Notes: the manual is applicable to full series power supply of our company.

Safety marks

(please pay attention to the marks during operation to avoid any harm to the power supply)

WARNING (Avoid physical injury)

HIGH VOLTAGE

GR

AC

Storage, Transport, Maintenance, Disposal

- **Storage**

Well packed when unused and store it in suitable environment (away from sunshine & good ventilation)

- **Transport**

Check the power supply is well packed & tagged with suitable marks before transport; avoid fall-off during transport!

- **Maintenance**

Only professional electric engineers could do the maintenance job

- **Disposal**

Comply with local regulation on electric goods disposal

Table of content

Chapter 1 Brief Introduction

1.1 Principle

PWM technology and imported IGBT or MOSFET are applied for our high-frequency switching power supply, compared to SCR power supply & linear power supply, it is lower in size & weight, and higher in power factor & efficiency, it also has quicker response time.

Now, it is widely used for electroplating, electrolysis, communication, battery charging and components testing etc.

1.2 Electric Specifications

1.2.1 Technology parameters

- Power switching tube: High-speed IGBT, magnetic core
- Applicable for all loads
- Environment conditions
  1. Working temperature: 5~45℃, indoor use only.
  2. Relative humidity: 5%~95% (non-condensing)
  3. Atmosphere pressure: 70~106KPA
- Main control board coating class: 3C3
- Input voltage: AC 220V±25%+PE, 50Hz±5%
- CV working status
  Voltage continuously adjustable from 0 to Max. value via 10-turn potentiometer (auto-switch to CC status when limit current reached)
- CC working status
  Current continuously adjustable from 0 to Max. value via 10-turn potentiometer (auto-switch to CV status when limit voltage reached)
- Regulation accuracy
  Linear regulation: ≤±0.1V (input voltage±10%)
  Load regulation: ≤±0.1V (15%~100% load variance)
  Dynamic response: ≤±1V, ≤±1A, (CV working status, 25%~75% load dynamic variance)
  Stability: ≤±0.1V (during 8 hrs working)
  Temp. coefficient: ±0.5V / ℃

Output voltage: 0~Maximum value≤±0.5V
Output current: 0~Maximum value≤±0.5A
Efficiency: ＞85%
Ripple voltage: ≤5%

- Working mode: Long-term continuously working with full load.
- Insulation: ≥20M (no breakthrough & flash-over) B class
  Input to shell: ≥1500VAC, 1min, leakage current ≤30mA
  Input to output: ≥1500VAC, 1min, leakage current ≤30mA
  Output to shell: ≥500VDC, 1min, leakage current ≤30mA
- Protection features
  Short protection
  Over current protection (current limit)
  Input over voltage/lack voltage protection, AC input breaker (built-in fuse)
  Auto-recover when fault removed
- Cooling method: forced air cooling
- Display: Output voltage, current display, 3 1⁄2 digits LED display (range: 1%~100% rated value)

1.2.2 Optional functions

Item	Standard function	Optional function
ON/OFF	○	
CV/CC CP Control	○	
Voltmeter	○	
Ammeter	○	
Power meter		●
Timer		●
Digital ammeter		●
Fault alarm	○	
Remote control		●
Soft-start	○	
PLC Control		●

1.2.3 General Specification

Control mode		PWM control switch mode
Input	Voltage	Single-phase 220VAC
	Frequency	50 / 60HZ
	Voltage range	±25%
Output	Control	CV, CC
	Regulation range	0~rated value (current, voltage)
	Accuracy	Rated value±1%
	Tolerance	RMS 5%

Chapter 2 Installation

2.1 Installation requirement

- Check the appearance, logo, model no. & spare parts (manual, power cord) after unpacking.
- Check the power switch at OFF position, then install, connect & test according the manual and keep the ventilation hole at least 50cm distant from the wall.
- No objects on roof of the power supply
- Installation environment should be suitable for use.
- Check the input voltage is right, connect power cord according "+" "-"marks and make it tightly

  Note: shell or plug grounding wire must be grounded! (because high frequency filter built inside, there would be high frequency filtering current through the shell)

2.2 Wiring method

Two issues should be taken into account for input / output wire selection.

- Withstand voltage value of wire should be higher than rated input / output voltage value.
- Safe current carrying capacity of wire should be higher than rated input / output current value.

Calculation formula as below:

Single-phase I＝P /（V*cosϕ）

P – active power I - current U – single-phase voltage COSQ – power factor

Tri-phase I＝P/(3^(1/2)*V*cosϕ)

P – active power I - current U – tri-phase voltage COSQ – power factor 3^(1/2) – about 1.732

Wire diameter ($mm^{2)}$		2.5	4	6	10	16	25	35	50	70	95	120
Copper core	Safe current carrying A	28	35	48	65	95	120	140	175	210	285	360
Within 10m	Current carrying factor	10	9	8	7	6	5	4	3.5	3	3	3
Aluminum core	Safe current carrying A	23	32	42	60	80	100	123	150	175	238	300
Within 10m	Current carrying factor	9	8	7	6	5	4	3.5	3	2.5	2.5	2.5

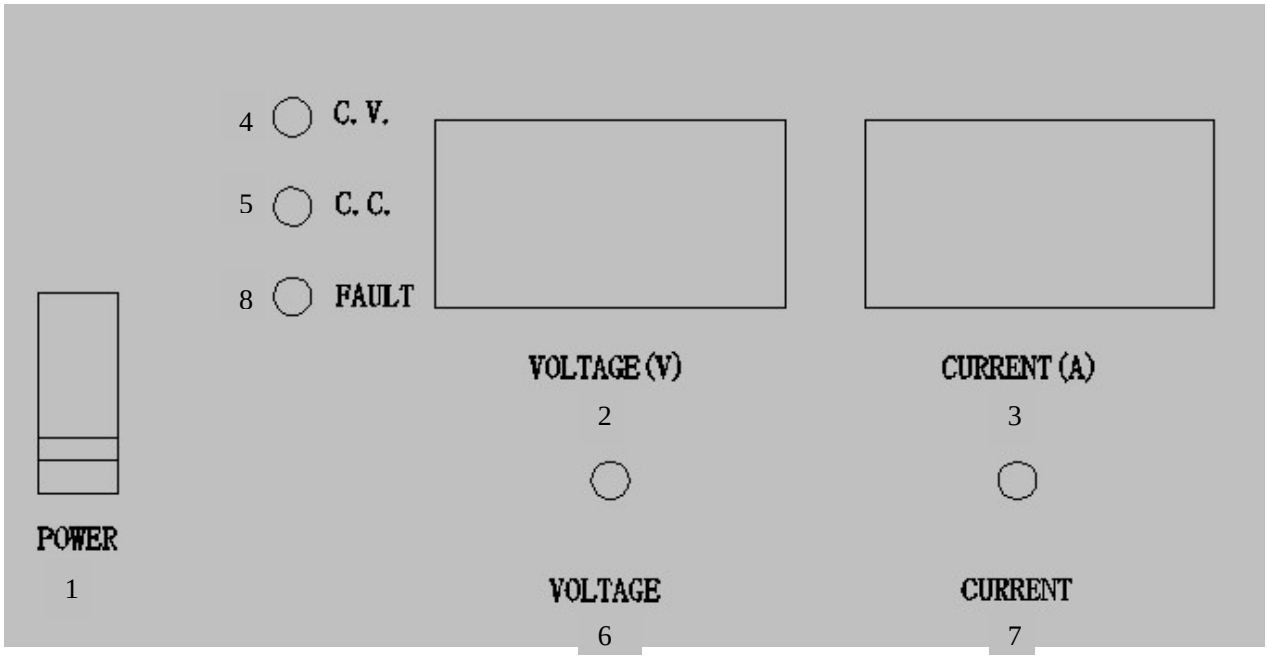
Wire diameter calculation formula as below

Copper wire: S= IL / 54.4
Aluminum wire: S= IL / 34
I - Maximum current of wire (A)
L - Wire length (m)
S - Wire sectional area (mm^2)
Wire current carrying capacity is in inverse proportion to wire length, the table above is listed under length no more than 10m, and factor is "1", if the length is 10~50m, the factor would be 0.5, if the length is 50~200m, the factor would be 0.3, and for 200~500m, the factor would 0.2.

Please check example below for estimating:
For Aluminum core insulation wire with sectional area less than 2.5mm^2 its current carrying capacity is about 9 times of its sectional area, that is, 2.5*9=22.5A
For wire with sectional area more than 4 mm^2 its current carrying capacity is (9-1)*wire number, that is, 4*8, 6*7, 10*6, 16*5, 25*4.
For wire with sectional area 35 mm^2 its current carrying capacity is 3.5 times of its sectional area, that is. 35*3.5=122.5A
For wire with sectional area 50 mm^2 & 70mm^2 its current carrying capacity is 3 times of its sectional area.
For wire with sectional area 90 mm^2 & 120mm^2 its current carrying capacity is 2.5 times of its sectional area.
The estimating formula is based on 25℃ ambient temperature & aluminum wire, if the temperature is high than 25℃, the current carrying capacity should be 10% discounted, if for copper wire, the wire number should be less than aluminum wire number, for example, for aluminum wire, wire number is 25mm^2, copper wire number would be 16mm^2

Chapter 3 Operation Instruction

3.1 Front Panel Instruction



Font panel scheme

1 ➔ Power switch
2 ➔ Output voltage display
3 ➔ Output current display
4 ➔ CV indicator light
5 ➔ CC indicator light
6 ➔ Voltage adjustor
7 ➔ Current adjustor
8 ➔ Fault indicator light

3.2 Operation instruction

3.2.1 Primary checking & Connection

1. Check the power supply & spare parts after unpacking, read the manual carefully before operation, then locate the power supply in suitable position, at least 0.5m distant from object around, and keep the power supply away from heat, humidity, dust & corrosive air.

(recommended humidity & temperature: 25%~70%, 20℃~30℃)

2. Check the input power cord and connect tightly according to manual.

3. Please connect the grounding wire as "⊥" on the shell to avoid static electricity.

4. For water-cooled type, please check water inlet / outlet connection & hydraulic pressure before operation.

5. Turn current adjustor anticlockwise to the end and then clockwise for one turn (for current-limit & power-limit purpose)

6. Turn on power switch, the fan starts to run and indicator light becomes lighted.

7. Turn voltage adjustor clockwise, voltage value would rise accordingly, and then CV indicator light becomes lighted.

8. Turn voltage adjustor to the Maximum position, then voltmeter would display rated value, ammeter would indicate according to the load.

9. Turn off the power supply

10. Shell would become heated and has static electricity during working for inner high frequency magnetic field, it is normal phenomenon, if all above are fine, please connect the load for operation.

3.2.2 Operation Instruction

Please check all switches are in OFF position, and turn all the adjustors to the minimum position before operation

1. CV working setting: connect the load, turn all the adjustors to the minimum position, turn on power switch (1), then turn current adjustor (7) to the maximum position and then turn back for one turn, and then turn voltage adjustor (6) to required value, now output voltage value remains, current varies with the load.

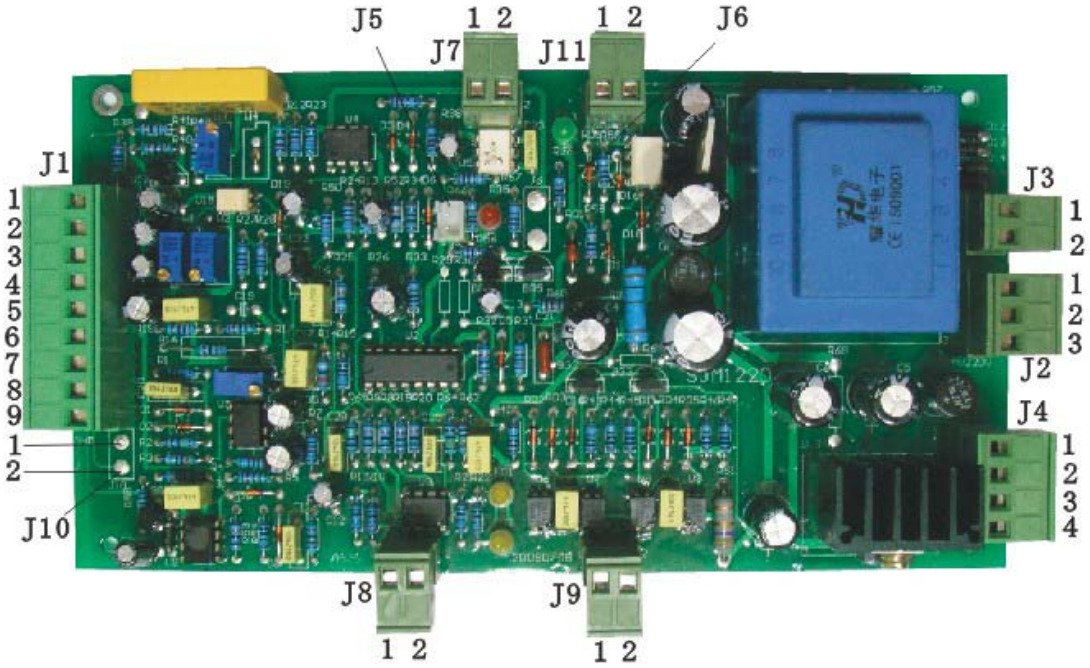
2. CC working setting: connect the load, turn all the adjustors to the minimum position, turn on power switch (1), then turn voltage adjustor (6) to the maximum position and then turn back for one turn, and then turn current adjustor (7) to required value, now output current value remains, voltage varies with the load.

Chapter 4 Calibration

4.1 Maintenance

- Clean the power supply periodically, please follow steps as below:
- Do not open the enclosure until 30 mins after input cut-off
- Clean inside with dry cloth or hairbrush or air blower, but air pressure could not be too high.
- Check the air switch periodically
- Check the fan periodically
- Check whether the bus bar is oxidized and clean periodically
- Check the tightness of screws
- Check whether there is a leakage in inner waterway (for water-cooled type)

4.2 Main control board terminal calibration instruction



Main control board figure

J1: ①+5V reference power supply ②0～5V reference voltage ③0～5V reference current ④GND ⑤+12V ⑥+12V ON 0V STOP ⑦ voltage feedback sampling input ⑧GND ⑨current feedback sampling input

J2: ①③ AC220Vinput

J3: ①② over current protection CT input

J4: ①② drive signal amplifying power supply input AC18V～24V ③④DC20V～30V output ③+ ④-

J5: ①② alarm LED output ①+ ②-

J6: ①② alarm buzzer interface +15V output，①+ ②-

J7: ①② over heat protection normal open interface (shut down output when over heat) ①- ②+

J8: ①② CC/CV indication ①+CV ②+CC

J9: ①② Drive pulsing signal output ±12V

J10: ①② IGBT protection signal input interface ①- ②+

J11: ①② primary protection ①- ②+

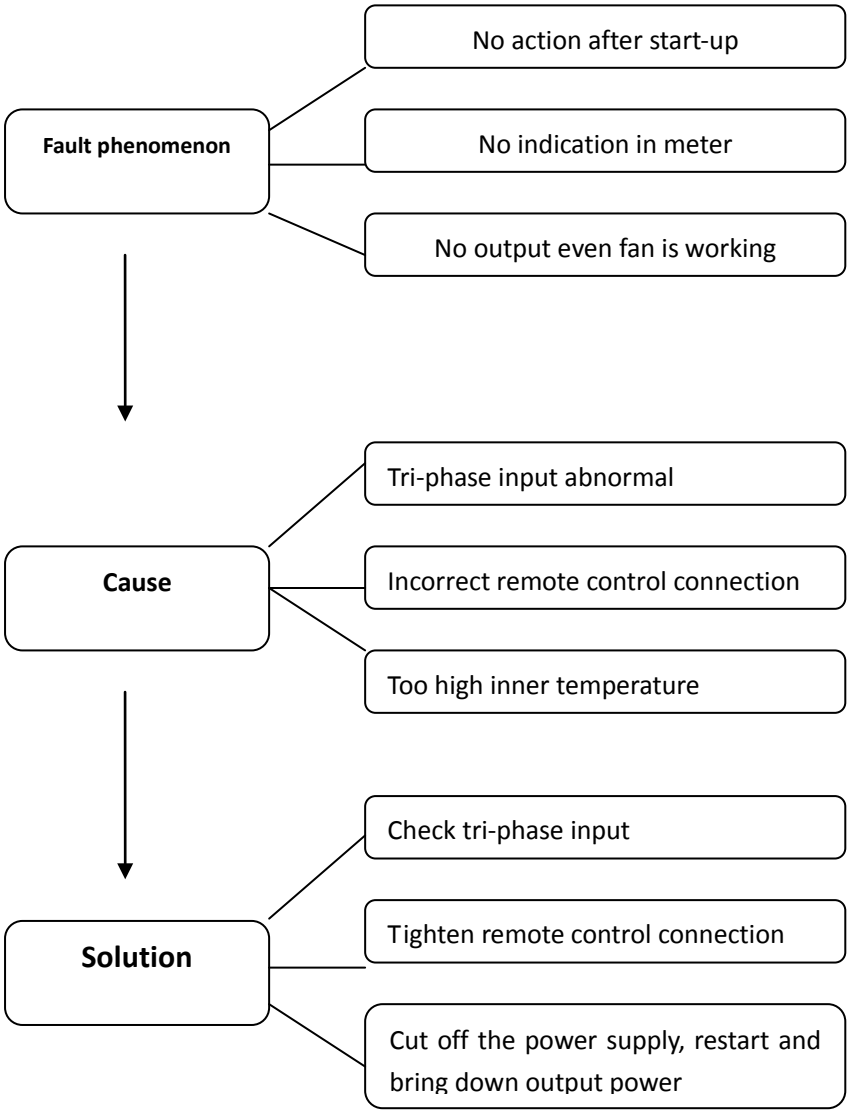
Chapter 5 Troubleshooting

5.1 Troubleshooting & Maintenance

- Stop the power supply when tripping, normally it is caused by rectifier bridge breakthrough or inversion bridge module broken, please check the model no. and replace accordingly.
- Cut off the power supply for a while when fault indicator light lighted, and restart the power supply, if still in fault, please check for cause of fault.
- If ammeter or voltmeter has no display, it might be caused by fall off or meter plug-in unit or 5V powering power supply broken, please check and replace
- If voltmeter & ammeter both show “000” after start-up, it might be reference potentiometer broken or drive circuit faulty or inversion power module broken, please check and replace accordingly.
- If output voltage adjustable from 0 to rated value but output current abnormal, it might be outer load problem, please check the load connection.
- Only professional person could do maintenance.
- If fault could not be solved, please contact with us directly.

5.2 Normal problems and solutions

If fault occurs, it is recommended to contact with us first, since some problems could be caused by improper operation or maintenance



5.3 Block diagram