NB-T Hybrid Solar Inverter

8KW~40KW

User Manual

Content

⚠ Warning

This is A class inverter. It might cause slightly radio interference in daily life.

And practical measure is required to take under this condition.

Preface

Thank you for the purchase of pure sine wave inverter or hybrid solar inverter (Hereinafter referred to as inverter). Please read this manual carefully before installing and using the inverter!

Copyright

1.Installation Instructions

1-1: Open-package inspection

1. After opening the package, please check random accessories, including user manual (contains conformity certificate and warranty card), 2pcs battery cables and accessories for optional functions. And check whether the inverter is still kept well after transportation, if find any broken or component missing, do not turn on the machine, feedback to the carrier and distributor.

Note:

- Please keep the packing box and packing material, can be used for next delivery if needed.
- This series of product is very heavy (check appendix as reference), please handle with care when carrying.

1-2: Installation notice

1) Install in an area of well ventilated, free of water, burning gas and corrodent.

2) Not good to put on the side, better keep good air ventilation from front panel's bottom air intake, or air outlet from back panel's fan, and side face of machine.

3) Around environment temperature should remain 0 to 40 centigrade.

4) If disassembling and operate under low temperature environment, may happen water condense, only can work till thorough dry of machine inside and outside, otherwise will be shock risk.

5) If the machine is placed for a long time, it should be confirmed that the machine is completely dry and no corrosion can be installed and used.

1-3:Installation steps

1) Environmental requirements

Open the package and place the inverter in a reasonable working environment. Refer to the "Installation Precautions" for specific requirements.

2) Wire diameter selection

Use a cable with a suitable wire diameter, which can not be lower than the national safety standard. The general wire diameter is selected according to the current density of not more than 5A/mm², and the length of the connecting wire is minimized to reduce the loss.

3) Connect the battery

Determine the appropriate number of battery cells according to the rated battery voltage of the inverter. Connect the battery cable to a circuit breaker that meets the breaking capacity, and then connect it to the BATTERY terminal of the inverter. Note that the positive and negative poles cannot be reversed. Otherwise, the product may be damaged.

4) Connecting the load

Turn off all loads firstly, then connect the AC load to the AC output of the inverter (AC OUTPUT), confirming that the load polarity is not reversed, and ensure the load is lower than the standard power of the inverter.

5) Connecting PV

Connecting the PV, the PV array voltage and current should be lower than the maximum PV input voltage and current of the rated charge controller. Connect the PV cable to the circuit breaker that meets the breaking capacity, and then connect it to the PV input terminal of the inverter. Note:Be careful not to reverse the polarity.

6) Connect to mains

Connect the mains input cable to a circuit breaker that meets the breaking capacity, and then connect it to the AC input terminal of the inverter. Note that the phase and polarity are not reversed.

7) Selection of circuit breaker

a. The circuit breaker on the battery side should be a DC circuit breaker whose working voltage should be greater than the rated voltage of the battery; the circuit breaker on the AC input side should be an AC circuit breaker whose working voltage should be greater than the rated voltage of the mains.

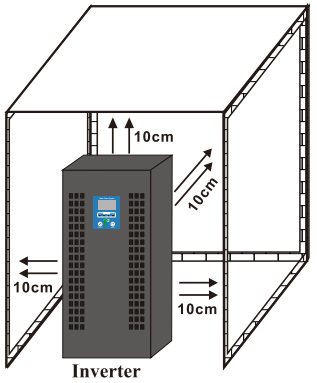
b. The rated current of the circuit breaker should be about 1.5 times of the maximum current inverter during operation .

Note:

- Before connecting the load to the machine, please turn off the loads firstly.
- This product can only protect high-voltage surges with low energy. In areas with high lightning output, it is recommended to install lightning protection devices outside the PV input terminals(Ignore this content if there is no built-in controller).
- To ensure the personal safety of the user and ensure the correct use of the product, please confirm that it is properly grounded before starting the machine.
- If user want to l oad an inductive load such as a motor or a laser printer which operating power is too large, the inverter rated capacity should be selected according to its peak power .The load starting power is generally 2 to 3 times of its rated power.

1-4: Placement

Please leave 10cm of space for each side of inverter to keep good air circulation.



★ Avoid direct sunlight

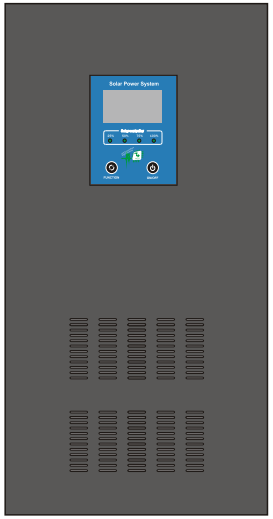
★ Avoid dust

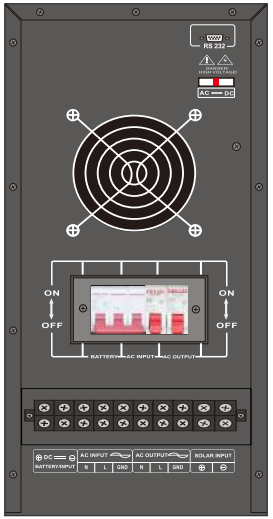
★ Avoid moisture and liquids

★ Avoid over heating

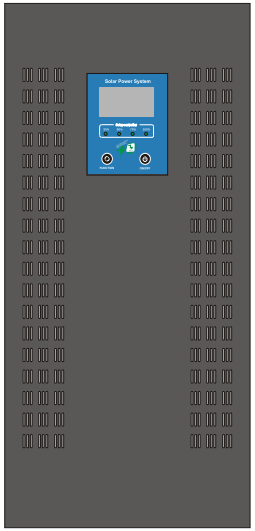
2. Outlook of Inverter

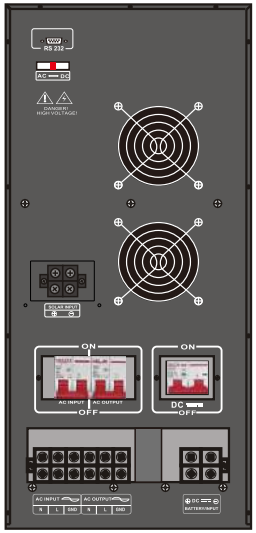
2-1: 8KW~12KW Series



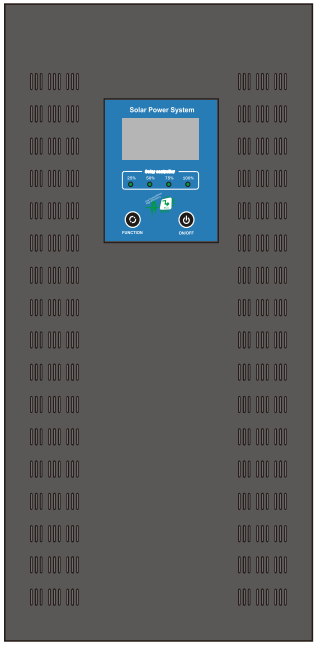


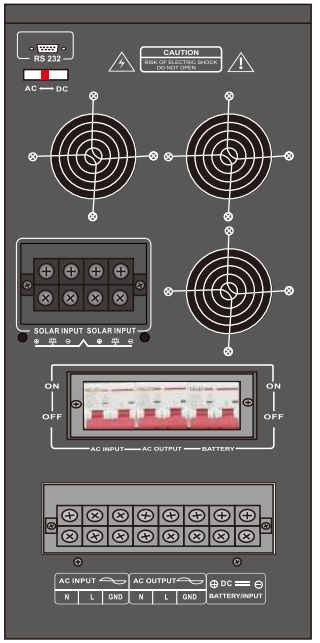
2-2: 15KW~25KW Series





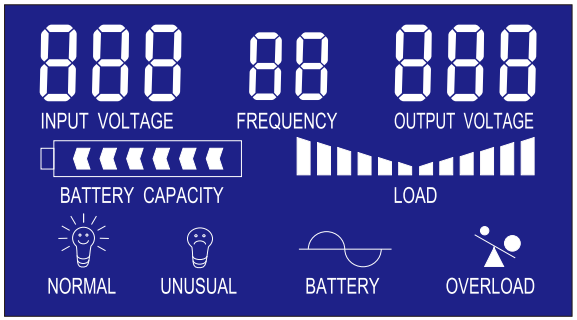
2-3: 30KW-40KW Series





Note: Images may be slightly different from actual product. Please in kind prevail!

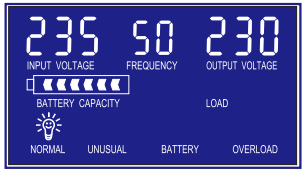
3. LCD display



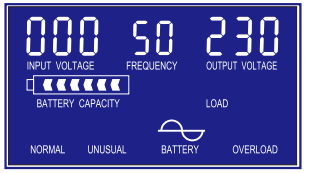
INPUT VOLTAGE	1. Display AC input voltage 2. When emergency come, shows alarm code here.
FREQUENCY	1. Display Output frequency; 2.When setting the parameters, display the work priority mode d1/d2/d3 and the mains charging current C0-C6
OUTPUT VOLTAGE	Display AC output voltage
BATTERY CAPACITY	Display battery working status and capacity
LOAD	Display load power capacity
NORMAL	If this icon is displayed, it means that the AC output is powered by the mains.
UNUSUAL	If this icon is displayed, it means that the machine is faulty.
BATTERY	If this icon is displayed, it means that the AC output is powered by the battery.
OVERLOAD	If the icon is displayed, it means that the output is overloaded.

3-1: LCD screen display content introduction

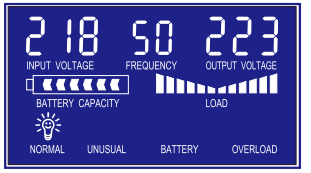
1) Mains priority mode(Has mains input)



2) Battery priority mode(No mains input)



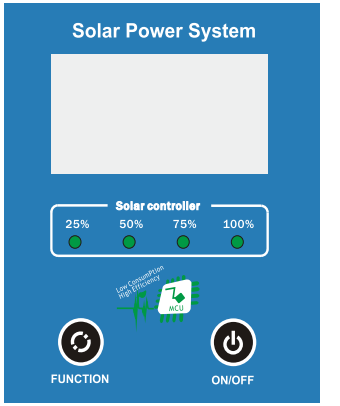
3) Mains priority mode(Has mains input and Loads)



Note: The actual display parameters are subject to the specific model, and the picture display contents are only used as examples.

4. Operation

4-1: Function and setting of button on board



1) ON/OFF button

◆ Battery supply state: Power on, press ON/OFF button for 1 second, the equipment start output; Power off, press ON/OFF button for 1 second, the equipment shutdown.

◆ AC supply state: Power on, the equipment will auto start when AC supply input; Power off, press ON/OFF button for 1 second, the equipment turn off output, the equipment shutdown after cut off AC supply.

2) FUNCTION Button

◆ Mute function: Press the FUNCTION button for 1 second to turn on/off alarm;

◆ Setting function: First long press FUNCTION button for 3 seconds, the frequency FREQUENCY on the display screen flashes, at this time, you can set the working priority mode (d1=Mains priority mode; d2=Energy saving mode; d3=Solar(Battery) priority mode); second long press FUNCTION button for 3 seconds, the frequency FREQUENCY on the display screen flashes, at this time, you can set the charging current(C0~C6, C0=0A, C6 is the maximum AC charging current); third long press FUNCTION button for 3 seconds to save data and exit setting interface.

Note: Value of AC charging current and working mode takes effect immediately after setting.

3) AC⟷ DC switching key (the key is at the back of the machine, the switching key is invalid and cannot be used)

4-2. LED indicator lights(25%/50%/75%/100%)

Solar panel charging and DC charging indicator lights

1) LED: 4 indicator light on front panel, indicate the solar panel charging capacity and battery capacity.

2) When charging in daylight, 4 indicator light are flickering, will stop flickering when battery is charged full.

3) When discharging at night, if the indicator light flickering at 25%, mean battery is almost out of power.

4) If indicator light is lighted, but no output, it mean over current, short circuit,low voltage, over voltage etc.

4-3: Features Introduction(Optional)

Auto Power On/Off Mode: under battery mode and without utility input, inverter will auto power-off when dischage battery to reach 10.5V(1x12V, low voltage protection); when charge battery to reach 13.2V(1x12V, recover voltage), inverter will auto power-on and provide statable electricity to loads.

4-4: Steps of start up

1) All required cables are connected, keep “ON” at the battery switch of the inverter.
2) Press “ON/OFF” button about 1 second to start the inverter.
3) Switch to “ON” position of city power input of the inverter(start automatically under the state of mains power).
4) Wait about 30 seconds until the output voltage stability.
5) In turn connect to the load, Turn on procedures.

4-5: Steps of power off

1) Move all loads.
2) Press“ON/OFF” button on front panel about 1 second to turn off the inverter.
3) Make input switch of the inverter to “OFF” position.
4) Make the battery switch of the inverter to “OFF” position.
5) Ensure all switches, circuit disconnected, all lights are off, the power are cut off completely.

Remarks:Introduction to three working modes

1) Mains priority mode(d1)

● When the mains is normal (in line with the mains input voltage range of the inverter), the mains charge battery, the mains and PV charge the battery simultaneously; on the other hand, the mains supplies stable power to the loads after stabilization. (the loads do not consume PV and battery energy);

● When the mains is abnormal(the mains exceeds the working range of the inverter or the mains supply is interrupted), the loads will be powered by the battery, when PV power rate is larger than the loads, PV will power the loads and the surplus energy will charge the battery; when PV power rate is less than the loads, the deficiency will be made up by battery, so both PV and battery will power the loads.

2) Battery(Solar) priority mode(d3)

● When the battery is fully charged (like single-cell battery voltage is up to 13.2VDC),even the mains is normal, the loads will be powered by the battery, when PV power rate is larger than that of the loads, PV will fully powers the loads and the surplus energy will charge the battery; when PV power rate is less than the loads, the deficiency will be made up by battery, so both PV and battery will power the loads;

● When the battery is in low voltage (the voltage of regular single-cell battery is 11VDC) and the mains is normal, the inverter will switch to mains priority mode. The mains supplies power to the load after stabilization, and the PV and mains charge the battery simultaneously. The loads do not consume the energy of PV and battery.

Remarks: Under Mains Priority Mode/ Battery Priority Mode, when the mains charging current is not set as 0A, the mains charge battery; when the mains charging current is set to 0A, the mains does not charge battery, but the solar controller charges the battery.

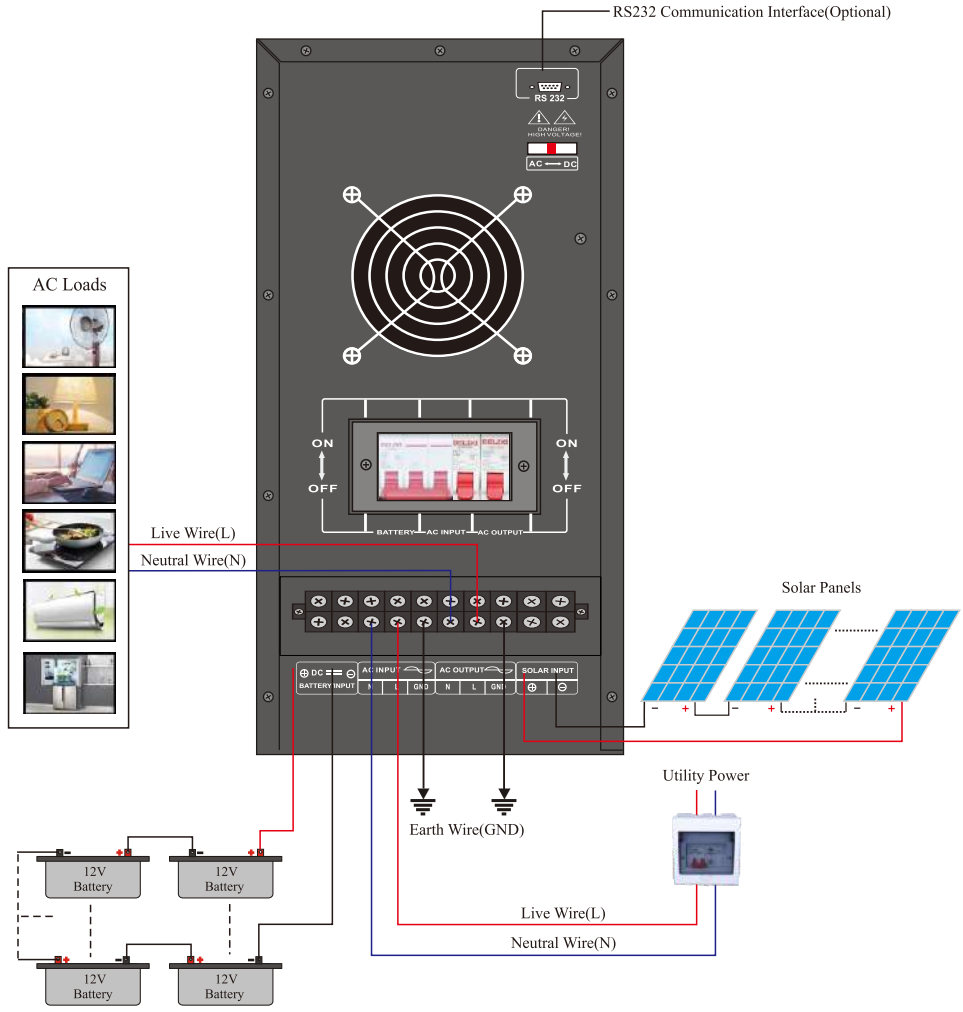
3) Energy saving mode(d2)

● Inverter works under the battery mode, once the load capacity is less than 5% of the inverter rated power, the inverter will start and stop regularly to achieve energy saving effect (ie: the machine will intermittently interrupt the inverter output); When the load is greater than 5% of the inverter rated power, the inverter will out of this energy saving mode.

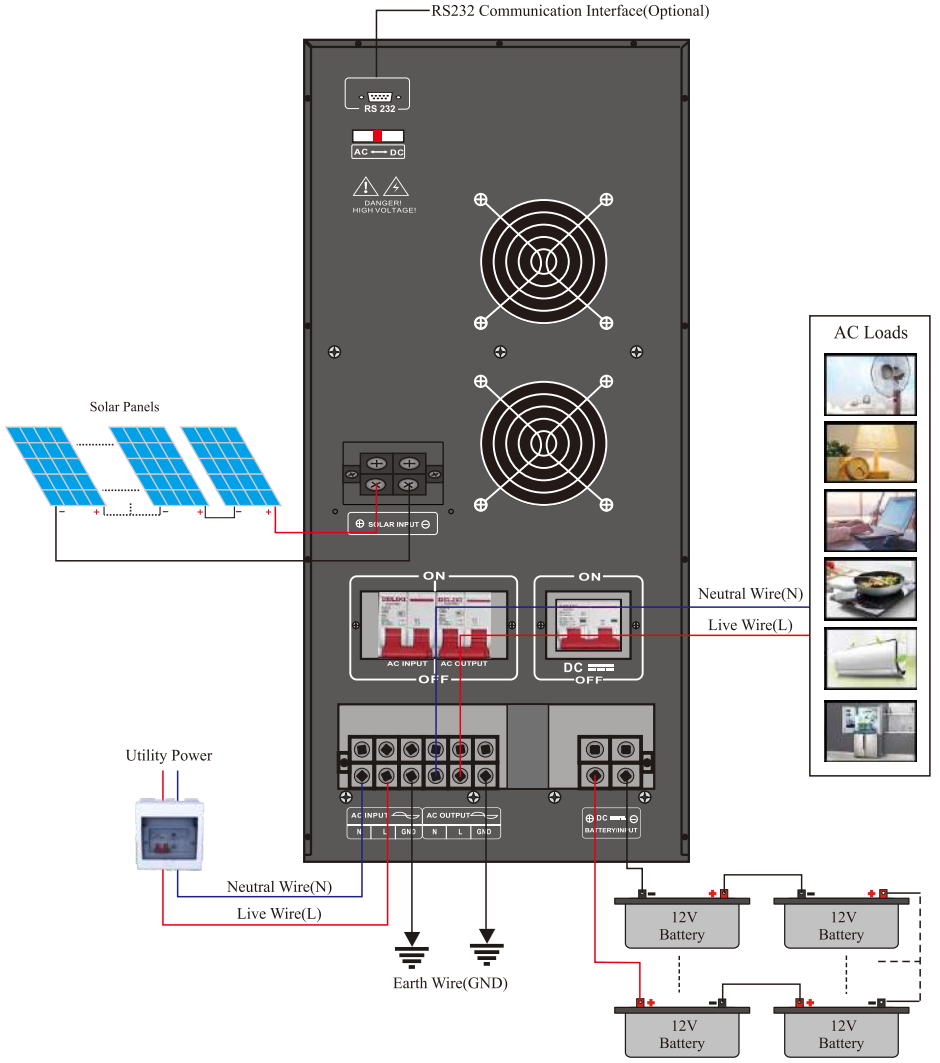
5. Wiring

(Remarks: Please refer to the technical parameter table for specific battery voltage and solar panel parameter, This diagram is only for wiring diagram. 12V system: single 12V battery; 24V system: 2 units 12V battery connect in series; 48V system: 4 units 12V battery connect in series; 96V system: 8 units 12V battery connect in series; 192V system: 16 units 12V battery connect in series; 240V system: 20 units 12V battery connect in series; 384V system: 32 units 12V battery connect in series.)

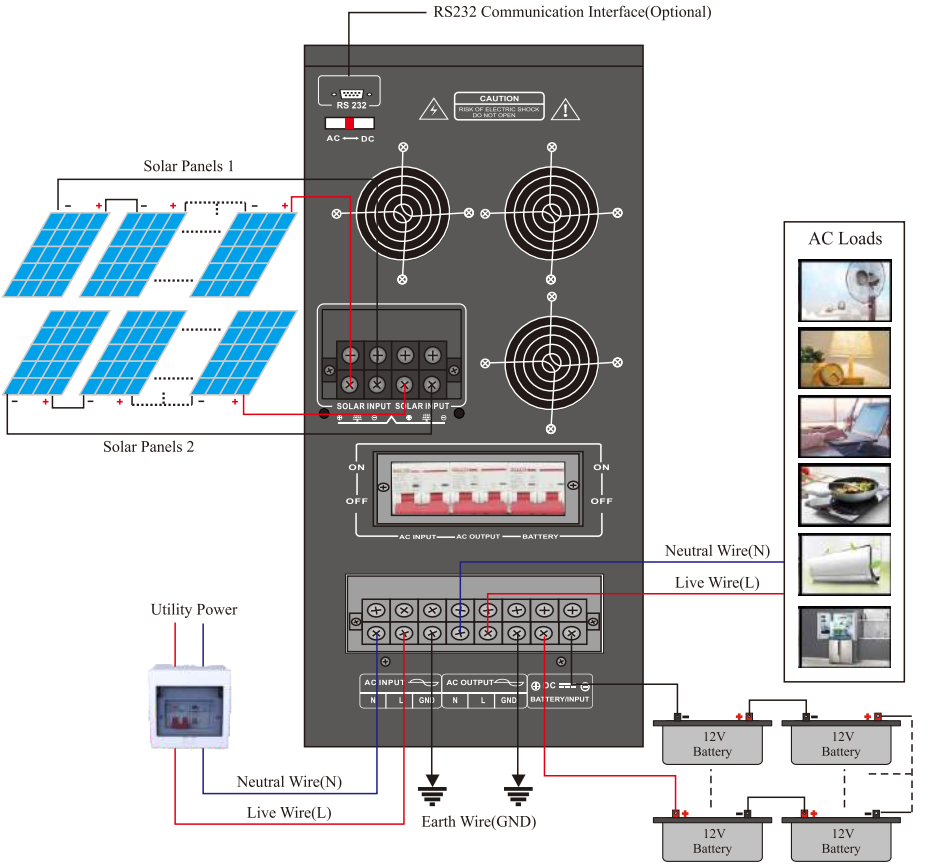
5-1:8KW-12KW Series



5-2: 15KW-25KW Series



5-6: 30KW~40KW Series



Note:

- Please avoid reverse connection while connecting batteries and PV to the inverter.
- If a generator is used as input power, the operation is as follow: start up the generator, after it runs steadily, connect and turn on inverter. When the inverter starts to work, connect user's equipment to the AC output.
- Capacity of generator≥3 times of the rated capacity of inverter.

6. Maintenance

1) The inverter just needs the minimum maintenance. And life of Pb(battery) can be preserved by frequent charge.
2) Batteries should be charged for every three months if the inverter is long-term unused.
3) Lifespan of battery normally lasts for three to five years. It should be replaced in advance if any battery is found in poor state. And the replacement shall be operated by the professional.
4) Batteries should be wholly replaced by the instruction of the supplier.
5) For every three months, batteries should be discharged (until the inverter shuts down) and recharged. Every charge (by standard inverter) should last at least for 12 hours.
6) Among high temperature area, batteries should be discharged and recharged forevery two months. Every charge (by standard inverter) should last at least for 12 hours.

Note:

- Please shut down the inverter and disconnect AC input before replacing batteries.
- Please do not wear metal jewelry such as ring or watch.
- Please use screwdriver with insulated handle and avoid to place tools or metal objects on batteries.
- Please avoid short circuit or reverse connection.

Warning:

1) Battery must not be put in the fire, which may cause explosion.
2) Shall not open or damage the battery. Electrolyte released will cause harm to eyes and skin and even intoxication.

7. Error and Solution

7-1: Regular error

Error	Reason	Solution
Unable to boot	Low voltage in battery or overload	Charging the battery or reduce the loads
Shut down with load	Low voltage in battery or overload	Charging the battery or reduce the loads
Alarm for boot	Low voltage in battery or overload	Charging the battery or reduce the loads
Heat of connector	Poor contact	Check and fasten the screws

7-2: Code for alarm

Code for alarm	Reason	Solution
A01	Over temperature protection	Check and reduce some loads
A02	Reversion of transformer	Please contact the supplier
A03	Data-saving error	Please contact the supplier
A04	Internal reference voltage error	Please contact the supplier
A05	Output short circuit protection	Please check if user's equipment is short circuit.
A06	Battery over voltage protection	Please contact the supplier
A07	NTC error	Please contact the supplier
A08	Communication failure of controller	Please contact the supplier
A11	Overload alarm/protection	Please reduce the loads
A12	Contra variant error	Please contact the supplier
A13	Battery low voltage alarm	AC output is going to stop, please set as AC first with charging mode, and restart the inverter
A14	Battery low voltage protection	Please turn into AC first with charging mode, and restart the inverte
A15	AC over voltage alarm	Please check the AC input voltage
A16	Battery over voltage protection	Please contact the supplier

8. Technical specification

Model: T		80296/192	10396/192	12396/192	153192	203220	253220	303240	403384
Rated Power		8KW	10KW	12KW	15KW	20KW	25KW	30KW	40KW
Battery Voltage		96/192VDC			192VDC	220VDC	220VDC	240VDC	384VDC
Size(L*W*Hmm)		485*300*646			600*300*800			720*435*1120	
Package Size(L*W*Hmm)		550*365*785			665*365*830			790*505*1260	
N.W.(kg)		64	66	70	108	113	119	135	160
G.W.(kg)(Wooden Packing)		74	76	80	121	130	136	150	180
Installation Method		Tower							
Input	DC Input Voltage Range	10.5-15VDC(Single battery voltage)							
	AC Input Voltage Range	98VAC~125VAC/ 108VAC~135VAC/195VAC~250VAC/205VAC~260VAC/215VAC~270VAC							
	AC Input Frequency Range	45Hz~55Hz(50Hz) / 55Hz~65Hz(60Hz)							
	Max AC charging current	6A~15A (Depending on the model)							
	AC charging voltage	LEAD battery: Charge Voltage :14.2V; Float Voltage:13.8V(Single battery voltage)							
	AC charging method	Three-stage (constant current, constant voltage, floating charge)							
Output	Efficiency(Battery Mode)	≥85%							
	Output Voltage(Battery Mode)	110VAC±2% / 120VAC±2% / 220VAC±2% / 230VAC±2% / 240VAC±2%							
	Output Frequency (Battery Mode)	50/60Hz±1%							
	Output Wave(Battery Mode)	Pure Sine Wave							
	Efficiency(AC Mode)	>99%							
	Output Voltage(AC Mode)	Follow input							
	Output Frequency(AC Mode)	Tracking Automatically							
	Output waveform distortion (Battery Mode)	≤3%(Linear load)							
	No load loss(Battery Mode)	≤1% rated power							
	No load loss(AC Mode)	≤2% rated power(charger does not work in AC mode)							
	No load loss (Energy saving Mode)	≤10W							
Battery Type	Customize battery	Charge and discharge parameters of different types of batteries can be customized according to user requirements							
Protection	Battery lowvoltage alarm	Factory default: 11V(Single battery voltage)							
	Battery lowvoltage protection	Factory default: 10.5V(Single battery voltage)							
	Battery overvoltage alarm	Factory default: 15V(Single battery voltage)							
	Battery overvoltage protection	Factory default: 17V(Single battery voltage)							
	Battery overvoltage recovery voltage	Factory default: 14.5V(Single battery voltage)							
	Overload power protection	Automatic protection (battery mode), circuit breaker or insurance (AC mode)							
	Inverter output short circuit protection	Automatic protection (battery mode), circuit breaker or insurance (AC mode)							
	Temperature protection	>90°C(Shut down output)							

Alarm	A	Normal working condition, buzzer has no alarm sound	
	B	Buzzer sounds 4 times per second when battery failure, voltage abnormality, overload protection	
	C	When the machine is turned on for the first time, the buzzer will prompt 5 when the machine is normal	
Inside Solar controller (Optional)	Charging Mode	PWM	
	Charging current	50A/100A	50A/100A/150A/200A
	PV Input Voltage Range	120V-176V(96V system); 240V-352V(192V system); 275V-403V(220V system); 300V-440V(240V system); 480V-704V(384V system)	
	Max PV Input Voltage(Voc) (At the lowest temperature)	200V(96V system); 400V(192V system); 458V(220V system); 500V(240V system); 750V(384V system)	
	PV Array Maximum Power	96V system: 5.6KW(50A)/11.2KW(100A) ; 192V system: 11.2KW(50A)/22.4KW(100A) ; 220V system: 12.8KW(50A)/25.6KW(100A); 240V system: 14KW(50A)/28KW(100A)/21KW*2(150A)/28KW*2(200A) ; 384V system: 22.4KW(50A)/44.8KW(100A)/33.6KW*2(150A)/44.8KW*2(200A)	
	Standby loss	≤3W	
	Maximum conversion efficiency	>95%	
Working Mode		Mains priority mode/Energy saving mode/Solar(Battery) priority mode	
Transfer Time		≤4ms	
Display		LCD	
Thermal method		Cooling fan in intelligent control	
Communication		RS232(Optional)	
Environment	Operating temperature	-10°C~40°C	
	Storage temperature	-15°C~60°C	
	Noise	≤55dB	
	Elevation	2000m(More than derating)	
	Humidity	0%~95% (No condensation)	

Above parameter revision change without notification.

Warranty Card

Customer Name: _____ Tel.: _____

Address: _____

Brand: _____ Model: _____

Serial No.: _____ Date of Purchase: _____

Bought From: _____

Invoice Number: _____ Invoice Price: _____

Warranty Instruction

- Please keep this warranty card as proof of maintenance.
- The warranty period is 1 year from the date of purchase.
- During the warranty period, under the condition of normal use and maintenance, if damage caused by the product's own quality, the company will provide free repair and replacement parts after verification.
- The company reserves the right to maintain and interpret all contents.

Free maintain won't be given under the following circumstance:

- The damage caused by the manipulation that hasn't follow the requests of the manual.
- The product has been repaired, modified by technicians other than our company's, and any internal parts of the product have been replaced by users.
- The product number has been altered or product is inconsistent with the warranty card.
- Damage caused by careless use, penetration of water or other substances into the product.
- Damage caused by accident or natural disaster.

Certificate

Name: _____

Model: _____

Inspectors: _____

Date: _____

Products have been tested qualified by standard and permitted to deliver.