CASTLE 1-3K

USER MANUAL

SANTAK®

Thank you for choosing Santak CASTLE products.

Safety information and operating instructions are included in this manual. Do not attempt to operate the UPS until reading through this manual carefully. Observe the warnings on the unit and please comply with all warnings and operating instructions in the manual strictly.

Save this manual properly for future reference.

Copyright Declaration

Safety information

Operation

1. Read this manual carefully and thoroughly before operating the UPS and save this manual properly for future reference.
2. All the warnings and operating instructions on the UPS and in this manual must be strictly complied with.
3. Avoid installation of the UPS in a location under direct sunlight, near running water, or excessive humidity.
4. Do not install the UPS in the environment where it is close to heating facilities such as space heaters or furnaces.
5. Position the UPS in a room with good ventilation, enough space for installation and adequate airflow for heat sinking. Refer to the manual to carry out the installation.
6. Cleaning with dry stuff, do not use liquid or spray detergent.
7. In the event of a fire occurring in the vicinity, please use dry powder fire extinguishers.The use of liquid fire extinguishing agents may causes electric shock.

Electricity

1. Verify the cabling and the polarities of the battery cable (for "S" models) are correct with protective earth ground provided before powering on the UPS.
2. Before moving or re-wiring the UPS, please disconnect it from the mains source outlet and make sure the UPS is completely powered off. Otherwise, the output outlets of the UPS may have live voltage, thus presenting electric shock risk.
3. Choose optional accessories from SANTAK or consult the authorized distributors or service center for further information.
4. The length of the output cables should be less than 10m in order to comply with EMC requirements.

Battery

1. High ambient temperature shortens the battery' s lifespan, the battery should be replaced periodically to ensure normal operation of the UPS and for adequate autonomy.
2. Servicing of battery should be performed or supervised by personnel who is knowledgeable of battery.
3. In replacement of battery, please use the same number and same type of the battery.

4. A battery can present a risk of electrical shock and high short circuit current. Pay attention to the following precautions prior to battery replacement.
   A. Metal objects, such as rings and watches shall be removed;
   B. Use tools with insulated handles;
   C. Wear rubber gloves and boots;
   D. Do not lay tools or metal parts on the batteries;
   E. Disconnect the load before removing the wirings from the battery.
5. Do not dispose of batteries in a fire, they may explode.
6. Do not open or mutilate the battery. It may cause an electrolyte leakage that is toxic and harmful to the skin and eyes. If electrolyte comes into contact with the skin, wash the affected area with plenty of clean water immediately and go to the hospital for further checkup.
7. Do not make the positive and negative terminals of the battery short circuit; otherwise it may cause electric shock or fire.

Maintenance

1. The operating environment and storage method are two main factors affecting the service lifetime and reliability of the UPS. It is advisable not to use the UPS in the following environments:

- Where the temperature and relative humidity are out of the specifications (temperature:0℃～40℃, relative humidity: 20%～90%.)
- Where vibrations or shocks are existing.
- Dust, corrosive agents or inflammable gas are present.

2. If the UPS does not use for a long period, it shall be kept in a dry environment. The storage temperature should be between －25℃～＋55℃ (without battery). If the UPS has been kept in the area where its temperature is lower than 0℃, please keep the UPS in a location with the ambient temperature over 0℃ for a certain period of time before powering on the UPS.

Contents

1 INTRODUCTION

Descriptions of Commonly Used Symbols

Some of the following symbols may be used in this manual and may appear in your application process. Therefore, all users should be familiar with them and understand their meanings.

Symbol & Description	
Symbol	**Descriptions**
	Alert you to pay special attention
	Danger of electrical hazard
	Alternating current source (AC)
	Direct current source (DC)
	Protective ground
	Recyclable
	Do not dispose of with ordinary trash

2 PRODUCT DESCRIPTION

Castle E Series is of true online UPS (Uninterruptible Power Systems) designed with an advanced double-conversion technology. It provides perfect protection especially for critical loads, such as computers, communications systems as well as computerized instruments.

The double-conversion design eliminates all mains power disturbances. A rectifier converts the alternating current from the utility power to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a pure sine wave AC power which is constantly powering the loads.

2.1 Models and Configuration

There are two types of UPS according to the battery configuration: standard type and long backup time type, each available in the following ratings: 1kVA, 2kVA and 3kVA UPS.

Table 2-1 UPS types and configurations

Type		Model	Remark
Standard model	1kVA UPS	C1K_E	With internal batteries
	2kVA UPS	C2K_E	With internal batteries
	3kVA UPS	C3K_E	With internal batteries
Long Backup Time model	1kVA UPS	C1KS_E	Without internal batteries, but equipped with high power charger
	2kVA UPS	C2KS_E	Without internal batteries, but equipped with high power charger
	3kVA UPS	C3KS_E	Without internal batteries, but equipped with high power charger

***** *Note: "S" stands for Long Backup Time model.*

2.2 The Appearance of the UPS

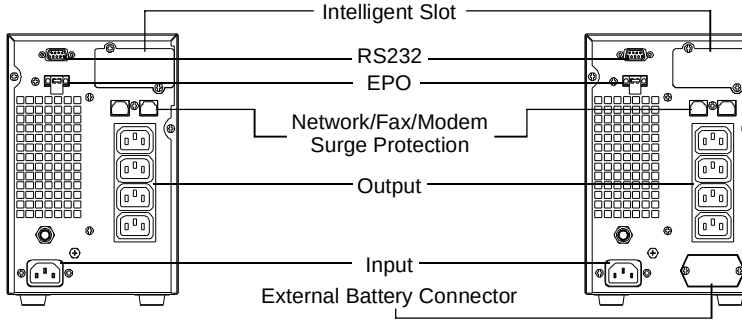


Figure 2-1The rear panel of C1K_E

Figure 2-2The rear panel of C1KS_E

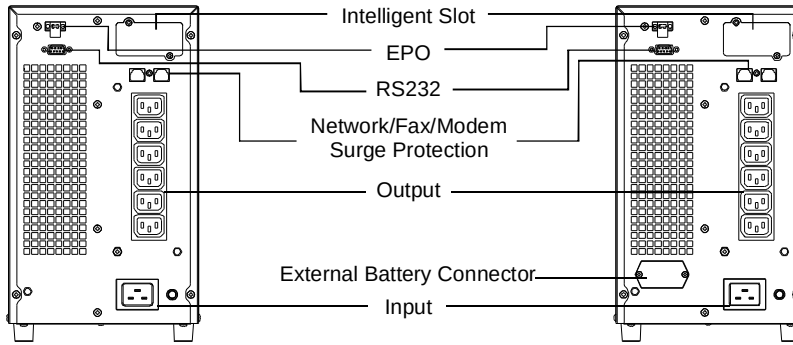


Figure 2-3The rear panel of C2K_E

Figure 2-4The rear panel of C2KS_E

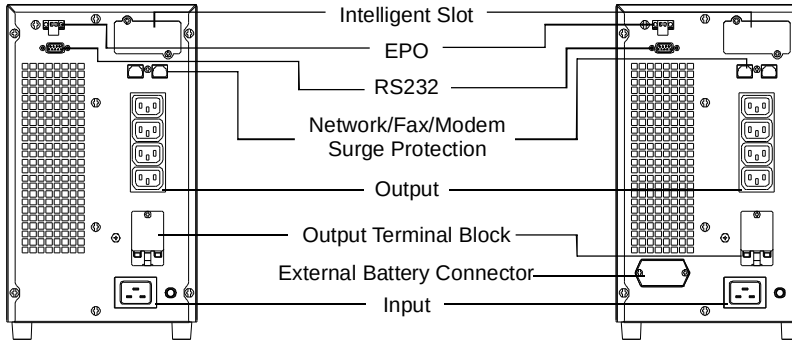


Figure 2-5The rear panel of C3K_E

Figure 2-6The rear panel of C3KS_E

2.3 Operating Principle

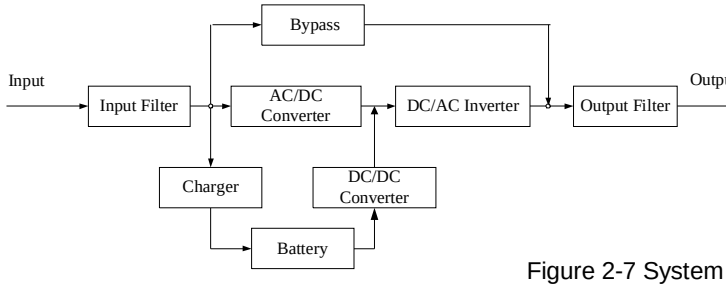


Figure 2-7 System block diagram

1. Input filter: It is for input noise filtering and provides clean AC power to the UPS.
2. AC/DC converter: In AC mode (Utility Power mode), it converts the AC input power to regulated DC power source for the inverter.
3. DC/DC converter: It boosts the DC Voltage from the battery to the optimum operating DC power for the inverter when the UPS is in Battery mode.
4. DC/AC inverter: It utilizes the regulated DC power of the AC/DC converter in AC mode or DC/DC converter in battery mode to generate a pure, clean and regulated sine wave AC power for output.
5. Bypass: The UPS automatically transfers to bypass mode powering the output load direct from utility power through the filters in the event of any fault of the UPS or the UPS is severely overloaded.
6. Charger: It charges the battery when the UPS is in AC mode. The output charging current of the standard models of C1K_E, C2K_E and C3K_E is 1A; the output charging current of the long backup time models of C1KS_E and C2KS_E/C3KS_E is 7A and 8A respectively.
7. Battery: sealed lead –acid maintenance-free battery is used as DC power source for standard models and is strongly recommended to be used as the DC source for long backup time models.
8. Output filter: It provides clean AC power for the output load.

3 INSTALLATION

3.1 Unpacking and Inspections

1. Unpack the UPS and examine the unit to see if there is any damage during transportation.
2. Check the accessories of the UPS as below.(Refer to Table 3-1)
3. If the appearance of the UPS is damaged, or there is any missing accessory, please contact the distributor immediately.

Table 3-1 List of Accessories

Model	Accessory	Quantity
Standard model	User manual	1
	WinPower software (CD)	1
	Communication cable	1
	Input Power Cable	1
	Output Power Cable	2
long backup time model	User manual	1
	WinPower software (CD)	1
	Communication cable	1
	External Battery Cable	1
	Input Power Cable	1
	Output Power Cable	2

3.2 Installation Notes

1. The UPS must be placed in a location with good ventilation, far away from water, inflammable gas and corrosive agents. The ambient temperature of the UPS should be kept in the range of 0℃ to 40℃.
2. The UPS should not be tilted. The air inlet port at the front panel and the outlet port on the rear panel should not be blocked so as to ensure good ventilation.
3. If the UPS is unpacked, installed and used at very low temperatures, condensations of water drops may appear. It is necessary to wait until the UPS fully dried inside out before proceeding to installation and use. Otherwise, there may be a risk of electric shock.
4. Place the UPS near the utility power source outlet which supplies power to the UPS and must be easily accessible. In any emergency, shut off the UPS and unplug the input power cord from the wall outlet. All power sockets must be connected with protective ground.

3.3 Cable Connections

3.3.1 Connections of Input and Output

1. Input cable connection

   If the UPS is connected via the power cable, please use a proper socket with protection against electric current, and pay attention to the capacity of the socket: over 10A for C1K_E/C1KS_E and C2K_E, over 16A for C2KS_E and C3K_E/C3KS_E. The wiring configuration is shown in the following diagram.

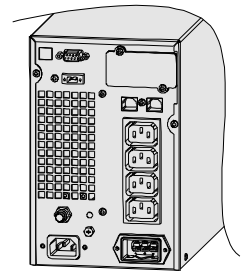


Figure 3-1 Connection Method of Input for 1~3kVA

2. Output connection

Table 3-2 Output of the UPS

Rating	Model	Quantity of output socket	Output Terminal Block
1kVA	C1K_E/C1KS_E	4	Nil
2kVA	C2K_E/C2KS_E	6	Nil
3kVA	C3K_E,/C3KS_E	4	Available

- The output of C1K_E/C1KS_E, C2K_E/C2KS_E and C3K_E/C3KS_E are available to use sockets for output connections. The total output power shall not exceed 1kVA/0.8kW, 2kVA/1.6 kW，3kVA/2.4 kW. Simply plug the load power cables to the output sockets to complete connection as shown in the following diagram

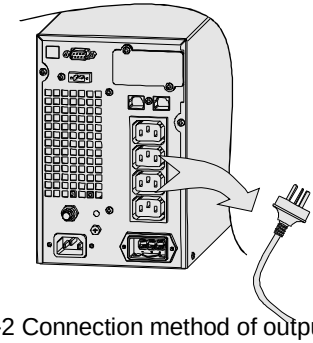


Figure 3-2 Connection method of output for 1~3kVA

- Apart from using the sockets for output connections, C3K_E/C3KS_E has the terminal block available for output as well. It is recommended to use this terminal block for output connection when its drawing current of the equipment is over 10A. The wring configuration is shown in the following diagram. Refer to the procedures as below,

1) Remove the small cover of the terminal block;
2) Use AWG14 (2.1mm^2) wires for wiring configuration;
3) Upon completion of the wiring configuration, please check whether the wires are securely affixed;
4) Put back the small cover to the rear panel.

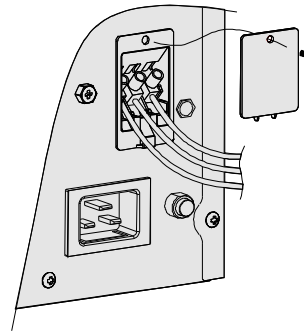


Figure 3-3 Connection method of terminal block for 3kVA

* ***Caution:*** *The wiring connection of the terminal block shall be carried out by professional personnel.*

3.3.2 Operation Procedures of External Battery for Long Backup Time models

The battery connection procedures are very important. Any incompliance may result in the risk of electric shock. Therefore, the following steps must be strictly complied with.

1. Firstly connect the batteries in series of a battery pack to ensure proper battery voltage that is 36Vdc for C1KS_E, 72Vdc for C2KS_E and 96Vdc for C3KS_E.
2. A battery cable for connection of the external battery pack comes with the UPS, one end of the external battery cable is a plug for connection to the UPS, the other end has 3 open wires for connection to the output of the battery pack.
3. Connect the external battery cable to the output terminals of the battery pack (DO NOT connect the plug of the cable to the external battery socket of the UPS first. Otherwise, it may cause electric shock). Connect the red wire to the: "+" terminal of the output of the battery pack. The black wire is connected to the "-" terminal of the output of the battery pack. The green/yellow wire is grounded for protection purpose.
4. Connect the plug of the external battery cable to the external battery socket on the rear panel of the UPS to complete the connection procedure.

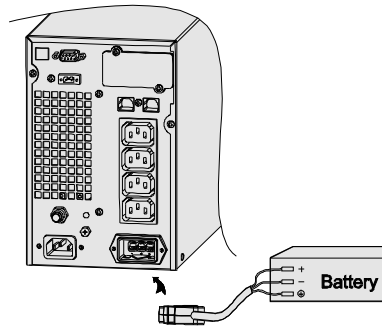
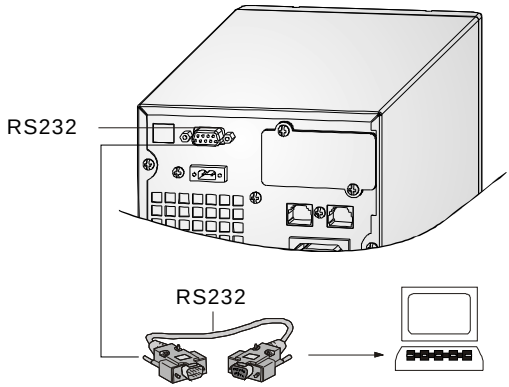


Figure 3-4 Battery connection diagram of Long Backup time models

* ***Note***：*The length of the external battery cable is standardized. There is a limitation of the length of the external battery cable to ensure normal operation of the UPS system.*

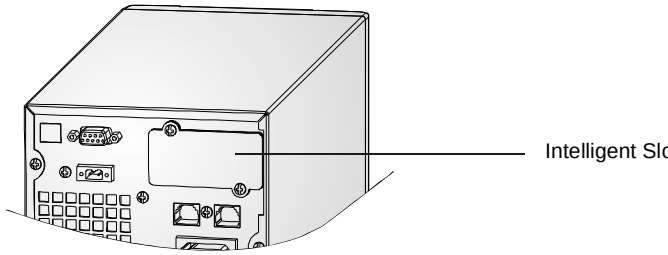
3.3.3 Connection of Communication Cable

1. RS232 interface



RS232 interface—It is used to communicate the UPS through a computer which has WinPower software installed on it for power monitoring and management.

2. Optional accessories



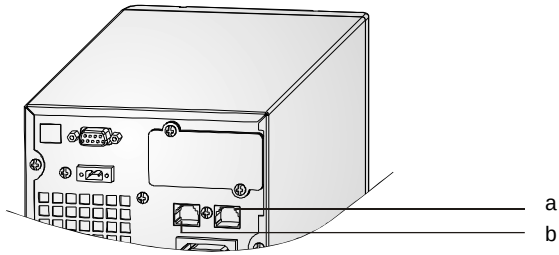
Intelligent Slot: It is compatible with optional communication cards, please consult the distributor or service center for further details.

a. AS400: Dry-contact closure interface.
b. WebPower Card(SNMP) : Remote monitoring and management of your UPS system over the network.
c. CMC: It is a Central monitor card and gives an easy and simple way to achieve remote monitoring and controlling of all the UPSs at the same time.
d. USB+RS232 card

* ***Note***:

1. Remove the cover of the intelligent slot before installation of an optional card.
2. Refer to some other relative documents for the use of the WinPower software and the AS400 card, WebPower(SNMP)card or WinPower CMC card. please consult the distributor or service center for further details if you have any questions.

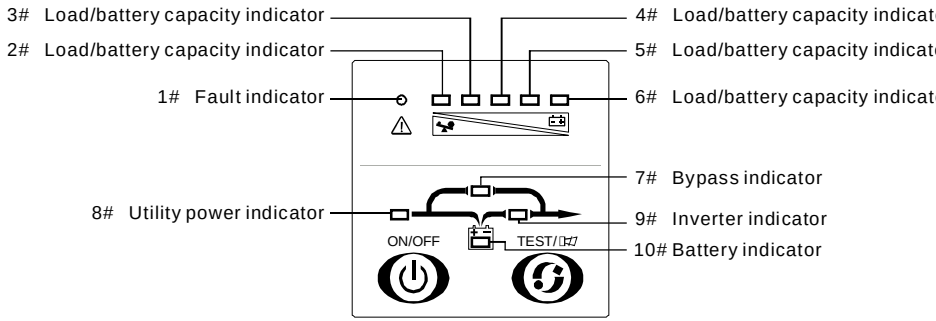
3. Surge protection port (RJ45)



a. Output port for connection to the device which needs to be protected.
b. Input port for connection to incoming network/telephone line.

4 OPERATION

4.1 Display and Control Panel



1. ON/OFF button:

The ON/OFF button is used to power ON or OFF the UPS:

1) Turn on the UPS system:

By pressing the ON/OFF button for more than 1 second to turn on the UPS system.

2) Turn off the UPS system:

By pressing the ON/OFF button again for more than 1 second, the UPS system will be powered off.

2. TEST/ button

The TEST/ button provides the following functions:

1) Battery self-diagnosis

When the UPS is operating in AC mode (Utility Power mode), by pressing the TEST/ button for more than 2 seconds, the UPS will perform battery self-diagnosis for 10 seconds.

2) Silence function in battery mode

When the UPS is working in battery mode, the UPS gives an audible alarm every four seconds, by pressing this TEST/ button for more than 2 seconds to silence the audible alarm; By pressing it again for more than 2 seconds to resume the audible alarm.

* ***Note:*** *The alarm silence function of the* TEST/ *button is valid only in battery mode. It cannot silence other fault warning alarms of the UPS system*

3. LED indicators

The LEDs display contains Fault indicator, Load/battery capacity indicators, Bypass indicator, utility power indicator, Inverter indicator and Battery indicator.

Table 4-1 Description of indicators

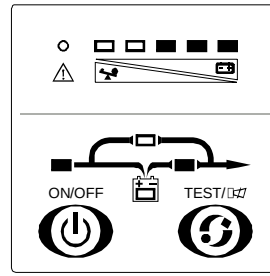
No.	Indicator	Color	Description
1#	Fault indicator	Red	Whenever the Fault indicator is on, it shows that the UPS is in abnormal condition.
2#	Load/battery capacity indicator	Orange	Show the level of the battery capacity or the load level: 1.Indicate the load level in AC mode and bypass mode 2. Indicate the battery capacity level in battery mode.
3#	Load/battery capacity indicator	Green	
4#	Load/battery capacity indicator	Green	
5#	Load/battery capacity indicator	Green	
6#	Load/battery capacity indicator	Green	
7#	Bypass indicator	Orange	Whenever the Bypass indicator is on, it shows that the loading current is supplied from the utility power directly.
8#	Utility power indicator	Green	When the Utility Power indicator is on, it shows that the utility power input of the UPS is normal.
9#	Inverter indicator	Green	When the Inverter indicator is on, it shows that the load current is supplied from utility power or battery via the inverter.
10#	Battery indicator	Orange	When the Battery indicator is on, it shows that the load current is supplied from battery via the inverter.

4.2 Operating Mode

4.2.1 AC mode (Utility Power mode)

In AC mode, the display on the front panel is shown in the following diagram. The utility power indicator and the Inverter indicator are turned on. The load/battery capacity indicator will be turned on in accordance with the load capacity connected.

1. If the utility power indicator blinks, it indicates that there are problems with reversed polarity (L, N) of site wiring or disconnected with ground that may result in shock hazard. The UPS is still working in AC mode. If the battery indicator is turned on at the same time, it shows that the voltage and/or frequency of the utility power are/is out of the normal input range of the UPS. The UPS works in battery mode.



2. If output overloaded, the load level indicators will be turned on and alarm will beep twice every second. You should get rid of some unnecessary loads one by one to decrease the loads connected to the UPS less than 100% capacity of the UPS.
3. If the battery indicator blinks, it indicates that no battery is connected to the UPS or battery voltage is too low. You should check if the battery pack is properly connected to the UPS. If the connection between the battery pack and the UPS is confirmed without any problem, it may be due to the defect or aging of the battery, please refer to the "troubleshooting" in chapter 6 to solve the problem accordingly.

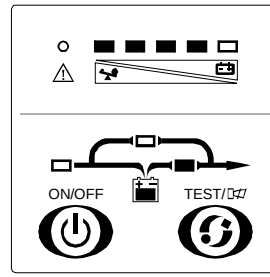
* ***Note***：*Connection to the power generator should be made according to the following steps:*

- *Activate the power generator and wait until the operation is stable before connecting the output of the power generator to the UPS (be sure that the UPS is in idle mode). Then, turn on the UPS according to the start-up procedure. After the UPS is turned on, the loads are connected one by one.*
- *It is recommended that the capacity of the AC generator chosen should double that of the UPS*.

4.2.2 Battery mode

In battery mode, the display on the front panel is shown in the following diagram. The battery indicator and the inverter indicator are turned on. The battery capacity indicators will be turned on in accordance with the level of the battery capacity. Please note that the load capacity level indicators in AC mode will indicate the level of the battery capacity in battery mode.

1. When the UPS is running in battery mode, the alarm will beep every 4 seconds. If the TEST/🔕 button is pressed for more than 2 seconds, the alarm will not beep（silence function）. Press the TEST/🔕 button for more than 2 seconds again to resume the alarm function.



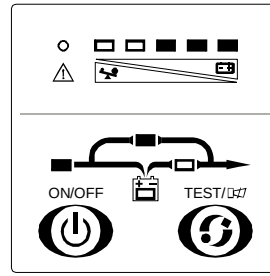
2. When the battery capacity decreases, the number of battery capacity indicators turned on will decrease. If the battery voltage drops to the pre-alarm level (capable of maintaining the backup time for more than 2 minutes for standard models), the alarm will beep every second to remind the user of insufficient battery capacity. Then, the load operations should be carried out promptly and the load should be eliminated one by one.
3. It is possible to check the backup function of the UPS even though utility power is not connected. The UPS can be powered up in battery mode.

4.2.3 Bypass mode

The UPS can be configured through WinPower software to supply output power from the mains power in bypass mode when the UPS is turned off (the factory default is no output when the UPS is off in AC mode).

When operating in bypass mode, the display on the front panel is shown in the following diagram. The utility power indicator and the bypass indicator are turned on. The load indicator will be turned on in accordance with the load capacity connected. The UPS beeps every 2 minutes.

1. If the utility power indicator blinks, it shows that the voltage and/or frequency of the utility power are/is out of the input range of the UPS or there are problems with reversed polarity (L/N) of site wiring or disconnected with the protective ground.
2. Other display on the front panel is same as those mentioned in AC mode.
3. When operating in bypass mode, the backup function of the UPS is not available and the power used by the load is directly from the utility power via internal EMI filters.



4.3 Operating Instructions

4.3.1 Turn On and Turn off the UPS

* ***Note***：*The battery is fully charged before delivery. However, storage and transportation will inevitably cause some energy loss. Therefore, it is advisable to charge the battery for 8 hours before using it, so as to ensure adequate battery autonomy.*

1. Turn on the UPS

   The operation of turning on the UPS contains: turning on with utility power supplied (in AC mode) and turning on without utility power supplied (in Battery mode).

1) Turn on with utility power supplied:

   Connect the mains input to the UPS, press the ON/OFF button for more than 1 second until the buzzer beeps, then the UPS begins self-diagnosis, with the load/battery capacity indicators on the front panel turned on and then off one after another rightwards. Seconds later, the UPS will begin to operate in AC mode; meanwhile, the utility power indicator, inverter indicator will turn on. If the utility power is abnormal, the UPS will work in battery mode.

2) Turn on without utility power supplied:

Without supply of the utility power to the UPS, press the ON/OFF button for more than 1 second until the buzzer beeps. In the power-on process, the UPS has the same operation as if it is connected to utility power except that the utility power indicator is not turned on and the battery indicator is turned on instead.

2. Turn off the UPS

The operation of turning off the UPS is shown as follows:

1) Completely power off the UPS in AC mode

Press the ON/OFF button persistently for more than 1 second to power off the UPS. If it is set up to supply output in bypass mode by WinPower software, the bypass indicator will be turned on to indicate that the UPS is working in bypass mode. In order to cut off the output from the UPS, simply cut off the utility power supply. Finally, not any display is shown on the front panel and no output is available from the UPS outlets.

2) Completely power off the UPS in Battery mode

Press the "ON/OFF" button persistently for more than 1 second to power off the UPS. When being powered off, the UPS will start self-diagnosis and all the load/battery capacity indicators will be turned on and off one after another. Finally, not any display is shown on the front panel and no voltage output is available from the UPS outlets.

4.3.2 Battery self-diagnosis

In normal operation of the UPS, users can manually perform battery self-diagnosis to check the battery conditions. There are two methods to perform the battery test:

1. Through the TEST/ button

In AC mode, press the TEST/ button for more than 2 seconds until the buzzer beeps. The indicators (LED7~10) will blink cyclically, indicating the UPS is performing the battery self-diagnosis. The battery self-diagnosis will last for 10 seconds by default. In the event of a battery fault during battery self-diagnosis, the UPS will transfer to normal operating AC mode automatically without interruption to the output.

2. Through the monitoring software

Users can also perform the battery self-diagnosis through the WinPower monitoring software or through WebPower if installed.

4.3.3 Audible alarm and LED indication of UPS operating status and faults

●: Solid On

★: Flash

↑: Depending on other conditions

S/N	Operating status		LED indicators										Audible alarm
			1#	2#	3#	4#	5#	6#	7#	8#	9#	10#	
1	AC mode	0%--35% load						●		●	●		None
2		36%--55% load					●	●		●	●		None
3		56%--75% load				●	●	●		●	●		None
4		76%--95% load			●	●	●	●		●	●		None
5		96%--105% load		●	●	●	●	●		●	●		None
6	Battery mode	0%--25% of battery capacity		●							●	●	Once every 1 second
7		26%--50% of battery capacity		●	●						●	●	Once every 4 seconds
8		51%--75% of battery capacity		●	●	●					●	●	Once every 4 seconds
9		76%--100% of battery capacity		●	●	●	●				●	●	Once every 4 seconds
10		100% of battery capacity		●	●	●	●	●			●	●	Once every 4 seconds
11	Bypass mode			↑	↑	↑	↑	●	●	●			Once every 2 minutes
12	Overloaded in AC mode and transferred to Bypass mode		●	●	●	●	●	●	●	●			Continuously beep
13	Utility power failure			↑	↑	↑	↑	●	↑	★	↑	↑	↑
14	Overloading in Battery mode		●	●							●	●	Twice every 1 second
15	Overloaded in Battery mode, no output		●	●									Continuously beep
16	Over temperature		●					●	↑	↑			Continuously beep
17	Inverter fault		●				●		↑	↑			Continuously beep
18	BUS voltage fault		●			●			↑	↑			Continuously beep
19	Utility power input NTC open		●				●	●					Continuously beep
20	Over charging		●		●				↑	↑			Continuously beep
21	Battery fault		↑	↑	↑	↑	↑	●				★	↑
22	Reversed polarities (L, N) of input wiring or disconnected with protective ground			↑	↑	↑	↑	●	↑	★	↑	↑	Once every 2 minutes
23	Charger or battery fault		●									★	Once every 1 second
24	Output short circuit		●	●			●			↑			Continuously beep

5 MAINTENANCE

5.1 Battery Maintenance

The battery is the key component of the UPS. The battery life depends on the ambient temperature, charge and discharge times. High ambient temperature and deep discharge will shorten the battery life.

1. Sealed lead－acid maintenance-free battery is used in the standard models. When being connected to the utility power whether the UPS is turned on or not, the UPS keeps charging the battery and also offers the protective function of over-charging and discharging.
2. Keep the ambient temperature between 15℃ and 25℃
3. If the UPS has not been used for a long period, charging is recommended at the intervals of 3 months.
4. Normally, the battery should be charged and discharged every 4 to 6 months. Charging should begin after the UPS shuts down automatically in the course of discharging. In the regions of hot climates, the battery should be charged and discharged every 2 months. Moreover, the standard charging time should be not less than 10 hours.
5. Batteries should not be replaced individually. All batteries should be replaced at the same time following the instructions of the battery supplier.
6. Under normal conditions, the battery life lasts 3 to 5 years. In case the battery is found not in good condition, earlier replacement should be made. The battery should only be replaced by qualified service personnel.

**** Note*:**

1. Prior to battery replacement, the UPS must be turned off and disconnected from utility power.

2. Metal objects such as rings and watches should be removed.

3. Use the screwdriver with insulated handle. Tools and other metal objects should not be placed on the battery.

4. Short circuit or reverse connection between the positive and negative terminals of the battery is strictly forbidden.

5.2 UPS functional check

Every time when conducting field maintenance, please check the regular functions of the UPS, including:

1. Check the operating status of the UPS
   If the mains voltage is within the specifications, the UPS should operate in normal mode (AC mode); if the mains voltage is abnormal, the UPS should operate in battery mode. In both modes, there should be no fault indication.
2. Check the transfer functions between the UPS operating modes

Disconnect the mains input to simulate mains failure, the UPS should transfer to battery mode and operate normally; then recover the mains input, the UPS should transfer to normal AC mode and operate normally

3. Check the LED indicators of the UPS
   During the checkup processes stated above, check that the LED indication of the UPS complies with the UPS operating mode.

6 TROUBLESHOOTING

The troubleshooting chart, Table 6-1, covers most of the difficulties that you may encounter under normal operating conditions. Such information can be used to determine whether the fault is caused by external factors or how to tackle the problem. If the fault still persists, please contact the distributor or service center as soon as possible.

Table 6-1 troubleshooting table

Problem	Possible cause	solution
The #1 Fault LED and #6 LED are on, the buzzer beeps continuously.	Internal over temperature	Ensure that the UPS is not overloaded and the ventilation opening is not blocked and ambient temperature is not too high. Wait for at least 10 minutes for the UPS to cool down before turning it on again. If it does not work. please contact the distributor or service center
The #1 Fault LED and #5 LED are on, the buzzer beeps continuously	Internal fault	Please contact the distributor or Service center
The #1 Fault LED and #4 LED are on, the buzzer beeps continuously	Internal fault	Please contact the distributor or Service center
The #1 Fault LED and #3 LED are on, the buzzer beeps continuously	Over-charging Protection	The charger of the UPS is defective. Please contact the distributor or Service center
The #8 utility power LED blinks	The voltage or frequency of the utility power is out of the input range of the UPS	The UPS is running in the battery mode. To save your data and then close the applications in use. Ensure that utility power is within the input voltage and frequency range permitted by the UPS
	Maybe reversed polarities (L, N) of the site wiring. The alarm beeps once every 2 minutes	Please check the polarities of the neutral wiring and the line wiring

The #1 Fault LED and #2 LED are on, the buzzer beeps continuously	The UPS overloaded or the load device is faulty in battery mode	Check the load and remove the non-Critical equipment. Recalculate the load power and reduce the number of loads connected to the UPS. Check whether the load device is faulty
The #1 Fault LED and #2 LED and #6 are on, the buzzer beeps once every second	Fan of the UPS is not connected or faulty	Please contact the distributor or Service center
The #1 Fault LED and #2 LED and #5 LED are on, the buzzer beeps continuously	The UPS output is short circuited	Turn off the UPS. Remove all loads. Ensure that the loads are not failed or has no internal short before turning it on again. If failed, please contact the distributor or service center
The #10 battery LED blinks	Battery is not connected or its voltage is too low.	Check the battery of the UPS and connect it properly. If the battery is damaged, you must replace it promptly
The #1 fault LED is on. The #10 battery LED blinks. The buzzer beeps once every second	The charger of the UPS is defective	Please contact the distributor or Service center
The utility power is normal but the UPS cannot operate in AC mode	The UPS input breaker is tripped	Reset the input breaker
The battery discharge time diminishes	The battery has not been fully charged	Keep the UPS connected to utility power persistently for more than 10 hours to charge the battery again
	The UPS is overloaded	Check the load status and remove the non-critical device
	Battery aged	Replace the batteries. Please contact the distributor to obtain the components for battery replacement
The UPS cannot power on after pressing the power on button	The power on button is pressed too briefly	Press the power on button persistently for more than 1 second
	The UPS is not connected to battery or the battery voltage is low	Check the connection of the battery. Turn on the UPS without load if the battery voltage is low
	Internal fault	Please contact the distributor or Service center

When you contact the distributor or service center reporting UPS fault, please provide the following information:

- The UPS model and its serial No.
- The date when the problem arose.
- Complete descriptions of the problem, including LED indications, power condition, load capacity, audible alarm and configuration of battery pack (if Long Backup time models).

7 SPECIFICATIONS

7.1 Electrical

Model			**C1K_E**	**C1KS_E**	**C2K_E**	**C2KS_E**	**C3K_E**	**C3KS_E**
Rating			**1kVA/800W**		**2kVA/1600W**		**3kVA/2400W**	
Input	Input		Single phase with earth ground					
	Nominal voltage		220VAC					
	Voltage range		115VAC～300VAC					
	Frequency		50/60 Hz (auto-sensing)					
	Power factor		0.98					
	Bypass Voltage range		80VAC* (1±5%) ～285VAC* (1±5%)					
Output	Output		Single phase with earth ground					
	Rated voltage		220VAC					
	Power factor		0.8					
	Voltage precision		±2%					
	Output frequency	AC mode	1. Syn to mains input frequency when the input frequency is in the range of 46 Hz～54 Hz or 56 ~ 64Hz 2. 50/60 Hz when the mains input frequency is out of the range of 46～54 Hz or 56~64Hz					
		Battery mode	50/60± 0.2 Hz					
	overload capacity （Utility power，25℃）		108%±5%<Load≤150%±5%： 47s～25s 150%±5%< Load <200%±5%： 25s～300ms Load ≥200%±5% ： 300ms					
	Transfer time		0ms （AC mode⇌Battery mode）					
			<4ms（AC mode⇌Bypass mode）					
	Crest factor		3:1 (max)					
Battery	nominal-voltage		36VDC		72VDC		96VDC	
	Quantity		3		6		8	
	Backup Time（25℃）		Full load ≥4min (Standard models)					
	Battery recharge time		* 5 hours recharge to 90% battery capacity（Standard models） * Dependent on the capacity of external batteries（Long backup time models）					

7.2 Mechanical

Model	W*H*D(mm)	Weight(kg)
C1K_E	145×220×355	15 kg
C1KS_E	145×220×355	9 kg
C2K_E	190×318×383	28 kg
C2KS_E	190×318×383	14 kg
C3K_E	190×318×433	33 kg
C3KS_E	190×318×433	15 kg

7.3 Environmental

Item	Normal range
Ambient temperature	0℃～40℃
Humidity	20% ~ 90% (non-condensing)
Altitude	Lower than 1000m
Storage temperature	-15℃～45 ℃

7.4 EMC standards

Item	Standard	Level
ESD	IEC61000-4-2	LEVEL4
RS	IEC61000-4-3	LEVEL3
EFT	IEC61000-4-4	LEVEL4
Surge	IEC61000-4-5	LEVEL4

7.5 Safety

Comply with IEC62040-1 and CE requirements.

7.6 Industriel Standards

Comply with EN62040，YD/T 1095-2000 requirements.

8 WARRANTY

Santak Corp. offers the buyer and the client (hereinafter referred to as 'the buyer') the following limited warranty for repair:
Starting from the initial date when the buyer purchases the product from Santak or the distributor/the reseller of Santak, the Uninterruptible Power System and its components related in this 'user manual' will not be short of materials and services under normal use, service and maintenance within three years. The foregoing warranty card is only acceptable warranty card unless other reasonable commercial agreements with specified purposes have been reached. In certain places where local laws have special provisions for the term of warranty, the foregoing term shall not be applicable. This warranty offers special legal rights. You are able to obtain other different pursuant to local laws. The buyer is responsible for certain service and maintenance expensive. The following situation is not covered by warranty: finished goods lost or serial number manipulated, loss or damage due to force majeure or external reasons, misuse, accident, negligence, unauthorized alternation or repair, overuse, violation of operation stipulations.

Warning: The warranty does not cover any loss caused by the over discharge of the battery. In order to prevent over discharge, when utility power supply is cut off, do not keep the UPS working in battery mode for more than two days without recharging of the battery. Moreover, the battery should be charged again at the interval of 4 to 6 months.
With the warranty period of three years, in case if any damage of the machine is covered by the warranty, Santak shall offer repair or replacement according to its own means. In case of need for the warranty services, please contact your local Santak service center. The transportation charges shall be borne by the buyer.

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