

BENCHTOP INSTRUMENT

**Single Output High Power
DC Power Supply
Operation Manual V1.1**

CE

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Use of Operation Manual

Please read through and understand this Operation Manual before operating the product. After reading, always keep the manual nearby so that you may refer to it as needed. When moving the product to another location, be sure to bring the manual as well.

Calibration notification

We notify that the instruments included in this manual are in compliance with the features and specifications as stated in this manual. Before shipment, the instrument has been calibrated in factory. The calibration procedures and standards are compliant to the national regulations and standards for electronic calibration.

Warranty

We guarantee that the instrument has been passed strict quality check. We warrant our instrument's mainframe and accessories in materials within the warranty period of one year. We guarantee the free spare parts for products which are approved defective in this period. To get repair service, please contact with your nearest sales and service office. We do not provide any other warranty items except the one being provided by this summary and the warranty statement. The warranty items include but not being subjected to the hinted guarantee items related to tradable characteristics and any particular purpose. We will not take any responsibility in cases regarding to indirect, particular and ensuing damage, such as modifications to the circuit and functions by the users, repairing or component replacement by the users, or damage during transportation.







For product improvement, the specifications are subject to change without prior notice.

SAFETY INSTRUCTION




This chapter contains important safety instructions that you must follow when operating the instrument and when keeping it in storage. Read the following before any operation to insure your safety and to keep the best condition for the instrument.



Safety Symbols

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

	WARNING	Identifies conditions or practices that could result in injury or loss of life.
	CAUTION	Identifies conditions or practices that could result in damage to the instrument or to other properties.
	DANGER	High voltage
	ATTENTION	Refer to the manual
		Protective conductor terminal
		Earth (ground) terminal

Safety Guidelines

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|---|----------------|---|
|  | WARNING | <ul style="list-style-type: none">● Before using the power supply, do not connect any load to the power supply before it's turned on. Make sure to disconnect the load before shutting down the power supply. Not following this instruction may cause damages to the power supply, which are not under warranty. |
|---|----------------|---|
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|---|----------------|--|
|  | WARNING | <ul style="list-style-type: none">● If you are running inductive load like magnetic coils, DC motors, stepper motors, etc., make sure to change the voltage/current slowly, and NEVER turn the power supply on or off with a inductive load connected. |
|---|----------------|--|
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- | | | |
|---|----------------|---|
|  | CAUTION | <ul style="list-style-type: none">● Before plugging into local AC mains, check and make sure that the output voltage is compatible to the load. (It is suggested to disconnect a load before plugging into local AC mains.)● Do not use this instrument near water.● Do not operate or touch this instrument with wet hands.● Do not open the casing of the instrument when it is connected to AC mains.● The max. output voltage of the instrument may be over 60VDC, avoid touch the metal contact part of the output terminals.● Do not use the instrument in an atmosphere which contains sulfuric acid mist or other substances which cause corrosion to metal.● Do not use the instrument in a dusty place or a highly humid place as such will cause instrument reliability degradation and instrument failures.● Install the instrument in a place where is free from vibration.● Install the instrument in a place where the ambient temperature is in range of -10~70°C. Note that the instrument operation may become unstable if it is operated in an ambient temperature exceeding the range of 0~40°C |
|---|----------------|---|
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Power supply	AC Input voltage: 110V or 220V \pm 10%, 50/60Hz
 WARNING	Connect the protective grounding conductor of the AC power cord to an earth ground to avoid electrical shock.
Fuse	<ul style="list-style-type: none"> ● Fuse type: refer to the fuse rate label on the rear panel of the power supply. ● Make sure the correct type of fuse is installed before power up. ● Replace the AC fuse with the same type and rating as the original fuse. ● Disconnect the power cord before fuse replacement. ● Make sure the cause of fuse blowout is fixed before fuse replacement.
 WARNING	
Operation environment	<ul style="list-style-type: none"> ● Location: indoor, no direc sunlight, dust free, almost non-conductive pollution (note below). ● Relative humidity: <80% ● Altitude: <2000m ● Temperature: 0°C ~ 40°C
	<p>(Pollution Degree) EN 61010-1:2001 specifies the pollution degrees and their requirements as follows. The instrument falls under degree 2.</p> <p>Pollution refers to “addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity”.</p> <p>Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.</p> <p>Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.</p> <p>Pollution degree 3: Conductive pollution occurs, or dry, nonconductive pollution occurs which becomes conductive due to condensation which is expected. In such conditions, equipment is normally protected against exposure to direct sunlight, precipitation, and full wind pressure, but neither temperature nor humidity is controlled.</p>
Storage environment	<ul style="list-style-type: none"> ● Location: indoor ● Relative humidity: <70% ● Temperature: -10°C ~ 70°C

1. PRODUCT INTRODUCTION

1.1 Description

This series are high power output DC power supply with output range up to 5kW. This series can be made according to customer request, with output voltage up to 400V and output current up to 150A. Over Voltage Protection, Over Current Protection, Over Temperature Protection and Over Power Protection keep power supplies and their load safe from unexpected conditions. High Accuracy, high stability and low ripple & noise make this series an ideal solution for various industrial applications.

1.2 Features

- Max. output power ranging from 100W to 5kW
- Max. output voltage 400V, Max. output current 150A
- Applying advanced PWM control technology
- Compact design and light weight (5~11kg)
- Constant voltage (CV) and constant current (CC) operations
- Auto CV/CC switch
- Coarse and Fine control for voltage and current
- Multiple protections: OVP, OCP, OTP and OPP
- Adjustable OVP & OCP range, OPP fixed 110% of Max. power
- Intelligent temperature control cooling fan
- Customized specifications and functions acceptable

1.3 List of Output

Output Voltage (V)	Output Current (A)	Output Capacity (W)
0~15	0~30	450
0~15	0~50	750
0~15	0~60	900
0~15	0~80	1200
0~15	0~100	1500
0~15	0~120	1800
0~15	0~150	2250
0~30	0~30	900
0~30	0~40	1200
0~30	0~50	1500
0~30	0~60	1800
0~30	0~80	2400
0~30	0~100	3000
0~30	0~150	4500
0~50	0~10	500
0~50	0~30	1500
0~50	0~50	2500
0~50	0~60	3000
0~50	0~80	4800
0~50	0~100	5000
0~60	0~20	1200
0~60	0~30	1800
0~60	0~50	3000
0~60	0~60	3600
0~60	0~80	4800
0~100	0~1	100
0~100	0~3	300
0~100	0~5	500
0~100	0~10	1000
0~100	0~20	2000
0~100	0~30	3000
0~100	0~50	5000
0~120	0~1	120
0~120	0~3	360
0~120	0~5	600
0~120	0~10	1200
0~120	0~20	2400
0~120	0~30	3600
0~120	0~40	4800

Output Voltage (V)	Output Current (A)	Output Capacity (W)
0~150	0~1	150
0~150	0~3	450
0~150	0~5	750
0~150	0~10	1500
0~150	0~20	3000
0~150	0~30	4500
0~200	0~1	200
0~200	0~3	600
0~200	0~5	1000
0~200	0~10	2000
0~200	0~20	4000
0~250	0~1	250
0~250	0~3	750
0~250	0~5	1250
0~250	0~10	2500
0~250	0~20	5000
0~300	0~1	300
0~300	0~2	600
0~300	0~3	900
0~300	0~5	1500
0~300	0~10	3000
0~400	0~1	400
0~400	0~2	800
0~400	0~3	1200
0~400	0~5	2000
0~400	0~10	4000

This series DC power supply is not limited to the above listed outputs. The above listed outputs are for reference only. For more outputs, please contact our sales team for details.

2. PANEL INTRODUCTION

2.1 Front Panel

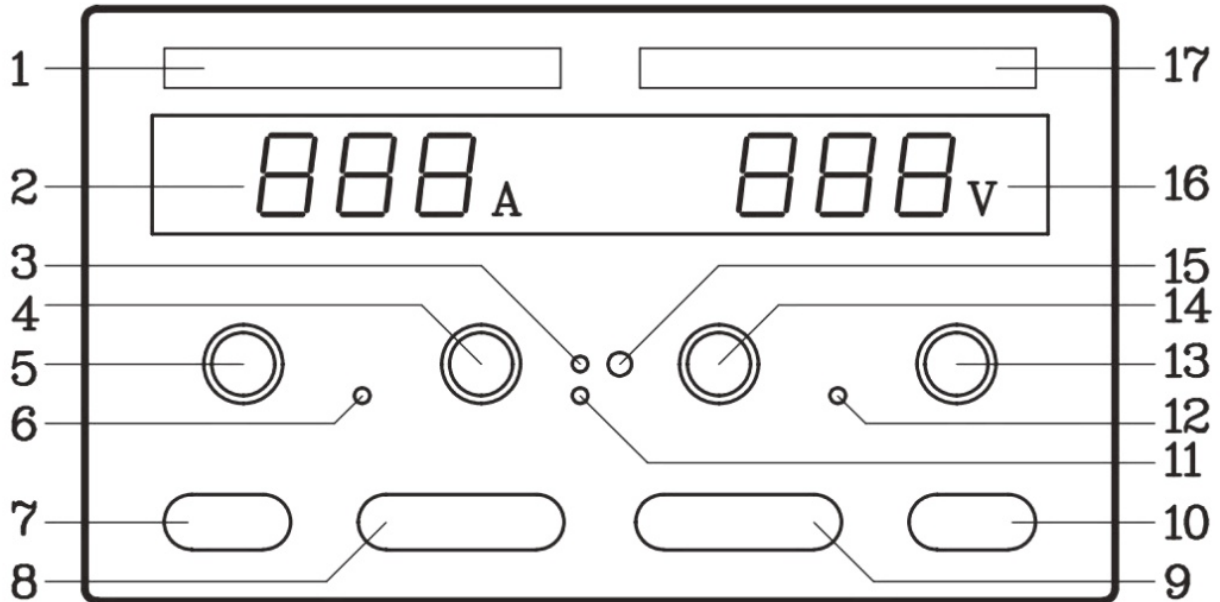


Fig.2.1-1 Front Panel

No.	Name	Description
1	Name label	Shows brand name and product name.
2	Ammeter	Displays the output current.
3	OTP indicator	The indicator lights on when the Over Temperature Protection is activated. And the power supply shuts down output under OTP. If the inner temperature of the power supply is over 70°C, the power supply will be in OTP mode and the output will be shut down. When the inner temperature is less than 65°C, the power supply will resume to work automatically.
4	Current coarse regulation knob	Coarsely regulates the value of output current.
5	Current fine regulation knob	Finely regulates the value of output current.
6	CC indicator	The indicator lights on when the power supply is under constant current operation mode.
7	Power switch	Press it to power on/off the power supply.
8	Output 1	Undefined: no output terminals in default sate.
9	Output 2	Undefined: no output terminals in default sate.
10	Output 3	Undefined: no output terminals in default sate.
11	OVP indicator	The indicator lights on when the Over Voltage Protection is activated. And the power supply shuts down output under OVP.
12	CV indicator	The indicator lights on when the power supply is under constant voltage operation mode.

13	Voltage coarse regulation knob	Coarsely regulates the value of output voltage.
14	Voltage fine regulation knob	Finely regulates the value of output voltage.
15	OVP setting knob	Used to set the value of over voltage protection. Please set it with a small screwdriver.
16	Voltmeter	Display the output voltage.
17	Name label	Shows model number and output range of the product.

2.2 Rear Panel

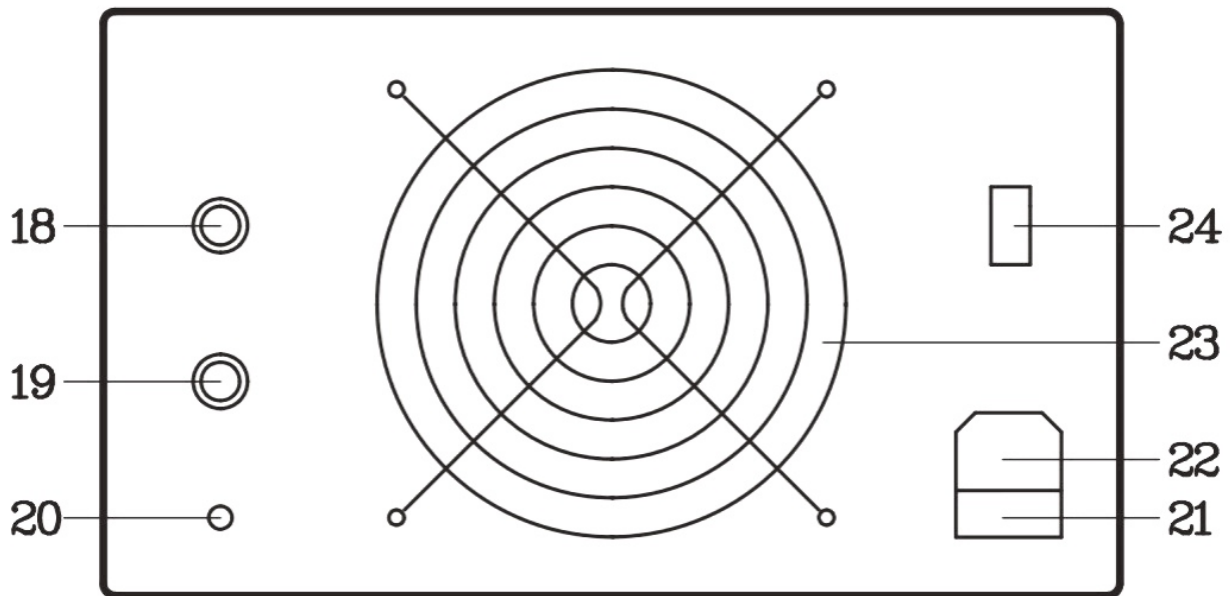


Fig.2.1-2 Rear Panel (Input module: power socket)

No.	Name	Description
18	“+” output terminal	Positive polarity output terminal (Red).
19	“-” output terminal	Negative polarity output terminal (Black).
20	“GND” terminal	Grounding terminal (Green).
21	Fuse socket	Use suitable fuse which is stated on the fuse rating label on the rear panel of the power supply.
22	Power input socket	Connect with power cord to switch on the power supply. Input voltage: 110V or 220V \pm 10%, 50/60Hz
23	Cooling fan	It is an intelligent temperature control fan. when the inner temperature is above 40°C, the cooling fan will start running. If the inner temperature is below 35°C, the fan will stop running.
24	AC input voltage selector	For 110V AC power system, please slide the input voltage selector to 115V position; while for 220V AC power system, slide it to 230V position. In default state, there is no such selector.

3. OPERATION INSTRUCTION

3.1 Preparation before Power On

1. Please make sure the input voltage is AC198-242V 50Hz, or 99V-121V 60Hz. If there has input voltage selection switch, please make sure the voltage you choose is the one you need, otherwise there will be damage to the power supply.
2. Make sure there is enough space for cooling. The two sides and back of the power supply should have at least 10cm space away from other objects. The operating temperature should be less than 40°C. Please **DO NOT** use it in a place where there is acid and alkaline gases or excessive dust. Also please prevent the power supply from rain, sun exposure and Strenuous Vibration.
3. The copper diameter of the cable should be over than 2mm², and it is certainly to add a control switch for it, so that it can be used to cut off the power completely when there is a need.
4. There will be a buffer for 2~3 seconds when turn on the power supply, also it has a buffer for 1~2 seconds when turn off it. Please do not turn on and turn off it frequently, or it will reduce the life of the power supply.



CAUTION

1. To avoid damage to the power supply, make sure that the input voltage selector [24] is set to a correct position.
2. To avoid electrical shock, the power cord protective grounding conductor must be connected to ground.
3. To avoid damage to the power supply, do not short the main terminals [18, 19] for more than 1 minute.

3.2 Constant Voltage Setting

Steps for setting:

1. Connect the power supply to local power source.
2. Press the power switch [7] to turn on the power supply.
3. Tune the over voltage setting knob [15] and Current Knobs [4, 5] clockwise to the maximum.
4. Tune knobs [13, 14] to the necessary value of voltage.
5. Connect the load to output terminals [18, 19].
6. Press the power switch [7] to turn on the power supply. The power supply can be used for work now.

The CV indicator [12] will light on, which means the output voltage is constant, while the output current changes according to load capacity.

3.3 Constant Current Setting

Steps for setting:

1. Connect the power supply to local power source.
2. Press the power switch [7] to turn on the power supply.
3. Tune the over voltage setting knob [15] clockwise to the maximum.
4. Tune voltage knob [13] to any value between 3~5V.
5. Tune current knob [4, 5] to the minimum.
6. Use a test lead to short the two main terminals [18, 19].
7. Tune voltage knobs [13, 14] to the necessary value of voltage.
8. Connect the load to output terminals [18, 19].
9. Press the power switch [7] to turn on the power supply. The power supply can be used for work now.

The CC indicator [6] will light on, which means the output current is constant, while the output voltage changes according to load capacity.

If the CC indicator [6] dose not light on, increase the load capacity or change the constant current value to reach a constant current.

NOTE: when the power supply is shorted, it will have some slight noise, which is a normal phenomenon.

3.4 Over Voltage Protection (OVP) Setting

Steps for setting:

1. Connect the power supply to local power source.
2. Press the power switch [7] to turn on the power supply.
3. Tune the over voltage setting knob [15] and current knob [4] clockwise to the maximum.
4. Tune voltage knob [13, 14] to the necessary value of OVP.
5. Tune current knob [15] to anti-clockwise until the OVP indicator [11] lights on. Now the power supply shuts down output.
6. Press the power switch [7] to turn off the power supply.
7. Tune voltage knob [13, 14] anti-clockwise to a small value.
8. Press the power switch [7] to turn on the power supply. The CV indicator [12] will light on.
9. Tune voltage knobs [13, 14] to the necessary value of voltage.
10. Connect the load to output terminals [18, 19]. The power supply can be used for work now.

NOTE: The output voltage should be less than the OVP setting value. Otherwise, the power supply will be under OVP mode and the output will be always shut down.

Cancel the OVP setting:

1. If you have set an OVP value, it can be canceled as per the following steps:
2. Tune the over voltage setting knob (15) clockwise to the maximum.
3. Press the power switch [7] to turn off the power supply. The OVP indicator will be light off in 2 seconds
4. Turn on the power supply again. The CV or CC indicator will light on at this time. Then the overvoltage protection will be canceled.

4. MAINTENANCE



The following instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

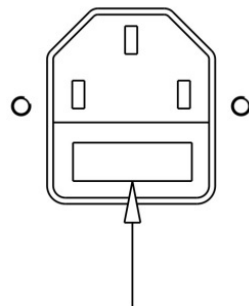
4.1 Inspection

1. Inspect the instrument at regular intervals so that it maintains its initial performance for a long time.
2. Check the input power cord for damage of the vinyl cover and overheating of the plug and cord stopper. Check the terminal screws and binding posts for loosening.
3. Remove dust from the inside of the casing and ventilation holes of the cover by using a compressed air or the exhaust air of a vacuum cleaner.

4.2 Fuse Replacement

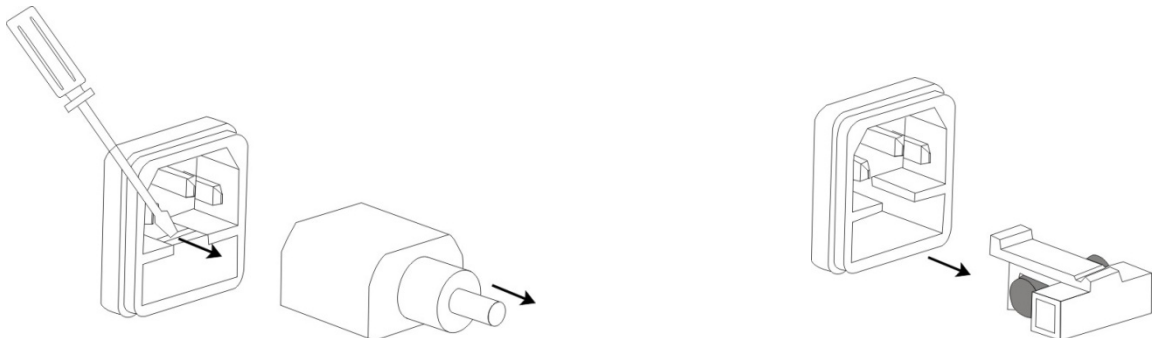
Steps for setting:

1. Disconnect all power connections.
2. Locate the fuse socket in the rear panel power socket.



Pull out the fuse socket

3. Take off the power cord, and pull out the fuse socket from the power socket.



4. Replace the fuse with identical rating. (Refer to label on the rear panel of the power supply)
5. Reinstall the fuse socket (Push the fuse socket into the power socket).



1. To avoid electrical shock, ensure no power is connected to the power supply.
2. To avoid damage to the fuse socket, do not over push the fuse socket.

4.3 Cleaning

1. Before cleaning, disconnect the AC mains.
2. To clean the power supply, use a soft cloth dampened in a solution of mild detergent and water. Do not spray cleaner directly onto the instrument, since it may leak into the cabinet and cause damage.
3. Do not use chemicals containing benzene, toluene, xylene, acetone, or similar solvents.
4. Do not use abrasive cleaners on any portion of the instrument.

4.4 Trouble Shooting

Problem	The power supply cannot startup. (No display)
Solution	<ol style="list-style-type: none">1. Ensure the power source or power cord is working properly.2. Check the fuse. If the fuse is blown, disconnect the unit from the power source. And then replace with a new fuse of identical rating.
Problem	When operating in the CV mode, the voltage suddenly drops and the CC indicator lights on.
Solution	The power supply is in current protection mode. The desired current value is below the circuit gain; therefore the power supply is switched to CC mode. Tune the current knob clockwise to increase the current range.
Problem	The power supply output is unstable.
Solution	<ol style="list-style-type: none">1. The power supply needs at least 30 minutes to warm up and reach the specifications as stated in this manual.2. The power source is below the minimum requirement.

If the above solutions cannot solve the problems, please contact your local distributor/dealer or the manufacturer for repairing.

5. SPECIFICATIONS

Output capacity	100W~5kW
Working mode	PWM
Output	
Output voltage	DC 0~100% full range adjustable
Output current	DC 0~100% full range adjustable
OVP range	DC 0~100% of rated output
OCP range	DC 0~100% of rated output
Line regulation	CV \leq 0.2% + 2d CC \leq 0.5% + 2d
Load regulation	\leq 0.5% + 2d
Ripple & Noise	\leq 1% RMS
Display	
Meter	3 1/2 digits LED display
Voltage resolution	100mV
Current resolution	10mA
Accuracy	\pm 1% \pm 1d
Optional functions	
Display meter	4 1/2 digits LED display (Max.display 19999)
Output terminal	On front panel; or on rear panel; or on both front and rear panels
Output ON/OFF	Switch; or Terminal block; or Wires
General	
Protection	Over Voltage Protection (OVP), Over Current Protection (OCP), Over Temperature Protection (OTP), Over Power Protection (OPP)
Power source	AC110V or 220V \pm 10%, 50/60Hz
Input module	Power socket or terminal block
Operating environment	0°C~40°C, <80%RH
Storage environment	-10°C~70°C, <80%RH
Dimension	260x160x380mm

For the purpose of product improvement, specifications are subject to change without prior notice.