

KLC Series Switch-type DC Stabilized Power Supply

Manual

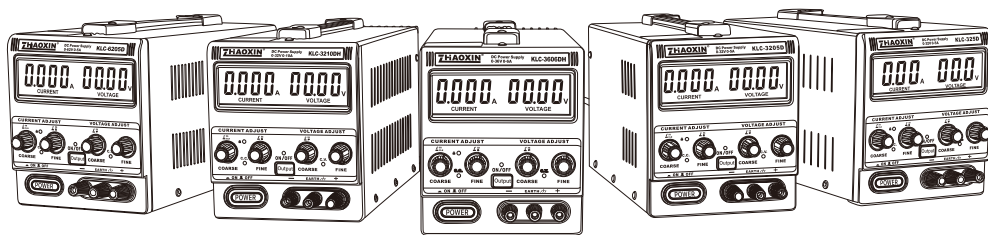


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General Security Overview

Please read the following security precautions carefully to avoid personal injury, and prevent damage to the product or any products connected to this product. In order to avoid possible danger, you are required to use the product in accordance with regulations. Only qualified personnel are allowed to perform repair process.

Avoid fire or personal injury

Use the suitable power line. Please use only the power line designed for this product and certified by country/region where it is located.

Use correct voltage settings. Before power-on, please ensure that line selector is set at corresponding position of current voltage.

Product grounding. This product should be grounded through earth conductor of the power line. The earth conductor must be connected to the earth, in order to avoid electric shock. Before connecting with the input or output terminals of this product, you should ground the product correctly.

Observe all rated values of terminal. Please observe all rated values and markings on the product, to avoid risks of fire or electric shock. Before connecting the product, you can consult the manual firstly for detailed information about rated values.

Disconnect the power. The power switch can disconnect the product from power source. Please refer to the description of relevant locations. Do not block the power switch; the power switch must be available for the user at any time.

Do not open the cover. Do not operate this product with the outside cover or panel open.

Do not operate the product when you suspect that it malfunctions. If you suspect that the product is damaged already, please have it inspected by qualified service personnel.

Keep away from exposed circuits. After power-on, do not touch exposed circuits and components.

Use the suitable fuse. Please only use the fuse type and rated index specified for the product.

Do not operate the product in a humid environment.

Do not operate the product in a flammable and explosive environment.

Please keep the surface of the product clean and dry.

Please ventilate properly. For more details on how to install the product to maintain proper ventilation, please refer to installation instructions in the Manual.

Terminology in this Manual

The Manual probably includes the following terms:



WARNING

ti indicates situations or operations that may cause personal injury or endanger life.



CAUTION

It points out situations or operations that may cause damage to this product or other properties.

Symbols and terms on the product

The following terms may be marked on the product:

- “DANGER” means injury that will occur immediately when you read this mark.
- “WARNING” represents injury that will not happen immediately when you read this mark.
- “CAUTION” indicates possible danger to this product or other properties.

The following symbols may be marked on this product:

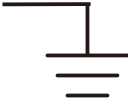
General Security Overview

Symbols and terms on the product

The following terms may be marked on the product:

- “DANGER” means injury that will occur immediately when you read this mark.
- “WARNING” represents injury that will not happen immediately when you read this mark.
- “CAUTION” indicates possible danger to this product or other properties.

The following symbols may be marked on this product:

 Protective Earth Terminal	 Ground terminal
 Warning for High Voltage	 CAUTION
 Positive Electrode	 Negative Electrode

Preface

Main Functions

- Automatic switching of constant voltage/constant current
- Display accuracy: 0.1V 0.01A
- Fine adjustment knob of voltage/current
- Output On/Off switch, current preset, anti-operation adjustment locking
- Four-digit display of current, with display accuracy 0.01V 0.001A (in some models)
- Low noise: Temperature-controlled fan is adopted, and it starts automatically to dissipate heat when internal temperature is greater than 50℃

Start Guide

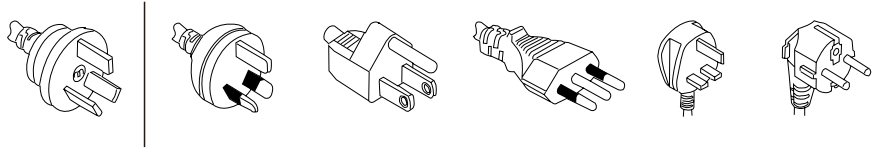
Standard Accessories and Selection

Tab. 1: Standard Accessories

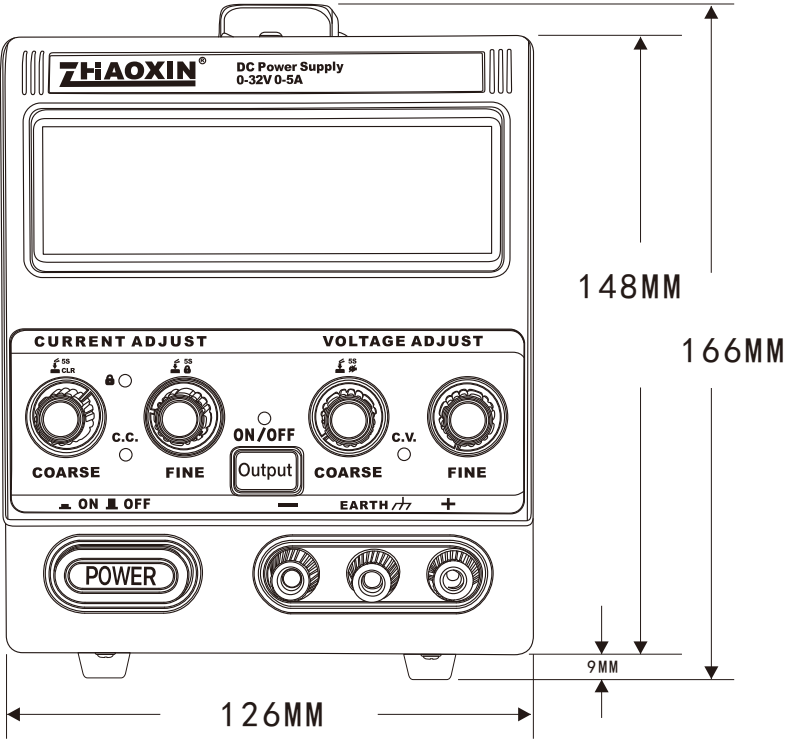
Power host	1 set
Input power line	1
Manual	1
Warranty certificate	1

Table 2: Accessories Selection (power plug)

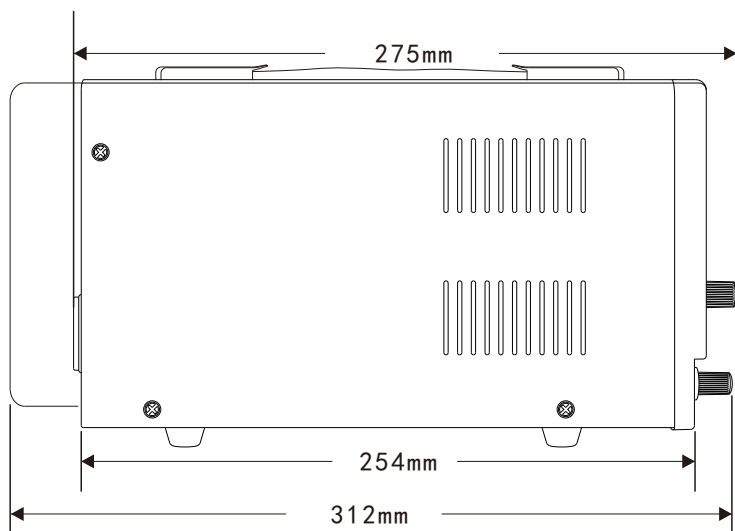
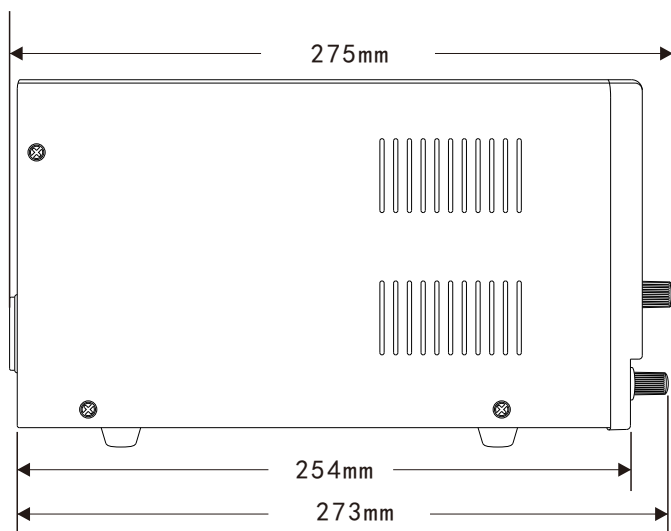
North America AC 110V	European General AC 220V
UK AC 220V	Australia AC 220V
Switzerland AC 220V	India AC 220V
Brazil AC 220V	



Product Size



Product Size



Preface

Technical Parameter

Tab. 1:

Type:	KLC-325D	KLC-3205D	KLC-6205D
Input voltage	☐ AC 220V±10% 50Hz ☐ AC 110V±10% 60Hz ☐ AC 240V±10% 50Hz		
Temperature	Working temperature: -10℃~40℃ Relative humidity < 80%		
	Storage temperature: -10℃~40℃ Relative humidity < 90%		
Output voltage	0-32V	0-32V	0-64V
Output current	0-5A	0-5A	0-5A
Voltage-stabilized state			
Voltage-stabilization degree	≤0.1%+2mV	≤0.1%+2mV	≤0.1%+2mV
Load stability	≤0.1%+2mV	≤0.1%+2mV	≤0.1%+2mV
Ripple noise	≤ 3%Vp-p (peak-to-peak value)		
Steady-flow state:			
Current-stabilization degree	≤0.1%+3mV	≤0.1%+3mV	≤0.1%+3mV
Load stability	≤0.2%+2mV	≤0.2%+3mV	≤0.2%+3mV
Display accuracy	3-digit LED digital display of Voltage/current	4-digit LED digital display of voltage/current	
	00.0V-09.9V ±2% (±1 digit)	00.00V-09.99V ±0.3% (±1 digit)	
	10.0V-32.0V ±1% (±1 digit)	10.00V-32.00V ±0.1% (±1 digit)	
	0.00A-0.99A ±2% (±1 digit)	0.000A-0.999A±0.3% (±1 digit)	
	1.00A-5.00A ±1% (±1 digit)	1.000A-4.999A ±0.1% (±1 digit)	
		5.000A-10.00A ±0.2% (±1 digit)	
Display resolution	Voltage:0.1V Power:0.01A	Voltage: 0.01V Current: 0.001A	
Boundary dimension	275 (depth) ×126 (width) ×166 (height)		
Weight	≈ 1.96KG	≈ 2.0KG	≈ 2.1KG

Preface

Technical Parameter

Tab. 2:

Type:	KLC-3206DH	KLC-3210DH
Input voltage	☐ AC 220V±10% 50Hz ☐ AC 110V±10% 60Hz ☐ AC 240V±10% 50Hz	
Temperature	Working temperature: -10℃~40℃ Relative humidity < 80%	
	Storage temperature: -10℃~40℃ Relative humidity < 90%	
Output voltage	0-32V	0-32V
Output current	0-6A	0-10A
Voltage-stabilized state		
Voltage-stabilization degree	≤0.1%+2mV	≤0.1%+2mV
Load stability	≤0.1%+2mV	≤0.1%+2mV
Ripple noise	≤ 3%Vp-p (peak-to-peak value)	
Steady-flow state:		
Current-stabilization degree	≤0.1%+3mV	≤0.1%+3mV
Load stability	≤0.2%+3mV	≤0.1%+3mV
Display accuracy	4-digit LED digital display of voltage/current	
	00.00V-09.99V ±0.3% (±1 digit)	10.00V-32.00V ±0.1% (±1 digit)
	0.000A-0.999A±0.3% (±1 digit)	1.000A-4.999A ±0.1% (±1 digit)
	5.000A-10.00A ±0.2% (±1 digit)	
Display resolution	Voltage:0.01V Power:0.001A	Voltage: 0.01V Current: 0.01A
Boundary dimension	312 (depth) ×126 (width) ×166 (height)	
Weight	≈ 1.96KG	≈ 2.0KG ≈ 2.1KG

Operational Requirements

1. Place the instrument on a workbench or similar surface.
2. Before operation, please make sure that the ambient temperature is
+0°C ~ +40°C (+32°F ~ +104°F)



WARNING: To ensure normal heat dissipation, please do not stack objects on the front, sides, or back of the instrument. A ventilation space at least 3cm should be reserved at the side and back of the instrument, to ensure air circulation of the instrument.

WARNING: Before using the product and any related instruments, you should ensure that all security precautions listed in this manual are followed. Although some instruments and accessories are only used under non-hazardous voltages, danger may also occur. Only qualified personnel are allowed to use this product because they need to be able to recognize risk of electric shock and be familiar with necessary security precautions, to avoid possible injuries. Before use, you are recommended to read and follow all regulations of installation, Operation and maintenance information carefully. For complete product technical specifications, please refer to this manual. Before performing any maintenance, you should disconnect the power line and all test cables. Operators of this instrument must take protective measures against electric shock at all times. The responsible agency must ensure that operators cannot touch any connection points and/or maintain insulation from each connection point. In some cases, the connection point must be exposed, which may cause physical contact. In this case, operators must be trained to know how to protect themselves from the risk of electric shock. Provided that circuits can work normally at 72 volts or higher, any conductive parts in the circuits must not be exposed.



WARNING: Please use wires with an appropriate rated load. The capacity of all load wires must be able to carry the maximum short-circuit output current of the power supply, without overheating. If there are multiple loads, each pair of load wires should safely bear the full rated short-circuit output current of the power supply.



WARNING: Do not loosen any screws on this product. There are no user-serviceable components inside.



WARNING: In order to reduce the risk of fire and electric shock, you should refer to the range of rated values of the power supply.

System Installation

- Open package of the instrument and check whether you have received all the items listed in the “standard accessories”.

Operational Requirements

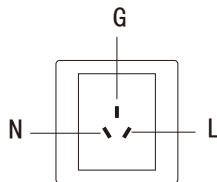
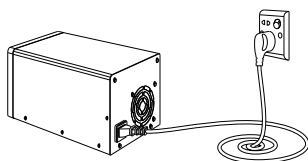
- Also, check you have received all other accessories ordered with the instrument or not.
- Please visit zhaoxin website (www.zhaoxinpower.com) for the latest information.

Please perform the following steps, to confirm that the power supply is ready:

Power on and off the Instrument Power

Please power on the instrument power and perform the following steps:

1. Complete all connections.
2. Connect the power line provided with the instrument to the power connector on the rear panel. Then, connect the power line plug to a properly grounded power socket.



3. Press power button on the front panel to power off the instrument.



WARNING: In order to meet security requirements, you need to ensure that load wire used must always be able to carry the maximum short-circuit output current of the power supply, without overheating. If there are multiple loads, each pair of load wires must safely bear full rated current of power supply.

How to Solve the Problem That Power Supply Fails

Please perform the following steps, in order to avoid possible problems when the instrument is turned on:

1. Verify whether there is AC at the AC input end of the power supply. Firstly, inspect whether AC power line is firmly inserted into power connector on the rear panel of power supply. Also, check whether AC power line connected to the power supply is powered on. Second, check whether the power switch is turned on.
2. Verify voltage setting of power input. Inspect label on the back of instrument to see if nominal input voltage is suitable for your country/region (AC 110V or 220V).
Note: In some cases, fuse of electric supply may disconnect if the instrument is powered with an incorrectly configured mains voltage.
3. Make sure that power line fuse has been installed correctly. If the fuse is damaged, please change it.
4. For more help, please contact zhaoxin.

Operational Requirements

Output Check

The following steps are used to check whether power supply produces rated output and whether it can correctly respond to operations from the front panel.

Voltage Output Check: Please operate the following steps to check basic voltage function under no-load conditions.

1. Remove all guide lines from the output connector.
2. Turn on the power.
3. Turn the current adjustment knob of power supply clockwise to the maximum.
4. In constant voltage output state of power supply, the C.V light is on. Check whether the voltage adjustment knob can be adjusted from 0V to the maximum value of rated range.

Current Output Check: Please operate the following steps to verify basic current function in the case of a short circuit between power supply outputs:

1. Remove all guide lines from the output connector.
2. Turn on the power.
3. Set the output voltage to about 5-6V.
4. Use insulated test leads to connect a short circuit between (+) and (-) output terminals. The size of guide lines used should be able to bear electric wire with the maximum current.



WARNING: To meet security requirements, the load wire used must always be sufficient to carry the maximum short-circuit output current of power supply, without overheating. If there are multiple loads, each pair of load wires must be able to safely bear full rated current of power supply.

5. Turn off the power and remove short-circuit wire between (+) and (-) output terminals.

Product Cleaning

Regularly check the power supply in accordance with operating conditions.

Please clean outer surface of the instrument as per following steps:

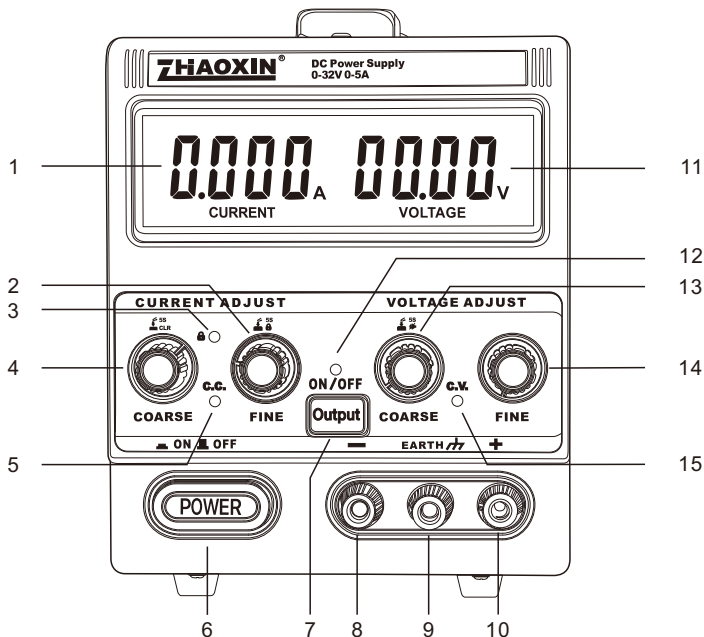
1. Use a lint-free rag to remove floating dust on surface of power supply.

Be careful to avoid scratching the display.

2. Use a soft cloth dampened with water to clean the power supply. For more thorough cleaning, please use 75% isopropanol in water.

Operating Basis

Overview of Front Panel

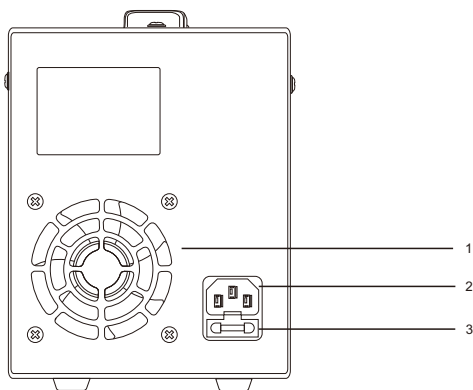


Controls and display elements are displayed in following diagram and table

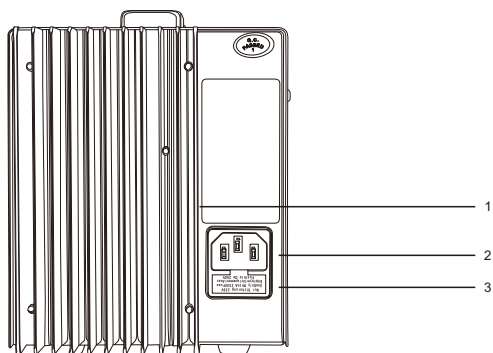
- | | |
|---|--|
| 1. Current (left) output display | 2. Current (fine) adjustment knob/Knob lock on/off |
| 3. Knob lock indicator | |
| 4. Current (coarse) adjustment knob/current display zero clearing | |
| 5. C.C. constant current indicator | 6. Power on/off |
| 7. Output start on/off | 8. Output terminal (-) negative |
| 9. Ground terminal | 10. Output terminal (+) positive |
| 11. Voltage (right) output display | 12. Output on/off indicator |
| 13. Voltage (coarse) adjustment knob/knob sound on/off | |
| 14. Voltage (coarse) adjustment knob | |
| 15. C.V. Voltage stabilizing indicator | |

Operating Basis

Overview of Rear Panel



- 1. Cooling fan
- 2. AC power connector
- 3.AC fuse box



- 1. Radiator
- 2. AC power connector
- 3.AC fuse box

Operating Basis

Description of indicators

C.V. 	Constant voltage state	C.C. 	Constant current state
	Knob rocking		Reverse protection indication/alarm

CURRENT ADJUST



Current display reset
Without any load, long press coarse adjustment knob of current for 5s and then you can reset current display digital after hearing the “DI” sound.

CURRENT ADJUST



Knob lock on/off
In standby state, long press the fine adjustment knob of current for 5s and  indicator is on. The 4 knob locks are locked.

VOLTAGE ADJUST



Knob sound on/off
In standby state, long press coarse adjustment knob of current for 3s to turn off the sound. If you need to turn it off, please repeat the above operation to turn on knob sound.



Power output start on/off
Short press Output to start up or turn off output.

Operating Basis

Connection of Load Line

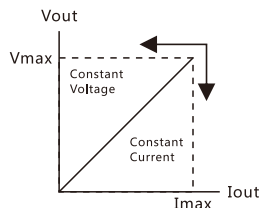
1. Rotate terminal counterclockwise to loosen the terminal
2. Insert load line terminal
3. Rotate terminal clockwise to lock the terminal
4. Banana plug: insert the banana plug into terminal block



Type of load line: The load line is an optional accessory for users, and current capacity of load line must be confirmed when the load line is purchased. The voltage drop at both ends of each load line cannot exceed 0.5V. The following table shows rated current of the load line.

Characteristics of Constant Voltage/Constant Current

1. The DC power supply can automatically switch between constant voltage mode (C.V.) and constant current mode (C.C.) according to load conditions. When output current is less than output preset value, the DC power supply works in constant voltage mode, and front panel indicator lights green (C.V.). The output voltage is constant at the set value; when output current changes with the load and the current reaches the preset value, the power supply enters a constant current mode (C.C.). Indicator on the front panel is red (C.C.). The current output will be constant at the preset value, and output voltage will vary with the load. When the output current is less than the preset value, DC power supply will automatically return to constant voltage mode (C.V.)



Note 1: Incorrect connection may cause damage to power supply or the load connected to DC power supply.

2. In actual (C.V.) operation, if output current increases to the setting value due to decrease of load resistance, the power supply will automatically switch to (C.C.) mode. When load resistance continues to decrease, the current will remain at the setting value. The voltage will decrease proportionally ($I=V/R$). At this time, C.V. output state can be restored by increasing load resistance or improving setting value of current.
3. In actual (C.C.) operation, if output voltage increases to the setting value due to increase of load resistance, the power supply will automatically switch to (C.V.) mode. When load resistance continues to increase, the voltage will remain at the setting value. The current will decrease proportionally ($I=V/R$). At this time, C.C. state can be restored by reducing load resistance or increasing setting value of voltage.

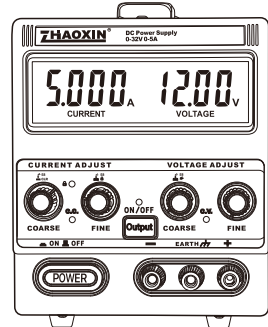
Operating Basis

Constant Voltage Operation

For example: the voltage is set to 12V, and the current is 5A.

Steps:

1. Turn on the power switch
2. Voltage setting: Use coarse/fine adjustment knob of voltage to set the voltage to 12V
3. Current setting: Use coarse/fine adjustment knob of current to set the current to 5A, and the current displayed is preset current at this time.
4. Connect the load. Press the output start on/off and when the indicator is on, the output terminal of power is in a charged state.

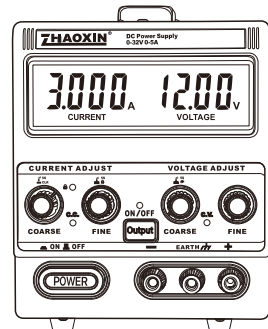


Constant Current / Current-Limit Setting Operation

For example: set constant current or current-limit to 3A.

Steps:

1. Current setting: Use coarse/fine adjustment knob of current to set the current to 3A, and the current displayed is preset current at this time.
2. Connect the load. Press the output start on/off and when the indicator is on, the output terminal of power is in a charged state.



Common Troubleshooting

When you press power switch on the front panel, the display goes blank without any display

1. Check whether power connector is connected properly.
2. Check whether the fuse is correct and intact.

Abnormal constant voltage output:

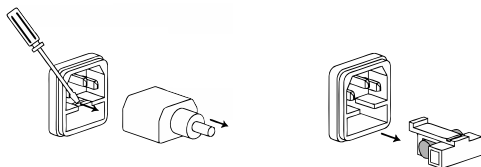
1. Check maximum output power meets load requirements or not.
2. If it is satisfied, please check whether current setting value is appropriate.
If it is too low, you can appropriately increase the setting value; whether there is a short circuit or open circuit in the cable connecting the load and power supply; whether the cable is in good contact and whether there is a problem with the load.

Abnormal constant current output:

1. Check maximum output power meets load requirements or not.
2. If it is satisfied, please check whether voltage setting value is appropriate.
If it is too low, you can appropriately increase the setting value; whether there is a short circuit or open circuit in the cable connecting the load and power supply; whether the cable is in good contact and whether there is a problem with the load.

Fuse change

1. Cut off the power and take out the fuse holder with a slot type screwdriver
2. Change the fuse



In order to ensure safe and effective fire protection measures, you can only change the fuse with specific specifications and rated value. Before replacement, please cut off the power supply and remove power line from power socket.

SCANNING IT



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Product: DC voltage-stabilized power supply

Product implementation standard: GBT-17478