

SD Series

Pure Sine Wave DC TO AC Power Inverter

User's Manual

Note: References to SU Series in this manual should be read SD Series

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Note : The specifications are subject to change without notice.

Model			SD-1600-12 SD-1600-24	SD-2200-12 SD-2200-24	SD-3000-12 SD-3000-24	
Inverter	Output	Continuous output	1600W	2200W	3000W	
		Surge	3200W	4400W	6000W	
		Voltage	AC100V/110V/115V/120V or /200V/220V/230V/240V			
		Frequency	60Hz or 50Hz or 50Hz/60Hz			
		Waveform	Pure Sine Wave			
		Regulation (Typ.)	Vrms <±3%			
		Total Harmonic	THD <3%			
		USB Output (Typ.)	DC 5V ± 5% 500mA			
	Input	Battery Voltage	DC 12V or DC 24V			
		DC Current (Typ.)	12V/160A,24V/80A,	12V/220A,24V/110A,	12V/300A,24V/150A	
		Low Battery Alarm	DC12V/ 10.6V±0.2V: 24V/ 21.2V±0.3V			
		Low Battery Protection	DC 12V / 10V±0.2V; DC 24V / 20V±0.3V			
		High Battery Protection	12V/ 15V±0.2V ; 24V /30V±0.3V;			
		No Load Current	12V/0.8A,24V/0.4A	12V/0.9A,24V/0.5A	12V/1.1A,24V/0.6A	
		Stand-by Current	12V/0.2A,24V/0.1A	12V/0.23A,24V/0.15A	12V/0.25A,24V/0.18A	
		Efficiency	89% ~ 94%(at full load)			
	Protection		High Temperature; Short-Circuit ; Over Load ; Input Voltage			
	Load Control	Load 100%	alarm			
		Load 105%	Alarm and for 2 minutes shut down			
		Load 110%	Alarm and for 3 seconds shut down			
		Load 115%	Alarm and shut down immediately			
	Operating temperature range		-20℃~40℃			
	Operation Humidity		20~90%			
	Intelligent Design Heat Auto Control		Fan slow speeding up 38℃±3,Fans start speeding up:42℃±3			
			High Temperature Shut Down : 63℃±3 , Restart Output: 56℃±3			
Indicator			Inverter : Green LED			
			Over Load : Red LED			
			Over Temperature : Yellow LED			
Others		soft start-up	soft started function			
		Remote Controller	Wired or Wireless remote Control (Optional)			
Mechanical		D*W*H(mm)	327*230*73	420*230*73	434*287.8*93.5	
		Weight(kg)	4.18kg	5.41kg	7.45kg	

Note : The specifications are subject to change without notice.



WARNING!

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

2. Important Safety Guidelines and Instructions

To avoid danger of electric shocks, fire, injury when using electrical equipment, please read this manual carefully before installing and starting up and store it in a safe place. This instruction manual must be handed along with the device.

Failure to observe this instruction can cause material damage, device malfunction or danger of injuries. Fundamental safety measures should be observed when using electrical equipment.

2-1. General Safety and installation Precautions

- Do not expose the inverter to water, snow, spray, or dust. Place the device in a dry, cool, clean and ventilated space. To reduce risk of hazard, do not cover or obstruct the ventilation shafts.
- Do not install the inverter in a zero-clearance compartment. Overheating may occur.
- The inverter must be kept in a safe place out of the reach of children. Make sure that the device is secured.
- To avoid a risk of fire and electronic shock, make sure that existing wiring is in good electrical condition and not undersized. Do not operate the inverter with damaged or substandard wiring.
- Danger might still occur during repair. There are some components in the inverter can cause arcs and sparks. Even if the fuse blows or protective device fails, parts of the inverter remain functional. Only qualified personnel should carry out

maintenance or repair work.

- To prevent from fire or explosion, do not put batteries, flammable materials, or anything should be ignition-protected around the inverter.
- Do not reverse the polarity of the input connections, to prevent permanent damage to the inverter. Make sure to connect the (+) and (-) cables from the battery to the respective terminals of the inverter.
- Always disconnect the inverter when not in use. To prevent electrical shock, do not operate without connecting to the ground.

2-2. Precautions When Working and Operation with Batteries

- Never smoke or make a spark or flame in the vicinity of the battery or the engine.
- If battery acid contacts skin or clothing, you shall wash it out with soap and water immediately. If battery acid contacts your eyes, you shall wash it out with cold running water for at least 20 minutes and get medical attention immediately.
- Make sure the plug is firmly connected in the socket. If the connection is not firm enough, the plug will heat up and cause device damage.
- Do not start the engine while the inverter is switched on, this may cause inverter to shut down. The inverter can be operated with the engine running or switched off. If it is necessary to operate the device for a long period of time, start the engine to recharge the vehicle battery.
- Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery or other electrical part may cause an explosion.
- Remove personal metal items such as rings, bracelets, necklaces, and watches when operating with lead-acid batteries. Doing so may cause short circuit and very high temperature, which can melt metal items and even burn you.

- USB only supply output 5V 500mA power source.

3. Features

- Pure Sine Wave output with THD<3%
- Advance microprocessor design
- Sort Start Function : High surge capacity for starting demanding loads
- High efficiency (89% ~ 94%)
- Input and Output isolated design
- Multi-stages saving mode : conserved energy with **green** power
- Multi-stages intelligent fans cooling system
- Intelligent output overload protection :
 - Load 100% alarm
 - Load 105% alarm and for 2 minutes shut down
 - Load 110% alarm and for 3 seconds shut down
 - Load 115% alarm and shut down immediately
- Suitable for resistive, capacitive, inductive in different loads of machines
- Full protection : output short circuit, input high/low voltage, temperature
- Wired remote control or wireless remote control for optional

4. Application and Descriptions

Compared to commercial grade Modified Sine Wave Power Inverter, the output of Pure Sine Wave inverters are more suitable for sensitive electronic equipments. Pure Sine Wave Inverter produced power that is either identical better to power from the public utility power grid system.

- Industrial equipment-metal halide lamp, high-pressure sodium lamp, etc.
- Power tools-circular saws, drills, grinders, sanders, buffers, weed and hedge trimmers, air compressors, etc.
- Office equipment-computers, printers, cash registers, monitors, facsimile machines, scanner, etc.

- Household appliances-vacuum cleaners, fans, fluorescent and incandescent lights, shavers, sewing machines.
- Kitchen appliances-coffee makers, refrigerators, blenders, ice makers, toasters, etc.
- Home entertainment electronics-television, VCRS, radios, video games, stereos, musical instruments, satellite equipment, etc.
- USB 5V DC is for-digital camera, cell phone, video game, MP3, MP4, PDA

5. Introduction

Please read the instructions of this manual carefully before you install and operate this model.

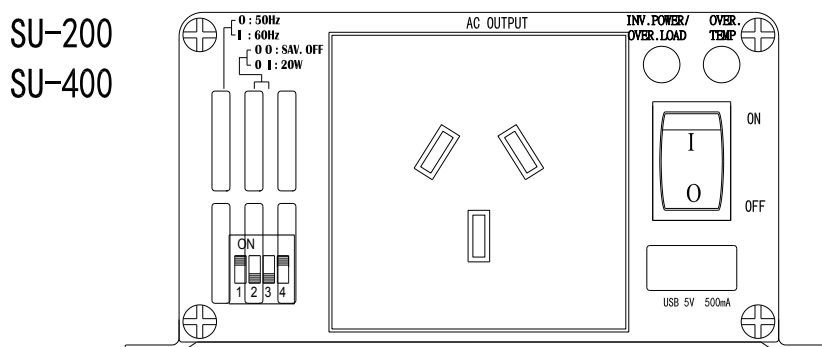
This power inverter series is one of the most advanced and high-quality respectice performance of AC power systems.

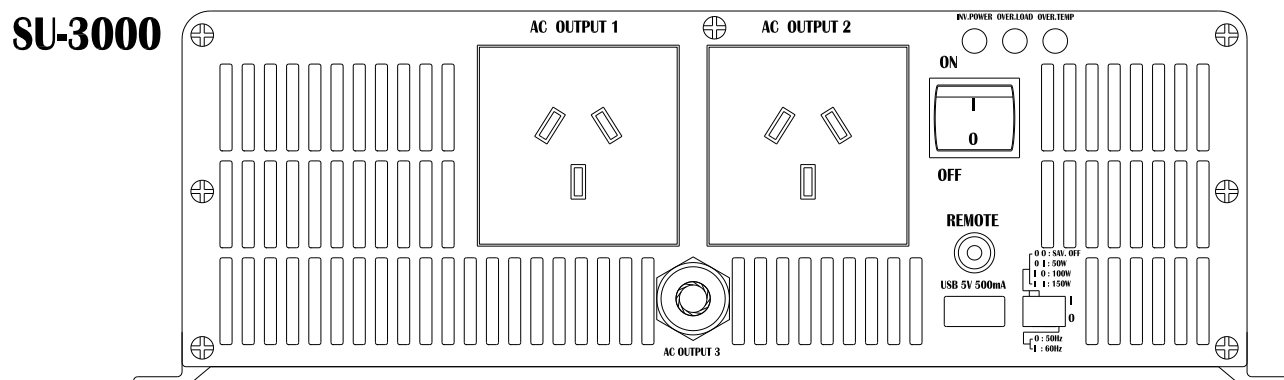
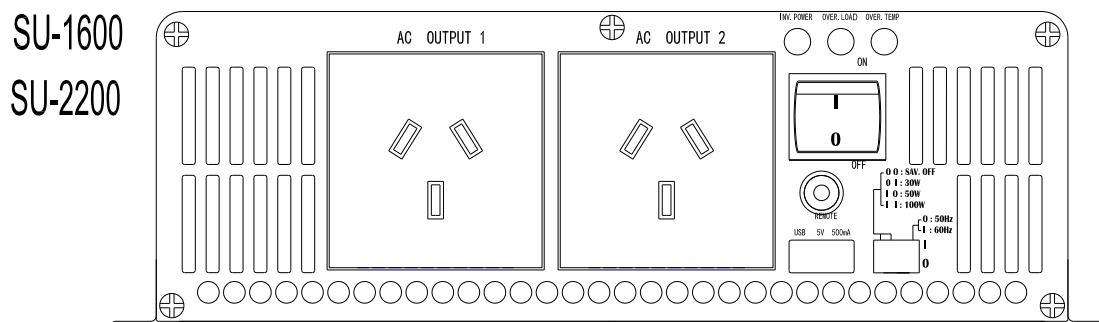
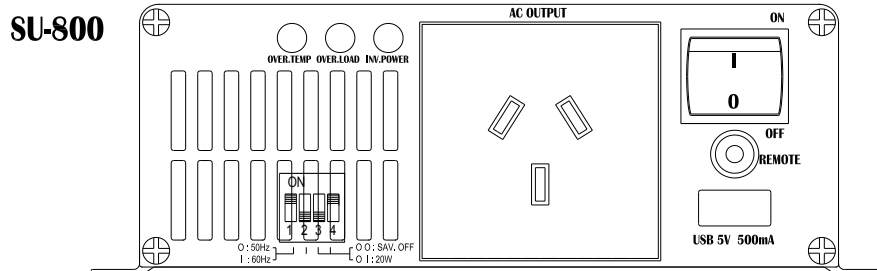
To get the most effective power inverter, it must be installed and used properly. The output voltage corresponds to the standard one of your socket (Pure Sine Wave Voltage)

5-1. Inverter Operation:

- First connect inverter with full charged battery.
- Use “ON/OFF” switch on the inverter panel to start or stop power. Turn switch to “ON” position, then on power.
- Inverter are in power then green LED show on panel, inverter work in normal.
- Connect the electric appiance to AC output socket of the inverter.
- Turn switch to “OFF” position, then power off inverter stop working.
- Before installing the inverter, you need to ensure the main switch must be “OFF”.

5-2. Front Panel Operations





- **ON/OFF:** Power switch
- **Remote:** Input terminal of wired remote controller, make sure power switch are turned to “ON” position. This controller only control to power on and off.
- **Power Saving Mode:** Power Saving Mode is adjustable and set by the Dip Switches, SW1 and SW2 on the front panel. After changes set up, please restart the machine.

SU-200 SU-400 SU-800	SU-1600 SU-2200	SU-3000	SW1	SW2
No Saving	No Saving	No Saving	OFF	OFF
20W	30W	50W	OFF	ON
No Saving	50W	100W	ON	OFF
20W	100W	150W	ON	ON

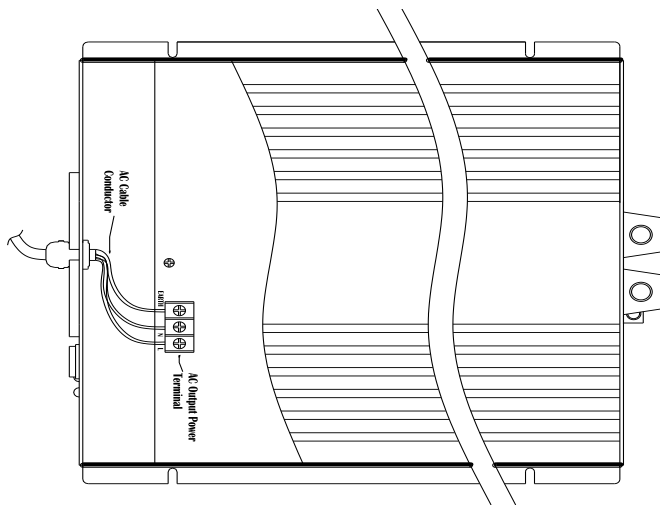
- **AC Frequency:** AC Output frequency selected by SW4 Dip Switches, switch to your selection frequency, before start the machine. After changes set up, please restart the machine.

Frequency	SW4
50HZ	OFF
60HZ	ON

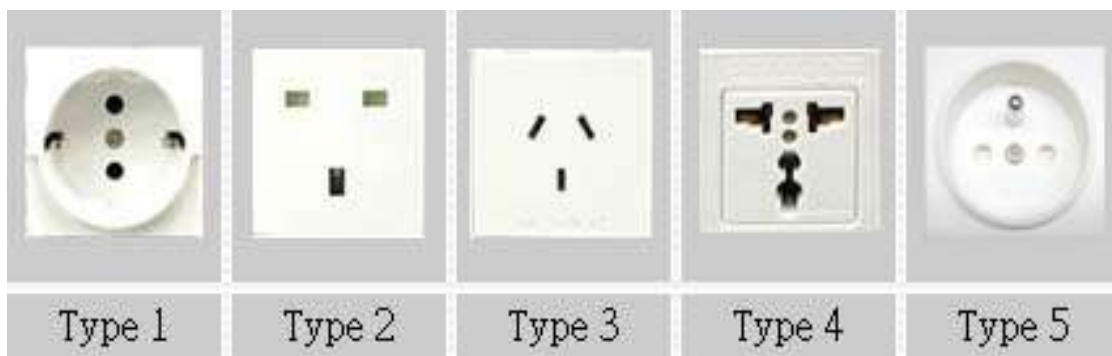
- **USB 5V 500MA:** To provide DC output 5V 500mA.
- **AC OUTPUT SOCKET : AC OUTPUT SOCKET 1 , SOCKET 2 :** Connect to AC110V or 230V, make sure your AC power source before use.

AC OUTPUT3: AC Output Power Terminal, this terminal provide output big power current, when you are ready to use this terminal, make sure to let experienced electrician operate it. Open the top lid first and find the AC output terminal screws on PCB, connected wire correctly. As follow chart shows:

SU-3000 AC Output Power Terminal



AC output power socket (available).



- **INV.POWER:** Inverter work in normal, Green LED show
- **OVER LOAD:** Over load, Red LED show
- **OVER TEMP:** Over temperature, Yellow LED show

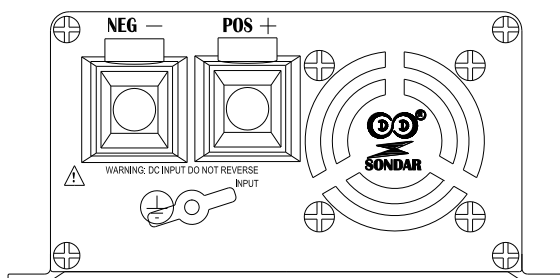
Green LED	LED Show	Status
Solid		Power Normal

Red LED	LED Show	Status
Solid		Over Load
Slow Blink		Over High Battery
Fast Blink		Over Low Battery

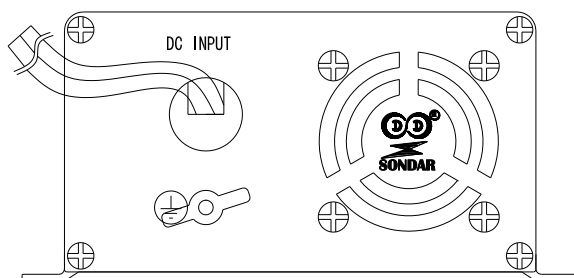
Yellow LED	LED Show	Status
Slow Blink		Over Temperature

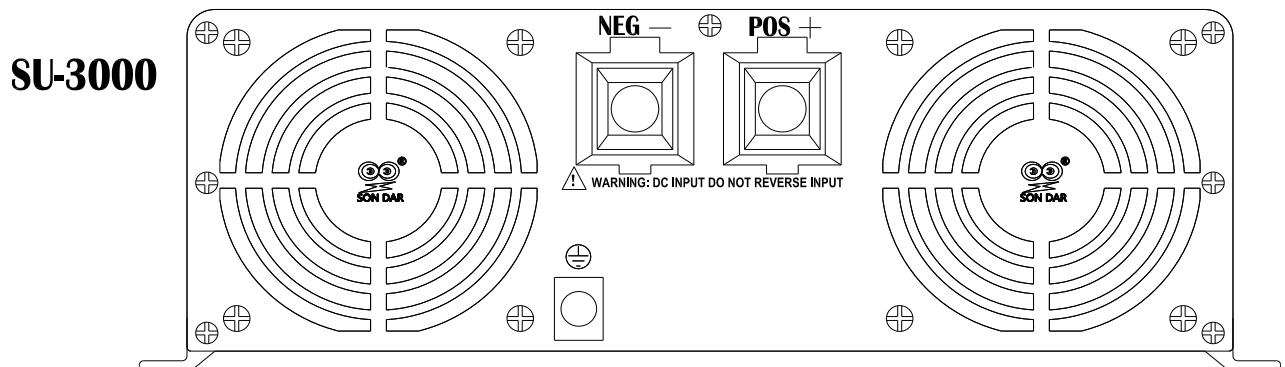
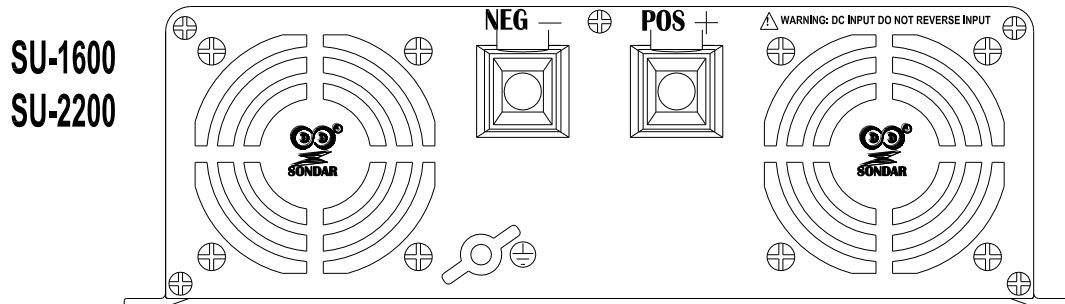
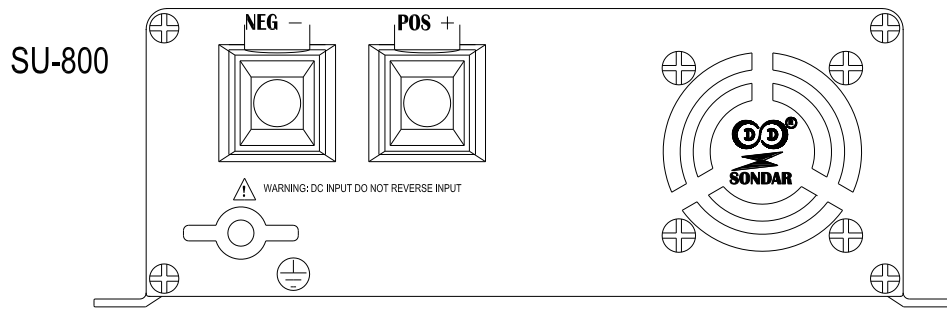
5-3. Rear Panel Operations

SU-400



SU-200





- **FAN Ventilation:** Be sure to keep it a distance 300mm from surrounding things
- **DC Input Terminal:** Connect DC terminal to 12V/24V/48V battery or the other power sources.



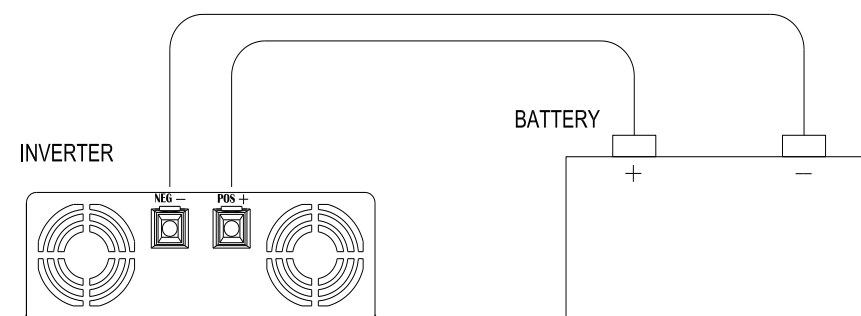
WARNING!

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

POS + : Represents positive

NEG - : Represents negative

Connect the (+) and (-) cables from the battery to the respective terminals of the inverter



MODEL	DC Input voltage	
	Minimum	Maximum
12V	10.5V	15.0V
24V	21V	30V
48V	42V	60V

- **Grounded connection:** Use wire(>#12) to connect chassis ground



WARNING!

Operating the inverter without a proper ground connection may cause electrical hazard.

5-4. Protections Features:

DC Input Voltage Protection:					
Model	Over Voltage		Under Voltage Alarm	Under Voltage	
	High Shut-down	Restart		Low Shut-down	Restart
12V	15V	14.5V	10.6V	10V	12.5V
24V	30V	29V	21.2V	20V	25V
48V	60V	58V	42.4V	40V	50V

Over Temperature Protection:	
Shut-down	Restart
65°C	55°C

Model	Over Load Protection:		
	2 min. Shut-down	3 sec. Shut-down	0 sec. Shut-down
SU-200W	210W~230W	230W~250W	>250W
SU-400W	420W~450W	450W~480W	>480W
SU-800W	830W~880W	880W~930W	>930W
SU-1600W	1650W~1750W	1750W~1850W	>1850W
SU-2200W	2250W~2350W	2350W~2450W	>2450W
SU-3000W	3050W~3150W	3150W~3300W	>3300W

5-5. Buzzer Alarm Fault Status:

Fault Type:	Sound Number	Sound Signal
Low Battery Alarm, Stage 1	"Bi" Tow Times Slowly	-- --
Low Battery Alarm, Stage 2	"Bi" Tow Times at middle speed	-- -- --
Low Battery Protection	"Bi" Tow Times fast	-- -- -- -- --
High Battery Protection	"Bi" Tow Times last long seconds	--- --- ---
Heat Protection	"Bi" Four Times	---- ---- ----
Load Control Alarm, Stage 1	"Bi" Three Times Slowly	--- --- ---
Load Control Alarm, Stage 2	"Bi" Three Times at middle speed	--- --- ---
Load Control Alarm, Stage 3	"Bi" Three Times Fast	--- --- --- ---
Over Load	"Bi" Three Times Fast	--- --- --- ---

5-6. Installation:

The power inverter should be installed in an environment that meets the following requirements.

- Dry--- Do not allow water to drip on or enter into the inverter.
- Cool---Ambient air temperature should be between 0°C and 40°C, the cooler the better.
- Safe---Do not install the inverter in a battery compartment or other areas where flammable fumes may exist, such as fuel storage areas or engine compartments.
- Ventilated---Keep the inverter a distance (as least 1 inch) away from surrounding things. Ensure the ventilation shafts on the rear and the bottom of the unit are not obstructed.
- Dust---Do not install the inverter in a dusty environment. Dust can be inhaled into the unit when the cooling fan is working.
- Close to batteries--- Avoid excessive cable lengths. Do not install the inverter in the same compartment as batteries. Use the recommended wire lengths and sizes. Do not mount the inverter where it will be exposed to the gases prolonged exposure will damage the inverter.



WARNING!

Shock Hazard. Before proceeding further, carefully check that inverter is NOT connected to any batteries, and that all wiring is disconnected from any electrical sources. Do not connect the output terminals of the inverter to an incoming AC source.

5-7. DC Wiring Connections:

Follow this procedure to connect the battery cables to the DC input terminals of the inverter. The cables be as short as possible (less than 10 feet/ 3 meters ideally) and large enough to handle the required current in accordance with the electrical codes or regulations applicable to the installation.

Cables that are an adequate gauge (too narrow) or too long will deteriorate inverter performance such as poor surge capability and frequent low-input voltage warnings and shutdowns.

These low input voltage warnings are due to DC voltage drop across the cables from the inverter to the batteries.

The longer and narrower the cables, the greater the voltage drop. Increasing DC cable size helps improve the situation.



WARNING!

DC wiring connected to inverter.

Ensure all the DC connection is tight. Loose connection may cause overheat and fire.

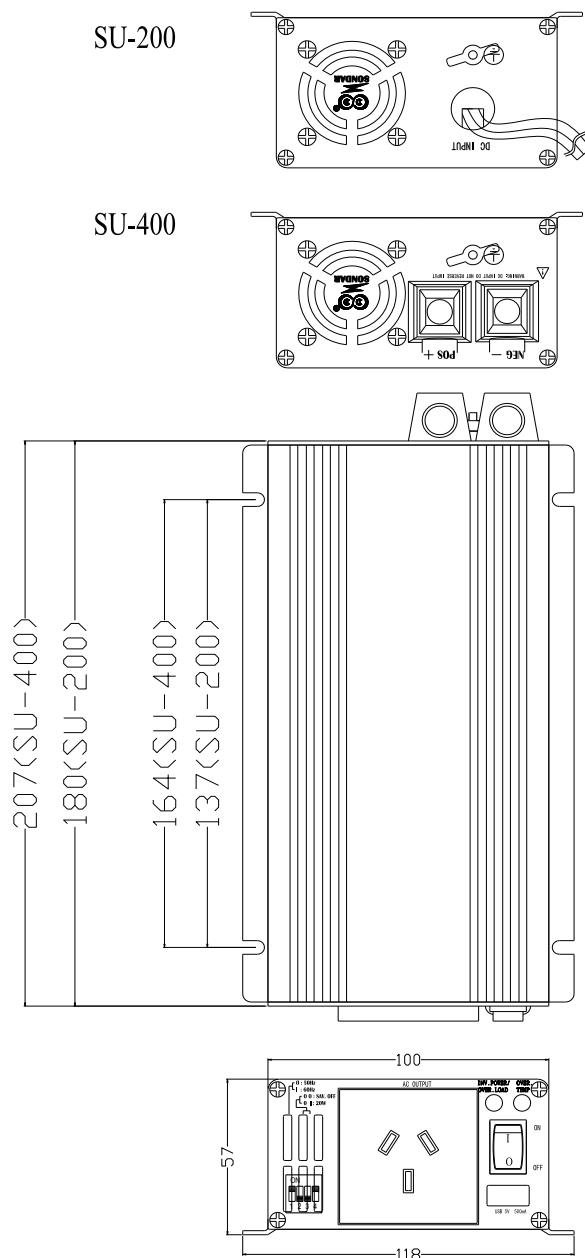
To recommends the following cables for optimum inverter performance.

SU Series	Wire AWG	Inline Fuse	Description
SU-48040/E	#14	15A	Black 1M + Red 1M
SU-24040/E	#12	25A	
SU-12040/E	#10	25A*2	
SU-48080/E		15A*2	
SU-24080/E	#8	25A*2	
SU-48160/E		15A*4	
SU-12080/E	#4	25A*4	
SU-24160/E		25A*4	
SU-24220/E		25A*6	
SU-48220/E		15A*6	
SU-48300/E		25A*4	
SU-12160/E	#2	25A*8	
SU-24300/E		25A*8	
SU-12220/E	#1	25A*12	
SU-12300/E	#2*2	30A*12	Black 1M*2 + Red 1M*2

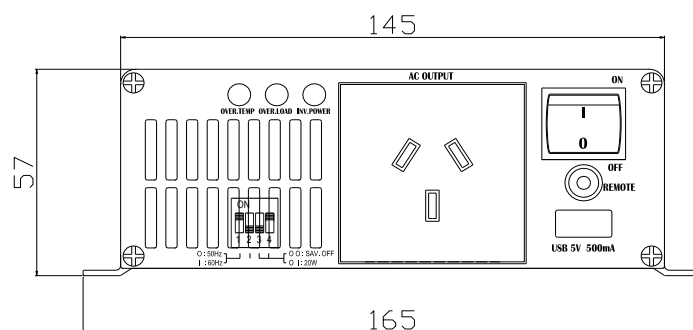
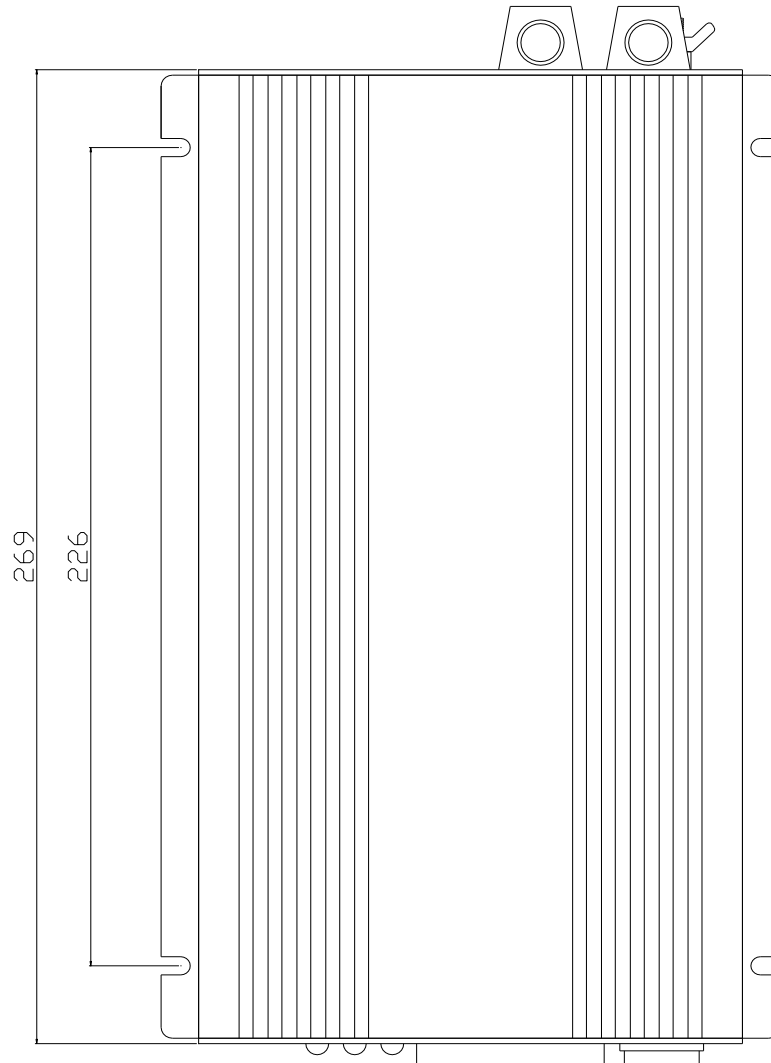
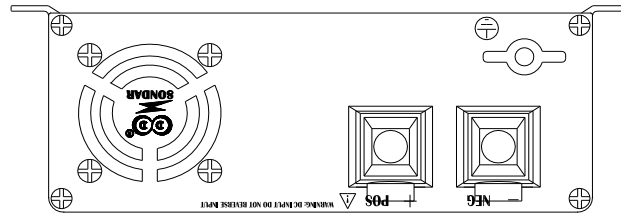
Lay the flexible earth cable from the earthing point of the vehicle to the earthing point of the inverter.

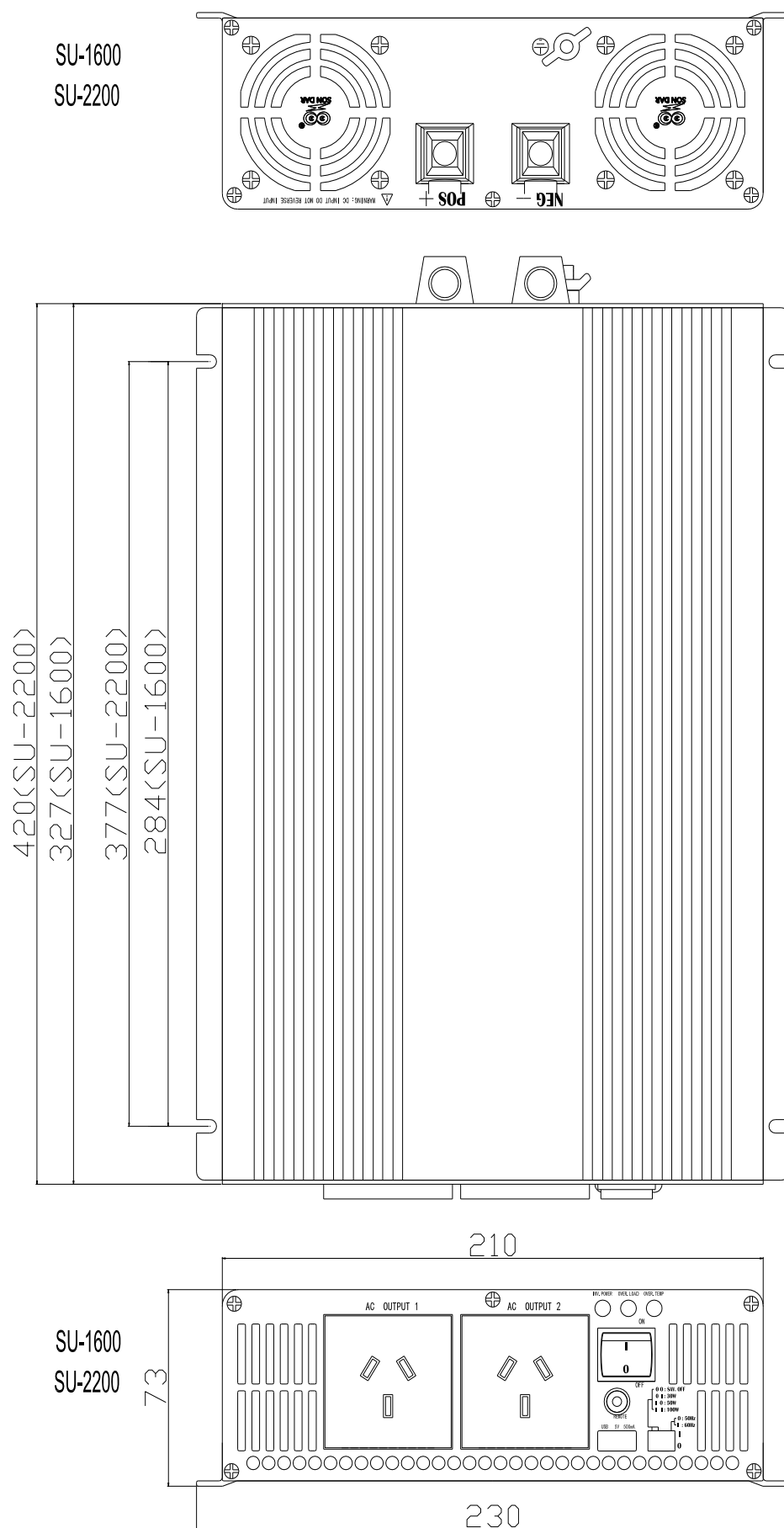
- If cables are to be fed through metal walls or walls with sharp edges, use ducts or wire bushings to prevent cable damage.
- Do not lay cables that are loose or bent next to electrically conductive materials.

6. Mechanical Drawings

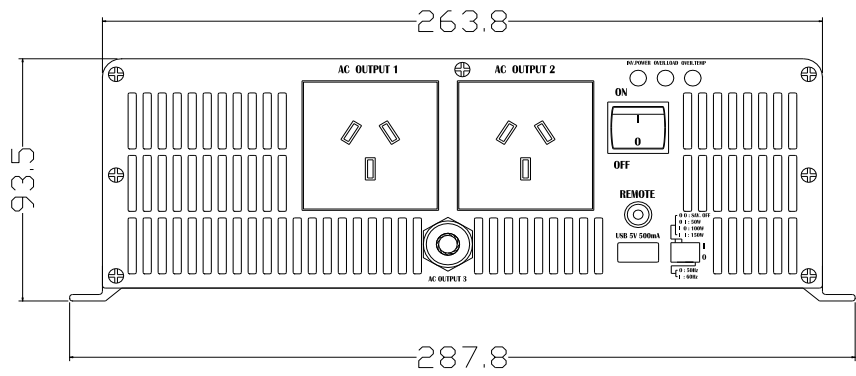
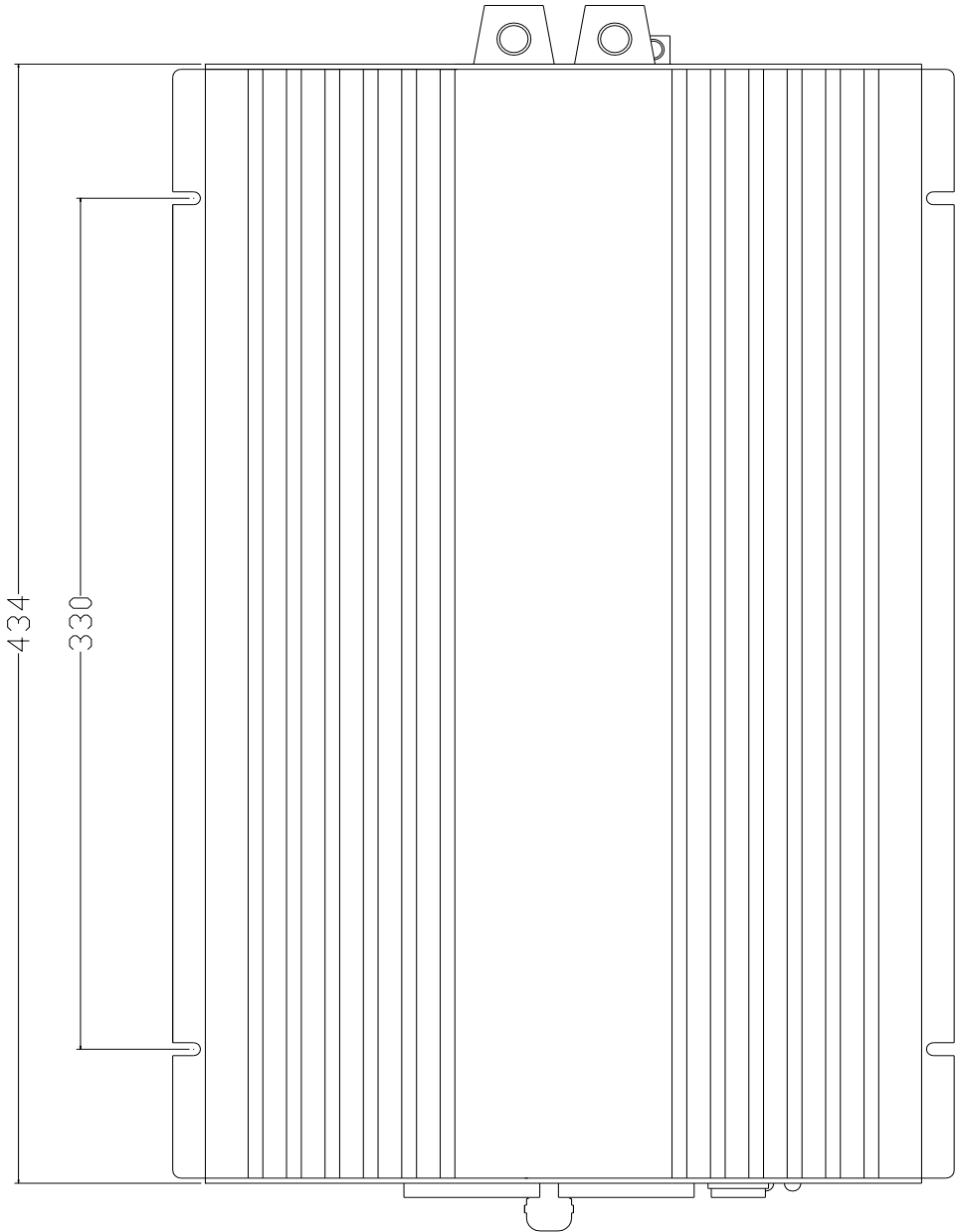
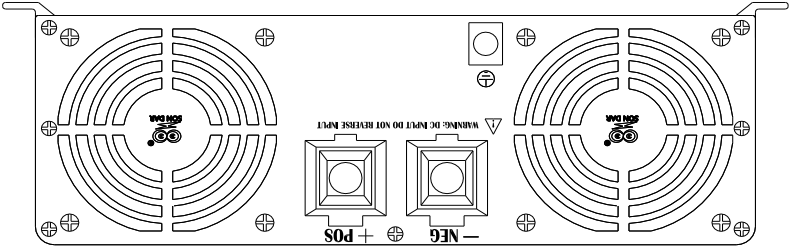


SU-800





SU-3000



7. Troubleshooting:



WARNING!

Do not open or disassemble inverter.

Attempting to service the unit yourself may cause the risk of electrical shock or fire.

Problems and Symptoms	Possible Cause	Solutions
No any reflection after turn on the switch	Battery damage or connection not success	Change battery, check the DC cable
No AC power output red LED always light	Output overload or short circuit	Check output whether overload or not ,decrease load, check AC cable
No AC power output red LED blink slowly	Low battery input or high battery voltage input	Inspect the model of battery,full charge of battery, check input connection
No AC power output yellow LED blink slowly	Over temperature shut-down	Check if there are ventilate barrier, keep ventilation in good condition

8. Maintenance:

To keep your operating properly, there is very little maintenance required. You should clean the exterior periodically with a damp cloth to prevent accumulation of dust and dirt. Do not use sharp or hard objects for cleaning as these may damage the device.

9. Warranty:

We guarantee this product against manufacturers defects for a period of 12 months from the date of purchase and will repair or replace any defective power inverter if you return it directly to us with postage paid. Please note that we are only responsible for ensuring our products are operational before delivery. We are not liable for anything that occurs as a result of the user's fault.

