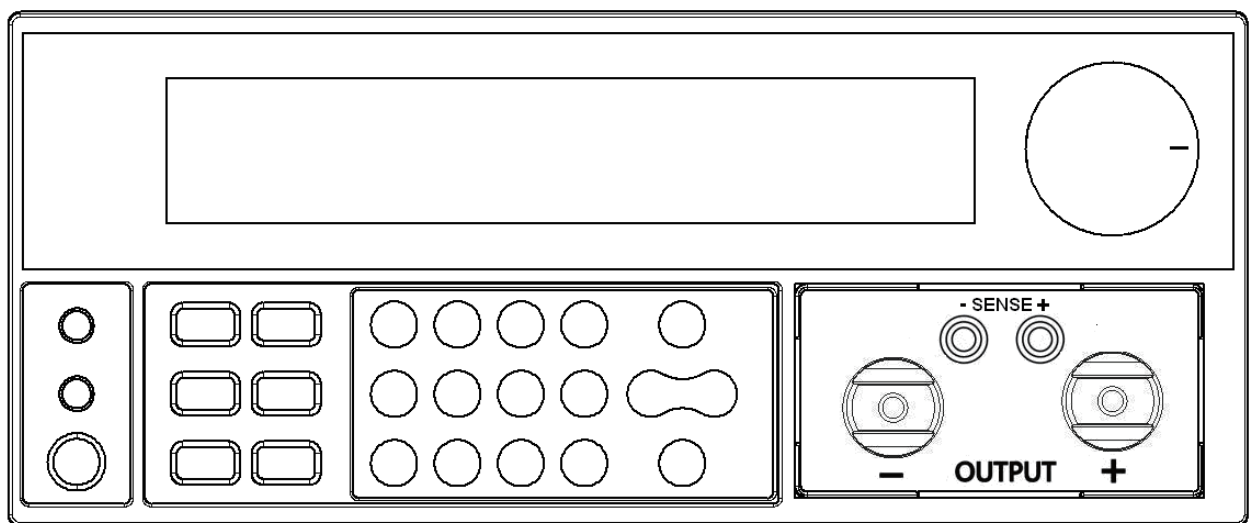


User's Manual



**High Precision Programmable Switching
DC Power Supply (K-SPV) V4.0**

Catalogue

Security Summary.....	III
1. Product description	1
1.1 Introduce	1
1.2 Characteristic	1
1.3 Panel description.....	2
1.4 Keyboard description.....	3
2. Operation declaration	4
2.1 Front panel operation instructions	4
2.2 Parameter input.....	4
2.2.1 Input through Digital key	4
2.2.2 Input through knob.....	4
2.3 Output voltage setting	4
2.4 Output current setting	4
2.5 Overvoltage protection setting	4
2.5.1 Overvoltage protection value setting	5
2.5.2 Overvoltage protection status setting.....	5
2.6 Overcurrent protection setting	5
2.6.1 Overcurrent protection value setting	5
2.6.2 Overcurrent protection status setting.....	5
2.7 Output delay time setting.....	5
2.8 Function Settings	6
2.8.1 Output State Memory Function	6
2.8.2 Maximum input voltage limit.....	6
2.8.3 Maximum input current limit	6
2.8.4 Parameter display selection.....	6
2.8.5 RS232 port baud rate setting	6
2.8.6 Beeper Setting	7
2.8.7 Hotkey Setting.....	7
2.8.8 Voltage self-test function setting	7
2.8.9 Communication address setting	7
2.8.10 Remote sensing function setting.....	7
2.8.11 External analog control (custom)	7
2.8.12 Trigger source selection	8
2.8.13 Trigger function selection.....	8
2.8.14 View software version.....	8
2.8.15 Automatic close time Setting	8
2.8.16 Communication protocol selection.....	8
2.8.17 Slow startup Setting	8
2.8.18 Encoder setup mode	8
2.8.19 Cumulative boot time.....	9
2.8.20 Line loss compensation setting.....	9
2.9 Storage / retrieval operations	9
2.9.1 Store operation	9
2.9.2 Retrieve operation	9
2.10 Automated execution mode operation.....	9

2.10.1 Set the statu	9
2.10.2 Set the starting address.....	9
2.10.3 Set the end address.....	10
2.10.4 Set the number of cycles.....	10
2.10.5 Set up the operating mode.....	10
2.10.6 Enter/exit automatic mode status	10
2.11 Additional function	10
2.11.1 Battery curve charging function.....	10
2.12 Output button	11
2.13 Adjustment knob	11
2.14 Protection function	11
2.15 Operation mode description	12
2.15.1 Constant voltage operation mode	12
2.15.2 Constant current operation mode.....	12
2.15.3 Constant voltage/current state switching.....	12
3. Telecontrol	13
3.1 Interface Setting	13
3.1.1 Interface	13
3.1.2 Communication Setting	13
3.2 SCPI programming instruction setting.....	13
4. Maintenance	14
4.1 Periodic inspection	14
4.2 Replacement of fuse	14
5. Product specification.....	15

No further notice will be given if the technical specifications are changed.

Security Summary

This chapter contains the operation of the power supply and important safety instructions that must be followed when storing it, users should read the following instructions in detail before operating to ensure safety and keep the machine in optimal condition.

Safety symbols

The following safety symbols may appear in this operating manual or on the product:

	Warning	The warning statement points out the conditions and behaviors that may endanger the life of the operator
	Attention	The notice states that damage may occur to the product or other devices connected to the product.
	Danger	Be careful with high voltage
		Protect grounding terminals
		Ground terminal
		Shell grounding end

Safety Guide

General Introduction



Attention

- Do not place heavy objects on the housing.
- Avoid serious impact or improper handling resulting in machine damage.
- Preventive measures against static electricity should be taken when connecting instruments.
- Do not block the ventilation ports of the side and rear panels.
- Do not disassemble the machine unless you are a professional.

power supply



Warning

AC input voltage: 200-240V AC, 50/60Hz.

Ensure that the power cable is connected to the grounding end to avoid electric shock.

fuse



Warning

- Make sure you use the correct fuse model before turning on the machine.
- In order to prevent fire, only the fuse of the specified specification of this product is allowed to be used.
- Cut off the power supply before replacing the fuse to eliminate the cause of the fuse damage.

Cleaning machines

- Cut off the power before cleaning.
- Use a mild detergent and water to moisten the soft cloth, do not spray cleaner directly
- Do not use chemical or cleaning products containing abrasives such as benzene, toluene, xylene and acetone

Operational environment

- Where to use: indoors, away from direct sunlight, dust and strong magnetic fields.
- Relative humidity: <80%
- Altitude: <2000m
- Temperature: 0°C ~40 °C

Storage environment

- Indoor
- Relative humidity: <70%
- Temperature: 10°C ~70°C

1. Product Description

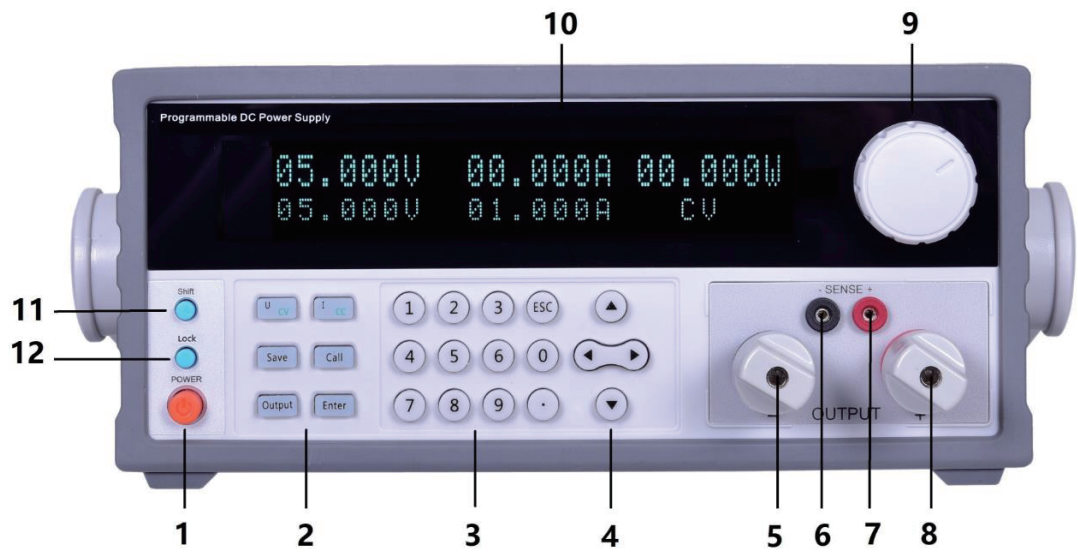
1.1 Introduce

This series of products is a high-precision single-output programmable DC switching power supply, featuring compact design, adjustable voltage/current, and multiple operating modes. The entire system is fully controlled by a microprocessor (MPU), enabling seamless connectivity with computers (PC) via RS-232 communication interfaces. It meets users' needs for automated testing and control systems, with software commands fully compliant with SCPI protocol standards, facilitating user development of custom automated testing and control applications. The fully digital system allows precise data input through keyboard and rotary controls, ensuring rapid and accurate operations. Widely applicable in electronic product development, component testing, telecommunications industries, laboratories, and research institutions.

1.2 Characteristic

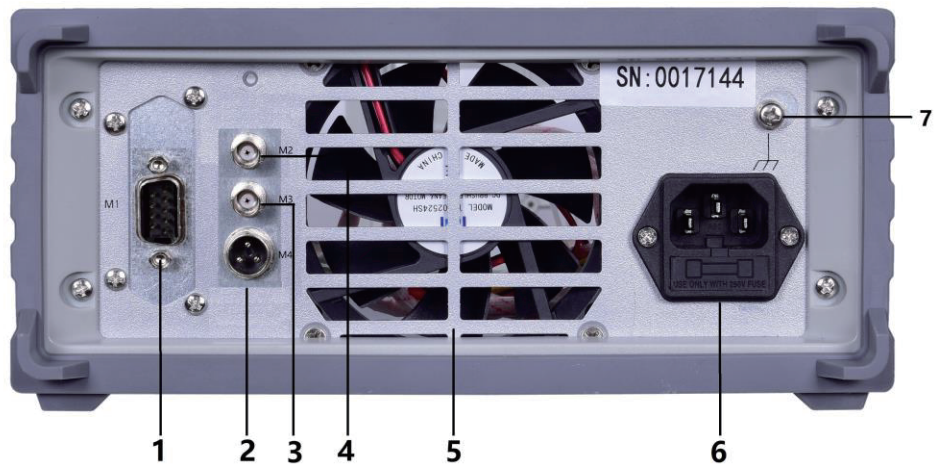
- High accuracy and high resolution
- High brightness, vacuum VFD display
- Constant voltage/current automatic switching
- With output control switch, control is more flexible
- Convenient and fast operation and setting interface, high speed adjustment knob and digital key input
- With the function of output at regular intervals, it supports infinite and specified number of cycles of output
- 100 sets of preset storage and retrieval functions, can store/call 100 sets of voltage current and other data, combined with timing execution to achieve the purpose of simple automatic test
- Remote sensing compensates for the voltage drop of the load line
- Overload, polarity reverse protection, overvoltage protection, overcurrent protection, overtemperature protection
- One-click lock function, effectively prevent misoperation
- Built-in buzzer as a reminder or warning
- The temperature control fan speed makes the instrument have low noise, the fan life is longer
- It can display the load resistance value and has the function of low resistance measurement
- Support battery charging function
- Standard RS232 interface, support SCPI and MODBUS programming instruction set, standard instrument frame design
- An optional analog control interface is available

1.3 Panel Description



Front panel layout

1. Power switch	2. function key	3. N umbering key	4. Direction key
5. Negative terminal	6. Remote sensing positive terminals	7. Remote sensing positive terminals	8. Output positive terminal
9. Adjustment knob	10. VFD display	11. Function combination keys	12. Lock button



Later panel map

1 M1 communication interface (standard RS232, optional RS485, USB, LAN)	2. M4 aviation control interface function can be customized	3. M3 BNC interface external trigger interface	4. M2 BNC interface function can be customized
5. Fan	6. Power outlet (including fuse holder)	7. Shell grounding terminal	

1.4 Keyboard Description

Key notes

The front panel features 24 buttons (excluding the POWER button). The text above each key indicates its primary function, which can be directly activated by pressing it. Below the key is the corresponding up-level function. To activate this, first press the [Shift] key to display "Shift" on the panel, then press any button to execute its up-level action. When a button is pressed, an audible "Beep" sound will alert you (if the buzzer setting is active).

Key name	Primary function	Secondary function	Key name	Primary function	Secondary function
0	Enter the number 0	Not tailored	7	Enter the number 7	LAN order
1	Enter the number 1	Not tailored	8	Enter the number 8	Not tailored
2	Enter the number 2	LIST function	9	Enter the number 9	Not tailored
3	Enter the number 3	Current functions	.	Enter decimal point	Not tailored
4	Enter the number 4	Not tailored	←、→	Move cursor left and right	None
5	Enter the number 5	TEST function	↑、↓	Scroll up and down	None
6	Enter the number 6	Pulse function	Enter	Confirmation key	None
U	Setting voltage	Not tailored	I	Setting current	Not tailored
Save	Save	Not tailored	Call	Redeployment	Not tailored
Output	Output on or off	None	Lock	Key lock	Menu
Shift	Select the up function key	None	Esc	Remove key	

2. Operation Declaration

2.1 Front Panel Operation Instructions

- (1) The units of voltage and current in this instrument and the manual are volts (V) and amperes (A).
- (2) This instrument is set to front panel operation mode when it leaves the factory. When the power is on, the required instrument setting can be performed on the panel.
- (3) When the power supply enters the remote operation mode, if you want to return to the panel operation mode, press the [Lock] key, then the power supply will return to the panel operation mode.

2.2 Parameter Input

2.2.1 Input through Digital Key

Use the numeric key to enter the desired value, and then press [Enter] to confirm. If the data is incorrect, press [Esc] to clear the current data, and then re-enter the data.

2.2.2 Input through Rotary Knob

In practical applications, continuous signal adjustment is sometimes required. This can be achieved using a digital rotary knob on the panel. When turning the knob to the right, the cursor indicator digit increments by one while carrying over to higher digits. Turning it to the left reduces the digit by one while borrowing from higher digits. Data input through this rotary knob takes effect immediately upon completion of digit changes.

2.3 Output Voltage Setting

Press [U] key, voltage parameter cursor flickers.

Method: Press the number key and press [Enter] to set the output voltage.

For example: Set the output voltage to 32.000V.

Press [U][3][2][.][0][0][0][Enter].

2.4 Output Current Setting

Press [I] key, the current parameter cursor flashes.

Method: Press the number key and press [Enter] to set the output current.

For example, set the output current to 3.200A.

Press [I][3][.][2][0][0][Enter].

2.5 Overvoltage Protection Setting

Overvoltage protection safeguards power supplies and DUTs by activating when voltage exceeds preset thresholds. Before operation, enable the overvoltage protection function and set its threshold value. When the output terminal voltage surpasses this limit, the output immediately shuts off while the display shows the corresponding "OVP" status. The voltage adjustment range is strictly limited to this protection threshold.

External voltage loaded on the output should not exceed 120% of the rated voltage, otherwise internal components will be damaged!

When the power supply is in the overvoltage protection state, the external cause should be checked. After the external factors are eliminated, the ON/OFF button can be used to reopen it.

2.5.1 Overvoltage Protection Value Setting

Press [U] and [▼] keys until "Parameter OVP Set" is displayed to set the overvoltage protection value.

Method: Press the number key and press [Enter] to set the overvoltage protection value.

For example, the overvoltage protection voltage value is set to 33.0V.

Press [U][▼][3][3][.][0][Enter].

2.5.2 Overvoltage Protection Function status setting

Press [U] and [▼] keys until "Parameter OVP Status" is displayed. Rotate the knob to switch OVP on or off.

2.6 Overcurrent Protection Setting

Overcurrent protection safeguards power supplies by activating when the load current exceeds preset limits. Before operation, enable the overcurrent protection function and set its threshold value. When the load current surpasses this limit, the output immediately shuts off while the display shows the "OCP" status, with the current adjustment being restricted to the set protection value.

2.6.1 Overcurrent Protection Value Setting

Press [I] and [▼] keys until "Parameter OCP Set" is displayed, and set the overvoltage protection value.

Method: Press the number key and press [Enter] to set the overcurrent protection value.

For example, the overcurrent protection current value is set to 3.30A.

Press [I][▼][3][.][3][0][Enter].

2.6.2 Overcurrent Protection Status Setting

Press [I] and [▼] keys until "Parameter OCP Status" is displayed. Rotate the knob to switch on or off the OCP.

2.7 Output Delay Time Setting

According to [I] and [▼], until the display shows "Parameter Delay", enter the output delay time setting.

Method: Press the number key and press [Enter] to set the output delay time.

For example, set the output delay time to 99999s.

Press [9][9][9][9][9][Enter].

Note: This Delay setting only works when the cycle is automatically executed, so when the memory is stored, this Delay setting is also stored in the memory location.

2.8 Function Setting

Press [Shift] and then [Lock] to enter the Utility Settings. Then press [▲] or [▼] to cycle through the options under the current function.

Note: The following is the function order of pressing the [▼] key.

2.8.1 Output State Memory Function

Press [▼] until "Utility OUT RECALL" is displayed to set the output status of the power supply when it is powered on, and use the knob to select open or close.

- 00 Off Def: Set the power output status to the default state.
- 01 Off Set: Set the output state of the power supply to the state remembered at the last shutdown.
- 02 On Set: Set the output state of the power supply to the state remembered by the user when last set.

2.8.2 Maximum input voltage limit

Press [▼] until "Utility U Max" is displayed. Set the maximum limit of voltage input parameters using a numeric keypad or knob.

The parameters set by this function will limit the maximum voltage setting for [U-CV] or communication.

For example, if the U Max parameter is set to 15V, then the [U-CV] or communication command setting voltage will be limited to a maximum of 15V.

2.8.3 Maximum input current limit

Press [▼] until "Utility I Max" is displayed. The instruction refers to "Utility U Max".

2.8.4 Parameter Display Selection

Press [▼] until "Utility Display" is displayed. Use the 0-99 number keys or knob to enter the parameters and select the third display parameter.

0 Power: The third parameter is displayed as power

1 Resistor: The third parameter is displayed as load resistance;

2 Time: The third parameter is displayed as output timing.

2.8.5 RS232 Port Baud Rate Setting

Press [▼] until "Utility Baud" is displayed, and set the code corresponding to the baud rate to make the device meet the requirements of the baud rate for computer remote control.

The following table shows the code table corresponding to the port rate:

code	0	1	2	3	4	5	6	7
Baud rate	1200	2400	4800	9600	19200	38400	57600	115200

Method 1: Press the 0-9 number keys and press [Enter] to set the code value.

Method 2: Rotate the knob to set the code value.

2.8.6 Beeper Settings

Press [▼] until "Utility Beep" is displayed. Use the knob to turn it on or off.

2.8.7 Hotkey Setting

Press [▼] until the "Utility HotKey" is displayed. Use the knob to enable or disable it.

After this function is enabled, you can call the corresponding group 0-9 Settings in the memory by pressing the 0-9 number keys.

2.8.8 Voltage Self-Test Function Setting

Press [▼] until "Utility VSelfTest" is displayed. Use the knob to enable or disable it.

After this function is enabled, the output voltage value of the automatic monitoring is adjusted to reduce the deviation between the set voltage value.

2.8.9 Communication Address Setting

Press [▼] until "Utility Address" is displayed, press the 1-250 number keys, and press [Enter].

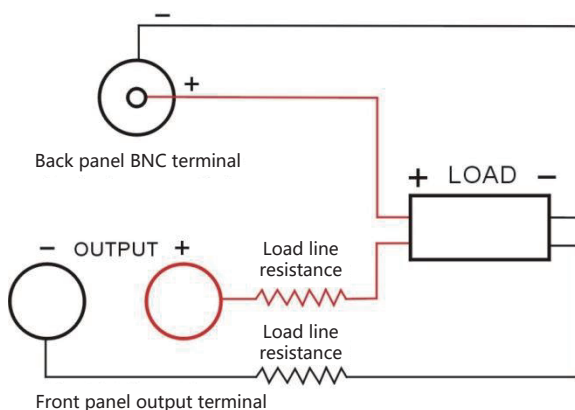
2.8.10 Remote Sensing Function Setting

When the load consumes a large current, a voltage drop will occur on the connection line between the power supply and the load terminal. In a constant voltage state, remote sensing can automatically compensate for the voltage drop on the load line.

Before using the remote sensing function, you must first set the power supply to remote sensing mode and enable the remote sensing function only when the output is turned off. The Sense lead should not be tangled with the load line.

Press [▼] until "Utility Sense" is displayed, and use the knob to turn it on or off.

Schematic diagram of power supply remote measurement wiring:



2.8.11 External Analog Control (custom)

2.8.12 Trigger Source Selection

Press [▼] until "Utility TRISOU" is displayed, and use the 0-99 number keys or knob to select the trigger source.

1 EXT : It is triggered by an external button.

3 Pulse: It is triggered by the rear panel TTL.

0 IMM: It is triggered by the "TRIGger: IMMediate" command, at which point all other triggering methods are invalid.

2 Bus : It is triggered by the communication interface.

2.8.13 Trigger Function Selection

Press [▼] until "Utility TRIFUN" is displayed, and use the 0-99 number keys or knob to select the trigger function.

0 Output : The switching of output state.

1 List : The timed output step that runs in a single step.

2.8.14 View Software Version

Press [▼] until the "Utility Version" is displayed, at which time the software version date of the instrument is displayed.

2.8.15 Automatic Close Time Settings

Press [▼] until "Auto OFF Time" is displayed, and set the parameters using the numeric keypad or knob.

This function can achieve 0 ~999999s timed output, when the output reaches the set time, will automatically close the output.

2.8.16 Communication Protocol Selection

Press [▼] until "COM Protocol" is displayed. Use [▲] [▼] key or knob to select SCPI or Modbus protocol.

2.8.17 Slow Startup Settings

Press [▼] until "Slow ON" is displayed. Use [▲][▼] keys or knobs to select functions.

Function item: OFF means to turn off the slow start function;

CV indicates the rising time of increased voltage in constant voltage mode;

CC indicates the increase in current rise time under constant current mode.

2.8.18 Encoder Setup Mode

Press [▼] until "EC SetMode" is displayed. Use [▲][▼] keys or knobs to select functions.

Function item: ON means to turn off the encoder setting function;

SetU indicates that there is no need to follow [U-CV], and the voltage can be adjusted directly through the rotary encoder;

SetI says there is no need for [I-CC] and the current can be adjusted directly through the rotary encoder.

2.8.19 Cumulative Boot Time

Press [▼] until "Utility Uptime" is displayed, which shows the cumulative power on time.

2.8.20 Line Loss Compensation Setting

Press the [Menu] button until "Wire Lose (mR)" is displayed. Use the [▲][▼] button, knob or numeric key to set the wire loss resistance value (mR).

2.9 Storage / Retrieval Operation

2.9.1 Store Operation

The power supply can store commonly used parameters in 100 non-volatile memory units, allowing users to retrieve them conveniently and quickly. The stored parameters include output voltage values, output current values, overvoltage protection values, overcurrent protection values, overvoltage protection status, overcurrent protection status, and delay time.

Press the [Save] key until "Utility Store" is displayed. Enter the 0-99 number keys, and press the [Enter] key to store the power parameters in the specified storage area.

For example, the storage is set to memory address 5.

Press [5] [Enter].

2.9.2 Retrieval Operations

Press the [Call] key until "Utility Recall" is displayed. Enter the 0-99 numeric keys, and press the [Enter] key to call the parameters of the specified storage area. After calling, the output will be automatically closed.

For example: Call the setting, memory address is 5.

Press [5] [Enter].

2.10 Automated Execution Mode Operation

2.10.1 Set Condition

After pressing [Shift][2], the display shows "Auto Status", at which time you enter the automatic execution mode status setting options. Press [▲] or [▼] keys to cycle through the options under the current function. Use the knob to select on or off.

2.10.2 Set the Starting Address

Press [▼] until the display shows "Auto Start" to set the starting memory address.

Method 1: Press the 0-9 number keys and press [Enter] to set the memory address at the beginning.

Method 2: Rotate the knob to adjust the starting memory address.

For example, set the starting memory address to 0.

Press [0] [Enter].

2.10.3 Set the End Address

Press [▼] until the display shows "Auto End" to set the end memory address.

Method 1: Press the 0-9 number keys and press [Enter] to set the end memory address.

Method 2: Use the [◀] or [▶] keys to move the cursor to the specified bit and rotate the knob to adjust the end memory address.

For example, set the end memory address to 8.

Press [8] [Enter].

2.10.4 Set the Number of Cycles

Press [▼] until the display shows "Auto Cycle" to set the number of cycles.

Method 1: Press the 0-9 number keys and press [Enter] to set the number of times to be recycled (0-99999). When 0 is input, it means that the cycle can be repeated indefinitely.

Method 2: Use the rotary knob to adjust the number of cycles.

For example, set the number of cycles to 99.

Press [9][9] [Enter].

2.10.5 Set the Operating Mode

Press [▼] button until the display shows "Auto Mode" to set the automatic operation mode. Use the knob to select "0 Continous" for continuous operation mode and "1 Step" for single-step operation mode, triggering one step output.

2.10.6 Enter/exit Automatic Mode Status

When the "Auto Status" state ON is enabled, "I

"Status indicator is lit, indicating that the automatic execution mode is entered.

If it is continuous mode, the third parameter of the display shows the remaining time information of the current group parameter. After pressing [On/Off], the output is turned on and the output is automatically executed.

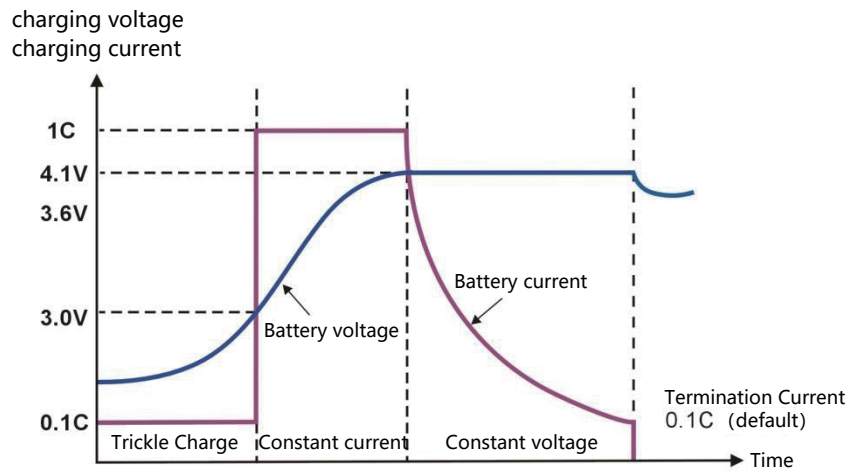
In the single-step operation mode, after pressing [On/Off], the output is turned on and one update of a group of data outputs is triggered.

2.11 Additional Function

The auxiliary function includes battery charging function, and other functions can be expanded according to user requirements.

2.11.1 Battery Curve Charging Function

This series of power supplies can charge the battery curve, as shown below, to effectively protect the battery.



Press the [Shift][3] key to display "Battery Status" on the screen. Rotate the knob to select ON to enable the charging function, and then press the [▽] key to cycle through the options under the current function.

Battery charging parameters:

Parameter name	Menu name
Junction gate threshold voltage	UnderV
floating charge voltage	StatuV
Trickle charging current	Trickle
Standard charging current	Charge Curr
Termination current threshold	I Off
charging interval	TIME

2.12 Output Switch

The [On/Off] button on the front panel controls the opening and closing of the output.

2.13 Adjustment knob

Press the adjustment knob to switch the cursor position.

2.14 Protection Function

This instrument provides over voltage, over current, over temperature protection function.

The overvoltage protection point of the power supply can be set by the key on the panel, and the overcurrent protection point of the power supply can be set by the key on the panel.

Over temperature (OTP) protection function. When operating this instrument, abnormal high temperature will be generated and the instrument will automatically shut down the output to ensure the safe use of the instrument.

2.15 Operation Mode Description

2.15.1 Constant Voltage Operation Mode

- (1) Connect the load to the output

For safety, connect the load to the (+) and (-) terminals of the output with the output closed.

- (2) Enter the desired current limit value

Press [I] to enter the current setting input mode. In this input mode, you can use the numeric keypad or knob to set the desired current setting.

- (3) Enter the voltage value to be output

Press [U] to enter the voltage setting value input mode. In this input mode, you can use the numeric keypad or knob to set the desired voltage setting value.

- (4) Launch the output

After pressing [On/Off], the output is turned on, and the display shows the actual output measurement value.

- (5) Confirm that the power supply is in constant voltage mode

Please check the CV status indicator to ensure that the output is operating in constant voltage mode. If the CC status indicator is present, increase its current limit value to ensure that the output is operating in constant voltage mode.

2.15.2 Constant Current Operation Mode

- (1) Connect the load to the output

For safety, connect the load to the (+) and (-) terminals of the output with the output closed.

- (2) Enter the desired voltage limit

Press [U] to enter the voltage setting value input mode. In this input mode, you can use the numeric keypad or knob to set the desired voltage setting value.

- (3) Enter the current value to be output

Press [I] to enter the current setting value input mode. In this input mode, you can use the digital keyboard or knob to set the desired current setting value.

- (4) Launch output

After pressing [On/Off], the output is turned on, and the display shows the actual output measurement value at this time.

- (5) Confirm that the power supply is in constant current mode

Please check the CC status indicator to ensure that the output is operating in constant current mode. If the CV status indicator is present, increase its voltage limit to ensure that the output is operating in constant current mode.

2.15.3 Constant Voltage/current State Switching

When operating in output mode, the power supply maintains constant voltage status when the output current falls below the preset threshold, with the constant voltage indicator illuminated. Once the output current reaches the set value, it transitions to constant current mode, marked by the constant current indicator activation. The system automatically switches between constant current and constant voltage modes based on varying load requirements.

3. Telecontrol

This series of power supply supports remote control mode, provides RS232 interface for communication with the computer, and realizes all functions on the panel through the upper computer software.

3.1 Interface Settings

3.1.1 Interface

RS232, RS485, USB and LAN interfaces can be installed on the back panel of the instrument, as shown in the figure below.

			
RS232 interface	RS 485 interface	USB interface	internet interface

3.1.2 Communication Settings

Set up the COM port on your PC according to the following

- (1) Baud rate: 9600
- (2) check bit : None
- (3) Data bits: 8
- (4) Stop position: 1
- (5) Data flow control: None

Note 1: If the power supply does not respond to remote control, please check:

- Whether the interface line itself is disconnected.
- Check whether the interface line and power supply are correctly connected to the corresponding PC pins.
- Check whether the interface cable is fastened.
- The communication parameters of the remote control program are consistent with 3.1.2.
- Whether the command terminator of the remote control program is a line break (hex 0 X0A).

Note 2: When the instrument is controlled by software, press the [Lock] key to return to the panel operation mode.

3.2 SCPI Programming Instruction Set

Refer to the programming manual for details of the SCPI programming instruction set.

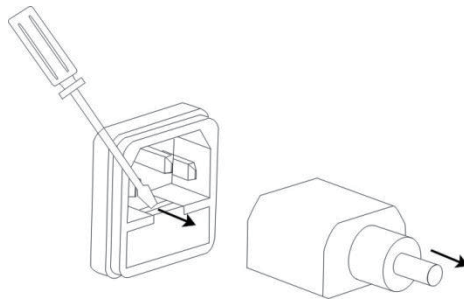
4. Maintenance

4.1 Periodic Inspection

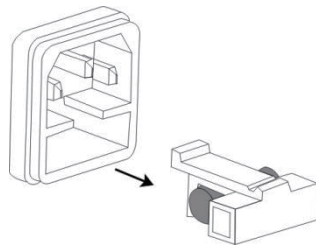
- In the process of using the product, in order to ensure that the product can achieve its best working state, please do regular inspection.
- Check whether the power supply input socket is burned out. Check whether the power output terminal is loose.

4.2 Replacement of Fuse

step : (1) Take the power cord and remove the fuse box with a small screwdriver.



(2) Replace fuse.



Wire specification: T4AL/250V (applicable to eTM-K 3010,2030,3020,6010,8008)

T8AL/250V (applicable to eTM-K 1560,2045,3030,6015,8010)

5. Product specification

When using this specification, ensure that the machine is turned on for more than 30 minutes.

Epi :

Model	30V10A	30V20A	60V10A	80V8A
Rated output (0℃~40℃)				
Voltage	0~30V	0~30V	0~60V	0~80V
Current	0~10A	0~20A	0~10A	0~7.5A
Overvoltage protection	0.1~34V	0.1~34V	0.1~64V	0.1~88V
Overcurrent protection	0.1~12A	0.1~24A	0.1~12A	0.1~8.8A
Voltage output				
Line regulation	≤0.01%+4mV			
Load regulation	≤0.1%+5mV			
Recovery time	≤1.5ms(50% load change)			
Ripples and noise	≤5mVrms,30mVpp			
Temp coefficient	≤300ppm/℃			
Set precision	±(0.03% of reading+10mV)(25±5℃)			
Set resolution	1mV(5 bits)/0.1mV(6 bits)			
Current output				
Line regulation	≤0.2%+3mA			
Load regulation	≤0.2%+5mA			
Ripples and noise	≤10mArms			
Set precision	±(0.3% of reading+10mA)(25±5℃)			
Set resolution	1mA(5 bits)/0.1mA(6 bits)			
Display				
Voltage	5 digits display/6 digits display			
Current	5 digits display/6 digits display			
Voltage resolution	1mV (5 bits)/0.1mV (6 bits)			
Current resolution	1mA(5 bits)/0.1mA(6 bits)			
Accuracy of reading	±(0.02% of reading+5mV)(25±5℃); ±(0.05% of reading+10mA)(25±5℃)			
Protection	Overload protection, polarity reversal protection, overvoltage protection, overcurrent protection, overtemperature protection			
Lock function	have			
Interface	Standard RS232 interface, support SCPI and MODBUS instruction set, analog control interface (optional)			
Storage and retrieval	100 group			
Insulativity	Between output terminals and housing or other terminals: ≥20M Ω /500 VDC			
Operational environment	Indoor usage Altitude: ≤2000m Environmental temperature: 0~40℃ Relative humidity: ≤80% Installation level: II Level of contamination: 2			
Storage environment	Environment temperature: -10~70℃ relative humidity: ≤70%			
Input	200-240VAC,50/60Hz			
Appendix	Power cable 1, PC software CD 1, RS232 interface cable 1			
Size	352(D)×215(W)×89(H)mm			
Weight	4.5kg			

Table 2:

Model	15V60A	30V30A	60V15A	80V11A
Rated output (0℃~40℃)				
Voltage	0~15V	0~30V	0~60V	0~80V
Current	0~60A	0~30A	0~15A	0~11A
Overvoltage protection	0.1~18V	0.1~34V	0.1~64V	0.1~88V
Overcurrent protection	0.1~62A	0.1~34A	0.1~18A	0.1~12A
Voltage output				
Line regulation	≤0.01%+4mV			
Load regulation	≤0.1%+5mV			
Recovery time	≤1.5ms(50% load change)			
Ripples and noise	≤5mVrms,30mVpp			
Temp coefficient	≤300ppm/℃			
Set precision	±(0.03% of reading+10mV)(25±5℃)			
Set resolution	1mV(5 bits)/0.1mV(6 bits)			
Current output				
Line regulation	≤0.2%+3mA			
Load regulation	≤0.2%+5mA			
Ripples and noise	≤10mArms			
Set precision	±(0.3% of reading+10mA)(25±5℃)			
Set resolution	1mA(5 bits)/0.1mA(6 bits)			
Display				
Voltage	5 digits display/6 digits display			
Current	5 digits display/6 digits display			
Voltage resolution	1mV (5 bits)/0.1mV (6 bits)			
Current resolution	1mA(5 bits)/0.1mA(6 bits)			
Accuracy of reading	±(0.02% of reading+5mV)(25±5℃); ±(0.05% of reading+10mA)(25±5℃)			
Protection	Overload protection, polarity reversal protection, overvoltage protection, overcurrent protection, overtemperature protection			
Lock function	have			
Interface	Standard RS232 interface, support SCPI and MODBUS instruction set, analog control interface (optional)			
Storage and retrieval	100 group			
Insulativity	Between output terminals and housing or other terminals: ≥20M Ω/500 VDC			
Operational environment	Indoor usage Altitude: ≤2000m Environmental temperature: 0~40℃ Relative humidity: ≤80% Installation level: II Level of contamination: 2			
Storage environment	Environment temperature: -10~70℃ relative humidity: ≤70%			
Input	200-240VAC,50/60Hz			
Appendix	Power cable 1, PC software CD 1, RS232 interface cable 1			
Size	352(D)×215(W)×89(H)mm			
Weight	4.5kg			