SP series Single Channel Output DC Power Supply

User Manual

For product support, visit:www.owon.com.hk/download

※：The illustrations, interface, icons and characters in the user manual may be slightly different from the actual product. Please refer to the actual product.

General Warranty

We warrant that the product will be free from defects in materials and workmanship for a period of 2 years (1 year for accessories) from the date of purchase of the product by the original purchaser from our company. This warranty only applies to the original purchaser and is not transferable to a third party.

If the product proves defective during the warranty period, we will either repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by our company for warranty work may be new or reconditioned like new. All replaced parts, modules and products become the property of our company.

In order to obtain service under this warranty, the customer must notify our company of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the designated service centre, a copy of the customers proof of purchase is also required.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. We shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than our company representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of not our supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Please contact the nearest Sales and Service Offices for services.

Excepting the after-sales services provided in this summary or the applicable warranty statements, we will not offer any guarantee for maintenance definitely declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. We should not take any responsibilities for any indirect, special or consequent damages.

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1. General Safety Requirements

Before use, please read the following safety precautions to avoid any possible bodily injury and to prevent this product or any other connected products from damage. To avoid any contingent danger, ensure this product is only used within the ranges specified.

Only a qualified person should perform internal maintenance.

To avoid Fire or Personal Injury:

- **Use Proper Power Cord.** Use only the power cord supplied with the product and certified to use in your country.
- **Product Grounded.** This instrument is grounded through the power cord grounding conductor. To avoid electric shock, the grounding conductor must be grounded. The product must be grounded properly before any connection with its input or output terminals.
- **Check all Terminal Ratings.** To avoid fire or shock hazard, check all ratings and markings on this product. Refer to the user manual for more information about ratings before connecting to the instrument.
- **Do not operate without covers**. Do not operate the instrument with covers or panels removed.
- **Use the Proper Fuse.** Use only the specified type and rating fuse for this instrument.
- **Avoid exposed circuit**. Be careful when working on exposed circuitry to avoid risk of electric shock or other injury.
- **Do not operate if any damage.** If you suspect damage to the instrument, have it inspected by qualified service personnel before further use.
- **Use your instrument in a well-ventilated area.** Please keep well ventilated and inspect the intake and fan regularly.
- **Do not operate in damp conditions.** To avoid short circuiting to the interior of the device or electric shock, please do not operate in a humid environment.
- **Do not operate in an explosive atmosphere.** To avoid damages to the device or personal injuries, it is important to operate the device away from an explosive atmosphere.
- **Keep product surfaces clean and dry.** To avoid the influence of dust or moisture in air, please keep the surface of device clean and dry.

2. Safety Terms and Symbols

Safety Terms

Terms in this manual (The following terms may appear in this manual):

Warning: Warning indicates conditions or practices that could result in injury or loss of life.

Caution: Caution indicates the conditions or practices that could result in damage to this product or other property.

Terms on the product. The following terms may appear on this product:

Danger: Indicates an immediate hazard or injury possibility.

Warning: Indicates a possible hazard or injury.

Caution: Indicates potential damage to the instrument or other property.

Safety Symbols

Symbols on the product. The following symbols may appear on the product:

Hazardous Voltage

Refer to Manual

Protective Earth Terminal

Chassis Ground

Public Ground

3. Quick Review

3.1 Panel and Interface

3.1.1 Front Panel

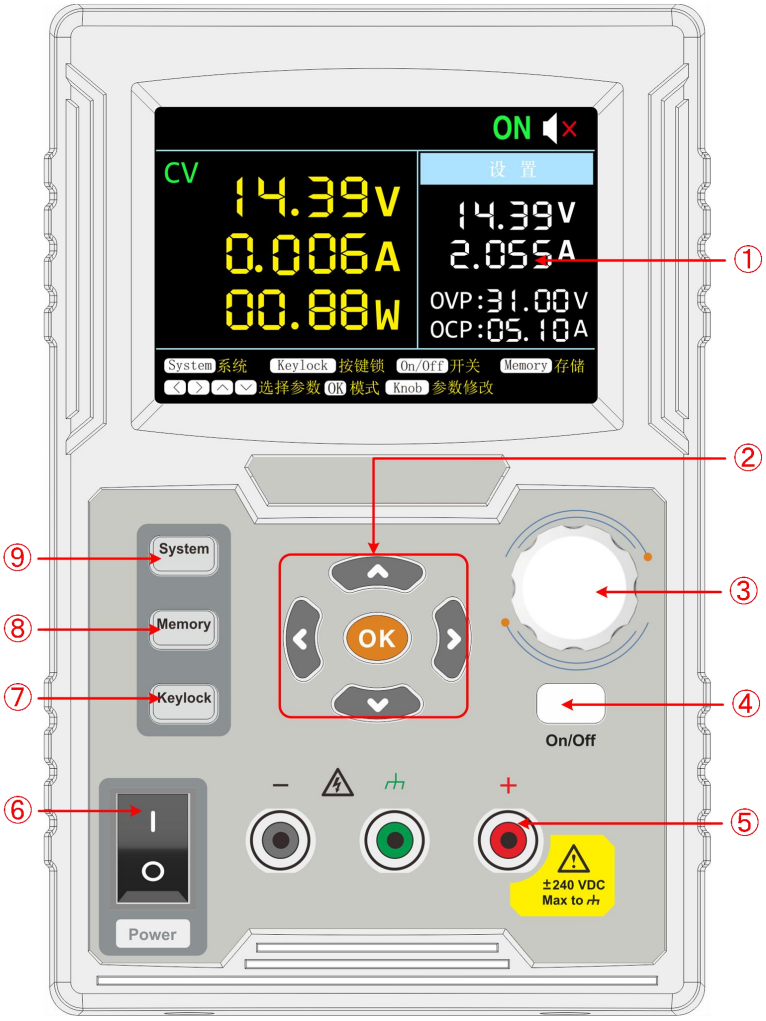


Figure **3-1** Front Panel Overview

①	**Display Area**	Display user interface.
②	**Direction Key**	Select menu; select parameters; Edit the cursor.
	OK Key	1) Enter the menu or confirm the entered parameters. 2) Switch the display mode between Number and Curve.
③	**Knob**	Select the main menu or change the value, function equals to the confirmation key.
④	**On/Off Key**	Turn on/off the channel.

⑤	**Channel Output Terminal**	Output access of channel.
⑥	**Power Button**	Turn on/off the instrument.
⑦	**Keylock Key**	Press and hold this button for about 5 seconds. When you hear a beep, the panel is locked and the lock icon is displayed on the top of the screen. When locked, pressing any other key has no effect. In the locked state, press and hold this button for about 5 seconds. When you hear a beep, the panel is unlocked.
⑧	**Memory Key**	5 sets of channel parameters can be stored for quick output.
⑨	**System Key**	System settings, interface settings, system information.

Button light instruction

On/Off key: The key lights up when the channel turns on.

3.1.2 Rear Panel

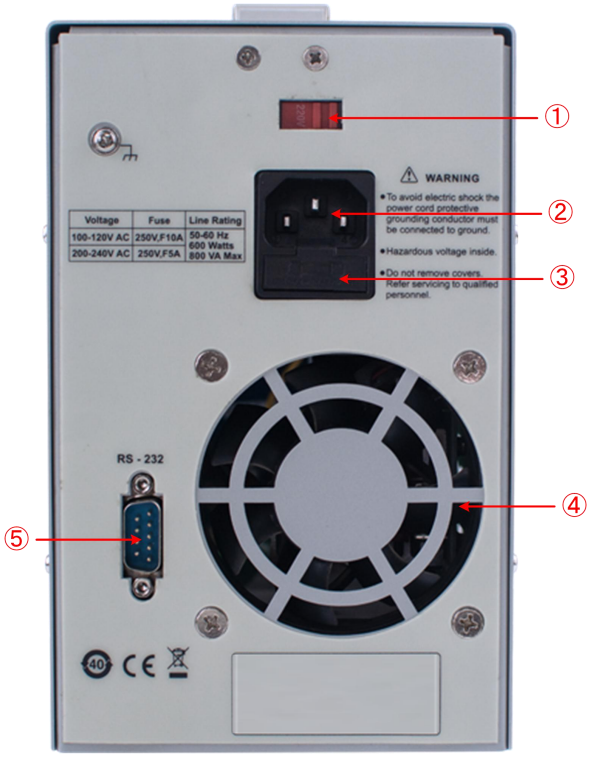


Figure 3- 2 Rear Panel Overview

①	**Power switch**	Switch between 110 V and 220 V.
②	**AC Power Input Jack**	AC power input interface.
③	**Fuse**	Power fuse.

④	**Air Vent**	Air vent.
⑤	**COM port**	Connect the serial port of the instrument and external device.

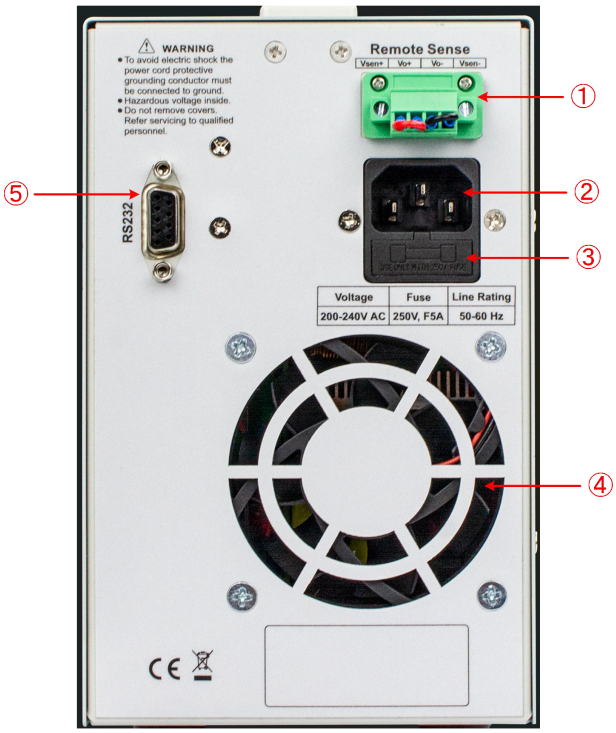


Figure 3- 3 SP80 Series Rear Panel Overview

①	**Remote Compensation**	Vsense+, Vo+, Vo-, Vsense-.
②	**AC Power Input Jack**	AC power input interface.
③	**Fuse**	Power fuse.
④	**Air Vent**	Air vent.
⑤	**COM port**	Connect the serial port of the instrument and external device.

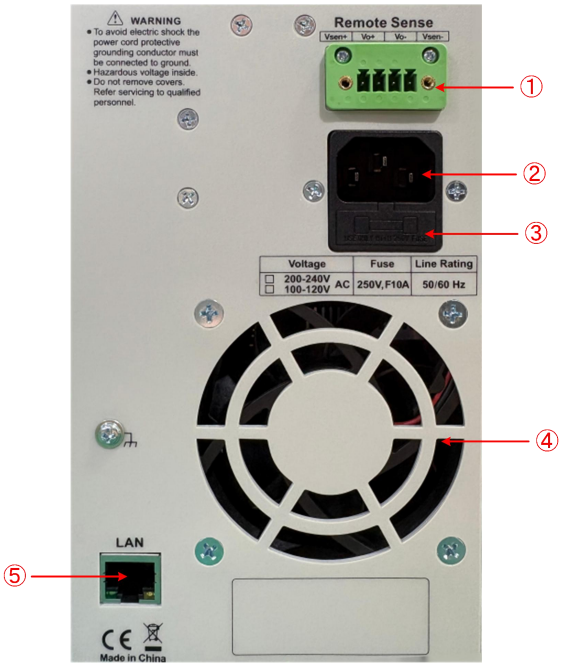


Figure 3-4 SP80-L Series Rear Panel Overview

①	**Remote Compensation**	Vsense+, Vo+, Vo-, Vsense-.
②	**AC Power Input Jack**	AC power input interface.
③	**Fuse**	Power fuse.
④	**Air Vent**	Air vent.
⑤	**LAN port**	Update the firmware, PC software control port.

3.1.3 User Interface

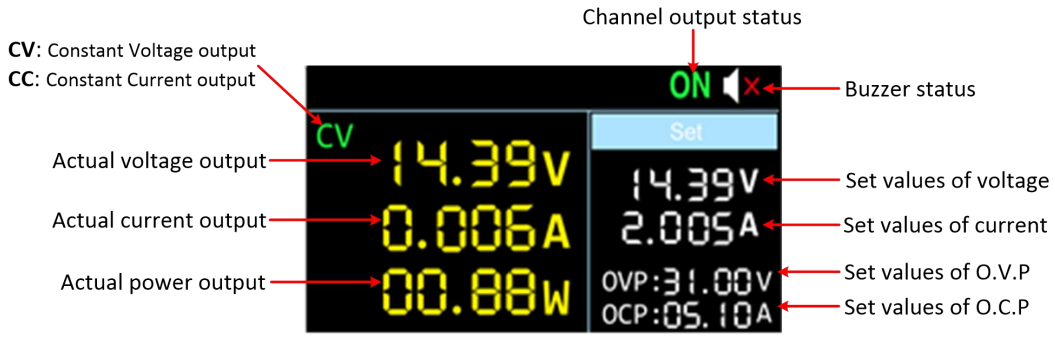


Figure 3-5 User Interface

3.2 General Inspection

After you get a new power supply, it is recommended that you should make a check on the instrument according to the following steps:

1. **Check whether there is any damage caused by transportation.**

   If it is found that the packaging carton or the foamed plastic protection cushion has suffered serious damage, do not throw it away first till the complete device and its accessories succeed in the electrical and mechanical property tests.

2. **Check the Accessories**

   The supplied accessories have been already described in the "Appendix A: Enclosure" of this Manual. You can check whether there is any loss of accessories with reference to this description. If it is found that there is any accessory lost or damaged, please get in touch with the distributor of our responsible for this service or the our local offices.

3. **Check the Complete Instrument**

   If it is found that there is damage to the appearance of the instrument, or the instrument can not work normally, or fails in the performance test, please get in touch with the our distributor responsible for this business or the our local offices. If there is damage to the instrument caused by the transportation, please keep the package. With the transportation department or the our distributor responsible for this business informed about it, a repairing or replacement of the instrument will be arranged by the we.

3.3 Power Inspection

(1) Use the power cord supplied with the accessories to connect the instrument to the AC power.

> ⚠ **Warning:**
> To prevent electric shock, make sure that the instrument is properly grounded.

(2) Press the **power button** on the front panel, the button light will be on, and the startup screen will be displayed on the screen.

3.4 Output Inspection

Output inspection is to ensure that the instrument can achieve its rated outputs and properly respond to operation from the front panel. For the procedures below, it is suggested that you read "*Turn On/Off the Channel Output*" on page 8 and "*Set the Output Voltage/Current*" on page 8.

3.4.1 Voltage Output Inspection

The following steps verify basic voltage functions without load:

(1) When the instrument is under no load, select a channel and ensure the output current setting for this channel is not at zero.

(2) Turn on the channel output, then ensure the channel is in Constant Voltage output mode.

(3) Set some different voltage values on this channel; check if the actual voltage value displayed is close to the set voltage value, and also that the actual current value displayed is nearly to zero.

(4) Check that if the output voltage can be adjusted from zero to the maximum rating. When it is set to the maximum or minimum, a beep is heard, indicating that the limit has been reached.

3.4.2 Current Output Inspection

The following steps check basic current functions with a short across the power supply's output:

(1) Connect a short across (+) and (-) output terminals with an insulated test lead on this channel. Use a wire size sufficient to handle the maximum current.

(2) Set the output voltage to the maximum rating on this channel.

(3) Turn on the channel output. Ensure the channel you used is in Constant Current output mode.

(4) Set some different current values on this channel; check if the actual current value displayed is close to the set current value, and to check if the actual voltage value displayed is nearly zero.

(5) Check that if the output current can be adjusted from zero to the maximum rating, When it is set to the maximum or minimum, a beep is heard, indicating that the limit has been reached..

(6) Turn off the channel output and remove the short circuit from the output terminals.

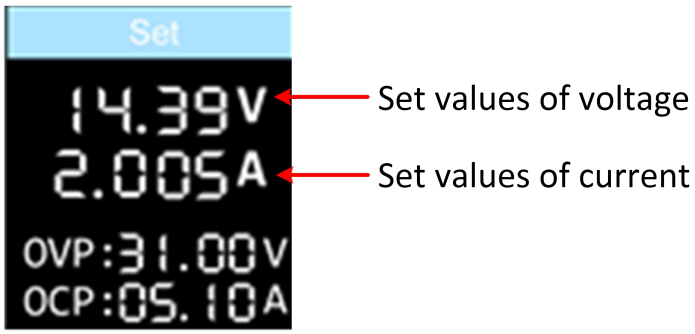
4. Panel Operation

4.1 Turn On/Off the Channel Output

Press the **On/Off** key to turn on/off the channel;

4.2 Set the Output Voltage/Current

In the channel setting area, press the ∧ / ∨ keys to move the red cursor between parameters. After selecting the output voltage/current setting value, turn the **knob** to change the current cursor value, and press < / > key to move the cursor position.



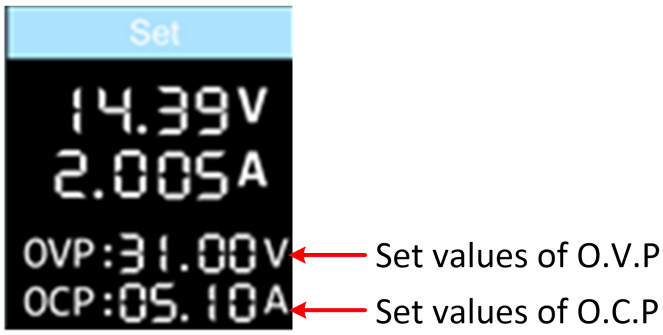
4.3 Over Voltage/Current Protection

Overvoltage protection (O.V.P) or overcurrent protection (O.C.P): after the output is turned on, once the output voltage/current reaches the set value of O.V.P/O.C.P, the instrument will cut off the output, a warning will show on the screen.

Note:
When the instrument disables the output due to protection, after you make some adjustments, the channel must be restarted to output normally.

This function can keep the power output from exceeding the load rating to protect the load.

In the channel setting area, press the ∧ / ∨ keys to move the red cursor between parameters. After selecting the overvoltage/overcurrent protection value, turn the **Knob** to change the current cursor value, and press the < / > direction key to move the cursor position.



4.4 Memory key shortcut settings

Press **Memory** key on front panel, the M1, M2, and M3 keys can store five sets of channel parameters M1, M2, M3, M4, and M5, respectively, for quick output.

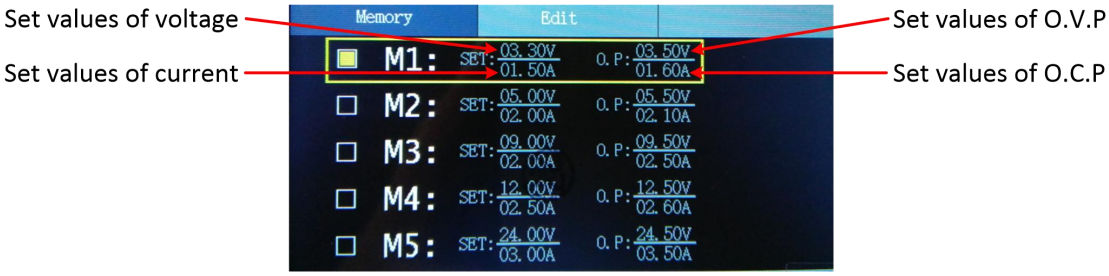
4.4.1 Quick output

To output a set of parameters from M1 to M5, follow these steps:

(1) Press **Memory** key on front panel, the shortcut interface will display.

(2) Press ∨ key and shows the yellow select box. Press ∧ / ∨ to move the select box.

(3) After selecting the certain parameter, press **knob** or **OK** on the panel to confirm the input value.



4.4.2 Edit

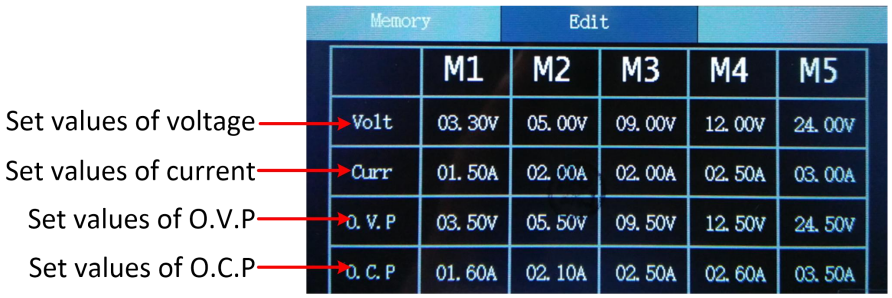
To edit the channel parameters of M1 to M5, follow these steps:

(1) Press the front panel **Memory** button, the screen displays the quick setup interface.

(2) Press the > arrow keys to display the editing interface.

(3) Press the ∨ keys to show a red cursor.

(4) Press the ∧ / ∨ / < / > keys to move the red cursor between parameters. Turn the **knob** to change the current cursor value, press the < / > arrow keys to move the cursor.



4.5 System Settings

4.5.1 Display Brightness

Press the System softkey and turn the **knob** to highlight the **System** main menu. Press the ∨ keys to highlight the **Brightness** submenu. Press the < /

> keys to adjust the brightness of the screen. The adjustment range is from 1 to 100.

4.5.2 Language Setting

Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose the **language**. Press the < / > arrow keys to select the desired language. Supported languages include Chinese and English.

4.5.3 Buzzer

Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **buzzer** submenu. Press the < / > arrow keys to toggle the beeper on/off. When the buzzer is on, the status bar icon lights up. When the system prompts, it beeps, such as when the output is cut due to overvoltage/overcurrent protection.

4.5.4 Display

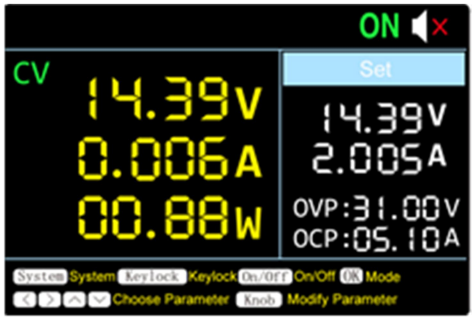
Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **Display** submenu. Press the < / > arrow keys or turn the **knob** to set the display mode to **Number** or **Curve**.

In system main interface, you can also press the **OK** key or press the **knob** to toggle between **Number** and **Curve** display mode.

Number

Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **Display** submenu. Press the < / > arrow keys or turn the **knob** to set the display mode to **Number**.

In system main interface, you can also press the **OK** key or press the **knob** to select the **Number** display mode. When the power supply is powered on, the default display mode is Number.



Curve

Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **Display** submenu. Press the < / > arrow keys or turn the **knob** to set the display mode to **Curve**.

In system main interface, you can also press the **OK** key or press the **knob** to select the **Curve** display mode.

Curve Type

You can set the type of the displayed curve to voltage curve or current curve.

1) Voltage Curve

Two methods to set the curve type to voltage curve.

- **1st Method:**

Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **Display** submenu. Press the < / > arrow keys or turn the **knob** to set the display mode to **Curve**. Press the ∨ arrow keys to choose **CurveType** submenu, press the < / > arrow keys or turn the **knob** to set the curve type to **Volt**.

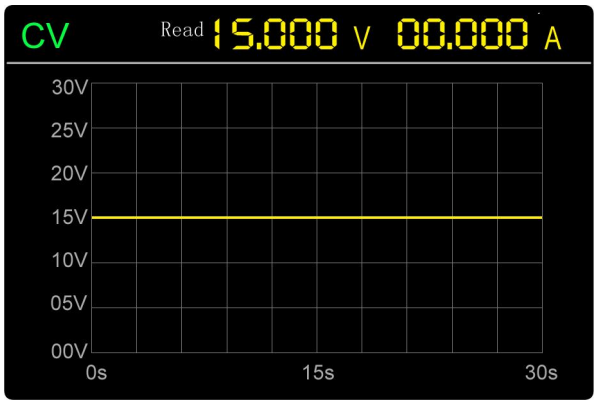
- **2nd Method:**

In system main interface, you can also press the **OK** key or press the **knob** to select the

Curve display mode. Press the ∧ / ∨ arrow keys to select the **Volt** curve

type.

The display mode of Volt curve is as below:



Note: In Volt curve display mode, you can still set the value of voltage or current. Press the < / > arrow keys or turn the **knob** to enter editing mode (edit voltage first). If the value is not changed, editing mode will be exited.

2) Current Curve

Two methods to set the curve type to current curve.

- **1st Method:**

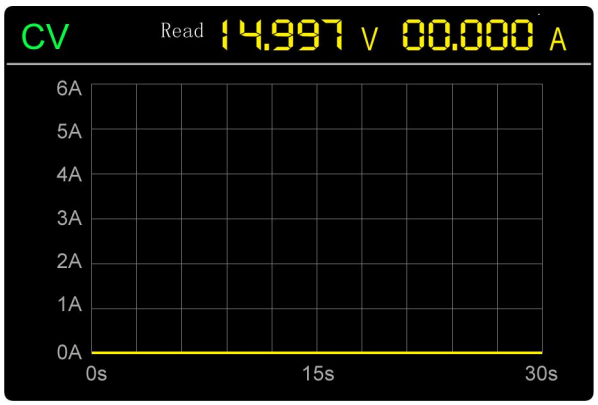
Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **Display** submenu. Press the < / > arrow keys or turn the **knob** to set the display mode to **Curve**. Press the ∨ arrow keys to choose **CurveType** submenu, press the < / > arrow keys or turn the **knob** to set the curve type to **Curr**.

- **2nd Method:**

In system main interface, you can also press the **OK** key or press the **knob** to select the

Curve display mode. Press the ∧ / ∨ arrow keys to select the **Curr** curve type.

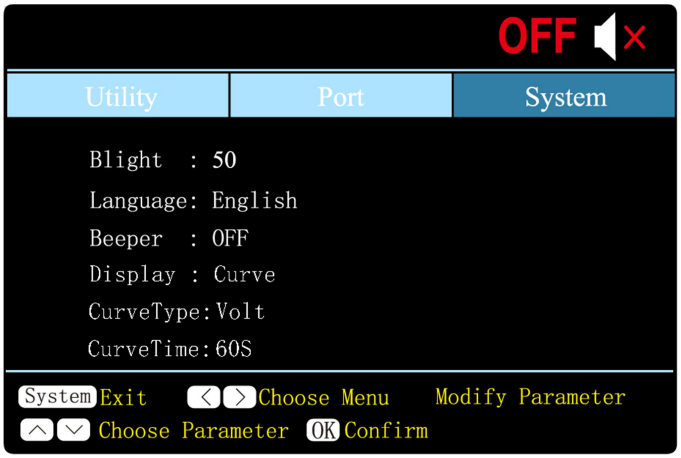
The display mode of Curr curve is as below:



Note: In Curr curve display mode, you can still set the value of voltage or current. Press the < / > arrow keys or turn the **knob** to enter editing mode (edit current first). If the value is not changed, editing mode will be exited.

3) Curve Time

Press the **System** softkey and turn the **knob** to select the [Utility] menu. Press the ∨ arrow keys to choose **CurveTime** submenu. Press the < / > arrow keys or turn the **knob** to set the display mode to **Curve**. Press the ∨ arrow keys to choose **CurveTime** submenu, press the < / > arrow keys or turn the **knob** to set the curve time to **30S** or **60S.**



4.6 Interface Setting

(1) Press the ∨ arrow keys to select the **baud rate**, and press the < / > arrow keys to set the baud rate of the RS232 serial interface. The optional values for the baud rate are: 2400, 4800, 9600, 19200, 38400, 57600, 115200, and the factory default setting is 115200. Make sure the instrument's baud rate setting matches the baud rate setting of the

computer you are using.

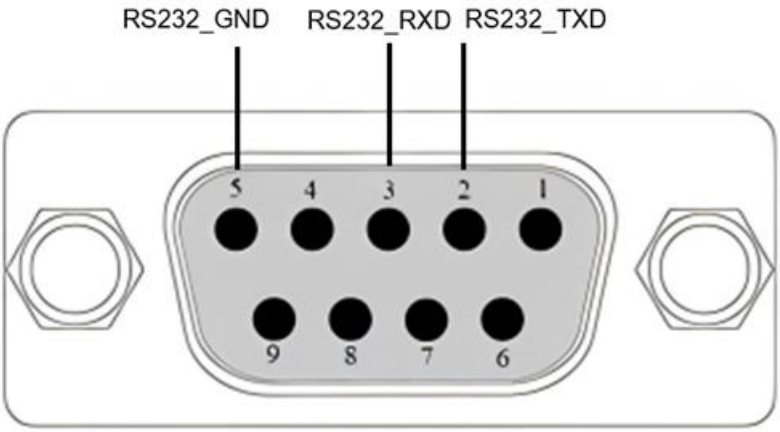
(2) Press the ∨ arrow keys to select the **check digit** and press the < / > arrow keys to toggle None, Odd, Even.

(3) Press the ∨ arrow keys to select the **stop bit**, and press the < / > arrow keys to toggle 1 or 2.

Note:

- The **data bits** submenu cannot be set, and the data bits are fixed at 8 bits.
- This product supports RS232 serial communication. The corresponding pin definitions (for DB9 connectors) are listed in the table below; the SP80 series features a female socket, while other models feature male sockets.

Pin	Function	Support Protocol	Define
Pin 2	RS232	SCPI	TXD
Pin 3			RXD
Pin 5			GND



4.7 System Information

4.7.1 Review System Information

Press the **System** softkey and turn the **knob** to select the **[SYSTEM]** menu. The screen shows the model number, version number, serial number , and checksum of the machine.

4.7.2 Restore Factory Settings

Press the **System** softkey and turn the **knob** to select the **[SYSTEM]** menu. Press ∨ arrow keys to select the **Factory Reset** submenu. Press **OK** to restore the factory default settings. See the factory setting detail table below

<table>
<tr><td rowspan="7">System</td><td colspan="2">Backlight</td><td colspan="2">50%</td></tr>
<tr><td colspan="2">Buzzer</td><td colspan="2">On</td></tr>
<tr><td rowspan="4">Port</td><td rowspan="4">Port Setting</td><td>Baud Rate</td><td>115200</td></tr>
<tr><td>Data Digit</td><td>8</td></tr>
<tr><td>Parity Check</td><td>None</td></tr>
<tr><td>Stop Digit</td><td>1</td></tr>
<tr><td colspan="2">Display</td><td colspan="2">Number</td></tr>
</table>

5. Troubleshooting

1. The instrument is powered on but no Display.

- Check if the power is connected properly.
- Check if the fuse which is below the AC Power socket is used appropriately and in good condition (the cover can be pried open with a straight screwdriver).
- Restart the instrument after the steps above.
- If the problem still exists, please contact our for our service.

2. The output is abnormal:

- Check if the output voltage is set to 0V. If so, set it to other value.
- Check if the output current is set to 0A. If so, set it to other value.
- When in programmable output status, check if there is any voltage/current value is set to 0. If so, set it to other value.
- If the problem still exists, please contact our for our service.

6. Appendix

6.1 Appendix A：Accessories

(The accessories subject to final delivery.)

standard:

Power Cord

User Manual

Fuse

RS232 Cable (Model -L not equipped)

optional：

Banana plug to crocodile clip test leads

USB2.0 to RS232 common port connector

6.2 Appendix B: General Care and Cleaning

General Care

Do not store or leave the instrument where the liquid crystal display could be exposed to direct sunlight for long periods of time.

Caution: To avoid any damage to the instrument, do not exposed it to any sprays, liquids, or solvents.

Cleaning

Inspect the instrument as often as operating conditions require. To clean the instrument exterior, perform the following steps:

(1) Wipe the dust from the instrument surface with a soft cloth. Take care not to scratch the transparent LCD protection screen when cleaning.

(2) Disconnect power before cleaning your instrument. Clean the instrument with a damp soft cloth (not dripping with water). It is recommended to clean with soft detergent or fresh water. To avoid damage to the instrument, do not use any corrosive chemical cleaning agents.

⚠ **Warning:** Before re applying power, ensure that the instrument is completely dry, avoiding any electric shock or electrical short circuit resulting from moisture.

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