User's Manual

Before using the inverter, you need to read and save the safety instructions.

STI SERIES

(STI200, STI300, STI500, STI700, STI1000)

Power Frequency
Pure Sine Wave Inverter

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.

CONTENTS

1. Introduction

Thanks for purchasing STI series inverter. The product is a pure sine wave power frequency inverter which can convert 12/24/48Vdc to 220/230Vac 50Hz based on full digital and intelligent design. It features high reliability, high efficiency, concise outline, full protection functions, easy installation and operation. The inverter can be applied in many fields, such as household appliances, electric tools and industrial devices etc, especially for solar photovoltaic power system.

Features:

- Complete isolation-type inverter technology, noiseless output.
- Adoption of advanced SPWM technology, pure sine wave output.
- Dynamic current loop control technology to ensure inverter reliable operation.
- Wide DC input voltage range.
- Excellent EMC design.
- Low output harmonic distortion(THD≤3%).
- LED indicators for input voltage range, load power range, normal output & failure state.
- Optional energy saving mode.
- Electronic protect for reverse polarity.
- Extensive protections: short-circuit, overload, under/over input voltage, over-temperature, and inverter's inner fault identification protections.
- Wide working temperature range (industrial level).
- Continuous operation at full power.

2. Important Safety Instructions

As an AC power supply equipment, the inverter's output voltage is with the same level as that of household power plug. Mind the AC output terminals, or you may get an electric shock!

Attentions:

- Connect the DC input according to the requirement strictly. The power inverter has a relatively wide input range, but too high or too low input may cause problems even destroy the inverter. The surge input voltage can't exceed 18V for the 12V inverters, 36V for 24V inverters, 72V for 48V inverters, or the inverters will be damaged.
- Do not expose the inverter to humid, flammable, explosive or dust environment.
- Keep the inverter out of children touch.
- Inverter input is recommended to connect to battery, the min. capacity of battery(expressed in AH) should be calculated in the following way: 5times of the rated power of the inverter/battery voltage. If for testing purpose, user should select DC power supply current at least twice greater than that of the inverter rated input to keep inverter normal operation. Use DC power supply for testing may cause the damage of the inverter.
- When the inverter works continuously, its surface may became very hot, please make sure the air ventilation clearance around the inverter is more than 10cm. Keep away from the material or device which may suffer from high temperature when the inverter is working. Do not install the inverter in airproof location and keep enough space around the inverter.
- The wire connects between battery and inverter should be shorter

than 3m, the current density should be less than 3.5A/mm^2 while the output of inverter is fully loaded. If the wire longer than 3m, the current density should be reduced.

- A fuse or breaker should be used between battery and inverter, the value of fuse or switch should be twice of the inverter rated input current.
- Do not connect the battery charger or similar devices to the input terminal of the inverter.
- Do not put the inverter close to the flooded lead-acid battery because the sparkle in the terminals may ignite the hydrogen released by the battery.
- It's an off-grid inverter, if connect to the grid, the inverter may be damaged.
- This inverter can only be used singly, parallel connection or in series will damage the inverters.
- Do not attempt to repair the fault inverter yourself, otherwise it may lead to a serious accident. Please contact the manufacture's engineer.

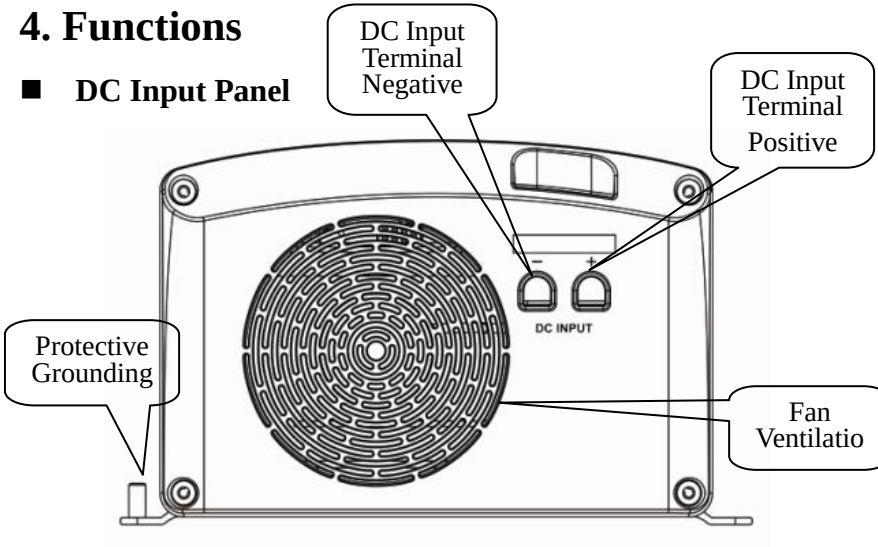
3. Inverter Operation

Connect the input and output terminals accurately. Turn on the power using the ON / OFF switch on the front panel. In order to avoid the protections resulted from the surge power, please turn on AC loads one by one after the output of the inverter is normal. Please check it as below:

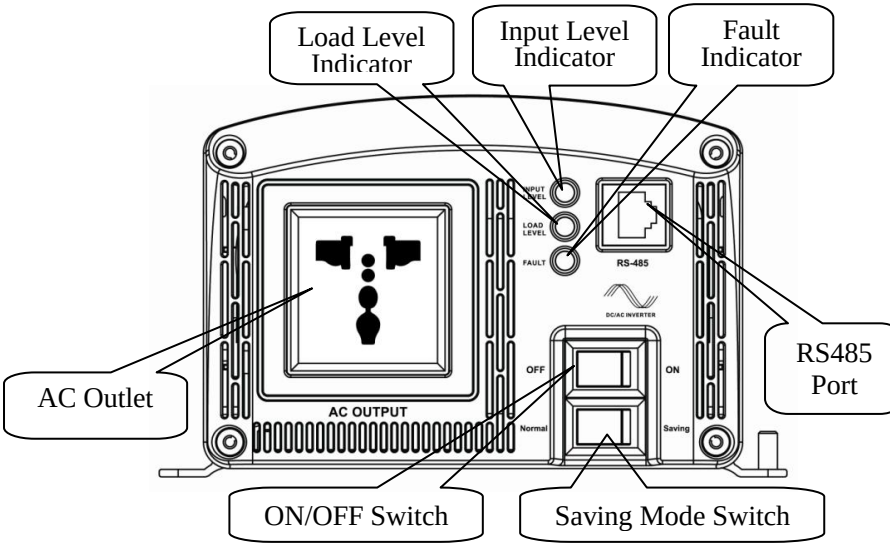
- Set the power switch to the ‘OFF’ position.
- Insert the load’s plug into the inverter’s output outlet.
- Connect the battery (‘+’ terminal with red line, ‘-’with black line). Do not connect them by contraries, or the power inverter will not work.
- Switch the inverter to ON and then turn on the loads one by one. Check the operation state of both power inverter and loads. ‘Green’ of the failure LED indicator means the state is normal.
- If there are different loads, it is suggested that turn on the load with large startup current first, such as television, then turn on the load such as lamp when the inverter works stable.
- If the failure LED indicator is ‘Red’ and the buzzer alarms or no output when you turn on devices, switch off the loads and power inverter immediately. Check the system by referring to the troubleshooting guide. Turn on the devices again according to the operation methods after the failure is removed.

4. Functions

■ DC Input Panel

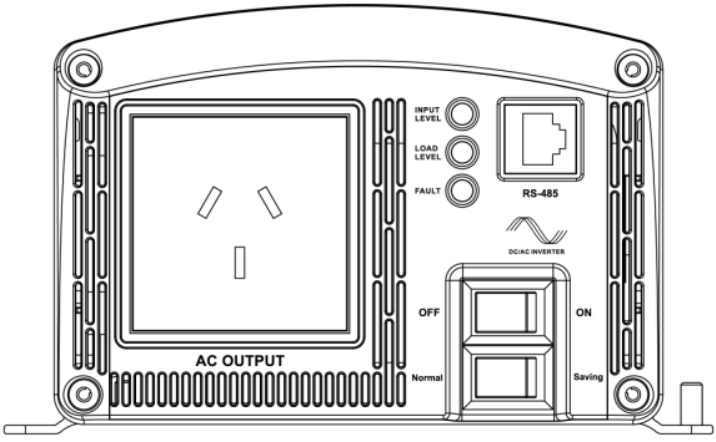


■ AC Output Panel

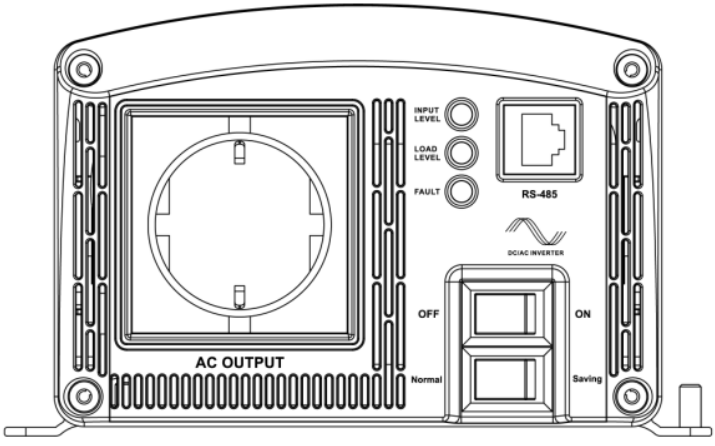


■ The Optional Outlet

Australia/New Zealand



European



■ Input Level: Display Input Voltages

LED Status	12V	24V	48V
RED Slow Blink	＜10.5	＜21	＜42
RED	10.5～11	21～22	42～44
ORANGE	11～12	22～24	44～48
GREEN	12～14.5	24～29	48～58
ORANGE Fast Blink	14.5～16	29～32	58～64
RED Fast Blink	＞16	＞32	＞64

■ Load Level: Display AC Loads

LED Status	AC Load
ORANGE	＜20%
GREEN	20%～75%
RED	＞75%
RED Slow Blink	Overload
RED Fast Blink	Short Circuit

■ Output & Fault Status

LED Status	Status
GREEN	Output Normal
RED Fast Blink	Overload or Short circuit, No Output
RED Slow Blink	Over or Low input voltage, No Output
ORANGE Fast Blink	Over temperature, No Output
RED	Inverter Fault, No Output
OFF	Power Off，No Output

■ Alarms

Alarms	Status
Buzzer Sounds	Overload or Short circuit, No Output
	Over or Low input voltage, No Output
	Over temperature, No Output
	Inverter Fault, No Output

The buzzer stops after 15S.

■ Protections

Output Short Circuit Protection

The inverter switches off the output immediately when the connecting load is short. Then it recovers the output automatically after delaying 5 seconds for the first time, 10 seconds for the second time, and 15 seconds for the third time. If the short circuit status still remains when the inverter tries to recover for 3 times, you should clear the load faults then restart the inverter manually.

Overload Protection

Overload / Character	125%	150%	200%	＞230%
Continuance	60S	10S	1.5S	＜0.2S
Recover 3 times	5 seconds for the first time, 10 seconds for the second time, and 15 seconds for the third time			

If the overload status still remains when the inverter tries to recover for 3 times, you should reduce the loads then restart the inverter manually.

Input Low Voltage Protection

The output is switched off when the input voltage is lower than low voltage protect value, and the output is auto-switched on when the input voltage reach low voltage recover value. User can also manually restart the inverter to switch on output by the ‘ON/OFF

switch', when the input voltage is higher than low voltage protect value.

	12V	24V	48V
Low Voltage Protect Value	10.5	21	42
Low Voltage Recover Value	13	26	52

Input Over Voltage Protection

The output is switched off when the input voltage is higher than over voltage shut off value, also the output is auto-switched on when the input voltage drops below over voltage recover value.

	12V	24V	48V
Over Voltage Shut Off Value	16	32	64
Over Voltage Recover Value	15	30	60

Fault Protection

The inverter will shut down when the output voltage is error or when the inverter has inner fault.

Over Temperature Protection

The inverter will shut off when the internal temperature is overheating. And it automatic restarts when the temperature recovers to the normal level.

Electronic Protect for Reverse Polarity

The Electronic circuit works to protect the inverter from damage while input reverse polarity. And the inverter will get right while the input is right.

■ Others

Saving Mode

When the switch is on “Saving” side, the inverter will enter into the Saving Mode. It will shut off the output if the loads value is less than 20VA. Then restart and detect the power of the load again after 10s. If the load is more than 20VA, the inverter will turn on the output .Otherwise it will shut off output again. It cycles like this. So please don’t use the saving mode if the load is smaller than 20VA.

5. Troubleshooting

WARNING:

High voltage is inside the inverter, do not open or disassemble it! Attempting to service the unit yourself may cause the risk of electrical shock or fire!

Problem	Possible Cause	Solution
Input LED blink, fault red LED slow blink	Input voltage is too high or too low	Measure the input voltage. The inverter recovers when the input becomes normal.
Load LED blink, fault red LED fast blink	Overload or load short	Check out if the AC load is within the rated power or whether there is load short.
Fault orange LED fast blink	Over temperature inside the inverter	Improve the quality of ventilation and do not block the vents. Restart the inverter when it is cool down.
Fault red LED	Inverter abnormal	Remove all the connected plugs then restart. If inverter works well, please check the load and line. If the LED keeps red, the inverter has inside faults and should be returned to the factory

6. Maintenance and Warranty

The casing of the inverters may be cleaned regularly with a damp cloth (not wet) to prevent accumulation of dust and dirt. The screws on the DC input terminals must be tightened.

The warranty period of the inverter is 2 year since the date of original shipping. Within the period, we will repair the products for free. Return the defective with shipping cost prepaid. And provide proof of purchasing date. We will pay the return shipping charges within warranty period.

The warranty doesn't apply under the following conditions:

1. Damaged by accident, negligence, abuse, improper use
2. Input voltage exceed the nominal input voltage of inverter
3. Unauthorized modification or attempted repair

7. Technical Specification

■ Technical Data

Types	STI200-12-220	STI200-12-230	STI200-24-220	STI200-24-230
Nominal Battery Voltage	12V		24V	
Input Voltage Range	10.5 ~16Vdc		21 ~32Vdc	
No Load Consumption	≤4W		≤5W	
Output Wave	Pure Sine Wave			
Output Voltage	220Vac ±3%	230Vac ±3%	220Vac ±3%	230Vac ±3%
Continuous Power	200VA			
Power 10 sec	300VA			
Power 1.5 sec	400VA			
Surge Power	640VA			
Frequency	50Hz ±0.2%			
Distortion THD	≤ 3%(resistive load)		≤ 2%(resistive load)	
Efficiency at Rated Power	≥81%		≥85%	
Max. Efficiency	≥88%		≥89%	
Dimensions	314.5×166×100.8mm			
Installation	200×154mm			
Hole Size	Φ8mm			
Net Weight	4.5kg			

Types	STI300-12-220	STI300-12-230	STI300-24-220	STI300-24-230
Nominal Battery Voltage	12V		24V	
Input Voltage Range	10.5 ~16Vdc		21 ~32Vdc	
No Load Consumption	≤5W		≤6W	
Output Wave	Pure Sine Wave			
Output Voltage	220Vac ±3%	230Vac ±3%	220Vac ±3%	230Vac ±3%
Continuous Power	300VA			
Power 10 sec	450VA			
Power 1.5 sec	600VA			
Surge Power	960VA			
Frequency	50Hz ±0.2%			
Distortion THD	≤ 3%(resistive load)		≤ 2%(resistive load)	
Efficiency at Rated Power	≥81%		≥87%	
Max. Efficiency	≥90%		≥91%	
Dimensions	314.5 ×166 ×100.8mm			
Installation	200 ×154mm			
Hole Size	Φ8mm			
Net Weight	5.3kg			

Types	STI500-12-220	STI500-12-230	STI500-24-220	STI500-24-230
Nominal Battery Voltage	12V		24V	
Input Voltage Range	10.5 ~16Vdc		21 ~32Vdc	
No Load Consumption	≤5W		≤6W	
Output Wave	Pure Sine Wave			
Output Voltage	220Vac ±3%	230Vac ±3%	220Vac ±3%	230Vac ±3%
Continuous Power	500VA			
Power 10 sec	750VA			
Power 1.5 sec	1000VA			
Surge Power	1600VA			
Frequency	50Hz ±0.2%			
Distortion THD	≤ 5%(resistive load)		≤ 2%(resistive load)	
Efficiency at Rated Power	≥81%		≥87%	
Max. Efficiency	≥91%		≥93%	
Dimensions	324.5×186.6×111.8mm			
Installation	200×174.6mm			
Hole Size	Φ8mm			
Net Weight	7.3kg			

Types	STI700-24-220	STI700-24-230
Nominal Battery voltage	24V	
Input Voltage Range	21 ~32Vdc	
No Load Consumption	≤8.5W	
Output Wave	Pure Sine Wave	
Output Voltage	220Vac±3%	230Vac±3%
Continuous Power	700VA	
Power 10 sec	1050VA	
Power 1.5 sec	1400VA	
Surge Power	2240VA	
Frequency	50Hz±0.2%	
Distortion THD	≤ 3%(resistive load)	
Efficiency at Rated Power	≥87%	
Max. Efficiency	≥93%	
Dimensions	335×232×123.3mm	
Installation	230×216mm	
Hole Size	Φ8mm	
Net Weight	9.4kg	

Types	STI1000-24-220	STI1000-24-230	STI1000-24-220	STI1000-48-230
Nominal Battery Voltage	24V		48V	
Input Voltage Range	21 ~32Vdc		42 ~64Vdc	
No Load Consumption	≤10W		≤12W	
Output Wave	Pure Sine Wave			
Output Voltage	220Vac ±3%	230Vac ±3%	220Vac ±3%	230Vac ±3%
Continuous Power	1000VA			
Power 10 sec	1500VA			
Power 1.5 sec	2000VA			
Surge Power	3200VA			
Frequency	50Hz ±0.2%			
Distortion THD	≤ 3%(resistive load)		≤ 2%(resistive load)	
Efficiency at Rated Power	≥87%		≥89%	
Max. Efficiency	≥93%		≥94%	
Dimensions	373 ×232 ×123.3mm			
Installation	260 ×216mm			
Hole Size	Φ8mm			
Net Weight	11.8kg			

■ Environmental Parameters

Working Temperature	-20℃~+50℃
Storage Temperature	-35℃~ +70℃
Humidity	< 95%(N.C.)
Altitude	< 5000 m (Derating to operate according to IEC62040 at a height exceeding 1000 m)

■ Others

Insulation Resistance	Between DC input terminals and metal case: ≥550MΩ; Between AC output terminals and metal case: ≥550MΩ.
Dielectric Strength	Between DC input terminals and metal case: Test voltage AC1500V, 1 minute Between AC output terminals and metal case: Test voltage AC1500V, 1 minute

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