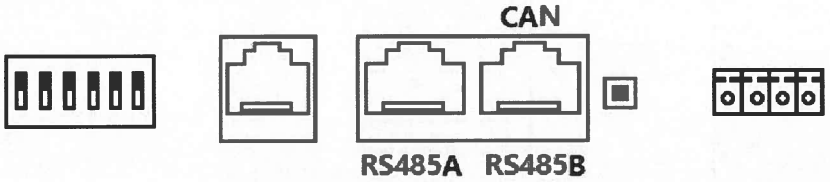
8.7. Dormancy and Activation Function

After 1 minute of no button operation in normal running, the display screen will be off (only the backlight is off). Pressing any button while the screen is off will allow the screen light and operate normally.

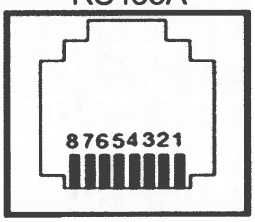
9. Communication

With RS485 and CAN interface, which supports communicating with multiple battery modules in parallel, with inverter and with the upper computer. RS485 baud rate is 9600 defaulted, CAN baud rate is 500K defaulted.

9.1. Pin Definition of Communication Interface

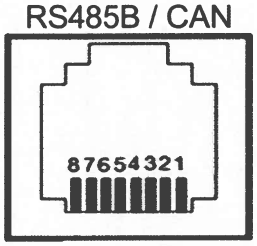


RS485A



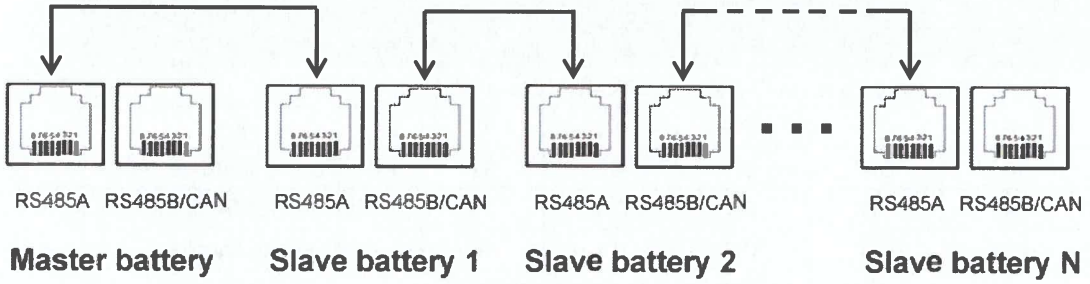
8P8C RJ45 Pins Assignment		
Pins	**Definition**	**Remark**
1	RS485A_B	For communication with upper computer or inverter
2	RS485A_A	
3, 6	GND	
4, 5	NC	
7	RS485B_A	For communication between multiple battery modules
8	RS485B_B	

RS485B / CAN



8P8C RJ45 Pins Assignment		
Pins	**Definition**	**Remark**
1	RS485A_B	For communication with upper computer or inverter
2	RS485A_A	
3, 6	GND	
4	CANH1	For communication with inverter
5	CANL1	
7	RS485B_A	For communication between multiple battery modules (only slave batteries)
8	RS485B_B	

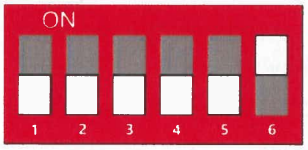
The multi-unit parallel connections are shown in the following figure.



9.2. DIP Switch Setting

Support battery modules parallel and inverter communication protocol selection.

When batteries are used in parallel, different batteries are distinguished by the dial address (or "ID"), and the ID of each battery in the entire battery group is unique.



There will be only one master battery and others will be slave batteries. The slave dialing address should be selected from 1 to 15, and the master dialing address should be selected from 0 or 16 or 32 or 48 according to the different communication protocol and inverter brand.

You can enter the ID of master or slave battery in the system parameters in upper computer monitor software to detect and communicate.

Note: The factory default settings support up to 16 batteries in parallel, if more than 16 batteries are needed in parallel, please contact manufacturer to upgrade the software (supports up to 32 batteries in parallel).

The reference table is as follows.

FOR SLAVE BATTERY

DIP SWITCH						ADD (ID)	REMARKS
1	2	3	4	5	6		
ON	OFF	OFF	OFF	OFF	OFF	1	Slave Pack 1
OFF	ON	OFF	OFF	OFF	OFF	2	Slave Pack 2
ON	ON	OFF	OFF	OFF	OFF	3	Slave Pack 3
OFF	OFF	ON	OFF	OFF	OFF	4	Slave Pack 4
ON	OFF	ON	OFF	OFF	OFF	5	Slave Pack 5
OFF	ON	ON	OFF	OFF	OFF	6	Slave Pack 6
ON	ON	ON	OFF	OFF	OFF	7	Slave Pack 7
OFF	OFF	OFF	ON	OFF	OFF	8	Slave Pack 8
ON	OFF	OFF	ON	OFF	OFF	9	Slave Pack 9
OFF	ON	OFF	ON	OFF	OFF	10	Slave Pack 10
ON	ON	OFF	ON	OFF	OFF	11	Slave Pack 11
OFF	OFF	ON	ON	OFF	OFF	12	Slave Pack 12
ON	OFF	ON	ON	OFF	OFF	13	Slave Pack 13
OFF	ON	ON	ON	OFF	OFF	14	Slave Pack 14
ON	ON	ON	ON	OFF	OFF	15	Slave Pack 15

FOR MASTER BATTERY.

DIP SWITCH						ADD (ID)	REMARKS
1	2	3	4	5	6		
Communicate via CAN Communication Protocol							
OFF	OFF	OFF	OFF	OFF	OFF	0	LXP
OFF	OFF	OFF	OFF	OFF	ON	32	Pylon, Deye, Goodwe, Solis
OFF	OFF	OFF	OFF	ON	OFF	16	Victron, SMA, Sofar
OFF	OFF	OFF	OFF	ON	ON	48	Growatt, Sacolor
Communicate via RS485 Communication Protocol							
OFF	OFF	OFF	OFF	OFF	OFF	0	SRNE
OFF	OFF	OFF	OFF	OFF	ON	32	Voltronic

9.3. Settings for no communication situation

Without communication protocol, inverter cannot communicate with our battery. You need to make some setting on your inverter, for example, select the user-defined mode and set the corresponding voltage level (according to the inverter user manual), so that they can work together without communication.

Here are some commonly used battery parameters that need to be set, for reference. If need more advices about battery parameters settings, please contact the manufacturer.

Over Voltage Disconnect Voltage	57.6V
Charging Limit Voltage	58.4V
Equalizing Charging Voltage	56V
Float Charging Voltage	54V
Low Voltage Warning Voltage	45V
Cut-off Discharge Voltage	43.2V
Discharge Limit Voltage	40V

10. Upper Computer Software Introduction

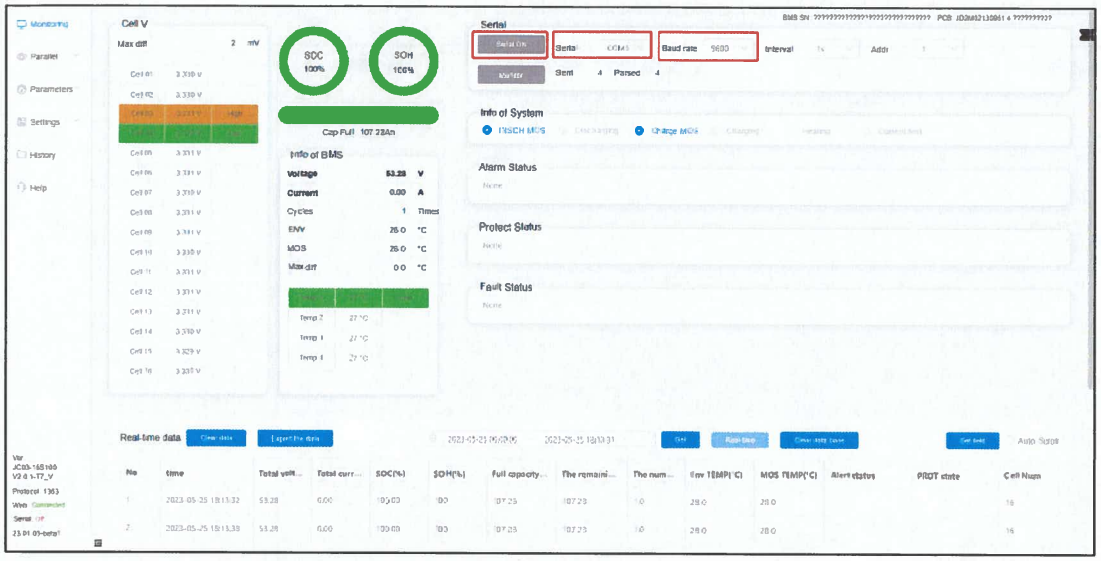
To monitor the battery module parameters, connect the RJ45 end of the provided upper computer communication cable into a battery module front panel "RS485A" or "RS485B" interface, and connect the USB end to computer.

10.1. How To Communicate With Upper Computer

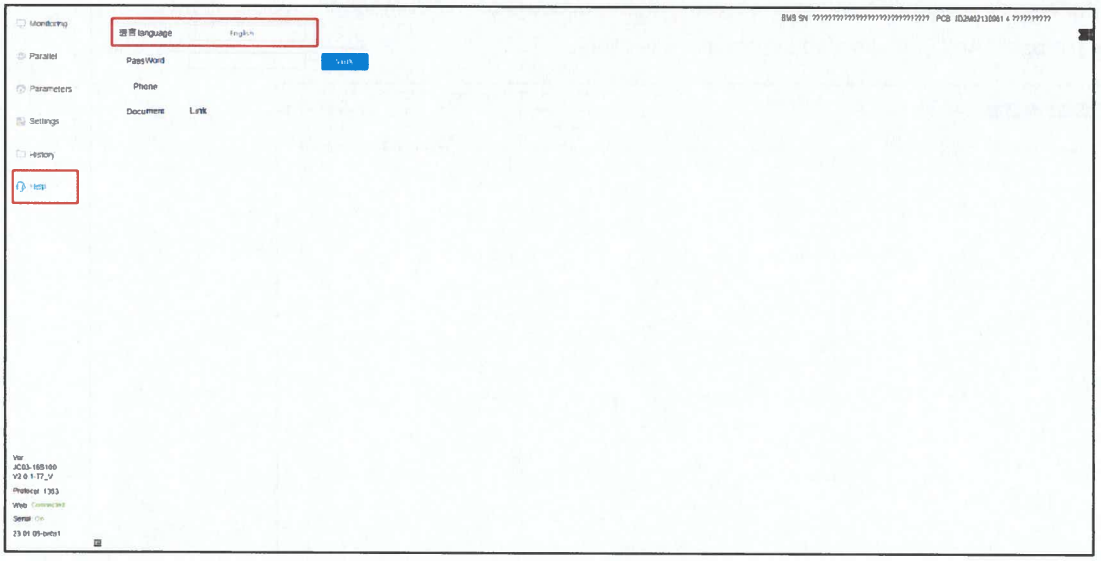
See Appendix I on page 18~19.

10.2. Upper Computer Software Introduction

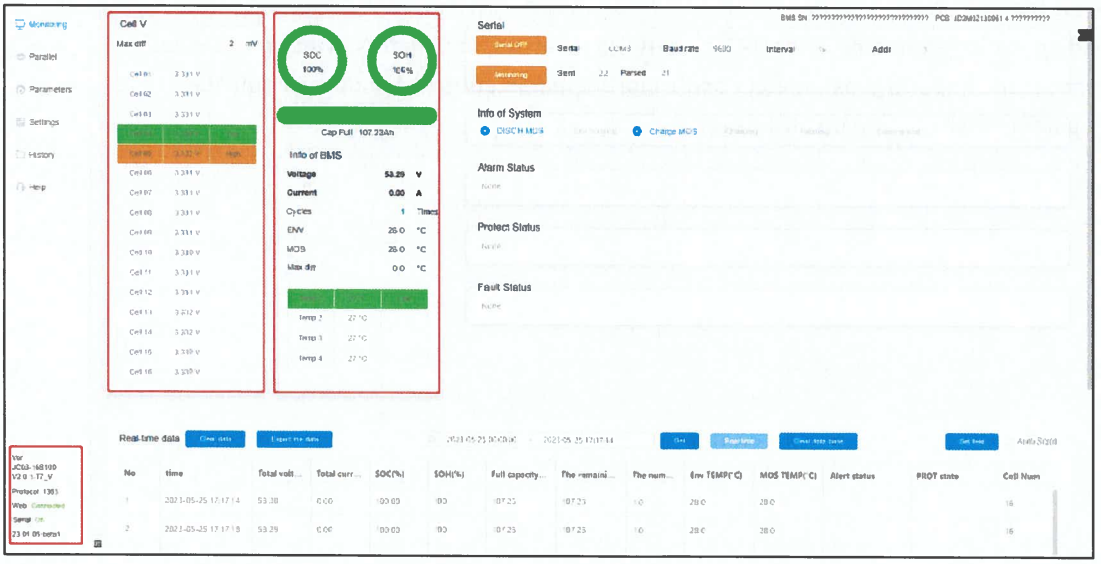
1. Enable the monitoring software, select the communication interface of the corresponding device, select the corresponding baud rate, and finally click "Open Serial Interface" to communicate with BMS and get the basic parameters. (picture on next page)



2. You can change the version in Chinese or English in help center.

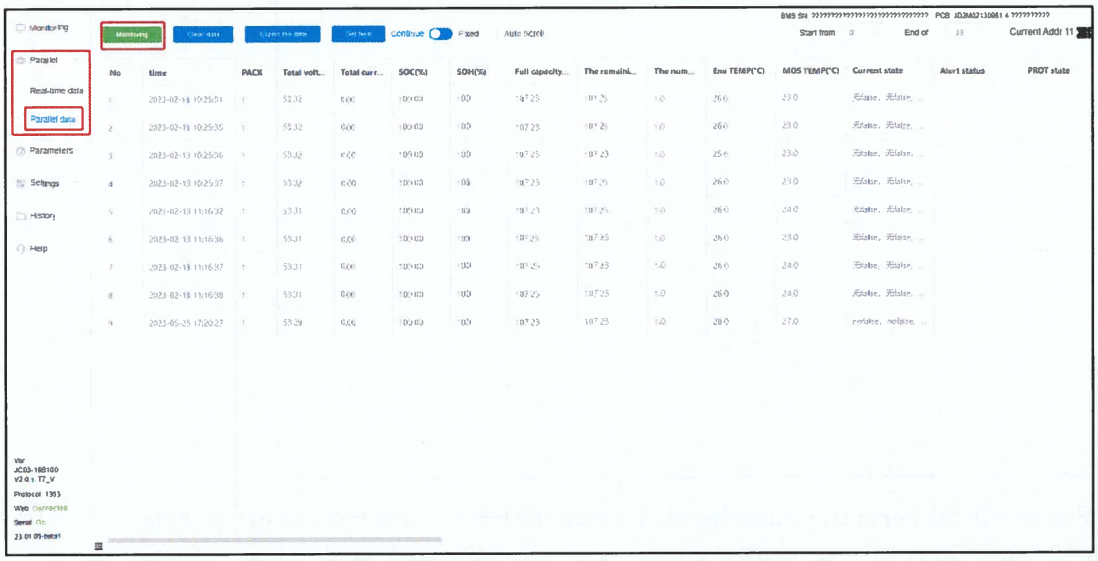


3. After the BMS communicates with the upper computer, you can monitor the basic parameters and status of the battery in real time. These information include battery voltage, current, SOC, SOH, cycle count, battery temperature, alarm status, protection status, etc.



4. You can view the real-time data storage of the BMS and export as excel tables.

5. When monitoring multiple packs, you need to set the start and end address of packs manually, you can check and comparethe data of each pack. And you can also export as excel table.



6. Parameters 1.

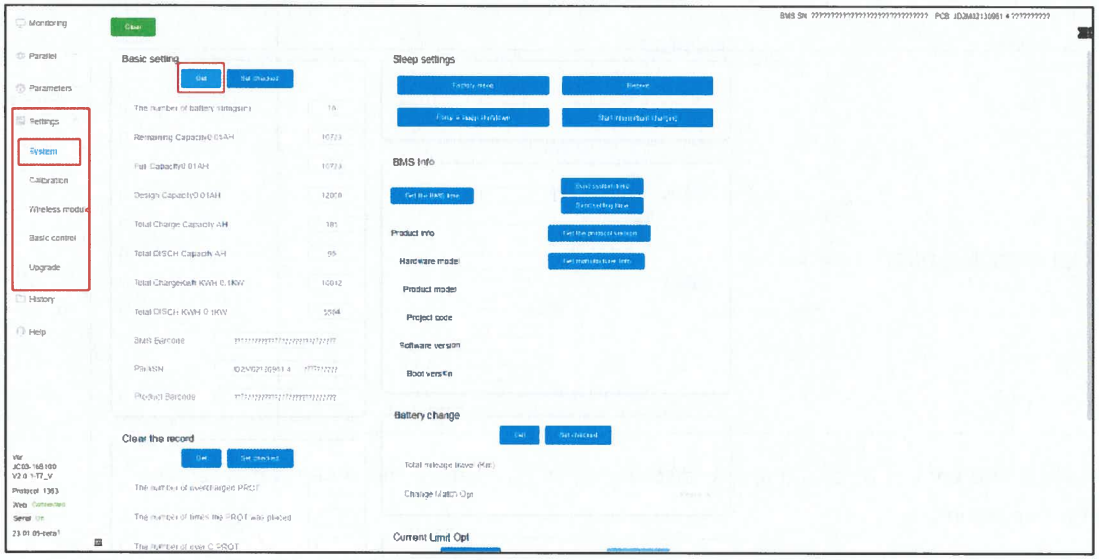
Click "Get All" when enter for the first time.

This section includes reading basic parameter information, restoring default parameters, writing individual parameters, writing all parameters, importing parameters and exporting parameters (it is not recommended to manually modified default parameters). (picture on next page)

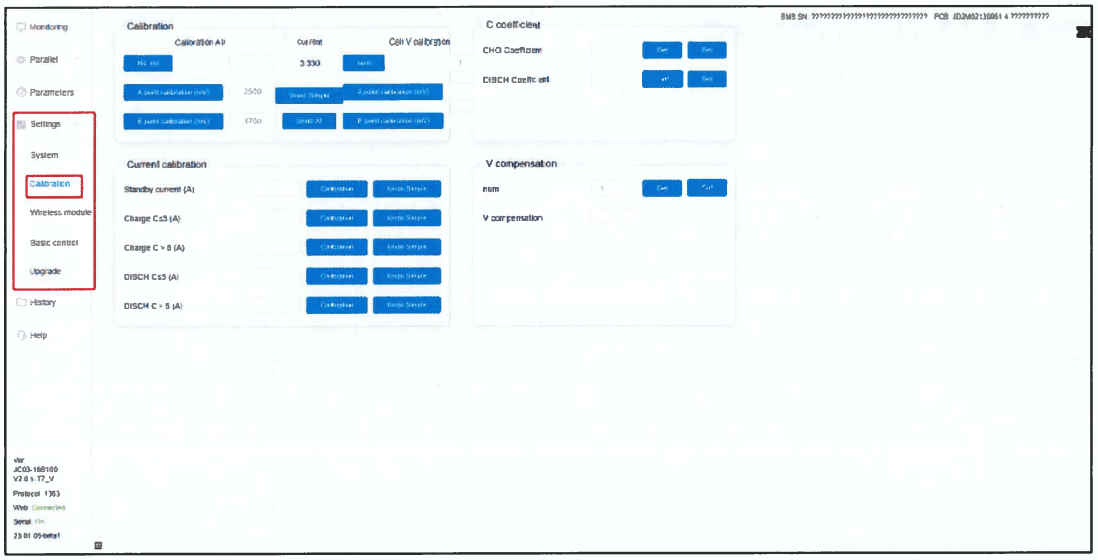
7. System parameter setting.

Click "Get" when enter for the first time.

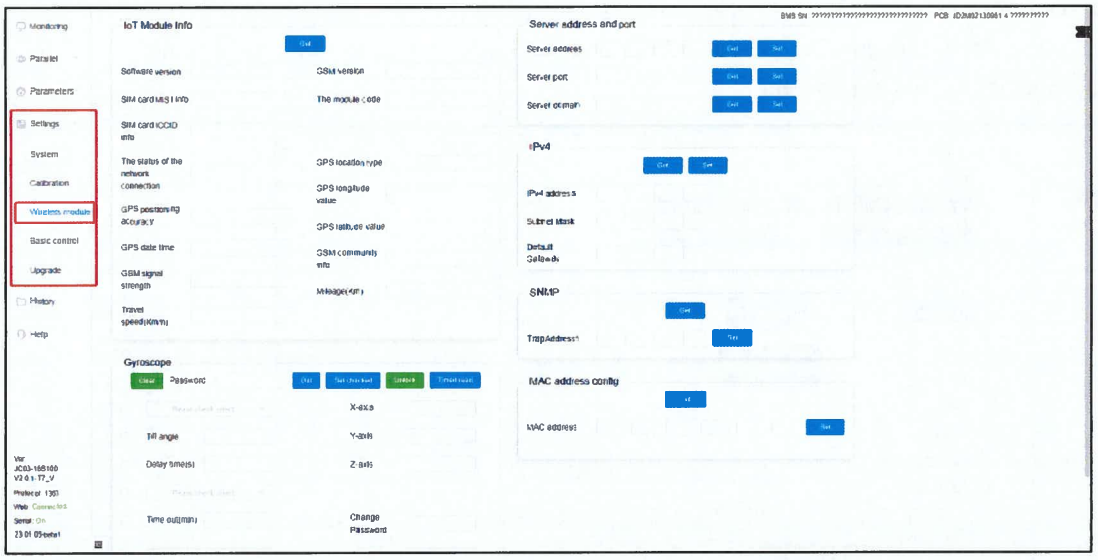
You can monitor the BMS parameters configuration, sleep settings and BMS information in real-time(it is not recommended to manually modified default parameters).



8. Calibration: Here is calibration content of BMS data (all has calibrated by factory, not recommended for private calibration). (picture on next page)

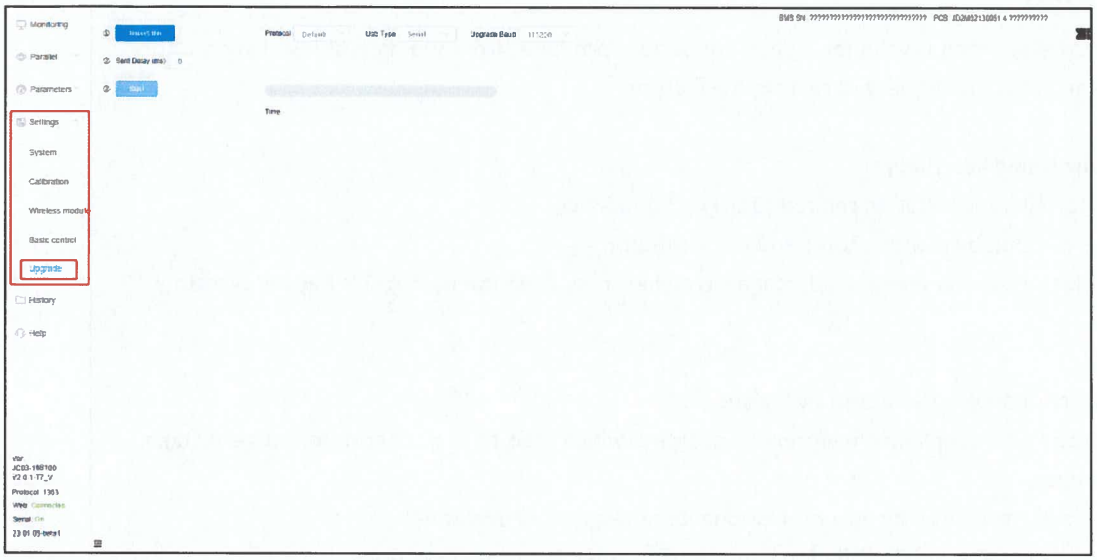


9. Wireless m odule: Here will contains information about some additional functional modules.

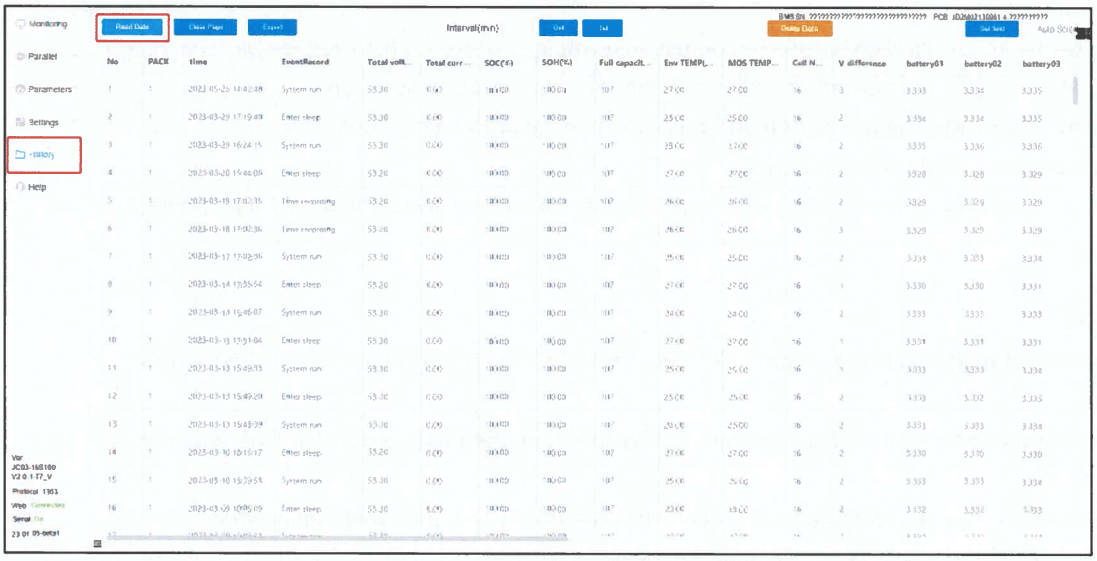


10. Basic control: Here includes the control of charging and discharging MOS, heating and other states (please consult the manufacturer for operation).

11. Upgrade: software online upgrade function of BMS (please consult the manufacturer for operation).



12. Click "Read Data" to get historical data and export data.



11. Warranty Policy

Offers standard factory warranty which is valid for 5 years for battery products, from the date of installation or no more than 5 and a half years from the delivery date from the factory.

1. Product Quality Standards and Warranty

1) Battery complies with safety transportation related to UN38.3 and MSDS.
2) The battery warranty is decided by manufacturer and its distributor.
3) After the products left factory, the appearance damage (scratches, rust, chemical damage) is beyond warranty.

2. Warranty Exceptions

1) Damage or lose to battery or accessory caused by logistics.
2) Battery failure caused by non- compliance inverters or chargers which lead to e. g. abnormal charge voltage, unqualified inverter or charger.
3) Battery malfunction or damage caused by non-professional or non-qualified personnel.
4) Failure to observe the user manual, the installation guide, and the maintenance regulations.
5) Product malfunction or damage due to disobey to relevant laws and regulations or technical requirements in power plant design, construction, or installation works.
6) Connect high voltage inverter to low voltage battery or connect low voltage inverter to high voltage battery.
7) Product malfunction or damage due to installation on movable device or in vibration occasions.
8) Failure or damage caused by corrosion, lightning and other natural damage or force majeure.
9) Unauthorized alteration or disassembly of the product.
10) Damage or malfunction caused by other facilities e.g. Surge damage caused by switching on/off high power generator.

3. Repair and Replacement

When a failure occurs, the user should check and record from the screen display the error code, protection values and necessary information.
When the dealer or manufacturer confirmed that is a product quality problem, the faulty product will be repaired and replaced by spares.
Manufacturer is only responsible for the company's products troubleshooting, repair and replacement, but doesn't assume any other special damages, consequential damages, or incidental damages (including loss of profits, loss of goodwill, loss of business reputation loss or delay, etc.).
This warranty does not affect the customer's enjoyment of any other rights laws and regulations relating to sales of consumer goods provided for in the host country or region.
Customers could contact local dealers or distributors to discuss how to proceed.

4. Force Majeure

Force majeure is not artificially unavoidable and insurmountable objective condition. In addition, it is the loss that even if the use of methods of prevention and attention, cannot prevent. It includes the following:

1) Earthquakes, floods, fires, storms and other natural disasters.
2) War, invasion, blockade and other hostile armed actors.
3) Revolution, rebellions, riots.
4) Strike.
5) Collection, prohibition, and other provisions of the government's actions.
6) Infectious diseases.
7) Third-party negligence and wrongdoing that manufacturers cannot control.

5. Warranty Disclaimer

We make no representations or warranties regarding the Product other than those expressly stated in this Limited Warranty. The foregoing Limited Warranties are exclusive and in lieu of all other express and implied warranties whatsoever. We specifically disclaim any implied warranties of merchant ability or fitness for a particular purpose. To the fullest extent that damages may be disclaimed by law, We shall not be liable, whether in contract or tort (including negligence and strict liability), for any damages in excess of the Product's purchase price or for any indirect, incidental, special, or consequential damages of any kind, or any loss of revenue, profits, business, information, data, or any other financial loss arising out of or in connection with the use r inability to use the Product.

6. Legal Rights

Some countries and/or states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, which may vary from country to country and/or state to state. This warranty shall be governed by and interpreted in accordance with the laws of China. This warranty is understood to be the exclusive agreement between the parties relating to the subject matter hereof. No employee or representative of us is authorized to make any warranty in addition to those made in this agreement.

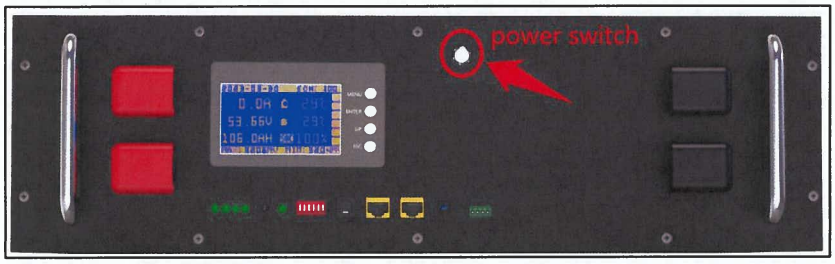
7. Product Sustainability Guarantee

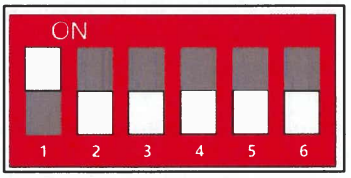
As a lifepo4 battery pack manufacturer, we committed to achieving the vision of sustainability through investment in products and efforts, we minimize waste, improve the performance of products and processes in terms of environment, health and safety, and use fewer resources. to provide competitive products and technologies in order to meet the needs of the market Demand. We also analyze the impact of the product life cycle and continue to develop innovative products that are durable, contain recycled or renewable ingredients, can be recycled, or help improve the environmental performance of final products. We work with suppliers and partners to promote responsible environmental management and the common goal of improving sustainability. We are committed to maintaining a safe and healthy workplace and creating more value in this area that is focused on renewable energy and sustainability.

12. Appendix I

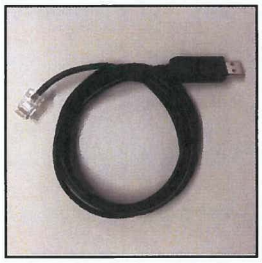
How To Communicate With Upper Computer (PC/laptop)

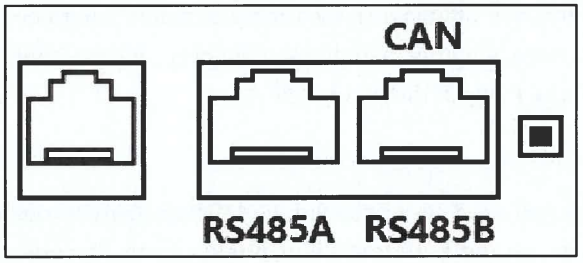
1. Turn on the battery by pressing the power switch, set the dip "1" as "ON" on the battery.





2. Connect the battery ("RS485A" or "RS485B" interfaces both work) with computer by RJ45 to USB cable.





3. Download and install the driver on your computer.

(USB to 485 Driver) CH341SER.EXE

4. Download the folder "DR software", you will find a app "DrStartApp" in folder, double click and open it.

DR Software

DrStartApp.exe

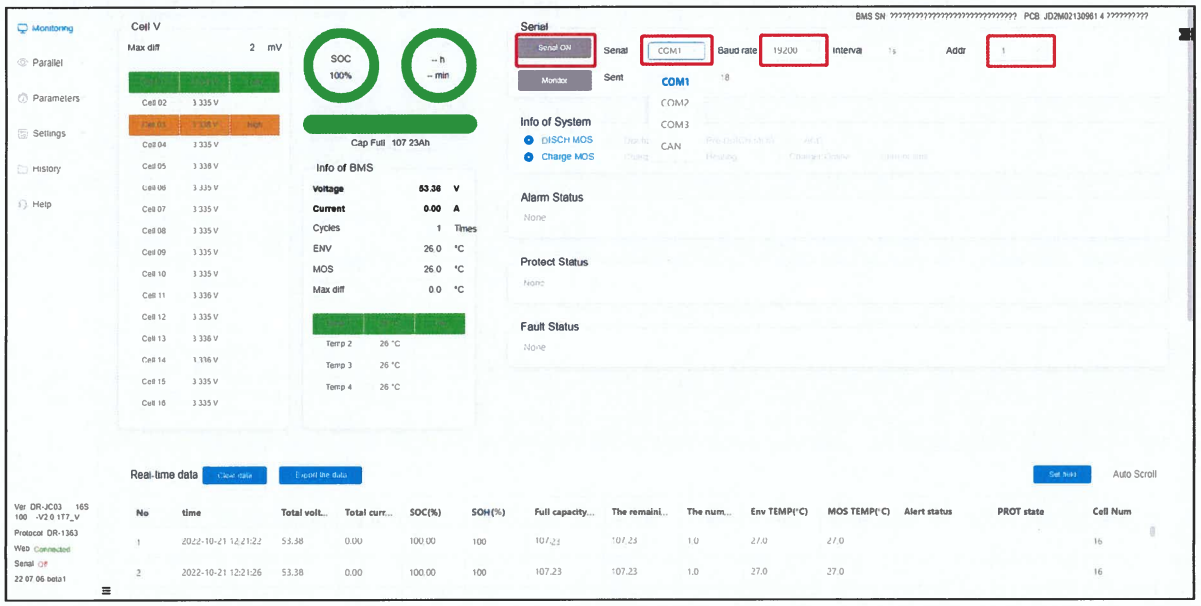
5. Some setting up on software. (picture on next page)

1) Click "Series ON",

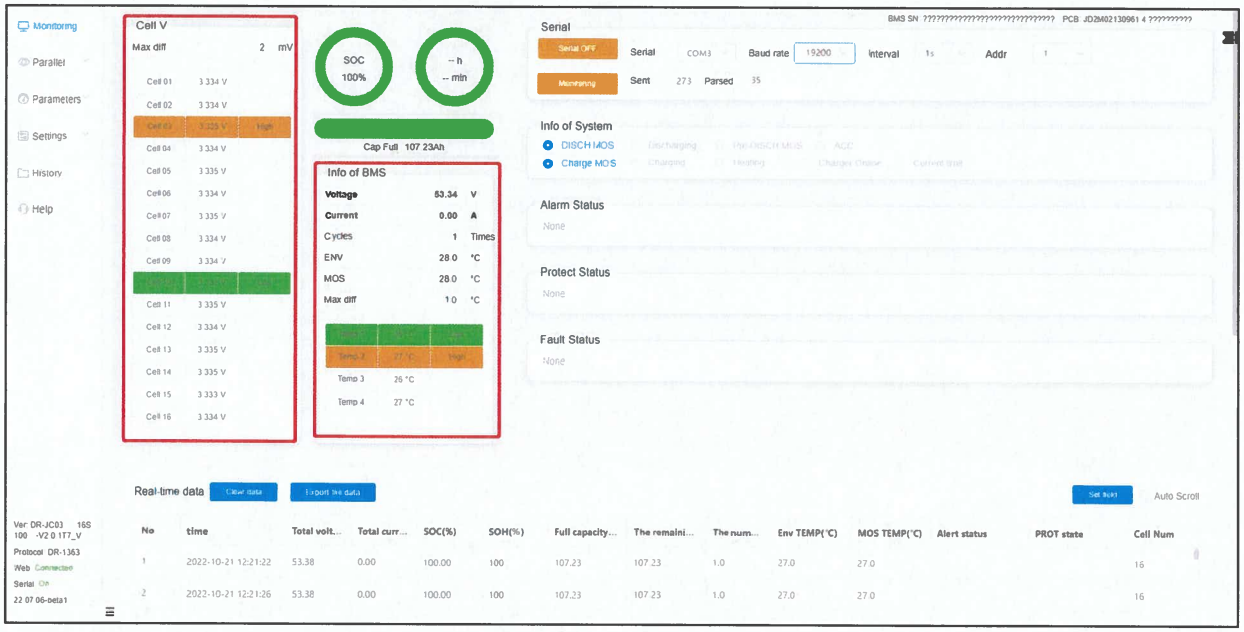
2) "Addr": select as "1",

3) "Baud rate": select as "9600",

4) "Serial": select each COM one by one, until you can see data on the page changes in real time, it means that is the suitable COM serial.

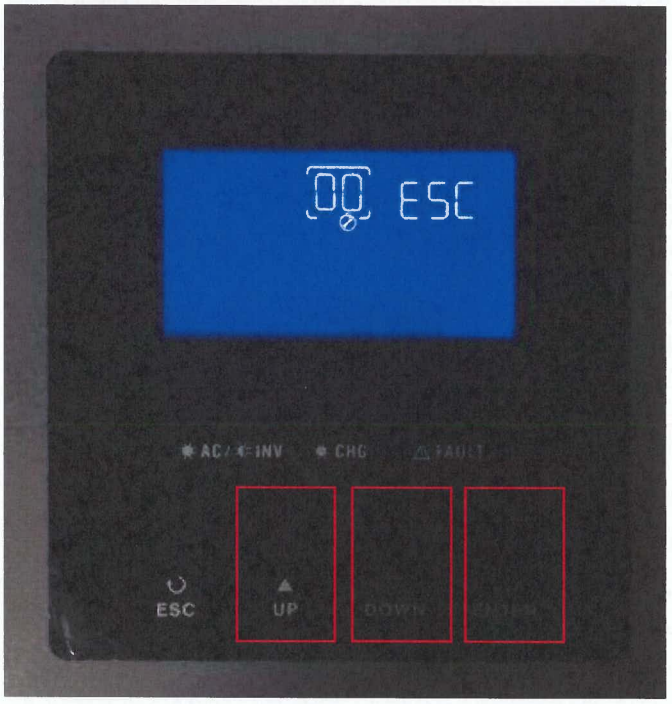


6. Due to the real-time monitor function, when they communicate successfully, the data on page will change in real time.



Press 'Up' and 'Down' to choose the setting item No., press 'Enter' to enter into the detailed setting parameter, when finish press 'Enter' again. The following setting items need to be set follow the recommended value:

Item No.	Setting Value
Program 02	Set to N*25A, N=battery amount
Program 05	Set to USE
Program 12	Set to 48V
Program 13	Set to 51V
Program 26	Set to 53.2V
Program 29	Set to 47.5V



Note:

1. PIP Inverters can only be waked up via battery, if the battery is turned off due to over-discharge, over temp. or other reasons, in order to wake up the inverter you need turn on the battery manually.
2. As there is no communication between inverter and battery, for a better using experience, it`s also acceptable to introduce monitoring device to visually display the real-time information from battery management system via the communication channel, such as Inverter Control Center(ICC) from centurionsolar. Same as the inverter compatibility condition, such a monitoring system needs get authorization from Pylontech in advance for the compatibility before using with the products from Pylontech mentioned above, otherwise the products from Pylontech will be exclusive of warranty.

HM

9.3. Settings for no communication situation

Without communication protocol, inverter cannot communicate with our battery. You need to make some setting on your inverter, for example, select the user-defined mode and set the corresponding voltage level (according to the inverter user manual), so that they can work together without communication.
Here are some commonly used battery parameters that need to be set, for reference. If need more advices about battery parameters settings, please contact the manufacturer.

Over Voltage Disconnect Voltage	57.6V
Charging Limit Voltage	58.4V DEAD
Equalizing Charging Voltage	56V
Float Charging Voltage	54V
Low Voltage Warning Voltage	(45V)
Cut-off Discharge Voltage	43.2V
Discharge Limit Voltage	40V EMTY

27 29

29 13

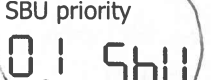
Pylontech:

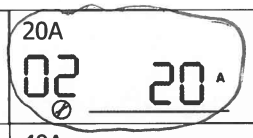
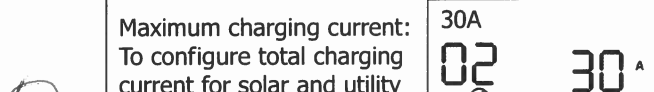
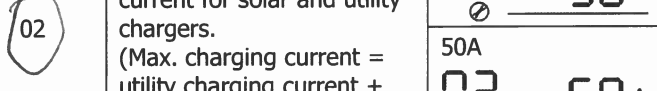
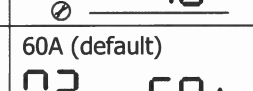
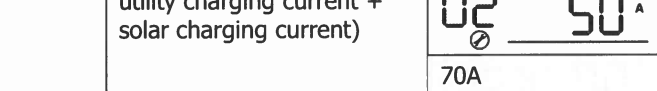
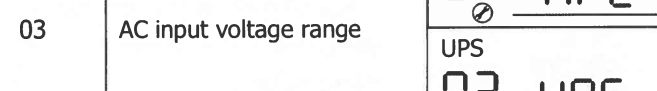
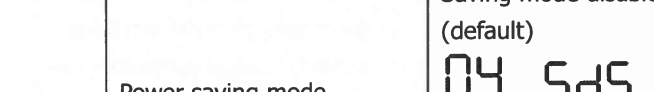
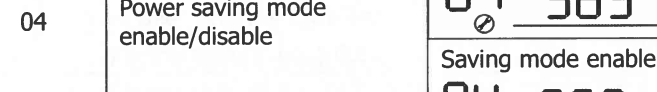
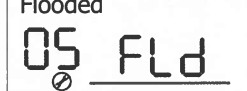
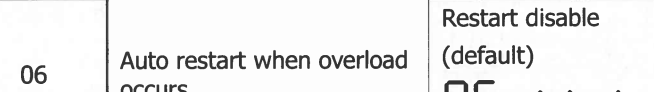
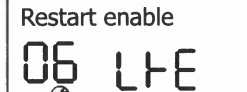
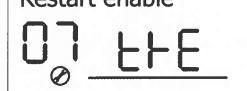
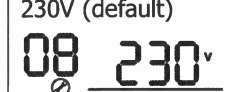
Item No.	Setting Value
Program 02	Set to N*25A, N=battery amount ✓ CURR
Program 05	Set to USE ✓ TYPE
Program 12	Set to 48V GRID
Program 13	Set to 51V DISCHG ✓
Program 26	Set to 53.2V BULK CHG
Program 29	Set to 47.5V FLOAT CHG ✓

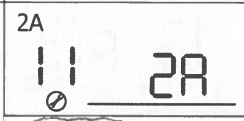
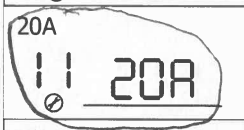
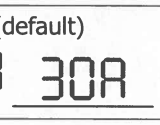
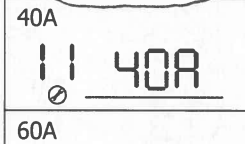
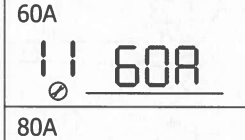
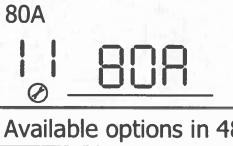
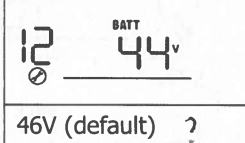
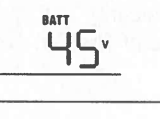
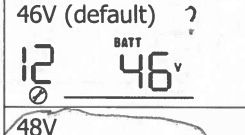
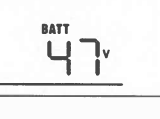
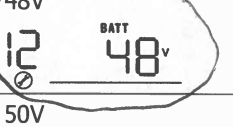
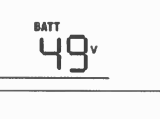
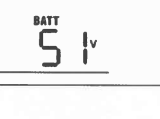
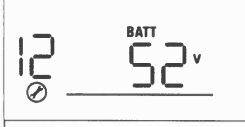
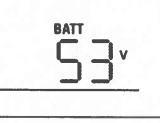
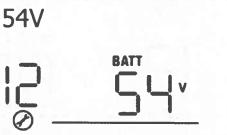
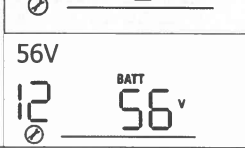
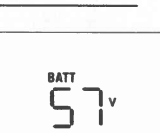
LCD Setting

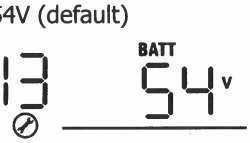
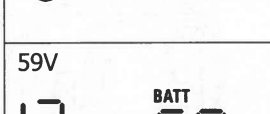
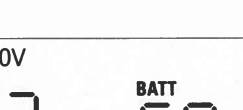
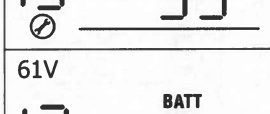
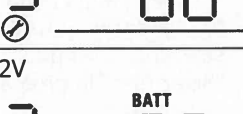
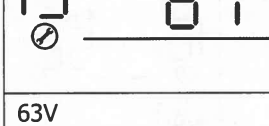
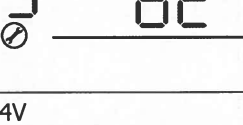
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.

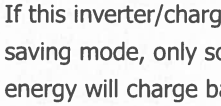
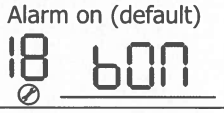
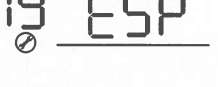
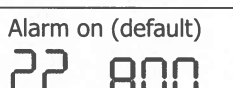
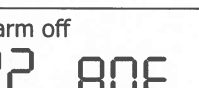
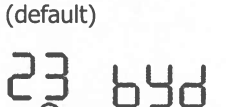
Setting Programs:

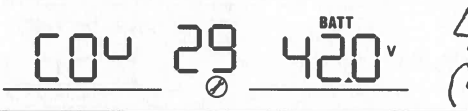
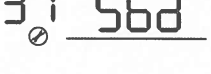
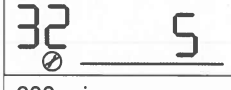
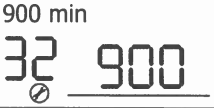
Program	Description	Selectable option	
00	Exit setting mode	Escape 	
01	Output source priority: To configure load power source priority	Solar first 	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power the loads at the same time. Utility provides power to the loads only when any one condition happens: - Solar energy is not available - Battery voltage drops to either low-level warning voltage or the setting point in program 12.
		Utility first (default) 	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
		SBU priority 	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.

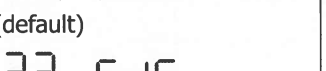
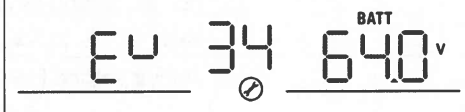
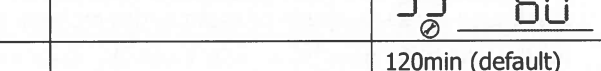
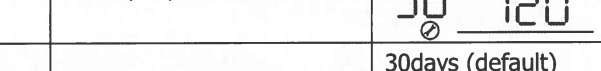
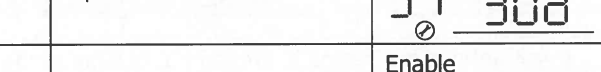
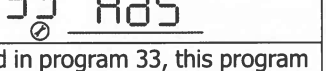
02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	10A 	20A 
		30A 	40A 
		50A 	60A (default) 
		70A 	80A 
03	AC input voltage range	Appliances (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS 	If selected, acceptable AC input voltage range will be within 170-280VAC.
04	Power saving mode enable/disable	Saving mode disable (default) 	If disabled, no matter connected load is low or high, the on/off status of inverter output will not be effected.
		Saving mode enable 	If enabled, the output of inverter will be off when connected load is pretty low or not detected.
05	Battery type	AGM (default) 	Flooded 
		User-Defined 	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
06	Auto restart when overload occurs	Restart disable (default) 	Restart enable 
07	Auto restart when over temperature occurs	Restart disable (default) 	Restart enable 
08	Output voltage	220V 	230V (default) 
		240V 	

09	Output frequency	50Hz (default) 	60Hz 
11	Maximum utility charging current	2A 	10A 
		20A 	30A (default) 
		40A 	50A 
		60A 	70A 
		80A 	
12	Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01.	Available options in 48V models:	
		44V 	45V 
		46V (default) 	47V 
		48V 	49V 
		50V 	51V 
		52V 	53V 
		54V 	55V 
		56V 	57V 

13	Setting voltage point back to battery mode when selecting "SBU priority" or "Solar first" in program 01.	Available options in 48V models:	
		Battery fully charged 	48V 
		49V 	50V 
		51V 	52V 
		53V 	54V (default) 
		55V 	56V 
		57V 	58V 
		59V 	60V 
		61V 	62V 
		63V 	64V 

16	Charger source priority: To configure charger source priority	If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:	
		Solar first 	Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.
		Utility first 	Utility will charge battery as first priority. Solar energy will charge battery only when utility power is not available.
		Solar and Utility (default) 	Solar energy and utility will charge battery at the same time.
		Only Solar 	Solar energy will be the only charger source no matter utility is available or not.
		If this inverter/charger is working in Battery mode or Power saving mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	
18	Alarm control	Alarm on (default) 	Alarm off 
19	Auto return to default display screen	Return to default display screen (default) 	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen 	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) 	Backlight off 
22	Beeps while primary source is interrupted	Alarm on (default) 	Alarm off 
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 	Bypass enable 
25	Record Fault code	Record enable 	Record disable (default)

<table>
<tr><td rowspan="2">26</td><td rowspan="2">Bulk charging voltage
(C.V voltage)</td><td colspan="2">default setting: 56.4V ?
 
54V (56V)</td></tr>
<tr><td colspan="2">If self-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 64.0V. Increment of each click is 0.1V.</td></tr>
<tr><td rowspan="2">27</td><td rowspan="2">Floating charging voltage</td><td colspan="2">default setting: 54.0V
  </td></tr>
<tr><td colspan="2">If self-defined is selected in program 5, this program can be set up. Setting range is from 48.0V to 64.0V. Increment of each click is 0.1V.</td></tr>
<tr><td rowspan="2">29</td><td rowspan="2">Low DC cut-off voltage</td><td colspan="2">default setting: 42.0V
 
47.5V (45V)</td></tr>
<tr><td colspan="2">If self-defined is selected in program 5, this program can be set up. Setting range is from 40.0V to 54.0V. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.</td></tr>
<tr><td rowspan="2">31</td><td rowspan="2">Solar power balance:
When enabled, solar input power will be automatically adjusted according to connected load power.</td><td>Solar power balance enable (Default):
  </td><td>If selected, solar input power will be automatically adjusted according to the following formula: Max. input solar power = Max. battery charging power + Connected load power.</td></tr>
<tr><td>Solar power balance disable:
  </td><td>If selected, the solar input power will be the same to max. battery charging power no matter how much loads are connected. The max. battery charging power will be based on the setting current in program 02.
(Max. solar power = Max. battery charging power)</td></tr>
<tr><td rowspan="4">32</td><td rowspan="4">Bulk charging time
(C.V stage)</td><td>Automatically (Default):
  </td><td>If selected, inverter will judge this charging time automatically.</td></tr>
<tr><td>5 min
  </td><td rowspan="2">The setting range is from 5 min to 900 min. Increment of each click is 5 min.</td></tr>
<tr><td>900 min
  </td></tr>
<tr><td colspan="2">If "USE" is selected in program 05, this program can be set up.</td></tr>
</table>

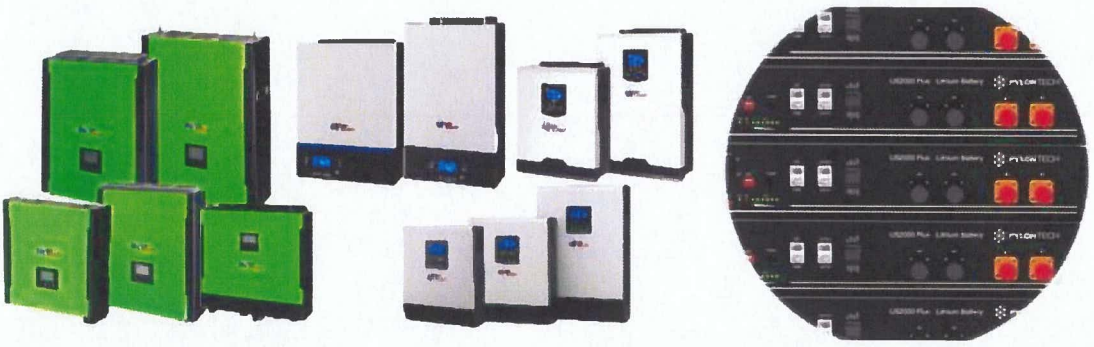
33	Battery equalization	Battery equalization 	Battery equalization disable (default) 
		If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.	
34	Battery equalization voltage	Default setting is 58.4V. Setting range is from 48V ~ 64V. Increment of each click is 0.1V. 	
35	Battery equalized time	60min (default) 	Setting range is from 5min to 900min. Increment of each click is 5min.
36	Battery equalized timeout	120min (default) 	Setting range is from 5min to 900 min. Increment of each click is 5 min.
37	Equalization interval	30days (default) 	Setting range is from 0 to 90 days. Increment of each click is 1 day
39	Equalization activated immediately	Enable 	Disable (default) 
		If equalization function is enabled in program 33, this program can be set up. If "Enable" is selected in this program, it's to activate battery equalization immediately and LCD main page will shows "". If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 37 setting. At this time, "  " will not be shown in LCD main page.	

Pylontech Lithium Battery Support

Date: 20 Feb 2019

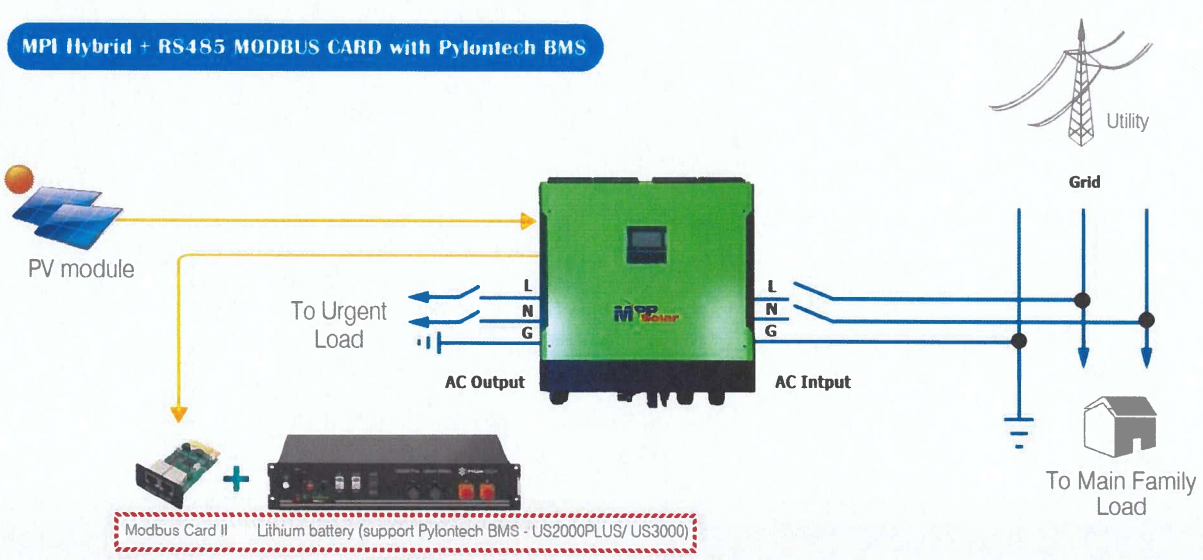
By: MPP Solar

Comment:
Comments are off



February 20th, 2019

We are pleased to announce that, starting January 2019, all our Hybrid and Off-Grid Solar Inverters are now officially compatible for use with **Pylontech US2000B Plus/3000 Lithium batteries**, in 3 ways.

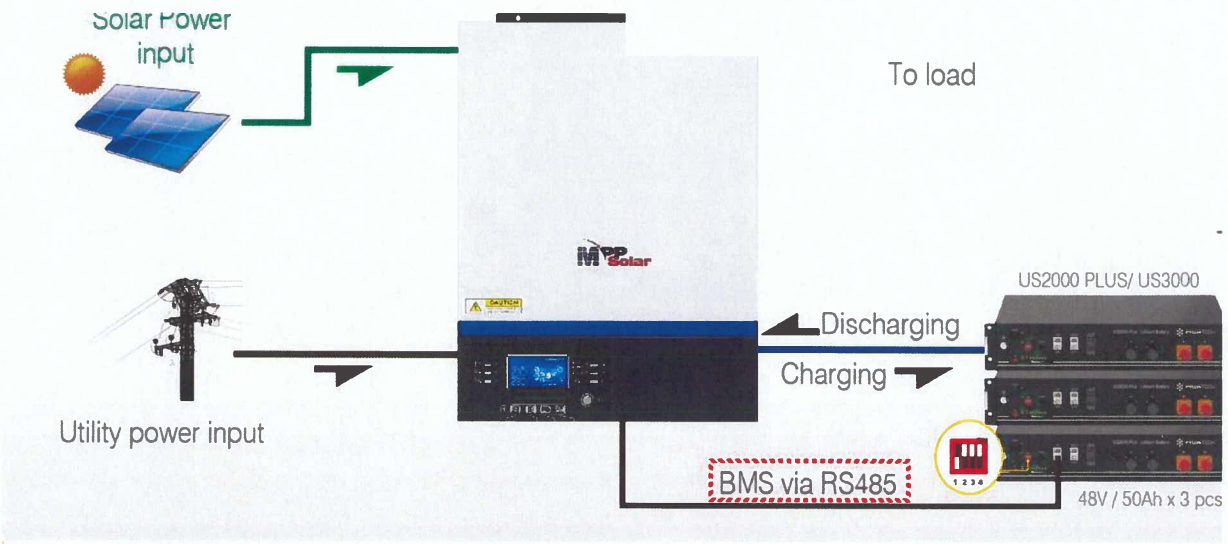


MPI Hybrid Application with BMS

- MPI Hybrid models starting January 2019 will now be able to work with Pylontech Lithium batteries through the use of optional RS485 Modbus Card (sold separately). Simply install RS485 card into Hybrid inverter's intelligent slot, then connect the card to Pylontech's BMS port and it is automatic compatibility. **Please note MPI Hybrid units produced prior to January 2019 will NOT be able to support Pylontech batteries.**

5048GK / 5048MK with Pylontech BMS

- Starting January 2019, all units 5048GK / 5048MK are now ready to communicate directly with Pylontech BMS battery system through the use of a direct data communication from inverter's BMS port to the battery. A special data cable sold separately will be required for this purpose. **Please note 5048GK / 5048MK produced prior to January 2019 will NOT be able to support Pylontech BMS communication.**



PIP Off-Grid Series with Pylontech without BMS

Application without BMS

- For application without BMS, our Off-Grid inverter family (PIP-HS/MS, PIP-HSE/MSE/MSXE, PIP-GE, PIP-MSD/MST, and older versions of PIP-C programmed to match setting with Pylontech batteries. For normal daily use it is not mandatory to use BMS with Pylontech batteries provided tha done correctly. It should be noted that without BMS, the inverter's display of battery SOC may not be very accurate. Please refer to Pylontech cc on how to program your inverter to use with Pylontech batteries without BMS support.

Should you have any questions, please feel free to contact our Sales team for further information. Thank you for your attention.

51.2V
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LFP48100P~48230P

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Subtotal	$1,179.72
Shipping	Free shipping
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AliExpress Coupon	-$0.10
Tax	$101.38
Total	**$1,280.13**

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Tax	$101.38
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48V 100AH 5KW, CHINA
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AliExpress Coupon -$0.10
Tax $101.38
Total
$1,280.13

Invoice

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Marketplace Facilitator	Alibaba.com Singapore E-Commerce Private Limited	**Delivery Address**	7406 S 40th Ave Phoenix Arizona

Invoice Date	**Invoice No.**
2024-01-03 -0700	B10MZAZ20240104030051

Transaction	**Quantity**	**Price** (USD)	**Sales Tax Rate**	**Sales Tax Amount** (USD)	**Total inclusive of Sales Tax** (USD)
LiFePO4 48V 200AH Battery Pack 51.2V 10KW Lithium Solar Battery 6000 Cycle With 16S 200A BMS Max 32 parallel For Inverter NO TAX	1	1178.85	8.600 %	101.38	1280.23
Total amount in USD				101.38	1280.23

*As required by the relevant State Sales Tax Laws, the marketplace facilitator is required to collect Sales Tax and remit to the relevant tax authorities.