

**PURE SINE WAVE INVERTER Charger**

**1080W-1580W**

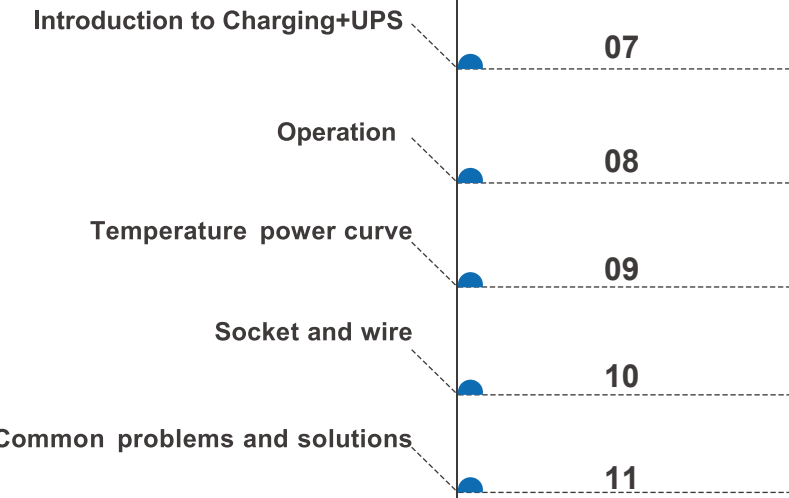
# User Manual

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\* Please read the instruction manual carefully before

# Table of Contents



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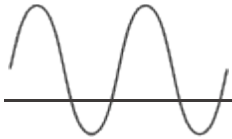
# 01

## Product introduction

### 1-1.What is an inverter

An inverter is an electronic device that converts DC power to AC power. Direct current is electricity generated by batteries, while alternating current is the electricity required to operate electrical equipment. It is mainly used in places and situations where there is no AC power supply.

### 1-2. Pure sine wave inverter



PURE SINE WAVE(PSW)



MODIFIED SINE WAVE(MSW)

The pure sine wave inverter technology is based on the principle of AC generator sets of the grid, and the microprocessor (MPU) is designed to control the voltage current waveform. Under the power corresponding, the pure sine wave we designed can be used and responsible for all AC.

The voltage waveform of the pure sine wave on the grid is from the AC power generator. Nikola Tesla invented the first AC generator in 1882, since then, sine wave alternating current is generated. The principle is that the conductor winding of the generator set is rotated by the magnetic field S-pole to N-pole rotation. The sine wave voltage and current generated by the exchange of switched changes in this magnetic field are supplied to the load from the normal half wave from the normal half wave Zero gradually increases to gradually reduce zero, re-reversible magnetic field polarity, by negative half waves, gradually change in the same way, and completes one cycle within a certain period of time. The change in pure sine wave is like two parabolic changes, the cycle change time is a positive half wave 10 ms plus a negative half wave 10ms equal to 20ms, that is, 50 Hz, because the sine wave gradually transform as parabola do, so it is enough to be used and responsible for all AC.

# 02 Safety Instructions

## 2-1. General Safety Precautions



**Warning! Before using the Inverter, read the safety instructions.**

- Do not expose the inverter to rain, snow, spray or dust To reduce the risk of fire hazard, do not cover or obstruct the ventilation openings and do not install the inverter in a zero-clearance compartment.
- To avoid the risk of fire and electric shock, make sure that the existing Wiring is in good electrical condition, and the Wire size is not undersized.
- This equipment contains components which can produce arcs or sparks.To prevent fire or explosion do not install in compartment containing batteries or flammable materials or in location which require ignition protected equipment This includes any space containing gasoline-powered machinery, fuel tanks, or joints, fittings, or other connection between components of the fuel system.
- Depending on the user scenario, the AC output of the inverter may require user installed breaker or fuse. In AC output hardwire application,AC socket will not be provided. The inverter incorporates standard AC shod circuit protection.
- An over current protection at the time of installation shall be provided by others for the AC output circuit.
- Additional breakers suitable for 20 A branch circuit protection shall be provided for the GFCI receptacles.
- The following precautions should be taken when working on the inverter:
  - Step 1 Remove watches, rings, or other metal objects
  - Step 2 Use tools with insulated handles
  - Step 3 Wear rubber gloves and boots

**This series of products are off-grid inverters. It is forbidden to connect other AC power with the output AC power of the inverter.**

# 02 Safety Instructions

## 2-2. Other Safety Notes

- Upon receipt, examine the carton box for damage. If you have found any damage on the carton box please notify the company you purchased this unit from.
- Do not operate near water or in excessive.
- Do not open or disassemble the inverter, and warranty may be voided.
- The DC side connections should be firm and tight.
- Grounding: Reliable grounding should be maintained
- Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery or on the other electrical pan may cause an explosion.
- Install the inverter in a well-ventilated area. Do not block the front air vents, or the rear air exhausts of the unit.
- Wiring: Adequate input power must be supplied to the inverter for proper use; correct wiring sizes must be ensured.
- Mount the inverter such that the fan axis is horizontal.
- Do not operate the inverter close to combustible gas or open fire.
- Do not operate appliances that may feed power back into the inverter.
- Temperature: The inverter should be operated in an ambient temperature range of -30°C to 60°C otherwise the output efficiency may be affected. Air flow to the inverter must not be blocked.

# 03

## Functional Characteristics Introduction

### 3-1. System

- The unit is a highly reliable DC-AC inverter system, designed with advanced power electronic and microprocessor technology offering the following features:
  - Pure sine wave output waveform O/P voltage THD<3%.
  - Intelligent software for power management
  - Loading and temperature controlled cooling fan
  - Dry contact terminal
- Advanced Protection Features
  - Input over/under voltage protection
  - Internal over temperature protection
  - Input reverse polarity protection (Fuse)
  - Output overload protection
  - Output short circuit protection
- SPWM technology controlled by MCU micro-processing, pure sine wave output.
- Unique dynamic current loop control technology to ensure reliable operation of the inverter.
- Strong load adaptability, including inductive load, capacitive load, resistive load, and mixed load.

# 03

## Functional Characteristics Introduction

### 3-2. Protective function

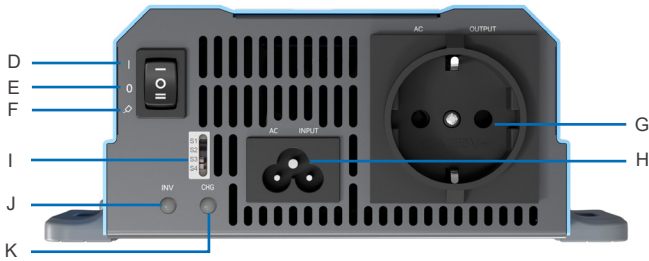
- 1) Low-voltage alarm: The buzzer sounds 2 times with 1 Hz gap.
- 2) Low voltage protection: The buzzer continuously sounds 3 times alarm, with 1 Hz gaps
- 3) Low-voltage recovery: the low-voltage rise automatically restores the output, and the buzzer sounds 3 times alarm is cancelled.
- 4) Overvoltage protection: The buzzer sounds 4 times, with 1 Hz gap.
- 5) Overvoltage recovery: The voltage is reduced automatically to restore the output, and the buzzer sounds 4 times alarm is cancelled.
- 6) Thermal protection:  $85^{\circ} \pm 5^{\circ}$ , when overheat protection buzzer sounds 5 times alarm, with 1 Hz gap.
- 7) Overload protection: overload 100%~115% 60s Turn off,  
overload 116%~150% 3s Turn off,  
overload 151%~200% 1s Turn off,  
overload >200%, 200ms Turn off, The buzzer blared .
- 8) Short circuit protection: Output short circuit protection 3s shutdown lock.

MODELNO.		1080W		
OUTPUT	Rated Power (Typ.)	1080W		
	Maximum Output Power (1 Min)	>1080W~1240W (100%~115%)		
	Surge Power ( Max. 3 Sec )	>1240W~1620W (115%~150%)		
	Surge Power ( Max. 1 Sec )	>1620W~2160W (150%~200%)		
	Surge Power ( Max. 0.2 Sec )	>2160W (>200%)		
	AC Voltage	220/230/240VAC		
	Frequency	50/60 Hz ± 0.5%		
	Waveform	Pure sine wave (THD<3%)		
	AC Regulation (Typ. )	±5%		
	LED Indicator	Input voltage level, output load level and faulty status		
AC INPUT	AC INPUT	180VAC~240VAC 50/60 Hz		
	LED Indicator	Red Light: In charging Green Light: Fully charged		
	Charging Way	3 Stage(Constant Current, Constant Voltage, Float Charge)		
	Suitable Battery	Gel, Lifepo4, Acid, AGM		
	Dip switch for select battery type	Constant Voltage: S1=14V,S2=14.2V,S3=14.4V,S4=14.6V Float Charge: S1=13.2V,S2=13.4V,S3=13.6V,S4=13.8V	Constant Voltage: S1=28V,S2=28.4V,S3=28.8V,S4=29.2V Float Charge: S1=26.4V,S2=26.8V,S3=27.2V,S4=27.6V	Constant Voltage: S1=56V,S2=56.8V,S3=57.6V,S4=58.4V Float Charge: S1=52.8V,S2=53.6V,S3=54.4V,S4=55.2V
Max Charging Current	20A	10A	5A	
By Pass Mode	By Pass Switching Time	≤15ms		
	Maximum bypass output current	8A		
INPUT	DC Voltage	12VDC	24VDC	48VDC
	Voltage Range	10.5~16.5VDC	21.0~33.0VDC	42.0~66.0VDC
	No Load Current	0.6A	0.4A	0.25A
	Efficiency (80% .)	91%	92%	93%
	Remote Standby Mode	≤ 0.8W	≤ 0.8W	≤ 0.8W
PROTEC- TION	Input Under - Voltage Protection	10.0 ± 0.3VDC	20.0± 0.5VDC	41.0 ± 1.0VDC
	Input Under - Voltage Recovery	12.5 ± 0.3VDC	25.0± 0.5VDC	50.0 ± 1.0VDC
	Input Over - Voltage Protection	16.5 ± 1.0VDC	33.0± 1.0VDC	63.0 ± 1.0VDC
	Input Over - Voltage Recovery	15.0 ± 0.5VDC	30.0± 0.5 VDC	58.0 ± 1.0VDC
	Output Overload	1080W ≥ 115% 1 minute automatic shutdown output, automatic lock, restart to recover		
	Output Short Circuit	Output short circuit protection 3s shutdown lock, restart to recover		
	Over Temperature	85°C ± 5°C		
	DC Input Reverse Polarity	By internal fuse open		
SAFETY& EMC	Withstand Voltage	Bat I/P-AC O/P:3.0 KVAC AC O/P -FG:1.5 KVAC		
	Isolation Resistance	Bat I/P-AC O/P, Bat I/P - FG, AC O/P-FG:10.0 M ohms / 50.0VDC/ 25°C /70% RH		
	EMC Emission	Compliance to FCC classA , E-Mark EACTPTC 020 , EN55032 classA, 72/245/ CEE.95/54/ CE		
	EMC Immunity	Compliance to EAC TPTC 020 , EN61000-4-2,3,4,5,6,8,11		
ENVIRON- MENT	Working Temp	-30 °C ~ 60°C		
	Working Humidity	20~90% RH		
	Storage Temp, Humidity	-30~ +70 °C /-22~+158 F,10~95% RH non-condensing		
OTHERS	Dimension	312*185*73mm		
	Packing	= 2.8 KG		



MODELNO.		1580W		
OUTPUT	Rated Power (Typ.)	1580W		
	Maximum Output Power (1 Min)	>1580W~1817W (100%~115%)		
	Surge Power ( Max. 3 Sec )	>1817W~2370W (115%~150%)		
	Surge Power ( Max. 1 Sec )	>2370W~3160W (150%~200%)		
	Surge Power ( Max . 0.2 Sec )	>3160W (>200%)		
	AC Voltage	220/230/240VAC		
	Frequency	50/60 Hz $\pm$ 0.5%		
	Waveform	Pure sine wave (THD<3%)		
	AC Regulation (Typ. )	$\pm$ 5%		
	LED Indicator	Input voltage level, output load level and faulty status		
AC INPUT	AC INPUT	180VAC~240VAC 50/60 Hz		
	LED Indicator	Red Light: In charging Green Light: Fully charged		
	Charging Way	3 Stage(Constant Current, Constant Voltage, Float Charge)		
	Suitable Battery	Gel, Lifepo4, Acid, AGM		
	Dip switch for select battery type	Constant Voltage: S1=14V,S2=14.2V,S3=14.4V,S4=14.6V Float Charge: S1=13.2V,S2=13.4V,S3=13.6V,S4=13.8V	Constant Voltage: S1=28V,S2=28.4V,S3=28.8V,S4=29.2V Float Charge: S1=26.4V,S2=26.8V,S3=27.2V,S4=27.6V	Constant Voltage: S1=56V,S2=56.8V,S3=57.6V,S4=58.4V Float Charge: S1=52.8V,S2=53.6V,S3=54.4V,S4=55.2V
	Max Charging Current	20A	10A	5A
By Pass Mode	By Pass Switching Time	$\leq$ 15ms		
	Maximum bypass output current	8A		
INPUT	DC Voltage	12VDC	24 VDC	48VDC
	Voltage Range	10.5~16.5VDC	21.0~33.0VDC	42.0~66.0VDC
	No Load Current	0.6A	0.4A	0.25A
	Efficiency (80% .)	91%	92%	93%
	Remote Standby Mode	$\leq$ 0.8W	$\leq$ 0.8W	$\leq$ 0.8W
PROTEC- TION	Input Under - Voltage Protection	10.0 $\pm$ 0.3VDC	20.0 $\pm$ 0.5VDC	41.0 $\pm$ 1.0VDC
	Input Under - Voltage Recovery	12.5 $\pm$ 0.3VDC	25.0 $\pm$ 0.5VDC	50.0 $\pm$ 1.0VDC
	Input Over - Voltage Protection	16.5 $\pm$ 1.0VDC	33.0 $\pm$ 1.0VDC	63.0 $\pm$ 1.0VDC
	Input Over - Voltage Recovery	15.0 $\pm$ 0.5VDC	30.0 $\pm$ 0.5 VDC	58.0 $\pm$ 1.0VDC
	Output Overload	1080W $\geq$ 115%		
		1 minute automatic shutdown output ,automatic lock, restart to recover		
	Output Short Circuit	Output short circuit protection 3s shutdown lock, restart to recover		
	Over Temperature	85°C $\pm$ 5°C		
DC Input Reverse Polarity	By internal fuse open			
SAFETY& EMC	Withstand Voltage	Bat I/P-AC O/P:3.0 KVAC AC O/P -FG:1.5 KVAC		
	Isolation Resistance	Bat I/P-AC O/P, Bat I/P - FG, AC O/P- FG:10.0 M ohms / 500VDC/ 25°C /70% RH		
	EMC Emission	Compliance to FCC classA , E-Mark EACTPTC 020 , EN55032 classA, 72/245/ CEE,95/54/ CE		
	EMC Immunity	Compliance to EAC TPTC 020 ,EN61000-4-2,3,4,5,6,8,11		
ENVIRON- MENT	Working Temp	-30°C ~ 60°C		
	Working Humidity	20~90% RH		
	Storage Temp, Humidity	-30~ +70°C /-22~+158 F,10~95% RH non-condensing		
OTHERS	Dimension	312*185*70mm		
	Packing	$\approx$ 3.0KG		

# 05 Panel description



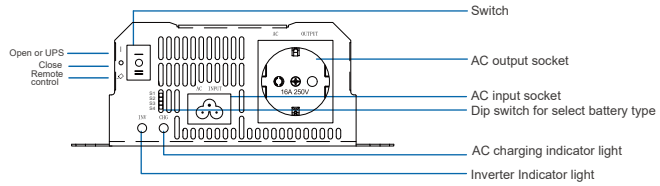
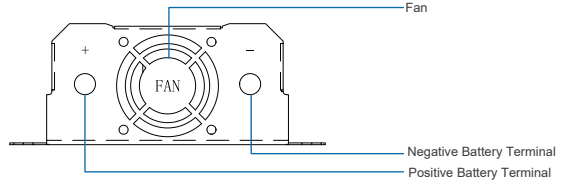
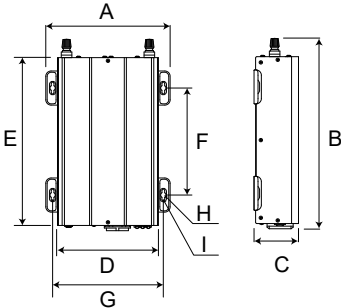
## POWER: 1080W/1580W

Model	1080W / 1580W	
A	Fan	1. temperature detection, forced air cooling; 2. Start the fan with load power;
B	Negative Battery Terminal	Connect the negative terminal of the battery
C	Positive Battery Terminal	Connect the positive terminal of the battery
D	Open	Inverter switch is on, or ups switchover
E	Close	Inverter switch is off
F	Remote control	Remote control switch is on
G	Terminal output (AC)	AC output socket
H	Terminal input (AC)	AC input socket
I	Dip switch for select battery type	S1=14V, S2=14.2V, S3=14.4V, S4=14.6V
J	Indicator light	Green: Inverter normal output, low voltage warning Red: short circuit, over temperature, over voltage, over load, under voltage protection
K	AC charging indicator light	Red Light: In charging Green Light: Fully charged

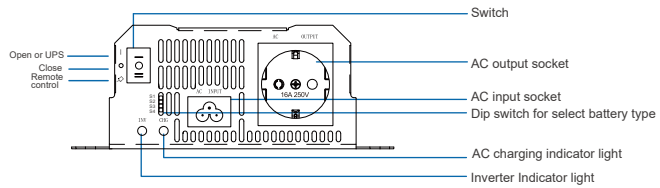
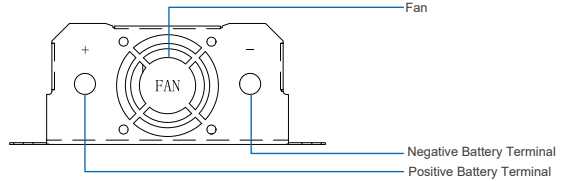
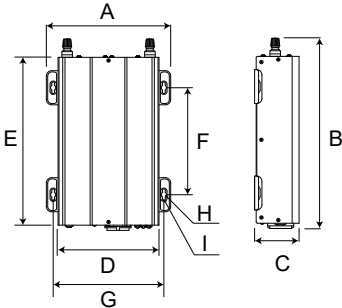
# 06

## Dimensions

### 1080W



### 1580W



Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
1080W	185	312	70	140	270	154	158.5	Ø10	Ø5.2
1580W	185	312	70	140	270	154	158.5	Ø10	Ø5.2

# 07

## Introduction to Charging+UPS

### Introduction :

When the public power supply fails, it converts the battery's DC power into AC power to support the operation of electrical appliances.

When the public power supply is turned on, it automatically switches to the AC main power supply, and then automatically performs three-level charging of the battery. The transmission time is less than 10ms or 15ms and has no impact on your AC appliances.

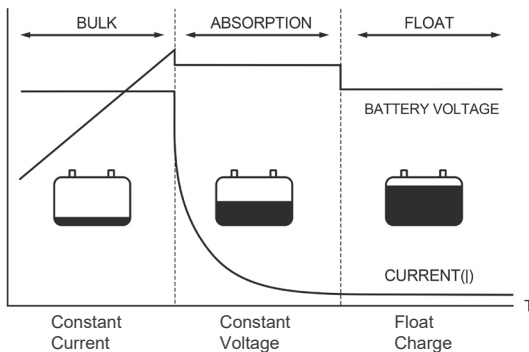
### 1.Charging working mode:

1 Automatic three-level battery charging:

7-1-1. The first stage of constant current - fast charging of high current batteries.

7-1-2. The second stage of constant voltage - the constant voltage battery is moderately charged so that the battery can absorb power well and maximize the battery life.

7-1-3. The third stage of float charging - when the battery is charged to about 99%.  
The charger automatically switches to "float charging mode" to keep the battery in good condition.

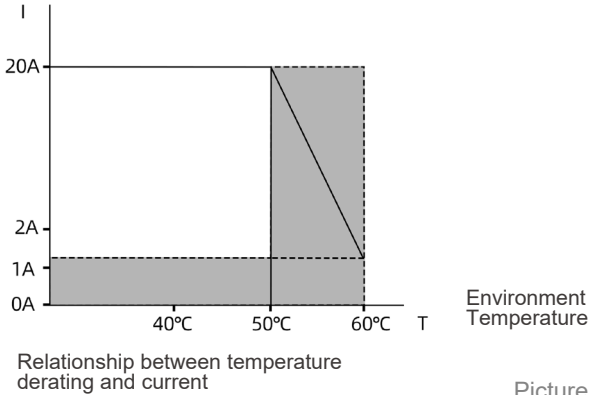


Picture1

# 07

## Introduction to Charging+UPS

When the temperature detection is abnormal and the fan does not start due to abnormality, the over-temperature protection is activated when the detected temperature reaches the set value of 90°, and the load is automatically derated to 1.2A of the rated power to ensure that the charger is in a safe state;



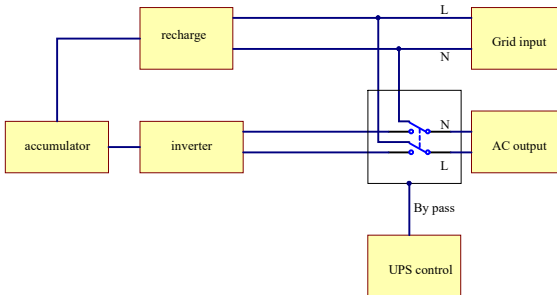
Picture2

### 2. UPS switching mode:

7-2-1. When the mains power is connected, the mains power charging will be used by default, with mains power priority.

7-2-2. The inverter switches on and enters the UPS switchover mode, By Pass Switching Time:≤15ms

7-2-3. Maximum bypass output current and voltage:8A 180V-240VAC



UPS block diagram

Picture3

# 08 Operation

## 8-1. Connecting the input power

Before making the DC input side connections , the main switch must be at “OFF”.

## 8-2. Connecting the loads

Calculate the total power consumption of the output load. Make sure that the total power consumption does not exceed the rated power.

If the total power consumption over the rated power of the inverter, remove the non-critical: loads until the total power consumption is below that rated power.

## 8-3. Connection the DC cable

Connect DC input terminals to 12V / 24V /48V battery or other DC power source [ + ] is positive, [ - ] is negative.

Reverse polarity connection can blow the internal fuse and may damage th inverter permanently.

## 8-4.\*Warning!

Make sure that all the DC connections are tight (torque to 2.2 – 2.5 ft-lbs, 3–3.5 Nm). Loose connections could result in overheating and can be a potential hazard.

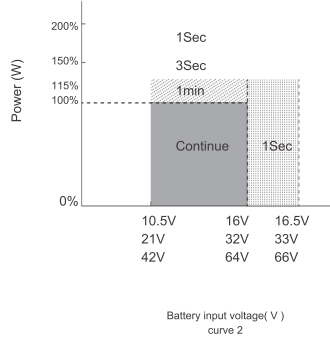
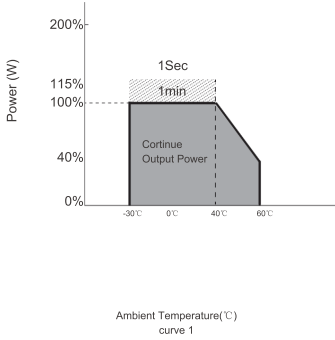
## 8-5. Switch ON Inverter

Set the power switch to the “ON” position . The inverter will carry out self-diagnosis and, the LED’s will also appear various colors. Set the power switch to the “OFF” position. The inverter stops and all the lights that are on will go off.

# 09

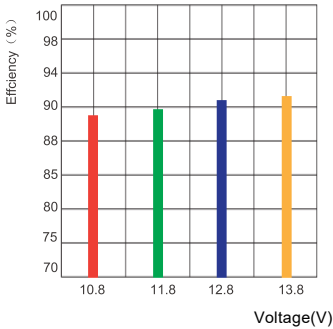
## Temperature Power Curve

### Derating Curve



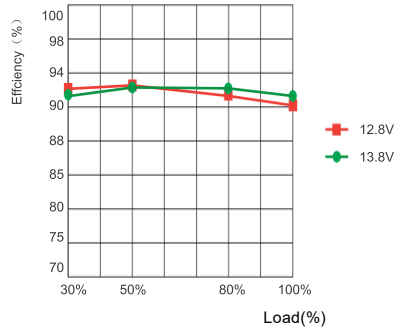
### Efficiency VS Load

12V model, ambient temperature 25 °C



Efficiency Comparison of Full Load Power Output at Different Input Voltages









12V model, ambient temperature 25 °C



Efficiency Variation with Different Output Loads at Fixed Input Voltage

# 10

## Socket And Wire

Socket type			 <small>(Terminal inside case only, no AC socket)</small>					 <small>(Terminal inside case only, no AC socket)</small>
	Standard	Optional	Optional	Standard	Optional	Optional	Optional	Optional
Country	USA	GFCI (60Hz)	—	—	AUSTRALIA	U.K	EUROPE	—

Inverter type	Input Voltage	DC Battery Cable	Fuse	Battery Capacity
1080W	12V	10mm <sup>2</sup>	40A*5	≥200Ah
	24V	5mm <sup>2</sup>	20A*4	≥80Ah
	48V	3mm <sup>2</sup>	10A*4	≥40Ah
1580W	12V	15mm <sup>2</sup>	40A*6	≥240Ah
	24V	8mm <sup>2</sup>	20A*6	≥120Ah
	48V	5mm <sup>2</sup>	10A*6	≥60Ah

### Accessories:

- 1.Charging cable, length 1000mm(standard)
- 2.Remote control (optional)
- 3.DC cable,length 500mm (optional)



Charging cable (standard)



Remote control (optional)



DC wiring (Test wire)



# 11

## Common Problems And Solutions

- The inverter may be affected by some strong electromagnetic waves in the use, such as nearby motors, power inverters, strong magnetic fields, etc.
- Inverter indicator is not light
  1. The battery and inverter are not connected and reconnected.
  2. The pole of the battery is reversed and the fuse is blown. Replace the fuse.
- Low output voltage
  1. Overload, the load current exceeds the nominal current, and some of the load is turned off to restart.
  2. The input voltage is too low. Make sure the input voltage is within the nominal voltage range.
- Low voltage alarm
  1. The battery is out of power and needs to be charged.
  2. The battery voltage is too low or the contact is poor, recharge, check the battery terminals or clean the terminals with a dry cloth.
- Inverter has no output
  1. The battery voltage is too low, recharge or replace the battery.
  2. The load current is too high, and some of the load is turned off to restart the inverter.
  3. Inverter over temperature protection. Allow the inverter to cool for a while and place it in a well ventilated area.
  4. The inverter failed to start and restarted.
  5. The terminal is reversed, the fuse is blown, and the fuse is replaced.
- Warm reminder:

\* Based on better optimization of product performance, the company has the right to optimize and upgrade the product without further notice to the user.