
Off-Grid Inverter

User Manual

HE300-4200-T

- Please read this Manual carefully and understand the content, so as to correctly install and use the converter.
- Please give this Manual to the end user and properly keep it.
- The technical specifications of the converter is subject to change without prior notice.

3HE20260110-1.1 Version A

English

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Note

HE300-4200-T inverter model:

T: Use 24V battery;

MPPT: Max power point tracking;

UPS: Uninterruptible power supply

WiFi: Wireless fidelity;

BMS: Battery management system;

AGM: Absorbent glass mat;

FLD: Fluoride ion battery;

LIB: Lithium-ion battery;

GRO: Growatt battery

LIA: Protocol compatible battery

PYL: Pylontech battery

TQF: Techfine battery

LIC: 3rd party lithium battery

USE: User-Defined

APP: Application;

PV: Photovoltaic;

SOC: State of charge;

1. Manual Information

1.1 Validity

This manual is applicable to the following equipment:

HE300-4200-T Inverter

1.2 Scope of Application

This manual describes the assembly, installation, operation, and troubleshooting of the equipment. Please read this manual carefully before installation and operation.

1.3 Target Population

This document is intended for qualified personnel and terminal users. Qualified personnel must possess the following skills:

- Understand the working principle and operation of the inverter;
- Know the dangers and risks involved in the installation and operation of electrical equipment and units;
- Pass the training on the installation and commissioning of electrical equipment;
- Be familiar with relevant standards and directives;
- Be aware of all safety information in this manual.

1.4 Label Instructions

To ensure the safety of users when operating this product, the inverter and manual include relevant label information and appropriate symbols to remind users. Users should carefully read the symbols used in this manual.

Inverter labels

	Caution Do not disconnect under load!
	Danger: High voltage! Danger: Risk of electric shock!
	Maintenance on the inverter should only be performed after disconnecting all external power sources for at least 5 min.
	Read the instructions carefully before performing any operation on the inverter.
	Grounding: For the operator's safety, the system must be properly grounded.

Document labels

 Warning!	High risk: Failure to avoid may result in death or serious injury.
 Caution!	Medium/low risk: Failure to avoid may result in moderate or minor injury. In severe conditions, this may result in death or serious injury.

1.5 Safety Instructions



Warning!

**This chapter contains important safety and operational instructions.
Read and keep this manual for future reference.**

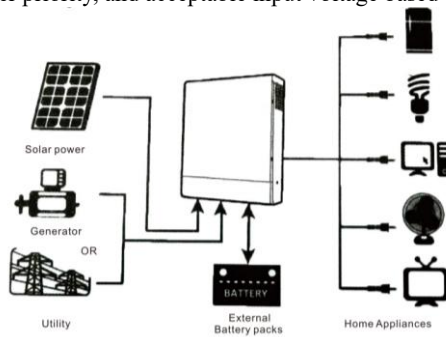
01. Please clearly identify the battery system you are using - whether it is a lithium battery system or an AGM system. If you set up the wrong system, the energy storage system will not operate correctly.
02. Before using the equipment, please read all instructions and warning labels on the equipment and battery, as well as all related sections of this manual. If the equipment is installed incorrectly and this leads to damage, the company reserves the right to void the warranty.
03. All operations and connections should be carried out by a qualified electrical engineer.
04. All electrical installations must comply with local electrical safety standards.
05. When installing PV modules during the day, installers should cover the modules with opaque materials. Otherwise, the terminal voltage of the modules will become dangerously high under sunlight.
06. Note: To minimize the risk of injury, only charge AGMs and lithium batteries. Other types of batteries may explode, causing personal injury and damage.
07. Do not disassemble the equipment. If maintenance is required, send it to a qualified service

center. Incorrect reassembly may lead to the risk of electric shock or fire.

08. To reduce the risk of electric shock, ensure that all wiring is disconnected before performing any maintenance or cleaning. Simply turning off the equipment does not eliminate the risk of electric shock.
09. Never charge frozen batteries.
10. To ensure optimal performance of this inverter, select the appropriate cable size according to electrical specifications.
11. Be very cautious when working with metal tools on or around the battery. Dropping tools could create sparks, cause the battery or other electrical components to short-circuit, and potentially lead to an explosion.
12. When disconnecting AC or DC terminals, strictly follow the installation procedure. For detailed instructions, please refer to the “Installation” section of this manual.
13. Grounding instructions: This inverter should be connected to a permanent grounding system. Ensure compliance with local requirements and regulations when installing this inverter
14. Never cause a short circuit between the AC output and DC input. Short circuits can cause equipment damage and jeopardize personal safety.

2. 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.



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

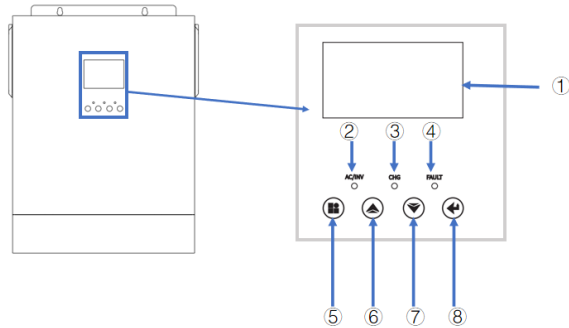
Consult with your system integrator for other possible system architectures depending on your requirements.

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.

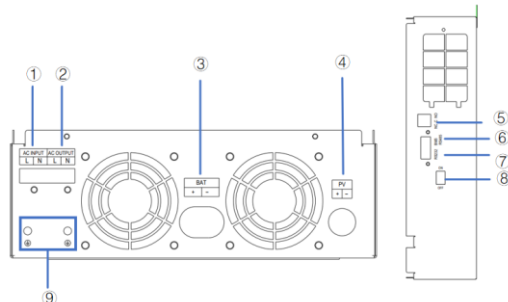
2.1 Features

- 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
- Battery connection required

2.2 Product Overview



- | | |
|-------------------------------|----------------|
| ① LCD display | ⑤ Exit button |
| ② AC/Inverter indicator light | ⑥ Up button |
| ③ Charging indicator light | ⑦ Down button |
| ④ Fault indicator light | ⑧ Enter button |



- | | | |
|-----------------|--------------------------------|----------------------------|
| ① AC input | ④ PV input | ⑦ RS232 communication port |
| ② AC output | ⑤ Dry contact | ⑧ ON/OFF |
| ③ Battery input | ⑥ RS485/BMS communication port | ⑨ Grounding |

3. Installation

3.1 Unpacking and Inspection

3.1.1 Unpacking and Inspection

The product has undergone strict testing before leaving the factory. Please inspect the product upon receipt. If the product is damaged, contact the local distributor immediately.

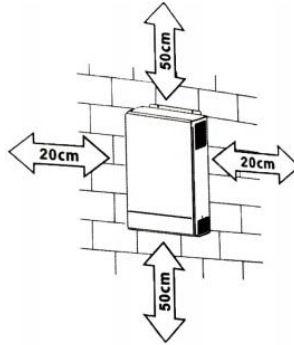
3.1.2 Installation Tools

Installation Tools	Multimeter 	Protective gloves 	Insulated anti-crushing shoes 
	Safety glasses 	Anti-static wrist strap 	Hammer drill 
	Electric screwdriver 	Phillips screwdriver 	Rubber hammer 
	Level 	Wire cutters/strippers 	Terminal crimping tool 

3.1.3 Bill of Materials

S/N	Item	Quantity	Description	Note
1	Inverter	1		
2	Accessories for installation	1		
3	User Manual	1		

3.2 Installation



Consider the following points before selecting where to install:

- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- 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 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.

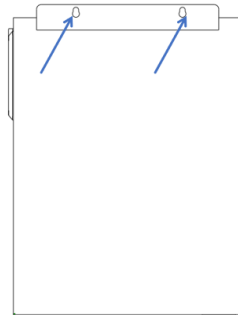


Warning!

The inverter is only suitable for installation on non-combustible surfaces, such as concrete.

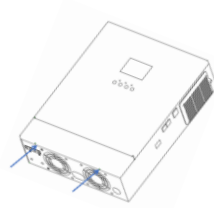
Installation of inverter:

Fix the inverter on the wall with two M6-50 screws and expansion pipes, and install the inverter on the wall through the holes on the rack of the housing.



3.3 Inverter Connection

Before connecting any wires, remove the screws on the bottom cover and open the top cover, as shown in the table below:



Caution!

Before connecting to the AC input power, install a separate AC circuit breaker between the inverter and the AC input power. This ensures that the inverter can be safely disconnected during maintenance and fully prevents overcurrent in the AC input. It is recommended that the specification of the connecting circuit breaker is 32A.



Caution!

Ensure that the live (L) and neutral (N) lines for the AC input are connected correctly. If the live (L) and neutral (N) wires are reversed, it may cause a short circuit when the inverter is running in parallel.



Caution!

Before connecting the PV modules, install a separate DC circuit breaker between the inverter and the PV modules.



Caution!

To ensure safe operation and regulatory compliance, a separate DC overcurrent protection device or disconnecting units should be installed between the battery and the inverter. In some applications, disconnecting units may not be required, but overcurrent protection devices should still be installed. The recommended protector or disconnect unit size is 125A.



Warning!

Do not ground the positive or negative terminals of the PV modules. Doing so may severely damage the inverter.

**Warning!**

Direct sunlight generates lethal high voltage in the PV strings, so strictly follow the safety precautions listed in the PV string and related documentation.

**Warning!**

Ensure that the PV input cables are connected to the corresponding terminals on the inverter. Reversed polarity may damage the inverter.

**Warning! electric shock**

Due to the high voltage in series-connected batteries, installation must be carried out with caution.

**Warning!**

All wiring must be performed by qualified personnel.

**Warning!**

Use the appropriate cables to connect the inverter. To minimize system safety risks, please use the recommended cable sizes below.

Recommended Cable Sizes for Connection

Cable category	Cable type	HE300-4200-T Inverter cable specifications
AC input cable	US standard specifications	12AWG
	National standard specifications	4mm ²
AC output cable	US standard specifications	12AWG
	National standard specifications	4mm ²
PV input cable	US standard specifications	12AWG
	National standard specifications	4mm ²
Battery input cable	US standard specifications	2AWG
	National standard specifications	25mm ²

Caution!



Before making the final DC connections or closing the DC circuit breaker/disconnect switch, ensure that the positive (+) terminal is connected to the positive (+), and the negative (-) terminal is connected to the negative (-).

Warning!



Do not close any AC/DC circuit breakers before completing the electrical connections.

All operations during the electrical connection process and the specifications of the cables and components used must comply with local laws and regulations.

3.4 PV module configuration

When configuring photovoltaic modules, please make sure to meet the following inverter parameters:

- 1. The inverter allows the input voltage range of photovoltaic modules to be 30-500Vdc;**
- 2. The inverter inputs two photovoltaic modules, and the maximum current allowed for each photovoltaic module input is 13A.**

When configuring photovoltaic modules, follow the steps below:

1. Check the technical parameters of the photovoltaic modules used, such as open circuit voltage and short-circuit current.
2. When configuring photovoltaic modules, it is recommended to use them in series to increase the input voltage of the photovoltaic modules. The total voltage after series connection should be within the range of 30-500Vdc, and some margin should be reserved to prevent voltage fluctuations from being overvoltage. It is recommended that the maximum calculated value be 450Vdc.
3. Check that the short-circuit current of the photovoltaic module does not exceed the input current allowed by the inverter.

Example: Configuring photovoltaic modules with HE300-4200-T inverter

Photovoltaic module parameters: maximum power: 450W; maximum voltage: 41.5Vdc; Maximum current: 10.85A; open circuit voltage: 49.3Vdc; Short circuit current: 11.60A.

Suggest connecting up to 7 photovoltaic panels in series on each channel! Cannot be connected in parallel!

3.5 WIFI Communication Module Connection (Optional Component)

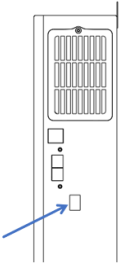
The WiFi communication module is used to connect to the cloud platform for remote monitoring of inverter parameters.

Please insert the WiFi communication module into the COM port. Scan the QR code on the WiFi package with your mobile phone to download the app, open the app, register an account, then scan the QR code on the WiFi communication module to add the device and perform Bluetooth network pairing.

4. Operation

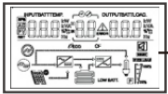
4.1 Power ON/OFF

After the equipment is correctly installed, press the ON/OFF switch (located on the casing button) to power on the equipment.

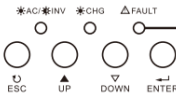


4.2 Operation of Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



LCD display



LED indicators
Function keys

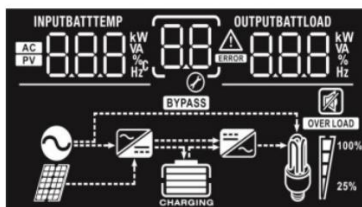
LED Indicator

LED Indicator			Messages
☀-AC/☀-INV	Green	Constant	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
☀-CHG	Yellow	Constant	Battery is fully charged.
		Flashing	Battery is charging.
⚠-FAULT	Red	Constant	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.
PV	Indicates the PV input.
INPUTBATT 888 kW VA Hz	Indicate input voltage, Input frequency, PV voltage, charger current, charger power, battery voltage.
Configuration Program and Fault Information	
88	Indicates the setting programs.
88 8888	Indicates the warning and fault codes. Warning: 88 [△] flashing with warning code Fault: 88 [■] lighting with fault code
Output information	
OUTPUTBATLOAD 888 kW VA Hz	Indicate output voltage, output frequency, load percent, load VA, load in Watt and discharging current.
Battery information	

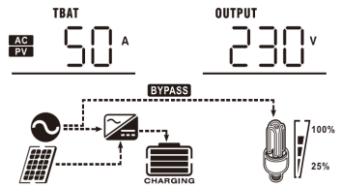
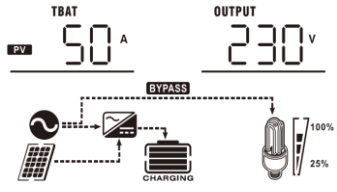
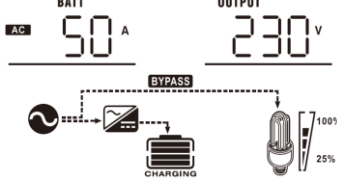
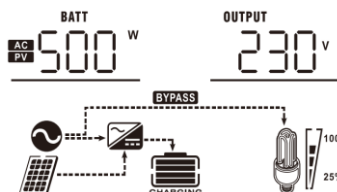
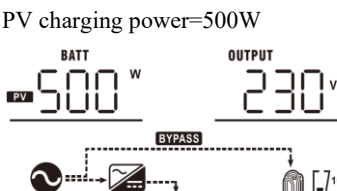
	Indicates battery level by 0-24%, 25-49%,50-74% and 75-100% and charging status.			
Load information				
	Indicates overload			
	Indicates the load level by 0-24%、25-49%、50-74%和 75-100%.			
	0-24%	25-49%	50-74%	75-100%
				
Mode operation information				
	Indicates unit connects to the mains.			
	Indicates unit connects to the PV panel.			
	Indicates load is supplied by utility power.			
	Indicates the utility charger circuits is working.			
	Indicates the DC/AC inverter circuit is working.			
Mute operation				
	Indicates unit alarm is disabled.			

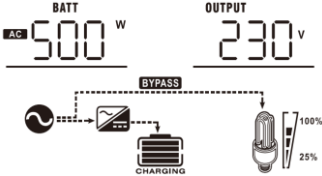
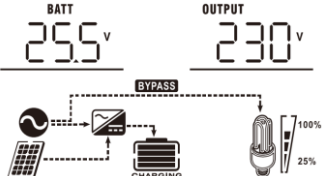
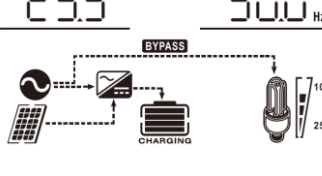
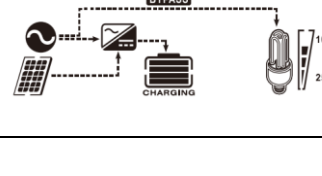
Display Setting

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, charging power battery voltage, output voltage, output frequency, load percentage, load in Watt, load in VA, load in Watt, DC discharging current, main CPU Version.

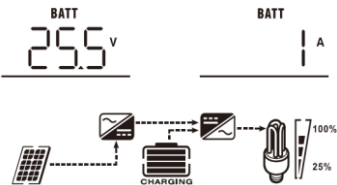
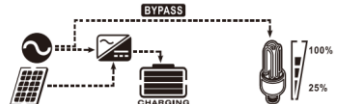
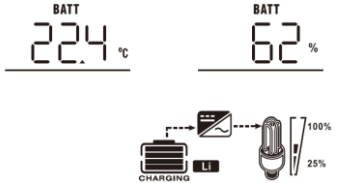
Selectable information	LCD display
Input voltage/output voltage (Default Display Screen)	Input Voltage=230V, Output voltage=230V

	INPUT AC 230 V OUTPUT 230 V
Input frequency	Input frequency = 50.0Hz INPUT AC 500 Hz OUTPUT 230 V
PV voltage	PV voltage = 260V INPUT PV 260 V OUTPUT 230 V
PV input current	PV current = 2.5A INPUT PV 2.5 A OUTPUT 230 V
PV power	PV power = 500W INPUT PV 500 W OUTPUT 230 V

Charging current	AC and PV charging current=50A 
	PV charging current=50A 
	AC charging current=50A 
Charging power	AC and PV charging power=500W 
	PV charging power=500W 

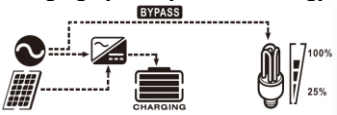
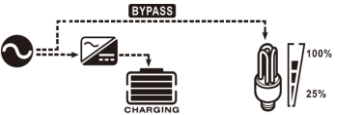
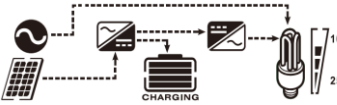
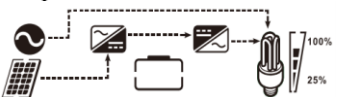
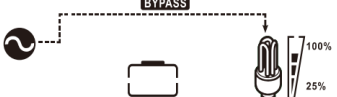
	AC charging power=500W 
Battery voltage and output voltage	Battery voltage=25.5V, output voltage=230V 
Output frequency	Output frequency=50Hz 
Load percentage	Load percent=70% 

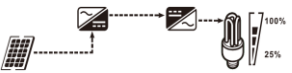
Load in VA	When connected load is lower than 1kVA, load in VA will present xxxVA like below chart. When load is larger than 1kVA ($\geq 1\text{kVA}$), load in VA will present x.xkVA like below chart.
Load in Watt	When load is lower than 1KW, load in W will present xxxW like below chart. When load is larger than 1KW ($\geq 1\text{KW}$), load in W will present x.xKW like below chart.

Battery voltage/DC discharging current	Battery voltage=25.5V, discharging current=1A 
Main CPU version checking	Main CPU version 00014.04 
Setting BMS communication success display	The left side shows the lithium battery temperature and the right side shows the lithium battery capacity. 
	The input current of the lithium battery is displayed on the left side, and the output current of the lithium battery is displayed on the right side. 

Operating Mode Description

Operating mode	Description	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.	No output is supplied by the unit but it still can charge batteries.	Charging by utility and PV energy. 
		Charging by utility. 
		Charging by PV energy. 
		No charging. 
Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.	PV energy and utility can charge batteries.	Charging by utility and PV energy. 
		Charger by utility. 
		Charging by PV energy. 
		No charging. 

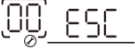
Line mode	The unit will provide output power from the mains. It will also charge the battery at line mode.	Charging by utility and PV energy.  The diagram shows a utility source (circle with a sine wave) and a PV source (solar panel) both connected to a charging unit labeled 'CHARGING'. A dashed line labeled 'BYPASS' goes from the utility source to a load (light bulb). The load has a meter showing 100% and 25%.
		Charging by utility.  The diagram shows only the utility source connected to the charging unit. The PV source is not connected. The 'BYPASS' line goes from the utility source to the load.
		If “solar first” is selected priority and solar energy is not sufficient to provide the load, solar energy and the utility will provide the loads and charge the battery at the same time.  The diagram shows both utility and PV sources connected to a central unit. From this unit, one path goes to the 'CHARGING' unit, and another path goes to the load. The load meter shows 100% and 25%.
		If “solar first” is selected as output source priority and battery is not connected, solar energy and utility will provide the loads.  The diagram shows both utility and PV sources connected to a central unit. The 'CHARGING' unit is disconnected. The central unit provides power to the load. The load meter shows 100% and 25%.
		Power from utility.  The diagram shows only the utility source connected to a central unit. The PV source and charging unit are not connected. The central unit provides power to the load.
Battery mode	The unit will provide output power from battery and PV power.	Power from battery and PV energy.  The diagram shows the PV source connected to a central unit. The utility source is not connected. The central unit provides power to the load. The load meter shows 100% and 25%.
		PV energy will supply power to the loads and charge battery at the same time.  The diagram shows the PV source connected to a central unit. The utility source is not connected. The central unit provides power to both the 'CHARGING' unit and the load. The load meter shows 100% and 25%.

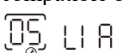
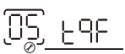
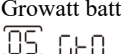
		Power from battery only 
Battery free mode	The device will provide output power from the PV power supply.	

4.3 LCD Setting

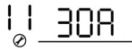
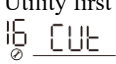
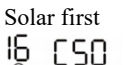
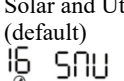
After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press “UP” or “DOWN” button to select setting programs. And then, press “ENTER” button to confirm the selection or ESC button exit.

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 12 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 maximum charging current. 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 24, 26, 27, 29 and 61.
		LIA-protocol compatible battery 	If selected, programs of 24, 26, 27 and 29 will be automatically set up. No need for further setting.
		Pylontech battery 	
		Techfine battery 	
		Growatt battery 	
		Felicity battery 	

		LIB-protocol compatible battery 05 LIB	Select "LIB" if using Lithium battery compatible to Lib protocol. If selected, programs of 26, 27 and 29 will be automatically set up. No need for further setting.
		3 rd party lithium battery 05 LIC	If selected, programs of 26, 27 and 29 will be automatically set up. No need for further setting. Please contact the battery supplier for installation procedure.
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	

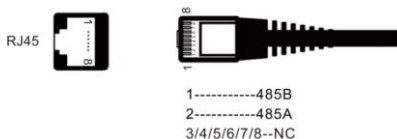
11	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program 11, the inverter will apply charging current from program 02 for utility charger.	30A(default) 	Setting range is 2A, then from 10A to max. AC charging current. Increment of each click is 10A.
12	Setting voltage point back to utility source when selecting “SBU” priority” in program 01.	Available options in 24V system:	
		23.0V (default) 	Setting range is from 22V to 25.5V. Increment of each click is 0.5V.
13	Setting voltage point back to battery mode when selecting “SBU priority” in program 01.	Available options in 24V system:	
		Battery full charged 	54V(default) 
		Setting range is from 24V to 29V. Increment of each click is 0.5V	
16	Charger source priority: To configure charger source priority	If this inverter/charger is working in line, Standby or Fault mode, charger source can be programmed as below:	
		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) 18 00N	Alarm off 18 00F
19	Auto return to default display screen	Return to default display screen (default) 19 ESP	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage/output voltage) after no button is pressed for 1 minute.
		Stay at latest screen 19 FEP	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) 20 LON	Backlight off 20 LOF
22	Beeps while primary source is interrupted	Alarm on (default) 22 AON	Alarm off 22 AOF
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 23 BYD	Bypass enable 23 BYE
24	Battery low voltage If battery power is only power source available inverter will alarm.	Battery low voltage 20.0V LU 24 100 ^{BATT}	
		Setting range is from 20.0V-27.0V for 24V system.	
25	Record fault code	Record enable (Default) 25 FEN	Record disable 25 FdS
26	Bulk charging voltage (CV voltage)	24V system default setting: 28.2V LU 26 282 ^{BATT}	
		If self-defined is selected in program 5, this program can be set up. Setting range is from 24.0V to 30.0V for 24Vsystem. Increment of each click is 0.1V.	
27	Floating charging voltage	24V system default setting: 27.0V FLU 27 270 ^{BATT}	

28	Reset factory setting	Default: <u>5td</u> <u>28</u> <u>OFF</u>	
		<u>5td</u> <u>28</u> <u>ON</u>	
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.	24V system default setting: 21.0V <u>LOW</u> <u>29</u> <u>21.0</u> ^{BATT}	
		If self-defined is selected in program 5, this program can be set up. Setting range is from 20.0V to 26.0V for 24V system. 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 <u>30</u> <u>EEH</u>	Battery equalization disable (default) <u>30</u> <u>EdS</u>
		If “Flooded” or “User Defined” is selected in program 05, this program can be set up.	
31	Battery equalization voltage	24V system default setting: 29.2V <u>EV</u> <u>31</u> <u>29.2</u> ^{BATT}	
		Setting range is from 24.0V to 30.0V for 24V system, Increment of each click is 0.1V.	
33	Battery equalized time	60min (default) <u>33</u> <u>60</u>	Setting range is from 5min to 900min. Increment of each click is 5min.
34	Battery equalized timeout	120min (default) <u>34</u> <u>120</u>	Setting range is from 5min to 900min. Increment of each click is 5min.
35	Equalization intervals	30days (default) <u>35</u> <u>30d</u>	Setting range is from 0 to 90 days. Increment of each click is 1 day.
36	Equalization activated immediately	Enable <u>36</u> <u>AEH</u>	Disable (default) <u>36</u> <u>AdS</u>
		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 show “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 bns 37 ON	Whether to enable the BMS communication function
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	b5t 41 BATT 50%	When the inverter is turned on, the SOC must be higher than the set value to work normally.

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



Communication Connection

Please use supplied communication cable to connect to inverter and PC. Please install a monitoring software on the computer.

Dry Contact Signal

There is one dry contact (3A/250VAC) available on the rear panel. It could be used to deliver signal to external device when battery voltage reaches warning level.

Unit Status	Condition			 Dry contact port:	
				NC&C	NO&C
Power Off	Unit is off and no output is powered.			Close	Open
Power on	Output is powered from battery or solar.	Normal mode	Battery voltage<Low DC warning voltage	Open	Close
			Battery voltage>Float charging voltage	Close	Open
		Solar first mode	Battery voltage<Solar to AC voltage	Open	Close
			Battery voltage>AC to DC voltage	Close	Open

5. Battery Equalization Description

Equalization function is added into charge controller, It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

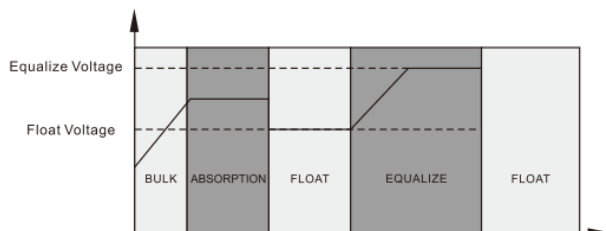
How to Apply Equalization Function

You must enable battery equalization function in monitoring LCD setting program 30 first. Then, you may apply this function in device by either one of following methods:

1. Setting equalization interval in program 35.
2. Active equalization immediately in program 36.

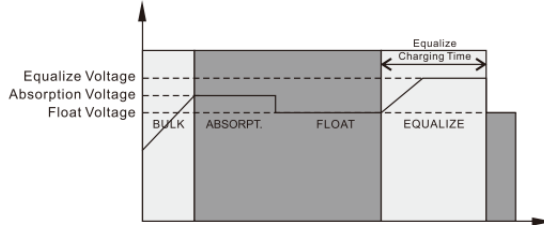
When to Equalize

In stage, when the setting equalization interval (battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.

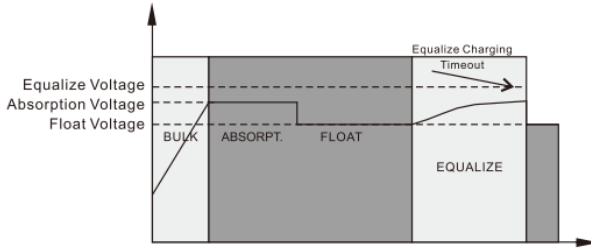


Equalize charging time and timeout

In equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.



6. Fault and alarm description

6.1 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.	

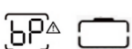
04	Battery voltage is too low.	
05	Output short circuited or over temperature is detected by internal converter components.	
06	Output voltage is too high.	
07	Over load time out.	
08	Bus voltage is too high.	
09	Bus soft start failed.	
51	Over currents or urge.	
52	Bus voltage is too low.	
53	Inverter 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.	

6.2 Alarm Descriptions

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

Alarm Indicator

Alarm Code	Alarm 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	

6.3 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 1 minutes, buzzer will beep. - Communication lost occurs after the inverter and battery is connected successfully, buzzer beep 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.

7. Trouble removal

Problem	LCD/LED/Buzzer	Explanation/Possible cause	What to do
Unit shuts down automatically during startup process.	LCD/LED and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low ($<1.91\text{V/Cell}$)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication	1. The battery voltage is far too low. ($<1.4\text{V/Cell}$) 2. Internal fuse tripped.	1. Contact repair center for replacing the fuse. 2. Re-charge battery.
Mains exist but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	3. Replace battery. Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wire 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→appliance)
	Green LED is flashing.	Set “Solar First” as the priority of output source.	Change output source priority to Utility first.
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.	
	Fault code 03	Battery is over-charged.	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirement.
	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.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to repair center.
	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.

8. Technical datasheet

Model		HE300-4200-T
Input	Input Sources	L+N+PE
	Rated Input Voltage	220/230/240VAC
	Voltage Range	90-280VAC $\pm$ 3V(APL Mode) 170-280VAC $\pm$ 3V(UPS Mode)
	Frequency	50Hz/60Hz (Auto Adaptive)
Output	Rated Capacity	3000W
	Output Voltage	220/230/240VAC $\pm$ 5%
	Output Frequency	50Hz/60Hz $\pm$ 0.1%
	Waveform	Pure Sine Wave
	Transfer Time (adjustable)	Computers (UPS Mode) 10ms, Appliance (APL Mode) 20ms.
	Peak Power	6000VA
	Peak Efficiency (battery Mode)	>94%
Battery	Battery Voltage	24Vdc
	Constant Charging Voltage (Adjustable)	28.2Vdc
	Floate Charging Voltage (Adjustable)	27Vdc
Charging	PV Charging Mode	MPPT Dual MPPT
	Max. PV input Power	3000W
	MPPT Tracking Range	30-500Vdc
	Best voltage	300-400V
	Max. PV Input Voltage	500Vdc
	PV Max. Input Current	13A
	Max. PV Charging Current	100A
	Max. AC Charging Current	60A
	Max. Charging Current	100A
Display	LCD Display	Display Running Mode/Loads/Input/Output etc.
Interface	RS232	Baud Rte2400
	Communication	Lithium Battery BMS communication Card

	port	WifiCard, Dry Contact
	Parallel Connect Interface	Without Parallel Connect
Environment	Operating Temperature	-10-50°C
	Humidity	20%-95% (Non-condensing)
	Storage Temperature	-15-60°C
	Altitude	Altitude Not Over 1000m, Derating over 1000m, Max 4000m, Refer to IEC62040
	Noise	≤50db

PRODUCT NAME: _____

PRODUCT MODEL: _____

DATE OF PRODUCTION: _____

Warranty Notice

- I. This warranty only applies to our company's products.
- II. If the damage to the product is caused by the following reasons, our company will not be obligated to provide free repair services.
 - 1. Unexpected factors or intentional damage caused by human factors, mechanical destruction, violent throwing, etc;
 - 2. Damage caused by using in an abnormal working environment or not following the instructions;
 - 3. Users who dismantle, modify or have not undergone after-sales maintenance by our company without authorization.
- III. Our company reserves the right to make the final interpretation decision.