*The specifications are subject to changes without notice.
*The company reserves the right of final interpretation and correction.

COSUPER

USER MANUAL

Pure Sine Wave Charger Inverter

CPT Series

CE FC PS E RoHS

▶▶ TABLE OF CONTENTS

Important Safety Information

WARNING! Before using the Inverter, you need to 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 maybe resulted. Allow at least 30CM of clearance around the inverter for air flow. Make sure that the air can circulate freely around the unit. A minimum air flow of 145CFM is required.

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. Refer Warranty for instructions on obtaining service.

1-1-4. Do not disassemble the Inverter/Charger. It contains no user-serviceable parts. Attempting to service the Inverter/Charger by yourself may result in a risk of electrical shock or fire. Internal capacitors remain charged after all power is disconnected.

1-1-5. To reduce the risk of electrical shock, disconnect both AC and DC power from the CPT Series Inverter/Charger before attempting any maintenance or cleaning. Turning off controls will not reduce this risk

CAUTION: Equipment damage

The output side of the inverter's AC wiring can not at no time be connected to public power or a generator. This condition is far worse than a short circuit. If the unit survives this condition, it will shut down until corrections are made.
Installation should ensure that the inverter's AC output is, at no time, connected to its AC input.

Warning: Limitations On Use
SPECIFICALLY, PLEASE NOTE THAT THE GLOBAL LF INVERTER/CHARGER SHOULD NOT BE USED IN CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EQUIPMENT OR DEVICES.

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 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.

1-2-5. To reduce the risk of injury, charge only deep-cycle lead acid, lead antimony, lead calcium gel cell, absorbed mat, or NiCad/NiFe type rechargeable batteries. Other types of batteries may burst, cause personal injury and damage.

Introduction

2-1. General Information

CPT Series Pure Sine Wave Inverter is a combination of an inverter, battery charger and AC auto-transfer switch into one complete system with a peak conversion efficiency of 88%.

It is packed with unique features and it is one of the most advanced inverter/chargers in the market at present.

It features power factor corrected, sophisticated multi-stage charging and pure sine wave output with unprecedentedly high surge capability to meet demanding power needs of inductive loads without endangering the equipment.

For the regular model, when utility AC power cuts off(or falls out of acceptable range), the transfer relay is de-energized and the load is automatically transferred to the Inverter output. Once the qualified AC utility is restored, the relay is energized and the load is automatically reconnected to AC utility.

CPT Series Inverter is equipped with a powerful charger of up to 90Amp(depending on model).

The overload capacity is 300% of continuous output for up to 20 seconds to reliably support tools and equipment longer

Another important feature is that the inverter can be easily customized to Battery priority via a DIP switch, this helps to extract maximum power from battery in renewable energy systems.

Thus, the CPT Series Pure Sine Wave Inverter is suitable for Renewable energy system, Utility, RV, Marine and Emergency appliances.

To get the most output power of the inverter, it must be installed, used and maintained properly. Please read the instructions in this manual before installing and operating.

2-2. Application

Power tools–circular saws, drills, grinders, sanders, buffers, weed and hedge trimmers, air compressors.

Office equipment – computers, printers, monitors, facsimile machines, scanners.

Household items – vacuum cleaners, fans, fluorescent and incandescent lights, shavers, sewing machines.

Kitchen appliances – coffee makers, blenders, ice markers, toasters.

Industrial equipment – metal halide lamp, high – pressure sodium lamp.

Home entertainment electronics – television, VCRs, video games, stereos, musical instruments, satellite equipment.

Resistive Load:rated power＜80% inverter rated power

Inductive Load:rated power＜1/3 inverter rated power

The inverter working time with full loads can not be more then 30 minutes

2-3. Features

•Professional solution for Off-Grid system

•Perfect combination of Low-voltage UPS and inverter

•Self-consumption down 50% than low frequency inverter

•Dry contact: no AC output or O.T,O.L ,UV to other device

•Remote control RJ11/RJ45 :PTM-10 and PTM-12 (optional)

•Input AC :power via grid power or Generator compatibly

•Pure sine wave output ,input & output fully isolation

•Three-gear switches ,with energy saving mode

•Attractive appearance with V0 plastic

•AC input to start inverter function

•Input polarity/UVP/OVP/OSP/OLP/OTP

•Network via RS232 Communicate Protocol (optional)

•DIP Switches: Output frequency, AC output range, charge current ,DC/AC priority

2.4 Order information

Typical part number ▶

| CPT | 2000 | — | 2 | 12 |

1.Basic Series
   CPT=Pure Sinewave Inverter&Charger

2.Power Rating
   600=600W 1000=1000W 1500=1500W 2000=2000W
   3000=3000W 4000=4000W 5000=5000W 6000=6000W
   7000=7000W

3.AC Voltage
   2=230VAC   1=120VAC
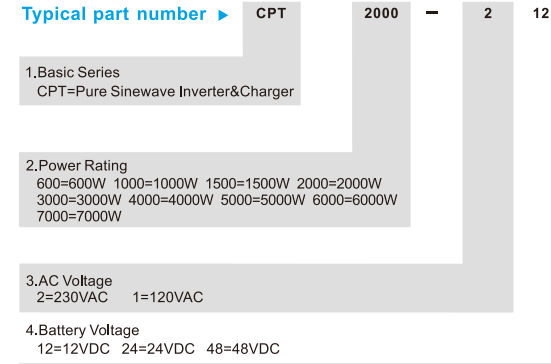
4.Battery Voltage
   12=12VDC   24=24VDC   48=48VDC

Figure 1

Electrical Performance
2.5.1 Invert

Topology

The CPT inverter/charger is built-in according to the following topology.

Invert: Full Bridge Topology.

Charge: Isolate Boost Topology

Because of high efficiency Mosfets and 16bit, 4.9MHz microprocessor and heavy transformers, it outputs PURE SINE WAVE AC with an average THD of 15% (min 5%, max 25%) depending of load connected and battery voltage.

The peak efficiency of CPT series is 88%

Overload Capacity

The CPT series inverters have different overload capacities, making it ideal to handle demanding loads.

1 For 110%<Load<125%(±10%), no audible alarm in 14 minutes, beeps 0.5s every 1s in the 15th minute, and Fault(Turn off) after the 15th minute.

2 For 125%<Load<150%(±10%), beeps 0.5s every 1s and Fault(Turn off) after the 1 minute.

3 For 300%≧Load>150%(±10%), beeps 0.5s every 1s and Fault(Turn off) after 20s.

2.5.2 AC Charger

CPT Series is equipped with an active PFC (Power Factor Corrected) multistage battery charger. The PFC feature is used to control the amount of power used to charge the batteries in order to obtain a power factor as close as possible to 1.

Unlike other inverters whose max charging current decreases according to the input AC voltage, CPT series charger is able to output max current as long as input AC voltage is in the range of 164-243VAC(95-127VAC for 120V model), and AC freq is in the range of 48-54Hz(58-64Hz for 60Hz model).

The CPT series inverter is with a strong charging current of 90Amp (for 3KW,12V), and the max charge current can be adjusted from 0%-100% via a liner switch at the right of the battery type selector. This will be helpful if you are using our powerful charger on a small capacity battery bank. Fortunately, the liner switch can effectively reduce the max charging current to 20% of its peak. Choosing "0" in the battery type selector will disable charging function.
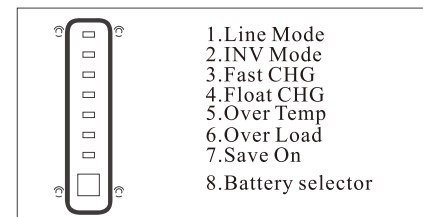
1.Line Mode
2.INV Mode
3.Fast CHG
4.Float CHG
5.Over Temp
6.Over Load
7.Save On
8.Battery selector

Figure 2

There are mainly 3 stages:

Bulk Charging: This is the initial stage of charging. While Bulk Charging, the charger supplies the battery with controlled constant current. The charger will remain in Bulk charge until the Absorption charge voltage (determined by the Battery Type selection) is achieved.

Software timer will measure the time from A/C start until the battery charger reaches 0.3V below the boost voltage, then take this time as T_0 and $T_0 \times 10 = T_1$.

Absorb Charging: This is the second charging stage and begins after the absorb voltage has been reached. Absorb Charging provides the batteries with a constant voltage and reduces the DC charging current in order to maintain the absorb voltage setting.

In this period, the inverter will start a T_1 timer; the charger will keep the boost voltage in Boost CV mode until the T_1 timer has run out. Then drop the voltage down to the float voltage. The timer has a minimum time of 1 hour and a maximum time of 12 hours.

Float Charging: The third charging stage occurs at the end of the Absorb Charging time. While Float charging, the charge voltage is reduced to the float charge voltage (determined by the Battery Type selection*). In this stage, the batteries are kept fully charged and ready if needed by the inverter.

If the A/C is reconnected or the battery voltage drops below 12Vdc/24Vdc, the charger will reset the cycle above.

If the charge maintains the float state for 10 days, the charger will deliberately reset the cycle to protect the battery.
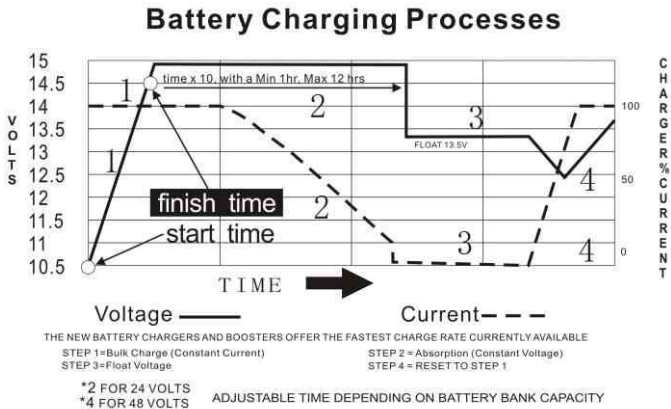

Figure 3

Battery type selector

12Vdc Mode (*2 for 24Vdc ; *4 for 48Vdc)

Switch setting	Description	Boost / Vdc	Float / Vdc
0	Charger Off		
1	Gel USA	14.0	13.7
2	AGM 1	14.1	13.4
3	AGM 2	14.6	13.7
4	Sealed lead acid	14.4	13.6
5	Gel EURO	14.4	13.8
6	Open lead acid	14.8	13.3
7	Calcium	15.1	13.6
8	De-sulphation	15.5 (4 Hours then Off)	
9	LFP	14.4	/

PS: Normally,select"4"
   "0" said no charge function, but there is a power bypass function
   Battery priority mode,0-9 knob no definition

De-sulphation

The de-sulphation cycle on switch position 8 is marked in red because this is a very dangerous setting if you do not know what you are doing. Before ever attempting to use this cycle you must clearly understand what it does and when and how you would use it.

What causes sulphation? This can occur with infrequent use of the batteries(nor), or if the batteries have been left discharged so low that they will not accept a charge. This cycle is a very high voltage charge cycle designed to try to break down the sulphated crust that is preventing the plates taking a charge and thus allow the plates to clean up and so accept charge once again.

Charging depleted batteries

The CPTseries inverter allows start up and through power with depleted batteries.

For 12VDC model, after the battery voltage goes below 10V, if the switch is still (and always) kept in "ON" position, the inverter is always connected with battery, and the battery voltage doesn't drop below 2V, the inverter will be able to charge the battery once qualified AC inputs are present.

Before the battery voltage goes below 9VDC, the charging can be activated when the switch is turned to "Off", then to "ON".

When the voltage goes below 9VDC, and you accidently turn the switch to OFF or disconnect the inverter from battery, the inverter will not be able to charge the battery once again, because the CPU loses memory during this process.

Charging current for each model

Model	Current	Model	Current
CPT600W 12V230V	21+/-5A	CPT600W 12V120V	21+/-5A
CPT1000W12V230V	35+/-5A	CPT1000W12V120V	20+/-5A
CPT1000W24V230V	20+/-5A	CPT1000W24V120V	15+/-5A
CPT1500W12V230V	45+/-5A	CPT1500W12V120V	45+/-5A
CPT1500W24V230V	25+/-5A	CPT1500W24V120V	25+/-5A
CPT2000W12V230V	65+/-5A	CPT2000W12V120V	40+/-5A
CPT2000W24V230V	30+/-5A	CPT2000W24V120V	30+/-5A
CPT2000W48V230V	20+/-5A	CPT2000W48V120V	15+/-5A
CPT3000W12V230V	85+/-5A	CPT3000W12V120V	65+/-5A
CPT3000W24V230V	45+/-5A	CPT3000W24V120V	40+/-5A
CPT3000W48V230V	30+/-5A	CPT3000W48V120V	25+/-5A
CPT4000W24V230V	65+/-5A	CPT4000W24V120V	50+/-5A
CPT4000W48V230V	35+/-5A	CPT4000W48V120V	30+/-5A
CPT5000W24V230V CPT5000W24V230VS	70+/-5A	CPT5000W24V120V	55+/-5A
CPT5000W48V230V CPT5000W48V230VS	40+/-5A	CPT5000W48V120V	35+/-5A
CPT6000W24V230V CPT6000W24V230VS	85+/-5A		
CPT6000W48V230V CPT6000W48V230VS	55+/-5A		
CPT7000W48V230V CPT7000W48V230VS	55+/-5A		

The charging capacity will go to peak in around 3 seconds. This may cause a generator to drop frequency, making inverter transfer to battery mode.

It is suggested to gradually put charging load on the generator by switching the charging switch from min to max, together with the 15s switch delay, our inverter gives the generator enough time to spin up. This will depend on the size of the generator and rate of charge.

2.5.3 Transfer

While in the Standby Mode, the AC input is continually monitored. Whenever AC power falls below the VAC Trip voltage (154 VAC, default setting for 230VAC,90VAC for 120VAC), the inverter automatically transfers back to the Inverter Mode with minimum interruption to your appliances - as long as the inverter is turned on. The transfer from Standby mode to Inverter mode occurs in approximately 10 milliseconds. And it is the same time from Inverter mode to Standby mode. Though it is not designed as a computer UPS system, this transfer time is usually fast enough to keep your equipment powered up.

There is a 15-second delay from the time the inverter senses that continuously qualified AC is present at the input terminals to when the transfer is made. This delay is built in to provide time for a generator to spin-up to a stable voltage and avoid relay chattering. The inverter will not transfer to generator until it has locked onto the generator's output. This delay is also designed to avoid frequent switching when input utility is unstable.

2.5.4 Auto frequency adjust(optinal)

The inverter is with Auto Frequency adjust function.
The factory default configuration for 220/230/240VAC inverter is 50Hz, and 60Hz for 110/110/120VAC inverter.
The output freq can be easily changed once a qualified freq is applied to the inverter.
If you want to get 60Hz from a 50Hz inverter, just input 60Hz power, and the inverter will automatically adjust the output freq to 60Hz and vice versa.

2.5.5 Power Saver

There are 2 different working status for Global LF inverter: "ON" and "OFF".
When power switch is in " OFF" position, the inverter is powered off.
When power switch is turned to either of " SAVER " or "ON", the inverter is powered on.
Power saver function is designed to conserve battery power when AC power is not or rarely required by the loads.
In this mode, the inverter pulses the AC output looking for an AC load (i.e., electrical appliance). Whenever an AC load (greater than 25 watts) is turned on, the inverter recognizes the need for power and automatically starts inverting and output goes to full voltage. When there is no load (or less than 25 watts) detected, the inverter automatically goes back into search mode to minimize energy consumption from the battery bank.
In "SAVER" mode, the inverter will draw power mainly in sensing moments, thus the idle consumption is significantly reduced.
The inverter is factory defaulted to detect load for 250ms every 30 seconds. This cycle can be customized to 3 seconds thru SW3 on the DIP switch.

Note: The minimum power of load to take inverter out of sleep mode (SAVER) is 25 Watts.

Model	CPT Series Idle Power Consumption		
	ON	SAVER	
	Idle	3Secs(Max)	30Secs(MAX)
600W	12W	5W	4W
1000W	21W	8W	5W
1500W	24W	10W	5W
2000W	30W	12.5W	5W
3000W	36W	14W	6W
4000W	60W	22.5W	7.5W
5000W	67.5W	25W	9W
6000W	72.5W	27.5W	9W
7000W	75W	30W	9W

When in the search sense mode, the green power LED will blink and the inverter will make a ticking sound. At full output voltage, the green power LED will light steadily and the inverter will make a steady humming sound. When the inverter is used as an "uninterruptible" power supply the search sense mode or "Saver" function should be defeated.

Exceptions
Some devices when scanned by the load sensor cannot be detected. Small fluorescent lights are the most common example. (Try altering the plug polarity by turning the plug over.) Some computers and sophisticated electronics have power supplies that do not present a load until line voltage is available. When this occurs, each unit waits for the other to begin. To drive these loads either a small companion load must be used to bring the inverter out of its search mode, or the inverter may be programmed to remain at full output voltage.

2.5.6 Protections

The CPT series inverter is equipped with extensive protections against various harsh situations/faults.
These protections include:
AC Input over voltage protection/AC Input low voltage protection
Low battery alarm/High battery alarm
Over temperature protection/Over load protection
Short Circuit protection (1s after fault)
Back feeding protection

When Over temperature /Over load occur, after the fault is cleared, the master switch has to be reset to restart the inverter.
The charge current can be selected between 50% and 100% thru the SW1 on DIP switch.
The inverter will go to Over temp protection when heat sink temp. ≥105ºC, and go to Fault (shutdown Output) after 30 seconds. The switch has to be reset to activate the inverter.
The Global LF series Inverter has back feeding protection which avoids presenting an AC voltage on the AC input terminal in Invert mode.
After the reason for fault is cleared, the inverter has to be reset to start working.

2.5.7 Remote control

Apart from the switch panel on the front of the inverter, an extra switch panel connected to the RJ45 port at the DC side of the inverter thru a standard telephone cable can also control the operation of the inverter.
If an extra switch panel is connected to the inverter via "remote control port", together with the panel on the inverter case, the two panels will be connected and operated in parallel.
Whichever first switches from "OFF" to "ON" or "SAVER", it will power the inverter on.
If the commands from the two panels conflict, the inverter will accept command according to the following priority:
SAVER> ON> OFF
Only when both panels are turned to "OFF" position will the inverter be powered off.
he Max length of the cable is 10 meters.
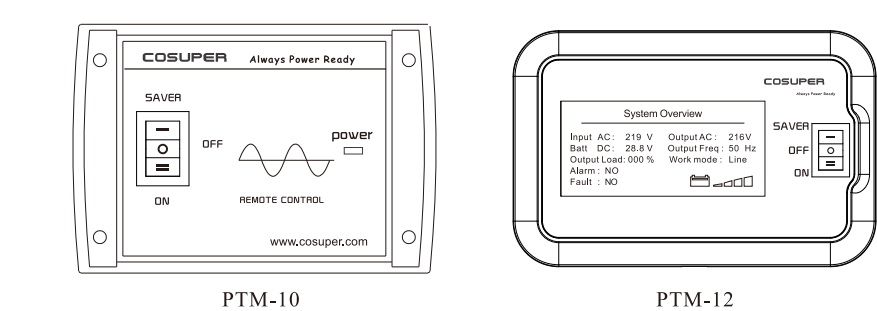

PTM-10   PTM-12

Figure 4

⚠ **WARNING**
Never cut the telephone cable when the cable is attached to inverter and battery is connected to the inverter. Even if the inverter is turned off. It will damage the remote PCB inside if the cable is short circuited during cutting.
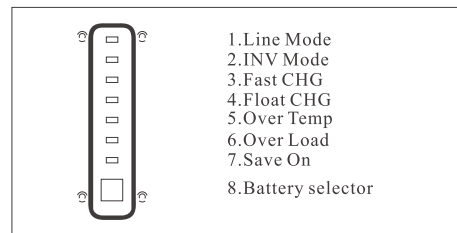
2.5.8 LED Indicator & LCD

1. Line Mode
2. INV Mode
3. Fast CHG
4. Float CHG
5. Over Temp
6. Over Load
7. Save On
8. Battery selector

Figure 5

SHORE ON	GREEN LED lit in AC Mode
INVERTER ON	GREEN LED lit in Inverter Mode
FAST CHARGE	Yellow LED lit in Fast Charging Mode
FLOAT CHARGE	GREEN LED lit in Float Charging Mode
OVER TEMP TRIP	RED LED lit in Over Temperature
OVER LOAD TRIP	RED LED lit in Over Load
POWER SAVER ON	GREEN LED lit in Power Saver Mode (Power Saver Load ≦10W)

2.5.9 Audible Alarm

Battery Voltage Low	Inverter green LED lit, and the buzzer beeps 0.5s every 5s.
Battery Voltage High	Inverter green LED lit, and the buzzer beeps 0.5s every 1s and Fault after 60s.
Invert Mode Over-Load	(1)110%<load<125%(±10%), No audible alarm in 14 minutes, Beeps 0.5s every 1s in 15th minute and Fault after 15 minutes; (2)125% <load<150%(±10%), Beeps 0.5s every 1s and Fault after 60s; (3)Load>150%(±10%), Beeps 0.5s every 1s and Fault after 20s;
Over Temperature	Heat sink temp. ≥105ºC, Over temp red LED Lighting, beeps 0.5s every 1s;

2.5.10 FAN Operation
For 1-3KW, there is one multiple controlled DC fan which starts to work according to the following logic.
For 4-7KW, there is one multiple controlled DC fan and one AC fan. The DC fan will work in the same way as the one on 1-3KW, while the AC fan will work once there is AC output from the inverter.
So when the inverter is in power saver mode, the AC fan will work from time to time in response to the pulse sent by the inverter in power saver mode.

The Operation of the DC fan at the DC terminal side is controlled by the following logic:

Condition	Enter Condition	Leave condition	Speed
HEAT SINK TEMPERATURE	T < 85℃	T ≥ 85℃	50%
	T ≥ 85℃	T < 80℃	100%
CHARGER CURRENT	I ≤ 50%Max	I > 50%Max	50%
	I > 50%Max	I ≤ 40%Max	100%
LOAD Percentage (INV MODE)	Load < 50%	Load ≥ 50%	50%
	Load ≥ 50%	Load ≤ 40%	100%

Allow at least 30CM of clearance around the inverter for air flow. Make sure that the air can circulate freely around the unit.
Fan noise level <60db at a distance of 1m

2.5.11 DIP Switches(optional)
On the DC end of inverter, there are 4 DIP switches which enable users to customize the performance of the device.

Switch NO	Switch Function	Position: 0	Position: 1
SW1	Charging Current	100%	50%
SW2	O/P Frequency Setting	50Hz	60Hz
SW3	AC Output	120V(230V)	110V(220V)
SW4	DC/AC priority	AC	DC

Low Battery Trip Volt:
For 12VDC model, the Low Battery Trip Volt is set at 10.0VDC by default. It can be customized to 10.5VDC using SW1, this is to prevent batteries from over-discharging while there is only a small load applied on the inverter.
*2 for 24VDC, *4 for 48VDC

AC Input Range:
There are different acceptable AC input ranges for different kinds of loads.
For some relatively sensitive electronic devices, a narrow input range of 184-253VAC (100-135V for 120VAC model) is required to protect them.
While for some resistive loads which work in a wide voltage range, the input AC range can be customized to 154-253VAC (90-135V for 120VAC model), this helps to power loads with the most AC input power without frequent switches to the battery bank.

Load Sensing Cycle:
The inverter is factory defaulted to detect load for 250ms in every 30 seconds. This cycle can be customized to 3 seconds thru the SW3 on the DIP switch.
O/P Frequency Setting:
You can choose 50Hz or 60Hz output via Dip switch

AC/Battery Priority:
Our inverter is designed with AC priority by default. This means, when AC input is present, the battery will be charged first, and the inverter will transfer the input AC to power the load. Only when the AC input is stable for a continuous period of 15 days, the inverter will start a battery inverting cycle to protect the battery. After 1 cycle normal charging and AC input will be restored.
The AC Priority and Battery Priority switch is SW5. When you choose battery priority, the inverter will invert from battery despite the AC input. Only when the battery voltage reaches low voltage alarm point(10.5V for 12V), the inverter transfers to AC Input, charges battery, and switches back to battery when battery is charged full. This function is mainly for wind/solar systems taking utility power as back up.

2.5.12 Output Socket
The inverter is either equipped with a dual GFCI socket (rated at 30Amps) or an universal socket (rated at 10Amps) for more convenient wiring.

2.5.13 Other features
Battery voltage recover start
After low battery voltage shut off (10V for 12V model or 20V for 24V model), the inverter is able to restore operation after the battery voltage recovers to 13V/26V (with power switch still in the "On" position). This function helps to save the users extra labor to reactivate the inverter when the low battery voltage returns to an acceptable range in the renewable energy systems. The built-in battery charger will automatically reactivate as soon as city/generator ac has been stable for 15 seconds.

WARNING
Never leave the loads unattended, some loads (like a Heater) may cause accident in such cases.
It is better to shut everything down after low voltage trip than to leave your load on, due to the risk of fire.

Auto Gen Start

The inverter can be customized to start up a generator when battery voltage goes low.

When it goes to low battery, the inverter will alarm and it can send a signal to start a generator, and turn the generator off after battery charging is finished.

The auto gen start feature will only work with generators designed to work with this feature. There is an open/closed relay that will short circuit the positive and negative cable from a generator. The input DC voltage can vary, but the Max current the relay can carry is 16Amp.

Conformal Coating

ALL COSUPER CPT/SPH inverters have been processed with a conformal coating on the PCB making it water, rust, and dust resistant.

Installation

3.1 Location

Follow all the local regulations to install the inverter.

Please install the equipment in a location that is Dry, Clean, Cool and that has good ventilation.

Working temperature: －10℃ － 40℃

Storage temperature: －40 － 70℃

Relative Humidity: 0% － 95%, non-condensing

Cooling: Forced air

3.2 DC Wiring recommendation

It is suggested the battery bank to be kept as close as possible to the inverter. The following able is a suggested wiring option for 1 meter DC cable.

Please find the following minimum wire size. In case of DC cable longer than 1m, please increase the cross section of cable to reduce the loss.

Power	DC Input voltage	Wire Gage
0.6KW	12V	AWG 1/0
1KW	12V	AWG 1/0
1KW	24V	AWG 4
1.5KW	12V	AWG 1/0
1.5KW	24V	AWG 4
2KW	12V	AWG 1/0
2KW	24V	AWG 1/0
2KW	48V	AWG 4
3KW	12V	AWG 4/0
3KW	24V	AWG 1/0
3KW	48V	AWG 4
4KW	24V	AWG 1/0
4KW	48V	AWG 1/0
5KW	24V	AWG 4/0
5KW	48V	AWG 1/0
6KW	24V	AWG 4/0
6KW	48V	AWG 1/0
7KW	48V	AWG 1/0

3.3 AC Wiring

We recommend using 10-5Awg wire to connect to the ac terminal block.

There are 3 different ways of connecting to the terminal block depending on the model. All the wirings are CE compliant, Call our tech support if you are not sure about how to wire any part of your inverter.

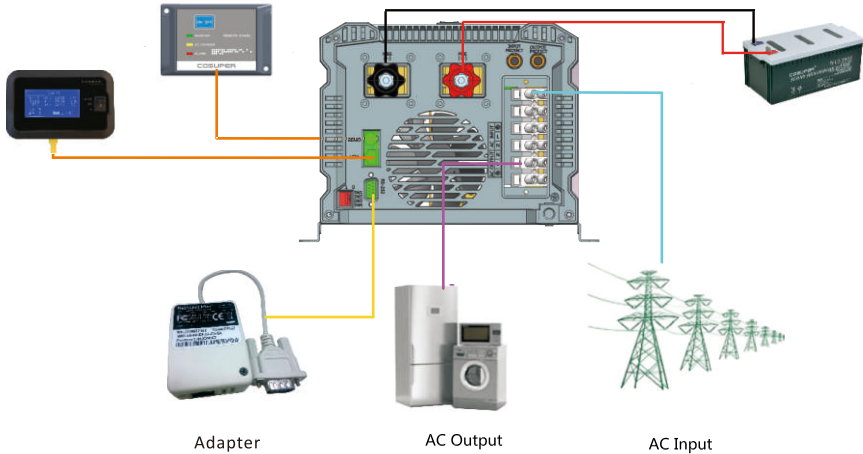Adapter　　　　AC Output　　　　AC Input

Figure 6

NOTE:

LCD PTM-12 display and Ethernet Remote Communication display can not be used at the same time

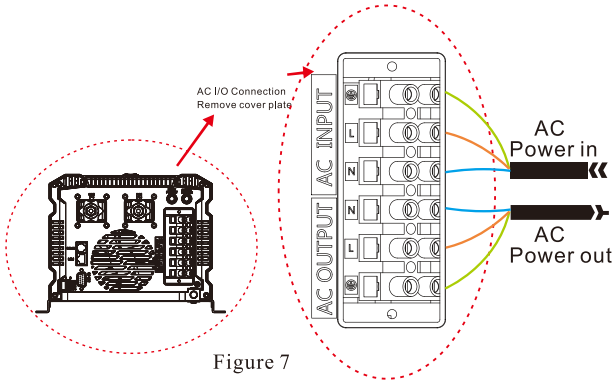**FORBID:** Do not reverse to the battery and the inverter polarity

AC I/O Connection
Remove cover plate

AC Power in

AC Power out

Figure 7

NOTE:

INPUT: Just connect Utility AC or Generator etc

OUTPUT: Just connect the AC load

E/L/N: Earth live Null

FORBID: Do not connect the Utility AC or Generator to output AC for avoiding permanently damaging the inverter.

In the instant , the spark happen when battery connected first, it is a normal phenomenon because the capacitor is charging state

Dry contact function: the machine has two sets of dry contacts were normally open and normally closed, the machine shut down: normally open for the open state, normally closed for the closed state. When the machine starts: Normally open to be normally closed state, normally closed to be normally open state. When the machine fails, the dry node can start another machine as a trigger signal

Troubleshooting Guide

Troubleshooting contains information about how to troubleshoot possible error conditions while using the CPT Inverter & Charger.
The following chart is designed to help you quickly pinpoint the most common inverter failures.

Indicator and Buzzer

Indication & fault finding chart

Status	Function	L.E.D.s on main unit						audible alarm	L.E.D.s on remote		
Charge Function	Constant current charge				on		on				
	Constant voltage charge				flash		on				
	Float			on			on				
	Standby						on				
Inverter mode	Inverter on				on					on	
	Power saver on	on								on	
Alarms	Battery low voltage				on			beep 0.5 s every 5 s			
	Battery high voltage				on			beep 0.5 s every 5 s		on	
	Over load (inverter mode)	on			on			beep 0.5 s every 5 s		on	
	Over temp (inverter mode)		on		on			beep 0.5 s every 5 s		on	
	Over temp (line mode)		on	on		on		beep 0.5 s every 5 s			
	Over charge			on		on		beep 0.5 s every 5 s			
Fault Mode	Fan lock							beep continuous			
	Battery high voltage				on			beep continuous		on	
	Inverter mode overload	on						beep continuous			
	Over temperature		on					beep continuous			
	Back voltage					flash		beep continuous			flash

Symptom	Possible Cause	Recommended Solution
Inverter will not turn on during initial power up.	Batteries are not connected, loose battery-side connections. Low battery voltage.	Check the batteries and cable connections. Check DC fuse and breaker. Charge the battery.
No AC output voltage and no indicator lights ON.	Inverter has been manually transitioned to OFF mode.	Press the switch to SAVER or ON position.
AC output voltage is low and the inverter turns loads OFF in a short time.	Low battery.	Check the condition of the batteries and recharge if possible.
Charger is inoperative and unit will not accept AC.	AC voltage has dropped out-of-tolerance	Check the AC voltage for proper voltage and frequency.
Charger is supplying a lower charge rate.	Charger controls are improperly set. Low AC input voltage. Loose battery or AC input connections.	Refer to the section on adjusting the "Charger Rate". Source qualified AC power.. Check all DC /AC connections.
Charger turns OFF while charging from a generator.	High AC input voltages from the generator.	Load the generator down with a heavy load. Turn the generator output voltage down.
Sensitive loads turn off temporarily when transferring between grid and inverting.	Inverter's Low voltage trip voltage may be too low to sustain Certain loads.	Choose narrow AC voltage in the DIP switch, or Install a UPS if Possible.
Noise from Transformer/case*	Applying specific loads such as hair drier	Remove the loads

The reason for the noise from transformer and/or case

When in inverter mode sometimes the transformer and/or case of the inverter may vibrate and make noise.

If the noise comes from transformer:
According to the characteristics of our inverter, mainly there is one type of load which most likely may cause rattles of transformer.
That is half wave load: A load that uses only half cycle of the power (see figure 1). This tends to cause an imbalance of the magnetic field of the transformer, reducing its rated working freq from 20KHz to, say, maybe 15KHz (it varies according to different loads). In such a case the frequency of noise falls exactly into the range (200Hz-20KHz) that human ears can hear.
The most common load of such kind is a hair drier.

If the noise comes from the case:
Normally when loaded with inductive loads, the magnetic field generated by the transformer keeps attracting or releasing the steel case at a specific freq, this may also cause noise.
Reducing the load power or using an inverter with bigger capacity will normally solve this problem.
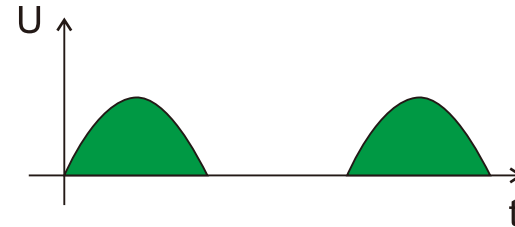The noise will not do any harm to the inverter or the loads.

Figure 13

Inspection Of Batteries

(1)Battery old/new condition. New batteries will charge the old batteries because of the bad discharge ability of old one.

(2)Use the same brand and same model battery.

(3)Make sure battery has no leak or swell before using.

Sequence Of Loads Launching

Please accord to the order of launching:

(1)Launch Inductive loads with priority

(2)Launch other type loads 10 seconds after inductive loads being launched.

Reason: Surge power is huge when inductive loads start. Make sure the inverter has capacity to start inductive loads.

Inverter Environment

Inverter should be placed on the dry, ventilated and cool environment.

Please keep away from dust and fog. Static from dust will make the electronic components be short circuit. In addition that fog will make the components be rusty.

General specifictaion

Input wave form:	Sine wave (utility or Generator)						
Nominal voltage:	120VAC			230VAC			
Low voltage trip:	100/90v±4%			184v/154v±4%			
Low voltage re engage:	100/95v±4%			194v/164v±4%			
High voltage trip:	135v±4%			253v±4%			
High voltage re engage:	127v±4%			243v±4%			
Max input AC voltage:	150VAC			270VAC			
Nominal input frequency:	50Hz or 60Hz (Auto detect)						
Low freq trip:	47Hz for 50Hz,57Hz for 60Hz						
High frq trip:	55Hz for 50Hz for 60Hz						
Output wave form:	(bypass mode)same as input						
Overload protection:	Circuit breaker						
Short circuit protection:	Circuit breaker						
Transfer switch rating:	30amp or 40amp						
Effeciency on line transfer mode	95%						
Line transfer time:	8ms Typical						
Bypass without battery connected	Yes						
Max bypass current:	30amp or 40amp						
Bypass over load current:	30 amp			40 amp			

Inverter Specification/output

Output wave form:	Pure sine wave or quasi sine wave						
Output continous power watts:	600	1000	1500	2000	3000	4000	5000	6000
Output continous power VA:	800	1300	2000	2500	3800	5000	6300	7500
Power factor	0.1-1.0						
Nominal output voltage rms	120/230VAC						
Output voltage regulation:	+/-5% rms						
Output frequency:	50Hz±0.3Hz or 60Hz±0.3Hz						
Nominal efficiency:	>88%						
surge ratings:	1800	3000	4500	6000	9000	12000	15000	18000
Short circuit protection:	Yes，fault after 10 secs						

Inverter specifictaion/input:

Nominal input voltage:	12v	24v	48v	
Minimum start voltage:	10v	20v	40v	
Low battery alarm:	10.5v	21v	42v	
Low battery trip:	10v	20v	40v	
High voltage alarm:	16v	32v	64v	
Power saver:	Below 25 watts when enabled			
Power saver:	Same switched on/off on remote			

Charger mode specification | 100-127VAC/95-127VAC | 194-243VAC/164-243VAC

Input voltage range:		
Output voltage:	Dependent on battery type	
Charge current:	35A/70A	
Battery initial voltage for start up:	0-15.7v for 12v(*2 for 24v;*4 for 48V)	
Over charge protection shutdown:	15.7v for 12v (*2for 24v;*4 for 48v)	

Charger curves (4stage constant current) battery types

4 step digital controlled progressive charge

Battery type:	Fast V	loat V(*2 for 24V;*4 for 48V)
Gel U.S.A	14	13.7
A.G.M.1	14.1	13.4
A.G.M.2	14.6	13.7
Sealed lead acid	14.4	13.6
Gel euro	14.4	13.8
Open lead acid	14.8	13.3
Calcium	15.1	13.6
De-sulphation	15.5 for 4 hrs	
Remote control/RS232/RJ45	Yes.Optional	
Size: mm	455*255*195	525*255*195	650*255*195

Weight:	600	1000	1500	2000	3000	4000	5000	6000
	12kg	15kg	17kg	19kg	24kg	30kg	33kg	38kg

Network Via RS232

6.1 Install the software. Please use Windows operation system higher than XP version. Install Netility(Windows V4.53), ClientMate(Windows V5.62), SNMPView V5.73
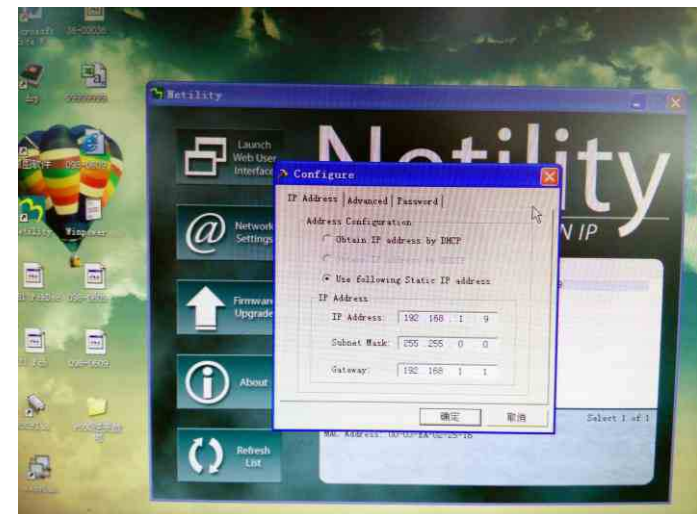

6.2 Make the correct connection of TCP/IP server
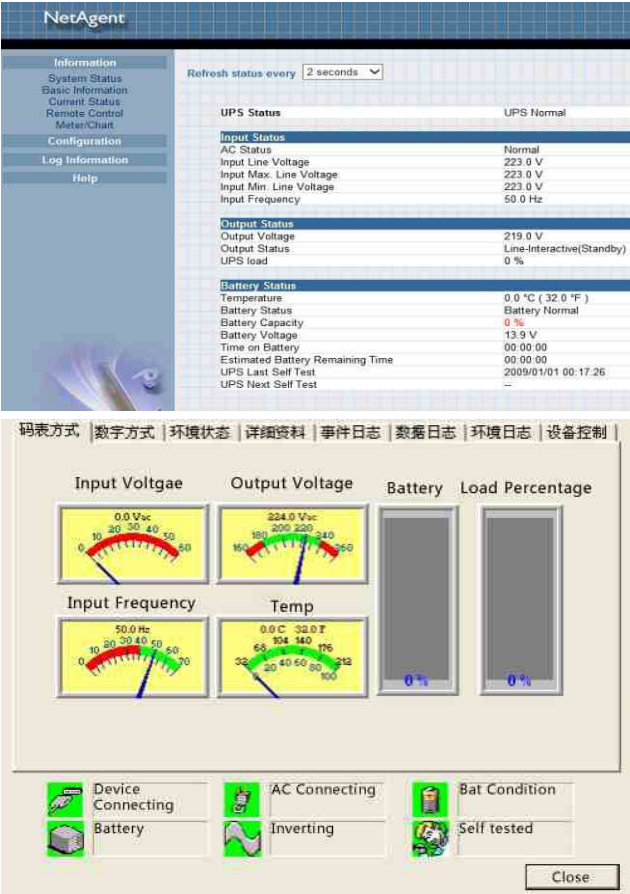6.3 Run Netility, Set your IP address:
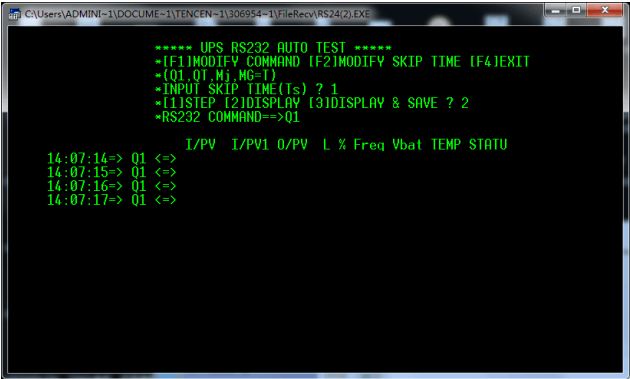IP address: 192.168.1.9
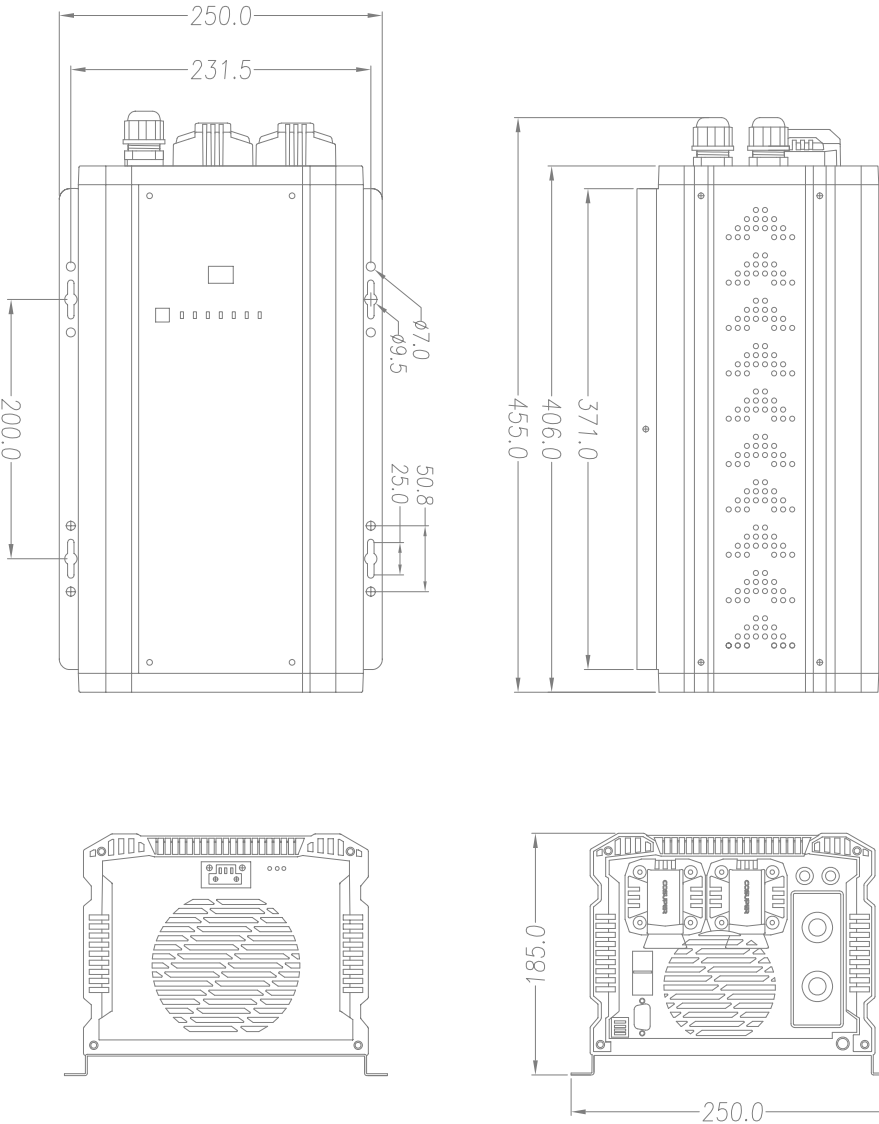Subnet Mask: 255.255.0.0
Gateway: 192.168.1.1

14

15

6.4 Go to 192.168.1.9 in your browser.

6.5 Stand-alone networked display：
    6.5.1 Connect inverter and computer via RS232 port.Install the software on the computer.
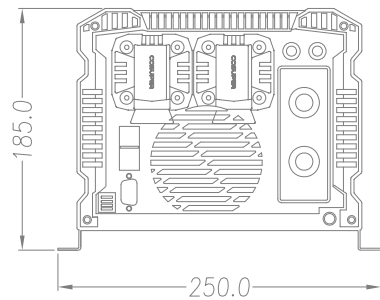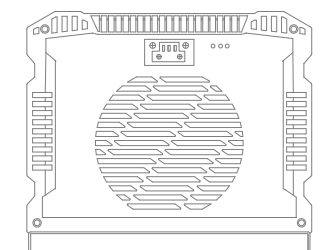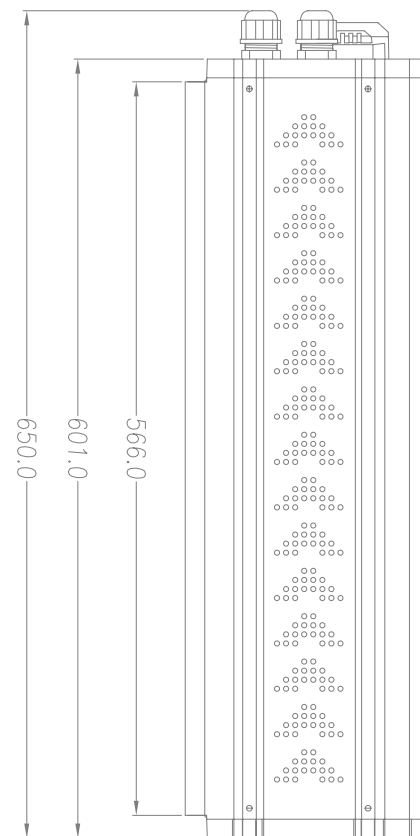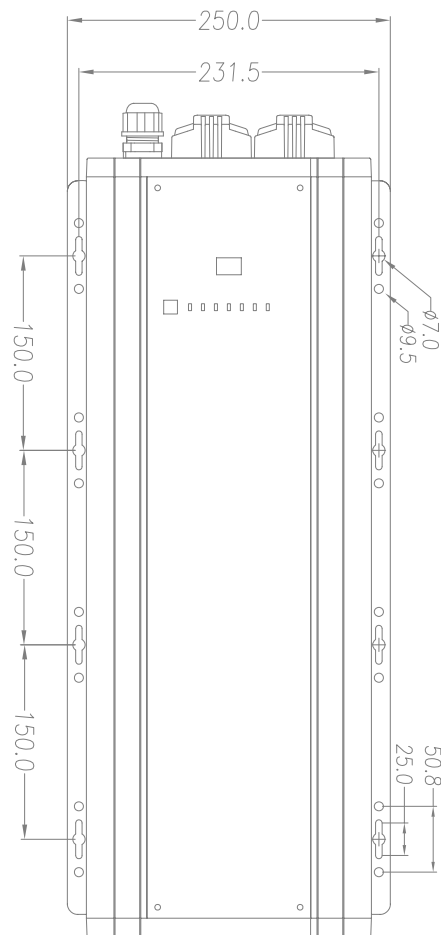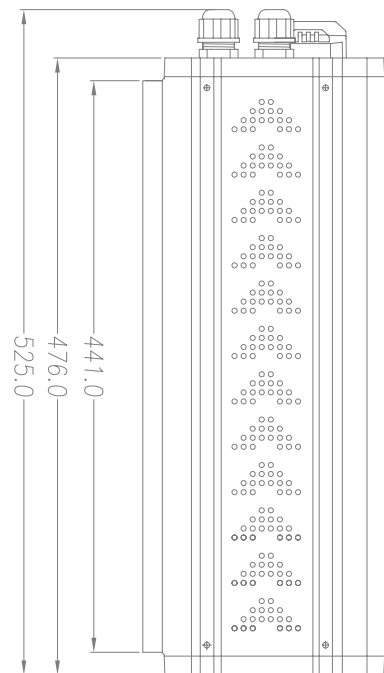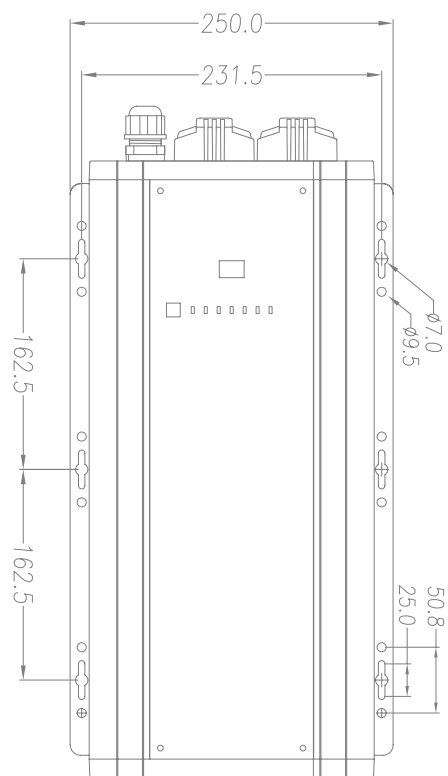   6.5.2 Double-click software and type: "1" Enter; "2" Enter; "Q1" Enter.Interface will display as below:

Install Flange

0.6-1.5KW

Figure 9

250.0

231.5

162.5

162.5

ø7.0
ø9.5

50.8
25.0

525.0
476.0
441.0

185.0

250.0

2-3KW

Figure 10

250.0

231.5

150.0
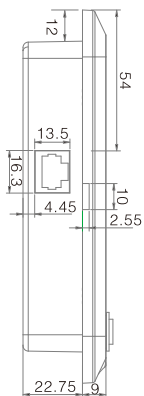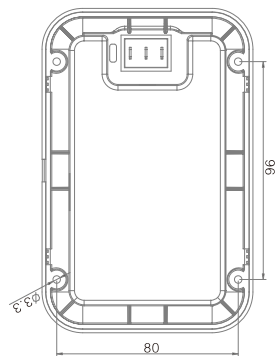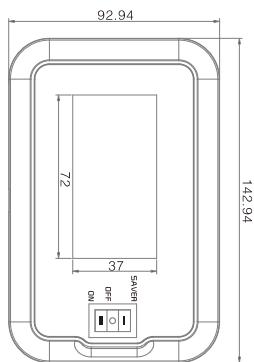
150.0

150.0

ø7.0
ø9.5

50.8
25.0

650.0
601.0
566.0

185.0

250.0
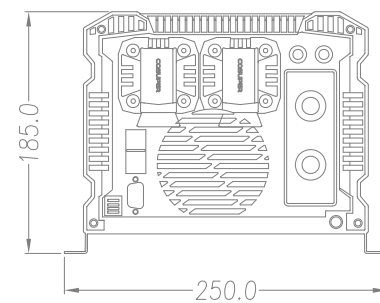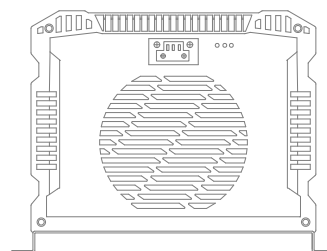
4-6KW

Figure 11
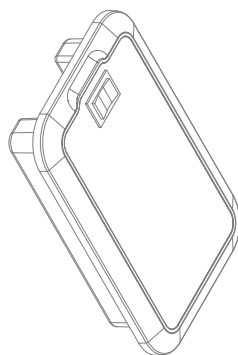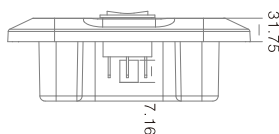
PTM-12

Attention

When you install this power supply, please read the safety instructions in the part of the first section manual. Install with the follow step after full understanding.

1. Opening the package, there should be: a, inverter b, manual c, Accessories AC protective cover, a DC protective cover and the fixing screws (Accessories LED remote control is optional).

2. Install the inverter on the position you want to. Inverter fan need space for air convection. And then install the screws to the inverter.

3. Make sure the switch is off. Then connect the DC and AC inputs, DC ignition is the normal phenomenon.

4. Make sure terminal is locked when connect the DC input or would be ignition. Do not reverse positive and negative load.

5. Connect the loads and AC power into AC input/output terminal.

6. Make sure inverter is grounded and no other grounding systems conflict.

7. Re-check the wiring is completely correct, and then turn on the inverter.

8. Refer to the instructions on the LED indicator to see if the inverter is working properly.

Warranty

Dear Customers,
Many thanks for selecting products from Cosuper. In order to extend better service to you, pls read our product manual carefully and keep warranty card. Welcome to log in www.cosuper.com to enjoy full scale support and service.

The products are under strict inspection before delivery.We offer 18 month limited warranty:
I In the warranty period, we will provide free repair and service parts when the machine is under normal use.Damaged parts shall be owned by Cosuper.

II The following cases are not covered under warranty.
1 Change the company trademark unauthorized
2 Damage due to misoperation, negligence use, and irresistible factors
3 Repair, modification or remove the label unauthorized