USER MANUAL

All-In-One Home Energy Storage

HSAIO5KW5KWHEU



1. SECURITY INSTRUCTIONS

This device contains critical components such as high-voltage circuits and lithium battery packs. Any operation violating the following warnings may cause serious safety incidents including thermal runaway, fire, explosion, electric shock, or chemical leakage, resulting in personal injury, death, and significant property damage. All operations must strictly adhere to these warnings, the product user manual, and relevant safety standards. If in doubt, immediately cease operation and contact authorized brand professionals.

1.1 Safety Warning

- This equipment contains lethal high-voltage electricity internally. Unauthorized personnel must not disassemble, modify, or open the equipment housing. Even when disconnected from power, internal capacitors may retain charge for a period after power is removed.
- Installation, initial commissioning, maintenance, and repair must be performed exclusively by qualified professional electricians or technicians.
- All electrical connections (grid, PV, grounding) must strictly comply with national and local electrical codes.
- Never place the equipment in flammable, explosive, or corrosive gas-filled environments (e.g., warehouses storing gasoline or chemicals).
- Never expose the equipment to any ventilation openings. Ensure the minimum safety distance specified in the manual is maintained around the equipment to guarantee adequate heat dissipation.
- Never place or spray any liquids on or near the equipment, nor expose it to rain or sprinkler systems (unless the product is explicitly rated for outdoor use and meets the corresponding protection rating).
- The equipment must be placed on a solid, level, waterproof load-bearing wall or floor to prevent tipping.
- This device contains a high-capacity battery. Strictly avoid puncturing, striking, crushing, or short-circuiting the battery module in any manner.
- Never operate or store the device outside its specified temperature range. Extreme temperatures may cause battery performance degradation, leakage, smoke emission, fire, or even explosion.
- If the device emits unusual odors, produces abnormal sounds, emits smoke, or exhibits casing deformation, immediately cease the following operations:
  a. Disconnect the main power supply and cut off all power inputs (grid and photovoltaic).
  b. Evacuate personnel promptly and maintain a safe distance.
  c. Use dry powder or carbon dioxide fire extinguishers to clear the fire scene. Water must not be used for firefighting.
  d. Contact professionals or the fire department immediately.

  Important Notice: This warning clause constitutes a core requirement for safe operation. For any matters not covered herein, please refer to the complete product user manual. The operator shall bear full responsibility for any safety incidents resulting from violation of this warning.

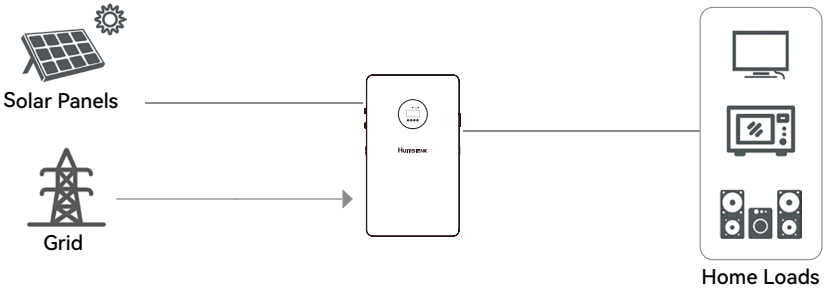
1.2 Operation and Daily Use

- User operations should be limited to those permitted in the manual or by authorized personnel, such as viewing status or setting operating modes via the screen. Any internal disassembly or modification is strictly prohibited.
- The device generates high temperatures during operation, and surfaces may become hot. Do not touch exposed components.
- Before cleaning, disconnect all power sources and wipe only with a dry cloth. Never use chemical solvents or rinse with water.
- Cleaning and maintenance should be performed by qualified personnel.

1.3 Points to Note

- **Disposal of Used Batteries:** Damaged or end-of-life battery modules must be handled by professional recycling agencies. Sort and dispose of them according to environmental regulations. Disposal in open areas is strictly prohibited to prevent soil or water contamination.
- **Extreme Environment Response:** During thunderstorms, ensure lightning protection devices are operational. Manually shut down equipment if necessary. When operating in high-temperature, extreme cold, or high-altitude environments, verify that the equipment meets corresponding environmental adaptability requirements.
- **Regular Inspections:** Conduct monthly visual inspections of equipment, checking for loose terminals or signs of corrosion. Schedule quarterly comprehensive maintenance by qualified personnel, including battery performance testing and circuit insulation checks, to ensure safe operational status.

3. SOLAR ENERGY STORAGE SYSTEM



4. SPECIFICATION

Battery	
Total Energy	5.12KWh
Rated Capacity	200Ah
Standard Discharge Capacity	≥ 200Ah
Battery Internal Resistance	≤ 13.9mohm
Charge Cut-off Voltage	28.4-29.2V
Standard Input Current	100A (Maximum Input Current 200A)
Standard Output Current	100A (Maximum Output Current 200A)
Battery Cycle Life	77° F / 25℃ , 0.5C: ≥ 8000 cycles, @80% DOD
BMS	
Sleep Power Consumption	≤ 150μA
Charging Method	Constant current/constant voltage charging
Overcharge Protection	29.2V
Overcharge Protection Recovery	26.8V
Over-Discharge Protection	20.8V
Over-Discharge Protection Recovery	21.2V
Charging High-Temperature Protection	158° F / 70° C
Charging High-Temperature Protection Recovery	140° F / 60° C
Charging Low-Temperature Protection	-4° F / -20° C
Charging Low-Temperature Protection Recovery	14° F / -10° C
Discharge High Temperature Protection	158° F / 70° C
Discharge High Temperature Protection Recovery	140° F / 60° C
Discharge Low Temperature Protection	-4° F ± 4 1 ° F / -20° C ±5° C
Discharge Low Temperature Protection Recovery	5° F ± 4 1 ° F / -15° C ±5° C
Charge Overcurrent Protection	200A
Discharge Overcurrent Level 1 Protection	200-400A
Discharge Overcurrent Level 2 Protection	400-600A

Short Circuit Protection Current	≥ 1000A/560 μs
Number of NTCs	2 PCS
Communication Method	RS485
Inverter	
Output Power	5kVA
Input Standard	L+N+PE
Input Voltage	230VAC
Voltage Range	90V-280V (APP MODE) 170V-264V (UPS MODE)
Frequency Range	40-70Hz
Input Power Factor	≥ 99%
Maximum Open-Circuit Voltage	500V
Maximum Input Current	27A
PV Input Short-Circuit Current	33A
MPPT Tracking Range	60-450Vdc
MPPT Tracking Efficiency	99.5% max
Minimum Activation Voltage	80V
Maximum Input Power	9000W
Maximum PV Charging Current	160A
Output Format	L+N+PE
Output Voltage	208/220/230/240VAC
Voltage Accuracy	5% (within rated load range)
Output Power Factor	100%
Output Frequency	50-60Hz±1%
Battery Charging Current	2-160A
General	
Storage and Transmission Capacity	60%±3%
Protection Rating	IP20
Operating Ambient Temperature	14° F to 140° F -10 to 60° C
Altitude	≤ 1000m, derating above 2000m, maximum 4000m

Display Screen	LCD keypad display
Dimensions (L × W × H)	17.72×9.84×30.71inch / 450 × 250 × 780 mm
Weight	147.27lb / 66.8 kg

5. BASIC OPERATIONS

To turn on the power, please press the battery switch first, then press the inverter switch.

BATTERY ON/OFF: Press the "Battery Switch Button", the work indicator and power indicator light up.



ON/OFF
BATTERY

Inverter ON/OFF: Press the "Inverter Switch Button", the inverter display lights up.



ON/OFF
INVERTER

Input Circuit Breaker: Press reset



INPUT BREAKER
PRESS TO RESET

AC Input On/Off: Turn the AC Input switch on and make sure the power is turned on. The product starts AC charging. Turning the AC switch off stops the AC input.



AC IN ON/OFF

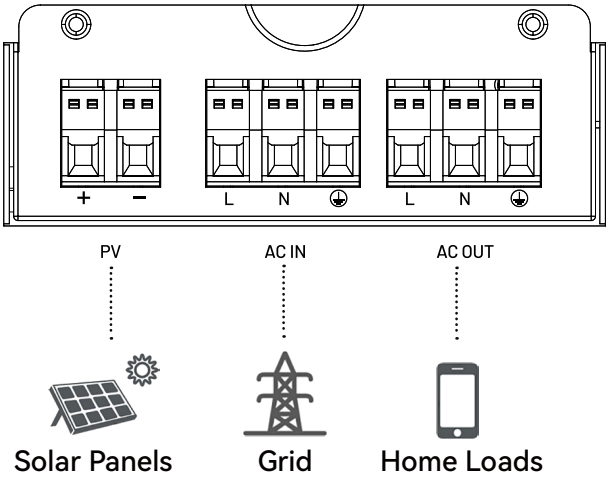
AC Output On/Off: Turn the AC Output switch on, the AC Output port is connected to an external load device and the product starts charging the external load device. Turning off the AC switch stops the AC output.



AC OUT ON/OFF

6. WIRING HOLE DESCRIPTION

6.1 PV Interface



Port Label		Terminal Name	Description
PV	PV +	Positive Terminal	Connect to the positive (+) output wire from the solar panel(s).
	PV -	Negative Terminal	Connect to the negative (-) output wire from the solar panel(s).
AC IN	L	Phase R (Line 1)	Connect to the Phase R (L1) live wire of the three-phase AC supply.
	N	Neutral	Connect to the neutral wire of the AC supply.
	⏚	Protective Earth (Ground)	Must be securely connected to a proper earth ground for safety.
AC OUT	L	Phase R (Line 1)	Output Phase R (L1) live wire.
	N	Neutral	Output neutral wire.
	⏚	Protective Earth (Ground)	Output protective earth wire. Must be connected to the ground terminal of the load equipment.

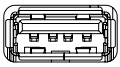
Critical Safety Instructions:

1. Professional Installation Required: Connection of three-phase AC power must be performed by a qualified electrician to ensure correct phase sequence and secure terminations.
2. Grounding is Mandatory: The PE (Protective Earth) terminals for both input and output MUST be properly grounded. This is essential to prevent electric shock and ensure operational safety.
3. Power Off Before Wiring: Ensure that ALL AC input power sources are completely disconnected (OFF) before making or modifying any connections.

6.2 Smart Interface

The COM interface connects to the smart communication stick, enabling data exchange between the battery system and the cloud platform.

Insert the smart communication stick vertically into the COM port until it is fully inserted and securely seated.

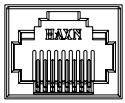


COM

6.3 BMS Interface

The BMS interface connects to the Battery Management System (BMS) to enable battery status monitoring, control, and communication.

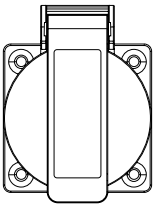
Align the BMS low-voltage wiring harness connector with the port and insert it vertically until you hear the latch engage.



BMS

6.4 AC Output Port

The AC output port provides alternating current power for external loads. Connect AC equipment cables to this port.



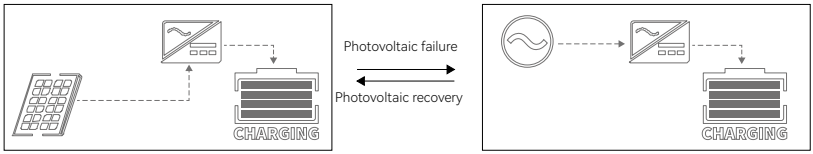
AC OUT

7. OPERATING MODE

7.1 Charge Mode

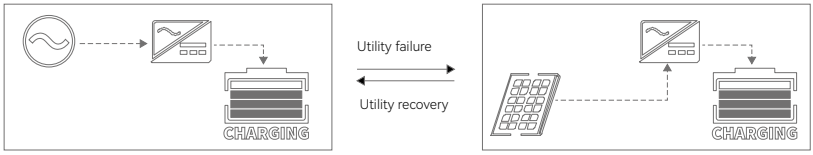
7.1.1 PV Priority

PV priority charging, utility charging is activated only when PV fails. Making full use of solar power during the day and switching to utility charging at night maintains battery power and is used in areas where the grid is relatively stable and electricity prices are more expensive.



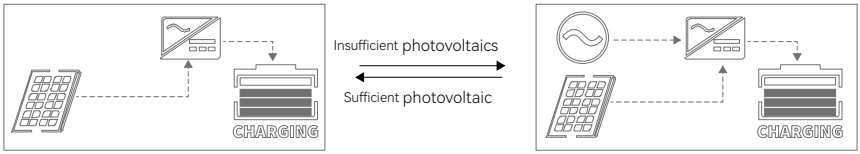
7.1.2 Utility Priority

The utility prioritizes the charging of the battery and only activates the PV charging when the utility is ineffective.



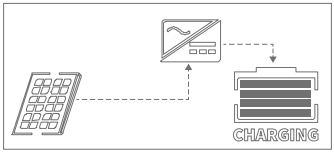
7.1.3 Hybrid charging

PV and utility hybrid charging, prioritizing PV MPPT charging, when PV energy is insufficient, utility power will supplement. When the PV energy is sufficient, the utility stops charging. This is the fastest way of charging, suitable for areas with unstable power grids, and can provide sufficient backup power supply at any time.



7.1.4 Only Solar

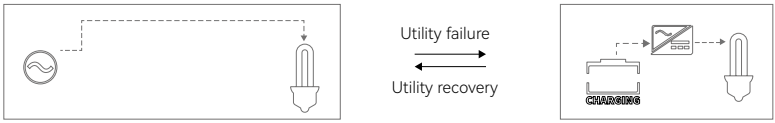
Only photovoltaic charging, not utility charging. This is the most energy efficient way, the battery power comes from solar energy, usually used in areas with good lighting conditions.



7.2 Output Modes

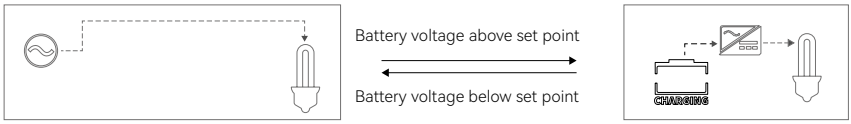
7.2.1 Utility Priority Mode

Switch to battery inverter power supply only when there is no utility power, and switch to utility charging and power supply when there is utility power. The device is equivalent to a backup UPS, used in areas with unstable power grids. Switching does not affect PV charging.



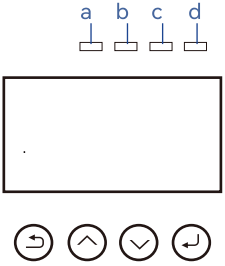
7.2.2 Inverter Priority Mode

Switches to mains power only when the battery voltage is below the set point (04 setting), and switches to battery discharge mode when the mains charging battery voltage is above the set point (05 setting), cycling the battery charge and discharge. This mode maximizes the use of DC power and is used in areas with stable power grids. The switchover does not affect PV charging.

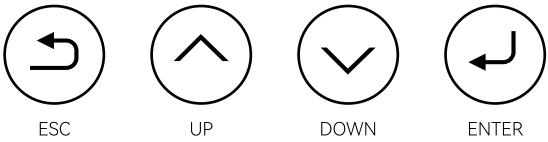


8. LCD SCREEN OPERATING INSTRUCTIONS

8.1 Operation And Display Panels



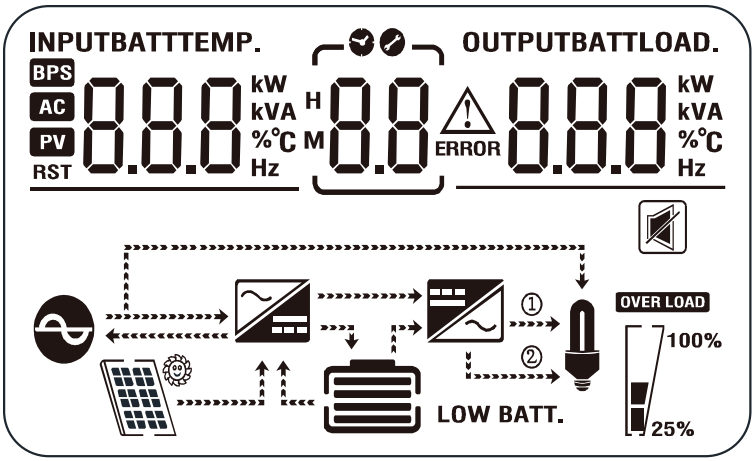
LED Indicator			Messages
a AC	Status indicator (Green)	Solid On	The mains power is normal and enters the mains power operation.
		Flashing	The mains power is normal, but it has not entered mains power operation.
		Off	The mains power is abnormal.
b Inverter	Invert indicator (Yellow)	Solid On	Output is powered by battery or PV in battery mode.
		Off	Other states.
c Charging	Charging indicator (Yellow)	Solid On	The battery is in float charging.
		Flashing	The battery is in constant voltage charging.
		Off	Other states.
d Fault	Fault indicator (Red)	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.
		Off	The inverter is working properly.



Function Buttons

Button	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

8.1.1 LCD Display Icons



For Lead-acid battery, detailed description of battery icon as following:
Note: Voltage showed in following chart stands for 1 batterry cell. For battery group, please multiple 2 to calculate.

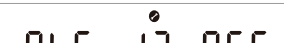
In battery mode, battery icon will present Battery Capacity		
Load Percentage	Battery Cells Voltage	Display
Load >50%	< 11.146V	
	11.146V ~ 11.685V	
	11.685V ~ 12.224V	
	> 12.224V	
50%> Load > 20%	< 11.795V	
	11.795V ~ 12.334V	
	12.334V ~ 12.873V	
	> 12.873V	
Load < 20%	< 12.12V	
	12.12V ~ 12.659V	
	12.659V ~ 13.198V	
	> 13.198V	

4.2.2 LCD Setting

After pressing and holding ENTER button for 2 seconds, the unit will enter setting mode. Press 'UP' or 'DOWN' button to select setting programs. Then press 'ENTER' button to confirm the selection or ESC button to exit.

Program	Description	Setting Option	
01	Output voltage		
		230V (default) Adjustable/settable value: 208V, 220V, 230V, 240V	
02	Output frequency		
		50Hz(default) Adjustable/settable frequency: 50Hz, 60Hz	
03	Output source priority	Grid first (default)	
		Grid provides power to the loads as first priority. Solar power will charge the battery. If solar is not sufficient to charge battery, grid will charge the battery at the same time. If grid is not sufficient to power all connected loads, solar energy will supply power to the loads at the same time. If solar energy and grid are not sufficient, battery will supply power to the loads at same time. If solar, grid and battery power is not sufficient to power loads, inverter will go to standby and charge battery.	
		Solar first	
		Solar energy provides power to the loads as first priority. If solar energy is sufficient, battery will be charged with solar energy. If solar energy is not sufficient to power all connected loads, Grid will supply power to the loads at the same time. The extra power will charge the battery. If solar energy and grid are not sufficient, battery will supply power to the loads at same time. If solar, grid and battery power is not sufficient to power loads, inverter will go to standby and charge battery.	

03	Output source priority	PBG priority	
		Solar energy provides power to the loads as first priority. If solar energy is sufficient, battery will be charged with solar energy. If solar energy is not sufficient to power all connected loads, battery will supply power to the loads at the same time. If solar energy and battery are not sufficient, grid will supply power to the loads at same time. If solar, grid and battery power is not sufficient to power loads, overload occurs. System will go to fault mode.	
		MKS	
		Generator provides power to loads as first priority. When generator, PV, battery all exist, the work mode is as PBG. When generator and battery exist (no PV), the work mode is as GPB. When generator and PV exist (no battery), the work mode is as GPB.	
04	Input mode	APP: Appliance (default)	
		Applied to household appliances Typical switching time is 10ms.	
		UPS	
		Applied to computer and other devices. Typical switching time is 10ms.	
		GEN	
		Applied to connect generator from AC IN port. Typically switching time is 20ms.	
05	Charger source priority	PNG: PV and Grid (default)	
		PV and Grid are charged at the same time.	
		OPV: Only PV	
		Only PV charge.	
		PVF: PV first	
		If both gird and PV are available, PV charge. If only PV is available, PV charge. If only grid is available, grid charge.	

06	Grid charging current		
		The default setting is 80A. Available options: 2/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150/160A	
07	Maximum charging current		
		Set total charging current for solar and grid chargers. The default setting is 120A. Available options: 2/10/20/30/40/50/60/70/80/90/100/110/120/130/140/150/160A	
08	Menu Default		
		During setting: Set to ON. If the current page is not on the first page and no operation with 1 minute, the system will return to display the first page. Set to OFF. If the current page is not on the first page and no operation with 1 minute, the system will stay on the current page.	
09	Auto restart when overload occurs	ON(default)	
10	Auto restart when over temperature occurs	ON(default)	
11	Main input cut warning		
		Enable/Disable Grid or PV loss alarm. The default setting is ON. If the grid/PV input detected lost, the buzzer will sound for 5 seconds. when set to OFF, after the grid/PV input is lost, the buzzer will not sound.	
12	Energy-saving mode		
		The default setting is OFF. When set to ON, in battery mode, if the load is lower than 25W, the system will stop output for a period then resume. If the load is still lower than 25W, the system will do the loop stop then resume. If the load is higher than 35W, the system will resume continuous normal output.	
13	Overload transfer to bypass		
		The default setting is OFF. When set to ON, in the case of PBG (PV priority) or MKS (generator priority) mode, if there is an overload, the system will immediately transfer to bypass mode (grid power output, also known as bypass mode).	

14	Silent mode setting		
		Enable/disable buzzer sound. The default setting is OFF. When set to ON, in any situation such as alarms or faults, the buzzer will not sound. This setting can be applied to all modes. Button sound is not effected.	
15	Battery return to grid voltage point		
		When the battery is set to the AGM (Lead Acid Battery Type) or FLD (Flooded Battery Type) mode. The default setting is 23V, and it can be adjusted within a range of [22, 26V].	
		When the battery is set to LIB (Ternary lithium battery). The default setting is 23.8V. It can be adjusted within a range of [23.8, 25V]. When the battery is set to FEL (Lithium iron battery), the default setting is 24.8V. It can be adjusted within a range of [24, 25V].	
		When the battery is set to the CUS (Customer Setting Type) mode. The default setting is 23.8V, and it can be adjusted within a range of [23.8, 25V].	
16	Switching back to battery mode voltage points		
		When the battery is set to AGM (Absorbent Glass Mat) or FLD (Flooded) mode,The default setting is 26V. It can be adjusted within a range of [24,28.2V] or [24, 29V].	
		When the battery is set to LIB (Ternary lithium battery). The default setting is 27.2V. It can be adjusted within a range of [25, 28.2V]. When the battery is set to FEL (Lithium iron battery), the default setting is 26.6V. It can be adjusted within a range of [25, 27.6V].	
		When the battery is set to CUS (Customer Set Type) mode, The default setting is 27.2V, The voltage range is [25, 28.2V].	
17	Battery type	AGM(default)	
		Flooded	
		Lithium (Ternary Lithium Battery)	
		FEL (Lithium iron)	
		User-Defined	

18	Battery low voltage point	
		Battery low voltage alarm setting. When the battery type is set to LIB, the default setting is 23.8V. The adjustable range for the voltage is [20.6, 25V]. Initial settings for CUS are the same as for LIB. When the battery type is set to FEL, the default setting is 24V. The adjustable range for the voltage is [20.6, 25V].
		The voltage cannot be set if battery is AGM or FLD. The default setting is 22V.
19	Battery shutdown voltage point	
		The battery low voltage shutdown point setting function cannot be adjusted when the battery is defined as AGM or FLD mode. The default setting is 21V.
		When the battery type is set to LIB , the battery shutdown point can be modified. The default setting is 23V, and the adjustable range is [20, 24V]. Initial settings for CUS are the same as for LIB. When the battery type is set to FEL , the battery shutdown point can be modified. The default setting is 21V, and the adjustable range is [20, 24V].
20	Constant voltage mode voltage point setting	
		When the battery is defined in AGM or FLD mode, the voltage set point cannot be configured. The default setting for AGM mode is 28.2V, for FLD mode is 29V. When the battery type is CUS, It can be set within the range of [24, 30V] for the constant voltage charging set point. The default setting is 28.2V. It is important to note that the constant voltage set point voltage needs to be higher than the float charge set point voltage.
		When the battery type is set to LIB, the default setting is 28.2V, and it can be adjusted within the range of [24, 30V]. When the battery type is set to FEL, the default setting is 27.6V, and it can be adjusted within the range of [24, 30V]. It is important to ensure that the constant voltage set point voltage is higher than the float charge set point voltage.

21	Floating charge mode voltage point setting	
		If battery type is AGM or FLD mode, the voltage set point cannot be configured. The default setting is 27V. If the battery type is CUS, the default setting is 27.6V. The setting range is [24, 30V]. If the battery type is LIB, the default setting is 27.6V. The setting range is [25, 29V]. If the battery type is FEL, the default setting is 27.2V. The setting range is [25, 29V]. It is important to note that the constant voltage point voltage should always be set higher than the floating charge point voltage.
22	Grid low voltage point setting	
		If intput mode is APP/GEN, Grid low voltage point can be set within a range of 90V to 154V. The default setting is 154V. If intput mode is UPS, Grid low voltage point can be set within a range of 170V to 200V. The default setting is 185V.
23	Grid high voltage point setting	
		If input mode is APP/GEN, Grid high voltage point can be set within a range of 264V to 280V. The default setting is 264V. If input mode is UPS, Grid high voltage point is set as 264V.
24	Automatic turn off backlight	
		The default setting is ON. If ON, the backlight will turn off after 1minutes of no button operation.
25	Inverter soft start setting	
		The default setting is OFF. If ON, the inverter output gradually increases from 0 to the target voltage value. If OFF, the inverter output directly increases from 0 to the target voltage value. Setting Condition: It can be set in single-machine operation mode.

26	Reset factory setting	 Restore all settings to factory default values. Before the setting, this interface is displayed as OFF. When set to ON, the system will restore to default settings. After the setting is completed, this interface will display OFF again. The setting can be applied immediately in mains and standby modes, but cannot be set in battery mode.
29	Battery Disconnection Alarm	 Enable/Disable battery disconnection alarm. OFF(default). When set to OFF, there will be no battery disconnection alarm when the battery is disconnected.
31	Equalization Voltage Point Setting	 The default setting for FEL battery type is 28V, setting range is [24, 30V]. The default setting for AGM/FLD/LIB/CUS battery type is 29.2V, with a configurable range of [24, 30V].
32	Equalization Charging Time Setting	 The function can be set as 'OFF' or active. During the equalization stage, the controller will charge the battery as much as possible until the battery voltage rises to the battery equalization voltage. Then, it will adopt constant voltage regulation to maintain the battery voltage. The battery will remain in the equalization stage until the set battery equalization time is reached. The setting range is [5, 900] with 5 minutes for every step. The default setting is OFF.

33	Equalization Delay Time Setting	 The function can be set as 'OFF' or active. During the equalization stage, if the battery equalization time expires and the battery voltage has not risen to the battery equalization voltage point, the charging controller will extend the battery equalization time until the battery voltage reaches the battery equalization voltage. When the battery equalization delay setting is completed and the battery voltage is still below the battery equalization voltage, the charging controller will stop equalization and return to the floating stage. The default setting is 120 minutes, with a configurable range of [5, 900], and an increment of 5 minutes for each setting.
34	Equalization Interval Time Setting	 When the battery connection is detected during the float phase with the equalization mode turned on, the controller will start to enter the equalization phase when the set equalization interval (cell equalization period)is reached.The default setting is 30 days, the settable range is[1,90], and the increment of each setting is 1 day.
35	Enable Equalization Immediately	 The default setting is OFF, and the function is not turned on. If it is set to ON, in the float charging stage when the equalization mode is turned on and the battery connection is detected. The equalization charging is activated immediately, and the controller will start to enter the equalization stage.

36	Grid-tie inverter function	 Set whether the inverter can feed to grid or not. If the value is 'INT', the inverter can feed to grid according to different output source priority. In PGB mode when battery level is sufficient, as long as grid is connected, PV can feed energy to grid as much as possible and surplus energy of PV charges the battery. In PGB mode when battery level is NOT sufficient, PV charges battery as much as possible and surplus energy of PV feeds to grid. In GPB mode and PBG mode, as long as grid is connected, PV charges battery as much as possible and surplus energy of PV feeds to grid. In MKS mode, inverter does not feed to grid.
37	Max Grid Tie Power	 Setting the output power value to grid. The default setting is 5.0kW. The setting range is [0, 5.0]kW. Every setting step is 0.5kW.
38	Battery dual output low voltage shutdown point	 When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery voltage drops below the set point, the secondary output is turned off. When the battery voltage rises above the set value plus 1V per additional battery cell, the secondary output is turned on. The default setting is 24V, with a configurable range of [22, 30]V. When the set point is higher than the constant voltage charging (CV) point – 1V per cell, the recovery voltage is set to the constant voltage charging point.
39	Battery dual output duration	 When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery discharge time reaches the set point, the secondary output is turned off. Default setting is OFF, the function is not enabled. The configurable range is [5,900] in minutes. When set to FUL, the secondary output has unlimited output time.

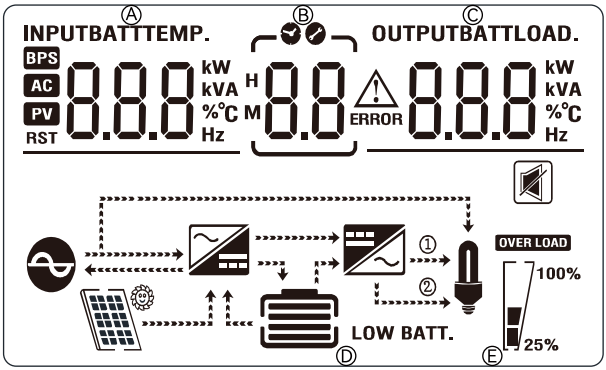
40	Dual output battery mode cut-off SOC	 When enabled, the secondary output of the inverter is enabled by default. In battery mode, when the battery SOC is lower than the set value, the secondary output is turned off. After the battery voltage is 5% higher than set value, the secondary output will turn on. The default setting is 20. The setting range is [5, 90] and OFF.
44	BMS Communication Function	 The default setting is OFF, and the function is not enabled. When set to a specific BMS protocol, the inverter communicates with the lithium battery BMS through the centralized control board and obtains battery information. If the communication is abnormal after the function is enabled, alarm 56 is generated, and the inverter does not determine the running logic based on the BMS information. CVT: CVTE protocol (485) PYL: PYLON protocol (485 and CAN) GRO: GROWATT protocol (485 and CAN) VOL: VOLTRONIC protocol (485) IRF: China Tower protocol (485) PAC: PACE RTU protocol (485)
45	BMS ID	 Setting BMS ID number to communication with. The setting value is AtO or numerical value [0, 15]. Among them, A-F represents 10-15 respectively. The default value is auto (AtO). When set to auto (AtO), system will automatically poll the BMS ID from small to large. When system poll for the first ID with a correct response, it locks the ID and only asks the BMS with that ID.

46	Low SOC Shutdown	 Set the inverter to shut down when the State of Charge (SOC) of the battery is low. The default setting is 20, with a configurable range of [5, 50]. When the lithium battery SOC reaches the set value in battery mode, the inverter shuts down and generates alarm 68. The alarm 68 is cleared when the SOC returns to the set value + 5%. In standby mode, the inverter can switch to battery mode only when the SOC reaches the set value + 10%. If it does not reach this threshold, alarm 69 is generated. Once the function is enabled, alarm 69 is triggered when the lithium battery SOC reaches the set value + 5%, and it is cleared when it returns to the set value + 10%. It can be set to OFF, in which case the inverter no longer performs shutdown, startup, or alarm operations based on the SOC condition. Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms.
47	High SOC to Battery	 Set the SOC value for the inverter to switch to battery mode. The default setting is 90, with a configurable range of [10, 100]. In PBG priority mode, when the lithium battery SOC reaches the set value in normal grid mode, the inverter switches to battery mode. Once enabled, the inverter will only switch to battery mode when the SOC is above the set point and the battery voltage is higher than the voltage point to switch back to battery mode. It can be set to OFF, in which case the inverter no longer switches from grid mode to battery mode based on the SOC condition. Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms.

48	Low SOC to Grid	StG 48 50 Set the SOC value for the inverter to switch to grid mode. The default setting is 50, with a configurable range of [10, 90]. In PBG priority mode, when the lithium battery SOC reaches the set value in battery mode, the inverter switches to grid mode. Once enabled, the inverter will switch to grid mode when the SOC is below the set point or the battery voltage is lower than the voltage point to switch back to grid mode It can be set to OFF, in which case the inverter no longer switches from battery mode to grid mode based on the SOC condition. Once the function is enabled, if a communication abnormality occurs, the inverter no longer operates based on the SOC information and clears the related alarms. When this setting is higher than the STB point, STB and STG will no longer take effect after the next activation.
61	Battery Max. Discharge Current	ndC 61 190A The default setting is 190A. The inverter will not limit battery discharging current when set to OFF. When set to a numerical value, it indicates the limitation current value. The setting range is [10, 190A] with a setting step of 5A. If the discharging current is over the limitation, alarm 60 will occur. If the continuous over-current time reaches 5 seconds, fault 14 will occur and inverter goes into fault mode. If the value set to OFF, there are risks of overheating if the current exceeds of 190A for a long time.

8.2 Display Information

The LCD display information will be switched in turns by pressing 'UP' or 'DOWN' key. The selectable information is switched as below order: voltage, frequency, current, power, firmware version.

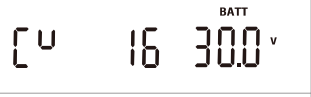


Ⓐ See table
Ⓑ Page number
Ⓒ See table
Ⓓ Battery capacity
Ⓔ Load percentage

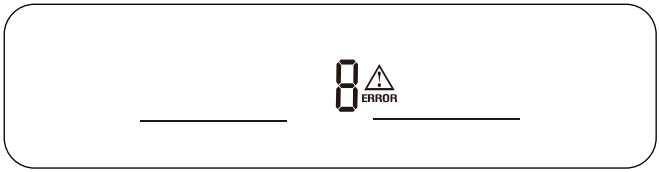
After enabling BMS, Page 12/13/14/15/16/17 will be available.

The selectable information is switched as below.

LCD display	Informatiopn
	Ⓐ AC input voltage Ⓒ Output voltage
	Ⓐ AC input frequency Ⓒ Output frequency
	Ⓐ Battery voltage Ⓒ Charge current
	Ⓐ PV voltage Ⓒ PV charging current
	Ⓐ PV voltage Ⓒ PV power
	Ⓐ Output voltage Ⓒ Active power output
	Ⓐ Output voltage Ⓒ Apparent power output
	Ⓐ Output voltage Ⓒ Load percentage
	Diaplay software version
	Ⓐ Total power generation Ⓒ Daily power generation
	Parallel operation status
	Ⓐ Mode Ⓒ SIG(constant): battery pack is operating asa single group; PAR(constant): battery pack is operating in multiple groups in series and parallel; PAR(Flash): battery pack is establishing a state of multiple groups in series and parallelbattery
	Ⓐ Display battery voltage from BMS Ⓒ Display battery current from BMS. When BMS communication fails, both the upper left and upper right displays will flash ERR.
	Ⓐ Display batterry temperature from BMS Ⓒ Display battery SOC from BMS. When BMS communication fails, both the upper left and upper right displays will flash ERR.
	Ⓐ Display battery rated capacity Ⓒ Display batterry current capacity. When BMS communication fails, both the upper left and upper right displays will flash ERR.

	Ⓐ Display the fixed letter CV Ⓒ Display the BMS constant voltage charging point. When BMS communication fails, the upper right display will flash ERR.
	Ⓐ Display BMS alarm information Ⓒ Display BMS fault information. When BMS communication fails, both the upper left and upper right displays will flash ERR.

9. FAULT REFERENCE CODE



Fault display:

Function description: If alarm occurs, Fault indicator flashes and buzzer sounds every one second for 1 minute, then stop. If fault occurs, the fault indicator is always on, the buzzer sounds 10 seconds then stops. System will try restart aromatically. If the machine does not work after six times' restart, the machine and LCD display will always in the fault status. You need to completely power off (off the screen) or wait for 30 minutes to restart the machine. The fault LCD display is shown in the figure above. In fault mode fault icon is bright, in alarm state alarm icon is flashing, and contact the manufacturer to troubleshoot the abnormal situation according to the fault information.

Fault: The inverter enters fault mode, with a constant red LED light and LCD displaying a fault code.

Fault code sheet

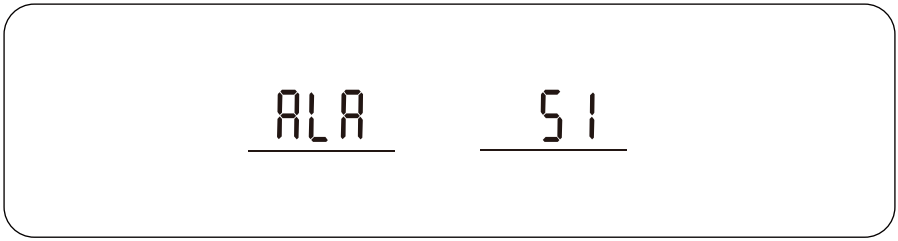
Fault code	Meaning	Relevant action	Trigger conditions	Resume conditions
1	Bus boost fail	Turn fault mode	Grid soft start process starts but bus voltage does not reach set value	Restore after reaching the set voltage for 15 seconds
2	Bus over voltage	Turn fault mode	Bus voltage is higher than set value	Restore after reaching the set voltage for 15 seconds
3	Bus below voltage	Turn fault mode	Bus voltage is lower than set value	Cannot restore

Fault code	Meaning	Relevant action	Trigger conditions	Resume conditions
4	Battery over current	Turn fault mode	Battery current is higher than set value	Cannot restore
5	System over temperature	Turn fault mode	PFC temperature is higher than set value or fan is not connected	Restore after temperature lower than set value and fan connected for 15 minutes
6	Battery over voltage	Turn fault mode	Battery voltage is higher than set value	Restore after reaching the set voltage for 15 seconds
7	Bus soft start failed	Turn fault mode	Battery soft start process starts but the bus voltage has not reached set value	Restore after reaching the set voltage for 15 seconds
8	Bus short circuit	Turn fault mode	Bus voltage is lower than set value	Cannot restore
9	Inverter soft start failed	Turn fault mode	Inverter soft start process starts but the inverter voltage has not reached set value	Restore after reaching the set voltage for 15 seconds
11	Inverter under voltage	Turn fault mode	The inverter voltage is lower than the set value in battery mode	Restore after reaching the set voltage for 15 seconds

Fault code	Meaning	Relevant action	Trigger conditions	Resume conditions
12	Inverter short circuit	Turn fault mode	Inverter voltage is less than the set value and current is higher than the set value	Restore after reaching the set value for 15 seconds
13	Inverter negative power	Turn fault mode	The inverter power is negative and exceeds the set value for a period of time	Restore after reaching the set value for 15 seconds
14	Over load	Turn fault mode	The load current is higher than the set value	Restore after reaching the set value for 15 seconds
17	Program updating	Turn fault mode	Inverter updating or OTA	Restore after updating
18	PV reverse connection	Turn fault mode	PV reverse connection	Restore after connecting correctly for 15 seconds
26	BMS fault	Turn fault mode	Error code in BMS message.	Restore after BMS fault resolved
29	Inverter load abnormal	Turn fault mode	Abnormal inverter load leads to abnormal voltage	Restore after voltage returning normal for 15 seconds

10. ALARM REFERENCE CODE

Alarm: the inverter does not enter the fault mode, LED red light flashing, LCD displays the Alarm code.



Alarm code sheet

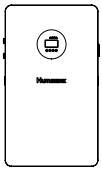
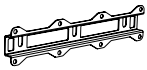
Alarm code	Meaning	Relevant action	Trigger conditions	Resume conditions
50	Battery open	Alarm	Battery disconnected for no more than 10 minutes	Restore after battery connected and charging for 2 minutes
51	Battery under voltage	Alarm, battery low voltage shutdown or cannot power on	Battery voltage is lower than BAU set value	Restore after the battery voltage exceeding the BAU set value by 2V
52	Battery low voltage	Alarm	Battery voltage is lower than BAL set value	Restore after the battery voltage exceeding the BAL set value by 2V
53	Battery charge short circuit	Alarm, battery does not charge	Battery voltage is less than 12V and the charging current exists.	Restore after a maximum of 1 minute when the short circuit is eliminated.
56	BMS loss	Alarm	Communication failure after BMS communication function is enabled	Restore after communication function disabled or communication success
58	Fan error	Alarm, fan operation in full speed	No fan speed signal detected	Restore after fan speed signal detected

Alarm code	Meaning	Relevant action	Trigger conditions	Resume conditions
59	EEPROM error	Alarm	EEPROM read/write exception	Can not restore
60	Overload	Alarm	The mains current/ battery discharge current/ load power is higher than the rated value.	Restore after the mains current/battery discharge current/load power is less than the rated value.
62	PV energy weak	Alarm, Turn off the PV output to the load, but keep the PV charging the battery	When the battery is not connected, the bus voltage is lower than the set value	Restore after battery connected or grid connected, or 10 minutes later.
68	Battery under SOC shutdown	Alarm, turn to standby mode	BMS reports SOC lower than BSU set value	Restore after meeting one of the following three conditions: 1. Disable low SOC shutdown function 2. Disable BMS communication function 3. SOC is higher than the set value by 5%
69	Battery below SOC warning	Alarm, if it is in standby mode, it will remain in standby mode.	Lithium battery SOC is lower than set value+5% (grid mode or battery mode), lower than set value+10% (standby mode)	Restore after meeting one of the following three conditions: 1. Disable low SOC shutdown function 2. Disable BMS communication function 3. SOC is higher than the set value by 10%
72	Battery can not startup	Alarm	During standby, battery voltage is lower than the allowed startup voltage	Restore after the battery voltage is higher than the allowed startup voltage
77	Grid power is unstable	Alarm	Lost of grid power three times within 5 minutes	Restore after 5 mins

11. INSTALLATION INSTRUCTIONS

11.1 Unpacking and inspection

Inspect the unit before installation. Make sure there is no damage in the package. You should receive the following items in the package:

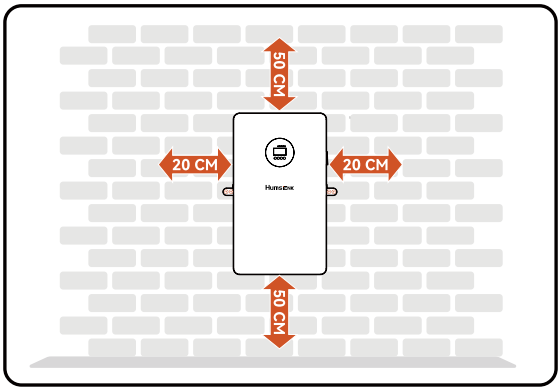
①		All-In-One Home Energy Storage
②		Wall-Mount Bracket x 1
③		L-Shaped Wall Bracket × 2
④		M6 Screws x 2
⑤		Wall-Mount Bracket Screws x 3
⑥		Expansion Screws x 8
⑦		User Manual x1

11.2 Key Points for Installation Location Selection

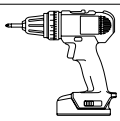
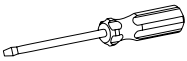
- It is strictly prohibited to install the product on surfaces made of flammable building materials.
- Avoid installing in harsh environments, and ensure the installation conditions meet the environmental requirements outlined later in this manual.
- The installation surface must be solid and reliable.

11.3 Environmental Requirements

- Ambient temperature: 0–55 ℃ (this range ensures optimal operating conditions for the device).
- Recommended installation method: Vertical wall-mounted installation.
- Clearance requirements: Sufficient spacing must be maintained between the device and surrounding objects (see diagram) to ensure proper ventilation and allow adequate space for cable routing and future maintenance.



11.4 Installation Tool List

Impact drill		For drilling holes in walls to secure wall-mounted brackets
Flathead screwdriver		Slotted screws for mounting the product's back panel
Tape measure		Used to measure and position installation holes and confirm the installation height

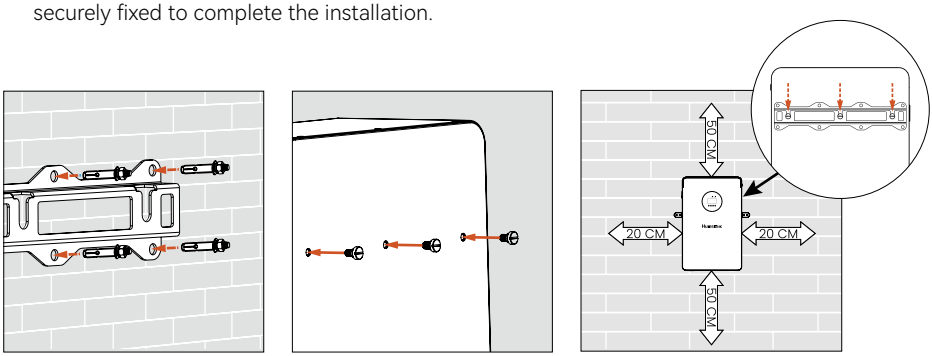
11.5 Installation Steps

Safety Warning:
When using an impact drill to bore holes, always wear safety glasses and a dust mask to prevent eye and respiratory tract injuries from flying debris. Before drilling, ensure there are no electrical wires, water pipes, or other conduits inside the wall to prevent potential safety hazards.

Safety Warning:
Handle the product with care during mounting to avoid impact damage. After the product is engaged with the slots, repeatedly verify that it is securely fixed to prevent the product from falling, which could cause damage to the device or personal injury.

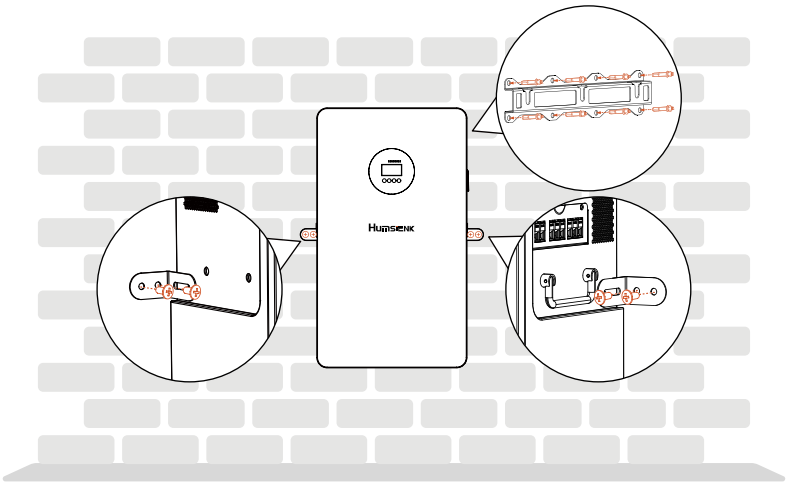
Wall-mounted installation method

1. **Securing the Wall Mount Bracket:** Use the provided anchor bolts to firmly secure the wall mount bracket to the wall, ensuring the bracket is level and stable without any looseness.
2. **Installing the Backplate Screws:** Take the three provided flathead screws and tighten them into the corresponding pre-drilled screw holes on the back of the product.
3. **Mounting the Product:** Align the three screws installed on the back of the product with the three U-shaped slots on the wall mount bracket. Insert the screws into the slots from the wider top section. Once properly positioned and adjusted, confirm the product is securely fixed to complete the installation.



Installation Safety Reminder

Please secure the battery to the wall to prevent it from falling.



Failure to securely mount the battery can lead to detachment caused by an unstable center of gravity, insufficient wall strength, or physical collision.

