



# Pure Sine Wave Power Inverter User's Manual



CE FC **e**13



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# 1. Important Safety Instructions



#### WARNING!

Before using the Inverter, read and save the safety instructions.

#### 1-1. General Safety Precautions

- 1-1-1. Do not expose the Inverter to rain, snow, spray, bilge or dust. To reduce risk of hazard, do not cover or obstruct the ventilation openings. Do not install the Inverter in a zero-clearance compartment. Overheating may result.
- 1-1-2. To avoid a risk of fire and electronic shock. Make sure that existing wiring is in good electrical condition; and that wire size is not undersized.

Do not operate the Inverter with damaged or substandard wiring.

1-1-3. This equipment contains components which can produce arcs or sparks. To prevent fire or explosion do not install in compartments containing batteries or flammable materials or in locations 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.

#### **1-2. Precautions When Working with Batteries**

- 1-2-1. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 20 minutes and get medical attention immediately.
- 1-2-2. Never smoke or allow a spark or flame in vicinity of battery or engine.
- 1-2-3. Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery of other electrical part may cause an explosion.
- 1-2-4. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery produces a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.



# 2. Functional Characteristics

### 2-1. General Information

ST-series consist of a stand-alone power inverter with built-in AC Transfer

Switch and is suitable for RV, Marine and Emergency applications.

The following two separate optional versions of these units are available (These are required to be ordered separately) :

### Option 1

• Off-line Mode: The AC input power from the utility is the primary source and the DC to AC inverter is the backup source. If AC input power from the utility is available, it will be passed through to the AC loads and the inverter will remain in the standby condition. If AC input power from the utility fails, the AC loads will be transferred to the inverter. When AC input power from the utility returns, the load will once again be transferred back to the utility and the inverter will once again remain in standby condition. This is the standard version.

### Option 2

• **On-line Mode:** The AC power from the DC to AC inverter is the primary AC power source and the utility AC power is the backup source. If the DC source or the inverter fail, AC input power from the utility will be passed through to the AC loads. Once the DC power source is restored, the load will once again be transferred back to the inverter. This is an optional version and has to be ordered specifically.



### WARNING!

The above two option are fixed during the production and customer unable to modify.



#### 2-2. Application

- <sup>2-2-1</sup> Power tools–circular saws, drills, grinders, sanders, buffers, weed and hedge trimmers, air compressors.
- 2-2-2. Office equipment computers, printers, monitors, facsimile machines, scanners.
- 2-2-3. Household items vacuum cleaners, fans, fluorescent and incandescent lights, shavers, sewing machines.
- 2-2-4. Kitchen appliances coffee makers, blenders, ice markers, toasters.
- 2-2-5 Industrial equipment metal halide lamp, high pressure sodium lamp.
- 2-2-6. Home entertainment electronics television, VCRs, video games, stereos, musical instruments, satellite equipment.



#### 2-3. Features

- Pure sine wave output (THD < 3%) to operate higher-end electronic Equipments.
- Output frequency : 50 / 60Hz switch selectable
- Built in 16A/25A or 30A rating transfer switch.
- Speed up transfer time and synchronized operation with the AC source at all times that allows the transfer to be interruption-free for sensitive equipments.
- Built in advance microprocessor to make friendly interface with user.
- Low power " Power Saving Mode " to conserve energy
- Capable of driving highly reactive & capacitive loads at start moment.
- Hardwire AC connection model option.
- Loading controlled cooling fan.
- Smart remote controller.
- 3 LED indicators with tri-color display all operation status.
- High efficiency 88 ~ 94%.
- Protection:

Input over voltage and Input low voltage protection.

Low battery alarm

Over temperature protection.

Over load protection

Short Circuit protection

Reverse polarity protection.

AC circuit breaker (6Amp to 30Amp)



	Specification			Mode	el No.			
	Item	ST1000-112	ST1000-124	ST1000-148	ST1000-212	ST1000-224	ST1000-248	
Cont	tinuous Output Power	1000W						
Maximu	um Output Power (3Min.)			115	0W			
	Surge Rating			200	0W			
	Input Voltage	12V	24V	48V	12V	24V	48V	
	Output Voltage	100 /	110 / 120V	± 5%	<b>220</b> /	230 / 240V	<b>± 3%</b>	
(1	Frequency Switch Selectable)			50 / 0	60Hz			
	Output Waveform		P	ure Sine Wa	ve (THD < 3%	%)		
E	fficiency (full load)	88%	90%	92%	90%	93%	94%	
No	Load Current Draw	1.43A	0.75A	0.38A	1.25A	0.65A	0.35A	
Sta	Ind-By Current Draw	0.25A	0.15A	0.09A	0.25A	0.15A	0.09A	
Inpu	ut Voltage Regulation	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC	
In	put Level Indicator	Red / Orange / Green LED						
L	oad Level Indicator							
	Failure Indicator	Red LED						
	Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over Temperature Over/Under Input Voltage, AC Input Circuit Breaker						
	Circuit Breaker	30 Amp 6 Amp						
R	emote Control Unit	CR6 / CR8 Optional						
Syn	chronous AC transfer	YES						
	Transfer switch	30 Amp 16 Amp						
	Transfer Time	Inverter to utility AC : 8 ~ 10msec. ; Utility AC to inverter : 16 ~ 50 m						
	Safety		Meet UL458					
-	EMI Conduction&Radiation	Comp	liance to FCC C	lass A	Complia	ance to EN5502	2 classA	
БИО	EMS Immunity				Compli	iance to EN610	00-3-2,3	
EMC	LVD				Com	pliance to EN60	950-1	
	e-MARK				Compliance	to e-13*72/245/I	ECC,95/54 EC	
Operat	ting Temperature Range			0 - 4	40℃			
Stora	ge Temperature Range	-30℃ to 70℃						
	Cooling	Loading controlled cooling fan						
	Dimensions	373(L)*236(W)*115(H) mm / 14.7(L)*9.29(W)*4.53(H) Inch						
	Weight			<b>6.2 kg</b> / 1	3.6 Lbs.			



	Specification			Mode	el No.				
ltem S		ST1500-112							
Con	tinuous Output Power	1500W							
Maxim	um Output Power (3Min.)			172	5W				
	Surge Rating			300	W				
	Input Voltage	12V	24V	48V	12V	24V	48V		
	Output Voltage	100 /	′ 110 / 120V	± 5%	<b>220</b> /	230 / 240V	± 3%		
(	Frequency Switch Selectable)			50 / 0	60Hz				
	Output Waveform		P	ure Sine Way	ve (THD < 3%	%)			
E	fficiency (full load)	88%	91%	<b>92%</b>	<b>92%</b>	93%	94%		
No	Load Current Draw	1.45A	0.75A	0.40A	1.40A	0.70A	0.40A		
Sta	and-By Current Draw	0.28A	0.15A	0.09A	0.28A	0.15A	0.09A		
Inp	ut Voltage Regulation	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC		
In	put Level Indicator								
L	oad Level Indicator	Red / Orange / Green LED							
	Failure Indicator	Red LED							
	Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over Temperature Over/Under Input Voltage, AC Input Circuit Breaker							
	Circuit Breaker	30 Amp 10 Amp							
R	emote Control Unit	CR6 / CR8 Optional							
Syn	chronous AC transfer	YES							
	Transfer switch	30 Amp 10 Amp							
	Transfer Time	Inverter to utility AC : 8 ~ 10msec. ; Utility AC to inverter : 16 ~ 50 m							
	Safety		Meet UL458						
	EMI Conduction&Radiation	Comp	liance to FCC C	lass A	Compliance to EN55022 classA				
EMC	EMS Immunity					ance to EN610			
	LVD					pliance to EN60			
	e-MARK				Compliance	to e-13*72/245/I	ECC,95/54 EC		
Opera	ting Temperature Range			0 - 4	10°C				
Stora	ge Temperature Range			-30℃ t	o 70℃				
	Cooling	Loading controlled cooling fan							
	Dimensions	403(L)*236(W)*115(H) mm / 15.9(L)*9.29(W)*4.53(H) Inch							
	Weight			<b>7.0 kg</b> / 1	15.4 Lbs.				

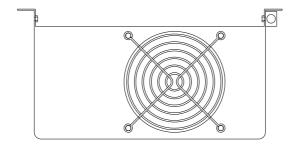


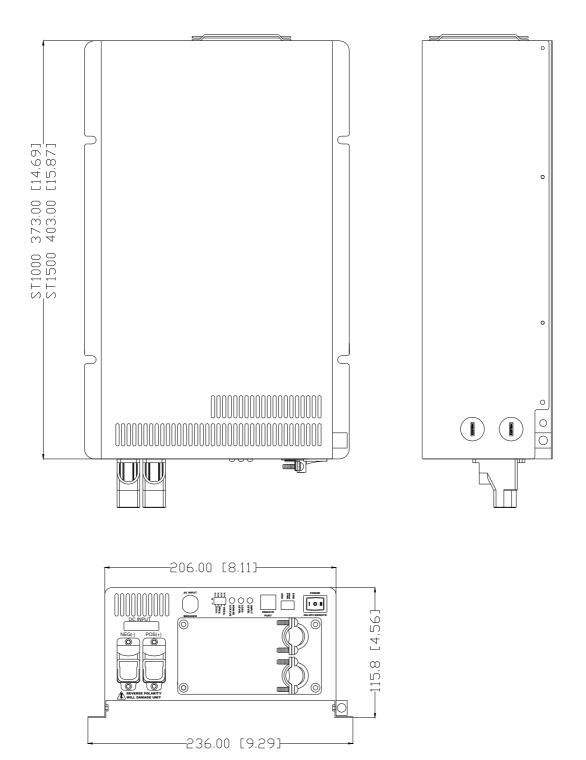
	Specification			Mode	el No.			
Item S		ST2000-112	ST2000-124	ST2000-148	ST2000-212	ST2000-224	ST2000-248	
Con	tinuous Output Power	2000W						
Maxim	um Output Power (3Min.)			230	W0			
	Surge Rating			400	W0			
	Input Voltage	12V	24V	48V	12V	24V	48V	
	Output Voltage	100 /	110 / 120V	± 5%	220 /	230 / 240V	<b>± 3%</b>	
(1	Frequency Switch Selectable)			50 / (	60Hz			
	Output Waveform		P	ure Sine Wa	ve (THD < 3%	%)		
E	fficiency (full load)	88%	91%	92%	90%	93%	94%	
No	Load Current Draw	2.6A	1.50A	0.70A	2.3A	1.1A	0.65A	
Sta	Ind-By Current Draw	0.60A	0.30A	0.2A	0.60A	0.3A	0.15A	
Inpu	ut Voltage Regulation	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC	
In	put Level Indicator							
L	oad Level Indicator	Red / Orange / Green LED						
	Failure Indicator	Red LED						
	Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over Temperature Over/Under Input Voltage, AC Input Circuit Breaker						
	Circuit Breaker	30Amp						
R	emote Control Unit	CR6 / CR8 Optional						
Syn	chronous AC transfer	YES						
	Transfer switch	30Amp			25 Amp			
	Transfer Time	Inverter to u	utility AC : 8	~ 10msec. ;	Utility AC to	inverter : 1	6 ~ 50 msec	
	Safety		Meet UL458					
	EMI Conduction&Radiation	Comp	liance to FCC C	lass A	Compliance to EN55022 classA			
EMC	EMS Immunity					ance to EN610		
20	LVD					pliance to EN60		
	e-MARK					to e-13*72/245/I	ECC,95/54 EC	
Operat	ting Temperature Range	0 - 40°C						
Stora	ge Temperature Range	-30℃ to 70℃						
	Cooling	Loading controlled cooling fan						
	Dimensions	433(L)*332(W)*115(H) mm / 17(L)*13(W)*4.53(H) Inch						
	Weight	11.2 kg / 24.6 Lbs.						



	Specification			Mode	el No.				
ltem S		ST2500-112							
Con	tinuous Output Power	2500W							
Maximu	um Output Power (3Min.)			287	′5W				
	Surge Rating			500	W0				
	Input Voltage	12V	24V	48V	12V	24V	48V		
	Output Voltage	100 /	/ 110 / 120V	± 5%	<b>220</b> /	230 / 240V	± 3%		
(1	Frequency Switch Selectable)			50 / 0	60Hz				
	Output Waveform		P	ure Sine Wa	ve (THD < 3%	%)			
E	fficiency (full load)	88%	91%	<b>92%</b>	90%	93%	94%		
No	Load Current Draw	2.62A	1.53A	0.72A	2.32A	1.15A	0.68A		
Sta	Ind-By Current Draw	0.60A	0.30A	0.2A	0.60A	0.3A	0.15A		
Inpu	ut Voltage Regulation	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC	10.5-15 VDC	21.0-30 VDC	42.0-60 VDC		
In	put Level Indicator								
L	oad Level Indicator	Red / Orange / Green LED							
	Failure Indicator	Red LED							
	Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over Temperature Over/Under Input Voltage, AC Input Circuit Breaker							
	Circuit Breaker	30 Amp							
R	emote Control Unit	CR6 / CR8 Optional							
Syn	chronous AC transfer	YES							
	Transfer switch	30Amp 25 Amp							
	Transfer Time	Inverter to utility AC : 8 ~ 10msec. ; Utility AC to inverter : 16 ~ 50 ms							
	Safety		Meet UL458						
	EMI Conduction&Radiation	Comp	liance to FCC C	lass A	•	ince to EN5502			
EMC	EMS Immunity					ance to EN610			
	LVD					pliance to EN60			
	e-MARK				Compliance	to e-13*72/245/I	ECC,95/54 EC		
Operat	ting Temperature Range	0 - 40°C							
Stora	ge Temperature Range	-30℃ to 70℃							
	Cooling	Loading controlled cooling fan							
	Dimensions	463(L)*332(W)*115(H) mm / 18.2(L)*13(W)*4.53(H) Inch							
	Weight			12 kg / 2	6.4 Lbs.				

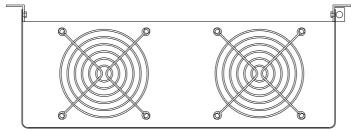


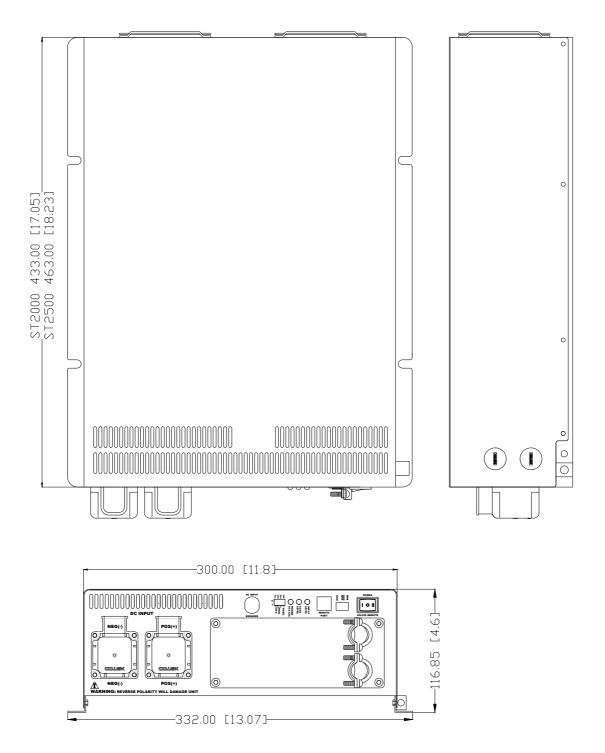






### 2-5. Mechanical drawings



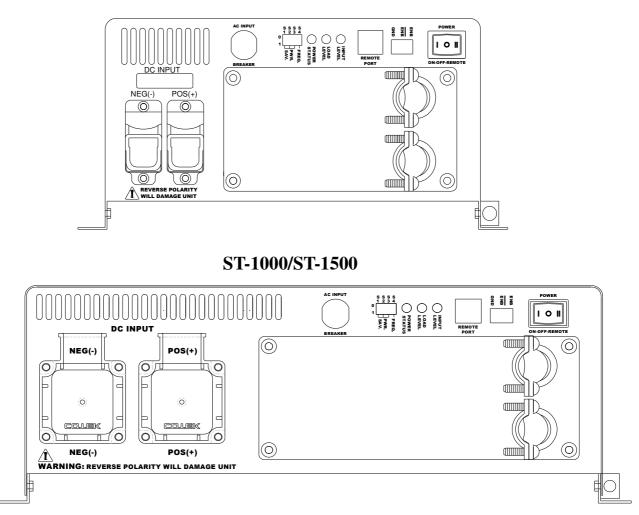




# 3. Introduction

3-1. Front Panel Operation

Front view



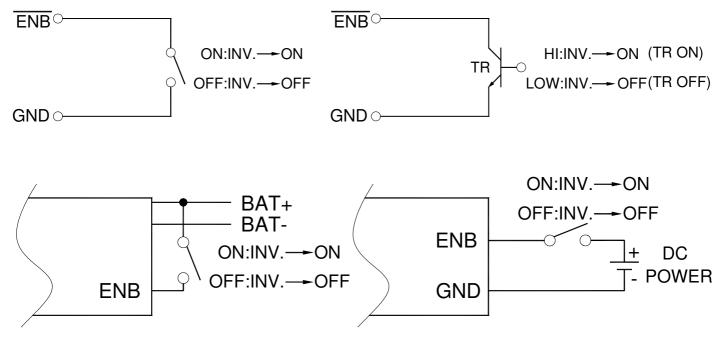
#### ST-2000/ST-2500

- 3-1-1. Power ON / OFF / REMOTE (Main) switch:
  - a. Before installing the inverter, you need to ensure the main switch is in the OFF position.
  - b. Before using the remote unit, you need to ensure the main switch is in the REMOTE position.
- 3-1-2. AC input Circuit Breaker:

The AC input circuit breaker protects the model from overload. When an overload condition exists, the circuit breaker stops to supply output AC grid power. To reset it, push the circuit breaker switch then the model will be back in normal operation. The source fault should be corrected before you reset it.



- 3-1-3 Green terminal
  - 1) Before installing the inverter, you need to ensure the main switch must be "OFF".
  - 2) Before using the remote control terminal, you need to ensure the main switch muse be "REMOTE".
  - 3) Ensure the remote contacts off.
  - 4) Use 20 ~ 24 #AWG wire to connect the remote control terminal.
  - 5) Remote control ON/OFF inverter setup status:



NOTE: At the same time, only can use one model to control the inverter. The maximum level is the same as input DC voltage.

3-1-4. Remote Port:

The ST Series Inverter is compatible with any of these remote controllers: CR-6 or CR-8.

LED Status	DC 12V	DC 24V	DC 48V
RED Blink (slow)	10.3~10.6	20.5~21.2	40.8~42.4
RED	10.6~11.0	21.2~21.8	42.4~43.5
ORANGE	11.0~12.1	21.8~24.1	43.5~48.1
GREEN	12.1~14.2	24.1~28.6	48.1~56.3
ORANGE Blink	14.2~15.0	28.6~30.0	56.3~59.6
OVER RED BLINK	15.01	30.01	59.61

3-1-5. Input Level : Display Input Voltages



3-1-6. Load Level : Display AC Loads (Watts)

LED Status	DARK	GREEN	ORANGE	RED	BLINKING RED
ST1000	0 ~ 80W	80 ~ 330W	330 ~ 750W	750 ~ 960W	Over 960W
ST1500	0 ~ 120W	120 ~ 495W	495 ~ 1125W	1125 ~ 1450W	Over 1450W
ST2000	0 ~ 160W	160 ~ 660W	660 ~ 1500W	1500 ~ 1920W	Over 1920W
ST2500	0 ~ 200W	200 ~ 825W	825 ~ 1875W	1875 ~ 2390W	Over 2390W

3-1-7. Power Status : Display Power & Fault Status

Orange LED	LED Signal	Status
Solid		Power OK
Slow Blink		Power Saving
Red LED	LED Signal	Status
Fast Blink		OVP
Slow Blink		UVP
Intermittent Blink		OTP
Solid		OLP
Green LED	LED Signal	Status
Solid		AC GRID INPUT OK

3-1-8. AC Frequency : Selected by "S4" Dip Switch

Frequency	S4
50 HZ	OFF
60 HZ	ON

3-1-9. Power Saving Mode: Power Saving Mode is adjustable and set by the Dip Switches, S1, S2 and S3 on the front panel.
Example: The load should be set above15W. If the load is below15W, the power saving mode will be activated.



ST1000 ST1500	ST2000 ST2500	S1	S2	S3
DISABLE	DISABLE	OFF	OFF	OFF
20W	40W	ON	OFF	OFF
40W	80W	OFF	ON	OFF
55W	125W	ON	ON	OFF
75W	170W	OFF	OFF	ON
95W	210W	ON	OFF	ON
115W	245W	OFF	ON	ON
135W	280W	ON	ON	ON

3-1-10. DC Input Terminals:

Connect DC input terminals to 12V / 24V / 48V battery or other power sources.

[+] represents positive, [-] represents negative. Reverse polarity connection can blow the internal fuse and may damage the inverter permanently.

	DC Input Voltage				
Model	Minimum	Maximum			
12V	10.5V	15.0V			
24V	21.0V	30.0V			
48V	42.0V	60.0V			

3-1-11. Chassis Ground: Connect the wire # 8 AWG to vehicle chassis.



#### WARNING!

Operating the inverter without a proper ground

connection may cause electrical safety hazard.



#### **3-2. Protections Features**

		DC Input (VDC)					Over Temperature Protection			
Model	Over	Over Voltage Under Under Voltage		INTERIOR		HEAT SINK				
	Shut- down	Restart	Voltage Alarm	Shut- down	Restart	Shut- down	Restart	Shut- down	Restart	
12V	15.3	14.3	11.0	10.2	12.7					
24V	30.6	28.6	22.0	20.3	25.2	<b>70°</b> ℃	<b>45</b> ℃	<b>90°</b> C	<b>60</b> ℃	
48V	61.2	57.2	44.0	40.8	49.7					

#### **3-3 DC Wiring Connections**

Follow the instructions to connect the battery cables to DC input terminals of the Inverter. The cable should be as short as possible (less than 6 feet / 1.8 meters ideally) so that it can handle the required current in accordance with the electrical codes or regulations application. Inappropriate length of cables will deteriorate the inverter performance such as poor surge capability, frequent low-input voltage warnings, and shutdown. UVP warning occurs when DC voltage drops across the cables from the inverter to the batteries. The longer or narrower the cables, the more the voltage drop.

Increasing your DC cable size will help improve the situation.

The following recommended cables are for the best performance of the inverter. (Apply both 120V and 230V versions)

Model No	Wire AWG	Inline Fuse
ST1000-112 / 212	#2	150 A
ST1000-124 / 224	# 4	80 A
ST1000-148 / 248	# 6	40 A
ST1500-112 / 212	#2	200 A
ST1500-124 / 224	# 4	100 A
ST1500-148 / 248	# 6	50 A
ST2000-112 / 212	# 2/0	250 A
ST2000-124 / 224	# 1/0	125 A
ST2000-148 / 248	# 2	70A
ST2500-112 / 212	# 4/0	400 A
ST2500-124 / 224	# 2/0	200 A
ST2500-148 / 248	# 1/0	100 A



3-3-1. Connect the cables to the power input terminals on the front panel of the inverter. The red terminal is positive (+) and black terminal is negative (-). Insert the cables into the terminals and tighten screw to clamp the wires securely.



#### WARNING!

Make sure all the DC connections are tight (torque to 9 - 10 ft-lbs, 11.7 - 13 Nm). Loose connections could result overheat in a potential hazard.

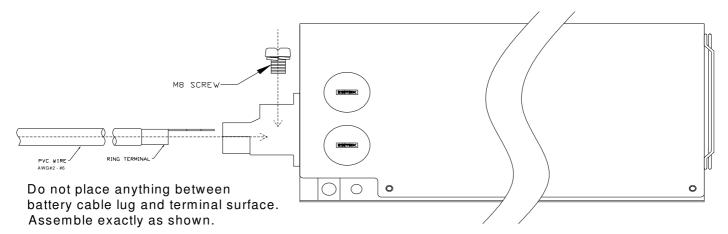
#### WARNING!



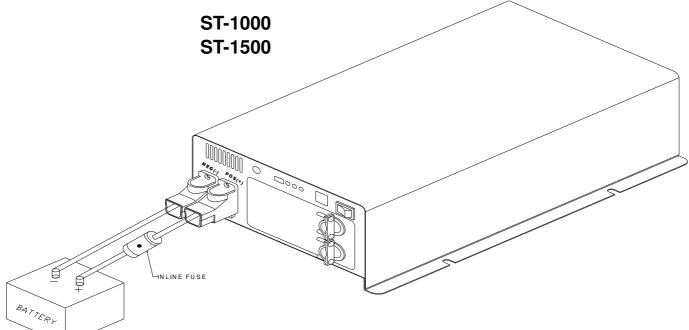
The installation of a fuse must be on positive cable. Failure to place a fuse on "+" cables running between the inverter and battery may cause damage to the inverter and will void warranty.

Also, only use high quality copper wire and keep the cable length short which is a maximum of 3 - 6 feet.

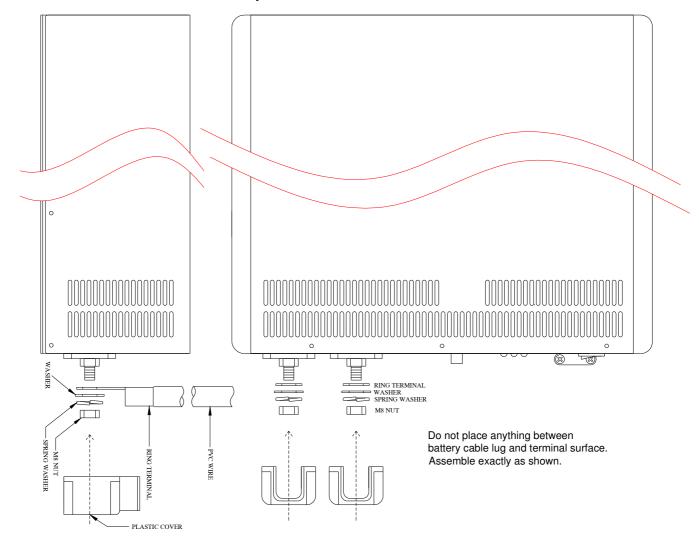
Battery to inverter cable connection



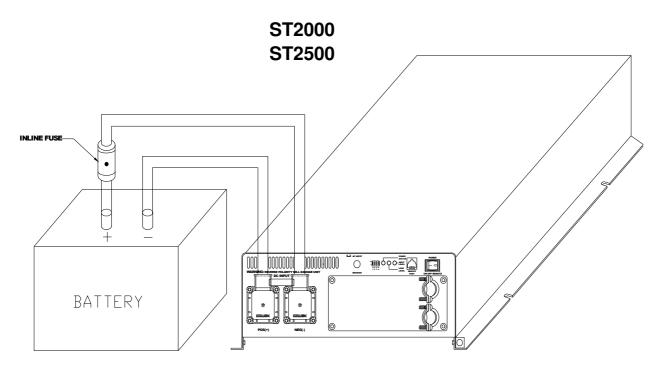




#### Battery to inverter cable connection

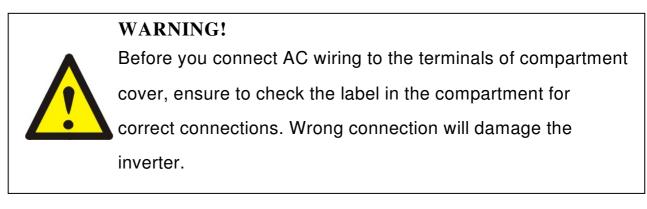








3-4-1. The AC wiring compartment is located on the front panel of the ST series. Remove the AC wiring compartment cover to gain access to the AC terminal.



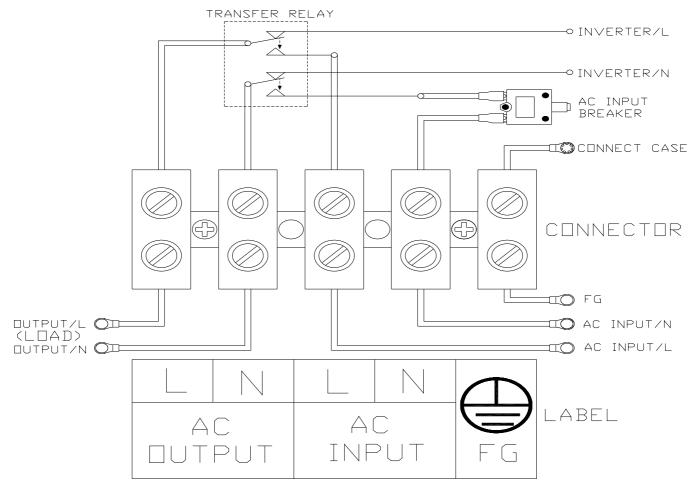
### CAUTION !

It is advised that all the electrical installation should conform to the local electrical codes and should be carried out by a certified electrician.

When the unit is feeding the internally inverted voltage (Power Status LED is green, power from the AC input source is not available), the current carrying conductors connected to the "L" and "N" terminals of the AC output will be isolated from the metal chassis of the inverter. Hence, during this condition, when the metal chassis of the inverter is connected to the earth ground, the "N" terminal of the AC output will not be grounded (bonded) to the earth ground. Under this condition, the "N" terminal of the AC output will not be a Neutral in the true sense. Do not touch this terminal as it will be at an elevated voltage(almost half the value the AC output voltage) with respect to the metal chassis / earth ground and may produce an electrical shock when touched!

When the unit is transferring power from the AC input source (Power Source LED is orange), the grounding condition of the "N" terminal of the AC output will be the same as the condition of the "N" terminal of the AC input source. If the AC input source is the power supplied from the utility, the "N" terminal would be a Neutral in the true sense, will normally be bonded to the earth ground and will read almost 0 V with respect to the earth ground. In this case, touching this terminal will not be a shock hazard.





3-4-2. Connect AC output and AC input wiring to the ST series terminals. Please take the following information as your reference.

-			Wire length / gauge							
Ierr	ninal	Wire color	ST1000&ST1500	ST2000&ST2500						
AC	Line (L)	Black								
OUTPUT	TPUT Neutral (N) White									
AC INPUT	Line (L)	Brown	Within 16 feet / AWG#	Within 16 feet / AWG#						
AC INFUT	Neutral (N)	Blue	14~16	10 ~12						
Gro	ound	Green / Yellow or Bare	26~32 feet / AWG#	26~32 feet / AWG#						
		copper	12~14	8 ~10						

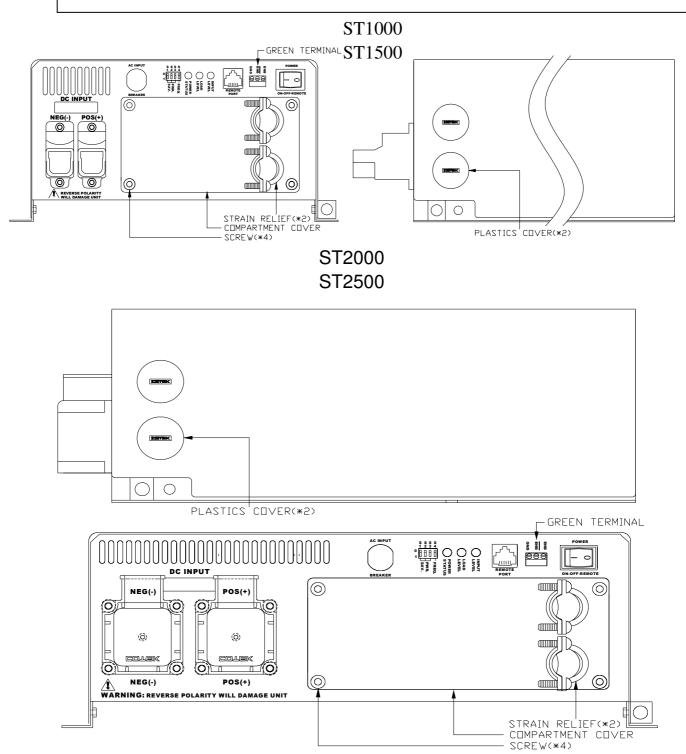
- 3-4-3. Please double check and review all connections to ensure the wires are in correct terminals and the connections are tight.
- 3-4-4. Before connecting AC output and AC input terminals of the ST series, you can either use front compartment cover or a side hole to coil out. Both AC input and AC output are coiled out from the front compartment cover when in production. If you want to change the position, you should open the top cover first, and then switch the wire of the front compartment cover and the plastic cover of the side of top cover.





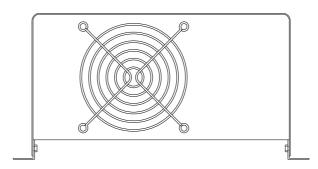
#### WARNING !

If the connection distribution of the frond panel is not feasible for your appliances, ST series also provides another distribution on the side panel, to utilize it please be ensured to remove the plastic covers before installing the strain relief; moreover, replace the empty hole of front panel with removed plastic covers for safety purpose.

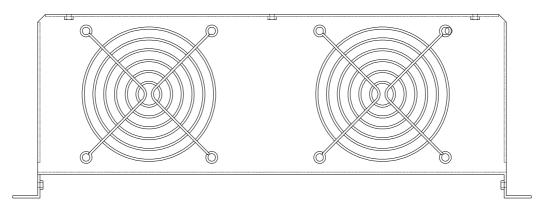




**Rear view** 



ST-1000/ST-1500



ST-2000/ST-2500

3-5-1. Fan Ventilation:

Be sure to keep it a distance (at least 1 inch) form surrounding things.

#### 3-6. Installation

The power inverter should be installed in a location that meets the following requirements:

- 3-6-1. Dry Do not allow water to drip or splash on the inverter.
- 3-6-2. Cool Ambient air temperature should be between 0  $^\circ C$  and 40  $^\circ C$  , the cooler the better.
- 3-6-3. Safety Do not install batteries in compartment or other areas where flammable fumes existence such as fuel storage areas or engine compartments.
- 3-6-4. Ventilated Allow at least one inch of clearance around the Inverter for air flow. Ensure the ventilation shafts on the rear and bottom of the unit are not obstructed.



- 3-6-5. Dust-free Do not install the Inverter in a dusty environments where dust, wood particles or other filings/shavings are present. The dust can be pulled into the unit when the cooling fan is operation.
- 3-6-6. Close to batteries Avoid excessive cable lengths but do not install the inverter in the same compartment as batteries.
  Use the recommended wire lengths and sizes (see section 4-3).
  Do not mount the inverter at the place where it is exposed to the gases produced by the battery.

These gases are very corrosive and prolonged exposure will damage the inverter.



#### WARNING!

Shock Hazard. Before proceeding further, carefully check that the 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.

#### 3-7. Inverter Operation

Switch the power ON, then the power inverter is ready to supply AC power to the loads. Turn on the loads separately after the inverter is ON to prevent OVP status caused by the surge power.

3-7-1. Switch the power ON, then the buzzer will send out beep sound. At the moment, the inverter is doing self-diagnosis. Then the LED's indicators will also show various colors.

Finally, the buzzer will send out another beep, and the Input Level and Status LED indicators will turn green. Then the inverter will start to work.

- 3-7-2. Switch the power OFF, then the inverter stops and all the lights that are On will go Off.
- 3-7-3. Switch the power inverter and the test load ON, then the inverter will supply the power to the load. If you want to measure true RMS voltage output of the inverter, a meter such as FLUKE 45 BECKMAN 4410 or TRIPLETT 4200 must be used.



# 4. Information

4-1. Troubleshooting



#### WARNING

Do not open or disassemble the ST series Inverter. Attempting to service the unit may cause the risk of electrical shock or fire.

Problems and Symptoms	Possible Cause	Solutions
No AC Power "Output" STATUS illuminates the l	LED	
a. Power status light is blinking fast.	Over input voltage. (OVP)	Check input voltage Reduce input voltage.
b. Power status light is Blinking slowly.	Low input voltage. (UVP)	Recharge battery. Check connections and cables.
c. Power status light is blinking Intermittently.	Thermal shutdown. (OTP)	Improve ventilation. Make sure ventilation, shafts of the inverter are not obstructed. Lower ambient temperature.
d. Power status light is glowed steadily.	Short circuit. Wiring error. Over Loading (OLP)	Check AC wiring for short circuit. Reduce load.

#### 4-2. Maintenance

Very little maintenance is required to keep your inverter operating properly. You should clean the exterior of the unit periodically with a damp cloth to prevent accumulation of dust and dirt. At the same time, tighten the screws on the DC input terminals.



#### 4-3. Warranty

We guarantee this product against defects in materials and workmanship for a period of 24 months from the date of purchase and will repair or replace any defective power inverters if you directly returned them to us with postage paid.

Please note that we are only responsible for ensuring our products are operational before delivering. This warranty will be considered void if the unit has been misused, altered, or accidentally damaged. Cotek is not liable for anything that occurs as a result of the user's fault.

# **5. Appendices**

CERTIFICATE	This is to certify that the following designated product	Product : POWER INVERTER Trade name : COTEK Model Number : ST1500-112, ST1500-124, ST1500-148 Company Name: COTEK ELECTRONIC IND. CO., LTD.	This product, which has been issued the test report listed as above in QuieTek Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.	FCC CFR Title 47 Part 15 Subpart B: 2003, CISPR 22:1997	TEST LABORATORY The Laboratory James Chang/ Manager James Chang/ Manager Datio Tour No.75-2, 3 Jun, Wang-Yen Valley, Vung-Hang, Tsuen, Chinager Hang, Roo.
CERTICATE	Issued Date: Dec. 28, 2004 Report No.: 051H003F This is to certify that the following designated product	Product : POWER INVERTER Trade name : COTEK Model Number : ST1000-1124, ST1000-148 Company Name : COTEK ELECTRONIC IND. CO., LTD.	This product, which has been issued the test report listed as above in QuieTek Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.	FCC CFR Title 47 Part 15 Subpart B: 2003, CISPR 22:1997	TEST LABORATORY



	Issued Date: Jun. 21, 2005 Report No.: 056H088F	This is to certify that the following designated product	Product : POWER INVERTER Trade name : COTEK Model Number : 5T2500-112, ST2500-124, ST2500-148 Company Name : COTEK ELECTRONIC IND. CO., LTD.	This product, which has been issued the test report listed as above in QuieTek Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.	FCC CFR Title 47 Part 15 Subpart B: 2003, CISPR 22:1997		TEST LABORATORY		
	t Date: Jun. 21, 2005 bit No.: 056H086F	ing designated product	Product : POWER INVERTER Trade name : COTEK Model Number : ST2000-112, ST2000-124, ST2000-148 Company Name : COTEK ELECTRONIC IND. CO., LTD.	ssued the test report listed as above in QuieTek s evaluation of one sample and confirmed to of the following EMC standard.	bpart B: 2003, CISPR 22:1997		TEST LABORATORY	Ю 클러코ስ코실코닝코잉컬러리스테코어코닝코싱코닝코닝코슈토윈코란드란드란드란드란드란드란드란트린	QuieTeK No.75-2, 3 Lin, Wang-Yeh Valley, Yung-Halng Tsuen, Chlung-Lin Shiang, Hsin-Chu 307 Taiwan, R.D.C. RuieTeK TEL:+886-3-592-8856 FAX:+886-3-592-8859 Email:service@quietek.com http://www.quietek.com



e13+72/245+95/54+296/1+00		M <sub>1</sub> , M <sub>2</sub> , M <sub>3</sub> , N <sub>1</sub> , N <sub>2</sub> , N <sub>3</sub> , O <sub>1</sub> , O <sub>2</sub> , O <sub>3</sub> , O <sub>4</sub> .	Cotek Electronic Iodustrial Co., Ltd. No. 33, Rong Hsin Rd., Pa Teh City, Tao Yuan County, Taiwan, R.O.C.	Label fixed on the bottom of the inverter	Cotek (Shenzhen) Electronic Co. Heng Ling Industrial Park, Ming Zhi Village, Long Hur Town, Pao Am Arca, Shenzhen, Guang Dong,	P.R. CHINA								our décrire les types de véhicule, de composant remplacés par le symbole "9" duns la documentation onent or sepanais schaitel wit types covered by this confictule,
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00*871 E*P\$226*25267*E12	Identification is done by type name	<ul> <li>Sticker on tup side of the inverter</li> </ul>	Not applicable	Codek (Shenzhen) Hiectronic Ca., Lid. Longshan 22, Rheir Prise Rond, Longshan, Baem, Shenzhen, P.R. CHTIVA.	Sticker affixed clearly legible and indelible on back side	or the inverter Costs (Stanober) Ellectronic Co. I fil.	Longshua, Batter Frise Road, Longshua, Baoan, Shernzhen, o D. Crinto, Baoan, Shernzhen,						thants pour décire les types de véhicule, de composant res sout reunplacés par le symbole "?" dans la documentation lois, component er separate technical ant types covered by this certificate, 712379,
	Moyens d'identification du type, s'ills sont marqués sur le véhieule / composant / estité celabiquer 0.13 Means of identification of ryse, firratica on the vehiels / component / especie declaridat-unit.	Emplacement de ce marquage: Location of thetmarking:	Catégorie de véhiente: <sup>(3)</sup> Casegory of véhicie:	Norn et adresse du constructeur: Name and addess of manufacture:	Dans le cus de composants et d'entités techniques, emplacement et procédé de fizzition de la marque de réception (EEE:	In the case of components and separate technical units, location and method of tEEKing of the EEC approval mark:	Adresses) de l'(des)itsure(s) u'assentoixee Address(e) of assembly plant(s):						Rayer k mention hattik Dess where suppressive St te ansyme if Viertitication du type tomportent das encretibrus una perforants pour décritre les types da véhicaia, de composant si le santoure if Viertitication du type tomportent das encretibrus una perforants pour despraced a véhicaia, de composant si le santoure in Viertitication et al. Précente fiche de réception, ces encretibres sont rempineds yrai le symbole "7" dans la document di per complex. All'111217. (for recent of Mediciant Opyreants charetter an relevant describe les which, component or zeparat and trypes covered by the exi- ficient constant software field entremper a bab a director of 101560/CKS. Al defined in Amer. 11 A to Direction.
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CERTIFICS CERTIFICS Issued Date: Dec. 30, 2004 Report No.: 051H002E This is to cartify that the following designated product This is to cartify that the following designated product Trade name : COTEK ELECTRONIC IND. CO., Model Number : STI500-212, STI500-224, STI Company Name : COTEK ELECTRONIC IND. CO., This product, which has been issued the test report lis taboratory, is based on a single evaluation of one sam comply with the requirements of the following EMC sti tec 61000-4-3: TEC 61000-4-3: TEC 61000-4-3: TEC 61000-4-4: TEC 61000-			TFICATE	Issued Date: Dec. 30, 2004 Report No.: 051H002E E following designated product	: POWER INVERTER : COTEK : ST1500-212, ST1500-224, ST1500-248 : COTEK ELECTRONIC IND. CO., LTD.	This product, which has been issued the test report listed as above in QuieTek taboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.	EN 55024: 1998+A1: 2001 IEC 61000-4-2: 1995+A1: 1998+A2: 2000 IEC 61000-4-3: 1995+A1: 1998+A2: 2000 IEC 61000-4-4: 1995+A1: 2000+A2: 2001 IEC 61000-4-5: 1995+A1: 2000	IEC 61000-4-6: 1996+A1: 2000 IEC 61000-4-8: 1993+A1: 2000 IEC 61000-4-11: 1994+A1: 2000	TEST LABORATORY	사 월급 밝혀 밝혀 밝혀 밝혀 같은 것은 알고 방고 방고 방고 방고 반드 반드 반드 반드 반드 반드 반드 반드 1
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	Issued Date: Jun. 23, 2005 Report No.: 056H087E	This is to certify that the following designated product	Product : POWER INVERTER Trade name : COTEK Model Number : ST2500-212, ST2500-224, ST2500-248 Company Name : COTEK ELECTRONIC IND. CO., LTD.	This product, which has been issued the test report listed as above in QuieTek Laboratory, is based on a single evaluation of one sample and confirmed to comply with the requirements of the following EMC standard.	EN 55022: 1998+A1: 2000+A2: 2003 EN 61000-3-2: 2000	EN 61000-3-3: 1995 + A1: 2001 IEC 61000-4-3: 2002 + A1: 2002   1 IEC 61000-4-3: 2004   1 IEC 61000-4-4: 2004   1 IEC 61000-4-5: 1995 + A1: 2000   1	IEC 61000-4-6: 1996+A1: 2000 [1]	James Chang/ Manager	붽 볞킍섉퀃섉퀃섉퀃섉퀃섉퀃섉퀃섉퀃섉퀃섉퀃섉퀻섉뉟윩녇탒녇봕톀봕듘봕댴봕댴봕댴봕댴봕댴탒녇벐
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Guang Fu RL, San Chung City, Tappei Hsien, Taiwan 186.248123188 Fax:+886.2.29959169 <b>atte Of Compliance</b> 23/EEC and the Amendment Directive 93/68/EEC 23/EEC and the Amendment Directive 93/68/EEC	<ul> <li>Asia Safety Link Inc.</li> <li>PF1, No. 80, Sec. 2, Guarg Far Rd., San Chung Cey, Taplei Hsten, Taivan Tei:+866-2-85123188 Fax:-886-2-2995169</li> <li>PF1, No. 80, Sec. 2, Guarg Far Rd., San Chung Cey, Taplei Hsten, Taivan Tei:+866-2-85123188 Fax:-886-2-2995169</li> <li>PC Contrifica Dene Cey, Tage, San Chung Cey, Taplei Hsten, Taivan Controp Directive 73/23/EEC and the Amendment Directive 93/68/EEC</li> <li>Producti Power Inder: 94-1003</li> <li>Manufacturer: Cotek Electronic Ind. Co., Ltd.</li> <li>No. 33, Rong Hsin Rd., Pa The city, Taoyuan Country, Taiwan</li> <li>Product: Power Inverter</li> <li>Model/Type: ST1500-224, ST1500-224, ST1500-224</li> <li>Model/Type: ST1500-212, ST1500-224, ST1500-224</li> <li>Colora (ST1500-224, ST1500-224)</li> <li>(3) 42-60Vdc, 40A (ST1500-224)</li> <li>(4) Carteror</li> <li>(5) 21-30V240Vac, 50/60Hz, 1500W</li> <li>(7) 1016 F Specification:</li> <li>Standards applied: IEC 60950-1: 2001; EN 60950-1: 2001</li> <li>(2) 21-3001; EN 60950-1: 2001; FN 60950-1: 2001</li> <li>(4) the technical provisions of the tested samples of the above products are in conformity with the technical provisions of the tested samples of the above products are in conformity with the technical provisions of the tested samples of the above products are in conformity with the technical provised tiberteres</li> </ul>
Following European Directive -	Following European Directive -
- Low Voltage Directive 73/23/EEC and the Amendment Directive 93/68/EEC-	- Low Voltage Directive 73/23/EEC and the Amendment Directive 93/68/EEC-
Date Issued: January 12, 2006	Date Issued: February 27, 2006
Approve & Authorized Signer:	Approve & Authorized Signer:



GG PF-1, No. 80, Sec. 2, Guang Fu Rd., San Chung City, Taipei Hsien, Taiwan GG	Certificate of Compliance Low Voltage Directive 2006/95/EC	Certificate Number: 95-0829	Manufacturer: Cotek Electronic Ind. Co., Ltd. No. 33, Rong Hsin Rd., Pa The city, Taoyuan Country, Taiwan	Product: Power Inverter	Model/Type: ST2000-x, x=212, 224 or 248	Electrical Rating: ip: AC 220/230/240, 50/60Hz, 30A or DC 10.5-15V, 230A / 21-30V, 108A / 42-60V, 52A op: AC 220/230/240V, 50/60Hz, 2000W	Other Specification:	Standards applied: IEC 60950-1: 2001; EN 60950-1: 2001	The tested samples of the above products are in conformity with the technical provisions of the Following European Directive -	Low Voltage Directive 2006/95/EC	Date Issued: May 22, 2007	Approve & Authorized Signer:
Definition of the sector of th	Certificate of Compliance	Certificate Number: 95-0830	Manufacturer: Cotek Electronic Ind. Co., Ltd. No. 33, Rong Hsin Rd., Pa The city, Taoyuan Country, Taiwan	Product: Power Inverter	Model/Type: ST2500-x, x=212, 224 or 248	Electrical Rating: ip: AC 220/230/240, 50/60Hz, 30A or DC 10.5-15V, 262A / 21-30V, 126A / 42-60V, 63A op: AC 220/230/240V, 50/60Hz, 2500W	Other Specification:	Standards applied: IEC 60950-1: 2001; EN 60950-1: 2001	The tested samples of the above products are in conformity with the technical provisions of the Following European Directive -	Low Voltage Directive 2006/95/EC	Date Issued: May 23, 2007	Approve & Authorized Signer:



No. 33, Rong Hsin Rd., Pa Teh City, Tao Yuan County, Taiwan Phone : 886-3-3661581 FAX : 886-3-3676029 E-mail : <u>sales@cotek.com.tw</u> http : // <u>www.cotek.com.tw</u> 2011.01.\_A1