EPTECH™

User's Manual

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

SHI 400 / SHI 600 / SHI 1000

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.

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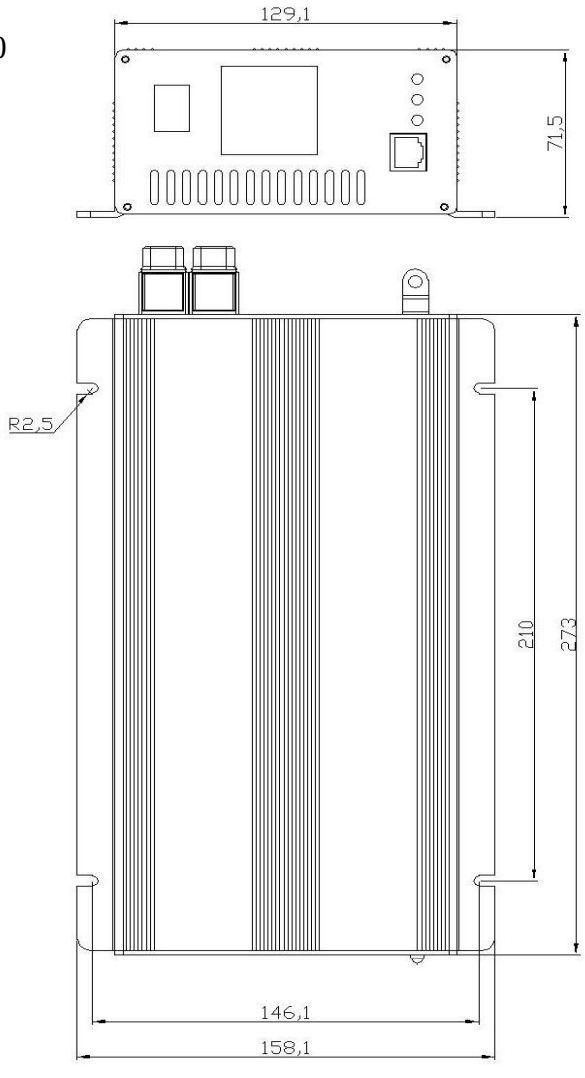
1. Introduction

Thanks for purchasing our company's power inverter of SHI series. The product is a sine wave power inverter which can convert 12V/24V/48V DC to 220V AC (50Hz/60Hz) based on high performance DSP full digital and intelligent design. It has the features of high reliability, high efficiency, low weight, small volume, full protection functions, easy installation and operation. The inverter can be applied in many fields especially for solar photovoltaic power system.

- Powerful DSP digital and intelligent design
- Wide DC input voltage range
- Pure sine wave output with high efficiency and stability
- Excellent EMC design
- Low output harmonic distortion（THD≤3%）
- Two on-off control mode: local main switch and remote control switch
- LED indicators for input voltage range, load power range, normal output & failure state
- Load short-circuit, overload, input voltage under/over and over-temperature protections and alarms, inverter's inner fault protections.
- RS-232 communication interface connecting with PC or other control and monitor device.
- Fitted for many kinds of AC loads such as household appliances, electric tools and industrial devices
- Wide working temperature range (industrial level)

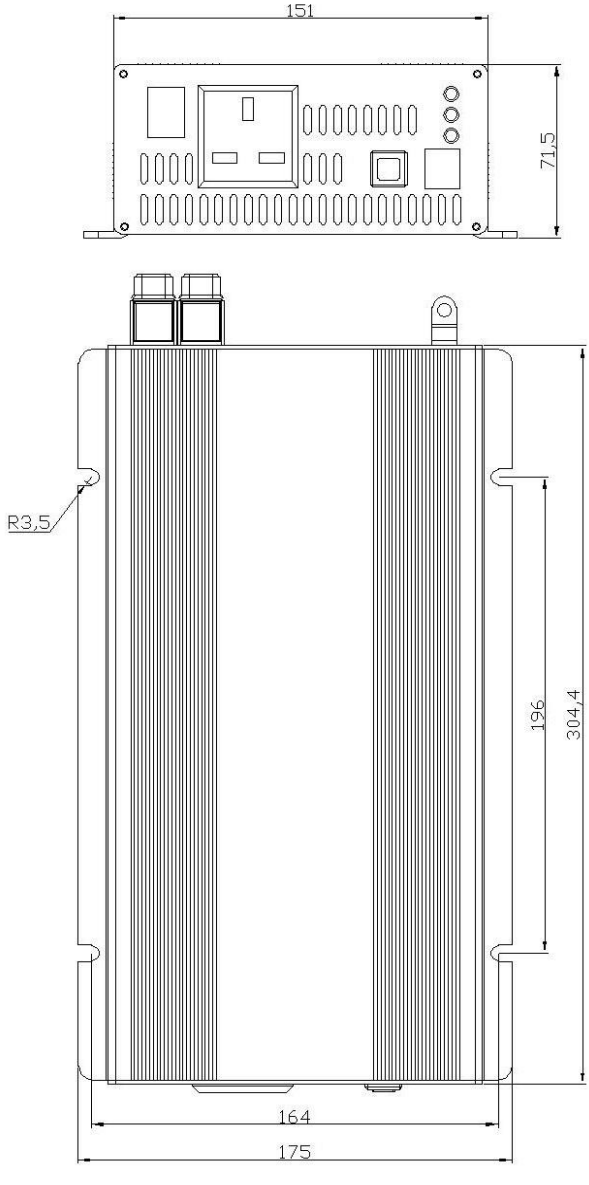
2. Mechanical Drawings

SHI 400

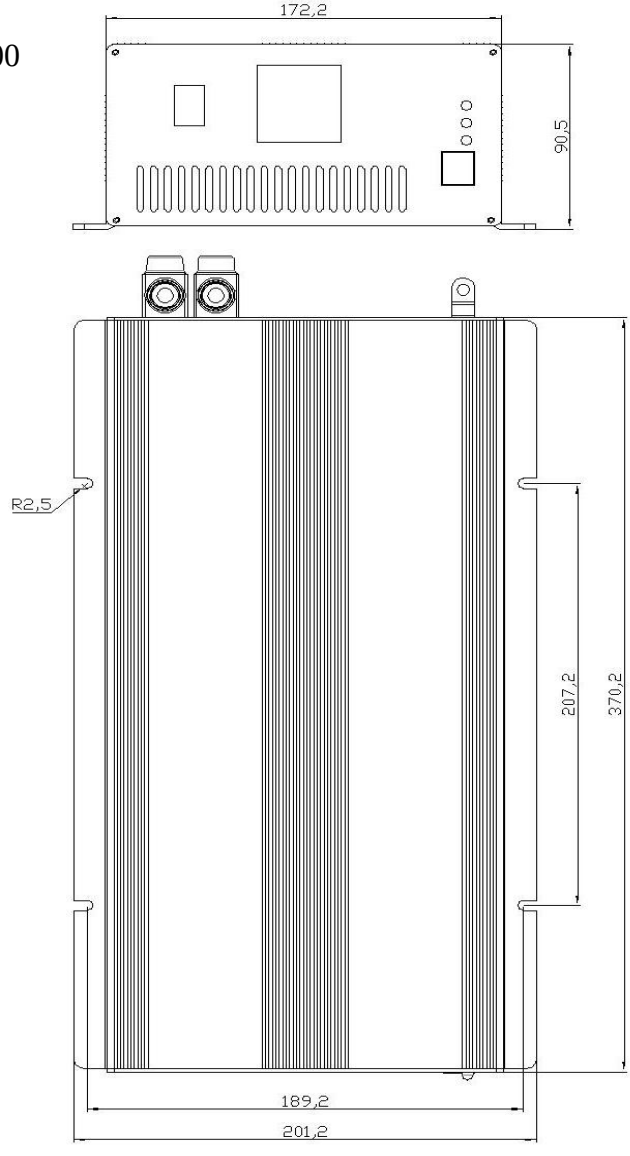


(Unit: mm)

SHI 600



SHI 1000



3. 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 strictly to the requirement. The power inverter has a relatively wide input range, but too high or too low input may cause problems even destroy the inverter.
- Do not expose the inverter to humid, flammable, explosive or dust environment. Do not install the inverter in airproof location and keep enough space around the inverter.
- Make sure the air ventilation clearance around the inverter is more than 10cm, for when the inverter works continuously its surface may became very hot. Keep away from the material or device which may suffer from high temperature when the inverter is working.
- Connect the load devices to the AC output outlet, then the DC input. Make sure both the input and output connects are correct, switch on the inverter first and then turn on the load.
- Do not connect the battery charger or similar devices to the input terminal of the inverter.
- Do not put the inverter close to the open lead-acid battery because the sparkle in the terminals may ignite the hydrogen released by the battery.
- Do not attempt to repair the fault inverter yourself, otherwise it may lead to a serious accident. Please connect the manufacture's engineer.

4. Inverter Operation

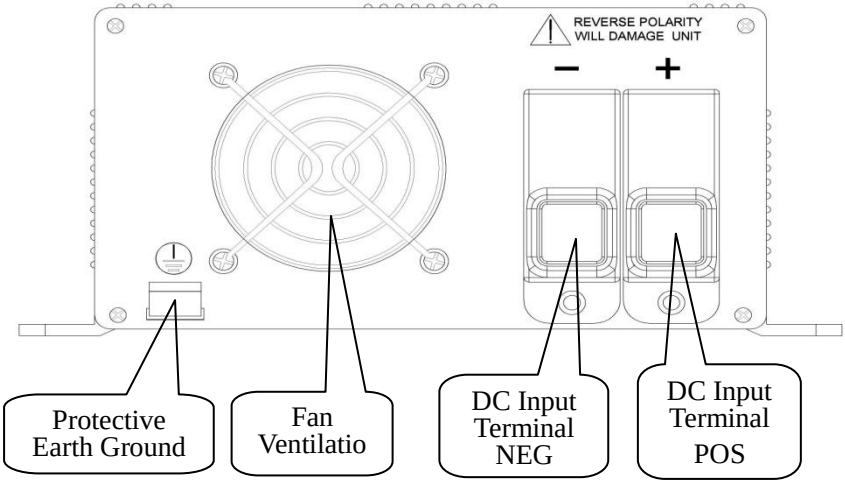
Connect the input and output terminals accurately by referring to the previous chapter. Use the ON / OFF switch on the front panel to turn the power on. Turn AC loads on one by one after the output of the inverter is normal, in order to prevent protections resulted from the surge power.

- 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 it will damage the power inverter.
- Switch the inverter to ON and then turn the loads on one by one. Check the operation state of both power inverter and loads. 'Green' of the 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.

5. Function

■ DC Input Panel

SHI 400 / SHI 600：



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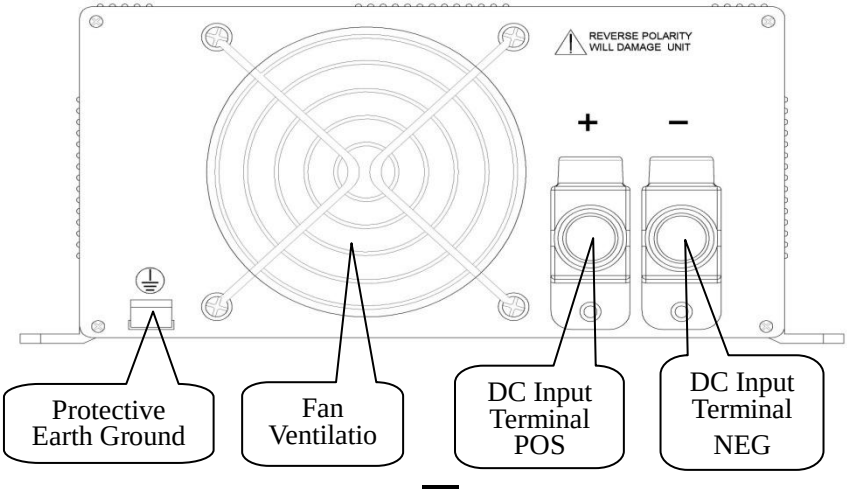
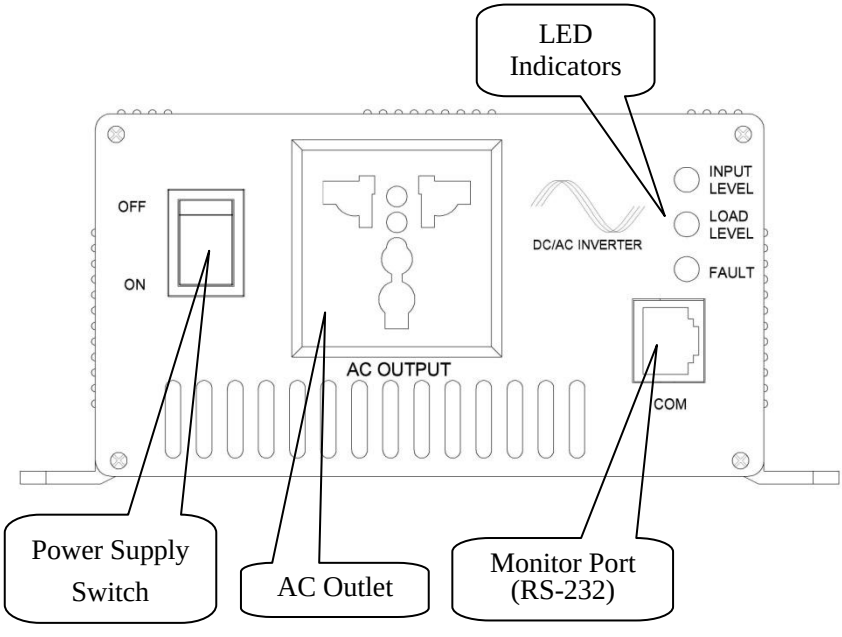


■ AC Output Panel

SHI 400 / SHI 600 / SHI 1000：



■ Input Level: Display Input Voltages

LED Status	Nominal input 12V DC	Nominal input 24V DC	Nominal input 48V DC
RED Slow Blink	＜10.8 V	＜21.6 V	＜43.2 V
RED	10.8～11.25 V	21.6～22.5 V	43.2～45.0 V
ORANGE	11.25～12.0 V	22.5～24.0 V	45.0～48.0 V
GREEN	12.0～14.5 V	24.0～29.0 V	48.0～58.0 V
ORANGE Fast Blink	14.5～16.0 V	29.0～32.0 V	58.0～64.0 V
RED Fast Blink	＞16.0 V	＞32.0 V	＞64.0 V

■ Load Level: Display AC Loads(Watts)

LED Status	SHI 400	SHI 600	SHI 1000
OFF	＜20VA	＜30VA	＜50VA
GREEN	20VA～240 VA	30VA～360 VA	50VA～600 VA
ORANGE	240VA～320 VA	360VA～480 VA	600VA～800 VA
ORANGE Slow Blink	320VA～360 VA	480VA～540 VA	800VA～900 VA
RED	≥360 VA	≥540 VA	≥900 VA
RED Slow Blink	Overload		
RED Fast Blink	Short Circuit		

■ Output & Fault Status

LED Status	Status
GREEN	Output Ok
RED Fast Blink	Overload or Short circuit, Output Off
RED Slow Blink	Over or Low input voltage, Output Off
ORANGE Fast Blink	Over temperature, Output Off
RED	Inverter Fault, Output Off
OFF	Power Off or Power Saving Mode，Output Off

■ Alarms

Alarms	Status
Buzzer Sounds	Overload or Short circuit, Output Off
	Over or Low input voltage, Output Off
	Over temperature, Output Off
	Inverter Fault, Output Off

■ 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. If the short circuit status still remains when the inverter tries to recover for three times, you should clear the load faults then restart the inverter manually or by remote mode.

Overload Protection

The inverter switches off the output after working for 30, 5 and 1.5 seconds when the load power is over 125% of rated value, 150% of rated value and 200% of rated value respectively.

Input Low Voltage Protection

The output is switched off when the input voltage is low than 90% of the rated value.

Input Over Voltage Protection

The output is switched off when the input voltage is over than 133% of the rated value.

Fault Protection

The inverter will shut down when the output voltage falls below 176V, or above 264V or when the inverter has inner fault.

Over Temperature Protection

The inverter will shut down when the power device's temperature is over 75℃.

Fan Ventilation

The fan runs when the output power is more than 5% of rated value.

6. 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

7. Maintenance

You must do regular proper maintenance on inverter.

You should clean the cover regularly with a cloth to prevent accumulation of dust and dirt, tighten the screws on the DC input terminals.

The warranty period of this product is one year from the date of original purchase. This limited warranty is void if the unit is abused, modified, installed improperly, or had its housing removed. The manufacture is not liable for damages arising from the use, misuse, or operation of this product.

During the warranty period, defective units will be repaired or replaced (with the same or a comparable model).

Please properly keep the maintenance card for after-sale service.

8. Technical Specification

DC Input

Model	SHI 400 /12-220	SHI 400 /24-220	SHI 600 /12-220	SHI 600 /24-220	SHI 1000 /24-220	SHI 1000 /48-220
Input rated voltage	12V	24V	12V	24V	24V	48V
Input voltage range	10.8-16 VDC	21.6-32 VDC	10.8-16 VDC	21.6-32 VDC	21.6-32 VDC	43.2-64 VDC
No-Load Current	≤1300 mA	≤600 mA	≤1200 mA	≤600 mA	≤1000 mA	≤600 mA

AC Output

Model	SHI 400/12-220 SHI 400/12-220	SHI 600/12-220 SHI 600/24-220	SHI 1000/24-220 SHI 1000/48-220
Output Voltage	220V±5%		
Rated Power	400VA	600VA	1000VA
Maximum Short Time Power	600VA 5s	900VA 5s	1500VA 5s
Surge Power	800VA 1.5s	1200VA 1.5s	2000VA 1.5s
Output Mode	Single phase		
Frequency	50Hz±2%		
Load Power Factor	COSθ-90°～ COSθ+90°		
Output Waveform Distortion	THD≤ 3%		
Efficiency at Rated Power	≥90%		

Mechanical parameters

Model	SHI 400/12-220 SHI 400/12-220	SHI 600/12-220 SHI 600/24-220	SHI 1000/24-220 SHI 1000/48-220
Exterior （L*W*H mm）	273×158×71.5	304×175×71.5	370×201×90.5
Installation （L*W mm）	210×146	196×164	207×189
Net weight (kg)	2.2	2.65	4.35

Environmental parameters

Working Temperature	-20℃~+55℃
Storage temperature	-25℃~ +60℃
Altitude	< 5000 m
Relative Humidity	< 90%（non-condensation）

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