DELIXI
ELECTRIC
德力西电气

NB Sine Wave Inverter

User Manual

Standard: GB/T 20321.1

☐ Please carefully read this User Manual before installing and operating the product, and keep this manual properly for future reference

Table of Contents

Note: The product instructions may change without notice.

1. Safety Precautions

■ Please carefully read this manual and keep it properly.
■ Please follow all warning signs on the machine, and do not tear or damage those warning labels.
■ Do not allow the inverter work under the load that exceeds the rated load.
■ Prevent the short circuit between the positive and negative poles of battery, otherwise this may cause a fire or electric shock.
■ Do not block all vents, and follow the instructions provided by the manufacturer for installation.
■ Do not store or operate this product in the following environment;
■ In the places with flammable gases, corrosive substances, or large amounts of dust.
■ In the places where the temperature is abnormally high or low (above 40°C or below -10°C), or the humidity is high (90% and above).
■ In the places with direct sunlight or close to heating device.
■ In the places with severe vibrations.
■ In the event of a fire around, please extinguish a fire with a dry powder fire extinguisher, because the use of a liquid fire extinguisher will cause a risk of electric shock.

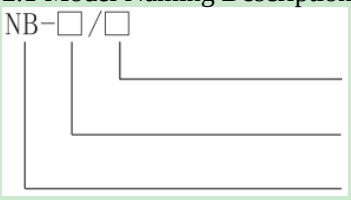

Caution:

There is high voltage in the inverter. In order to avoid injury to personal safety, if you have any questions, please consult the dealer's professional or maintenance center, and it is forbidden to open or repair it without permission.

2. Product Introduction

With advanced SPWM sine wave control technology used, the NB series sine wave inverter adopts perfect protection and battery management functions. Thanks to its high power supply quality, this product is suitable for various loads, and can be widely used in household appliances such as TVs, refrigerators, induction cookers, electric fans, microwave ovens, and air conditioners.

2.1 Model Naming Description



2.2 Product Features

◆Pure sine wave output, suitable for household appliances such as TVs, refrigerators, induction cookers, electric fans, microwave ovens, and air conditioners

◆ Microcomputer (CPU) control technology used, with superior performance

◆ Ultra-wide input voltage range, high-precision output, fully automatic voltage regulation

◆Built-in overload, short circuit, overvoltage, undervoltage, and overtemperature protection functions, with high reliability

◆The simple and clear LED display can be upgraded to a comprehensive digital LCD display for easy observation of machine status

◆The battery can be configured according to different requirements for the power supply time

◆Valve-regulated maintenance-free lead-acid battery is used; with the intelligent battery management, and overcharge and over-discharge protection, prolong the battery life.

2.3 Main technical indicators

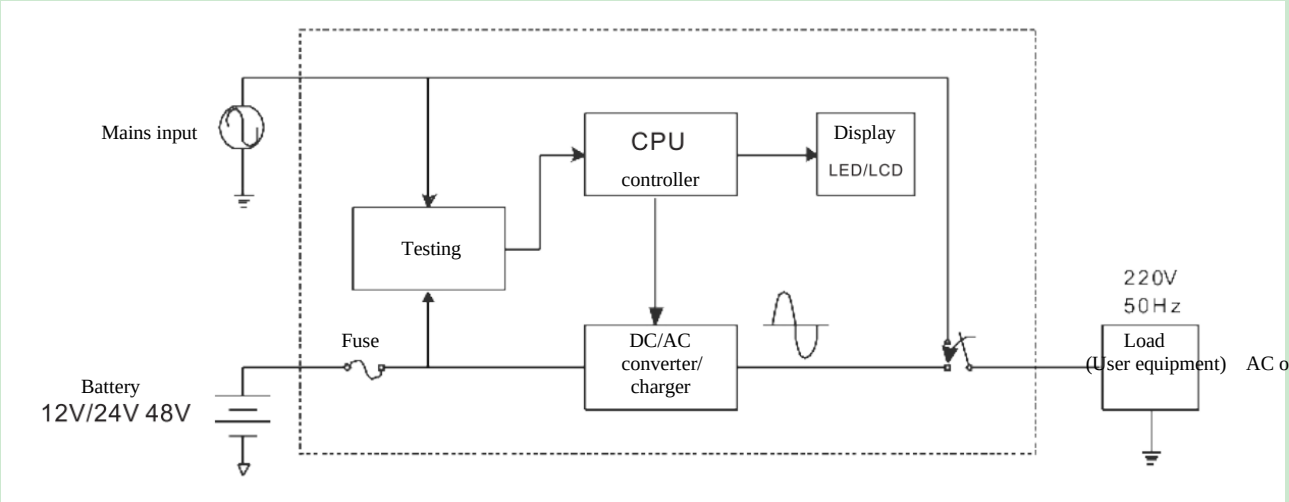
Main technical indicators

Model		NB-500/12	NB-1000/24	NB-1500/48	NB-2000/48	NB-3000/48
Input	Volage range	150~270VAC				
	Freq.	50Hz±10%				
Output	Rated capacity	500VA	1000VA	1500VA	2000VA	3000VA
	Waveform	Sine wave				
	Freq.	Mains supply: Synchronize with the mains supply Inverter: 50Hz±0.5				
	Volage accuracy	Mains supply: 220V±10% Inverter: 220V±5%				
	Overload capacity	When the load exceeds 150%±5%, the inverter protectionwill workafter 10s to stop the machine; when the load resumes to the rated load, the inverter will automatically work.				
	Protection	Overload, overtemperature, and battery over-voltage protection				
Battery	DC voltage	12VDC	24VDC	48VDC		
	Number of batteries (12V)	1	2	4		
	Battery protection	Over-discharge protection, overcharge protection, and intelligent management				
	Charging current	Max. 15A				

2.4 Working environment

Item	Content
Ambient temperature	-10ºC~+40ºC
Relative humidity	<85% (non-condensing)
Altitude	Less than 1000 meters. When greater than 1000 meters, the rating is reduced by 1% for every 100 meters of an increase
Storage temperature	-15ºC~45ºC

2.5 System block diagram



3. Installation

3.1 Unpacking inspection

1) Unpack the product, and check the product appearance for poor appearance quality or damage caused during transportation.

2) Check the list of accessories to confirm whether the machine accessories are complete.

3) Confirm whether the machine is the model you want to purchase according to the nameplate pasted on the side of the product.

4) If you have the above problems, please contact the dealer or company in time!

3.2 Installation precautions

■Please put the inverter in a well-ventilated place far away from the dangerous objects such as water, flammable gases, or corrosives. The specific installation environment should meet the product specification requirements.

■Side installation is not allowed; keep the air inlet on the front panel and side plate and the air outlet on the rear cover unblocked.

■ If the machine is working at low temperatures, water droplet condensation may occur; therefore, please wait until the inside and outside of the machine are completely dry before installation, otherwise there is a risk of electric shock.

■ Protect the inverter to ensure good contact.

3.3 Battery selection and power supply time

Table 1 Battery power supply time selection

Model	Number of cells per pack	Capacity / power supply time of single pack of battery (minute)							
		20AH	40A	55AH	65AH	75AH	100AH	120AH	150AH
NB-500	1 cell	10	35	45	50	65	90	110	160
NB-1000	2 cells	10	35	45	50	65	90	110	160
NB-1500	4 cells	17	50	65	70	95	130	150	200
NB-2000	4 cells	12	35	40	45	70	85	115	150
NB-3000	4 cells	5	20	25	30	40	50	65	90

Note: The above table is for reference only (calculated under full battery charge and full load conditions), the actual power supply time depends on the size of the load and the battery level.

3.4 Wiring

There is no a mains on-off switch and a battery on-off switch in the main circuit of this product, and it is recommended that a 25A or above switch (or connected to the mains socket) is installed in the front of the AC input of this product by users, and a 63A or above switch is installed in the front of the battery input end.

3.4.1 Battery wiring

It is important to follow the correct procedure to connect the battery, otherwise there may be a risk of electric shock. Please strictly follow the steps below:

1) First connect the battery pack in series to ensure the appropriate battery voltage, with 12VDC for NB-500, 24VDC for NB-1000, and 48VDC for NB-1500, NB-2000, and NB-3000.

2) One end of the battery connecting cable of NB-500 and NB-1000 has been fixed on the device, and the other end is connected to the battery pack through two open wires, as shown in Figure 3-1.

3) The battery inputs of NB-1500, NB-2000 and NB-3000 adopt the terminal block form, and the battery connecting wire is first connected to the battery end (do not connect it to the inverter end first, otherwise there may be a risk of electric shock); the red line is connected to the positive pole "+"of the battery, and the black line is connected to the negative pole "-"of the battery, as shown in Fig. 3-2.

4) The red line is connected to the positive pole "+"of the battery, and the black line is connected to the negative pole "-"of the battery

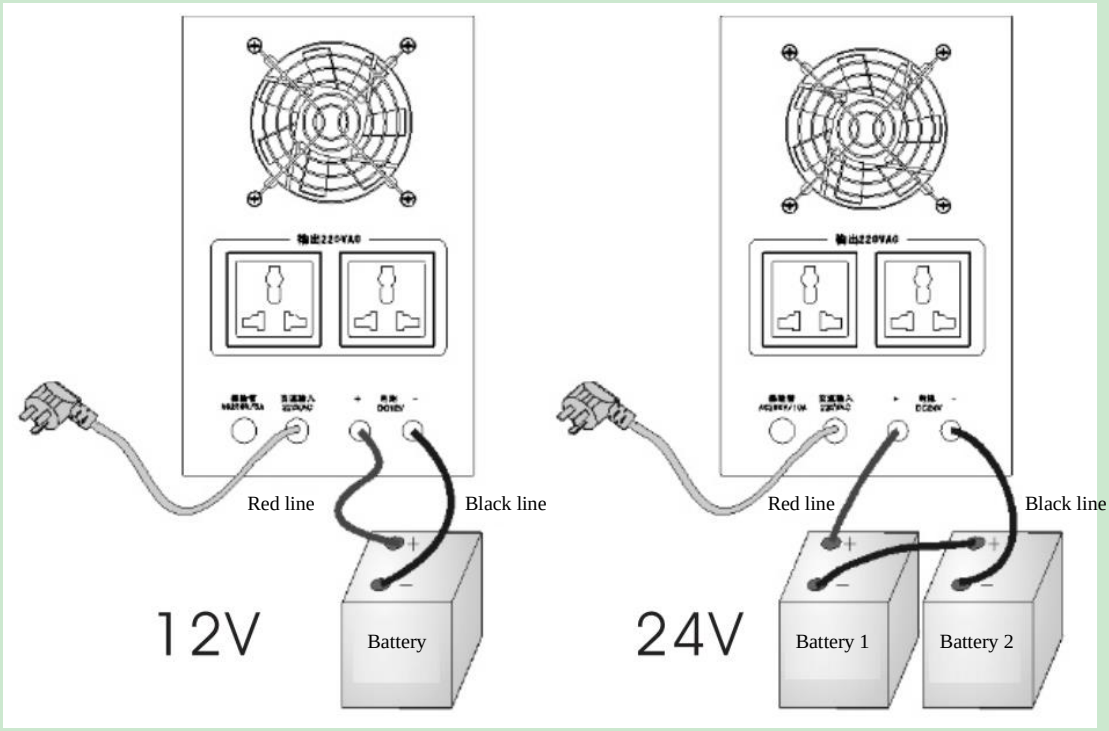


Fig. 3-1 NB-500 and NB-1000 battery wiring

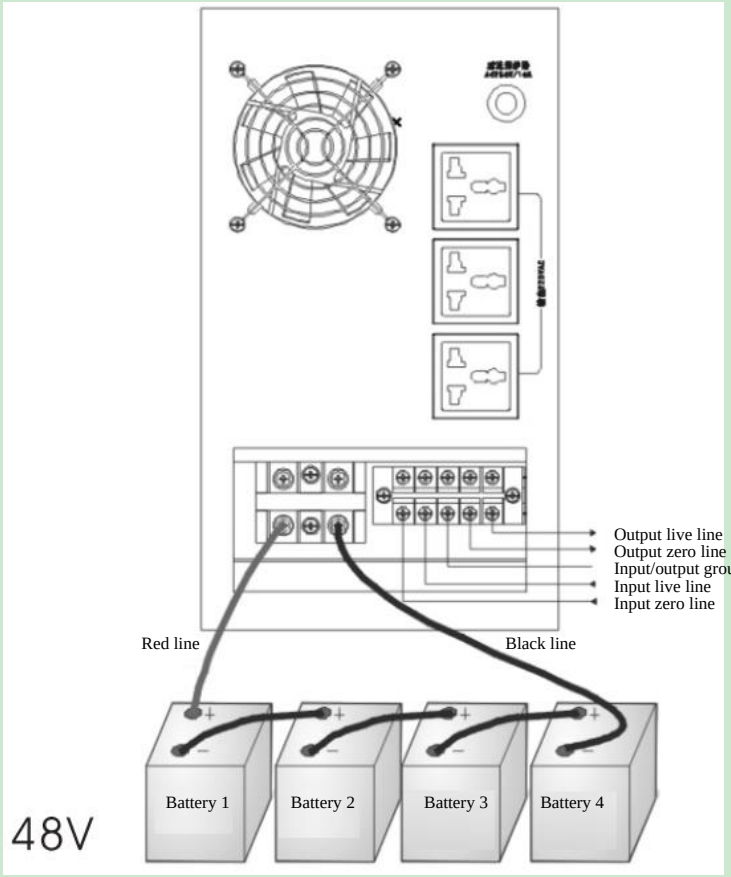


Fig. 3-2 NB-1500, NB-2000, and NB-3000 battery wiring

3.4.2 AC input and output wiring

The socket with an overcurrent protection device is used for NB-500, NB-1000 input power line connection. One end of the minas input line has been fixed with the inverter, and the other end can be connected to the mains socket. There are two output sockets on this machine, and the specific connection method is shown in Fig. 3-3:

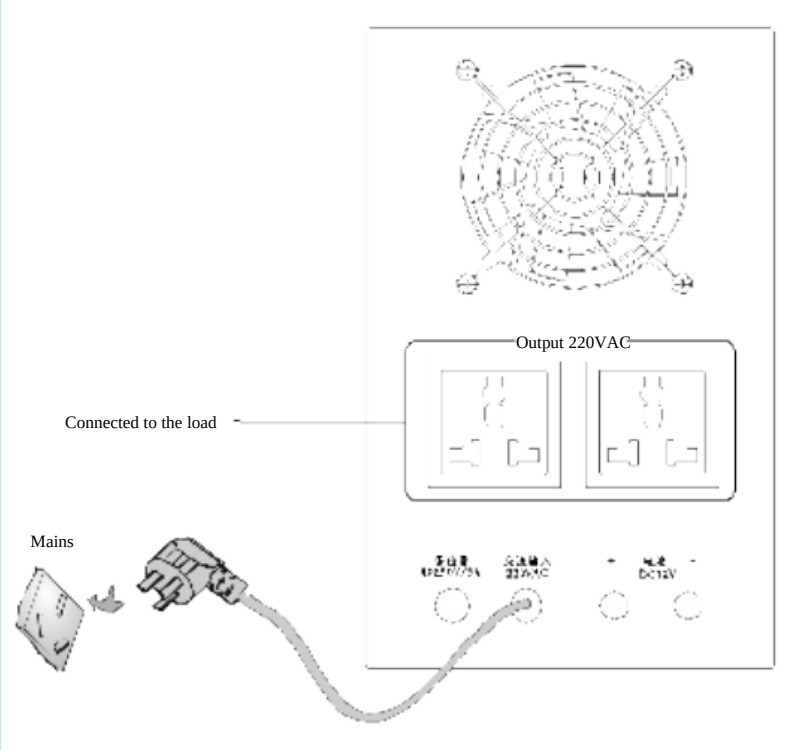


Fig. 3-3 NB-500, NB-1000 AC input and output wiring methods

The terminal block is used for the connection of NB-1500, NB-2000, NB-3000 input and output power line (two terminal block and socket methods are used for output). To identify the terminal, first remove the rear cover plate. For specific connection method, see Fig. 3-4:

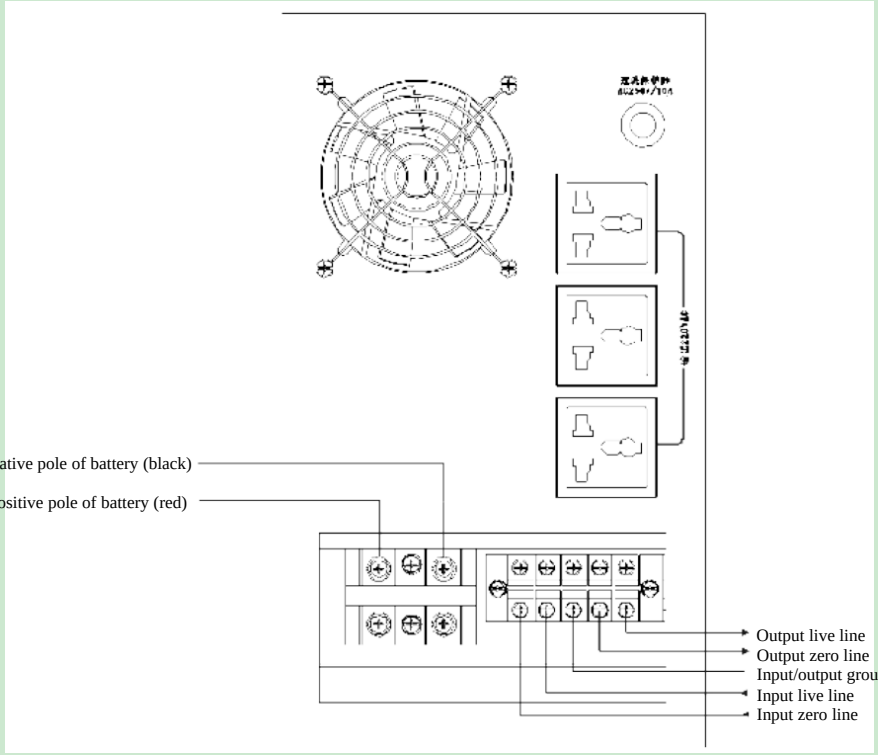


Fig. 3-4NB-1500, NB-2000, NB-3000 input and output wiring method

Note: The terminal block is used for 6A or above output.
Note: The battery connecting cable is a standard cable, and it cannot be extended indefinitely, otherwise it will affect the normal operation of the inverter.

4. Operation

4.1 LCD display panel

Fig. 4 - 1 LCD Display Panel

Fig. 4-1 LCD display panel

A: Mains power indicator	B: Mains voltage value
C: Output indicator	D: Output voltage value
E: Battery status indicator	F: Battery capacity percentage
G: Inverter status indicator	H: Load size indicator
I: OFF –stop	J: ON- start

4.3 Operation Mode

The operating mode of the inverter can be divided into mains mode and battery mode.

4.3.1 Mains mode

When the inverter is running in mains mode, the LCD panel will display the main screen shown in Fig. 4-2.

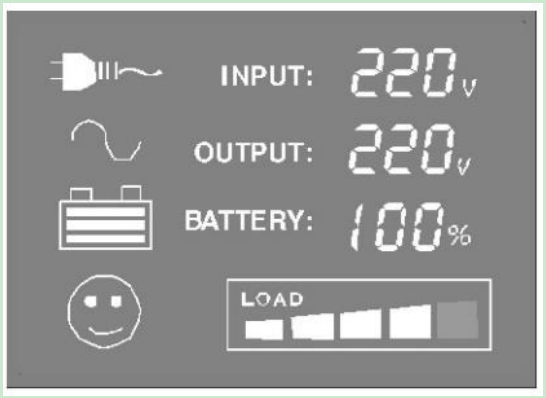


Fig. 4-2 LCD mains display screen

Note: To connect the generator, please follow the steps below:
Start the generator, connect the output power of the generator to the input of the inverter after the generator is running smoothly (at this time, confirm that the inverter is no-loaded), then press the Start button to start the inverter, and then connect the load one by one after the inverter starts. It is recommended to select the generator capacity that equals to the twice the capacity of the inverter.

4.3.2 Battery Mode

1) When the battery capacity reduces, the number of lights of the battery capacity indication part will decrease; when the battery voltage drops to the pre-warning level, the buzzer will beep every second to remind the user that the battery capacity is insufficient.

The main screen of the LCD panel display is shown in Fig. 4-3

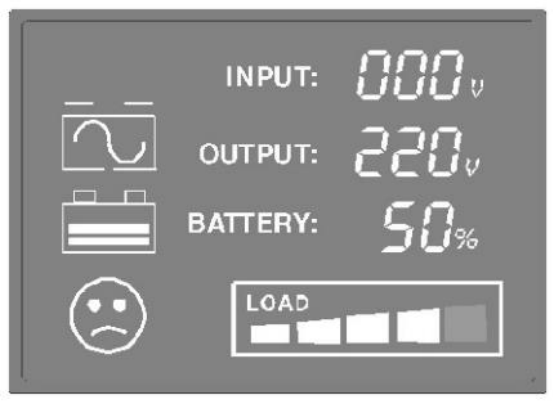


Fig. 4-3 Battery mode

4.3.3 Fault and alarm display

In case of failure of inverter, the "FAULT" fault indicator light on the LED panel will be on, the smiling face on the LCD panel will change to a crying face, as shown in Fig. 4-4, and the inverter will always beep.

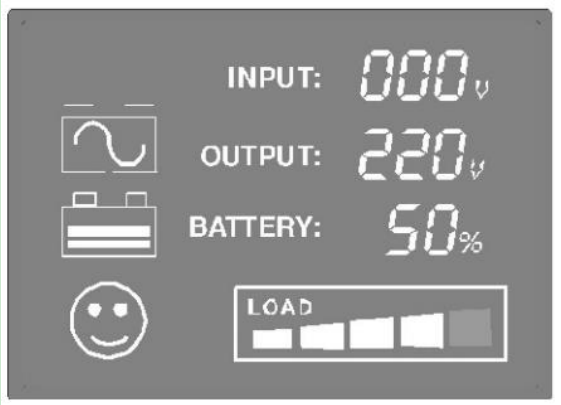


Fig. 4-4 fault display

4.4 Operation

4.4.1 Switch operation

Start operation modes: Mains start and battery start

■Mains start

Connect the battery, and then turn on the mains, and the inverter will automatically start.

■ DC start

When there is no mains input, press the Start button once. The panel lights up after a few seconds, and the inverter is already running in battery mode.

4.4.2 Stop operation

With the Stop button pressed, the system power is turned off and there is no display on the panel. If out of the service for a long time, please disconnect the mains and battery connection cables!

5. Maintenance

5.1 Battery maintenance

The battery is an important part of the inverter system. The life of the battery depends on the ambient temperature and the number of discharges. Operation at high temperatures or deep discharge can shorten the life of the battery.

■ The battery should work in the ambient temperature ranged 15℃ to 25℃as much as possible.

■ If the inverter is out of the service for a long time, it is recommended to charge it once every 3 months.

■ If the battery is discharged to stop the machine by the protective device, it shall be charged in time, and cannot be turned on again, otherwise the battery will be scrapped in advance

■ Under normal circumstances, the battery life is 1~3 years; if found harsh condition, replace it early. The battery must be replaced by professionals.

Note:

● **Please turn off the inverter and disconnect the mains before replacing the battery;**

● **Take off metal objects such as rings and watches;**

● **Please use a screwdriver with an insulated handle, and do not put tools or other metal objects on the battery;**

● **Do not short connect or reversely connect the positive and negative poles of the battery.**

6. Troubleshooting and Service

If found any abnormality of the inverter, please check the following items before contacting a customer service representative

■ Check whether the battery is connected normally, and whether the battery voltage is too low.

■ Check whether there is a mains input, and whether the mains voltage and frequency meet the requirements.

■ Check whether the fuse located at the rear panel for damage or disconnection.

When report a fault to the customer service, be sure to record and inform the following information:

1) Inverter model, date of purchase
2) Fault occurrence date
3) Complete problem description (including panel display information, buzzer beeping situation, power situation, load capacity, and battery configuration).

■ Common faults and troubleshooting

Table 1 Common troubleshooting

Fault	Cause	Alarm	Solution
With the ON/OFF key pressed, the machine cannot start	The inverter output short circuit or overload or too short ON key pressing time	No	Turn off the inverter, remove all loads, confirm no fault or internal short circuit of the load; press the ON key for more than 1 second
	The internal fuse is burnt, indicating there is an internal fault	No	Do not try to open or repair it, but contact your dealer
Battery discharge time is reduced	The battery is not charged	No	Power on the inverter with mains for more than 3 hours to re-charge the battery
	The inverter output overladed	No	Check the load capacity, and remove the non-critical equipment
	The battery itself is aged, and the battery cannot be fully charged	No	Replace the battery, and contact the dealer to obtain the battery replacement components
The fault indicator is on or the display is failed to show a crying face, the buzzer always beeps	The inverter is turned off due to internal fault	Always beep	The inverter needs to be repaired, and contact your dealer
The display shows a crying face (the fault light on the LED dispaly is lit); load indciation bars are full	Overload prewarning	Beep once every one second	Decrease the load, otherwise the outlet will be powered off
The display shows a crying face (the fault light on the LED dispaly is lit); load indciation bars are full	Output short circuit	Always beep	Disconnect the load, and check the laod for short circuit

Fault	Cause	Alarm	Solution
The battery voltage is normal, but there is no output voltage	Internal fault of inverter	Always beep	Start the inverter after cooling down; if still failed to start the machine, please contact the Customer Service Center.
Inverter stops suddently	Interter overheated; inverter is daamged	No	Start the inverter after cooling down; if still failed to start the machine, please contact the Customer Service Center.
The display shows a crying face (the fault light on the LED display is lit); the battery capacity shows 0%.	Voltage undervoltage alarm	Beep once every one second	The output will be powered off; please connect the mains for charging, or replace it by the fully charged battery
Under mains power, click sound is issued from the machine	There is mains voltage fluctuations; the inverter is in the voltage stabilizing regulation	No	Only when the output voltage is within the 220±10% range, this belongs to the normal phenomenon
The mains input display shows that the mains voltage is 0V (the mains indicator on the LED screen is not on)	Fust is burnt	No	Replaced by the fuse of the same specification (500-1000VA); reset the overcurrent protector (1500-3000VA).

7. Machine Accessories

1. User Manual 1 copy;
2. Certificate of Conformity 1 copy;
3. Battery cable:

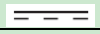
12V power supply type (no connection configuration)
24V power supply type 1 piece (battery cable)
48V power supply type 5 pieces (battery cable)

4. Fuse tube:

NB-500VA, 1000VA2 pcs;
No fuse tube provided for NB-1500VA and above type (self-reset protector used).

8. Description of common symbols

The following symbols are used in this manual, and may also occur during application. Therefore, users shall familiarize them, and know their meanings.

Symbols and their meanings			
Symbol		Meaning	
	Caution prompt		Protective grounding
	High voltage hazard		Battery
	Turn on the host		Repetitive cycle
	Turn off the host		Do not leave with debris
	Alternating current		Direct current

Product Warranty Card

User name	
Address	
Tel.	**Zip**
Model & Spec.	**Date of production**
Sales unit	
Date of sales	**Invoice number**
Warranty unit	**Inspector**
Warranty address	

Company Commitment

The company will provide the "three guarantees" service for any poor manufacturing quality causing that the product cannot work normally under the normal storage, transport, maintenance, and operation conditions within the 24 months from the date of production. For any damage due to one of the following situations, a paid repair will be given even if within the warranty period:

1) Improper operation, maintenance, or storage;
2) Modified without permission or improper repair;
3) Damage due to falling off or caused during installation after purchase;
4) Force majeure such as earthquakes, fires, lightning strikes, abnormal voltages, and secondary disasters;

If you have any question, please contact the dealer or our company's customer service department.

5) The model marked on the three-guarantee certificate is inconsistent with the model of the product to be repaired, the warranty card and purchase invoice are altered, the warranty period expires, and there is no warranty certificate provided.

Within the warranty period, if the product is failed due to its poor quality problem, the user can send it to the sales company's repair center for repair or replacement free of charge if the filled warranty card (user page) and purchase invoice shall be shown.

The warranty card and purchase invoice are used as the warranty certificate of this machine, and shall be kept properly by the user, and they will not be provided again if lost.

If you have any questions, please contact your dealer or our customer service department.

Zhejiang Delixi Electrical Co., Ltd.

Maintenance Records

Repair date	Warranty contents	Repairer

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Certificate

DELIXI ELECTRIC LTD

Name: Sine Wave Inverter

Model: NB Series

This product passes the inspection and is allowed to be shipped.

Standard: GB/T 20321.1

Inspector: Check 02

Production date: See label on inner box

www.cn-delixi.com
The first edition of this manual was issued on May 2021.