Seplos Xtreme battery pack specification

CONTENT

1

Safety Precautions

Warning: This section contains important safety and operating instructions. Please read it carefully and retain this manual for future reference.

1． Please specify which battery you are using, lithium battery or lead-acid battery, if you set the wrong battery mode, the system will not work properly.

2． Please have a professional electrician or mechanical engineer perform all operations and connections.

3． All electrical installations must comply with local electrical safety standards.

4． When installing photovoltaic modules during the day, the installer should cover the photovoltaic modules with opaque materials, otherwise the terminal voltage of the modules in the sun will be too high and cause danger.

5． Do not disassemble the unit. When service or repair is required, take it to a qualified service center . Improper reassembly may result in a risk of electric shock or fire.

6． To reduce the risk of electric shock, please disconnect all wiring before attempting any maintenance or cleaning. Simply turning off the device will not reduce this risk of electric shock.

7． Never charge a frozen battery.

8． In order to make the inverter work well, please select the appropriate cable size according to the required specifications, it is very important to operate this inverter correctly.

9． Be very careful when using metal tools on or around the battery. Dropping a tool could short out batteries or other electrical components or create sparks, possibly resulting in an explosion.

10． When you want to disconnect the AC or DC terminals, please strictly follow the installation procedure. See the installation section of this manual for details.

11． Grounding inst ructions: The inverter should be permanently grounded. Be sure to follow local requirements and regulations to install this inverter.

12． Do not short-circuit the AC output and DC input. When the DC input is short-circuited, please do not connect it to the mains.

13． Please make sure the inverter is fully assembled before operation.

Product introduction

（To understand the detailed parameters of POLO-S, please refer to the instruction manual of POLO-S）

The battery system is suitable for home energy storage and small and medium-sized commercial storage. It uses 3.2V 50Ah lithium cells to form 2 P16S battery modules and Smart BMS to form 51.2V100Ah lithium battery system. The system supports a maximum of 16 sets of batteries in parallel, and the system prohibits the use of series and mixed use with other batteries of different brands and models. It is equipped with a multi-functional off-grid solar inverter, which integrates MPPT solar charge controller, high-frequency pure sine wave inverter and UPS function module, which is very suitable for off-grid self-generation or as a backup power supply. This inverter works with or without batteries. The WiFi/GPRS module is a plug-and-play monitoring device installed on the inverter. Users can use this device to monitor the status of the system through mobile phones or web pages anytime and anywhere.
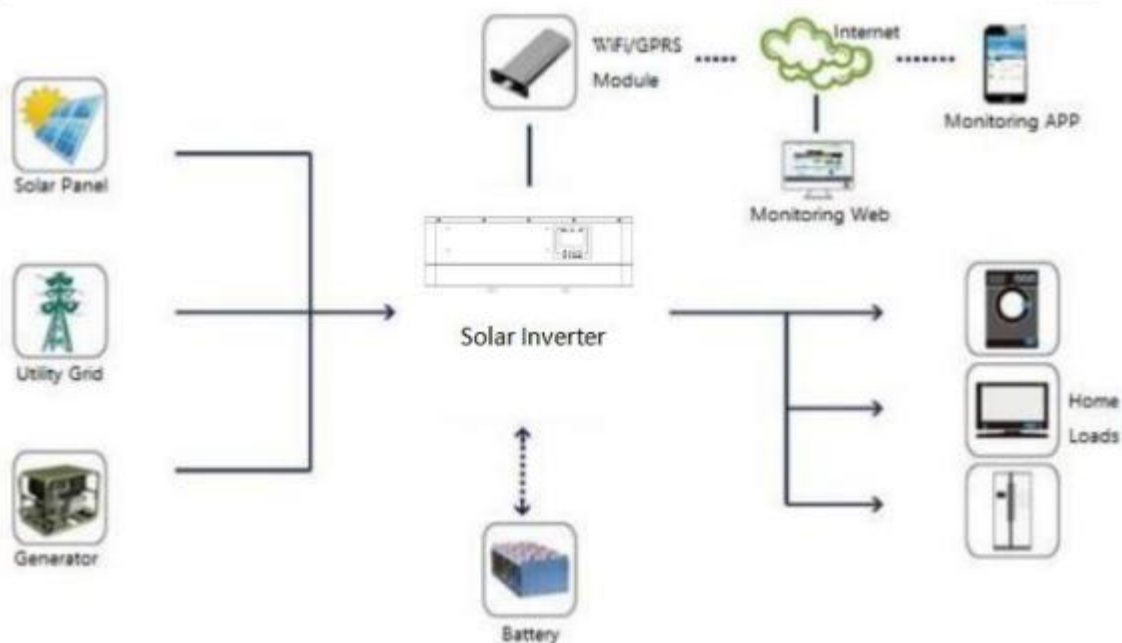

Off-grid solar inverter system

Features

1. Rated power 5KW, power factor 1.

2. MPPT range 120V~430V,450Voc.

3. High frequency inverter with small and light weight.

4. Solar and utility grid can power loads at the same time.

5. With CAN/RS485 for BMS communication.

6. With the ability to work without battery.

7. WIFI/GPRS remote monitoring(optional)

Product overview

POLO-S

Inverter
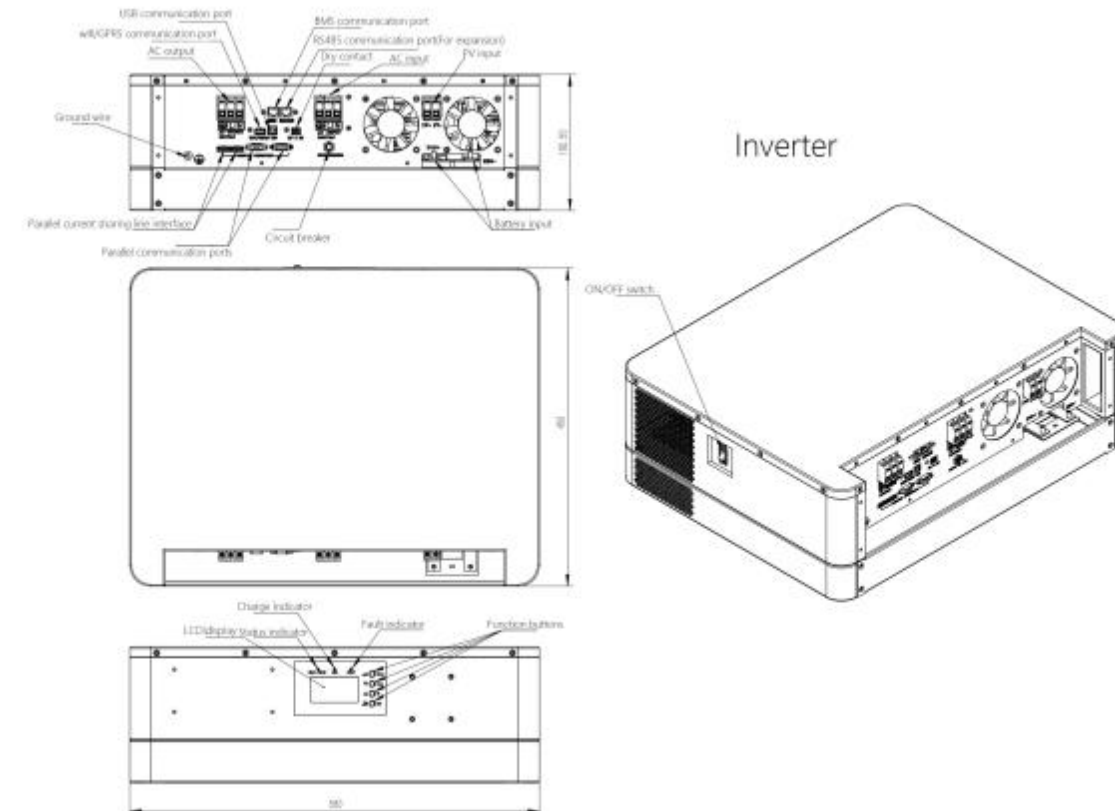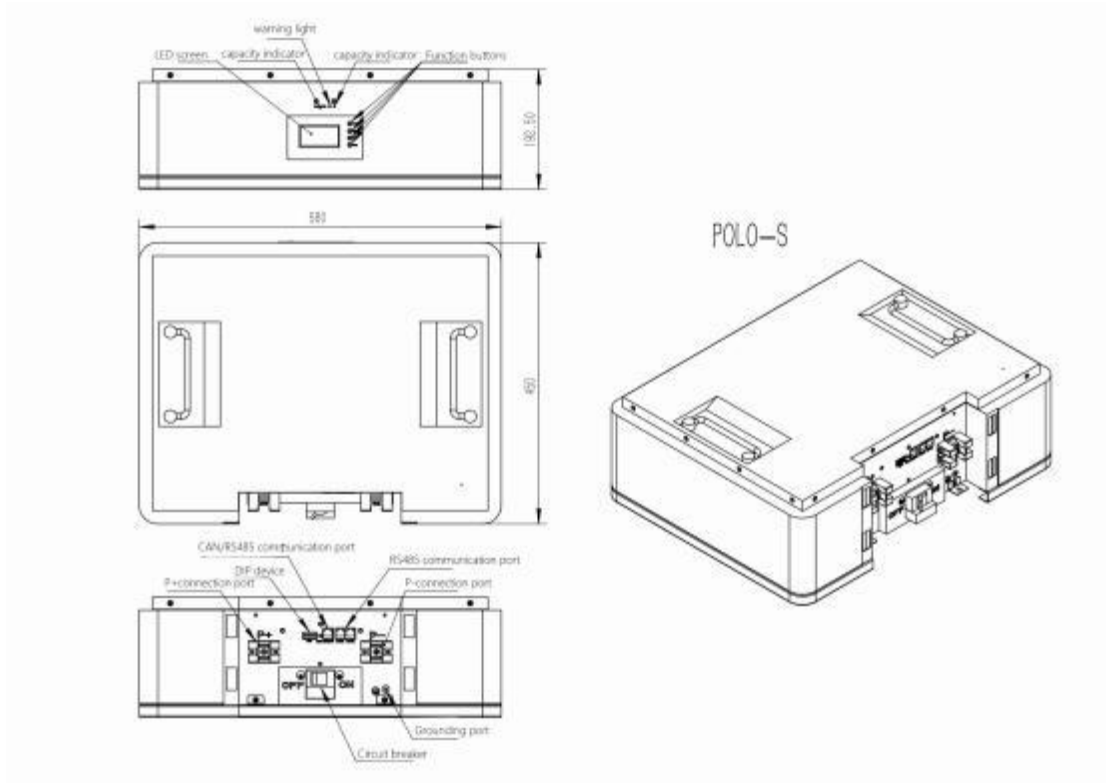
Parameters

| Item\Stack Quantity	3*POLO-S + IF-5000-S	4*POLO-S + IF-5000-S	5*POLO-S + IF-5000-S	6*POLO-S + IF-5000-S
Rated energy(kWh)	15.36kWh	20.48kWh	25.6kWh	30.72kWh
Nominal Capacity(Ah)	300AH	400AH	500AH	600AH
Nominal Voltage(V)	51.2V			
Cell type	LFP			
Output power	5KAV/5KW			
Output voltage (V)	230Vac±5%			
Maximum charge/ discharge current	100A			
Maximum charge /discharge power	5KAV/5KW			
Communication mode	CAN/RS485			
Cycle life	4500			
Working Temperature	0℃ - 40℃			
Storage temperature	-10℃-35℃			
Humidity(%)	5%~65% Relative humidity (non-condensing)			
Altitude Limited(m)	<2000m			
Dimension(mm)	580*450*822.5	580*450*995	580*450*1167.5	580*450*1340
Weight(Kg)	174.8KG±3KG	224KG±3KG	273.2KG±3KG	322.4KG±3KG

Installation

Unpacking and inspection

Before installation, you need to check whether the items are in good condition. Unpack the inverter and make sure there are no damaged items in the package. Check that the following items are all included :

> ▶ Inverter x 1
> ▶ Instruct ion x 1
> ▶USB communication line x 1
> ▶Parallel current equalizing line x 1
> ▶Parallel communication line x 1

Note: The new version of the CD in the package of the previous version is no longer available. If you need the CD content, please contact the seller.

Preparation before installation
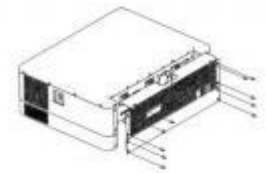
Before wiring, please take out the screws on the rear panel of the machine and remove the two rear panels.

Installation fixed

Before choosing an installation location, consider the following:

1.   Do not place stacked batteries on flammable construction materials.

2.   Recommended that the batteries be placed on a level ground, and that the batteries be stacked 6 heights or less. The inverter is at the top of the battery stack.

3.   To ensure optimal operation of the inverter, the ambient temperature should be between 0°C and 55°C.

4 .   Make sure there is some free space around the inverter, as shown in the picture on the right, to ensure adequate heat dissipation and enough space to move cables.

The inverter is suitable for installation above polo-s.
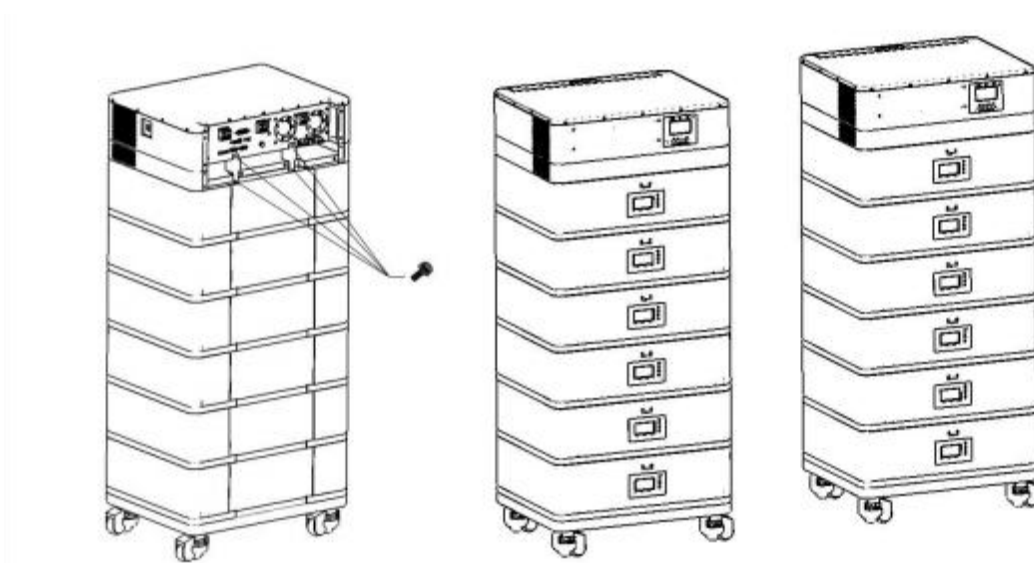
As shown in the picture above, use screws to fix the installation. M4 screws are recommended.

Battery connection
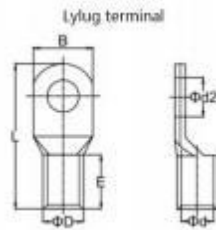
Lithium battery connection

Notice: In order to operate safely and comply with safety regulations, a DC over current protection disconnecting device must be installed between the battery and the inverter. The fuse or circuit breaker of a single machine is recommended to use a specification of 40A for M3500H BP, and a specification of 50A for M5000H BP.

If the lithium battery is matched with the M3500H-48BP / M5000H-48BP inverter, only the lithium battery that has been matched with the inverter is allowed to be used. There are two kinds of connection ports on the lithium battery, the RJ45 port for communication and the positive and negative power cord ports of the battery.

Warning: All wiring must be performed by professionals.

Warning: Connecting the battery with the proper cables is very important for the safe and efficient operation of the system.

To reduce r i s k，use the correct cable and terminal sizes as recommend be l ow .

Lytug terminal

Please follow the steps below to connect the inverter to the lithium battery:

1． According to recommend e d battery cable and terminal specification .

Model	Cable specification	Torque value
M5000H-48BP	1 * 2 AWG	2-3 Nm

2 . Inset the connect or terminal of the battery cable evenly into the battery connect or of the inverter, and make sure the bolts are tightened with a 2- 3 Nm . Make sure the polarity of the battery and inverter are connect e d correctly and that the connect or terminals are tightened to the battery terminals .

The following figure is a schematic diagram of stacking 6 POLO-S, with the inverter stacked on top of the connecting cables and copper bars

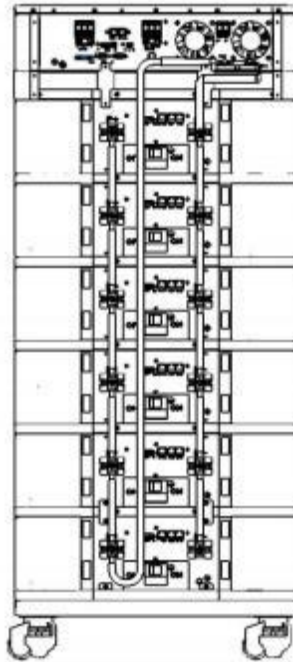Standard configuration is a 1.5m power cable and a PS-0 soft copper bar
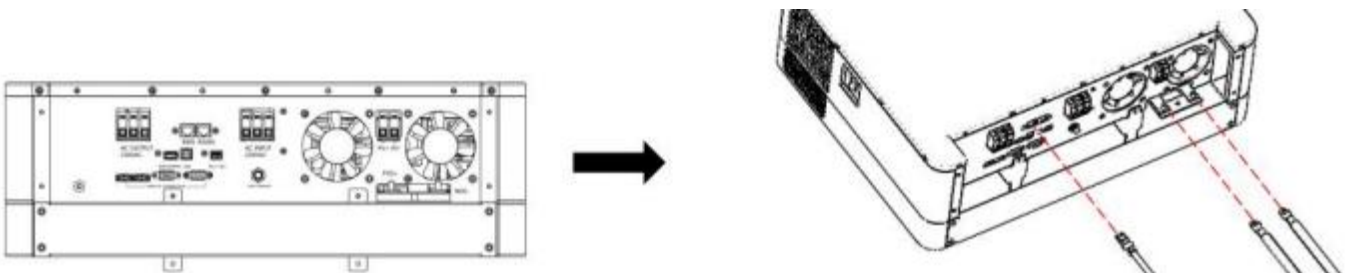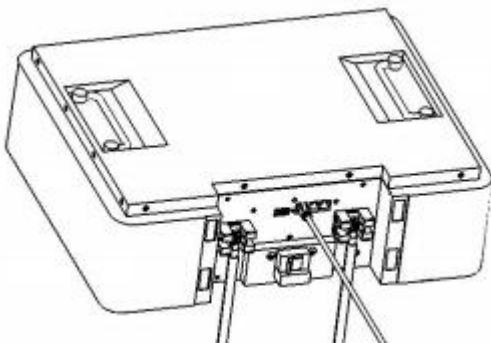
1.5m power cable

PS-0 soft copper bar

Standard configuration is a 1.5m power cable and a PS-0 soft copper bar

3. Connect one end of the RJ45 cable to the inverter BMS communication interface (RS485/CAN).

4. Plug the other end of the RJ45 cable into the battery communication interface (RS485 or CAN).

Notice: If you choose a lithium battery and communicate with the inverter, please make sure to use the RJ45 communication cable to connect the battery and the inverter, and select the battery type as "Li" on the inverter .

Lithium battery communication and setting

In order to communicate with the lithium battery BMS, set the battery type to "Li" in item 05 of the inverter program, and the LCD screen will switch to program item 36 to set the communication protocol type. The inverter has several RS485 communication protocols to match some specific batteries. Please consult your supplier before selecting a battery model.

Use the RJ45 cable to connect the battery end and the inverter end BMS communication interface

Please make sure that the pins of the lithium battery BMS interface correspond to the pins of the inverter BMS communication interface. The pin definition of the inverter BMS interface is shown in the figure below:

| Pin	BMS interface	RS485 interface (For expansion)
1	RS485B	RS485B
2	RS485A	RS485A
3	- -	- -
4	CANH	- -
5	CANL	- -
6	- -	- -
7	- -	- -
8	- -	- -
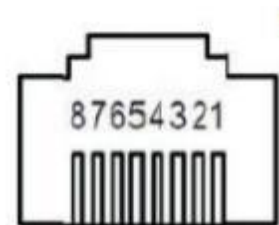
POLO-S setting communication protocol

Select the corresponding communication protocol according to the inverter type;

As follows, the communication protocol that can be set by POLO-S;

NO	Inverter Agreement	Inverter Manufacturer Agreement
0	派能（CAN 协议）	Pylon_CAN
1	古瑞瓦特（CAN 协议）	Growatt_CAN
2	固德威（CAN 协议）	Goodwe_CAN
3	首航（CAN 协议）	Sofar_CAN
4	SMA（CAN 协议）	SMA_CAN
5	Victron（CAN 协议）	Victron_CAN
6	Studer（CAN 协议）	Studer_CAN
7	锦浪（CAN 协议）	Ginlong_CAN
8	日月元（RS485 协议）	Voltronic_485
9	硕日（RS485 协议）	SRNE_485
10	古瑞瓦特（RS485 协议）	Growatt_485
11	派能（RS485 协议）	Pylon_485
12	德业（派能 RS485 协议）	Deye_485

Remarks: To switch the protocol, turn to the corresponding protocol interface, press the confirmation key twice, and the protocol switch is successful
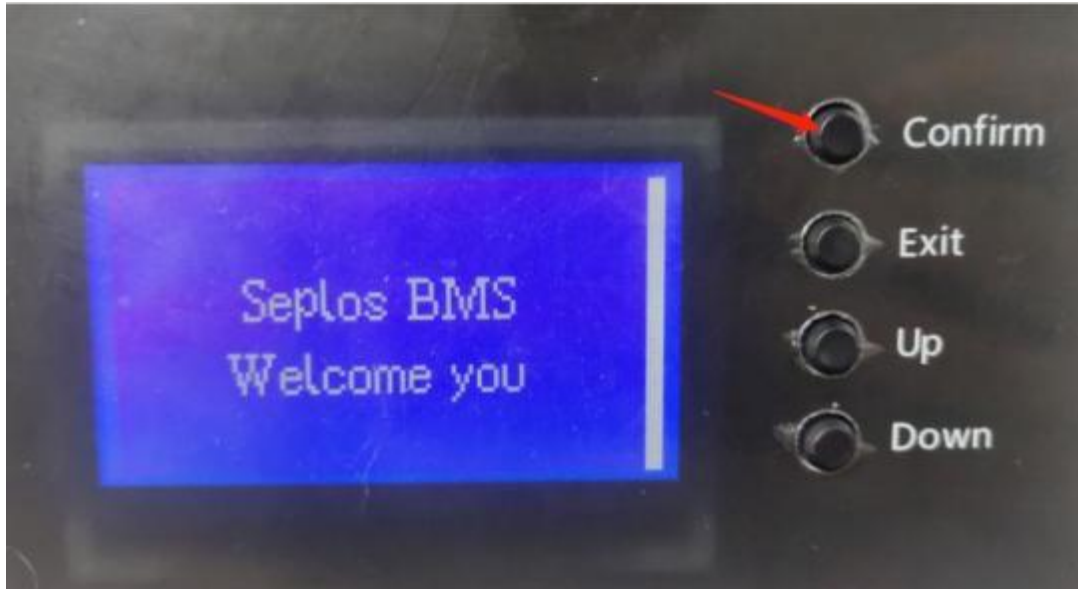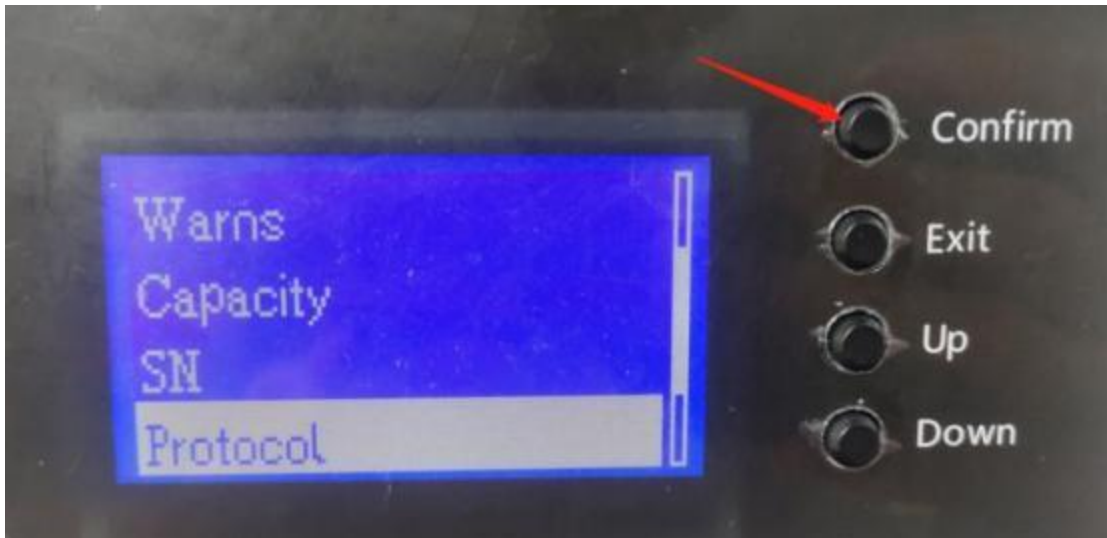

As shown in the figure above, click the Confirm button, and the window shown in the figure below will appear

As shown in the figure above, click the Confirm button, and the window shown in the figure below will appear

As shown in the picture above, press the Down key six times, and the window shown in the picture below will appear

As shown in the figure above, click the Confirm button, and the window shown in the figure below will appear.
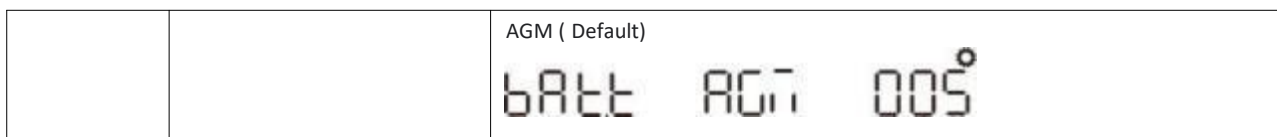

As shown in the figure above, after pressing the Down key to find the corresponding protocol of the inverter, press the Confirm key twice to

set successfully.

LCD screen parameter setting

If communicating with the battery BMS, the fifth program of the inverter should be set to "Li". After setting to "Li", the screen will jump to the

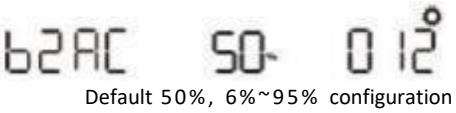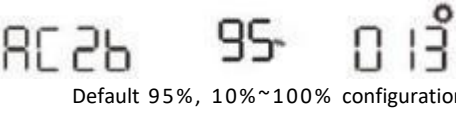51st program, which is to set the battery agreement. L01~LL50 are RS485 protocol, L51~L99 are CAN protocol.

Notice: The inverter RS485 or CAN share the port "BMS", and only one of the protocols can be selected for communication.

		AGM (Default)
		bAtt AGⁿ 005°

05	Battery Type	Flooded water battery `bAtt FLd 005`	
		Li Lithium battery (only for communication with BMS) `bAtt LI 005`	
		USE User- defined (suitable for manual setting of lead- acid battery performance) `bAtt USE 005` If it is set to "USE", the battery voltage value setting items 19, 20, and 21 are not manually set	
		US2 User- defined 2 (suitable for Lithium battery without communication) `bAtt US2 005` If it is set to "USE", the battery voltage setting items 19, 20, and 21 cannot be manually set. It is suggested that item 19 and item 20 can be set to the same value, when this value is reached, the inverter will stop charging.	
36	RS4 8 5 communication protocol	Protocol L01	`PtCL L01 036`
		Protocol L02	`PtCL L02 036`
		. . .	. . .
		Protocol L50	`PtCL L50 036`
	CAN communication protocol	Protocol L51	`PtCL L51 036`
		Protocol L52	`PtCL L52 036`
		. . .	. . .
		Protocol L99	`PtCL L99 036`

Notice: When the battery mode is set to "Li", the values of item 12, 13, and 21 o f the setting item will be set in the form of percentage.

Notice： When the battery mode is set to " Li", the setting items for setting the maximum charging current, item 2 and item 11 cannot be manually set.

12	When selecting SBU mode or SOL mode in item 01 of the program, it is necessary to set the SOC switching point for the battery to mains power supply.	b2AC 50- 012° Default 50%, 6%~95% configuration
13	When selecting SBU mode or SOL mode in item 01 of program, it is necessary to set the SOC switching point of mains to battery.	AC2b 95- 013° Default 95%, 10%~100% configuration

21	If it is set to "Li" in item 05, it is necessary to set the battery low voltage cut-off point SOC.	Cut4 20- 021° Default 20%,5%~50% configuration

Notice： When the battery mode is set to " Li", if the communication fails, the inverter will report an error and cut off the output . If you have any problems communicating with the BMS, please contact the supplier.

AC input/output connections

Notice: Before connecting to the AC input power, please install a separate AC circuit breaker between the inverter and the AC input power. This will ensure that the inverter is safely disconnected during maintenance and avoids overloading the AC input. The recommended specification for 5 KW inverter AC circuit breaker is 50 A, and the recommended specification for 3.5 KW inverter AC circuit breaker is 40 A.

Notice: There are two terminal blocks labeled "IN" and "OUT". Please avoid wrong connection of input and output wires, otherwise it will cause damage to the machine.

Notice: All wiring must be performed by professionals.

Notice: Using proper cables for AC input connections is important for safe and efficient system operation. To reduce the risk of injury, use the correct cable size recommended below.

Recommended circuit breaker specifications for AC input：

Model	Cable specification	Torque value
M3500H BP	1 * 10 AWG	1.2-1.6 Nm
M5000H BP	1 * 8 AWG	1.2-1.6 Nm

Follow the steps below to perform AC input/output connections:

1 . Before making AC input/output connections, make sure that the DC protector or isolating switch is disconnected.

2 . Strip off the 10 mm insulating sleeves of the 6 wires, and cut the L wire and N wire 3 mm shorter .

3 . Insert the AC input cable according to the mark on the terminal, and then tighten the terminal screw. Be sure to connect the PE protective wire first.

→ **Ground wire (Yellow-Green)**

L→Fire wire (Brown、Black)
N→Zero wire (Blue)
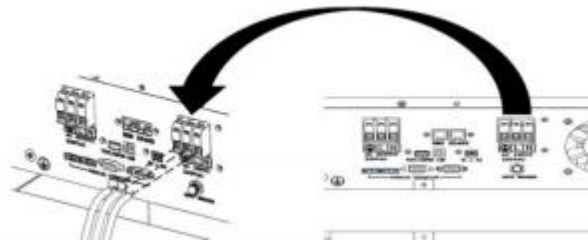
⚠	Warning: Before connecting it to the device, please make sure the AC input circuit breaker is disconnected to avoid the risk of electric shock

4 .Then, insert the AC output cable according to the identification on the terminal block, and tighten the port screws. Be sure to connect the

PE protective wire first

→**Ground wire (Yellow-Green)**
L→ Fire wire (Brown、Black)
N→Zero wire (Blue)
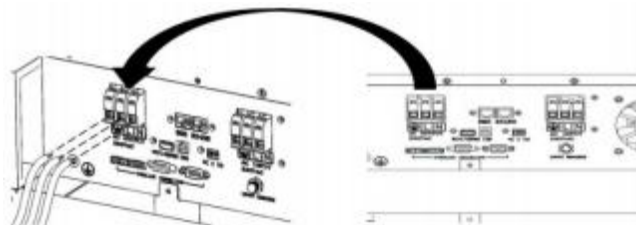
5 . Make sure the wire connection is secure.

Warning: AC wiring is performed according to the marking. If the L line and the N line are connected incorrectly, multiple units running in

parallel may cause a short circuit in the power grid.

Warning: Appliances like air conditioners may take 2-3 minutes to restart because there needs to be enough time to balance the refrigerant

gas inside the circuit. If power goes out for a short period of time and comes back on, it will cause damage to your connected equipment.

To prevent such damage, please confirm with the air conditioner manufacturer whether it has a delay function before installation. Otherwise,

the solar inverter will trigger an overload fault and cut off the output to protect your equipment, but sometimes cause damage to the inside of

the air conditioner .

PV connection

Notice: Before connecting the PV modules, please install a DC circuit breaker between the inverter and the PV modules.

Warning: All wiring must be performed by professionals.

Warning: Connecting PV modules with proper cables is important for safe and efficient system operation. In order to reduce the risk of system use, please use the following recommendations correct cable specification.

Model	Cable specification	Torque value
M5000H BP	1 * 12 AWG	1.2-1.6 Nm

Photovoltaic module selection

:

When selecting a suitable PV module, it is important to consider the following parameters:

1. The PV open circuit voltage (Voc) does not exceed the maximum value of the open circuit voltage allowed by the inverter.

2. The PV open circuit voltage (Voc) should be higher than the battery voltage minimum.

Model	M5000H BP
Open circuit voltage(Voc)	450Vdc
Starting voltage	150Vdc
MPPT voltage range	120Vdc~430Vdc

Please follow the steps below to connect the PV module array

1 . Strip 10 mm of the positive and negative conductor insulation sleeves.
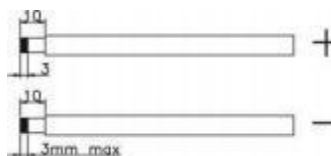
2 . Check the correct polarity of the cable connection between the PV module and the PV input connector.

Connect the positive (+) of the cable to the positive (+) of the PV input connector. Connect the negative (-) of the cable to the negative (-) of the PV input connector.
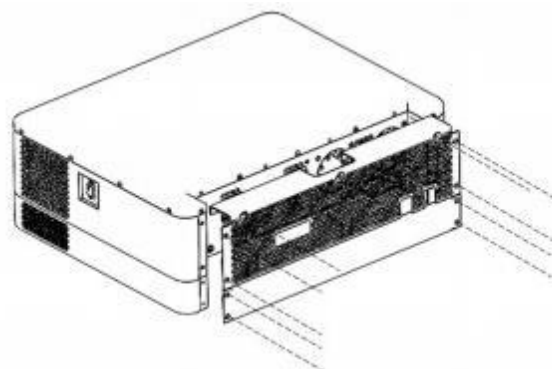
3. Make sure the wiring is secure.

Product Wiring Diagram
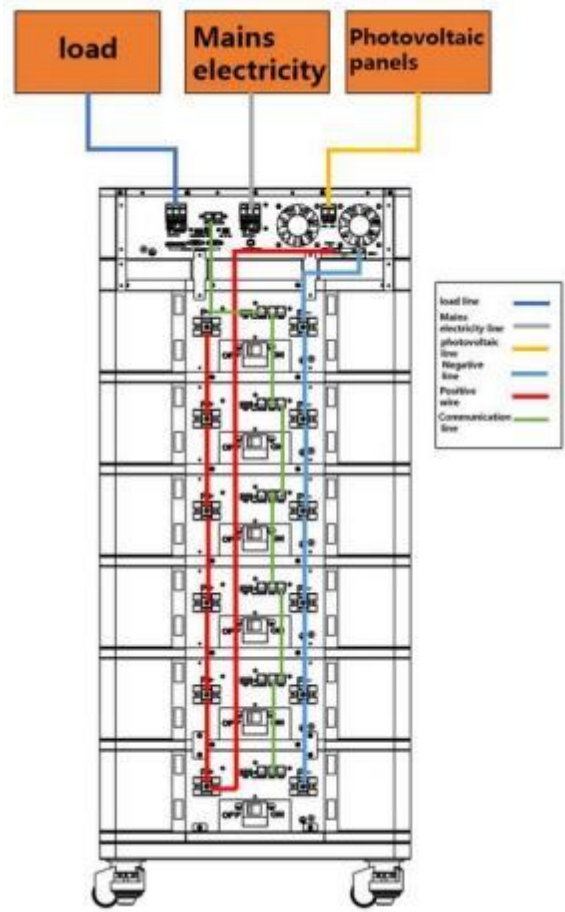
Installation Finishing

Once all the wires are connected, put the bottom cover back on and screw it in.

Dry node

There is a dry node (3A/250VAC) in the bottom port, which is used to send a signal to the external device when the battery voltage or capacity

is low to a certain value. Typically used to connect associated external generators.

| Device status	Condition			Dry contact port : NC C NO	
				NC & C	NO & C
OFF	Device is off			OFF	ON
ON	The output is bypassed by the mains at load			OFF	ON
	Output is powered by battery or solar	The first setting item is "UTI" mode	Battery voltage (or SOC)< Low voltage alarm (or low pressure alarm SOC)	ON	OFF
			Battery voltage (or SOC) > The setting value of item 13 or the battery is in the floating charging stage	OFF	ON
		The first setting item is "SOL", "SBU" or "SUB" mode	Battery voltage (or SOC) < Setting value of item 12	ON	OFF
			Battery voltage (or SOC) > The setting value of item 13 or the battery is in the floating charging stage	OFF	ON

Product operation

Switch ON/OFF

After the unit is properly installed and the battery is properly connected, just press the On / Off switch (on the side) to turn on the machine.

Operation and display

The operation and display panel shown in the figure below is located on the front panel of the inverter. It includes three indicator lights, four

function keys and an LCD display for indicating operating status and input/ output power information.

1. LCD display

2. Stat us Indicator

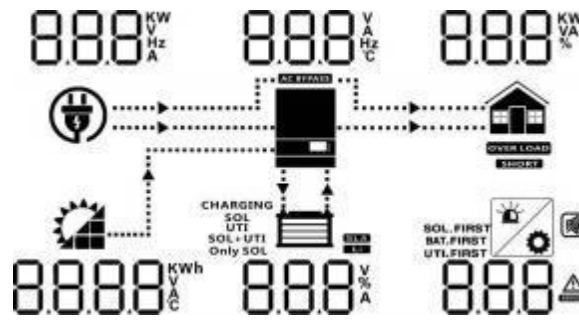3. Charging indicator

4. Error indicator

5. Function button
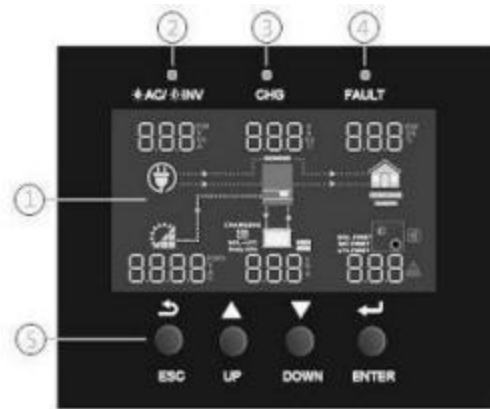
LED indicators

LED indicators			Message
AC / INV	Green	Fixed	In the mains mode, the power is provided by the mains
		Blink	In battery mode, the output is powered by battery or PV
CHG	Green	Fixed	Battery fully charged
		Blink	Battery is charging
FAULT	Red	Fixed	Inverter failure
		Blink	Inverter warns

Function button

Button	Description
ESC	exit setup mode
UP	Skip to previous setting
DOWN	Skip to next setting
ENTER	Confirm the selection of the set mode or enter the setting mode

LCD display Icon Introduction

Icon	Power description
AC input information	
AC input icon	AC input
8.8.8 KW V Hz	Display AC input power, AC input voltage, AC input frequency, AC input current
AC BYPASS	AC bypass operation
PV input information	
PV input icon	PV input
8.8.8.8 KWh V C	Display PV power, PV voltage, PV current
Output information	
Inverter icon	Inverter icon
8.8.8 V A Hz C	Display output voltage, output current, output frequency, inverter temperature
Load information	
load icon	load icon
8.8.8 KW VA %	Display load power, load percentage
OVER LOAD	Display overload
SHORT	Show short circuit
Battery information	
battery capacity icon	Display battery capacity，0~24%,25%~49%, 50%~74%,75%~100%
8.8.8 V % A	Display battery voltage, voltage capacity percentage, battery current
SLA	Show lead- acid batteries
Li	Show lithium battery
CHARGING SOL SOL+UTI Only SOL	Display the charging priority, SOL means solar energy priority charging, SOL+UTI means solar energy and utility power charging together, Only SOL means only solar energy charging

Other information	
SOL. FIRST BAT. FIRST UTI. FIRST	Display load priority, SOL, UTI, SBU, SUB, see item 1 of the setting item for details
8.8.8 ⚠	Display warning or fault codes
(alarm icon)	Display warning or fault codes
⚙	Displayed in the setup parameters
(muted buzzer icon)	Display buzzer off
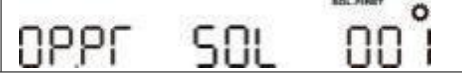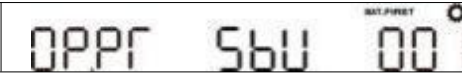
In mains mode, the battery icon will replace the current charging status		
state	battery voltage	LCD display
Constant current mode / Constant voltage mode	< 48V	The 4 bars of the battery icon flash in sequence
	48 ~ 49.992V	The top 3 bars of the battery icon flash in turn, and the bottom 1 bar is always on
	49.992 ~ 52.008V	The top 2 bars of the battery icon flash sequentially, and the bottom 2 bars are always on
	> 52.008V	The top 1 bar of the battery icon flashes in turn, and the bottom 3 bars are always on
Float charge mode, the battery is fully charged		4 battery icons are always on
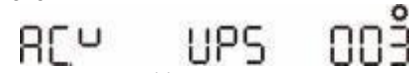
In battery mode, the battery icon will replace the current capacity		
load percentage	Battery voltage	LCD display
load >50%	< 41.208V	(battery icon)
	41.208 ~ 43.2V	(battery icon)
	43.2 ~ 45. 192V	(battery icon)
	> 45. 192V	(battery icon)
50%> load > 20%	< 43.608V	(battery icon)
	43.608V ~ 45.6V	(battery icon)
	45.6 ~ 47.592V	(battery icon)

	> 47.592V	
load < 20%	< 44.808V	
	44.808 ~ 46.8V	
	46.8 ~ 48.792V	
	> 48.792	

LCD display parameter setting

Press the ENTER key for 3 seconds to enter the setting item, and press the up and down keys to scroll through the options. Use ENTER to confirm the option, ESC key to exit the setting interface.

setting item	Description	setting item		
01	Output priority: Configuring the On-load Power Supply Priority	Photovoltaic priority	OPPr	SOL	001
		Photovoltaic power is given priority to the load. When the photovoltaic is insufficient, the photovoltaic and the battery supply power to the load together. Mains will supply power to the load under any of the following conditions: — No PV — The battery voltage drops to the low voltage warning point or the set point in program 12			
		Mains priority (default)	OPPr	Utl	001
		The utility power supplies power to the load first. When there is no mains power, photovoltaic and battery will supply power to the load			
		SBU mode	OPPr	SbU	001
		Photovoltaic power is given priority to the load. When the photovoltaic is insufficient, the photovoltaic and the battery supply power to the load together. Only when the battery voltage drops to the low voltage warning point or the set point in program 12, the utility power will supply power to the load.			
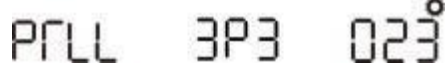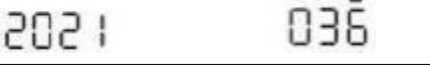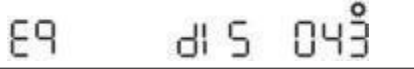
		SUB mode	OPPr SUb 001
		Photovoltaic power is given priority to the load. When the photovoltaic is insufficient, the photovoltaic and the mains supply power to the load together. The battery will only discharge when the photovoltaic power is insufficient and there is no mains power.	
02	Maximum charging current : Sets the total maximum charge current (Maximum charging current = Mains charging current + Photovoltaic charging current)	CHGi 60A 002 Default 60A, 10A~100A configuration (If it em 5 is set t o "L i", this item can not be manually set)	
03	AC input voltage range	Appliance (Default) ACu APL 003 AC enter acceptable range 90~280VAC	
		UPS ACu UPS 003 AC enter acceptable range 170~280VAC	
		Generator (only diesel generators are supported) ACu GEN 003 AC enter acceptable range 90~280VAC **Notice:** When connected to a generator, the power of the generator should not be less than 10KVA. If it is connected to a three-phase parallel system, the power of the generator should not be less than 20KVA, and the number of inverters connected to one phase should not exceed two	
04	power saving mode	power saving mode off（Default） SAuE diS 004 Turn off the power saving mode, and the switching status of the inverter is not affected by the load	
		power saving mode on SAuE EnA 004 Turn on the power saving mode, when the load is very small, the inverter will cut off the output.	
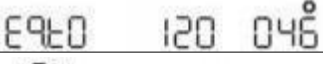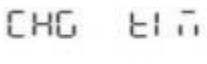
05	Battery Type	AGM (Default)
		
		`bAtt   AGm   005°`
		
		Flooded water battery
		
		`bAtt   FLd   005°`
		
		Li Lithium battery (only for communication with BMS)
		
		`bAtt   LI   005°`
		
		USE User-defined （Suitable for manual setting of lead-acid battery parameters）
		
		`bAtt   USE   005°`
		
		US2 User-defined 2 （Suitable for lithium batteries without communication）
		
		`bAtt   US2   005°`
		
		If it is set to "USE", it is recommended that items 19 and 20 can be set to the same value. When this value is reached, the inverter will stop charging

06	Automatic restart when overloaded	Don't restart (Default) `LdrS   dIS   006°`	Restart `LdrS   ENA   006°`
07	Automatic restart when over temperature	Don't restart (Default) `tmrS   dIS   007°`	Restart `tmrS   ENA   007°`

08	The output voltage
	*This setting item can only be set in standby mode Setting (inverter switch off state)
		230V (Default)
		
		`Outᵛ   230   008°`
		
		240V
		
		`Outᵛ   240   008°`
			220V
			
			`Outᵛ   220   008°`
			
			208V
			
			`Outᵛ   208   008°`

09	Output frequency *This setting item can only be set in standby mode (inverter switch off state)	50Hz (Default) `OutF   50   009°`	60Hz `OutF   60   009°`
10	The number of 12V batteries that can be	`bAtn   4   010°`	

	connected in series	
11	Maximum Mains Charging Current	**ACI 30ᴬ 011** Default 30A, 0A~80A configuration (The setting value of this item should not exceed the value of item 2. If item 5 is set to "Li", this setting item cannot be set manually)
12	When selecting SBU mode or SOL mode in item 01 of the program, it is necessary to set the switching point of battery to mains power	**b2AC 46.0ᵛ 012** Default 46.0V, 44.0V~51.2V configuration **b2AC 40% 012** When item 5 is set to "Li": Default 40%, 6%~50% configuration, The setting value should be higher than the value of item 21.
13	When selecting SBU mode or SOL mode in item 01 of the program, it is necessary to set the switching point of mains to battery	**AC2b 54.0ᵛ 013** Default 54.0V, 48.0V~58.0V configuration **AC2b 80% 013** When item 5 is set to "Li": Default 80%, 51%~100% configuration
14	Charging priority	When the inverter is in mains, standby or fault mode, the charging priority can be set as follows

		Photovoltaic priority **CG.Pr SOL CSO 014**	Photovoltaics give priority to charging the battery. Mains charges the battery only when photovoltaics are not available
		Photovoltaic + Mains **CG.Pr SOL+UTI SNU 014**	Photovoltaic and mains charge the battery at the same time
		Photovoltaic only **CG.Pr Only SOL OSO 014**	PV will be the only source of charging regardless of utility power availability

15	Alarm control	Alarm on（Default） bUZZ ON 015	Alarm off bUZZ OFF 015
16	Backlight control	backlight on（Default） LCdb ON 016	backlight off LCdb OFF 016
17	Buzzer alarm when input is disconnected	Alarm on （Default） ALAN ON 017	Alarm off ALAN OFF 017
18	Overload to bypass	Overload t obypass o ff（Default） bYP dIS 018	Overload to bypass on bYP ENA 018
19	Equalizing voltage (C.V voltage) (If the 5th item chooses custom mode, some items can be set)	CV 56.4V 019 Default 56.4V, 48.0V~58.4V configuration	
20	Float voltage (If the 5th item chooses custom mode, some items can be set)	FLtV 54.0V 020 Default 54.0V, 48.0V~58.4V configuration	
21	Low pressure cut-off point (If the 5th item chooses custom mode, some items can be set)	CUtV 42.0V 021 Default 42.0V, 40.0V~48.0V con figuration，The se tting value should be lower than the value of item 12	
		CUtV 20% 021 When item 5 is set to "Li"：Default 20%, 5%~49% configuration，The setting value should be lower than the value of item 12.	
		Low pressure cut-off point reached : If the battery is the only power input source, the system will shut down; If there is a PV and a battery at this time, the system will turn off the output, and the PV will charge	

		the battery; If there is PV, mains power and battery at this time, the system will switch to bypass load and charge the battery at the same time	
23	output mode *This setting item can only be set in standby mode （inverter switch off state） * Batteries must be connected for parallel operation	Stand-alone mode: PrLL SI G 023°	Single-phase parallel mode: PrLL PAL 023°
		L1 phase: PrLL 3P1 023°	L2 phase: PrLL 3P2 023°
		L3 phase: PrLL 3P3 023°	
		When single-phase paralleling, all machines are set to "PAL" For three-phase parallel operation, at least 3 machines are required. The machines of L1 phase are all set to "3P1", the machines of L2 phase are all set to "3P2", and the machines of L3 phase are all set to "3P3" and need to be disconnected after setting battery and restart the inverter. The current equalizing line needs to be connected between the machines of the same phase, and the current equalizing line cannot be connected between the machines of different phases. Power saving mode will not be available in parallel mode.	
28	Address settings （Extended use）	Addr I 028° Default 1, 1~255 configuration	
37	Time setting---Year	2021 036°	Default 2000, range2018~2099
38	Time setting --- Month	MON 11 037°	Default 01, range 01~12
39	Time setting--- day	dAY 10 038°	Default 01, range 01~31
40	Time setting－－－hour	HOUr 14 039°	Default 00, range 00~23
41	Time setting－－－minute	MIN 52 040°	Default 00, range 00~59
42	Time setting---Year	2021 036°	Default 2000, range 2000~2099
43	Balanced charging （Generally suitable for	Balanced charging on E9 ENA 043° If "Flooded" or "User-Defined" is selected in item 05, this program can be set	Balanced charging off（Default） E9 di S 043°

	water batteries)		
44	Balanced charging voltage	E9ᵘ 58ч· 0ᵘᵘ Default 58.4V, 48.0V~58.4V configuration	
45	Balanced charging time	⁻¹¹ ⁿ E9ᵗ 60 0ᵘ⁵	Default 60min, 5min~900min configuration
46	Balanced charging timeout	⁻¹¹ ⁿ E9ᵗ0 I20 0ᵘᵉ	Default 120min, 5min~900min configuration
47	Equalization charge interval	dAᵞ E9ⁱ 30 0ᵘⁱ	Default 30 days, 1day~90days configuration
48	Equalization charging activated immediately	Equalization charging activated immediately on E9 0ⁿ 0ᵘᵉ	Equalization charging activated immediately off （Default) E9 0FF 0ᵘᵉ
		If the equalization charging function is turned on in item 43, this item can be set. If "On" is selected in this item, the equalization charge will be activated immediately, and the main page of the LCD screen will display "E9" . If "Off" is selected, the equalization charge will be canceled until the time set by program 47 to start the equalization charge next time. During this period, "E9" will not b e displayed on the screen.	
49	Mains charging time	0000（Default，no time limit) CHG ᵗ¹ⁿ 0000 0ⁱ	Use 4 digits to set the time range, the first two digits are the start time (setting range 00~23), and the last two dig its are the end time (setting range 00~23), for example: 2320, which represents the allowable time range for mains charging From 23:00 to 19:59 the next day.
50	AC output time zone	0000（Default，no time limit) 0UP ᵗ¹ⁿ 0000 0ⁱ	Use 4 digits to set the time range, the first two digits are the start time (setting range 00~23), and the last two digits are the end time (setting range 00~23), for example: 2320, which represents the allowable time range for mains charging From 23:00 to 19:59 the next day.

LCD display information

By pressing the "UP" or "DOWN" key, the LCD display information will be switched in turn. Displayable information includes voltage, frequency,

current, power, and firmware version.
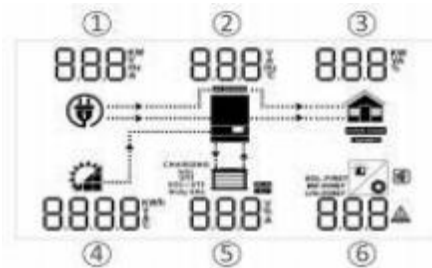
Parameter information	LCD display
① AC input voltage ② Out put voltage ③ load percentage ④ PV input voltage ⑤ Battery voltage ⑥ warning or fault code ⑤ Battery voltage(default page)	230ᵛ 230ᵛ 8.1% 386.0ᵛ 56.4ᵛ
①AC input frequency ② Out put frequency ③ load apparent power(VA) ④ PV Energy Summary(KWH) ⑤ battery percentage ⑥ warning or fault code	50.0ʜᶻ 50.0ʜᶻ 800ᵛᴬ 0.2ᴷᵂʰ 88.0%
① AC input current ② Out put current ③ load percentage ④ PV input current ⑤ battery charging current ⑥ warning or fault code	4.7ᴬ 1.7ᴬ 8.1% 16.8ᴬ 36.6ᴬ
①AC input power (W) ② Inverter temperature ③ load active power (W) ④ PV Energy Summary (KWH) ⑤ battery percentage ⑥ warning or fault code	1.10ᴷᵂ 31.4ᶜ 1.00ᴷᵂ 0.2ᴷᵂʰ 88.0%
Firmware version (CPU1 :040-00- b 21 ; CPU2:041-00- b 21)	040 00 b21 041 00 b21

Time (2018- 12- 15, 15:20:10)	

Operating Mode Description

Operating mode	Instruction	LCD display	
standby mode ＊standby mode ： The inverter has not started yet, but the inverter can charge the battery at this time, and there is no output . ＊In power saving mode, when the load is small, the inverter will cut off the output .	The machine has no output, but it can still charge the battery	Mains and solar charging at the same time 	Mains charging
		solar charging 	No charging
failure mode ＊ When the machine reports failure, it will cut off the output	The machine has no output, but it can still charge the battery	Mains and solar charging at the same time 	Mains charging
		solar charging 	No charging
Mains mode	Mains supply power to the load, also can charge the battery	solar charging 	
		Mains charging 	

Inverter Mode (Battery Mode)	Solar and battery on-load	No battery mode Solar and battery on-load battery only
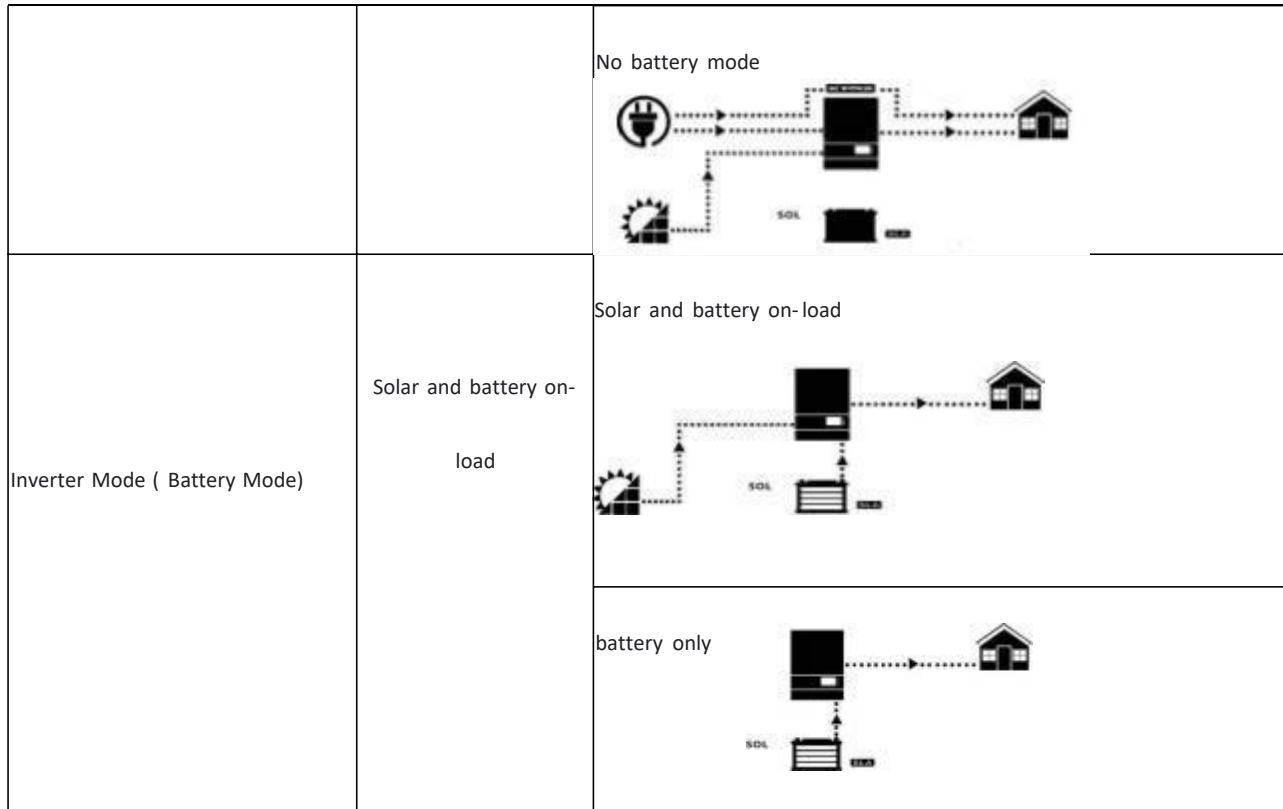
Error code

Error code	Failure event	Icon is always on
01	Fan failure	01-
02	Overheating	02-
03	battery voltage too high	03-
04	battery voltage too low	04-
05	output short circuit	05-
06	output voltage is too high	06-
07	overload timeout	07-
08	BUS voltage is too high	08-
09	BUS soft start failed	09-
51	Over current	51-
52	BUS voltage is too low	52-
53	Inverter soft start failed	53-
55	Output DC component is too high	55-

56	Battery disconnected	56-
57	current sensor failure	57-
58	output voltage is too low	58-
60	Negative work failure	60-
61	PV voltage is too high	61-
62	Internal communication failure	62-
80	CAN communication failed	80-
81	Host lost	81-

warning code

Warning code	Warning event	Sound alarm	Icon flashing
01	Fan failure	Three beeps per second	01
02	Overheating	One beep per second	02
03	battery voltage too high	One beep per second	03
04	battery voltage too low	One beep per second	04
07	Overload	Beep every 05 seconds	07
10	output power derating	Two beeps per three second	10
12	Battery voltage is too low, PV stops charging	One beep per second	12
13	PV voltage is too high, PV stops charging	One beep per second	13
14	Overload, PV stops charging	One beep per second	14
15	The input mains power is different when the machine is in parallel	One beep per second	15
16	Input phase sequence error in parallel	One beep per second	16
17	Output phase loss in parallel	One beep per second	17
18	BMS communication error	One beep per second	18
19	BMS communication lost	No sound	19
20	Lithium battery cell over voltage	One beep per second	20

21	Lithium battery cell under voltage	One beep per second	21
22	Do not work without battery in parallel	One beep per second	22
25	Lithium battery overall under voltage	One beep per second	25
33	Discharge over current	One beep per second	33
34	Charge over current	One beep per second	34
35	Discharge over temperature	One beep per second	35
36	Charge over temperature	One beep per second	36
37	Mosfet overheating	One beep per second	37
38	Battery over temperature	One beep per second	38
39	Battery temperature is too low	One beep per second	39
40	system shutdown	One beep per second	40
41	battery overcharge	One beep per second	41
42	battery low voltage	One beep per second	42
43	Overload	One beep per second	43
44	output power derating	One beep per second	44
45	Battery voltage is too low, PV stops charging	One beep per second	45

Battery equalization charge

The machine contains an equalizing charge function, generally for water batteries, which can reverse some of the accumulated negative chemical effects, such as the stratification effect, that is, the acid concentration at the bottom of the battery is higher than that at the top. Equalization also helps to remove sulfate crystals that may build up on the plates, a condition called sulfation that can reduce the overall capacity of the battery if left unchecked. Therefore, regular equalization charging of the battery is recommended.

How to use the equalizing charging function

First, choose to enable the equalization charging function in item 43. Then choose the following method settings:

1. Item 47 sets the cycle equalization charging interval time
2. Item 48 sets to start equalizing charging immediately

When to start equalizing charging

In the floating charging stage, when the start time is reached after the cycle equalizing charging is set, or when the equalizing charging starts immediately, the charging will enter the equalizing charging stage.
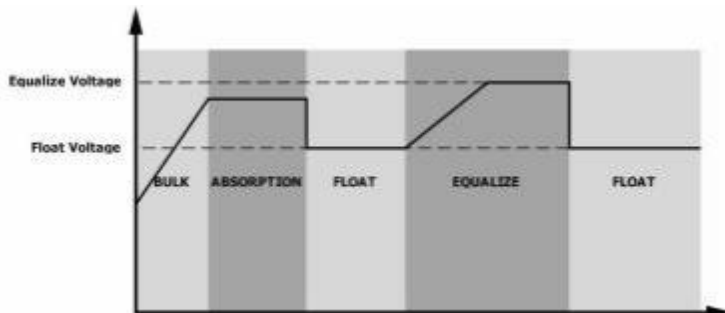
Equalization charging time and charging cut-off time

In the stage of equalizing charging, the machine will charge the battery as much as possible until the battery voltage reaches the voltage point of equalizing charging. Then it will continue to stabilize at this voltage point for a period of time until the set equalization charging time ends.
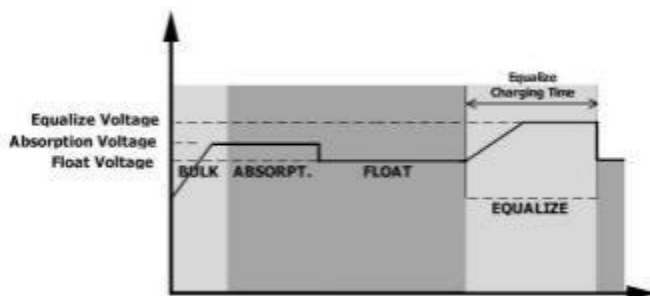
If the equalizing charging stage does not reach the equalizing charging voltage point until the end of the set equalizing charging time, the machine will extend the equalizing charging stage until it reaches this voltage point. If the voltage point of equalizing charging is not reached within the set extended time, the machine will stop equalizing charging and return to the float charging stage.
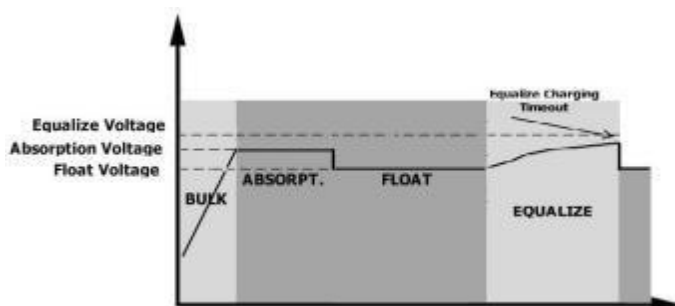
Parameters Table

Table 1 Mains mode parameter information
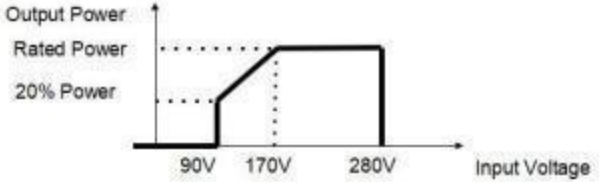
Model	M5000H▮BP
Input voltage waveform	Pure sine wave / consistent with the input voltage waveform of the mains or generator
Rated input voltage	230Vac
Low voltage cut-off voltage	170Vac±7V (UPS) ; 90Vac± 7V (Appliances)
Return voltage after low voltage cut off	180Vac±7V (UPS); 100Vac±7V (Appliances)
High voltage cut-off voltage	280Vac±7V
Return voltage after high voltage cut off	270Vac±7V
Maximum AC input voltage	300Vac
Rated input frequency	50Hz / 60Hz (adaptive)
low frequency cut-off point	40± 1Hz
Return point after low frequency cut	42± 1Hz
high frequency cut-off point	65± 1Hz
Return point after high frequency cut	63± 1Hz
Output short circuit protection	Breaker
Efficiency (bypass mode)	>95% (Based on R load, battery full state)
witching time	Normally about 10ms, maximum 20ms in stand-alone mode, maximum 30ms in parallel mode
output derating When the AC input voltage drops to 170V, the output starts to derate	

Table 2 Inversion mode parameter information

Model	M5000H BP
Rated output power	5KVA/5KW
Output voltage waveform	pure sine wave
The output voltage	230Vac±5%
Output frequency	50Hz
Rated output current	21.7A
Maximum output current/duration at fault	80A/ 300 μs
Output over current protection current	65A
peak efficiency	93%
overload protection	5s@≥150% load; 10s@110%~150% load
peak power	2 times rated power for 5 seconds
Battery rated voltage	48Vdc
Cold cranking voltage (lead-acid battery mode)	46.0Vdc
Cold start battery SOC (lithium battery mode)	Default 30%, DC low voltage SOC cut-off point +10%
DC low voltage warning voltage (lead-acid battery mode)	44.0Vdc @ load < 20% 42.8Vdc @ 20% ≤ load < 50% 40.4Vdc @ load ≥ 50%
DC low voltage alarm return voltage (lead-acid battery mode)	46.0Vdc @ load < 20% 44.8Vdc @ 20% ≤ load < 50% 42.4Vdc @ load ≥ 50%
DC low voltage cut-off voltage (lead-acid battery mode)	42.0Vdc @ load < 20% 40.8Vdc @ 20% ≤ load < 50% 38.4Vdc @ load ≥ 50%
DC low voltage cut-off voltage (lead-acid battery mode)	42.0Vdc
DC low voltage SOC warning point (lithium battery mode)	DC low voltage SOC cut-off point +5%
Return point of DC low voltage SOC alarm point (lithium battery mode)	DC low voltage SOC cut-off point +10%
DC low voltage SOC cut-off point (lithium battery mode)	Default 20%, 5%~50% configuration
DC high voltage recovery voltage	56 4Vdc(C V constant pressure)

DC high voltage cut-off voltage	60.8Vdc
Load loss	<60W

Table 3 Charging mode parameter information

Model		M5000H BP
Mains Charging Mode		
charging logic		3 stage charging
Maximum AC charging current		80Amp(@VI/P=230Vac)
Equalized charging voltage	Water battery	58.4Vdc
	Other lead-acid batteries	56.4Vdc
Float voltage		54Vdc
Charging curve		
Photovoltaic charging mode		
The maximum photovoltaic power that can be handled		6000W
Maximum PV module input current		22A
Starting voltage		150Vdc± 10Vdc
MPPT voltage range		120Vdc~430Vdc
Maximum photovoltaic open circuit voltage		450Vdc
Inverter backflow photovoltaic module current		0A
Maximum Photovoltaic Charging Current		100A
Maximum charging current (mains + photovoltaic)		100A

Table 4 Basic parameters

Model	M5000H BP
Certification standards	CE
operating temperature	0 ℃ to 5 5 ℃
Storage temperature	- 15℃ ~ 60℃
humidity	5% to 95% Relative humidity (non-condensing)
altitude	<2000m
Dimension(D*W*H), mm	580 x 450 x 192.5
net weight, kg	18

Troubleshooting

Question	LCD/ LED/ buzzer	Explanation/ Possible Cause	solution
Automatically shut down during startup	LCD/LED and buzzer turn off after 3 seconds after start	battery voltage is too low(<45.84V)	1. Recharge the battery 2. Replacement battery
No response after booting	no inst ructions	1. battery voltage is too low (<33.6V) 2. The polarity of the battery is reversed	1. Check if the battery and wiring are well connected 2. Recharge the battery 3. Replacement battery
Mains power exists, only work in inverter mode	The input voltage is displayed as 0 on the LCD, and the LED green light flashes	Input protection device tripped	Check if the AC circuit breaker is tripped, and check if the AC line is connected correctly
	LED green light flashing	Insufficient AC power	1. Check if the AC cord is too thin or too long 2. Check that the generator (if used) is working properly or that the input voltage range is set

			correctly
	LED green light flashing	The first load priority is set to "SOL" or "SBU"	Modify loading priority
After power-on, the internal relay turns on and off repeatedly	LCD display and lights blinking	battery disconnected	Check if the battery cable is well connected
The buzzer beeps continuously and the red LED lights up (fault code)	Error code 01	fan failure	1.Check if the fan is normal 2.Replacement fan
	Error code 02	Internal device temperature exceeds 100°C	1.Check if the airflow path of the device is blocked or if the ambient temperature is too high 2.Check if the temperature sensor is loose
The buzzer beeps every second, and the red LED flashes (alarm code)	Error code 03	current overcharge	Restart the inverter, if the failure still occurs, send it to the maintenance center
		battery voltage too high	Check whether the specifications and quantity of batteries meet the requirements
	warning code04	Battery voltage or SOC is too low	1.Measure the voltage at the battery terminals 2.If in Li mode, check the battery SOC 3.charge the battery
	Error code 05	output short circuit	Check whether the wiring is well connected, and exclude abnormal loads.
	Error code 06/58	Abnormal output (voltage lower than 80Vac or higher than 280Vac)	1.Reduce the load on the connection 2.Restart the inverter, if the failure still occurs, send it to the maintenance center
	Error code 07	Overload, inverter overload exceeds 110%, and exceeds the allowable over ba d time	Reduce the load on the connection by turning off some devices

	Error code 08	BUS voltage is too high	1.If the lithium battery is connected and there is no communication with the battery, check whether the values of items 19 and 20 are set too high 2.Restart the inverter, if the failure still occurs, send it to the maintenance center
Buzzer beeps continuously and red LED is on. (Error code) Buzzer beeps once every second, and red LED is flashing. (warning code)	Error code 09/53/57	Internal device failure	Restart the inverter, if the failure still occurs, send it to the maintenance center
	warning code15	The input states of different inverters are different during parallel operation	Check whether the AC input of each machine is connected properly
	warning code16	Input phase abnormality	Change the wiring of input phase S and T
	warning code17	Out put phase abnormality	1.Make sure that the 23rd parallel machine setting is correct 2.Make sure all machines are turned on normally
	warning code20	The communication between the lithium battery and the inverter fails	1.Check whether the communication line is correct 2.Check whether the communication protocol is selected correctly
	Error code 51	Over current	Restart the inverter, if the failure still occurs, send it to the maintenance center
	Error code 52	BUS voltage is too low	
	Error code 55	The output voltage is unstable	
	Error code 56	The battery is disconnected or the fuse is blown	1．If the lithium battery is connected and there is no communication with the battery, check whether the values of items 19 and 20 are set too high 2．Restart the inverter, if the failure still occurs, send it to the maintenance center
	Error code 60	negative work error	1.Check whether the AC output is connected to the AC input 2.Check whether the 8th setting item of all parallel machines are the same setting 3．Check whether the current equalizing line between

			the same-phase devices is connected properly 4．Check whether the L lines of all parallel machines are connected together 5．If the failure still occurs, send it to the maintenance center
	Error code 80	CAN communication failure	1．Check whether the communication line is correct
	Error code 81	host lost	2．Make sure that the 2 3 rd parallel machine setting is correct 3．if the failure still occurs, send it to the maintenance center

Note: When restarting the inverter, all power input sources need to be disconnected. After the LCD screen light goes out, just connect the

battery and restart .