



USER MANUAL

Lithium Battery

Inverter Integrated Machine



Table Of Contents

1 About This Manual	1
1.1 Purpose	1
1.2 Scope	1
2 Safety Instructions	1
3 Introduction	2
3.1 Features	2
3.2 Basic System Architecture	2
3.3 Product Overview	3
4 Installation	4
4.1 Unpacking And Inspection	4
4.2 Preparation	5
4.3 Mounting The Unit	5
4.4 Ac Input/Output Connection	6
4.5 PV Connection	7
4.6 Final Assembly	8
4.7 Communication Connection	9
5 Operation	9
5.1 Power On/off	9
5.2 Operation and Display Pane	10
5.3 LCD Stting	17
5.4 Fantion and alarm description	25
6 Trouble removeal	27
7 Technical datasjeet	28
8 Single connection	29
9 LCD Setting and Display	31
10 Wiring form	32
11 External dimensions	32

1 About This Manual

1.1 Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations, Keep manual for future reference.

1.2 Scope

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

2 Safety Instructions



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

1. Before using the unit read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. **CAUTION**-To reduce the risk of battery damage, please charge within the voltage range of lithium batteries
3. Do not disassemble the unit Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. **CAUTION**-Only qualified personnel can install this device with battery.
6. **NEVER** charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals, Please refer to INSTALLATION section of this manual for the details
10. One piece of 150A fuse is provided as over-current protection for the battery supply.
11. **GROUNDING INSTRUCTIONS** -This inverter/ charger should be connected to a permanent grounder wiring system. Be sure to comply with local requirements and regulation to install this inverter.
12. **NEVER** cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.

3 Introduction

This is a multi-function Inverter/charger, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

3.1 Features

- ◆ Pure sine wave inverter
- ◆ Configurable input voltage range for home appliances and personal computers via LCD setting
- ◆ Configurable battery charging current based on applications via LCD setting
- ◆ Configurable AC/Solar Charger priority via LCD setting
- ◆ Compatible to mains voltage or generator power
- ◆ Auto restart while AC is recovering
- ◆ Overload/Over temperature/short circuit protection
- ◆ Smart battery charger design for optimized battery performance
- ◆ Cold start function

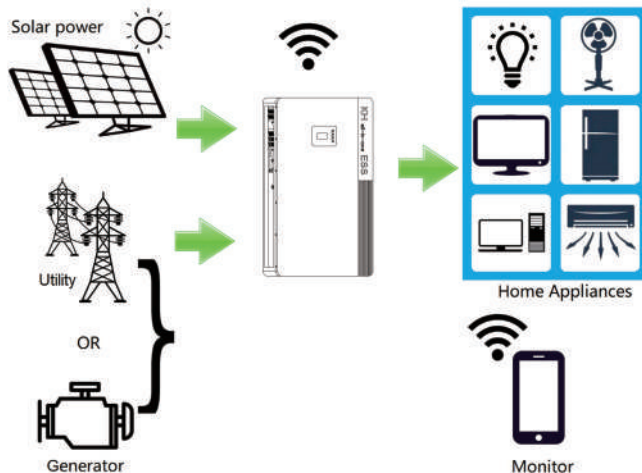
3.2 Basic System Architecture

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

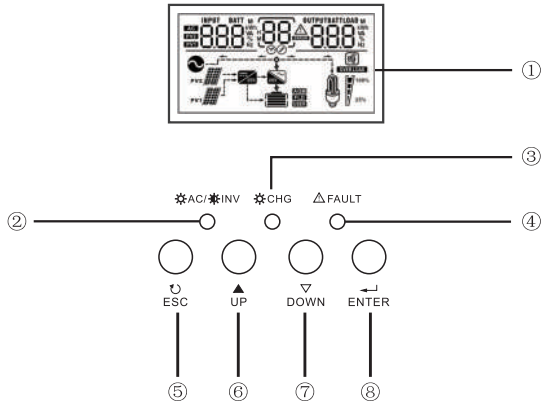
Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioner.



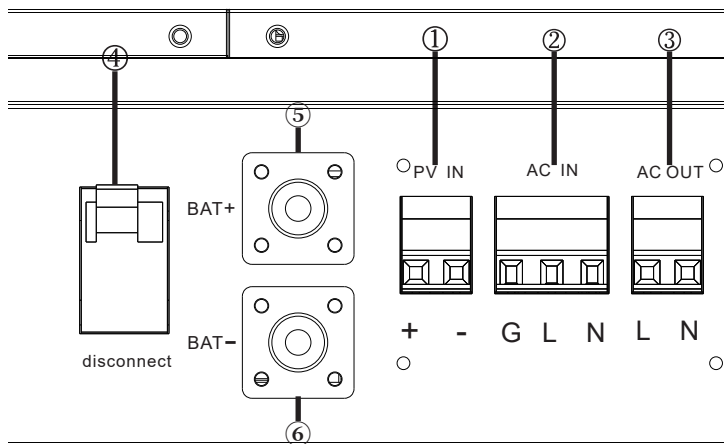
3.3 Product Overview

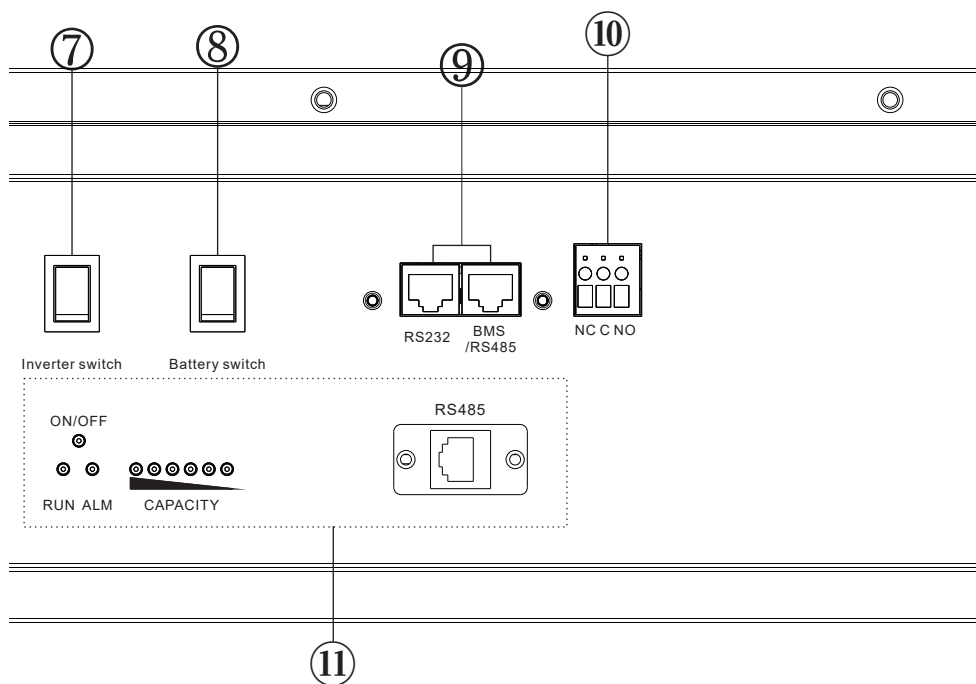
3.3.1 LCD Screen



- | | |
|--------------------------|-------------|
| 1.....LCD display | 5.....ESC |
| 2.....Status indicator | 6.....UP |
| 3.....Charging indicator | 7.....DOWN |
| 4.....Fault indicator | 8.....ENTER |

3.3.2 Back Panel





- 1..... PV IN
- 2..... AC input
- 3..... AC output
- 4..... Battery disconnect switch
- 5..... Lithium battery positive electrode output port
- 6..... Lithium battery negative output port
- 7..... Inverter start switch
- 8..... Lithium battery start switch
- 9..... Inverter/BMS/WIFI communication port
- 10.....NTC
- 11.....Lithium battery BMS information port

4 INSTALLATION

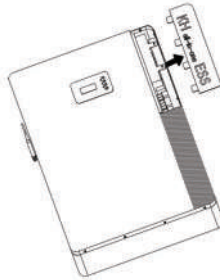
4.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- ◆ The unit x 1
- ◆ Wall mounted bracket x1

4.2 Preparation

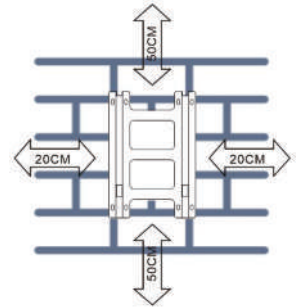
Before connecting all please take off bottom cover by removing two screws as shown below.



4.3 Mounting the Unit

Consider the following points before selecting where to install:

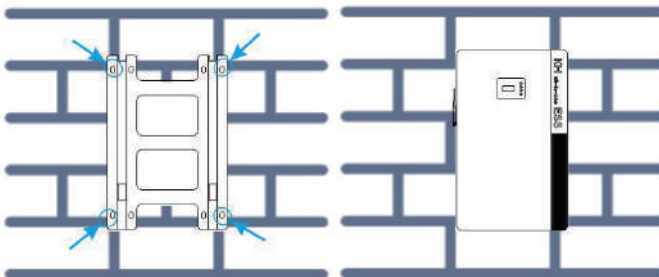
- ※ Do not install the inverter energy storage integrated machine on flammable building materials
- ※ Mount on a solid surface
- ※ Install this system at eye level for easy reading of the LCD display at any time
- ※ For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- ※ The ambient temperature should be between and to ensure optimal operation.
- ※ The recommended installation position is to be adhered to the wall vertically.
- ※ Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Install the unit by screwing four screws.

- Fix the wall mounting bracket with 4 M6 * 80mm expansion bolts



	WARNING: Shock Hazard Installation must be performed with care due to high battery voltage in series.
	CAUTION!! Before making the final DC connection or closing DC breaker/disconnector, 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 disconnected during maintenance and fully protected from over current of AC input. The recommended spec of breaker is 32A for 3 KW and 50A for 5 KW.

CAUTION!! There are two terminal blocks with " IN " and " OUT " markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by qualified personnel.

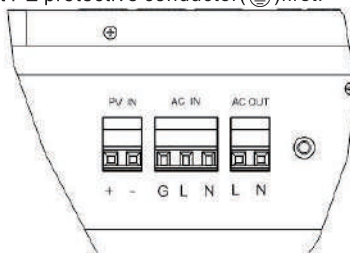
WARNING! It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

Suggested cable requirement for AC wires

Model	Gauge	Torque value
2KVA	14AWG	08~1.0Nm
3KVA	12AWG	1.2~1.6Nm
3.6KVA	12AWG	1.2~1.6Nm
5KVA	10AWG	1.4~1.6Nm
5.5KVA	10AWG	1.4~1.6Nm
6.2KVA	10AWG	1.4~1.6Nm
8KVA	8AWG	1.4~1.6Nm
11KVA	8AWG	1.4~1.6Nm

Please follow below steps to implement AC input/ output connection

1. Before making AC input/output connection be sure to open DC protector or disconnector first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N3 mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor(⊕)first.





WARNING:

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

4. Make sure the wires are securely connected

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

4.6 PV Connection

PV Connection(Only apply for the model with solar charger)

CAUTION: Before connecting to PV modules, please install **separately** a DC circuit breaker between inverter and PV modules.

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 PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

Typical Amperage	Gauge	Torque Value
30A	12AWG	1.4~1.6Nm

PV module selection:

When choosing the right PV module, be sure to first consider the following requirements:

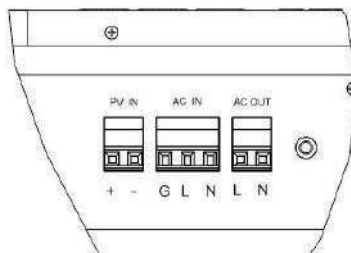
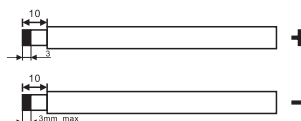
The open circuit voltage (Voc) of the PV modules does not exceed the maximum PV array open circuit voltage of the inverter. The maximum supply voltage of the PV modules should be close to the optimal PV access voltage range of the inverter for best performance. If one PV module cannot meet this requirement, it is necessary to connect multiple PV modules in series.

Model	2024P	3024M	3524M	3024MH	3624MH	5048MH	5548MH	6248MH	8048MH	11048MH
PV Charging Mode	PWM	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT Dual MPPT	MPPT Dual MPPT
MAX.PV Input Power	1200W	1500W	1500W	4200W	4200W	5500W	5500W	6200W	2*5500W	2*5500W
MPPT Tracking Range	N/A	30~145 Vdc	30~145 Vdc	120~500 Vdc	120~500 Vdc	120~500 Vdc	120~500 Vdc	120~500 Vdc	90~500 Vdc	90~500 Vdc
Best voltage	30~32V	30~115V	30~115V	300~400V	300~400V	300~400V	300~400V	300~400V	300~400V	300~400V
MAX.PV Input Voltage	80Vdc	150Vdc	145Vdc	500Vdc	500Vdc	500Vdc	500Vdc	500Vdc	500Vdc	500Vdc
MAX.PV Charging Current	50A	60A	60A	100A	100A	100A	100A	100A	150A	150A
MAX.AC Charging Current	50A	60A	60A	60A	80A	60A	60A	80A	120A	150A
MAX.Charging Current	100A	120A	120A	100A	120A	100A	100A	120A	150A	150A

PV Module Wire Connection

Please follow below steps to implement PV module connection:

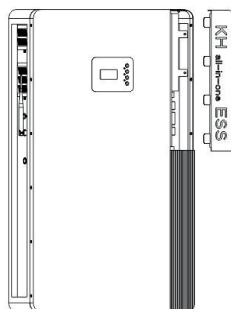
1. Remove insulation sleeve 10 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool
3. Fix wire cover to the inverter with supplied screws as shown in below chart.



4. Check correct polarity of wire from PV modules and PV input connectors. Then, connect positive pole(+) of connection wire to positive pole(+) of PV input connector. Connect negative pole (-) of connection wire to negative pole(-) of PV input connector. Screw two wires tightly in clockwise direction. Recommended tool: 4mm blade screwdriver.

4.7 Final Assembly

After connecting all wirings, please put bottom cover back by screwing two screws as shown below.



4.8 Communication Connection

1. Please use supplied communication cable to connect to inverter and PC. Insert bundled CD into a compute and follow on-screen instruction to install the monitoring software. For the detailed software operation. please check user manual of software inside of CD.

2. Wi-Fi cloud communication(option):

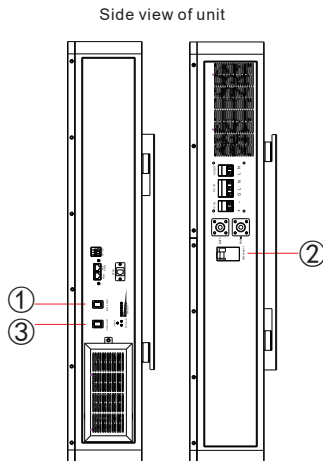
please use supplied communication cable to connect to inverter and Wi-Fi module. Download APP and installed from APP store, and Refer to "Wi-Fi Plug Quick Installation Guideline" to set up network and registering. The inverter status would be shown by mobile phone APP or webpage of computer.

3. GPRS cloud communication(option):

please use supplied communication cable to connect to inverter and GPRS module, and then applied external to GPRS module. Download APP and installed from APP store, and Refer to" GPRS RTU Quick Installation Guideline" to set up network and registering. The inverter status would be shown by mobile phone APP or webpage of computer.

5 OPERATION

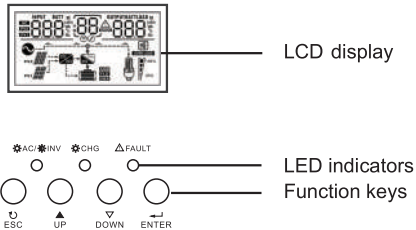
5.1 Power ON/OFF



After installing the device.turnon switch1 (battery switch.waitfor10 seconds)→turnon switch2 (battery circui breaker)upwards→turn switch3 ((inverter switch). and the device can function normally.(if the device is turned on forthe first time or has not been used fora long time .it is necessary toactivate the battery switch twice .and this operation depends on the actual situation.)

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.



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 mode.
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 Key	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

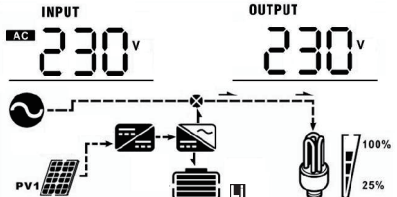
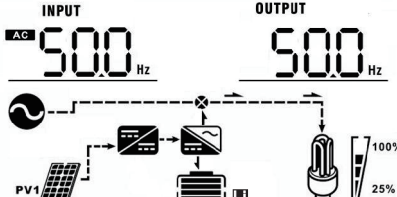
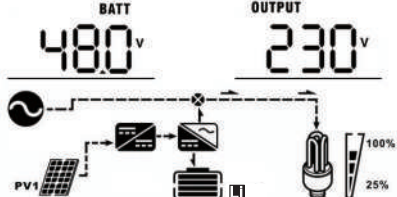
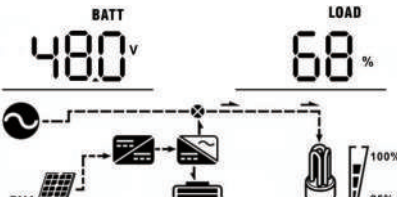
LCD Display Icons

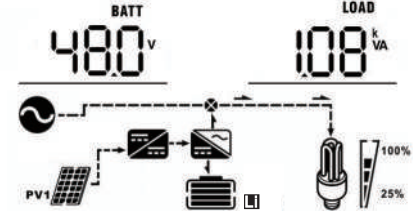
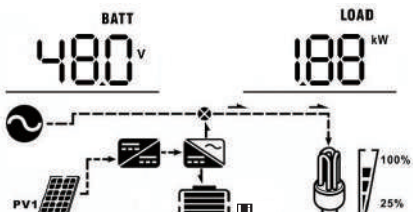
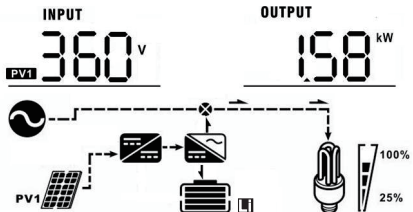
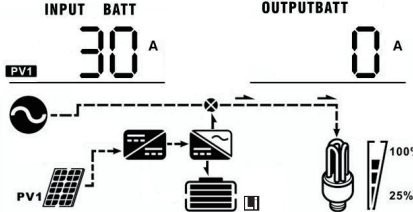
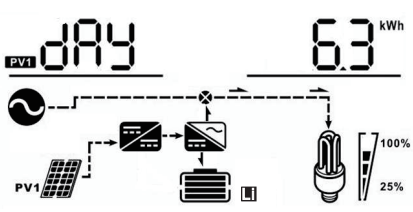


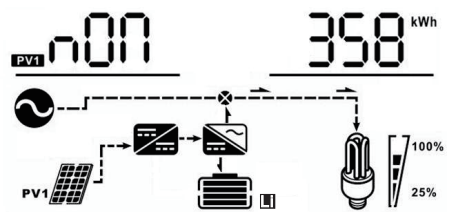
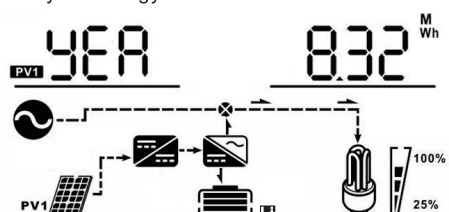
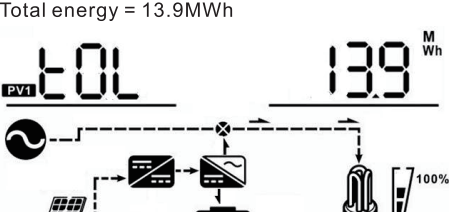
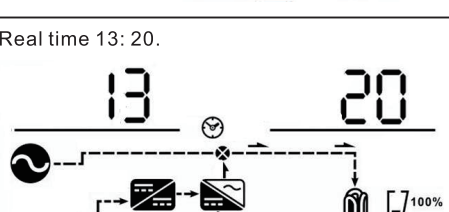
Icon	Function			
Input source information				
AC	Indicates the AC input			
PV1	Indicates the 1 st PV panel input			
PV2	Indicates the 2 nd PV panel input			
Left digital display information				
INPUT BATT M AC 888 kWh PV2 % PV1 Hz	Indicate input voltage, input frequency, battery voltage, V1 voltage, PV2 voltage, charger current			
Middle digital display information				
88 ⌚	Indicates the setting programs.			
88⚠ ERROR	Indicates the warning and fault codes. Warning: Flashing 88⚠ with warning code Fault: display 88🔧 with fault code			
Right digital display information				
OUTPUTBATTLOAD 888 M kWh VA % Hz	Indicate the output voltage, output frequency, load percent, load VA, load W, PV1 charger power, PV2 charger power, DC discharging current.			
Battery information				
🔋	Indicates battery level by 0-24%,25-49%,50-74% and 75-100% and charging status.			
🔋 USER	Battery type: lithium battery or user-defined battery			
Load information				
OVER LOAD	Indicates overload.			
💡 100% 25%	Indicates the load level by 0-24%,25-50%,50-74%,and 75-100%.			
	0%~25%	25%~50%	50%~75%	75%~100%
	📊	📊	📊	📊
Mode operation information				
🌀	Indicates unit connects to the mains.			
🔌 PV1	Indicates unit connects to the 1 st PV panel			
☀️	Indicates the solar charger is working			
🔌	Indicates the DC/AC inverter circuit is working.			
Mute operation				
🔕	Indicates unit alarm is disabled.			

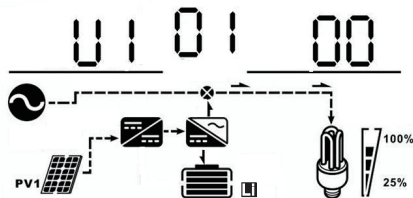
Display Setting

The LCD display information will be switched in turns by pressing "UP" or "DOWN" key. The selectable information is switched as below order: input voltage, input frequency, PV voltage, charging current, battery voltage, output voltage, output frequency, load percentage, load in Watt, load in VA, load in Watt, DO discharging current, main board firmware version and SCC firmware version.

Select item	LCD display
Input voltage and output voltage (Default Display Screen)	Input Voltage=230V, output voltage=230V 
Input frequency and output frequency	Input frequency=50.0Hz, output frequency=50.0Hz 
Battery voltage and output voltage	Battery Voltage=48.0V, output voltage=230V 
Battery voltage and load percentage	Battery Voltage=48.0V, load percentage 68% 

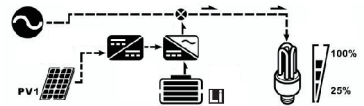
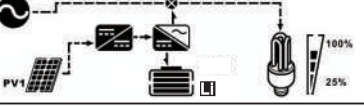
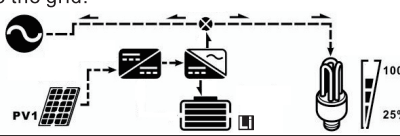
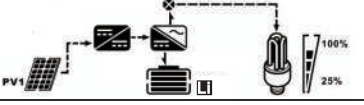
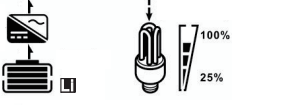
Battery voltage and load in VA	Battery Voltage=48.0V, load in VA=1.08kVA 
Battery voltage and load in Watt	Battery Voltage=48.0V, load in Watt=1.88kW 
PV1 voltage and PV1 charger power	PV1 Voltage=360V, charging power=1.58kW 
Charger current and DC discharging current	Charging current=30A, discharging current=0A 
PV energy generated today	Today energy = 6.3kWh 

PV energy generated this month	This month energy = 358kWh.  The display shows 'PV1' on the left and '358 kWh' on the right. Below the numbers is a schematic diagram of a PV system: a solar panel (PV1) is connected to a DC-DC converter, which is connected to a battery bank. The battery bank is connected to an inverter, which is connected to a light bulb. A meter is shown between the inverter and the light bulb, with a scale from 0% to 100% and a 25% mark.
PV energy generated this year	This year energy = 8.32MWh  The display shows 'PV1' on the left and '8.32 MWh' on the right. Below the numbers is a schematic diagram of a PV system: a solar panel (PV1) is connected to a DC-DC converter, which is connected to a battery bank. The battery bank is connected to an inverter, which is connected to a light bulb. A meter is shown between the inverter and the light bulb, with a scale from 0% to 100% and a 25% mark.
PV energy generated totally	Total energy = 13.9MWh  The display shows 'PV1' on the left and '13.9 MWh' on the right. Below the numbers is a schematic diagram of a PV system: a solar panel (PV1) is connected to a DC-DC converter, which is connected to a battery bank. The battery bank is connected to an inverter, which is connected to a light bulb. A meter is shown between the inverter and the light bulb, with a scale from 0% to 100% and a 25% mark.
Real date	Real date Nov 28, 2016.  The display shows the date '16 11 28' (representing Nov 28, 2016). Below the date is a schematic diagram of a PV system: a solar panel (PV1) is connected to a DC-DC converter, which is connected to a battery bank. The battery bank is connected to an inverter, which is connected to a light bulb. A meter is shown between the inverter and the light bulb, with a scale from 0% to 100% and a 25% mark.
Real time	Real time 13: 20.  The display shows the time '13 20' (representing 13:20). Below the time is a schematic diagram of a PV system: a solar panel (PV1) is connected to a DC-DC converter, which is connected to a battery bank. The battery bank is connected to an inverter, which is connected to a light bulb. A meter is shown between the inverter and the light bulb, with a scale from 0% to 100% and a 25% mark.



Operating Mode Description

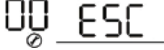
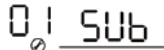
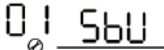
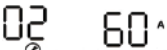
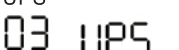
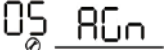
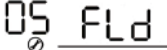
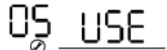
Operating mode	Behaviors	LCD display
Standby mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output. *Power swing mode: If enabled, the output of inverter will be off when connected load is pretty low or not detected.	No output power, solar or utility charger available	Battery is charged by utility.
		Battery is charged by PV energy.
		Battery is charged by utility and PV energy.
		Battery is charged by PV energy and feed PV energy grid.
		No charging.
Line mode	Output power from utility. Charger available	Utility charges battery and provides power to load.
		Utility and battery power provide power to load.

Line mode	Output power from utility. Charger available	PV energy, battery power and utility provide power to load. 
	Output power from utility. Charger available	PV energy and utility charge battery, and utility provides power to load. 
		PV energy charges battery, utility and PV energy provide power to the load. 
		PV energy charges battery, PV energy provides power to the load and feeds remaining energy to the grid. 
Battery mode	Output power from battery or PV	PV energy charges battery, PV energy provides power to the load and feeds remaining energy to the grid. 
		PV energy and battery energy supply power to the load. 
		Battery provides power to the load. 
Only PV mode	Output power from PV	PV provides power to the load. 

5.3 LCD Setting

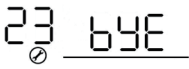
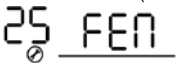
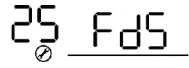
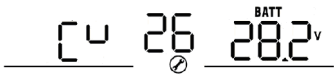
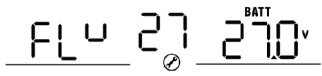
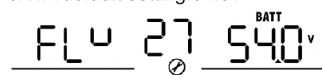
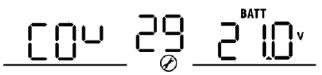
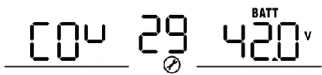
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button exit.

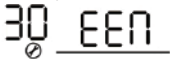
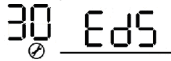
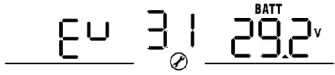
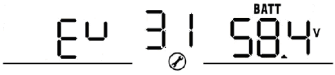
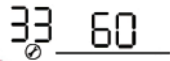
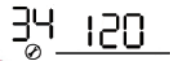
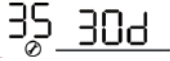
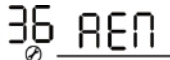
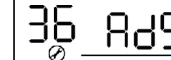
Setting Programs:

Program	Description	Selectable option	
00	Exit setting mode	Escape 	
01	Output source priority selection		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.
			Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 20 or solar and battery is not sufficient.
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) 	Setting range is from 10A to 100A. Increment of each click is 10A.
03	AC input voltage range	Appliances (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS 	If selected, acceptable AC input voltage range will be within 170-280VAC.
05	Battery type	AGM (default) 	Flooded 
		User-Defined 	If "User-Defined" is selected, battery charge voltage, low DC cut-off voltage and dual cut -off voltage can be set up in program 26,27,29and 61.

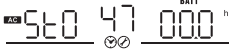
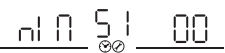
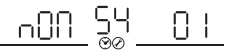
06	Auto restart when overload occurs	Restart disable(default) 06 Lfd	Restart enable 06 LfE
07	Auto restart when over temperature occurs	Restart disable (default) 07 Lfd	Restart enable 07 LfE
08	ECO function: System will temporarily stop when the load is low in battery mode.	disable (default) ECO 08 Sds	
		enable ECO 08 SEN	
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	Setting range is 2A, then from 10A to 60A. Increment of each click is 10A.
12	Setting voltage point back to utility source when selecting“SBU priority” in program 01.	Available options in 3KVA model:	
		23.0V (default) 12 ^{BATT} 230 ^v	Setting range is from 22V to 25.5V. Increment of each click is 0.5V.
		Available options in 5KVA model:	
		46V (default) 12 ^{BATT} 46 ^v	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} 270 ^v
		Setting range is from 24V to 29V. Increment of each click is 0.5V.	

		Available options in 5KVA model:	
		Battery fully charged	54V (default)
		13 ^{BATT} FUL	13 ^{BATT} 54.0^v
		Setting range is from 48V to 58V. Increment of each click is 1V.	
16	Charger source priorit: To configure charger source priority	If this inverter/charger is working in Line, Standby or Fault mode,charger source can be programmed as below:	
		Utility first	Utility will charge battery as first priority. Solar energy will charge battery only when utility power is not available.
		Solar first	Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.
		Solar and Utility(default)	Solar energy and utility will charge battery at the same time.
		Only Solar	Solar energy will be the only charger source no matter utility is available or not.
		If this inverter/charger is working in Battery mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	
18	Alarm control	Alarm on (default)	Alarm off
19	Auto return to default display screen	Return to default display screen (default)	If selected, no matter how users switch display screen, it wil automatically return to default! display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default)	Backlight off
22	Beeps while primary source is interrupted	Alarm on (default)	Alarm off

23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 	Bypass enable 
25	Record Fault code	Record enable (default) 	Record disable 
26	Bulk charging voltage (C.V voltage)	3KVA default setting: 28.2V 	
		5KVA default setting: 56.4V 	
		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 61.0V for 5KVA model. Increment of each click is 0.1V.	
27	Floating charging voltage	3KVA default setting: 27.0V 	
		5KVA default setting: 54.0V 	
28	Reset factory setting	default: 	
			
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.	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 42.0V to 48.0V for 5KVA model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected. 	
		5KVA default setting: 42.0V 	

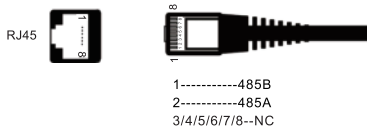
		If self-defined is selected in program 5, this program can be set up. Setting range is from 21.0V to 24.0V for 3KVA model and 42.0V to 48.0V for 5KVA model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.	
30	Battery equalization	Battery equalization 	Battery equalization disable (default) 
		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 	
		5KVA default setting: 58.4V 	
		Setting range is from 25.0V to 31.5V for 3KVA mode and 48.0V to 61.0 V for 5KVA model. Increment of each click is 0.1V.	
33	Battery equalized time	60min (default) 	Setting range is from 5min to 900min. Increment of each click is 5min.
34	Battery equalized timeout	120min (default) 	Setting range is from 5min to 900min. Increment of each click is 5min.
35	Equalization interval	30days (default) 	Setting range is from 0 to 90 days. Increment of each click is 1 day.
36	Equalization activated immediately	Enable 	Disable (default) 
		If equalization function is enabled in program 30, 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 " E9 ", If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 35 setting. At this time, " E9 " will not be shown in LCD main page.	

37	BMS Function Switch	off(default) bns 37 OFF	Whether to enable the BMS communication function
		bns 37 ON	
38	Bat Soc Under Lock	b5u 38 ^{BATT} 10 %	BMS low voltage SOC value, if the BMS SOC value is lower than the set value, the inverter will shut down to protect the battery.
39	Bat Soc Turn To Ac	5tc 39 ^{BATT} 20 %	When the working mode of the inverter is set to the battery priority mode, the inverter will be forced to enter the mains charging when the SOC of the BMS is lower than the set value.
40	Bat Soc Turn To Dc	5tb 40 ^{BATT} 95 %	When the working mode of the inverter is set to the battery priority mode, the inverter resumes the DC working mode when the SOC of the BMS is higher than the set value.
41	Bat Restart Soc	b5r 41 ^{BATT} 50 %	When the inverter is turned on, the SOC must be higher than the set value to work normally.
43	Solar supply priority	43 6LU	Solar energy provides power to charge battery as first priority.
		43 1bU	Solar energy provides power to the loads as first priority.
44	Solar energy feed to grid configuration	44 0fd	Solar energy feed to grid disable.
		44 0fE	Solar energy feed to grid disable.
45	Reset PV energy storage	Notre set (Default) 45 nrt	Reset
		45 rst	
46	Start charging time for AC charger	00:00(Default) 46 ^{BATT} 000 h	The setting range of start charging time for AC charger is from 00:00 to 23:00, increment of each click is 1 hour.

47	Stop charging time for AC charger	00: 00(Default) 	The setting range of scheduled Time for AC output on is from 00: 00 to 23:00,increment of each click is 1 hour.
48	Scheduled time for AC output on	00: 00(Default) 	The setting range of scheduled Time for AC output off is from 00: 00 to 23:00,increment of each click is 1 hour.
49	Scheduled time for AC output off	00: 00(Default) 	The setting range of scheduled Time for AC output off is from 00: 00 to 23:00,increment of each click is 1 hour.
50	Set country customized regulations	India(Default) 	If selected, acceptable feed-in grid voltage range will be 195.5~253VAC. Acceptable feed-in grid frequency range will be 49~51Hz.
		Germany 	If selected, acceptable feed-in grid voltage range will be 184~264.5VAC. Acceptable feed-in grid frequency range will be 47.5~51.5Hz.
		South America 	If selected, acceptable feed-in grid voltage range will be 184~264.5VAC. Acceptable feed-in grid frequency range will be 57~62Hz.
51	Time setting-Minute		For minute setting, the range is from 00 to 59.
52	Time setting-Hour		For hour setting, the range is from 00 to 23.
53	Time setting-Day		For day setting, the range is from 00 to 31.
54	Time setting-Month		For month setting, the range is from 1 to 12

55	Time setting-Year	4EA 55 16 For year setting, the range is from 16 to 99.	
56	GRID-tie current	^{10A} 56 10 ^A	Increment of each click is 2A.
60	Dual output	Disable(default) 60 12F	Use 60 120
61	Enter the dual output functional voltage point	Default setting:44.0V 60d 6 44.0 ^{BATT} V	
		Default setting:22.0V 60d 6 22.0 ^{BATT} V	
		If battery voltage lower than inverter setting, second output will be cutted of, Increment of each click is 0.1V.	
62	Enter the dual output functional SOC point	65d 62 15 ^{BATT} %	If BMS capacity lower than SOC setting, second output will be cutted of

When the BMS/485 communication interface is externally connected, as shown in the following figure:



5.4 Fansion and alarm description

5.4.1 Faults Descriptions

➤ **Fault:** The inverter enters the fault mode, the red LED light is always on and the LCD displays the fault code.

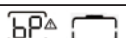
Fault Reference Code

Fault Code	Fault Event	Icon on
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	
51	Over currents or surge	
52	Bus voltage is too low	
53	Inverter soft start failed	
55	Over DC voltage in AC output	
57	Current sensor failed	
58	Output voltage is too low	
59	PV voltage is over limitation	

5.4.2 Warning Descriptions

➤ **Alarm:** The red LED flashes, and the LCD displays an alarm code, the inverter does not enter the failure mode

Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan is locked when inverter is on.	Beep three times every second	
02	Over temperature	None	
03	Battery is over-charged	Beep once every second	
04	Low battery	Beep once every second	
07	Overload	Beep once every 0.5 second	
10	Output power derating	Beep twice every 3 seconds	
15	PV energy is low.	Beep twice every 3 seconds	
16	High AC input (>280VAC) during BUS soft start	None	
E9	Battery equalization	None	
bP	Battery is not connected	None	

5.4.3 Code Reference

Related information code will be displayed on LCD screen. Please check inverter LCD screen for the operation.

Code	Description
60 	If battery status is not allowed to charge and discharge after the communication between the inverter and battery is successful, it will show code 60 to stop charging and discharging battery.
61 	Communication lost - After battery is connected, communication signal is not detected for 3 minutes, buzzer will beep. After 10 minutes, inverter will stop charging and discharging to lithium battery. - Communication lost occurs after the inverter and battery is connected successfully, buzzer beeps immediately.
69 	If battery status is not allowed to charge after the communication between the inverter and battery is successful, it will show code 69 to stop charging battery.
70 	If battery status must to charge after the communication between the inverter and battery is successful, it will show code 70 to charge battery.
71 	If battery status is not allowed to discharge after the communication between the inverter and battery is successful, it will show code 71 to stop discharge battery.

6. Trouble removal

Problem	LCD/LED/Buzzer	Explanation/Possible cause	What to do
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication	1. The battery voltage is far too low.(<1.4V/Cell) 2. Internal fuse tripped.	1.Contact repair center for replacing the fuse. 2. Re-charge battery. 3. Replace battery. Check if AC breaker is tripped and AC wiring is connected well.
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 tripped	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.(UP-->sppliance)
	Green LED is flashing	Insufficient quality of AC power. (Shore or Generator)	Change output source priority to Utility first.
	Green LED is flashing.	Set "Solar First" as the priority of output source.	
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.	Fault code 07	Overload error. The inverter is overload 105% and time is up.	Reduce the connected load by switching off some equipment.
		If PV input voltage is higher than specification, the output power will be derated.At this time, if connected loads is higher than derated output power, it will cause overload.	Reduce the number of PV modules in series or the connected load.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
		Temperature internal converter component is over 120°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 02	Internal temperature of inverter component is over 100°C	Return to repair center.
	Fault code 03	Battery is over-charged	Check if spec and quantity of batteries are meet requirements.
		The battery voltage is too high.	Return to repair center.
	Fault code 01	Fan fault	Replace the fan.
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 08/09/53/57	Internal components failed.	Restart the unit, if the error happens again, please return to repair center.
	Fault code 51	Over current or surge.	
	Fault code 52	Bus voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	
	Fault code 59	PV input voltage is beyond the specification.	Reduce the number of PV modules in series.

7. Technical datasheet

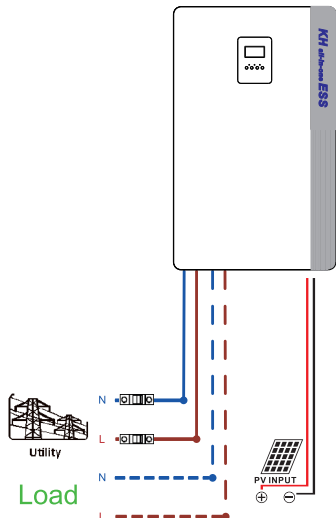
Model		2024P	3024M	3524M	3024MH	3624MH	5048MH	5548MH	6248MH	8048MH	11048MH
Input	Input Sources	L+N+PE									
	Rated Input Voltage	220/230/240VAC									
	Voltage Range	90-280VAC±3V(APL Mode)170-280VAC±3V(UPS Mode)									
	Frequency	50Hz/60Hz(Auto Adaptive)									
Output	Rated Capacity	2000W	3000W	3500W	3000W	3600W	5000W	5500W	6200W	8000W	11000W
	Output Voltage	220/230/240VAC±5%									
	Output Frequency	50/60Hz±0.1%									
	Waveform	Pure Sine Wave									
	Transfer Time (adjustable)	Computers(UPS Mode)10ms, Appliance(APL Mode)20ms									
	Peak Power	4000VA	6000VA	7000VA	6000VA	7200VA	10000VA	11000VA	12400W	16000W	22000W
	Over Load Ability	Battery Mode: 21s@105%-150%Load 11s@150%-200%Load 400ms@>200%Load									
	Peak Efficiency (battery Mode)	>93%	>94%	>94%	>94%	>94%	>98%	>98%	>98%	>98%	>98%
Battery	Battery Votage	24Vdc	24Vdc	24Vdc	24Vdc	24Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc
	Constant Charging Voltage(Adjustable)	28.2Vdc	28.2Vdc	28.2Vdc	28.2Vdc	28.2Vdc	56.4Vdc	56.4Vdc	56.4Vdc	56.4Vdc	56.4Vdc
	Floate Charging Voltage(Adjustable)	27Vdc	27Vdc	27Vdc	27Vdc	27Vdc	54Vdc	54Vdc	54Vdc	54Vdc	54Vdc
	PV Charging Mode	PWM	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT	MPPT Dual MPPT	MPPT Dual MPPT
Chargers	MAX.PV Input Power	1200W	1500W	1500W	4200W	4200W	5500W	5500W	6200W	2*5500W	2*5500W
	MPPT Tracking Range	N/A	30~145 Vdc	30~145 Vdc	60~500 Vdc	60~500 Vdc	60~500 Vdc	60~500 Vdc	60~500 Vdc	90~500 Vdc	90~500 Vdc
	Best voltage	30~32V	30~115V	30~115V	300~400V	300~400V	300~400V	300~400V	300~400V	300~400V	300~400V
	MAX.PV Input Voltage	80Vdc	150Vdc	145Vdc	500Vdc	500Vdc	500Vdc	500Vdc	500Vdc	500Vdc	500Vdc
	MAX.PV Charging Current	50A	60A	60A	100A	100A	100A	100A	100A	150A	150A
	MAX.AC Charging Current	50A	60A	60A	60A	80A	60A	60A	80A	120A	150A
	MAX.Charging Current	100A	120A	120A	100A	120A	100A	100A	120A	150A	150A
	Display	LCD Display	Display Running Mode/Loads/Input/Output etc.								
Interface	RS232	Baud Rate2400									
	Communication Port	Lithium Battery BMS Communication Card WifiCard									
	Parallel Connect Interface	Without Parallel Connect					With Parallel				
Environments	Operating Temperature	-10~50℃									
	Humidity	20%~95%(Non-condensing)									
	Storage Temperature	-15~60℃									
	Altitude	Altitude Not Over 1000m,Derating over 1000m,Max 4000m. Refer to IEC62040									
	Noise	≤50db									

Basic Battery Parameters

LiFePO4	NominalVoltage	51.2V					51.2V				
	NominalCapacity	100Ah					200Ah				
	Discharge Cut-off Voltage	43.2V					43.2V				
	Charging Voltage	58.4V					58.4V				
	StandardDischarge	100A					100A				
	StandardCharging	20A (0.2C)					40A (0.2C)				
	Fast charging	100A(MAX)					100A(MAX)				
	Rated Energy	51.2KWh					10.24KWh				

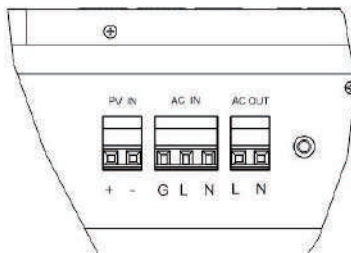
8-1 Single connection

Power Connection(Each photovoltaic panel needs to be connected to an independent system)



3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor(⊕)first.

⊕→**Ground(yellow-green)**
L→LINE(brown or black)
N→Neutral (blue)



WARNING:

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

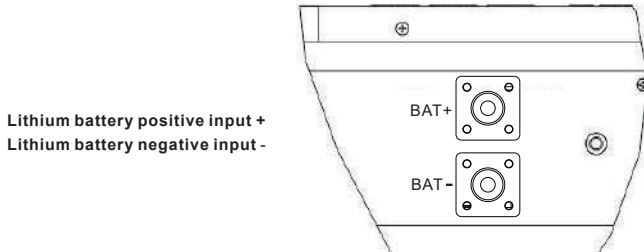
4. Make sure the wires are securely connected

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

5. Lithium battery parallel expansion capacity

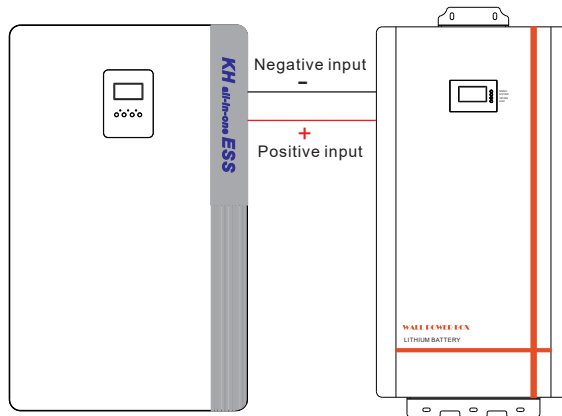
This integrated reverse storage machine has a lithium battery capacity expansion function. You can add multiple lithium batteries in parallel to the machine from the outside to achieve capacity expansion

Parallel input through the following ports (as shown in the figure):



It is worth noting that you can also use DC48V on this port to power other devices.

6. Wiring Example:



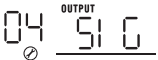
WARNING:

When connecting the cable to the machine, please turn off all power switches and it must be installed by professional personnel

Be careful! When expanding the capacity of lithium batteries in parallel, it is necessary to choose lithium batteries of the same specifications, otherwise it will result in uneven capacity and malfunction

9.LCD Setting and Display

Setting Program:

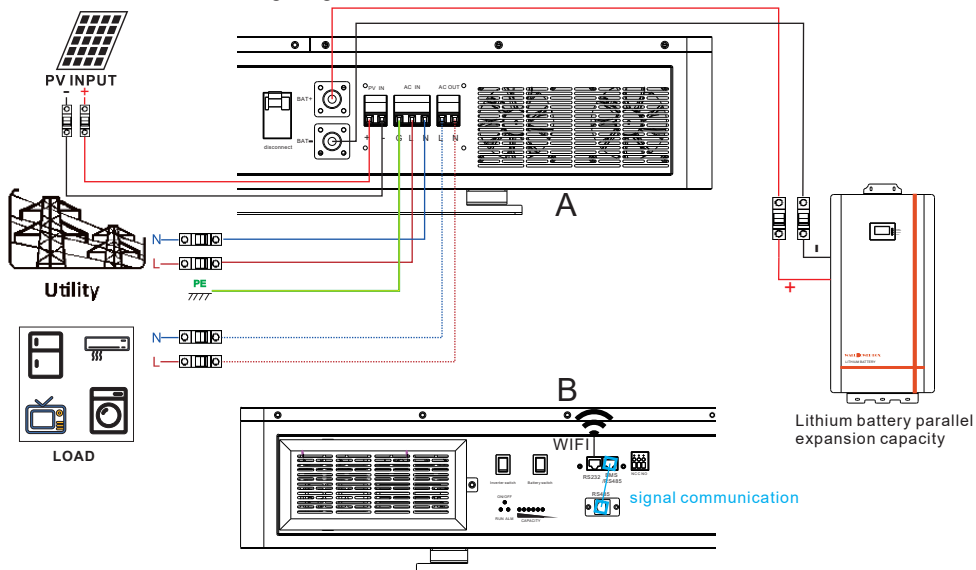
Program	Description	Selectable option	
04	AC output mode *This setting is only available when the inverter is in standby mode (Switch off).	Single: 	When the units are used in parallel with single phase, please select "PAL" in program 4.
		Parallel: 	It is required to have at least 3 inverters or maximum 9 inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase please-2 for detailed information. Please select "3P1" in program 4 for the inverters connected to phase, "3P2" in program 4 for the inverters connected to L2 phase and "3P3" in program 4 for the inverters connected to L3 phase.
		L1 phase: 	
		L2 phase: 	
		L3 phase: 	Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases. Besides, power saving function will be automatically disabled.

Fault code display

Fault Code	Fault Event	Icon on
60	Power feedback protection	
71	Firmware version inconsistent	
72	Current sharing fault	
80	CAN fault	
81	Host loss	
82	Synchronization loss	
83	Battery voltage detected different	
84	AC input voltage and frequency detected different	
85	AC output current unbalance	
86	AC output mode setting is different	

10. Wiring form

Please refer to the following diagram:



11. External dimensions

L = 858±3mm
W = 529.5±3mm
H = 152±3mm

