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*修改內容:
p.2-3機構圖變更-
風向標示更正/機構印刷更正
p.8-9刪除Item選取框
p.8 NO Load Current Draw
-修改為1.0/0.5/0.25 (by工程)
p.14.ST600-148/248 - DC Input under voltage shut-down :修改為40.8 (by 工程)
p.15 5-2-1 DC48V 數值全修改(by工程)
※以上敘述非本文※

COTEK
出圖人 | 確認章
研發部 2011.04.12 簡世宗
請見附件

COTEK
正式文件，妥善保存

COTEK

ST600-XXX Series

Pure Sine Wave Power Inverter User's Manual

COTEK ELECTRONIC IND. CO., LTD.
文管中心
發行章

CE

e13
022192

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Table of Contents

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1. Important Safety Instructions

WARNING!

Before installing or using ST600-XXX Inverter, you need to read these safety instructions carefully.

1-1. General Safety Precautions

1-1-1. Do not expose ST600-XXX Inverter to water, mist snow, or dust. TO reduce the risk of fire, do not cover or obstruct the ventilation shafts. Do not install ST600-XXX Inverter in a zero-clearance compartment. Overheating may occur.

1-1-2. To avoid the risk of fire and electronic shock, make sure that existing wiring is in good electrical condition and not undersized. Do not operate ST600-XXX inverter with damaged or substandard wiring.

1-1-3. There are some components in the inverter can cause arcs and sparks. To prevent from fire or explosion, do not put batteries, flammable materials, or anything should be ignition-protected around the inverter.

1-2. Battery Precautions

1-2-1. If battery acid contacts your 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.

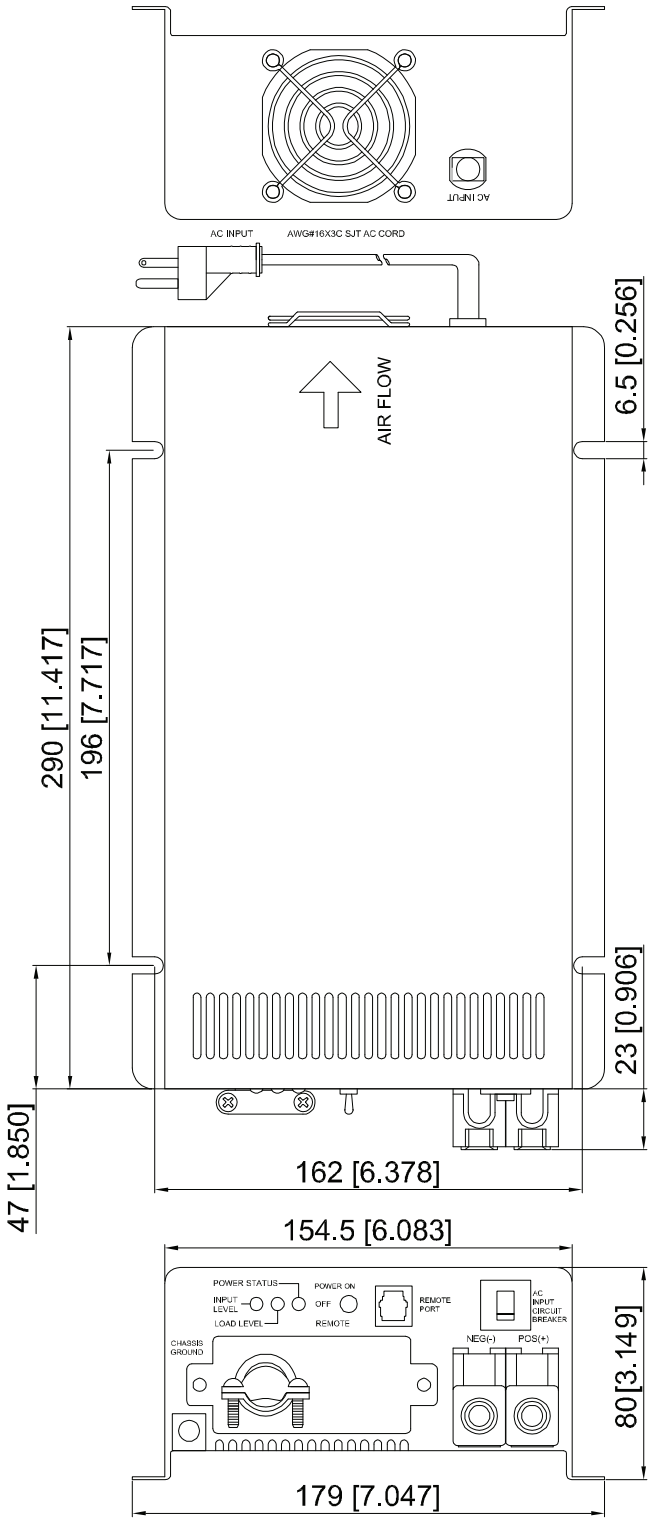
1-2-2. Never smoke or make a spark or flame in the vicinity of the battery or the engine.

1-2-3. Do not drop metals on the battery. The resulting spark or short-circuit on the battery or other electrical parts may cause an explosion.

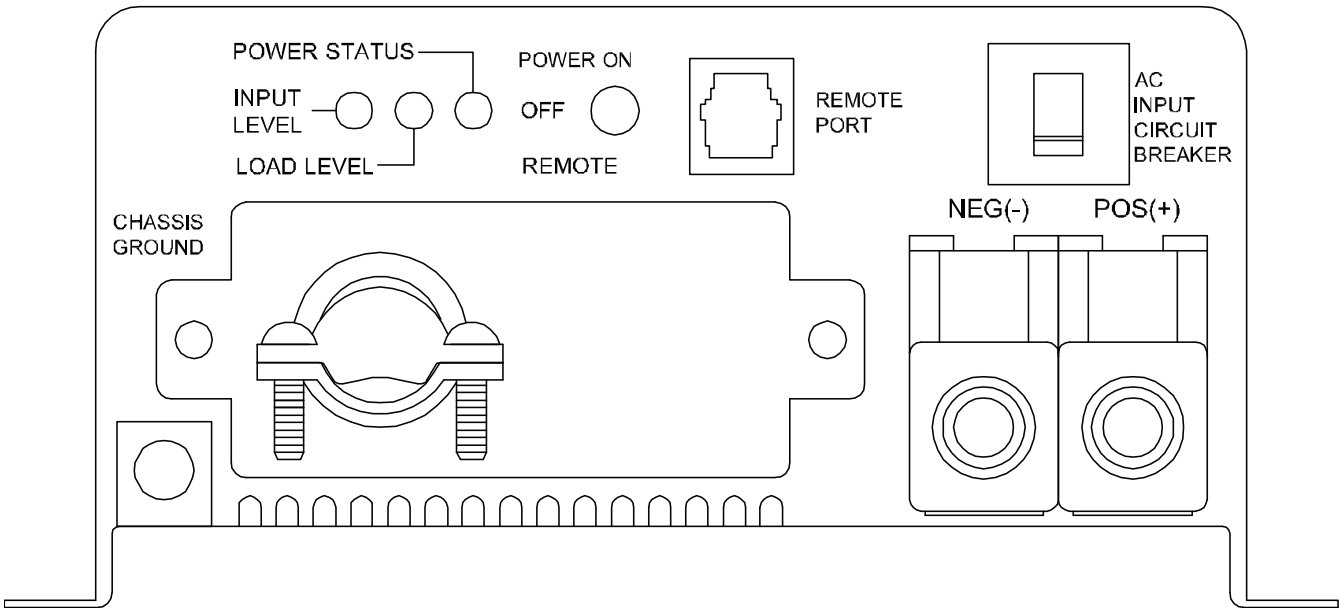
1-2-4. Remove personal metal items such as rings, bracelets, necklaces, and watches when operating with lead-acid batteries. Doing so may cause short circuit and very high temperature, which can melt metal items and even burn you.

2. Basic Descriptions

2-1. Mechanical Drawings



2-2. The Front Panel Interface



2-2-1. Power ON / OFF / REMOTE switch：

If you want to use remote control, switch the “on/off” controller to “remote”.

2-2-2. AC Input Circuit Breaker：

The 7Amp circuit breaker protects the inverter from overload. If it is overloaded, the circuit breaker will stop supplying output AC grid power. To reset it, switch the circuit breaker, then the inverter will be changed back to normal operation status. Note that the source fault should be corrected before you reset it.

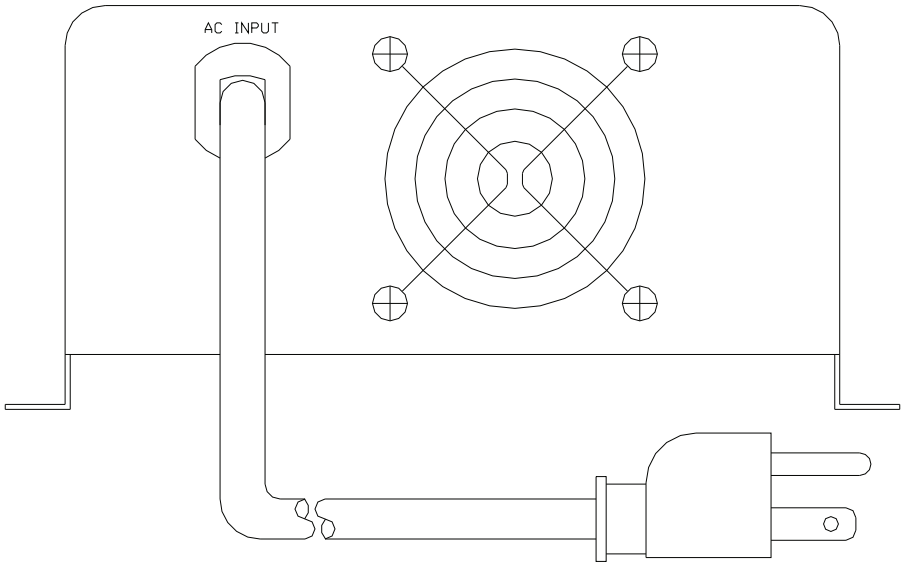
2-2-3. Remote Port：Connect the wiring RJ-11 to the remote control port.

2-2-4. Battery Terminals：

Connect 12V / 24V / 48V batteries or other 12V / 24V / 48V power sources.

2-2-5. Connect the chassis ground terminal to the earth.

2-3. The Rear Panel Interface



2-3-1. Ventilation shaft：
Do not obstruct it． Allow at least 3-inch distance for ventilation.

2-3-2. AC input：(source)
Plug it into AC source directly.

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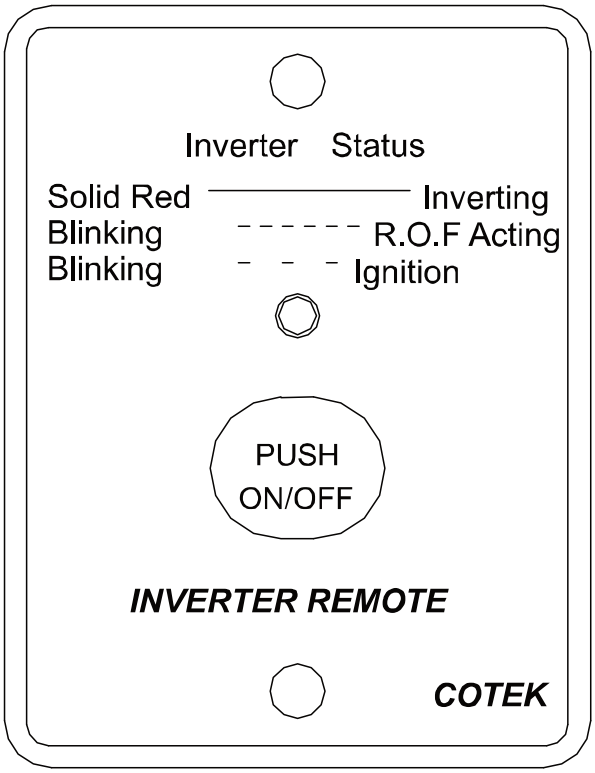
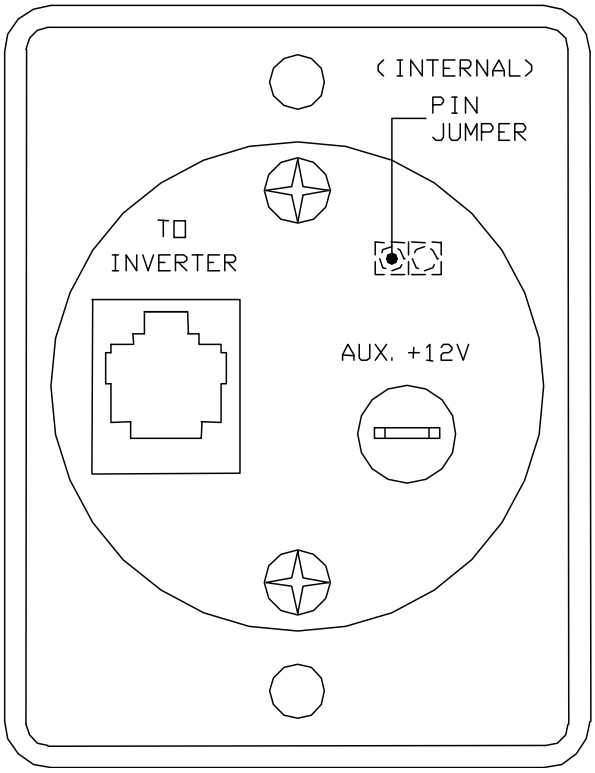
2-4. The Remote Control Panel





- This is a simple ON / OFF remote control.
  - ∗ Steadily blinking red LED light represents the Inverter is on.
  - ∗ Fast blinking red LED light represents that you are in **R.O.F** selection status.
  - ∗ Slow blinking red LED light represents that you are in **Ignition Lockout** selection status.
- The Jumper wire is placed inside the remote controller and it is to present either **R.O.F** or Ignition **lockout function**.
  - ∗ Pin jumper “Open” - **R.O.F**
  - ∗ Pin jumper “Short” – **Ignition lockout function**
- The wire must go with a 12 Volt fuse with proper sizes.
- Connect the wire RJ-11 to the remote port in front of the panel.
  - ∗ **Ignition Lockout function** – The Ignition lockout function is to turn the Inverter OFF when the auxiliary input wiring is connected to the ACC, and 12 Volts is applied.
  - ∗ **R.O.F** – The **R.O.F (Return Override Function)** is to turn the Inverter ON when the auxiliary input wiring is connected to the reverse gear Shift, and 12 Volts is applied.

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3. Functional Characteristics

3-1. General Information：

ST600-XXX goes with stand – alone power inverter and AC transfer switch and is suitable for RV, Marin, and Emergency appliances.
When the utility AC power is cut off, the transfer relay is de- energized and the load is automatically transferred to the ST600-XXX series output.
Once the AC utility is restored, the transfer relay will be energized and the load will be automatically reconnected to AC utility.

ST600-XXX series is available for 12 / 24 or 48Vdc Input and 120 Vac or 240Vac / 50-60 Hz Output. There are 2 versions as follows：

1. With Hardwire
   Provide with hardwired installation.

2. With GFCI
   This provides GFCI with safety receptacle so that it's easier to plug it into the appliances.

Please read all instructions and precautions marking on this manual carefully before using ST600-XXX series products.

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3-2. Features

Product :

- 600Watt continuous output with 800Watt power surge for electronic appliances
- Pure sine wave output (THD < 3%) to operate higher-end electronic Equipments
- Built-in 12A rating transfer switch with plug-in socket that is easy to maintain
- Speed up transfer time and synchronized operation with the AC source make the transfer interruption-free for sensitive equipments all the time
- Built-in advanced microprocessor for user-friendly interface
- Dual AC outlets and hardwire AC connection model options
- Smart remote controller
- 3 LED indicators with tri-color display for every operation status
- Meet UL458 approval and FCC class B

Protection :

- Battery over voltage and under voltage protections
- Over temperature protection
- Overload protection
- Short Circuit protection
- GFCI receptacle for Ground fault protection
- Reverse polarity protection
- ROF (remote override function) or Ignition Lockout options
- AC circuit breaker (3Amp to 7Amp)

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3-3. Electrical Performance

Specification	Model No.		
Item	ST600-112	ST600-124	ST600-148
Continuous Output Power	600W		
Maximum Output Power (3Min.)	680W		
Surge Rating	800W		
Input Voltage	12V	24V	48V
Output Voltage / Frequency (Switch Selectable)	100 / 110 / 120V ± 5%		
	50 / 60 Hz ± 0.05%		
Efficiency (full load)	87.0%	90.0%	90.0%
No Load Current Draw	1.0A	0.5A	0.25A
Output Waveform	Pure Sine Wave (THD< 3%)		
Power Factor Allowed	cosθ-90° ~ cosθ+90°		
Output Voltage Regulation	100 / 110 / 120V VAC -10% / + 4%		
Input Voltage Regulation	10.5 – 15VDC	21.0 – 30VDC	42.0 – 60VDC
Input Level Indicator	Red / Orange / Green LED		
Load Level Indicator			
Power Status	Red / Green LED		
Protections	Overload, Short Circuit, Reverse Polarity (Fuse), Over / Under Input Voltage, Over Temperature. AC Input Circuit Breaker, GFCI.		
Circuit Breaker	7Amp		
Transfer switch	12Amp		
Transfer Time	4 ~ 8 msec.		
Safety Certification	Meet UL458		
EMC	FCC class B	FCC class B	FCC class B
Remote Control	Available		
Synchronous AC transfer			
Operating Temperature Range	0 - 40℃		
Storage Temperature Range	-30℃ to 70℃		
Cooling	Loading controlled cooling fan		
Dimensions	11.42 (L) x 7.05 (W) x 3.15 (H) Inch		
Weight	3.3 kg / 6.6 lbs.		

Specification	Model No.		
Item	ST600-212	ST600-224	ST600-248
Continuous Output Power	600W		
Maximum Output Power (3Min.)	680W		
Surge Rating	800W		
Input Voltage	12V	24V	48V
Output Voltage / Frequency (Switch Selectable)	200 / 220 / 240V ± 3%		
	50 / 60 Hz ± 0.05%		
Efficiency (full load)	90.0%	93.0%	93.0%
No Load Current Draw	0.87A	0.43A	0.22A
Output Waveform	Pure Sine Wave (THD< 3%)		
Power Factor Allowed	cosθ-90° ~ cosθ+90°		
Output Voltage Regulation	200 / 220 / 240V VAC -10% / + 4%		
Input Voltage Regulation	10.5 – 15VDC	21.0 – 30VDC	42.0 - 60 VDC
Input Level Indicator	Red / Orange / Green LED		
Load Level Indicator			
Power Status	Red / Green LED		
Protections	Overload, Short Circuit, Reverse Polarity (Fuse), Over / Under Input Voltage, Over Temperature. AC Input Circuit Breaker, GFCI.		
Circuit Breaker	3Amp		
Transfer switch	12Amp		
Transfer Time	4 ~ 8 msec.		
Safety Certification	EN60950-1		
EMC	EN55022 classB EN61000-3-2,3 EN60950-1 e-13*72/245/EEC,95/54 EC	e-mark e13-022192	
Remote Control	Available		
Synchronous AC transfer			
Operating Temperature Range	0 - 40℃		
Storage Temperature Range	-30℃ to 70℃		
Cooling	Loading controlled cooling fan		
Dimensions	11.42 (L) x 7.05 (W) x 3.15 (H) Inch		
Weight	3.3 kg / 6.6 lbs.		

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4. Installation

4-1. Where to install

The power inverter should be installed in an environment which is：

4-1-1. Dry – Do not expose the inverter to water.

4-1-2. Cool – The ambient temperature should be as cool as possible between 0℃ and 40℃.

4-1-3. Safe – Do not install batteries with flammable fumes close by.

4-1-4. Ventilated – Be sure to keep the inverter a distance (at least 2 to 3 inch) from surrounding things. Ensure the ventilation shafts located on the rear and bottom side of the case are not obstructed.

4-1-5. Dust free – Do not install ST600-XXX Inverter in a dusty Environment. The inverter can inhale the dust when the fan is working.

4-1-6. Close to batteries – Avoid excessive cable lengths. Do not install the ST600-XXX Inverter in the same compartment as batteries. Use the recommended wire lengths and sizes. Do not mount the ST600-XXX Inverter in where it will be exposed to the gases produced by the battery. The gases are very corrosive and prolonged exposure will also damage the ST600-XXX Inverter.

WARNING!

Shock Hazard. Before proceeding further, carefully check to see if the ST600-XXX Inverter is connected to batteries, and every electrical source wiring is disconnected.

Do not connect output terminals of ST600-XXX Inverter to incoming AC source.

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4-2. AC Safety Grounding：

During the AC wiring installation, AC input and output ground wires are connected to the inverter. The AC input ground wire must be connected to the incoming ground from AC utility source.
The AC output ground wire should go to the grounding point for your loads (for example, a distribution panel ground bus).

Ground Fault Circuit Interrupters (GFCI)：

Installations in Recreational Vehicles (for North American approvals) will require GFCI protection of all branch circuit connected to the AC output of the hardwire terminal equipped with Inverter. In addition, electrical codes require GFCI protection of certain receptacles in residential installations. While the pure sine wave output of the Inverter is equivalent to the waveform provided by utilities, compliance with UL standards requires us to test and recommend specific GFCI.
Cotek has tested the following GFCI – protected 20A receptacles and found that they functioned properly when connected to the output of the Inverter.

4-3. Hardwire：

To make AC wiring connections：

4-3-1. The AC wiring compartment is located on the front panel of the ST600-XXX. Remove the AC wiring compartment cover to gain access to the AC terminal.

4-3-2. Connect the AC output wiring to ST600-XXX AC output terminals. Terminal to wiring connections is mentioned as follows：

Terminal	Wire color	Wire length / gauge
Line (L)	Black	Within 16 feet / AWG# 16 ~ 18 16 ~ 32 feet / AWG# 14 ~16
Neutral (N)	White	
Ground	Green / Yellow or Bare copper	

4-3-3. After AC wiring is well connected, double check all connections to ensure that the wires are in correct terminals and the connections are tight.

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4-4. Making SDC Wiring Connections：

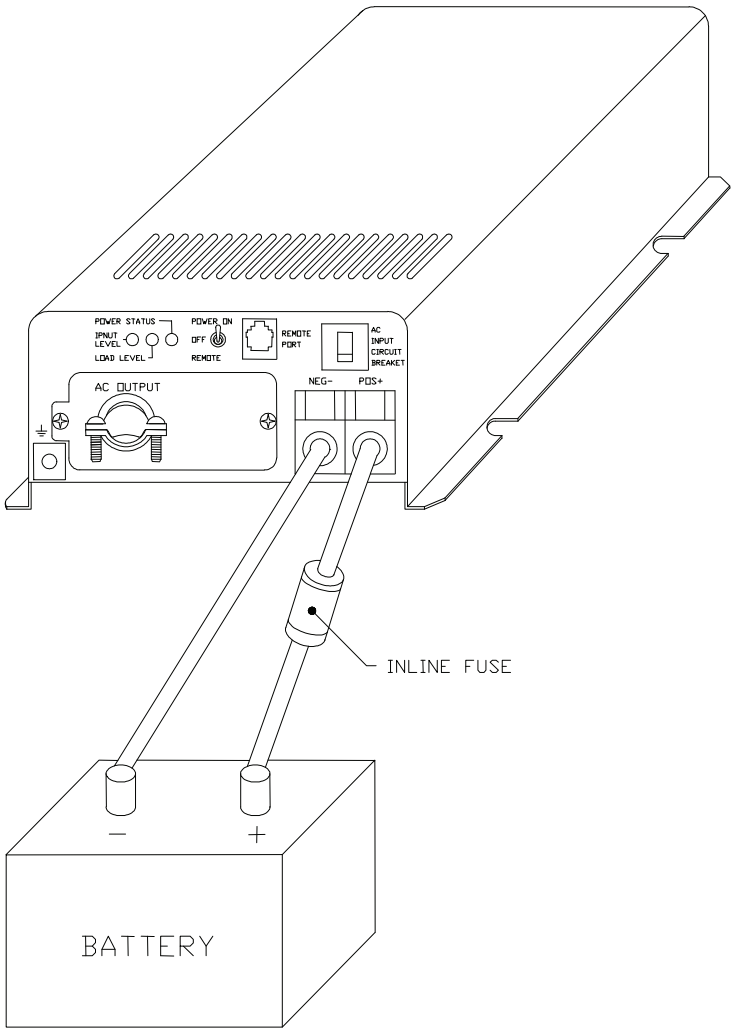
The following procedure is for connections between the battery cables and the DC input terminals on ST600-XXX Inverter. The cables should be high quality copper wiring and keep cable length as short as possible. The maximum length is 6 feet that is enough to handle the current, which is required by the electrical code or regulations.

Cables that are not 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. The low input voltage warnings are due to DC voltage drop across the cables from the inverter to the batteries.

Battery Cable Fusing --- A fuse is required by the National Electrical Code (NEC) to protect the battery and cables. UL notes that DC slow-blow fuse must be installed in positive battery cable, within 18 inches of the battery.

COTEK recommends to use the following cables for optimum inverter performance.

Model No	Wire AWG	Inline Fuse
ST600-112/212	# 4	100 A
ST600-124/224	# 6	50 A
ST600-148/248	# 8	30 A



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..

5. Operation:

To operate ST600-XXX series products, use the ON / OFF / REMOTE switch to turn the power on. Then the inverter is ready to deliver AC power to the loads. If you are loading several appliances, turn them on separately after switching on the inverter；this process is to avoid the power inverter delivering the starting current to all the loads at one time.

5-1. Controls and indicators：

The ON / OFF switch is to turn on/off the control circuit of the power inverter. If you connect it to power inverter, the ST600-XXX Inverter will operate with input voltage ranging as follows：

10.5 to 15.0 VDC for 12V models

21.0 to 30.0 VDC for 24V models

42.0 to 60.0 VDC for 48V models

The ST600-XXX Inverter indicates DC voltage status as follows：

Model	DC Input over voltage shut-down	DC Input under voltage alarm	DC Input under voltage shut-down
ST600-112/212	15.3	11.0	10.2
ST600-124/224	30.6	22.0	20.3
ST600-148/248	61.2	44.0	40.8

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5-2. System Status LEDs.

There are 3 LED indicators on the front panel of the inverter：
Input Level, Load Level, and Power status.

5-2-1. Input Level：Display Input Voltage

LED Status	DC 12V	DC 24V	DC 48V
Slow Red Blink	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
Red Blink	15.0 ↑	30.0 ↑	59.6 ↑

5-2-2. Load Level：Display AC Load Watts

LED Status	Load Condition
Dark	0~30W
Green	30W~200W
Orange	200W~450W
Red	450W~580W
Red Blink	Over 580W

5-2-3. Power Status：Display power success / failure status

LED Status	Power Status
Green	Supply AC power from an external AC source
Orange	Supply AC power from an inverter
Fast Red Blink	OVP：over voltage
Slow Red Blink	UVP：under voltage
Intermittent Red Blink	OTP：over temperature
Red	OLP：overload

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6. Information:

6-1. Troubleshooting：

WARNING!
Do not open or disassemble the ST600-XXX Inverter. Attempting to service the unit may cause the risk of electrical shock or fire.

Problems and Symptoms	Possible Cause	Solutions
No output voltage, the LED glows Red light.		
a. Power status light is blinking red fast.	Over input voltage.	Check input voltage. Reduce input voltage.
b. Power status light is blinking red slowly.	Low input voltage.	Recharge battery. Check connections and cable.
c. Power status light is blinking red intermittently.	Thermal shutdown	Improve ventilation. Make sure ventilation shafts in the inverter are not obstructed. Lower ambient temperature.
d. Power status light is glowing red steadily.	Short circuit, Wiring error, Overload	Check AC wiring for short circuit. Remove load.

6-2. Maintenance

To keep your inverter 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. At the same time, tighten the screws on the DC input terminals.

6-3. 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 Cotek is 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.

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7-1. e-mark (e13 022192) Declaration of Conformity

GRAND-DUCHE DE LUXEMBOURG

MINISTERE DES TRANSPORTS

Luxembourg, le 09 mars 2004
19-21, Boulevard Royal
L-2910 Luxembourg
Tél. 478-1 – Télécopieur 241 817 – Télex 1465 CIVAIR LU

REFERENCE: e13*72/245*95/54*2192*00

ANNEXES: Documentation technique

Certificat de réception CE par type
EC Type-Approval Certificate

Grand-Duché de Luxembourg 6 6 Ministère des Transports

Communication concernant: (1)
Communication concerning the:

- **la réception par type**
- type-approval
- ~~**l'extension de la réception par type**~~
- ~~extension of type-approval~~
- ~~**le refus de la réception par type**~~
- ~~refusal of type-approval~~
- ~~**le retrait de la réception par type**~~
- ~~withdrawal of type-approval~~

d'un ~~type de véhicule~~ / ~~composant~~ / entité technique (1) **en ce qui concerne la directive 72/245/CEE conformément au dernier amendement par la directive 95/54/CE.**
of a ~~type of vehicle~~ / ~~component~~ / separate technical unit with regard to Directive 72/245/EEC, as last amended by Directive 95/54/EC.

	Numéro de réception par type: Type-approval number:	e13*72/245*95/54*2192*00
	Raison(s) de l'extension: Reason(s) for extension:	Not applicable

Section I
Section I

0.1.	**Fabricant (marque commerciale du constructeur):** Make (trade name of manufacturer):	COTEK
0.2.	**Type:** Type:	ST600
	Description(s) commerciale(s) générale(s): General commercial description(s):	Pure sine wave inverter
	Version(s)/Variante(s): *Version(s)/Variant(s):*	*ST600-212, ST600-224*
0.3.	**Moyens d'identification du type, s'ils sont marqués sur le ~~véhicule~~ / ~~composant~~ / entité technique:** (1, 2) Means of identification of type, if marked on the ~~vehicle~~ / ~~component~~ / separate technical unit:	ST600-2??
0.3.1.	**Emplacement de ce marquage:** Location of that marking:	On the bottom of the inverter

7-2. CE (EMC EN55022B) Declaration of Conformity

CE

Declaration of Conformity

The following products is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC). The listed standard as below were applied:

The following Equipment:

Product	:	Power Inverters
Trade Name	:	COTEK
Model Number	:	ST600-212H, ST600-212D, ST600-224H, ST600-224D

This product is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC).For the evaluation regarding EMC, the following standards were applied:

RFI Emission:

EN55022:1994+A1:1995+A2:1997 Class B	: Emission standard
EN 61000-3-2:1995 Class A Amendment 1:1998 Amendment 2:1998	: Limits for harmonic current emission
EN 61000-3-3:1995	: Limitation of voltage fluctuation and flicker in low-voltage supply system

Immunity :

EN 55024:1998+A1:2001	:Immunity standard

The following importer/manufacturer is responsible for this declaration:

Company Name	:	***COTEK ELECTRONIC IND. CO., LTD.***
Company Address	:	***NO.33 Rong Hsin Road Pa Teh City Taotuan County Taiwan.***
Telephone	:	***886-3-3661581*** Facsimile : ***886-3-3676029***

Person is responsible for marking this declaration:

COTEK ELECTRONIC IND. CO., LTD. 文管中心 發行章

Name (Full Name)	Position/ Title
Date	Legal Signature

7-3. CE (LVD EN60950-1) Declaration of Conformity

EU Declaration of Conformity

According to the Low Voltage Directive 73/23/EEC and the Amendment Directive 93/68/EEC

For the following equipment:

Product:	Inverter
Type Designation/Trademark:	ST600-212D, ST600-224D
Manufacturer's Name:	Cotek Electronic Ind. Co., Ltd.
Manufacturer's Address:	No. 33, Rong Hsin Rd., Pa The City, Taoyuan Country, Taiwan

is herewith confirmed to comply with the requirements set out in the Council Directive 73/23/EEC for electrical equipment used within certain voltage limits and the Amendment Directive 93/68/EEC.

For the evaluation of the compliance with this Directives, the following standards were applied:

EN 60950

Responsible for making this declaration is the :

Manufacturer ☐ Authorized representative established within the EU ☐

Authorized representative established within the EU (if applicable) :

Company Name : COTEK ELECTRONIC IND. CO., LTD.

Company Address : NO.33 Rong Hsin Road Pa Teh City Taotuan County Taiwan.

COTEK ELECTRONIC IND. CO., LTD. 文管中心 發行章

Person responsible for making this declaration

Name, Surname :

Position/Title :

(Place) (Date) (Company stamp and legal signature)

COTEK ELECTRONIC IND. CO., LTD.
文管中心
發行章

COTEK

No. 33, Rong Hsin Rd., Pa Teh City, Tao Yuan County, Taiwan

Phone：886-3-3661581　FAX：886-3-3676029

E-mail：sales@cotek.com.tw　　http：// www.cotek.com.tw

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1000-0224_A0
般書寫紙
A5 黑白 雙面印刷
無庫存/無採購/無承認-故改版更新
*修改內容:
p.2-3機構圖變更-
風向標示更正/機構印刷更正
p.8-9刪除Item選取框
p.8 NO Load Current Draw
-修改為1.0/0.5/0.25 (by工程)
p.14.ST600-148/248--DC Input under voltage shut-down :修改為40.8 (by 工程)
p.15 5-2-1 DC48V 數值全修改(by工程)
※以上敘述非本文※

COTEK	
出圖人	確認章
	4/12

COTEK

0-XXX Series

Pure Sine Wave Power Inverter User's Manual

CE e13 022192

不須ECR\ECN更新圖檔明細表

產品料號	品名規格	版本	備註
75-1000-0012	USER MENU S150/S300 COTEK	A4	庫存自然汰換，通知移除承認書.
75-1000-0224	USER MENU ST600 COTEK	A1	庫存自然汰換,尚未承認
75-1000-0225	USER MENU ST600 NO COTEK	A1	庫存自然汰換,尚未承認
75-1000-0214	USER MENU CR6 COTEK	A1	無庫存,無承認,通知廠商更新圖檔

更新日期：2011/04/12

＊上述資料不需附ECE\ECN

確認：