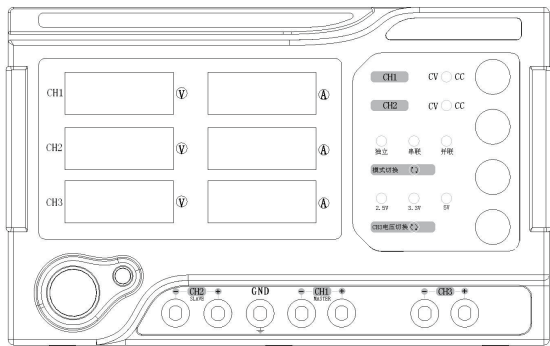


Multi-Channel DC Voltage and Current Stabilized Power Supply



Product User Manual

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Chapter I Introduction

This series of adjustable DC regulated power supply is a multi-channel DC linear power supply with high stability, high reliability and high precision, which can continuously adjust the output voltage and output current, and automatically switch between constant voltage and constant current. It also has an output control switch for more flexible control.

This series of DC power supply is LED display, which can display the output voltage value and current value of each channel at the same time. One of them is a fixed voltage (5V-3A or 3.3V-3A or 2.5V-3A) switching output channel.

The other two channels are adjustable and can be used in series or parallel, with one channel tracking the voltage and current of the main channel. In series, the maximum output voltage can reach the sum of the two voltage ratings, and in parallel, the maximum output current can reach the sum of the two current ratings.

Specifications are as follows:

Epi :

Model	3303D	3305D	3603D
Specifications			
output voltage output (current)	$2 \times 0 \sim 30V$ $2 \times 0 \sim 3A$	$2 \times 0 \sim 30V$ $2 \times 0 \sim 5A$	$2 \times 0 \sim 60V$ $2 \times 0 \sim 3A$
Fixed output (three groups can be switched)	5V-3A /3.3V-3A / 2. 5V-3A	5V-3A /3.3V-3A / 2. 5V-3A	5V-3A /3.3V-3A / 2. 5V-3A

Chapter I Technical parameter

2.1 Communication Input and Operating Environment

2.1.1 Input voltage: 110/220VAC 10% switchable.

2.1.2 Test Conditions: Temperature 10~35°C Relative Humidity $\leq 75\%$.

2.2 Output Range and Key Technical Specifications for Master and Slave Channels

2.2.1 Rated output voltage : see Table 1.

2.2.2 Rated output current: see Table 1

2.2.3 Line Regulation

$$CV \leq 0.01\% + 3\text{mV}$$

$$CC \leq 0.2\% + 3\text{mA}$$

2.2.4 Load Regulation

$$CV \leq 0.01\% + 3\text{mV} \quad (I \leq 3\text{A})$$

$$CC \leq 0.2\% + 3\text{mA} \quad (I \leq 3\text{A})$$

$$CV \leq 0.02\% + 5\text{mV} \quad (I > 3\text{A})$$

$$CC \leq 0.2\% + 5\text{mA} \quad (I > 3\text{A})$$

2.2.5 Ripples and Noise

$$CV \leq 1\text{mV}_{\text{rms}} \quad (I \leq 3\text{A}, 5\text{Hz} \sim 1\text{MHz})$$

$$CC \leq 3\text{mA}_{\text{rms}} \quad (I \leq 3\text{A})$$

$$CV \leq 2\text{mV}_{\text{rms}} \quad (I > 3\text{A}, 5\text{Hz} \sim 1\text{MHz})$$

$$CC \leq 10\text{mA}_{\text{rms}} \quad (I > 3\text{A})$$

2.2.6 Protection functions

Overvoltage protection, overcurrent protection, shortcircuit protection, overtemperature protection and polarity reverse protection.

2.2.7 Display accuracy

Voltage current display accuracy: $\pm (1\% \text{ reading} + 2 \text{ characters})$

2.3 Tracking Operations

2.3.1 Parallel Mode

Line Regulation: $CV \leq 0.01\% + 3\text{mV}$

Load Regulation: $CV \leq 0.01\% + 3\text{mV} (I \leq 3\text{A})$

$CV \leq 0.02\% + 5\text{mV} (I > 3\text{A})$

Slave channel Tracking Current Error $\leq$ master channel output $\times 2\% + 50\text{mA}$ (full load $\leq 300\text{mA}$ load variation rate).

2.3.2 Series Mode

Line Regulation: $CV \leq 0.01\% + 5\text{mV}$

Load Regulation: $CV \leq 300\text{mV}$

Voltage tracking error of the slave channel during power supply output $\leq 0.5\%$ master channel output $+10\text{mV}$ (full load $\leq 300\text{mA}$ load variation rate).

2.4 Fixed Output Power Supply

2.4.1 Rated output voltage: 2.5V/3.3V/5V three groups can be switched

2.4.2 Maximum rated output current: 3A

2.4.3 Power supply effect: $\leq 25\text{mV}$

2.4.4 Line Regulation: $\leq 25\text{mV}$

2.4.5 Ripple and noise: $\leq 2\text{mV}_{\text{rms}}$ (5Hz~ 1MHz)

2.4.6 Protection: Features output limiting and short-circuit protection

2.5 Operating environment

0~40°C RH $\leq 80\%$

2.6 Storage environment

-10°C~ 70°C RH $\leq 70\%$

2.7 Standard accessories

Instruction manual *1, Power cord*1, Certificate of conformity*1

2.8 Unit Dimensions

330 (D) $\times$ 250(W) $\times$ 155(H)mm

2.9 Packaging size

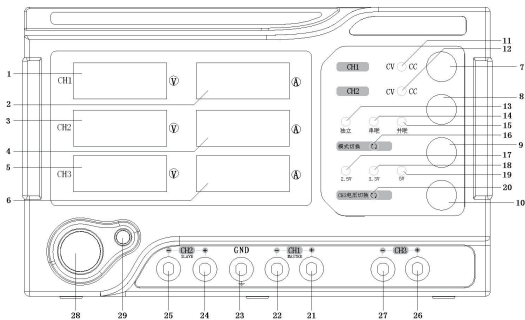
420(D) $\times$ 310(W) $\times$ 220(H)mm

2.10 Weight

Net weight is about 9Kg

Chapter III Operational instructions

3.1 Panel Introduction



3.1.1 Front Panel

(1) CH1 voltage display (unit: V): displays the output voltage of master channel 1 (CH1).

(2) CH1 current display (unit: A): displays the output current of master channel 1 (CH1).

(3) CH2 voltage display (unit: V): displays the output voltage of slave channel 2 (CH2).

(4) CH2 current display (unit: A): displays the output current of slave channel 2 (CH2).

(5) CH3 voltage display (unit: V): displays the output voltage of fixed channel 3 (CH3).

(6) CH3 current display (unit: A): displays the output current of fixed channel 3 (CH3).

(7) Voltage adjustment knob: Adjusts the output voltage of CH1. In parallel or series tracking mode, it is used to adjust the maximum output voltage of CH2.

(8) Current adjustment knob: Adjusts the output current of CH1. In parallel mode, it is used to adjust the maximum output current of CH2.

(9) Voltage adjustment knob: used to adjust the output voltage of CH2 in independent mode.

(10) Current adjustment knob: used to adjust the output current of CH2.

(11) C.V. / C.C. indicator: When the CH1 output is in constant voltage source mode, this indicator will illuminate green; when the CH1 output is in constant current source mode, this indicator will illuminate red.

(12) C.V. / C. C. indicator: When the CH2 output is in constant voltage source mode, this

indicator will illuminate green; when the CH2 output is in constant current source mode, this indicator will illuminate red.

(13) Independence mode indicator: This light is on in independence mode.

(14) Series tracking mode indicator: This light is on in series tracking mode.

(15) Parallel tracking mode indicator: This light is on in parallel tracking mode.

(16) Tracking mode button: When the button is pressed, CH1 and CH2 can operate in independent mode, series tracking mode, or parallel tracking mode for output.

(17) 2.5V indicator: Select fixed output channel CH3. This light will be on when the 2.5V output is applied.

(18) 3.3V Indicator: Select Fixed Output Channel (CH3). This light will be on when the 3.3V output is applied.

(19) 5V indicator: This light will be on when the fixed output channel CH3 is selected for 5V output.

(20) CH3 Voltage Switch Button: When pressed, the button can switch and select the fixed output voltage of 2.5V, 3.3V or 5V .

(21) "+" output terminal: the positive output terminal of CH1.

(22) "-" output terminal: the negative output terminal of CH1.

(23) "GND" terminal: ground and base grounding terminal.

(24) "+" output terminal: the positive output terminal of CH2.

(25) "-" output terminal: the negative output terminal of CH2.

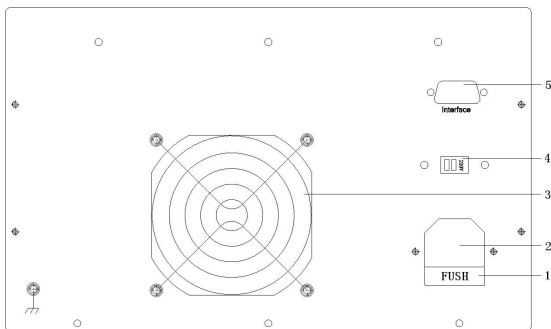
(26) "+" output terminal: the positive output terminal of CH3.

(27) "-" output terminal: the negative output terminal of CH3.

(28) Power switch

(29) ON/OFF Switch: Master Switch for Three-Channel Control Outputs.

3.1.2 Back Panel



(1) Fuse holder: contains a fuse. It can be replaced by using a screwdriver.

(2) Power input socket: AC input port.

(3) Cooling fan: exhaust hot gas to avoid overheating damage to the machine.

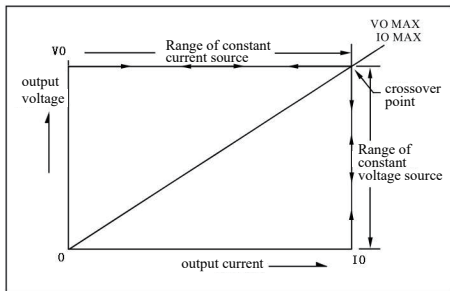
(4) Power input switch: AC110V/220V input switch.

(5) Optional interface: The interface can be customized according to customers. Communication with power supply can be carried out through this interface (this communication interface is not included by default)

3.2. Method of Use

3.2.1 Constant Voltage/current Characteristics

This series of power supplies operates with automatic switching between constant voltage and constant current modes. When the output current reaches a predetermined threshold, it automatically switches from voltage stability to current stability, and vice versa. The intersection point of these two modes is called the crossover point, as shown in the following diagram illustrating its relationship with load characteristics. For example, A load is applied to operate the power supply in constant voltage mode, providing a stable output voltage to the load. Now increase the load resistance until the constant current threshold is reached. At this point, the power supply switches to constant current mode, causing a slight drop in output voltage. The CV/CC indicator on the front panel changes from green to red.



Similarly, as the load decreases, the voltage output gradually returns to a constant level. The crossover point automatically converts the constant current into a steady voltage state. For example, if you want to charge a 12V DC battery, first set the power supply's output preset to 13.8V, When the battery is charged at this low-state charge acts as a massive load on the power supply's output, causing it to operate as a constant current source. By adjusting the instrument to maintain a 1 A charging current through the battery, we complete the charging process. At this stage, the battery no longer requires the 1A rated current for charging. From the above example, we can observe the crossover characteristics of the power supply's constant current source/constant voltage source. Specifically, when the output voltage reaches the predetermined value, it automatically switches to

constant voltage mode.

3.2.2 Independence Mode

3.2.2.1

Press the tracking mode button to select the power in independence mode, and the corresponding independence mode indicator light will be lit.

3.2.2.2

When CH1 and CH2 are used as constant-voltage power supplies respectively, turn knob (8) and (10) clockwise to the maximum first. After starting up, adjust (7) and (9) respectively to make the output voltage of the main and driven paths to the required value.

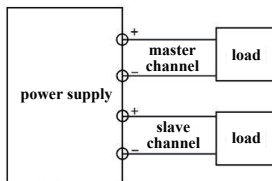
3.2.2.3

When used as a constant current source, turn knob (7) and (9) clockwise to the maximum first. After starting up, adjust (8) and (10) respectively to make the output current of the main and driven paths reach the required value.

3.2.2.4

Setting the voltage or current limit protection points: Turn on the power supply. With the output in the off state (ON/OFF switch backlight

is red), adjust knobs (7), (8), (9), and (10) respectively. (10) to set the preset output voltage and current values for CH1 and CH2 equal to the desired voltage or current limit protection points. Once set, press the ON/OFF switch to enable the output (the ON/OFF switch backlight will turn green).



independence mode

3.2.3 Series Tracking Mode

3.2.3.1

Press the tracking mode button to select the power supply in series tracking mode, and the corresponding series tracking mode indicator light will be lit.

3.2.3.2

When two channels are connected in series, the current adjustment of both channels is still independent. If knob (10) is not at the maximum,

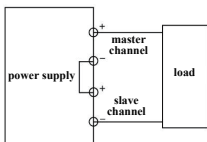
but at a certain current limiting point, when the load current reaches this current limiting point, the output voltage of the slave channel will no longer track the adjustment of the master channel.

3.2.3.3

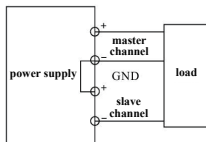
When using the series tracking mode with two channels, if high power output is required, thick wires should be used to securely connect terminals (22) and (24) to prevent damage to the internal components of the machine.

3.2.3.4

When using the series tracking mode with two channels, if the negative end of the active road and the ground end of the passive road are connected with a connection sheet, it should be disconnected, otherwise the short circuit of the slave channel will occur.



Series Connection for Higher Voltage



Series-Connected Tracking

3.2.4 Parallel Tracking Mode

3.2.4.1

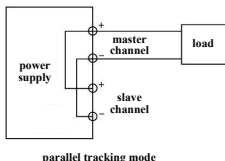
Press the tracking mode button to select the power supply in parallel tracking mode, and the corresponding parallel tracking mode indicator light will be lit.

3.2.4.2

In parallel operation, the current adjustment (10) for the slave circuit is disabled. Adjusting only (8) enables simultaneous control of both channels, with the output current being the sum of the two currents. The maximum output current is the sum of the two rated values.

3.2.4.3

When using dual-channel parallel tracking mode, if high power output is required, use thick cables to short-circuit terminals (21) and (24), as well as (22) and (25), to prevent damage to internal machine components.



Chapter IV. Notes

4.1 Input Voltage Selection:

Before connecting the power supply, be sure to check whether the voltage is the same as that of the local power grid. Note: The machine has an 110V/220V power selection switch. Please choose the input voltage according to the local power grid, so as not to burn out the machine .

4.2 Abnormal Operation :

This power supply features comprehensive current-limiting protection. When a short circuit occurs at the output terminal, the output current will be restricted to the maximum limit point without further increase. However, power loss still persists in the power transistors during this phase. Therefore, when short circuits or load issues occur, immediately shut down the power supply and troubleshoot promptly to restore normal operation. Additionally, avoid continuous instantaneous short circuits at the output terminal to prevent damage to internal circuitry.

4.3 Do Not Touch

This power supply belongs to a high-power instrument, so attention should be paid to the ventilation and heat dissipation of the power supply when it is used under heavy load. The temperature of the power supply shell and radiator is very high, do not touch it with your hands, otherwise you will be burned!

4.4 Connect to the Ground

The protection and grounding end of the three-core power line must be reliably and safely grounded to ensure the safety of users and surrounding instruments!

4.5 Place

To ensure optimal machine performance, store the device in a well-ventilated environment ($23^{\circ}\text{C} \pm 5^{\circ}\text{C}$) during extended use. Avoid operating in environments exceeding 40°C . When not in use, unplug the power cord immediately. Keep all other equipment and flammable materials away from the unit.

4.6 Preheat

When the power supply is idle for a long time and reused, it should be powered on and preheated for at least 30 minutes, and then the instrument can be put into use after running stably.

4.7 Cleaning

Wipe the device with a soft cloth moistened with mild detergent and water. Do not spray cleaning agents directly onto the machine, as this may cause internal damage. Avoid using products containing hydrocarbons or chloride, or similar solvent, or abrasive detergent is not allowed.

4.8 Replacement of Fuse

If the fuse is burnt out, the CV/CC indicator will not light up and the instrument will fail to operate. The fuse typically won't open circuit unless there's a malfunction in the device itself. First, identify the cause of the fuse failure and replace it with a properly rated replacement unit. The fuse housing is located on the back panel. For safety reasons, always disconnect the power supply by removing the cord from the outlet before performing any replacement operations!

4.9 Fault Handling

If there is any abnormality in the instrument, please send it to the professional technical maintenance personnel of the manufacturer or designated distributor. Do not repair by yourself, otherwise the manufacturer will not be held responsible for all the consequences caused!

Chapter V Declaration of Toxic and Harmful Substances in Products

Part name	Products toxic and harmful substances or elements					
	lead (Pb)	mercury (Hg)	cadmium (Cd)	Hexavalent chromium (Cr(VI))	Polychlorinated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Printed electricity	X	O	O	O	O	O
Road co- mponents						
transformer	X	O	O	O	O	O
connecting line	X	O	O	O	O	O
Hardware chassis	X	O	O	O	O	O
power line	X	O	O	O	O	O
electron material	O	O	O	O	O	O
plastic cement	O	O	O	O	O	O
face-plate						
pack material	O	O	O	O	O	O

O: indicates that the content of the toxic and harmful substance in all homogeneous materials of the component is below the limit requirements specified in SJ/T 11363-2006 standard.

X: indicates that the content of the toxic and harmful substance in at least one homogeneous material of the component exceeds the limit requirements specified in SJ/T 11363-2006.

Note: This table shows that the product may contain these substances, but this information may be updated with technological development; the reason for marking "X" is that there is no technology and components available to provide alternatives at this stage, and it complies with the requirements of the Pollution Control Management Measures for Electronic Information Products of the People's Republic of China.

Chapter VI. Warranty Services

6.1 We sincerely appreciate your choice of our power supply. Our company will strictly implement the national three-warranty policy (repair, replacement, and return). For non-human-induced product quality issues, you may process repairs, replacements, or returns with your invoice and warranty certificate. For products beyond the warranty period, only spare parts replacement fees will be charged.

6.2 Please pack the products properly when sending them for repair. If there is any damage or loss during transportation, our company will not be responsible.

6.3 Please make sure that the warranty card is stamped and dated by the after-sales unit to ensure your rights and interests.

6.4 The following situations are not covered by the exemption service:

- (1) Exceeding the validity period of the three guarantees.

- (2) Unauthorized alteration of the three guarantees certificate.
- (3) Damage caused by failure to use, maintain and keep the product as required in the product instructions.
- (4) Natural disasters, power grid failures or other force majeure factors cause product damage.
- (5) The accessories are not covered by the warranty.
- (6) The product model or number on the three certificates does not match the physical goods.

Warranty Card

This card is the product warranty certificate, please be sure to keep it safe

Product name (product model)	
date of purchase	
Vendors	
customer name	
Customer address	
Customer phone number	
Description of the fault	

Note: Free warranty service is available within 12 months (excluding accessories), and the shipping cost is borne by the sender (only mainland customers)