
CKT8000 Series

DC Programmable Electronic Load

User's Manual



Applicable model: CKT8001 / CKT8003 /CKT8003+

Version number: V1.0

Foreword

Dear users:

Thank you very much for choosing CKT8000 series DC programmable electronic load produced by Changzhou Chuangkai electronic. This manual is only applicable to CKT8000 series DC programmable electronic load produced by Changzhou Chuangkai electronic Co., Ltd. It details the specification, installation, operation and maintenance of the electronic load.

To ensure that you can safely and correctly use our company's products, you must read this manual carefully before using the product and please keep it properly for further reference.

Declaration

The copyright of this manual is owed by Changzhou Chuangkai electronic Co., Ltd. Without permission, any contents of this manual shall not be reproduce or reprint in any way. All information in the manual is provided to the user according to the existing conditions. If there is any change, no further notice will be given. Chuangkai electronic is not responsible for any possible errors or damages caused by this manual. If there is any doubt in use, please contact us.

Quality Assurance

Chuangkai electronic certifies that CKT8000 series electronic load fully meets all specifications introduced in this manual. Our product's quality is stable and reliable.

Chuangkai electronic only makes the above guarantee and does not make other property guarantee. We are not responsible for any special, accidental or indirect damage.

Warranty Service

Chuangkai electronic provides warranty service for the products of our company in accordance with the national regulation. We offer free maintenance of the product for a period of one year from date of delivery(Warranty service shall not apply to the damages resulting from the situation that beyond the guarantee).

When using this product for warranty service or maintenance, please send the product to the maintenance locus designated by our company or contact the manufacturer directly.

Limitation of Warranty

Chuangkai electronic does not provide warranty service for the damages caused by the following or similar circumstances.

1. The customer modifies the circuit of the maintenance equipment and the relevant identification cannot be recognized.
2. Improper operation, nonagency, using in abnormal environment, etc.
3. Damages caused by accidents, including but not limited to lightning stroke, in-water, fire and other irresistible force factors.

4. Damages caused by the customer's self-installed circuit or improper use of the product.
5. Damages resulting from the customer's operation outside the designated environment.
6. The product's model or serial number has been altered, deleted, removed or unrecognizable.

Safety instructions

When using the electronic load, please follow the following security precautions. Chuangkai electronic is not responsible for the accidents or injuries caused by the behaviors that failure to follow the precautions or other warnings in the manual.

1. Please observe all marks on the device before connecting it. The device supports 110V and 220V AC input, and please be sure to check if the switch matches the input power and the fuse has been installed properly before starting the power to avoid damages to the electronic load.
2. Please don't open the computer case of the electronic load, and don't try to maintain it.
3. Do not install replacement parts or perform any unauthorized modifications to ensure the safety of the electronic load.
4. Please use the cable connecting device provided by the original plant and ensure that the ground connection of the device is reliable.
5. Do not use this product in hazardous environments such as flammable, explosive, dust or steam.
6. Please ensure that the working voltage of the mains supply does not exceed 10% of the rated range to avoid the risk of damaging the device.
7. Please use proper electric wire to connect the load and the power under test to ensure that the capacity of the wire can sustain the maximum short circuit current without overheating.
8. Please do not use this device in case the cover is removed or loose to avoid dangers.
9. Please do not plug the thermovent of the device, and regularly clean the shell of the device to ensure the reliable operation of it.(note: please cut off the power supply before cleaning)
10. Please use dry cloth to clean the shell of the device. Do not clean any internal parts of the device.
11. Do not use damaged or defective device. Please check whether there are any cracks in the shell of the device before using it.
12. It is strictly prohibited to use this device on life support system or any other equipment with safety requirements.
13. If you fail to use the device in the manner specified by the manufacturer, the protection provided by the equipment may be damaged.

Safety Symbols

	Direct current	N	Neutral wire
	Alternating current	L	Live wire
	Both direct and alternating current	I	Power on
	Three-phase current	O	Power off
	Grounding		Reserve power supply
	Protective ground terminal	⊥	Signal ground
	Hazard sign		Caution

Operational Environment

CKT8000 series electronic load can only be used in normal temperature and low condensation area. The table below shows the general environmental requirements of this device. During the loading process, the revolving speed of the cooling fan will intelligently adjust with the temperature of the radiator.

Operational Environment	Environmental Requirement
Operational temperature	0°C~40°C
Operational humidity	20%~80%(Non-condensing)
Storage temperature	-10°C~60°C
Elevation	≤2000 meters
Pollution degree	Pollution degree2

Note

We suggest you operate the instrument after half an hour warm machine operation to ensure the accuracy of it.

Regulations Tag

	This symbol means in its shown period, dangerous or toxic substances will not produce leaks or damage. The service life of this product is 10 years, you can use it securely in the environmental protection period. When it exceeds the prescribed time, the instrument should be put into the recycling system.
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Chapter 1 Service Inspection

1.1 Packaging Inspection

You are welcome to purchase CKT8000 series electronic load of our company. Please check the equipment packing list below carefully before use. If there's any discrepancy, please contact us as soon as possible.

Item	Quantity	Description
DC programmable electronic load	1	The model is subject to the actual order.
Power connecting wire	1	The standard configuration is 250V/10A China regional power line
Backup fuse	2	250V/3A
User's manual	1	This manual can be download from our official website
Qualification test report	1	Instrument factory acceptance test report
Quick start guide	1	Basic introduction and quick use of the instrument
Certificate of approval	1	Factory inspection certificate

Note: Please check the product carefully to see whether its packaging and cushioning material is damaged. If the appearance of the electronic load (shell, panels, screen, switch, etc.) is damaged, please do not connect the power supply and immediately contact with the dealers to avoid danger.

If the packing contents are consistent with the list and there is no problem, please keep the packing box and relevant content properly. The instrument shall meet the packing requirements when returning to the factory for warranty.

1.2 Profile size introduction

Different models of CKT8000 series electronic load have different types and sizes, and the corresponding detailed dimensions of different models are listed below:

Model	CKT8001	CKT8003	CKT8003+
Length	365mm	365mm	465mm
Width	215mm	215mm	215mm
Height	88.5mm	88.5mm	88.5mm

1.3 Adjustment of handle

CKT8000 series electronic load is equipped with handle so that it's convenient to carry and display.

The load handle has three adjustable positions, each has a corresponding lock to hold fixed. When you adjust the handle, slightly pulled out to both sides and move to your desired position.

1.4 Removal of handle

When you need to install the device on the rack, please remove the handle of the load.

The removal method is:

1. First adjust the handle to the vertical position of the horizontal plane. Only in this position you can remove the handle. On the position, pull out and you can remove the handle.
2. Pull the handle to both sides of the bayonet and complete. Please avoid excessive force during the removing process in case of hurting your hands or other parts of your body.

1.5 Rack installation

CKT8000 series electronic load can be installed on a 19-inch standard cabinet and you can select and install the rack according to your own needs.

Installation process:

1. Refer to the contents of chapter 1.4 and remove the handle of the load.
2. Use the connector to fix the screw to the position of two brackets mounting holes on the flank of the load.
3. Screw two mounting holes on one side of the load on the cabinet.
4. Use screws and connectors to connect the other side of the load and the second load.
5. Attach the other side of the second load to the cabinet.

Note:

This instrument needs to be installed in a well-ventilated environment. Please ensure that the electronic load is in sufficient clearance with other objects during installation. The minimum spacing requirement is: right or left $\geq 50\text{mm}$, back $\geq 150\text{mm}$.

Please select a reasonable installation space according to the size of the electronic load.

1.6 Check power supply

Please check whether the provided power supply meets the following criteria before use:

Parameter	Requirement
Voltage	AC 220/100($\pm 10\%$)V
Frequency	50/60Hz
Power Dissipation	50W

The power supply cable provided by the factory is a three-core power cord. Please ensure that the power line of the three-phase socket is reliable grounded before use.

This device is equipped with 220/110v power supply switch. Please check and make sure the switch has been allocated to the correct gear before the power is connected.

This device uses 250V/3A fuse with a specification of 5x20mm. The fuse has been installed properly and spare fuse is provided. When replacing the fuse, please remove the external power supply cord first, then open the fuse slot below the power supply interface and replace the old fuse with a new one. When the replacement is completed, the device can be back to normal use.

Note: do not use the power line with any signs of damage to avoid danger!

1.7 Install the power cord

Please use the standard power cord to ensure the power supply of the electronic load.

The power cord models adapted to each country are listed below. Please select the appropriate model according to your area. The first type of power cord will be used by default. Please contact the distributor if you have special needs.

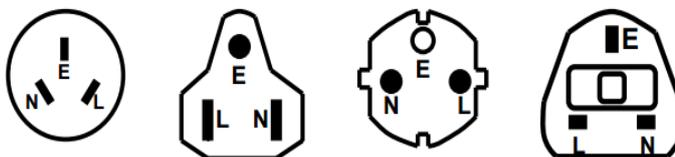


Figure 1-1 Common power cord specifications

1.8 Install the load connecting wire

The electronic load connects the objects to be tested by the "+" and "-" terminals in the front. When conducting a connection, you should notice whether the wire core diameter of the input wire is suitable, and whether the positive or negative polarity corresponds. The connecting wire should be thick enough to minimize voltage drops. When measuring high current, there tends to be larger voltage drops, so it is recommended to use the Sense terminals of the electronic load for compensation to ensure the accuracy of measurement.

Note:

Please check whether the polarity of the input terminal is connected correctly before testing, or it may damage your device.

1.9 Environment Inspection

1. Please use this device in the environment of 0 ~ 40 °C to ensure the accuracy of the instrument.
2. Avoid using the instrument in severe environment such as dusty, quaky, humid, corrosive gas, exposed to sunlight and so on.
3. Try to minimize the electromagnetic interference of the device and power supply. This instrument is elaborately designed, but the interference by other noise waves is somewhat inevitable. So it is suggested that you use this device in low noise environment.
4. If the instrument will not be used for a long time, please keep it properly in the packaging box and avoid severe environment such as damp, corrosive gas, strong light, etc.
5. When using the instrument, please ensure enough heat dissipation space of the device and prevent the internal over temperature to damage the machine.

1.10 Using the instrument

The electronic load can be used when the environment meets the requirements described above. Switch on the power supply and press the power button at the lower left corner of the device. The device starts up and enters the self-checking interface. After loading the initial information and entering the test mode, the device can be used normally.

In order to ensure the accuracy of the measurement, please make measurements after half an hour warm machine operation.

If the instrument will not be used for a long time, please cut off the power supply and keep it properly.

Note:

If you need to clean the instrument, please use dry cloth to wipe it gently. Do not clean any internal parts of the machine. The power supply must be cut off before cleaning.

Chapter 2 Quick Use

This chapter introduces CKT8000 series electronic load in terms of electrical inspection steps, functions and operations of the front panel, back panel, keyboard and LCD screen.

Make sure you've learned about the appearance, structure, and functions of the keys of the electronic load before using so as to better operate it.

CKT8000 series DC programmable electronic load produced by Changzhou Chuangkai electronic Co.,Ltd. has a wide power range and its resolution can reach 0.1mV/0.1mA. It supports a variety of test modes such as dynamic test, overload test, automatic test, list test, battery test, CR - LED test, etc. It is mainly applicable to electronic device performance test, battery (group) test, power supply test, new energy test, aerospace test, high power test, laboratory, R&D, production line, etc.

CKT8000 series electronic load is standard equipped with RS232 communication interface, and other communication interface is optional. We provide multi-purpose solutions according to your designing and testing requirements.

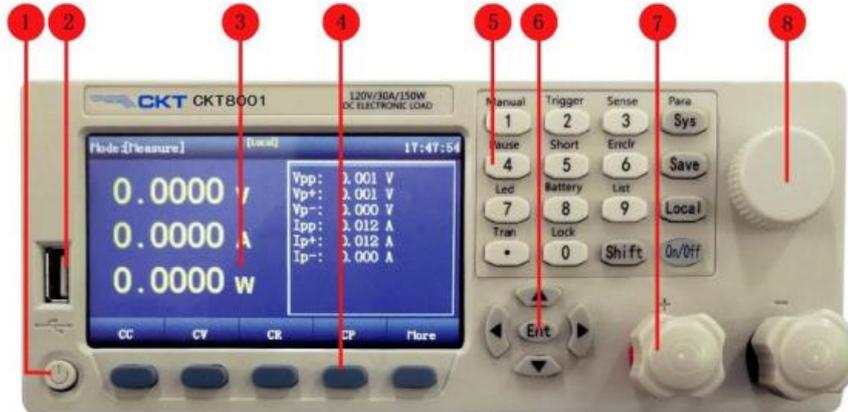
2.1 Product features

CKT8000 series electronic load has the following features:

1. Measurement range: 150W/300W/600W,120V,30A/120A
2. Four basic modes: CC/CV/CR/CP
3. Current remote monitoring function, external triggering function
4. 0.1 mV / 0.1 mA high resolution
5. Dynamic current/voltage test, up to 10K dynamic frequency
6. Voltage and current sampling speed of 50KHz
7. CR-LED test, power supply rise/fall time test
8. Frequency scan/sine-wave current test (some models)
9. Over voltage, low voltage, over current, over power, over heat, anti-wiring error and other basic protection. Besides, it has extended protection function of voltage overshoot, current overshoot, power monitoring lock, power start-up, etc.
10. The list mode comes with storage function, and it supports external USB saving and calling.
11. Screen printing and saving function
12. Standard equipped with RS232 interface, and more expanded interfaces are supported.
13. Remote voltage compensation input function
14. Equipped with upper computer software to realize remote operation and monitoring.
15. High speed ripple sampling and detection function
16. Three kinds of combination test: Constant resistance + constant current, constant voltage + constant resistance, constant voltage + constant current
17. OCP/OPP/OVP test, load effect test
18. Intelligent fans cooling and power failure memory function
19. Independent short circuit test function(Support in the stationary mode and list mode)

20. Suspend function

2.2 Front Panel Introduction



No.	Item	Description
1	Power knob	Be used for turn on&turn off the power supply.
2	USB interface	Be used for connecting USB disk to save test data, screen shots and list test files.
3	Soft key	Be used for choosing test mode(CC、 CV、 CR、 CP and More); At other interface perform the corresponding function shown on the display screen above the keys.
4	LCD display screen	Be used for displaying information such as the operation condition of the load, measurement parameters, operation mode, etc.
5	Arrow key	Be used for adjusting the position of the cursor or parameter values.
6	Digital&Function key	Be used for inputting digits or perform the corresponding function shown on the keyboard.
7	Input terminal	Be used for connecting to the power supply. Do not reverse the connection to avoid damages to the equipment.
8	Pulse knob	Be used for setting data and adjusting the position of the cursor in the menu.

2.3 Key Introduction

Key details of DLC8000 series electronic load :

Item	Description
Soft key (Below the display screen)	At the initial interface, select to enter CC, CV, CR, CP and more mode; At other interface perform the corresponding function shown on the display screen above the soft keys.
Digital key	Digital keys 0~9 are used for inputting the required number and the decimal point.

Shift	Press Shift(there are instructions on the screen) to perform the corresponding function printed above the keys.
Arrow key	Arrow keys are used to move the cursor or adjusting the value according to the selected parameters.
Enter	Be used for confirming/modifying current option or parameter
Local/Remote	Be used for choosing local or remote controlling mode
SYS	System Settings are used for setting system parameters, communication settings, file operations and viewing device information.
Para	Be used for setting the operational timing and protection parameters of the device.
Save	Be used for saving the current screen image.
On/Off	Be used for controlling the input status of the load: On/Off

2.4 Fast function key

The combined use of digital keys on the panel of CKT8000 series electronic load and the Shift key can realize the functions marked above the key. The detailed function are shown in the following table.

Key Name	Function Description
Shift+1 (Manual)	Set the trigger form of the electronic load: manual trigger or external trigger (Ext)
Shift+2 (Trigger)	Manually trigger the keys. Every time the electronic load is pressed, it performs a manual trigger action.
Shift+3 (Sense)	Turn on/off remote compensation function. The display screen will show Sense icon on it when it's on.
Shift+4 (Pause)	The Pause key is used to stop current loading.
Shift+5 (Short)	Start short circuit test
Shift+6 (Errclr)	Alarm clearance. Clear alarm manually.
Shift+7 (Led)	Enter LED test mode.
Shift+8 (Battery)	Enter Battery test mode.
Shift+9 (List)	Enter List test mode.
Shift+(.) (Tran)	Enter dynamic test mode.
Shift+0 (Lock)	Lock the keys on the electronic load panel

2.5 Screen display and status indicator introduction

2.5.1 Screen display introduction

After entering the test mode, the LCD screen is divided into several regions to display corresponding information.

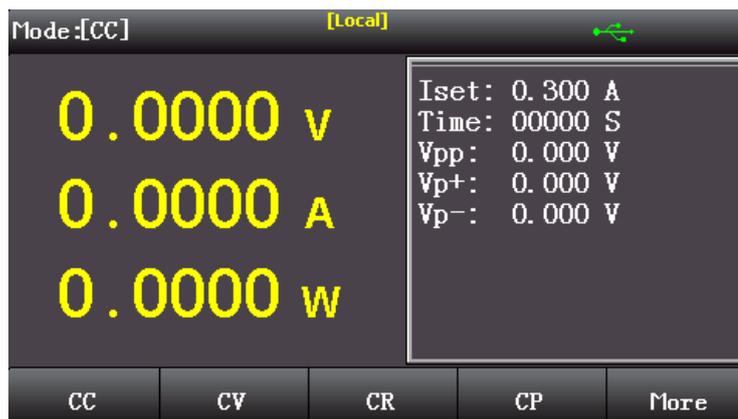


Figure 2-2 Test display interface

2.5.2 Measurement interface display

No.	Item	Description
1	Status information	Displays the current mode or state of the load.
2	System icon	Be used for displaying USB, remote compensation, short circuit test, keyboard lock, trigger function, etc.
3	Time display	Displays current system time
4	Host parameters	Displays real-time voltage, current and power.
5	Set/ripple display area	Be used for displaying mode-setting information, voltage, current ripple value.
6	Mode selection area (soft keyboard)	Be used for choosing the working mode of the electronic load. Performs the function of the corresponding key below the screen under other interfaces.

2.5.3 The status bar introduction

Status	Display status	Function description
Measuring state	Status (Mode)	Displays current measurement status or working mode
Controlling mode	Local/Remote	Local/remote operation mode for current load working
Screenshots state	Saving/Success/Fail	Saving images/saving success/failure
Trigger mode	Manual/Ext	The current trigger mode is manual/external mode
Remote Compensation	Sense	When being lighted, it indicates that the remote compensation function has been opened.
USB state		The USB storage device is now plugged in
System time	00:00:00	Displays current system time
Keyboard locked	Keylock	When being lighted, it indicates that the keyboard has been locked.
Waiting for triggering	Trig	The current state is "waiting for triggering". The icon disappears when the action is triggered.
Delay start	Delay	Wait for delay start. When it arrives corresponding delay time, the icon will disappear and start up.

Short circuit sign	Short	Currently the load is working in short circuit test condition
Pausing operation	Pause	Currently the load is suspended.

2.5.4 Running indicator light

The On/Off key of CKT8000 series electronic load has running indicator light with it. When the electronic load is on-load, the On/Off key will be lighted up to indicate the on-load state. Press the On/Off key again, and the electronic load will stop loading with the indicator light being put out.

2.6 Back panel introduction

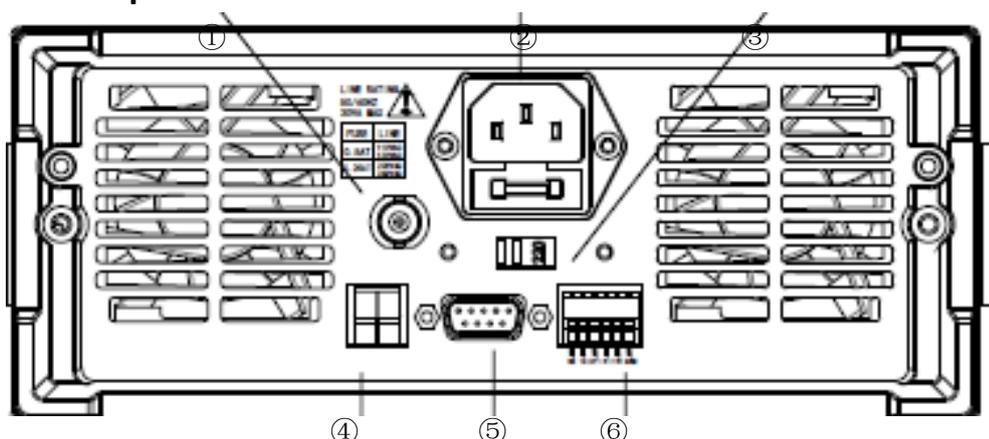


Figure 2-3 Back panel introduction

No.	Item	Description
1	Current monitoring terminal	BNC current monitoring output terminal
2	AC220/110V power socket	AC power access socket (with fuse)
3	AC220/110V transfer switch	Transfer switch of AC supply's voltage gear
4	Sense(remote compensation)terminal	Be used for remote voltage sampling of the electronic load
5	RS232 interface	External communication interface to realize remote control of the electronic load
6	Trigger signal terminal	Trigger terminal

Note: The external trigger signal is voltage trigger. When a voltage signal of 12~24V is given, the trigger is valid. The trigger is invalid when there is no voltage. The current monitoring output is voltage output, and the output signal range is 0~10V, indicating the real-time current of zero to full range.

2.7 Power-on Self-test

The correct power-on self-test process of the electronic load is as follows:

1. Connect the power cord correctly and press the Power key for about 1 second, then the electronic load will be power on.

The electronic load's screen will display the progress bar of the power-on self-test and device information parameters, etc.

2. After the initialization is completed, the current measurement status will be displayed on the screen. If the starting mode has already been set, it will directly enter the preset measurement mode when the load is power on.

The correct power-on self-test completion indicates that the electronic load product in use meets the factory standard, and the user can use it normally.

Note: Before operating and using the electronic load, please make sure you've learned the safety instructions in the first chapter. When using the electronic load, please long press the power key for about 1 second to power on the instrument, and press the power key shortly to shut down the device.

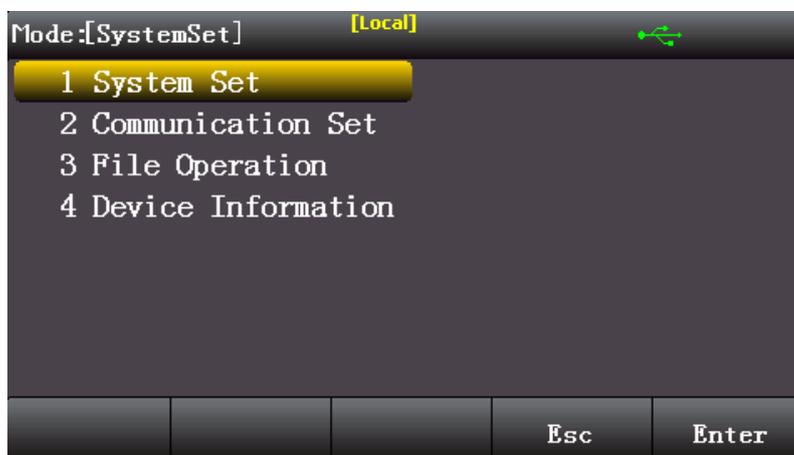
Chapter 3 Functional Operation

This chapter provides a detailed description of the main functions of the electronic load, so that you can have a deeper understanding of its operation. This chapter mainly introduces the following functions:

1. System setting function
2. Parameter setting function
3. Shortcut key function
4. Local/remote switching
5. On-line operation
6. Configuration access
7. Screen capture
8. Parameter input/load measurement
9. Stationary mode operation
10. More mode operations

3.1 System setting (SYS)

The system is divided into four parts: system parameters, communication settings, file operation and device information.



3.1.1 System setting

System Parameter	Content	Description
Date	Year/Month/Day	Set system date
Language	Chinese/English	Set system language
Time	Hr/Min/Sec	Set system time
Brightness control	Brightness 01~05	Control brightness of the screen, 5 gears to choose from
Alarm sound	On/Off	Set alarm sound
Key sound	On/Off	Set key sound

Starting mode	Default/Last time	If you choose "Default", the device will enter measurement interface when starting up; If you choose "Last time", it will enter the the last shutdown test mode.
Factory reset		Choose "Factory reset", the device will clear the current parameter Settings and revert to the factory setting state.

System Settings:



① Date setting/time setting

Be used for setting up the current date and time of the system. The user chooses this setting option and move the cursor to the location needed through the arrow keys. The user can further modify the content by adjusting the rotating knob or directly inputting digits. Press the "Enter" key to complete modification.

② Language setting

The electronic load provides two system languages (Chinese/English) for users to select, and users can choose language in system parameter Settings. Select the language setting and rotate the knob or use the arrow keys to choose the language you need. Press the "Enter" key to complete language setting.

③ Time setting

Time setting is the same as date setting. It's used for setting the current system time.

④ Brightness control

In order to adapt to the operating environment of different brightness, the electronic load has the screen brightness adjusting function, and the user can alter brightness in the system parameter settings. Select the brightness adjustment option and press the "Enter" key to enter into the setting. Rotate the knob or use the arrow keys to change the value to your needs. Press the "Enter" key to complete setting.

⑤ The alarm sound

CKT8000 series electronic load has warning voice prompt function. When the load running process is ended or it comes across abnormal problems in the testing process, the electronic load will send out alarm sound through the built-in buzzer. When the test is successfully carried out, the load will send

out two short sound. When the test fails or it encounters other abnormal situation, the load will send out three long sound. The default factory setting of the alarm sound option is "On". If you need to alter, select this option through system setting and adjust the value to complete setting.

⑥ Key sound

Key sound is used for setting up the prompt tone when you operate the keyboard or knob. If the option is "On", the buzzer will send out a short prompt sound when you press any key or operate the knob. If the option is set "Off", the electronic load will not make a sound whenever you operate keys or knobs. The default factory setting of the key sound option is "On". If you need to alter, select this option through system setting and adjust the value to complete setting.

⑦ Starting mode

If the starting mode is selected "Last time", every time the electronic load will enter the the last shutdown test mode when it starts up. If it is selected "Default", the device will enter measurement mode when it starts up.

⑧ Factory reset

Select this option to restore the settings of the electronic load to the default value of the factory. Choose the "Factory reset" key and the screen will pop up a dialog box to confirm whether you need to restore factory settings. Move the cursor to "yes" and press the "Enter" key, then the system will reset the values of the system settings and parameter settings to the factorial default values.

List of factory default menu parameters:

System parameter	
Language setting	Chinese
Brightness control	03 gear
Alarm sound	On
Key sound	On
Starting mode	Default
Communication setting parameter	
Baud rate	9600
Mailing address	001
Parameter setting	
Timing of unloading	0s
Delay start	0s
Short-circuit time	0.1ms
Over voltage protection	120V
Over current protection	30A
Over power protection	150W
On-load voltage	0V
Off-load voltage	0V

3.1.2 Communication setting

Communication setting is mainly used to set the communication method between the electronic load and the upper computer. The electronic load carries out communications with the upper computer

through RS232 interface. Users can choose cables to realize remote control of the electronic load. Before connecting to the upper computer, please make sure that you've selected the specified connector and set the corresponding communication parameters properly.



Communication setting	Content	Description
Baud rate	9600/19200	Set the communication baud rate of RS232 communication interface.
Mailing address	001~254	Set the current mailing address of the load .

3.1.3 File Operation

The file operation is mainly used for calling, copying and deleting of the list test files and screen captures. The device has two storage modes (U disk/internal Flash), and you can view the files stored in two paths. The screen captures can only be saved to the USB disk and can not be viewed on the electronic load. Users can do copying, calling and deleting operations of the list test files of the two storage spaces.

3.1.4 Device information

Users can view the basic information of the device including model number, version number and serial number of the electronic load from the device information .

3.2 Parameter setting

Users can enter the parameter setting page through the Shift+Sys (Para) key, and the parameter setting is used to set the operation parameters and protection parameters of the system.

Parameter setting	Setting range	Parameter description
Timing of unloading	0~99999s	Set the loading time. Every time when the electronic load runs to the corresponding running time, it will automatically stop loading regardless of the mode.
Delay start	0~9999s	Be used for setting the delay time of the load switch. When the "Delay start" option is enabled, press the On/Off key and the electronic load won't start loading until the delay time ends.
Short-circuit time	0.1~99999ms	Set the time of short circuit test.

Over voltage protection	0~120V	Set the voltage of over voltage protection.
Over current protection	0~30A	Set the current of over current protection.
Over power protection	0~150W	Set the power value of over power protection.
On-load voltage	0~120V	Set the initial on-load voltage.
Off-load voltage	0~120V	Set the low voltage that the load automatically stops loading.

3.3 Shortcut key function

CKT8000 series electronic load defines several shortcut keys to help users quickly realize some functions. With the combination of the Shift key and the numeric key, users can realize the corresponding functions of the keys.

Numeric key	Shortcut function	Function description
1	Manual	Set the trigger form of the electronic load, and you can change over between manual trigger and external trigger (Ext).
2	Trigger	Every time the electronic load is pressed, it performs a manual trigger action.
3	Sense	Turn on/off remote compensation function.
4	Pause	Pause function. During the running process, this function can temporarily stop loading, and the load will continue loading when the key is pressed again.
5	Short	Simulate short circuit test to detect whether the protection function of the measured object can be operated normally.
6	Errclr	Clear the alarm prompt.
7	Led	Quickly enter LED test mode.
8	Battery	Quickly enter Battery test mode.
9	List	Quickly enter List test mode.
(.)	Tran	Quickly enter dynamic test mode.
0	Lock	Lock the keypad, all the keys are locked except for Shift, 0, On/Off.

3.3.1 Select the trigger mode

When using the dynamic test, list test or other similar modes, you may need the trigger function of the electronic load. Users can choose manually trigger or external (Ext) trigger, and may modify trigger mode with the shortcut key "Shift+1"(trigger) . When external trigger is selected, the trigger signal is connected to the trigger terminal of the the electronic load's back panel, controlling each action of the load. When manual trigger is selected, uses can practice triggering with the key "Shift+2" on the keyboard(manually). Every time the use presses the manual trigger key, it performs a triggering action accordingly.

3.3.2 (Sense) Remote compensation function

When the electronic load is loading with a larger current, it produces a greater pressure drop on the connecting line between the load and the measured object. In order to ensure the accuracy of the measurement, the electronic load provides a pair of remote measuring terminals in the back panel, and

you can measure the precise voltage of the output terminal of the measured instrument by the terminal sampling.

Operation steps:

1. Press "Shift+3"(Sense), and a "Sense" icon will be displayed on the screen, indicating that the remote compensation function is enabled. The electronic load measures the remote sampling voltage of the back terminal as the actual voltage. Press "Shift+3"(Sense) again and the remote compensation function can be turned off, and the load will measure the voltage of the main terminal as the actual voltage.

Note: When connecting the lines, please make sure that the connection between the object being tested and the positive&negative electrode of the terminal is correct.

3.3.3 (Pause)Pause function

Sometimes you may need the Pause function in some automatic test modes. During the running process, press "Shift+4"(Pause) and the load will temporarily stop loading. Press "Shift+4"(Pause) again and the load will continue loading. This mode is different from the operating switch in the case of temporarily stop loading for emergencies. Using pause function will not return the loading process to its starting state, and the load will continue loading from its suspended running state.

3.3.4 (Short) Short circuit simulation function

The electronic load can simulate a short-circuited circuit at the input end to test whether the protective function of the tested object can be operated normally when the external terminals of the tested material are short-circuited.

Press "Shift+5"(Short) on the electronic load's front panel to switch short circuit state. When it achieves the set short circuit time (**You can refer to Part 3.9 "parameter setting" in this chapter for short circuit time setting**), the electronic load will return to its original working condition.

The actual current value consumed by the electronic load in the short circuit mode depends on the working mode and current range of the load at that time. When a short circuit test is carried out, the electronic load is loading on a full range, and when one of the current/power reaches the upper limit, the load will be loading on the full range of the upper limit.

3.3.5 (Lock) Keyboard lock function

In order to avoid the wrong operation in some cases, we've add keyboard locking function to the electronic load. Press "Shift+0"(Lock)and you'll open the keyboard Lock with all the keys on the electronic load's front panel locked except for "Shift","0" and "On/Off". When you need to use the keyboard again, press "Shift"+"0" (Lock) to end the keyboard lock and then it can be used normally.

3.4 Local/remote switching

The electronic load provides both local and remote control modes. You can switch between two operating modes through the Local key. The electronic load's initialized operation mode is local operation mode.

Local operation mode: Operate with the keys on the electronic load.

Remote operation mode: The electronic load is connected to the PC with the communication cable,

and is operated by sending commands via the upper computer software on the PC. When the electronic load is in remote operation mode, except for the Local/Remote key, all the other keys of the panel will not work. When you don't need to use the remote function, you can switch to the Local operation mode through the Local/Remote key.

The Local/Remote identity will be shown on the status bar at the top of the screen indicating the current control status of the load. The user judges the load's control status according to the information displayed on the screen.

3.5 On-line operation

* Note: The on-line operation function is only accessible to partial models.

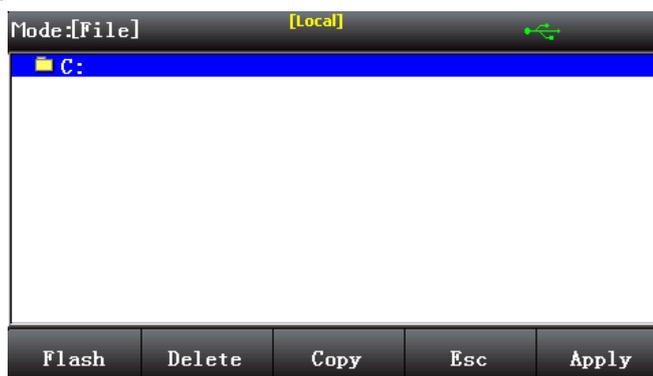
Users can set the on-line operation of the electronic load on its parameter setting panel. Through setting the on-line operation quantity, address and master&slave devices, the user can realize parallel operation of multiple electronic loads.

Before carrying out the on-line operation, please connect the electronic loads in need. Then enter the parameter setting interface to modify the online parameters, and set one of them as the master device. Afterwards, set the loading parameters on the master device, and then operate it with the operation method for the steady state mode to realize on-line loading.

Note: When using the electronic load's on-line operation function, be sure to parallel connect the positive&negative anodes of the loads that need to be online and ensure that the wires in use are able to bear the corresponding current so as to avoid overheat of the wires and other bad circumstances.

3.6 Access to the configuration

After USB connection is detected, the electronic load will automatically create a folder named "DCE" in the root directory to save screen captures and list test files of the electronic load. You can enter the file operations through the system settings "Sys" key to practice deleting, copying, calling and other operations of the files.



The name of the screen capture saved by the electronic load is constituted by 12 digits composed of date and time. The first six digits are the date of the year and the last six digits are the BMP file of time. The list file name is in the format of LIST00. TXT, and the following two digits represent the group number of the test mode.

The CKT8000 series electronic load can store commonly used test files in USB drives or internal Flash which can hold 60 groups of test files.

* Note: The USB disk used by the electronic load to save files must use FAT32 file system, and the allocation unit size should not be greater than 4096 bytes. Please format the USB disk before using it, otherwise it may lead to the failure of saving files.

Use of the file operation:

Name	Description
USB disk/Flash	Select current storage space displayed as USB disk or Flash. Press the key to switch between these two options.
Delete	Be used to delete currently highlighted file. Press the key to delete files immediately.
Copy	Copy the currently selected file to another storage space.
Backtrack	Exit the current interface and return to the upper level interface
Call	Be used to call the currently selected test file(Be used for the calling of list test files).

3.7 Screen capture

After the user inserts the USB disk in the front panel, the electronic load will automatically identify it and display the symbol of USB in the upper right corner of the screen, indicating that the USB drive has been connected to the device.

When you need to use the screen capture function, press the "Save" key and the electronic load will save the current screen image to the USB dish. in the preservation process, the screen will show "Saving" on its upward side indicating that it is saving pictures. When the saving process is ended, the screen will show "Success" indicating that the image preservation is completed. If the image is not preserved successfully, the screen will show "Fail" to tell you that the image preservation is failed. The screen capture can only be saved to the USB disk because it occupies a large space, and you can view the images stored in the USB disk through the computer.

3.8 Parameter input and on-load measurement

The electronic load has two parameter input methods. You can modify the parameters through the keyboard or the knob.

3.8.1 Keyboard input

Enter the parameter interface that needs to be set and input the parameters through the digital keyboard after the cursor is located. Press the "Enter" key when setting is completed. If the parameter set is within the effective range, it will take effect and be shown on the screen. If the parameter set is not within the upper and lower limits, the digit you input will not be shown on the screen, and the cursor will return to the first digit at the same time. Then you'll need to input the digits within the corresponding range again and press the "Enter" key to complete parameter setting.

Note: The significant digit of the input parameter can't exceed the upper limit of it, or the cursor will return to the first number to remind you of inputting parameters again.

3.8.2 Knob input

Before you input parameters, there will be a default value on the cursor's location. You can adjust the digit corresponding to the cursor's position through the knob, and then move the cursor until all the digits are set to the values you need. Press the "Enter" key to complete parameter setting.

Note: The digit in the corresponding position will not be able to continue scrolling while the parameter set is beyond the limit.

3.8.3 Ripple measurement

CKT8000 series electronic load supports the measurement of voltage ripple(Vpp) and current ripple(Ipp) , and the result will be shown timely. The parameters "Vpp/Vp+/Vp-", "Ipp/Ip +/Ip-" are shown in the test interface, and you can alternately view the parameters you need through the "Page" soft key at the bottom right side.

Unlike the traditional oscilloscope measurement method, the ripple measurement of the electronic load has a good degree of flatness and accuracy in a certain measuring range and bandwidth. Under certain circumstance the ripple contains two types of different frequency bands, power frequency ripple and switching ripple. The result of the ripple measurement is the combined effect of the superposition of these two kinds of ripple .

3.8.4 Input control

The electronic load is in off-load status after the power supply is turned on. You can press the "On/Off" key on the front panel of the electronic load to control the input switch of it.

If the indicator light of the On/Off key is lighted, it indicates that the input is opened, and the load's LCD screen will show the real-time voltage, current and power information in the current loop.

If the indicator light of the On/Off key is out, it indicates that the input is closed, and the LCD screen shows the current voltage on both ends of the load.

3.9 Steady state test mode

The electronic load has four steady state test modes: CC, CV, CR, and CP. The user can select mode in the initialization interface through the soft key under the screen.

After entering steady state test mode, the set current(Iset), voltage (Vset), resistance(Rset), power(Pset) and other parameters will be displayed on the right side of the screen. The user can input load parameters through the digital keyboard or the knob. When the electronic load starts loading, the loading time(Time), voltage peak value(Vpp), current peak value(Ipp) and other parameters will be displayed on the right side of the screen.

In the steady state test mode, the user can alter parameter settings through the digital keyboard or the knob. As often as changes occurred in the number, the screen will highlight the changed value. Press the "Enter" key and the parameter will take effect, then the load will be running based on new load parameters.

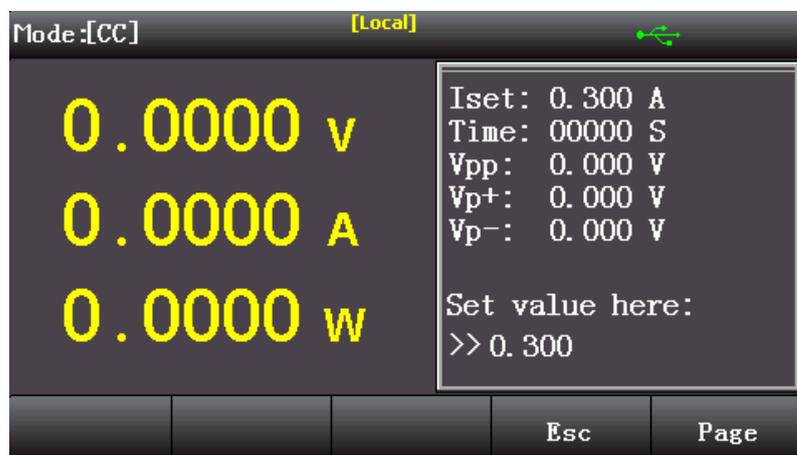
Introduction of steady state operation parameters:

Name	Description
CC mode	No matter how the input voltage changes, the electronic load always

	consumes a constant current.
CV mode	The load keeps the input voltage constant by changing the current consumed.
CR mode	The electronic load is equivalent to a resistor and the load changes the input current as the voltage changes to maintain a constant loading resistance.
CP mode	The electronic load consumes a fixed amount of power, and the device adjusts the current as the voltage changes to maintain the set power value.
More mode	There are many modes under this menu that can be selected by the cursor to meet the diversity of test requirements.
V、I、P parameter	Current voltage, current, power value.
Status bar	Display current mode, time, status and other parameters.

3.9.1 Constant current test

In the CC mode, no matter how the input voltage changes, the electronic load will always consume a constant current.



The user can select CC mode in the initial interface to enter the setting interface of the CC mode. Then set the input current value in the setting interface and press the “Enter” key to confirm the input. When you press the “On/Off” key, the electronic load starts loading, and the indicator light under the key will be lighted; if you need to stop loading, press the “On/Off” key again, and then the indicator light will go out.

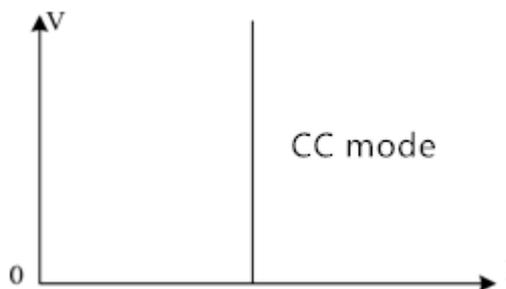
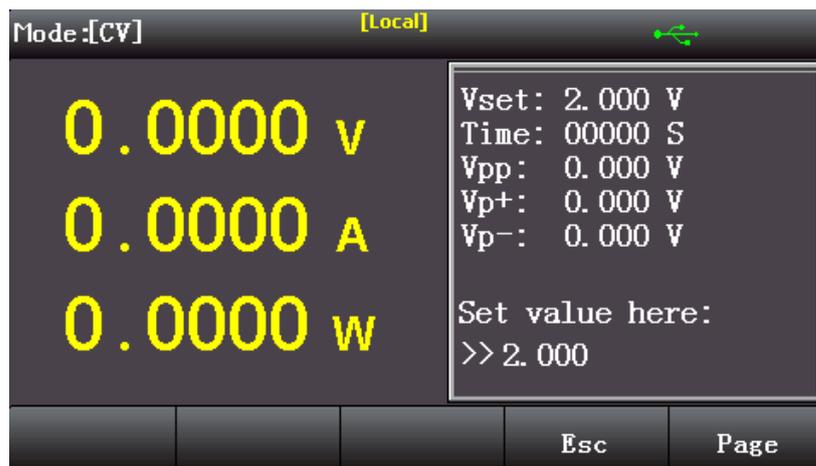


Figure 3-1 voltage¤t diagram of CC mode

3.9.2 Constant voltage test

In the CV mode, the load keeps the input voltage constant by changing the current consumed.



The user can select CV mode in the initial interface to enter the setting interface of the CV mode. Then set the input voltage value in the setting interface and press the “Enter” key to confirm the input. When you press the “On/Off” key, the electronic load starts loading, and the indicator light under the key will be lighted; If you need to stop loading, press the “On/Off” key again, and then the indicator light will go out.

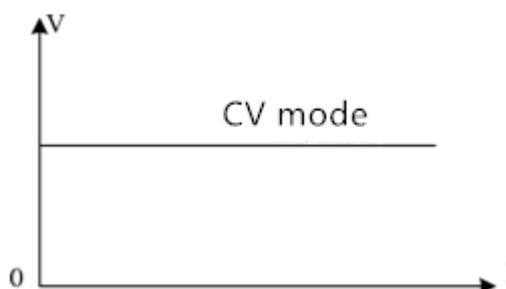


Figure 3-2 voltage & current diagram of CV mode

3.9.3 Constant resistance test

In the CR mode, the electronic load is equivalent to a resistor and the load changes the input current as the voltage changes to maintain a constant loading resistance.



The user can select CR mode in the initial interface to enter the setting interface of the CR mode. Then set the input resistance value in the setting interface and press the “Enter” key to confirm the input.

When you press the “On/Off” key, the electronic load starts loading, and the indicator light under the key will be lighted; If you need to stop loading, press the “On/Off” key again, and then the indicator light will go out.

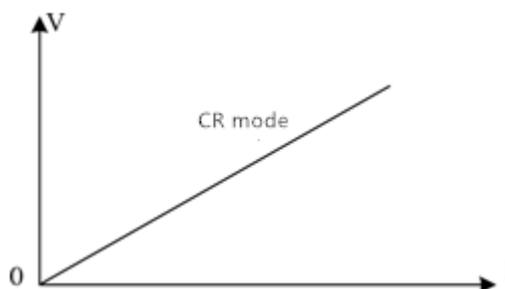
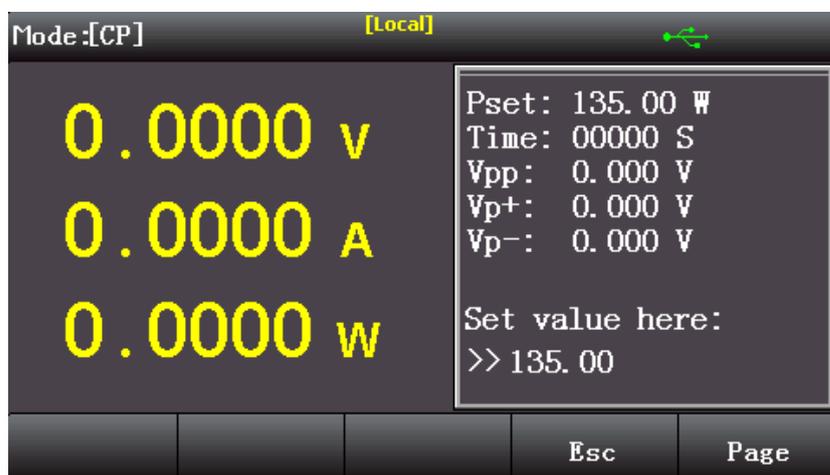


Figure 3-3 voltage & current diagram of CR mode

3.9.4 Constant power test

In the CP mode, the electronic load consumes a fixed amount of power, and the device adjusts the current as the voltage changes to maintain the set power value.



The user can select CP mode in the initial interface to enter the setting interface of the CP mode. Then set the input power value in the setting interface and press the “Enter” key to confirm the input. When you press the “On/Off” key, the electronic load starts loading, and the indicator light under the key will be lighted; If you need to stop loading, press the “On/Off” key again, and then the indicator light will go out.

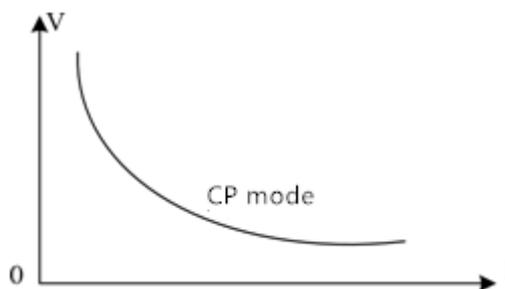


Figure 3-4 voltage & current diagram of Cp mode

3.10 More modes

CKT8000 series electronic load provides more test mode for the user to choose from so as to meet a variety of test requirements, including dynamic test, OCP/OPP/OVP test, combination test, list test, battery test, CR-LED test, time test, etc.

Introduction of more modes:

More modes	Mode description
Dynamic test	Set two different current/voltage values to switch between these two values during the test.
OCP/OPP/OVP test	Set the overload current/power/voltage value to identify whether the protection function of the measured object is normal. When a test is carried out, the load constantly improves the set loading value so that the value of the protection function of the measured object is detected.
Combination test	The combination of two steady state mode CR+CC, CV+CR and CV+CC is able to satisfy more steady state test requirements.
List test	A maximum of 16 steps can be set up with different load modes, and step approach and ceiling-floor determination for the test can be user-defined. Moreover, it has the function of saving memory for each test mode.
Battery test	Two discharge methods of CC/CP are used to discharge the tested battery, and the test will automatically finish when it reaches the set cut-off value. In addition, the battery capacity and the discharge curve can be shown.
CR-LED test	For the test mode of LED power supply, simulate the working parameters of LED and set the voltage/current and LED coefficient of the operation point so as to check the performance of LED power supply.
Time test	For the start/drop time test of the switching power supply, set the starting value and the ending value of the loading method, and the time of reaching the stable voltage can be detected when the voltage of the tested object is stable.
Load effect	Practicing loading according to three different set loading value and calculate ΔV and Reg(load regulation).

3.10.1 Dynamic test mode

CKT8000 series electronic load provides two kinds of dynamic loading mode: CC/CV. In the dynamic mode, the user can set two fixed value parameters corresponding to steady state mode. Through the set operation mode, the load will be loading and switching between the two values.



Parameter setting of the dynamic mode:

Dynamic test	Parameter description
mode	Dynamic loading mode:CC/CV
operation method	Choose constantly operation method: continuous/pulse/flip
Low-value	Set the low-parameter value
Low-timing	Set the low-loading time
High-value	Set the high-parameter value
High-timing	Set the high-loading time
Rising slope	Set the ring slope
Descending slope	Set the descending slope
Repeat count	Set the number of times to run the repeat cycle

Take the figure below as an example. In the dynamic CC mode, the user sets the low-current value and the high-current value, and the load will constantly switch the current value between the low-current value and the high-current value.

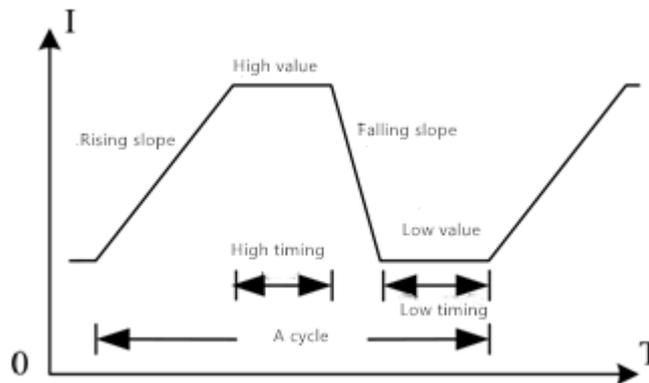


Figure 3-5 Dynamic test mode

Additional remarks of the dynamic mode:

Choose appropriate operation method: continuous/pulse/flip

In continuous mode, the load will automatically switch between two set high/low values until the running reaches the set number of repetitions, and the test ends.

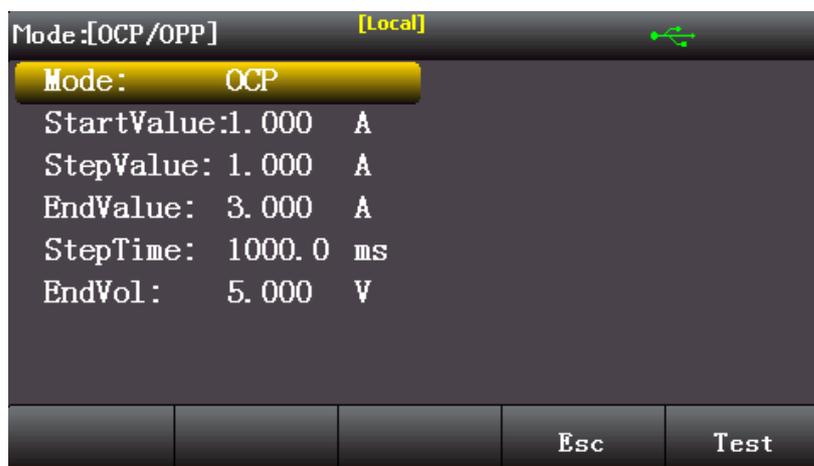
In the pulse mode, the load will firstly be loading with the low-parameter, and then switch to the

high-value when it receives a pulse signal each time. After maintaining the set time, it will switch back to the low-value. In this mode, the load will only be flipped once per receiving pulse signal, without setting the low-time.

When the chosen operation mode is flip, every time a trigger is conducted, the load will switch the current loading status. At this time, there is no need to set both high/low-timing, and it will only switch to another status when a trigger is conducted.

3.10.2 OCP/OPP test mode

This mode is used to detect the protection function of the tested power under overload condition. CKT8000 series electronic load provides two test modes of OCP/OPP. This test can detect output response of the protection circuit when the tested object is under overload condition.



Parameter setting of OCP/OPP mode:

Set parameters	Parameter description
Test mode	OCP/OPP
Initial value	Set the initial value of this test mode
Step value	Set the step value in every stepping time of this test mode
Cut-off value	Set the largest cut-off value of this test mode
Stepping time	Set the time interval for each step
Cut-off voltage	Set the lowest voltage to stop running

In the overload mode, the user continuously increases the loading value by setting the initial value, step value and stepping time, until the cut-off value is reached or the protection point of the tested object is detected, and the test will be stopped.

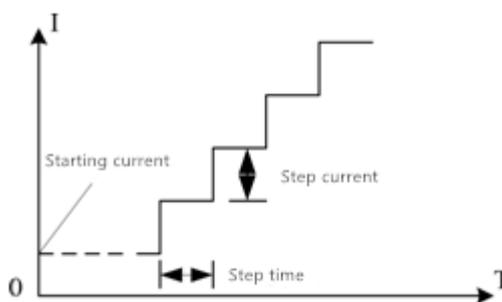


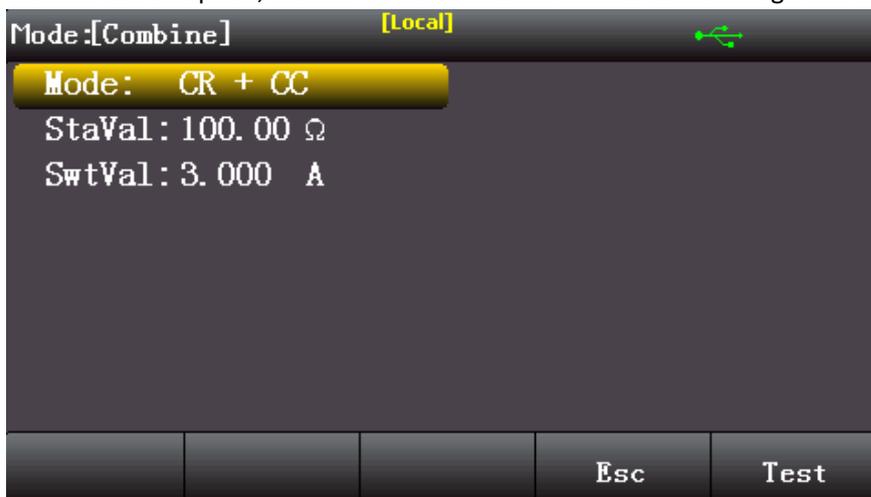
Figure 3-6 Overload test mode

Description of the overload test mode:

Because the overload test mode will continuously increase the output power of the measured objects, please input reasonable loading parameters in the test so as to avoid damages to the measured object. When the test is finished, the electronic load will show the time of this test and the current/power value of the peak point.

3.10.3 Combination test

In order to meet more test requirements, the electronic load provides three combination modes: CR+CC, CV+CR, CV+CC, and users can choose appropriate mode according to their actual situation. CR+CC mode can be used for the start-up test of the power supply, CV+CR mode can be used for the setting application of the Von point, and CV+CC mode can be used in the discharge test of the battery.



Parameter setting of the combination mode:

Set parameters	Parameter description
Combination mode	CR+CC/CV+CR/CV+CC
Initial value	Set the initial mode loading value of the combination mode
Switching value	Set the switching mode loading value of the combination mode

When using the combination mode, please first choose your required combination method, and then set the constant value of these two modes. When the load starts loading, it will first run according to the constant value of the first mode. When the change of the external input makes the parameter reach the switching value, the load will switch to the second loading mode.

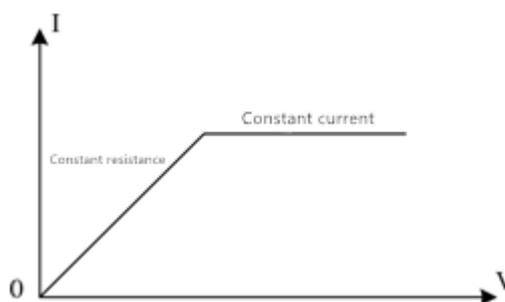


Figure 3-7 Combination test mode

Description of the combination test mode:

When using the combination test , you need to set reasonable initial and switching parameters to

ensure the effective switch when it reaches the set switching value during the test.

3.10.4 List test

The list test function can realize switching among different modes according to the set parameters. For the power supply and charger equipment, you'll able to get a deeper understanding of the comprehensive working characteristics of the tested product under practical application through multi-parameter mixing test.

Step	Mode	Value	Time/ms	Check	Min	Max
1	CC(A)	1.000	500	Off	0.00	0.00

Parameter setting of the list mode:

List mode	Parameter	Description
Group number	1~60	Set the group number of the group list test parameter to facilitate calling.
Step number	1~16	Set the step number of the group list test
Repetition	0~99999	Set the number of repetitions per measurement
Operation	Continuous/Trigger/ Continuous+Err/Trigger+Err	Set the switching method and stopping method of every step

The top of the list test setting interface is used to set parameters such as the list group number. The internal Flash of the electronic load can save 60 groups of list modes. When setting the list parameters, please set the reasonable group number first. Press the "Enter" key after that, and used/unuse will be shown behind the digits, indicating whether the group number is already in use. If the set group number has been used, it will overwrite the original parameters of this group number when saving the test files. If the group number has not been used, a new list file will be produced after setting the parameters. The "Err" in the operation mode indicates that the load will automatically stop loading when an exception occurs.

Select the storage location (Flash/USB) before saving, and press the "save" key to complete saving. Record the set group number to be called when needed next time. There are four options of the operation modes: continuous/trigger/continuous+Err/trigger+Err. In the continuous mode, the load will continue the next step after executing one step to the end of the operation; In the trigger mode, the load will suspend after complete one step, and it will wait for the trigger signal to proceed to the next step; In the Err operation mode, the load will automatically stop the test when it come across

over-limit or other error condition in the running process.

Parameter setting of the mode:

	List value	Description
Mode	CC/CV/CR/CP/Open/Short	Select the loading mode of the current step
Constant value	Set the constant value of the chosen mode	Set the constant of the mode, the default value of Open/Short is 1
Timing	0.1~999999ms	Set the loading execution time of every step, any time between 0.1 and 999999ms is allowable.
Inspection	Off/Current/Voltage/Power	Select the inspection item
Upper limit	check the upper limit of the item	Set the upper limit of the inspection item
Lower limit	check the lower limit of the item	Set the lower limit of the inspection item

After setting the group number, step number and operation parameters, the following list will show parameters to set the step number, and you can modify the parameters as you need. Adjust the cursor to the position that needs to be modified by a knob or arrow key; First, select the mode of each step and press the "Enter" key to switch the current mode. Stop when the mode you need appears and then switch the cursor to set the next parameter. The constant value can be simply set by inputting the digit after the cursor is selected, and then moves the cursor to the next parameter that needs to be changed. You can use the same method to complete timing, checking and upper&lower limits setting. When you input a parameter that is not among the correct upper and lower bounds of the parameter, the cursor will not be able to move, and you will need to use the backspace button to clear the parameter or change to the correct value.

When the test is completed, the user can click on the test results to check whether the test of each item is passed or not. If the test result is among the user set upper and lower limits, it will show "Pass" when the test is completed, or it will display "Fail" if the test result does not achieve the set upper and lower limits. The user can view the test results of each item and save test records by screen shots.

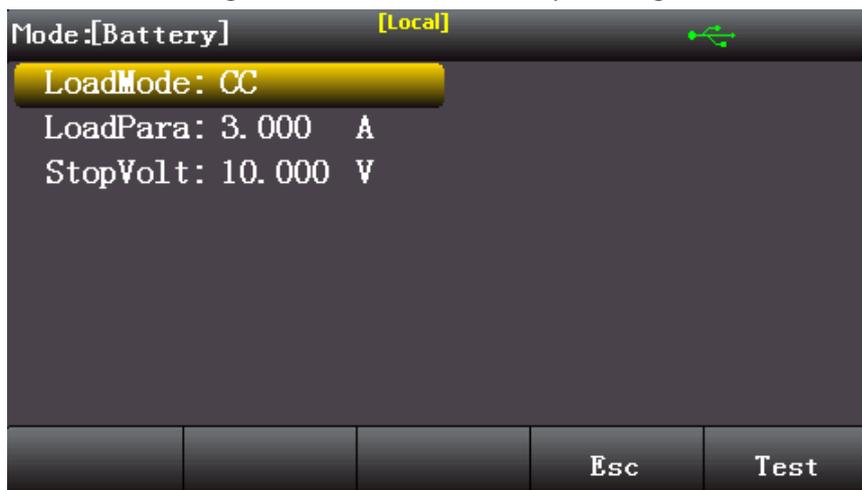
Note: The input data should not exceed the upper and lower limits of the current parameters; When the data exceeds the parameter limit, it will not be saved and the cursor will stay in the blank to remind you of clearing or re-inputting the parameters that are within the appropriate range for continuous use. When you need to change the number in the list, click the "delete" key and clear the data in the table. Once you complete the parameter setting in the list, click the "save" button so that you can call it for further use next time.

When you use the checking function of the list mode, you cannot check the range of the value in a single constant value mode. For example, in the CC mode, you can only check the voltage and power values, and the upper and lower limits of current can not be checked.

3.10.5 Battery test mode

Battery test mode is used for battery capacity detection. Battery capacity is an important indicator of the battery. It reflects the service time and reliability of the battery, so it is necessary to carry out such tests. When testing the capacity of the battery, the voltage will decrease as the discharge time increases, so the cut-off voltage needs to be set. When the cut-off voltage is reached, the test will be

ended. You can click the “discharge curve” to show the battery discharge curve.



Battery test mode parameters:

Set parameters	Parameter description
Mode	Set the discharge mode: CC/CR/CP
Load value	Set the load value
Cut-off voltage	Set the lower limit voltage to stop discharging (cut-off voltage)

In the battery test mode, you can select the discharge mode according to your requirement, and set the load parameters of this mode and the cut-off voltage. When the battery is discharged to the cut-off voltage, the electronic load will automatically stop loading.

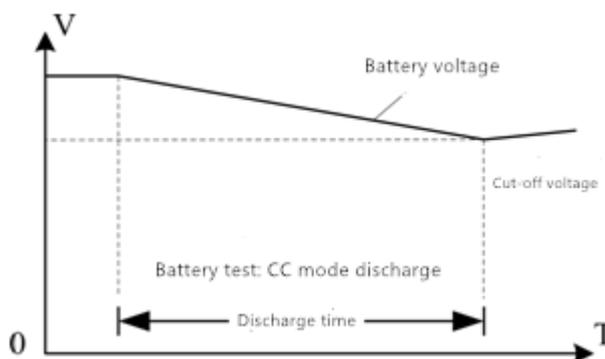


Figure 3-8 Battery test mode

Description of the battery test mode:

During the actual testing process, you can check the battery voltage, discharge current and discharge capacity at any time. When the test is completed, you can choose to display the discharge curve for reference.

3.10.6 CR - LED test

CR-LED test is the test mode for the LED power supply. By setting the break-over voltage and the working current of the luminous diode, it simulates the real working principle of LED, controlling the test voltage and current between a normal stable value to avoid the unstable situation such as shock caused by constant resistance discharge, so that the actual loading situation of the LED driving power supply can be detected better.



Parameter setting of the CR-LED test:

Set parameters	Parameter description
Operating voltage	Operating voltage with the rated current of the LED power supply
Operating current	Rated output current of the LED power supply
LED coefficient	Rd coefficient of the LED (Setting range from 0.1 to 0.4)

Operation steps:

CR-LED test is mainly used for testing the LED power supply. We increase the diode break-over voltage setting so that the working principle of the diode can be simulated more accurately and the test voltage and current can reach a normal stable value.

3.10.7 Time test

Time test of the electronic load is detecting the time of the power supply rise/fall from one voltage point to another voltage point under preset conditions. After the test is completed, the load will show the interval of the two time points with the time measuring accuracy of 1 ms.



Parameter setting of the time test:

Set Parameters	Parameter description
Mode	Set the loading mode (CC/CV/CR/CP/Open)
Load value	Set the load value of the selected mode
Start triggering	Set the starting condition (Voltage/Current/External)
End triggering	Set the ending condition (Voltage/Current/External)

Starting edge	Set the initial triggering mode (rising edge/falling edge)
Ending edge	Set the ending triggering mode (rising edge/falling edge)
Initial constant value	Set the initial triggering value
Ending constant value	Set the ending triggering value

When doing the time test, you firstly set the load mode and load value of the electronic load, then set the starting&ending condition and triggering mode, and finally set the starting&ending value. During the time test process, the electronic load will be loading with the set mode and the value. When the load meets the initial triggering condition, it starts timekeeping; When it runs to the end triggering condition, the load will stop timekeeping and display the time tested on the screen.

The time test mode simulates the test of the rising voltage rate of the oscilloscope, which can be widely used in the field of switch power start-up time test.

3.10.8 OVP test

OVP (overvoltage protection) test function of the electronic load is able to capture the peaks of the input voltage and the entire declining process of the protection. When the voltage drops to the set triggering voltage, the load will record the time from the highest point to the triggering point, which is considered to be the overvoltage protection time of the measured power .



Parameter setting of the OVP test:

Set Parameters	Parameter description
Triggering voltage	Set the voltage value of the recording trigger point.

When doing the OVP test, please enter the “more mode” menu and move the cursor to the OVP test mode, then set the voltage value of the triggering point to enter the test and start loading. By increasing the output voltage of the measured power supply to trigger the over-voltage protection, and the load will start timekeeping when it captures the voltage peak and falling edge, and then start triggering at the set triggering voltage. The load will record peaks of voltage and calculates the time from the peak point to the triggering point. When the test is completed, the load will display the Vmax (voltage peak) and Tgap (protection time) of the test with the protection time measurement accuracy of 1mS.

3.10.9 Load effect

The electronic load provides test function of the load effect, which can be loading in three different load cases (10%, 50%, 100%) by the preset time (5s) respectively, and then record the voltage value under different loads, finally calculate the load regulation, ΔV , etc. according to the formula.



Parameter setting of the load effect:

Set Parameters	Parameter description
Rated voltage	Set the voltage at the rated working condition.
Rated current	Set the current at the rated working condition.

When doing the load effect test, the electronic load will calculate the ΔV and the Reg (load regulation) according to the three different loads set with the following method: $V_{max}=V_{dc}@I_{min}$, $V_{min}=V_{dc}@I_{max}$, $\Delta V=V_{max}-V_{min}$, $Regulation=\Delta V/V_{set}$. Before carrying out the load effect test, you should firstly input rated voltage and rated current, and then click “enter test” so that the load will take turns to be loading in accordance with three different load capacities, and check out the ΔV and Reg value. During the test process, you may control the switch of the load with the “on-off” key.

Chapter 4 Technical Specifications

Main technical parameters of CKT8000 series electronic load:

Model		CKT8001 150V 30A 150W		CKT8003 150V 30A 300W		CKT8003+ 150V 120A 600W	
Input Rating	Voltage	0~150V		0~150V		0~150V	
	Current	0~3A	0~30A	0~3A	0~30A	0~12A	0~120A
	Power	150W		300W		600W	
	MOV	1.4V at 30A		1.4V at 30A		2.8V at 120A	
CV Mode	Range	0~18V	0~120V	0~18V	0~120V	0~18V	0~120V
	Resolution	1 mV	10 mV	1 mV	10 mV	0.1 mV	1 mV
	Accuracy	$\pm(0.05\%+0.025\% FS)$		$\pm(0.05\%+0.025\% FS)$		$\pm(0.05\%+0.025\% FS)$	
CC Mode	Range	0~3A	0~30A	0~3A	0~30A	0~12A	0~120A
	Resolution	0.1mA	1mA	0.1mA	1mA	0.1mA	1mA
	Accuracy	$\pm(0.05\% + 0.05\%FS)$		$\pm(0.05\% + 0.05\%FS)$		$\pm(0.05\% + 0.05\%FS)$	
CR Mode	Range	0.05 Ω ~7.5K Ω		0.05 Ω ~7.5K Ω		0.01 Ω ~7.5K Ω	
	Resolution	16 bit					
	Accuracy	0.1% + 0.08S		0.1% + 0.08S		0.1% + 0.008S	
CP Mode	Range	150W		300W		600W	
	Resolution	10mW		10mW		10mW	
	Accuracy	0.1% + 0.1%FS		0.1% + 0.1%FS		0.1% + 0.1%FS	
		Dynamic Current					
Dynamic Mode	T1&T2	100 μ S~99.99 S / Res:100 μ S		100 μ S~99.99 S / Res:100 μ S		100 μ S~99.99 S / Res:100 μ S	
	Accuracy	5 μ S \pm 100 ppm		5 μ S \pm 100 ppm		5 μ S \pm 100 ppm	
	Rising/Falling Slope	0.001~0.15A/ μ S		0.001~0.15A/ μ S		0.001~0.15A/ μ S	
V Measurement	Range	0~18V	0~120V	0~18V	0~120V	0~18V	0~120V
	Resolution	0.1mV	1mV	0.1mV	1mV	0.1mV	1mV
	Accuracy	$\pm(0.025\% + 0.025\%FS)$		$\pm(0.025\% + 0.025\%FS)$		$\pm(0.025\% + 0.025\%FS)$	
C Measurement	Range	0~3A	0~30A	0~3A	0~30A	0~12A	0~120A
	Resolution	0.1mA		0.1mA		0.1mA	
	Accuracy	$\pm(0.025\% + 0.05\%FS)$		$\pm(0.025\% + 0.05\%FS)$		$\pm(0.025\% + 0.05\%FS)$	
P Measurement	Range	150W		300W		600W	
	Resolution	10mW		10mW		10mW	
	Accuracy	$\pm(0.1\% + 0.1\%FS)$		$\pm(0.1\% + 0.1\%FS)$		$\pm(0.1\% + 0.1\%FS)$	

Model		CKT8003+ 500V 10A 150W		CKT8003+ 500V 15A 300W	
Input Rating	Voltage	0~500V		0~500V	
	Current	0~1A	0~10A	0~1.5A	0~15A
	Power	150W		300W	
	MOV	1.4V at 10A		1.6V at 15A	
CV Mode	Range	0~50V	0~500V	0~50V	0~500V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	$\pm(0.05\%+0.025\%FS)$		$\pm(0.05\%+0.025\%FS)$	
CC Mode	Range	0~1A	0~10A	0~1.5A	0~15A
	Resolution	0.1mA	1mA	0.1mA	1mA
	Accuracy	$\pm(0.05\%+0.05\%FS)$		$\pm(0.05\%+0.05\%FS)$	
CR Mode	Range	0.1 Ω ~25K Ω		0.1 Ω ~25K Ω	
	Resolution	16 bit			
	Accuracy	0.01% + 0.08S		0.01% + 0.08S	
CP Mode	Range	150W		300W	
	Resolution	10mW		10mW	
	Accuracy	0.1% + 0.1%FS		0.1% + 0.1%FS	
Dynamic Current					
Dynamic Mode	T1&T2	100 μ S~99.99 S / Res:100 μ S		100 μ S~99.99 S / Res:100 μ S	
	Accuracy	5 μ S \pm 100 ppm		5 μ S \pm 100 ppm	
	Rising/Falling Slope	0.001~0.15A/ μ S		0.001~0.15A/ μ S	
V Measurement	Range	0~50V	0~500V	0~50V	0~500V
	Resolution	0.1mV	1mV	0.1mV	1mV
	Accuracy	$\pm(0.025\%+0.025\%FS)$		$\pm(0.025\%+0.025\%FS)$	
C Measurement	Range	0~1A	0~10A	0~1.5A	0~15A
	Resolution	0.1mA	0.1mA	0.1mA	0.1mA
	Accuracy	$\pm(0.05\%+0.05\%FS)$		$\pm(0.05\%+0.05\%FS)$	
P Measurement	Range	150W		300W	
	Resolution	10mW		10mW	
	Accuracy	$\pm(0.1\%+0.1\%FS)$		$\pm(0.1\%+0.1\%FS)$	
Size	215 mm* 88.5 mm* 365mm				

Chapter 5 Communication interface introduction

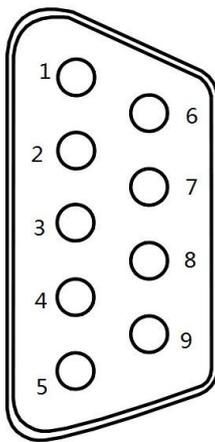
CKT8000 series electronic load is standard equipped with the RS232 communication mode, and you can use the corresponding communication line for remote operation as required.

RS-232 Interface

There is a DB-9 male connector interface at the terminal of the electronic load, which can be connected to the computer COM interface by using a both-female-connector cable. RS232 adopts standard communication mode, you can select this mode in the communication setting of the electronic load's SYS menu, and set the communication parameters the same as the upper computer.

Note: In actual use, the electronic load uses only 2.3.5 of the pins to communicate with the device.

RS232 pin definition



Pin No.	Symbol	Description
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring Indicator

Supplement parameter

List test internal storage capacity :60 groups.

Recommended calibration frequency :1 time/year

Ac power input level :(Two gears of 110V or 220V can be selected with the switch on the pack panel of the electronic load)

110V gear:110V \pm 10% 50~60Hz

220V gear:220V \pm 10% 50~60Hz