USER MANUAL

PVM Plus 3KVA-5.5KVA

SOLAR INVERTER/CHARGER

Table OF Contents

1. ABOUT THIS MANUAL

1.1 Purpose

This manual describes how to assemble, install and operate the units and how to trouble shoot of this unit. Please read this manual carefully before installation and operation .Keep this manual for future reference.

1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

1.3 SAFETYINSTRUCTIONS

⚠ **WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.**

1.Read and follow all installation, operation, and maintenance information carefully before using the product.

2.**CAUTION:** To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.

3.Do not disassemble the unit personally. Take it to a qualified service center to repair.

4.To reduce risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning, turning off the unit will not reduce this risk.

5. **WARNING:** Disconnecting all power supply before any maintaining or cleaning, please noted that if you only turnoff the unit are not safe enough.

6. **WARNING:** Only qualified service persons are allowed to operate this product. If fault not solved after following trouble shooting table, please send this inverter back to local dealer or service center for maintenance.

7. **WARNING:** Because this inverter is non-isolated, only three types of PV modules are adaptable: single crystalline, poly crystalline with class A-rated and CIGS modules. To avoid any malfunction, do not connect any PV modules which likely with current leakage flow to the inverter. For example, grounded PV modules may cause current leakage flow to the inverter. When using CIGS modules, please be sure of NO grounding.

8. **CAUTION:** It's requested to use PV junction box with surge protection. Otherwise, it may cause damage on inverter.

2. INTRODUCTION

This is a multi-function inverter/charger; combining varies of functions of inverter, solar charger and battery charger. Supply uninterruptible electric energy to loads. It's comprehensive LCD display allowed user setting the varies date according to user's requirements, such as battery charging current, AC/solar charger priority, and setting different input voltage based on different applications.

2.1 Features

1. off grid inverter

2. Output power factor COS ϕ =1.0

3. On-grid with energy storage

4. Configurable AC/Solar Charger priority via LCD setting

5. Smart battery charger design for optimized battery performance

6. Compatible to mains voltage or generator power

7. Overload, Over temperature, Short circuit protection, battery low voltage

8. External WIFI devices

9. Parallel operation with up to 9 units

2.2 Basic System Architecture

The following illustration shows basic application for this inverter/charger. It also includes following devices to have a complete running system:

Generator or Utility. PV modules
Consult with integrators who provide you the system about the architectures as you request. This inverter can supply power to all kinds of appliances in home or office, including motor-type appliances, such as tube light, fan, refrigerator and air-conditioner.

NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural up grade, it is subject to prior notice.
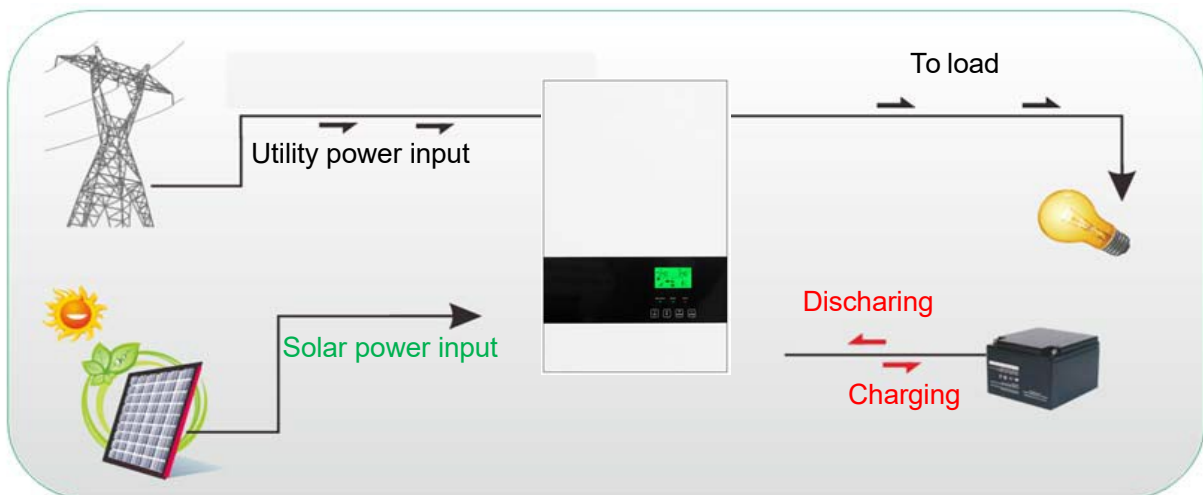

Figure1Hybrid Power System

2.3 Product Overview
NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.
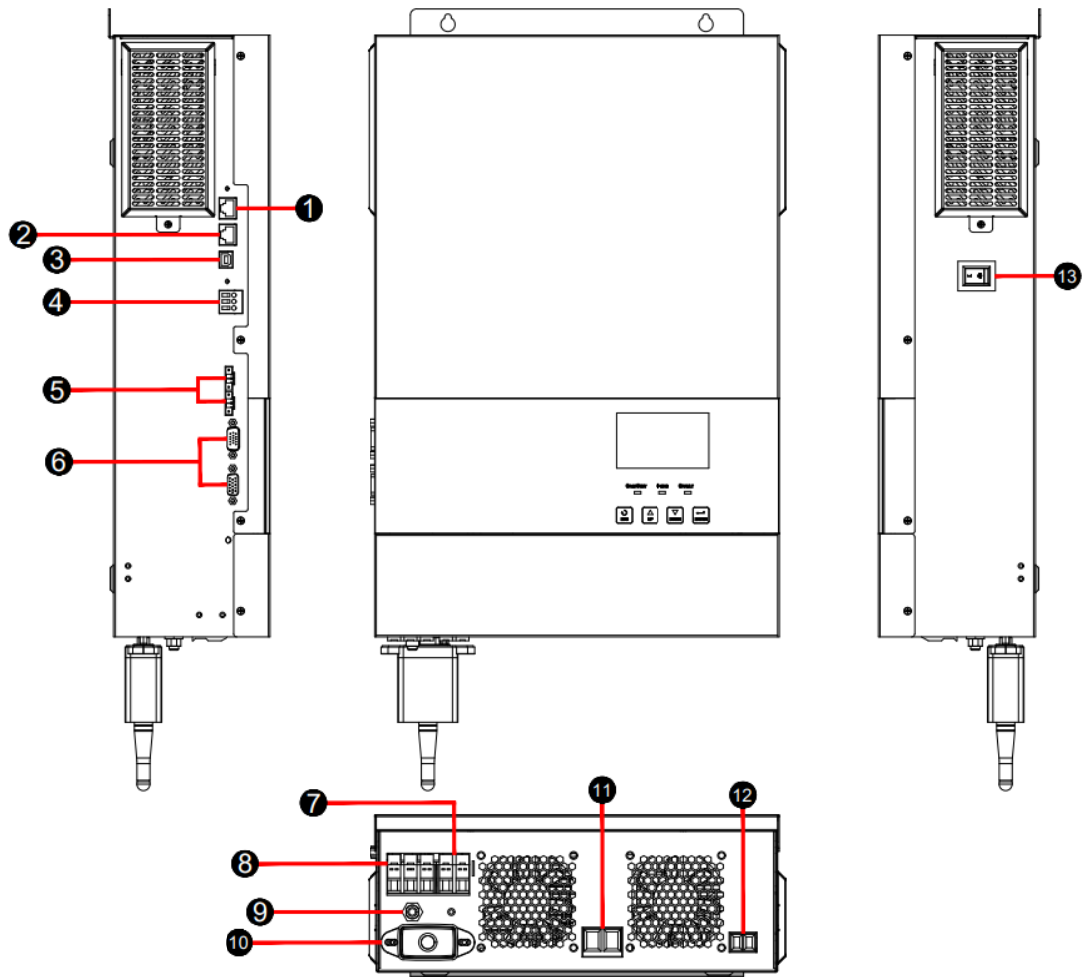
1. RS-232 /RS485/CAN communication port
2. RS-232 /RS485/CAN communication port
3. USB communication port
4. Dry contact
5. Current sharing port
6. Parallel port
7. AC output

8. AC input
9. Circuit breaker
10. WIFI port
11. Battery input
12. PV input
13. Power on/off switch

Communication port definition:

Pin number	1	2	3	4	5	6	7	8
definition	VCC	485-A	485-B	CAN-H	CAN-L	RXD	TXD	GND

RS232	6:RXD , 7:TXD, 8:GND
RS485	2:485-A , 3: 485-B
CAN	4:CAN-H, 5: CAN-L
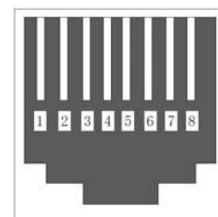
RJ45 Port

3. WIFI Connection (Optional)

Inverters come equipped with factory-integrated Wi-Fi capability which makes it very easy to integrate into a home network(Wi-Fi Dongle is Optional)This makes it ideal for local monitoring via the inverter's own wireless home network or for online monitoring platforms.

4. INSTALLATION

4.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that everything in the package is not damaged. The following items inside of package would be received.

Theinverterx1

Usermanualx1

RS232 Communication cable x 1

USB Communication cable x 1

Network cable x 1

DC Fuse x 1

4.2 Preparation

Please remove the two screws on the back cover of the device before opening it.

4.3 Mounting the Unit

Consider the below points before selecting where to install:

1. Do not mount the inverter on the surface of flammable construction materials.

2. Mount on the surface of a solid material.

3. Install this inverter at a visible place in order to allow the LCD display to be read at all times.

4. For proper air circulation and dissipate heat, make sure there is 20 cm distance from the two side,50 cm distance from bottom of the unit.

5.The ambient temperature should be between 0°C and 55°C to en sure optimal operation.

6. The recommended installation position is to be adhered to the wall vertically.

7. Be sure to keep other objects and surfaces as shown in the diagram to guarantee suffice en the at dissipation and to have enough space for collecting wires.

Suitable for mounting on concrete or other non-combustible surface only
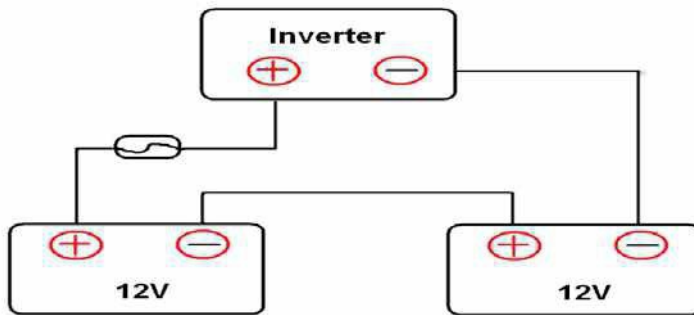
4.4 Battery Connection

CAUTION: For safety operation and regulation compliance, it's requested to adopt a separate DC over-current protector or disconnect device between battery and inverter. It may not be necessary to have a disconnect device in some applications, however, it's still need to adopt over-current protection device. Please refer to typical amperage in below table as required fuse or breaker size.

**WARNING!** All wiring must be performed by a qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper cable as below.

Model	Typical amperage	Battery capacity	Gauge	Cable(mm^2)
3KW24VDC	143A	100AH	1*2AWG	1*35
		200AH	2*2AWG	2*35
3.5KW24VDC	167	100AH	1*2AWG	1*35
		200AH	2*2AWG	2*35
5.5KVA48VDC	131A	200AH	1*2AWG	1*35

24V DC battery connection diagram

Inverter

⊕ ⊖

12V   12V

48V DC battery connection diagram

Inverter

⊕ ⊖

12V   12V   12V   12V
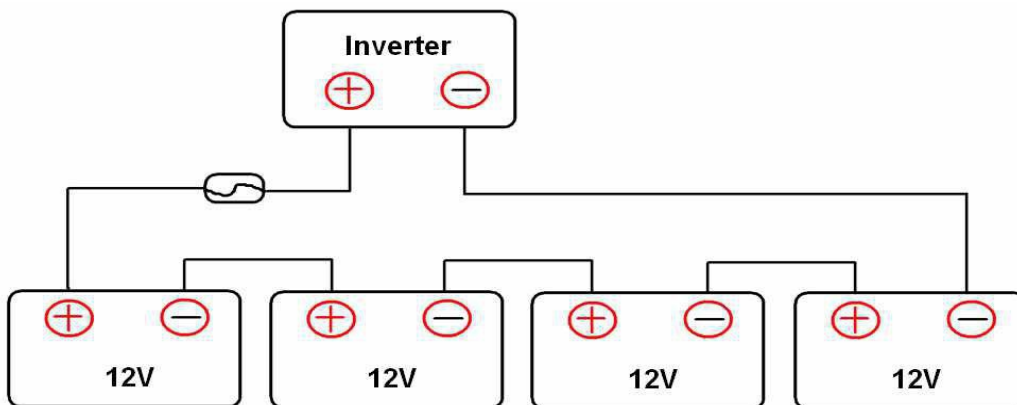
CAUTION! Before making the final DC connection or closing DC breaker / disconnect or, be sure positive(+) must be connected to positive (+) and negative(-) must be connected to negative (-).

4.5 AC Input/output Connection

CAUTION! Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended spec of AC breaker is 32A for 3KVA to 3.5KVA and 63Af or 5.5KVA.There are two terminal blocks with "IN" and "OUT" markings. Please do NOT connect input and output connectors wrong.
WARNING! All wiring must be performed by qualified personnel. It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

Model	Gauge	Cable(mm^2)	Torque Value
3KW	12AWG	4	1.2-1.6Nm
3.5KW/5.5KW	10AWG	6	1.4-1.6Nm

4.6 PV Connection

CAUTION: It is for bidden for inverter to share the same solar panel group.
CAUTION: Before connecting to PV modules, please install separately a DC circuit breaker between inverter and PV modules.
WARNING: It's very important for system safety and efficient operation to use appropriate cable for PV module connection .To reduce risk of injury, please use the proper cable size as below.

Model	Wire Size	Cable(mm^2)	Torque value(max)
3KVA-5.5KVA	12AWG	4	1.2-1.6Nm

WARNING: Because this inverter is non-isolated, only three types of PV modules are acceptable: single-crystalline, polycrystalline with class A-rated and CIGS modules. To avoid any malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using CIGS modules, please be sure NO grounding.
CAUTION: It's requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.
PV Module Selection:
When selecting proper PV modules, please be sure to consider below parameters:
Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.

INVERTER MODEL	3KVA- 5.5KVA
Max. PV Array Open Circuit Voltage	450Vdc
PV Array MPPT Voltage Range	120Vdc~450Vdc

Application Example:

	SOLARINPUT	Qty of panels	Total input power
Solar Panel Spec.250Wp Vmp:30.1Vdc Imp:8.3A Voc:37.7Vdc Isc:8.4A	(Min in serial:5 pcs, max. in serial: 11pcs)		
	5 pcs in serial	5 pcs	1250W
	8 pcs in serial	8 pcs	2000W
	10pcsin serial	10pcs	2500W
	9 pieces in serial and 2 sets in parallel	18pcs	4500W
	10 pieces in serial and 2 sets in parallel	20pcs	5000W
	11 pieces in serial and 2 sets in parallel	22pcs	5500W

PV Module Wire Connection

Please follow below steps to implement PV module connection:

1. Remove insulationsleeve10 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool.
3. Fix PV wire cover to the inverter with supplied screws as shown in below chart.
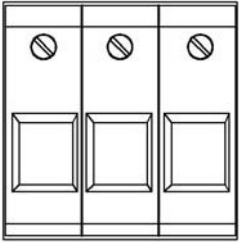

4.7 Final Assembly

After connecting all wires, please put bottom cover back by screws.

4.8 Communication Connection

Please use supplied communication cable to connect inverter and PC, follow the instructions on the screen to install the monitoring software. For the detailed software operation, please check user manual.

4.9 Dry contact signal

There is one dry contact (3A250VAC)available on the rear panel. It could be used to deliver signal to external device when battery reaches warning level.

Unit Status	State	NC &C	C& NO
Power off	Unit is off and no output is powered	Open	Close
Power on	Battery voltage≤45.0VDC	Close	Open
	Battery voltage ≥51.0VDC，after 1 minute	Open	Close

5. OPERATION
5.1 Power ON/OFF
Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the button of the case) to turn on the unit.
5.2 Operation and Display Panel
The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.
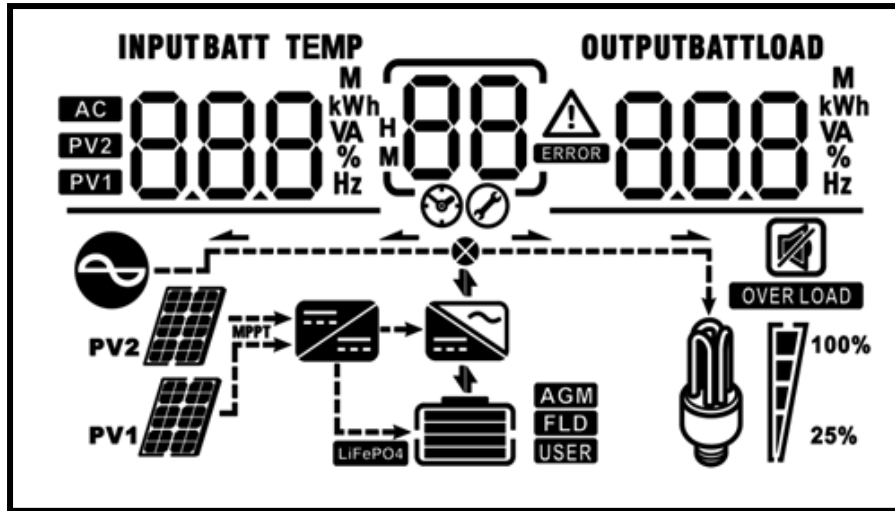
LCD display

LED indicator

Function buttons
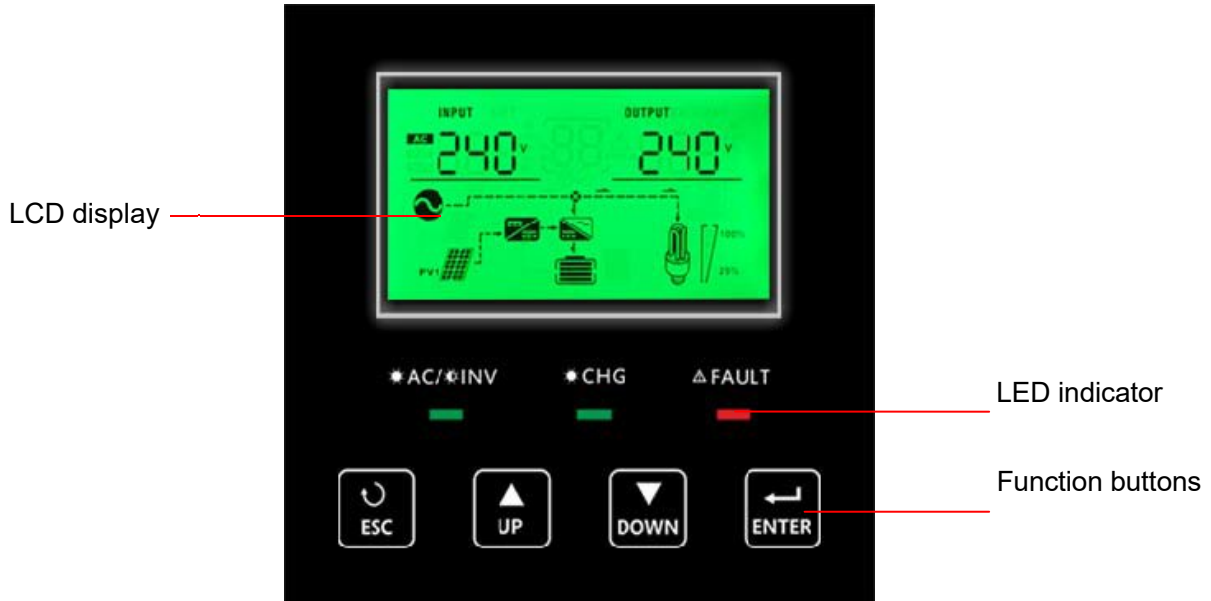
LED Indicator

LED Indicator			Messages
☀AC / ☀INV	Green	Solid On	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery
☀CHG	Green	Solid On	Battery is fully charged
		Flashing	Battery is charging.
⚠FAULT	Red	Solid On	Fault occurs in the inverter
		Flashing	Warning condition occurs in the inverter

Function Keys

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

5.3 LCD Display Icons

Icon	Function Description
Input source information	
AC	Indicates the AC input
PV1	Indicates the 1st PV panel input(Use only the PV1)
PV2	Indicates the 2nd PV panel input(PV2 is reserved for use)
Left digital display information	
INPUT BATT TEMP (display)	Indicates input voltage,input frequency, battery voltage,PV1 voltage,PV2 voltage, charger current
Middle digital display information	
88	Indicates the setting programs
88 ERROR	Indicates the warning and fault codes warning: Flashing with warning code. 88 ⚠ Fault: display with fault code. 88 ERROR
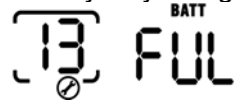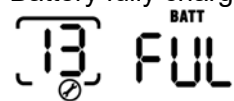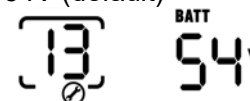
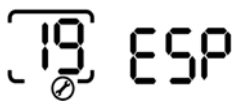| Right digital display information	
OUTPUT BATT LOAD 8.8.8 kW VA % Hz	Indicates the output voltage, output frequency, load percent, load VA, load W, DC discharging current
Battery information	
(battery icon)	Indicates battery level by 0-24% ,25-49% ,50-74% ,75-100% and charging status.
Load information	
OVER LOAD	Indicates overload

	Indicates the load level by 0-24% ,25-49% ,50-74% ,75-100%			
(light bulb icon) 100% 25%	0-24%	25-49%	50-74%	75-100%
	(bar icon)	(bar icon)	(bar icon)	(bar icon)

Mode operation information	
(mains icon)	Indicates unit connects to the mains
PV1 (panel icon)	Indicates unit connects to the PV panel
(solar charger icon)	Indicates the solar charger is working
(inverter icon)	Indicates the DC/AC inverter circuit is working
Mute operation	
(mute icon)	Indicates unit alarm is disabled. Press and hold the "ESC" key for 3 seconds.
M	LCD display in master unit
H	LCD display in slave unit
88	Number of parallel machines
E9	Battery equalization enable
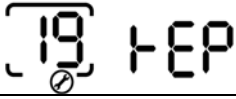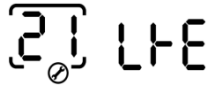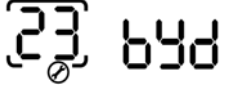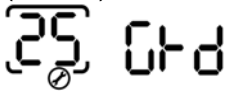
5.4 LCD Setting
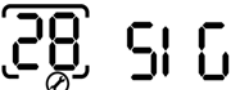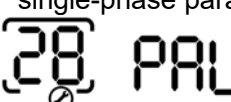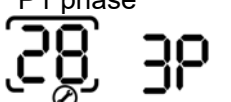
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.
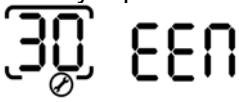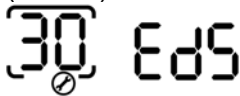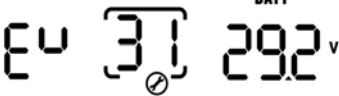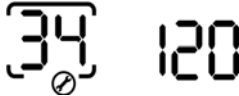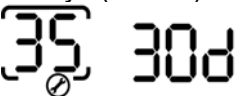
Program	Description	Selectable option	
00	Exit setting mode	Escape 00 ESC	
01	Output source priority: To configure load power source priority	Utility first (default) 01 USb	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only When utility power is not available.
		Solar first 01 Sub	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the Loads at the same time.
		SBU priority 01 SbU	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 orthesettingpointinprogram12.
02	Maximum charging current: To configure total charging current for solar and utility chargers.(Max. charging current =utility charging current + solar charging current)	60A (default) 02 60 ^	Setting range is from 10A to 100A. Increment of each click is 10A.
03	AC input voltage range	Appliances (default) 03 APL	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.

		⏷**03** UPS	
05	Battery type	AGM (default) ⏷**05** ACn	Flooded ⏷**05** FLd
		No Battery ⏷**05** Nbt	If inverter work without battery, program 04 must be set to ⎯N⎯b⎯t⎯
		User-Defined ⏷**05** USE	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) ⏷**06** Lrd	Restart enable ⏷**06** LrE
07	Auto restart when over temperature occurs	Restart disable (default) ⏷**07** trd	Restart enable ⏷**07** trE
09	Output frequency	50Hz (default) ⏷**09** 50 Hz	60Hz ⏷**09** 60 Hz
10	Output voltage	220V ⎽**10** 220 V	230V (default) ⎽**10** 230 V
		240V ⎽**10** 240 V	
11	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger.	30A (default) ⎽**11** 30A	Settingrangeis2A,then from10A to 80A.Incrementofeachclickis 10A.
12	Setting voltage point back to utility source when selecting "SBU	Available options in 3KVA model:	
		23.0V (default) ⎽**12** 23.0 V BATT	Setting range is from 22V to 25.5V. Increment of each click is 0.5V.

		Available options in 3.5/5/5.2/5.5KVA model:	
	priority" in program 01.	46V (default) `12 BATT 46ᵥ`	Setting range is from 44V to 51V. Increment of each click is 1V.
13	Setting voltage point back to battery mode when selecting "SBU priority" in program 01.	Available options in 3KVA model:	
		Battery fully charged `13 BATT FUL`	27V (default) `13 BATT 27.0ᵥ`
		Setting range is from 24V to 29V. Increment of each click is 0.5V.	
		Available options in 3.5/5/5.2/5.5KVA model:	
		Battery fully charged `13 BATT FUL`	54V (default) `13 BATT 54ᵥ`
		Setting range is from 48V to 58V. Increment of each click is 1V.	
14	Setting the battery charging capacity and close the charging point	BSC `bSC 14 CON%`	Continuous charging.
		Disconnect the charging point (default) `bSC 14 100%`	The battery capacity disconnect charging when it reaches the setting value and resumes charging after a decrease of 5 percentage points
		Setting range is from 50% to 100%. Increment of each click is 1%.	
15	Setting the discharge capacity of the battery and disconnect the discharge point of the battery.	5%(default) `bSd 15 10%`	The discharge disconnect point is set to 5%, and the battery will stop discharging when the battery capacity is below this point.
		Setting range is from 5% to 50%. Increment of each click is 1%.	
18	Alarm control	Alarm on (default) `18 bON`	Alarm off `18 bOF`
19	Auto return to default display screen	Return to default display screen (default) `19 ESP`	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 `19 HEP`	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) `20 LON`	Backlight off `20 LOF`
21	Lithium battery wake-up function （If the function is turned on, there is no lithium battery communication, and when charging, it will wait for 5 minutes before charging）	wake-up function disable (default) `21 Ltd`	wake-up function enable `21 LtE`
22	Beeps while primary source is interrupted	Alarm on (default) `22 AON`	Alarm off `22 AOF`
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) `23 bYd`	Bypass enable `23 bYE`
25	Grid-connected function Settings (Disable this function when connecting the generator or running in parallel)	Grid-connected disable (default) `25 Gtd`	Grid-connected enable `25 GtE`

26	Bulk charging voltage (C.V voltage)	3KVA default setting: 28.2V
		
		`Cu 26 28.2v`
		
		 3.5/5/5.2/5.5KVA default setting: 56.4V
		
		`Cu 26 56.4v`
		
		 If self-defined is selected in program 5, this program can beset up. Setting range is from 25.0V to 31.5V for 3KVA model and 48.0V to 60.0V for 3.5/5/5.2/5.5KVA model. Increment of each click is0.1V.	

		3KVA default setting: 27.0V `FLu 27 27.0v`	

27	Floating charging voltage	55/5.2/.5KVA default setting: 54.0V FLᵘ **27** 54.0ᵥ
		If self-defined is selected in program 5, this program can be set up. Setting range is from 25.0V to 31.5V for 3KVA model and 48.0V to 60.0V for 3.5/5/5.2/5.5KVA model. Increment of each click is 0.1V.

28	Single and Parallel setting	default **28** SIG	Single enable
		single-phase parallel **28** PAL	single-phase parallel enable
		P1 phase **28** 3P1	P1-phase parallel enable **VT model only**
		P2 phase **28** 3P2	P2-phase parallel enable **VT model only**
		P3 phase **28** 3P3	P3-phase parallel enable **VT model only**
		Please note: 1. when three-phase series, make sure that A-phase is the host; 2. after the parallel parameters are modified, the device must be restarted to take affect.	

29	Low DC cut-off voltage: If battery power is only power source available, inverter will shut down. If PV energy and battery power are available, inverter will charge battery without AC output.	3KVA default setting: 21.0V COᵘ **29** 21.0ᵥ
		3.5/5/5.2/5.5KVA default setting: 42.0V COᵘ **29** 42.0ᵥ
		If self-defined is selected in program 5, this program can be set up. Setting range is from 21.0V to 24.0V for 3KVA model and 40.0V to 48.0V for 3.5/5/5.2/5.5KVA model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter W at percentage of load is connected.

30	Battery equalization	Battery equalization 30 EEn	Battery equalization disable (default) 30 EdS
		If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.	
31	Battery equalization voltage	3KVA default setting: 29.2V EU 31 29.2ᵥ BATT	
		3.5/5/5.2/5.5KVA default setting: 58.4V EU 31 58.4ᵥ BATT	
		Setting range is from 25.0V to 31.5V for 3KVA model and 48.0V to61.0V for 3.5/5.0/5.2/5.5KVA model. Increment of each click is 0.1V.	
33	Battery equalized time	60min (default) 33 60	Setting range is from 5min to 900min. Increment of each click is 5min.
34	Battery equalized timeout	120min (default) 34 120	Settingrangeisfrom5minto900 min. Increment of each click is 5min.
35	Equalization interval	30days (default) 35 30d	Setting range is from 0 to 90 days. Increment of each click is 1 day
36	Equalization activated immediately	Enable 36 AEn	Disable (default) 36 AdS
		If equalization function is enabled in program30,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 "Eq". If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program35 setting. At this time,"P3 "will not be shown in LCD main page.	
40	Discharge limited current	OFF(default) 40 OFF	Discharge current limited disable
		40 10ᴬ	Setting range:10A to 200A Setting increase or decrease of 5A. NOTE: if you work in "PV priority mode" or "SBU priority

			mode", when the loads are greater than the current limiting point, it will automatically switch to utility mode.

5.5 Parallel function operation instructions

 (Maximum of nine parallel machines)

1. **CAUTION:** Parallel for bidden without battery
2. **CAUTION:** It is for bidden for inverter to share the same solar panel group.
3. Connecting the parallel communication line and power cable as shown below
Warning: All inverters must share the same battery pack when paralleling.
4. Set the parameters of each inverter separately (working mode, single-phase
parallelfunction).**Warning:** When working in parallel, the working mode of each inverter must be the same working mode, output voltage, frequency.
5. After setting the parameters, turn on each inverter in turn.
WRINGING: for each group of PV, only one inverters can be connected, otherwise, it may damage inverters. Two inverters in parallel :
Power Connection:
NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade; it is subject to prior notice.

Communication Connection:
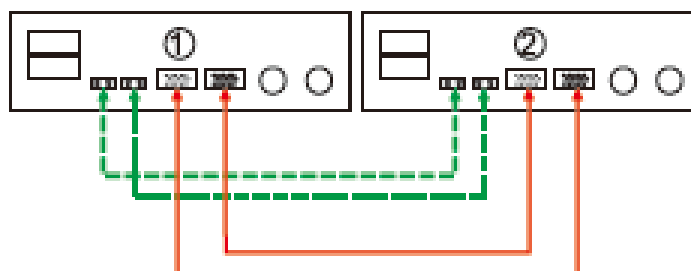
Three inverters in parallel：

Power Connection:

NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.

Communication Connection:

Six inverters in parallel：

Power Connection:

NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.
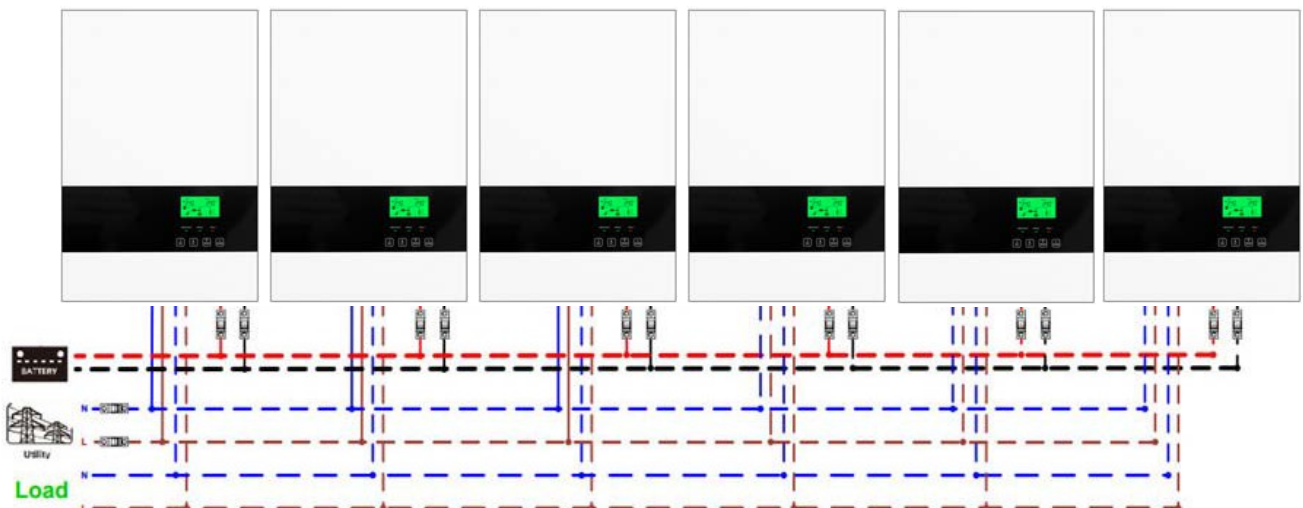
Communication Connection:
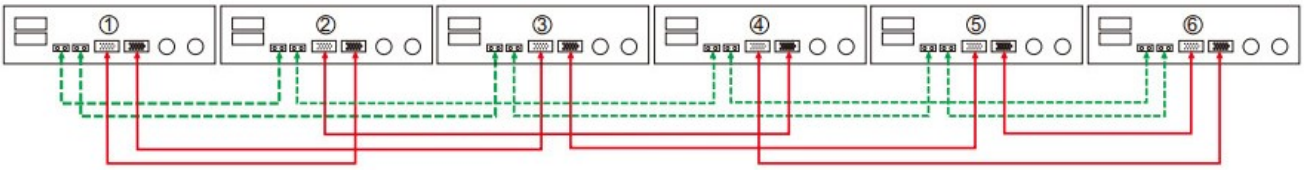
Nine inverters in parallel：

Power Connection:
NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.
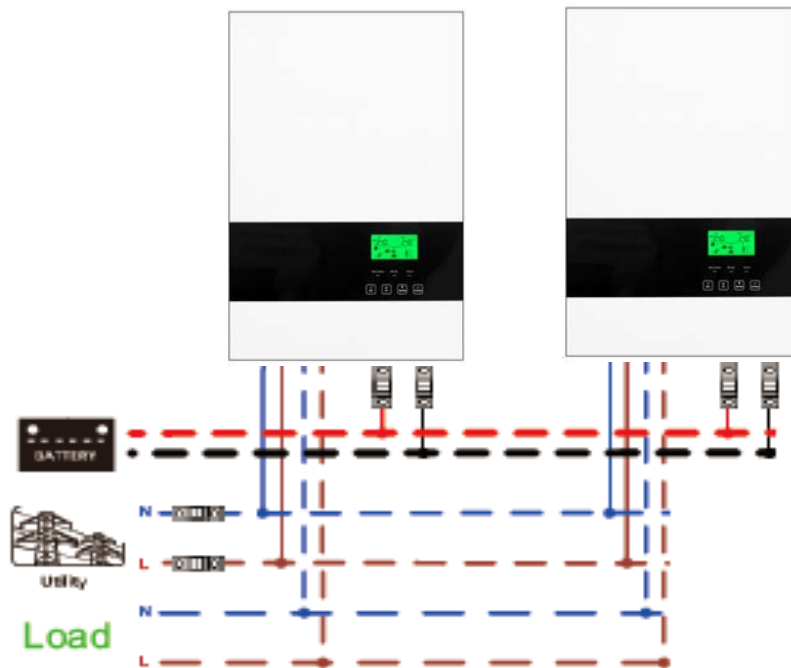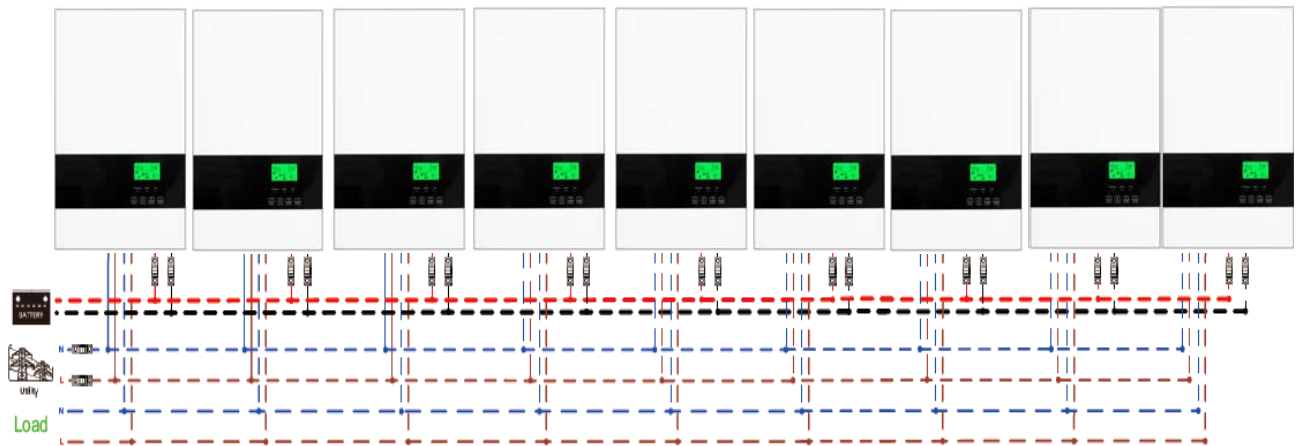

Communication Connection:
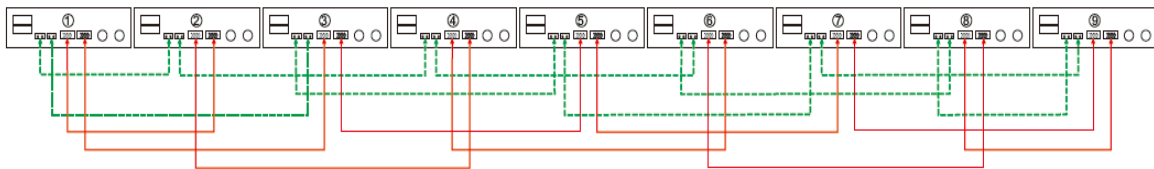
Three-phase parallel:

1.**CAUTION:** Parallel forbidden without battery

2.**CAUTION:** It is for bidden for inverter to share the same solar panel group.

3. Connecting the parallel communication line and power cable as shown below

Warning: All inverters must share the same battery pack when paralleling

4.Set the parameters of each inverter in dependently (working mode, single-phase parallel function, three-phase parallel function and set A/B/C phase sequence).

Warning: When working in parallel, the working mode of each inverter must be the same working mode.5.Aftersetting the parameters, first turn on the A phase inverter and then turn on each inverter in turn. One inverter in each phase:

WRINGING: Do not connect the current sharing cable between the inverters which are in different phase. Otherwise, it may damage inverters.

Power connection:

NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.

Communication connection:
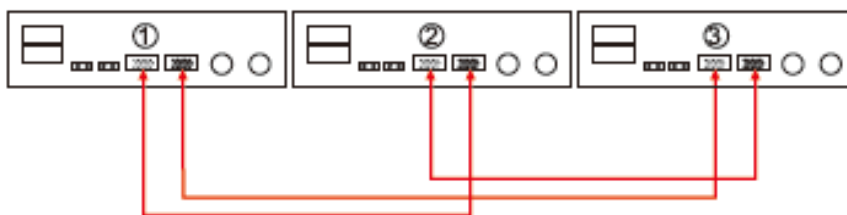
Two inverter in each phase:
Power connection:
NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.
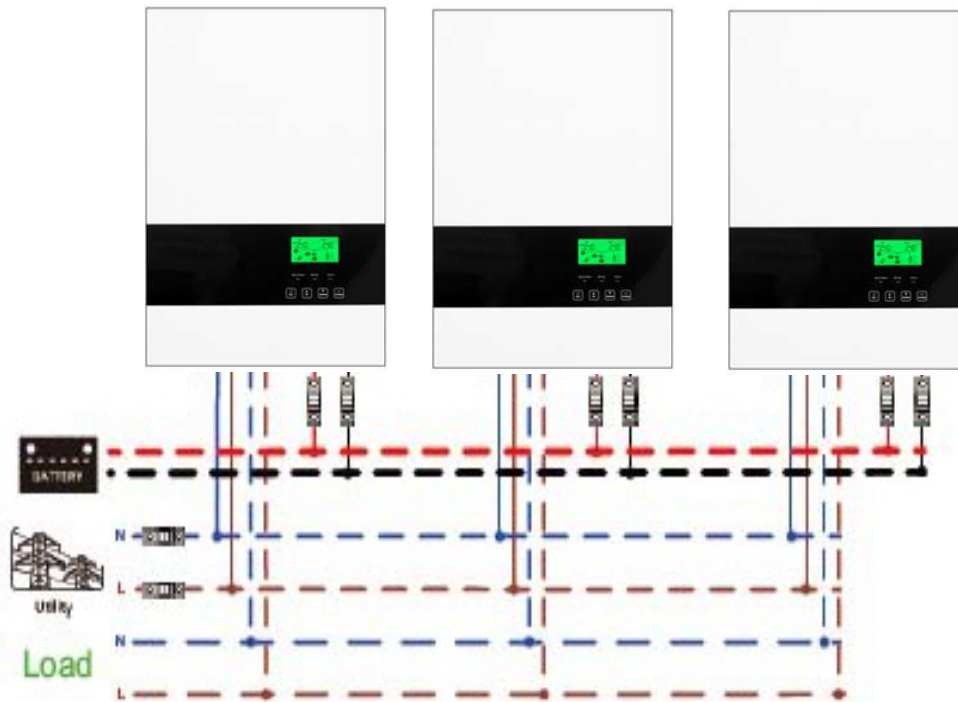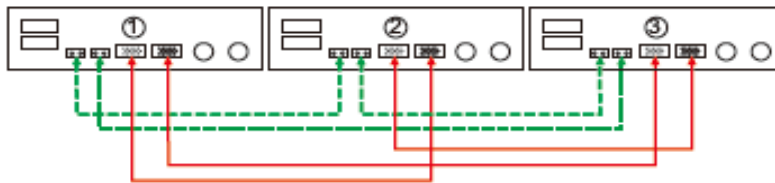
P1 P2 P3
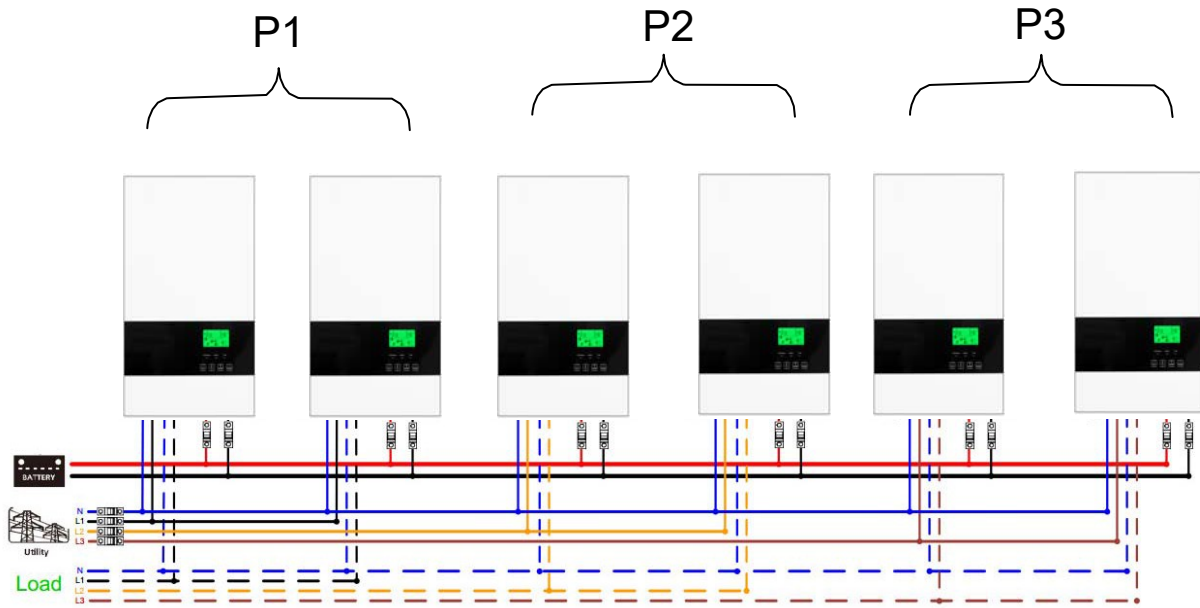
Communication connection:
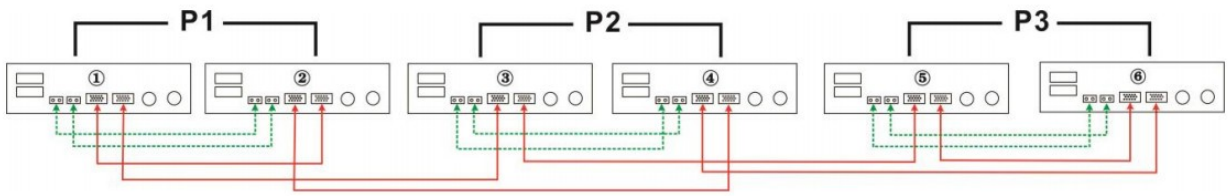
Three inverter in each phase:
Power connection:
NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.

P1   P2   P3
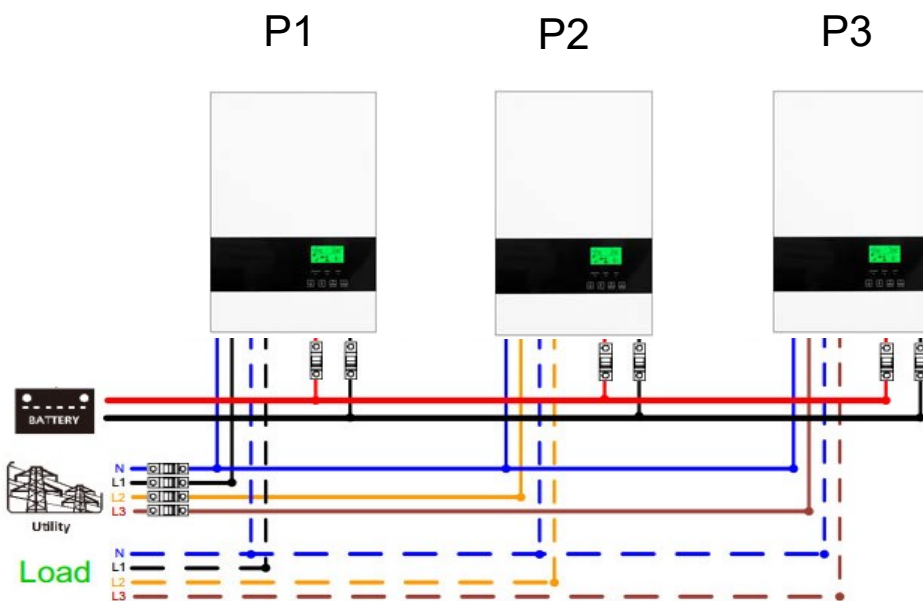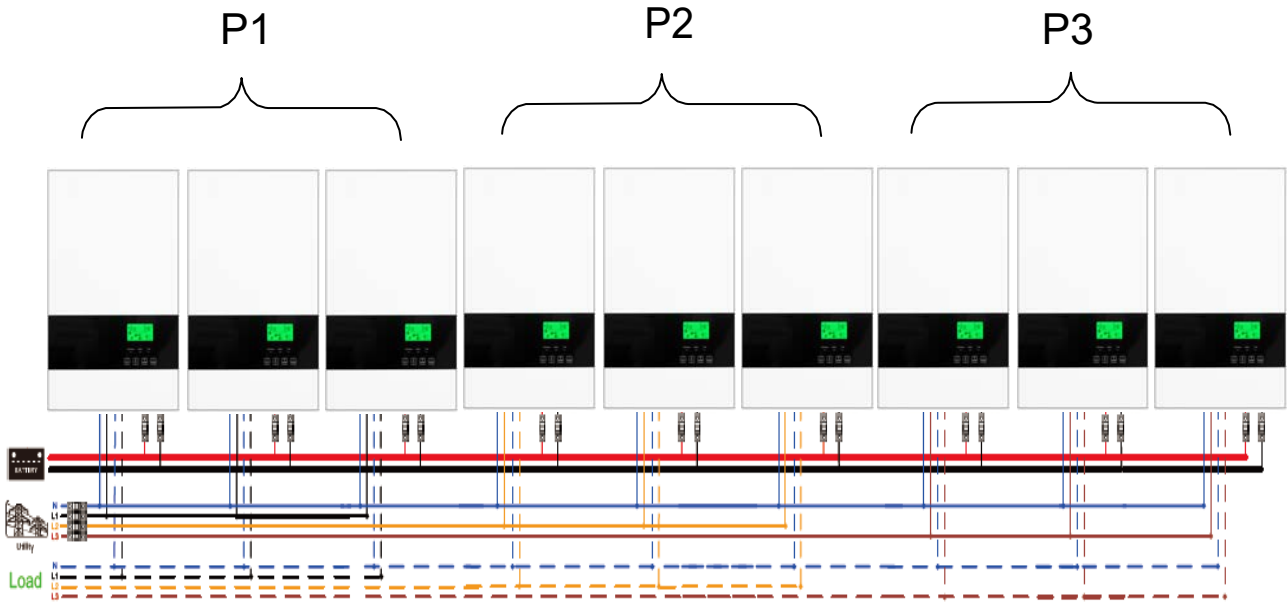
Communication connection:
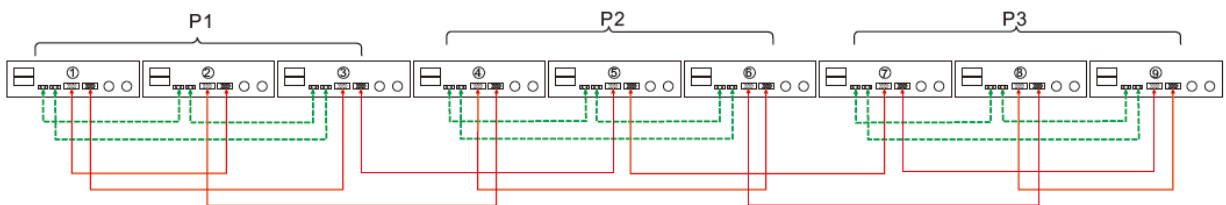
5.6 Fault Reference Code

Fault code	Fault event
01	Fan is locked when inverter is off.
02	Over temperature or NTC is not connected well.
03	Battery voltage is too high
04	Battery voltage is too low
05	Output short circuited or over temperature is detected by internal converter components.
06	Output voltage is too high.
07	Over load time out
08	Bus voltage is too high
09	Bus soft start failed
10	Charge Fault
11	BAT NTC over temperature
23	PV is over current
24	PV over temperature
25	PV overload
26	PV boost fault
51	Inverter R phase over current
52	Bus voltage is too low
53	Inverter soft start time out
54	Self-test failure
55	Inverter DC component is too high
56	Battery disconnect fault
57	Current sensor failure

58	Inverter voltage is too low
60	Inverter negative power supply
70	Truth table fault
71	The parallel version is different
72	The output current fault
73	The output voltage is different
80	CAN communication failure
81	The main parallel line is lost
82	Secondary parallel line lost
83	Parallel battery voltages are different
84	Parallel lines are different
85	Parallel line current imbalance
86	Parallel output voltage Settings are different

5.7 Warning Indicator

Warning Code	Warning Event
01	Fan is locked when inverter is on.
02	Over temperature
03	Battery is over-charged
04	Low battery
07	Over load
10	Output power derating
21	PV voltage is too low
22	PV voltage is too high

6.TROUBLESHOOTING

Problem	LCD/LED/Buzzer	Possible cause	What to do
Unit shuts down automatically during start up process	LCD/LED and buzzer will be active then complete off	The battery voltage is too low	1.Re-charge battery. 2. Replace battery
No response after power on	No indication	1.The battery voltage is too low. 2. Internal fuse tripped	1.Contact repair center for replacing the fuse. 2. Re-charge battery. 3. Replace battery.
Mains exist but the unit works in battery mode	Input voltage is displayed as'0' on the LCD and green LED is flashing	Input protector is triggered	Check if AC breaker is turned on and AC wiring is connected well.
	LED is flashing	Insufficient quality of AC power	1. Check if AC wires are too thin and/ or too long. 2. Check if generator (if applied)is working well or if input voltage range setting is correct.
When the unit is turned on, internal relay is switched on and off repeatedly	LCD display and LED flashing	Battery is disconnected	Check if battery wires are connected well
Buzzer beeps continuously and red LED is on	Warning code 01	Fan fault	Replace the fan
	Warning code 02	Internal temperature of inverter component is over 85°C	Check whether the environment around the equipment well ventilated
	Warning code 03	The battery voltage is too high	check if spec and quantity of batteries are meet requirements
		Battery is over charged	Return to repair center
	Warning code 10	Discharge over current	Please check whether the discharge current of Item 15 is lower than the discharge current of the inverter
	Fault code 82	Parallel fault	Please check if the connection between the inverters is loose

Buzzer beeps continuously and red LED is on	Fault code 05	Output short circuited	Check if wiring is connected well and remove abnormal load
	Fault code 07	Over load error , the inverterisoverload100% andoverloadtimereaches the upper limit	Reduce the connected load by switching off some equipment
	Warning code 59	If PV input voltage is higher than specification, the output power will be rerated. At this time, if connected loads are higher than rerated output power, it will cause over load.	Reduce the number of PV modules in series or the connected load
	Fault code 06/58	Output abnormal(Inverter voltage below than180VAC Or is higher than260VAC)	1. Reduce the connected load 2. Return to repair center
	Fault code 51	Over current or surge	Remove abnormal load or check PV input
	Fault code 08	Bus voltage is too high	Restart the unit if the error happens again please return to repair center
	Fault code 52	Bus voltage is too low	
	Fault code06/58	Output voltage is unbalanced	
	Fault code11	Internal temperature of inverter component is over85°C	Check whether the environment around the equipment well ventilated
	Fault code3	The battery voltage is too high	Check if spec and quantity of batteries are meet requirements
		Battery is over-charged	Return to repair center

	fault code 84	Phase loss	1.check whether three-phase power is connected 2.check whether the inverter turns on three-phase parallel
Buzzer beeps continuously and red LED is on	fault code86	AC output voltage and frequency setting is different	Check whether the output voltage and frequency of each inverter are set the same
	Fault code71	Firmware version inconsistent	1.update all inverter firmware to the same version 2.if the problem Remains please contact your installer.
	Fault code85	The output current of each inverter is different	1.Check if sharing cables are connected well and restart the inverter. 2.if the problem Remains, please contact your installer.

7. SPECIFICATIONS

Table1 Solar Mode specifications

MODEL	3KW/24VDC	3.5/5/5.2/5.5KW 48VDC			
Rated output power	3000W	3500W	5000W	5200W	5500W
PV Input Max Power	5500W				
PV operating voltage range	120-450VDC				
PV normal operating voltage	280-360VDC				
Normal output voltage	230VAC				
Output voltage range	230 ±5％VAC				
Normal output current	13A	15.2A	21.7A	22.6A	23.9A
Efficiency(DC/AC)	≥92%				
Frequency	50/60Hz				
Overload protection	MPPT will close immediately as long as the input power is greater than the maximum output power				
PV Max input current	20A				

Table2 Line Mode specifications

Input Voltage Waveform	Pure sine wave(utility or generator)
Normal Input Voltage	230VAC
Low Loss Voltage	120VAC±7V（widerange）170VAC±7V(narrow range)
Low Loss Return Voltage	130VAC±7V（widerange）180VAC±7V(narrow range)
High Loss Voltage	280VAC±7V
High Loss Return Voltage	270VAC±7V
Max AC Input Voltage	300VAC
Normal Input Frequency	50Hz / 60Hz (Auto detection)
Low loss Frequency	40±1Hz
Low loss Return Frequency	42±1Hz
High loss Frequency	70±1Hz
High loss Return Frequency	67±1Hz
Output short circuit protection	Circuit Breaker
Efficiency(Line Mode)	>95%（Rated R load, battery full charged）
Communication	USB,RS232,RS485,WIFI,CAN
Humidity	0-90%RH(No-condensing)
Operation temperature	0℃-50℃
Storage temperature	-15℃-60℃

Table3 Charge Mode specifications

INVERTERMODEL	3KW	3.5/5/5.2/5.5KW
Charging Algorithm	3-Step	
Utility Charging Mode		
AC Charging Current	0/10/20/30/40/50/60/70A/80Amp (@$V_{I/P}$=230Vac)	
Bulk ChargingVoltage	24.0-30.0vdc (Default:28vdc)	48.0-60.0vdc (Default:56vdc)
Floating Charging Voltage	24.0-30.0vdc (Default:27vdc)	48.0-60.0vdc (Default:54vdc)
Charging Curve		
Max. charging current (Solar +AC)	100A	
Over-charging voltage	30vdc	60vdc

Table 4 Inverter Mode specifications

Normal DC voltage	24V	48V		
Waveform	Pure sine wave			
Output voltage range	230VAC±5%			
Output frequency	50/60Hz±1Hz			
Peak Efficiency	≥92%			
Power factor	1.0			
Overload protection	20s@101%~120% load , 10s@121%~150% load, 5s@≥150%load			
Transfer time	10ms typical(UPS)20ms typical(APL)			
Protection features	Low voltage protection; High voltage protection Overload protection ; Over-temperature protection Short circuit protection; Over-charge protection; Battery reverse protection			
Cold start voltage	23.0VDC	46.0VDC		
Low voltage alarm(optional)	18.0-25.0VDC	36.0-50.0VDC		
Low voltage alarm recovery	22.0VDC	44.0VDC		
Low voltage shut down (optional)	18.0-25.0VDC	36.0-50.0VDC		
High voltage alarm recovery	30.0VDC	60.0VDC		
Dimension(L*W*H)mm	486X313X125			
Net Weight(KG)	9.6	9.6	11.6	11.6
Gross Weight(KG)	10.6	**10.6**	12.6	12.6

8. 3KVA-5.5KVA Installation dimension drawing

NOTE: The following picture is only a schematic diagram of the equipment .If the actual chassis does not conform to the schematic due to a structural upgrade, it is subject to prior notice.

614-00051-00