# PDS series
# Programmable DC power supply
# User manual

**MATRIX TECHNOLOGY INC.**

# table of Contents

**Technical indicators are subject to change without further notice.**

# Safety summary

This section contains the operation of the power supply and important safety instructions that must be observed when storing.The user should read the following instructions carefully before operation to ensure safety and keep the machine in top condition.

## Safety symbol

The following various safety symbols may appear in this operating manual or on this product:

| Symbol | Term | Description |
|---|---|---|
| ⚠ 警告 | caveat | Warning statements indicate conditions and actions that may endanger the safety of the operator |
| ⚠ 注意 | note | A caution statement indicates damage to this product or other equipment connected to this product. |
| ⚡ | Danger | Attention to high voltage |
| ⏚ | | Protective earth terminal |
| ⏚ | | Ground (earth) terminal |
| ⏚ | | Housing ground |

## Safety guide

| | |
|---|---|
| General introduction ⚠ 注意 | ● Do not place heavy objects on the case.<br>● Avoid serious damage or improper handling that can cause damage to the machine.<br>● Precautions to discharge static electricity are required when connecting the instrument.<br>● Do not block the vents on the side and rear panels.<br>● Do not disassemble the machine unless it is a professional. |
| power supply ⚠ 警告 | AC input voltage: 220V ± 10%, 50/60Hz<br>Make sure the ground cable of the power cable is connected to the ground to avoid electric shock. |
| fuse ⚠ 警告 | ● Be sure to use the correct fuse type before turning it on.<br>● To prevent fire, only fuses of the specified specifications of this product are allowed.<br>● Turn off the power before replacing the fuse to eliminate the cause of the fuse damage. |
| Cleaning machine | ● Turn off the power before cleaning.<br>● Damp a soft cloth with a mild detergent and water. Do not spray the cleaner directly.<br>● Do not use chemicals or cleaners containing abrasive products such as benzene, toluene, xylene and acetone |
| Operating environment | ● Use location: indoors, avoid direct sunlight, dust and strong magnetic fields.<br>● Relative humidity: <80% |

| | | |
|---|---|---|
| | ● | Altitude: <2000m |
| | ● | Temperature: 0 ° C ~ 40 ° C |
| Storage environment | ● | indoor |
| | ● | Relative humidity: <70% |
| | ● | Temperature: 10 ° C ~ 70 ° C |

# 1. Product Description

## 1.1 Introduction

This series of products is a programmable DC switching power supply with high accuracy and single output. It is light and compact, adjustable in voltage and current, and has multiple operating modes.The whole system is completely controlled by the microprocessor (mpu), and can easily use the communication interface (rs-232) to connect with the computer (pc) to meet the user's requirements for automatic testing and automatic control. The software instructions are completely in accordance with the scpi command. The format makes it easy for users to develop automatic test and automatic control applications.Due to the full digitalization of the system, the data input is completely controlled by the keyboard and knob, which is fast, accurate and convenient.Can be widely used in electronic product development, device testing, communications industry, laboratories and scientific research institutions.

## 1.2 Features

- High accuracy and high resolution 1mV/1mA
- High brightness, vacuum vfd display
- Constant voltage / constant current automatic switching
- With output control switch for more flexible control
- Convenient and fast operation and setting interface, high speed adjustment knob and digital key input
- Timing output function, support unlimited and output of specified number of cycles
- 100 sets of storage and recall functions, can store/recall 100 sets of voltage and current data, and can be used for simple automatic test purposes with timing execution.
- Remote sensing to compensate for the voltage drop of the load line
- Overload, polarity reverse protection, overvoltage protection, overcurrent protection, over temperature protection
- One-button lock function to prevent misoperation
- Built-in buzzer as a reminder or warning
- Temperature controlled fan speed makes the instrument low noise and longer fan life
- Load resistance value can be displayed with low resistance measurement function
- Support battery charging function
- Standard rs232 interface, programming instruction set conforms to scpi, standard instrument rack design
- Optional analog control interface

## 1.3 panel description
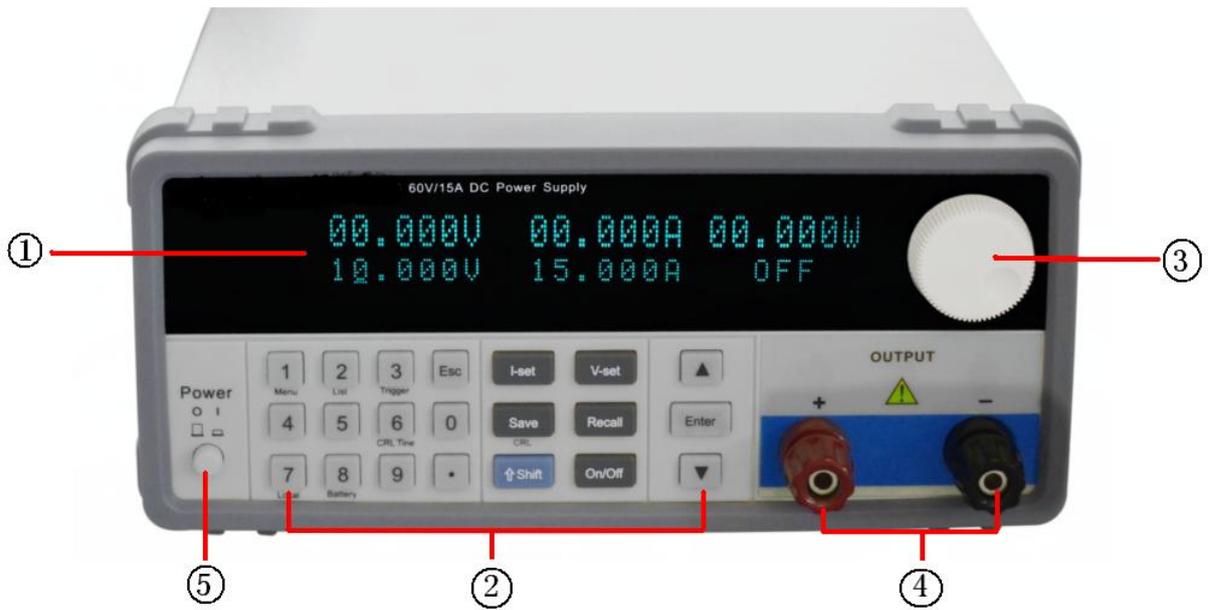


**Front panel**

| Display | 2. Function keys, number keys | 3. Adjustment knob |
|---|---|---|
| 4. Output terminal | 5. Power switch | |



Change picture

**Rear panel**

| 1.RS232 interface | 2. Trigger input | 3. Analog control interface (optional) |
| --- | --- | --- |
| 4.Remote sensing terminal | 5. Fan | 6. Housing ground terminal |
| 7. Power socket (with fuse holder) | | |

## 1.4 keyboard description

**Key Description**

There are 21 buttons on the front panel (excluding the power button), and the buttons directly perform basic functions.

| Key name | Main function | Combined function key |
|---|---|---|
| 0 | Enter the number 0 | |
| 1 | Enter the number 1 | Menu menu selection |
| 2 | Enter the number 2 | List auto-execute setting |
| 3 | Enter the number 3 | Trigger trigger settings |
| 4 | Enter the number 4 | |
| 5 | Enter the number 5 | |
| 6 | Enter the number 6 | CRL Tine output timing clear |
| 7 | Enter the number 7 | Local local operation |
| 8 | Enter the number 8 | Battery battery charging function |
| 9 | Enter the number 9 | |
| . | Enter the decimal point | |
| Esc | Exit button | |
| $\pi$、$\theta$ | Up and down keys | |
| Enter | Enter | |
| Knob button | Cursor left | |
| I-set | Set current | |
| V-set | Setting voltage | |
| Save | Parameter storage | Crl battery function clear |
| Recall | Parameter call | |
| Shift | Combined function key | |
| On/Off | Output on or off | |

# 2. Operating instructions

## 2.1 Front Panel Operating Instructions

(1)   The voltage and current units appearing in this instrument and in the instruction manual are in volts v and amperes a.

(2)   The instrument is factory set to the front panel operation mode. When the power is turned on, the required instrument settings can be performed on the panel.

(3)   When the power enters the remote operation mode, to return to the panel operation mode, press the [Shift] [7] key, the power returns to the panel operation mode.

## 2.2 Input method

### 2.2.1 Number key input

Use the numeric keys to enter the value you want to set, and then press the [Enter] key to confirm.If the data input is wrong, press the [Esc] key to clear the current data, and then re-enter the data.

### 2.2.2 Knob input

In practical applications, it is sometimes necessary to continuously adjust the signal. In this case, the digital adjustment knob can be used.The knob on the panel is the digital adjustment knob. Turn the knob to the right to increase the number of the cursor indication digits continuously and carry it to the high position.Turn the knob to the left to decrement the number of the cursor indicator digits by 1 and borrow from the high digits.When you use the knob to enter data, the number changes immediately.

## 2.3 Output voltage setting

Press the [V-set] key and the voltage parameter cursor will flash.

Method: Press the number key and then press the [Enter] key to set the output voltage.

For example: set the output voltage to 32.000v.

Press [V-set] [3] [2] [.] [0] [0] [0] [Enter].

## 2.4 Output current setting

Press the [I-set] key and the current parameter cursor will flash.

Method: Press the number key and then press the [Enter] key to set the output current.

For example: set the output current to 3.200a.

Press [I-set] [3] [.] [2] [0] [0] [Enter].

## 2.5 Over-voltage protection setting

Over-voltage protection protects the power supply and the dut is protected when the set voltage is exceeded.Before the operation, the over-voltage protection function is turned on, and the over-voltage protection value is set. When the output voltage exceeds this limit, the output is immediately turned off, the display shows the state corresponding to "OVP", and the voltage adjustment size is limited by the protection value.

The external voltage applied to the output should be prevented from exceeding 120% of the

rated voltage, otherwise the internal components of the product may be damaged!

When the power supply is in the over-voltage protection state, check the external cause. After the external factor is removed, press the on/off button to reopen it.

### 2.5.1 Over-voltage protection value setting

Press the [V-set] [(] key until "Parameter OVP Set" is displayed to set the overvoltage protection value.

Method: Press the number key and then press the [Enter] key to set the overvoltage protection value.

For example: set the over-voltage protection voltage value to 33.0v.

Press [V-set] [(] [3] [3] [.] [0] [Enter].

### 2.5.2 Over-voltage protection function on/off

Press [V-set] [(] key until "Parameter OVP Status" is displayed, turn the knob to switch OVP on or off.

## 2.6 Over-current protection setting

Over-current protection protects the load current of the power supply from exceeding the set current.Turn on the over-current protection function before operation and set the overcurrent protection value. When the load current exceeds this limit, the output is immediately turned off, the display shows the status corresponding to "ocp", and the current adjustment size is limited by the protection value.

### 2.6.1 Over-current protection value setting

Press the [I-set] [(] key until "Parameter OCP Set" is displayed to set the overvoltage protection value.

Method: Press the number key and then press the [Enter] key to set the overcurrent protection value.

For example: set the overcurrent protection current value to 3.30a.

Press [I-set] [(] [3] [.] [3] [0] [Enter].

### 2.6.2 Overcurrent protection status setting

Press [I-set] [(] key until "Parameter OCP Status" is displayed, turn the knob to switch OCP on or off.

## 2.7 Output delay time setting

Press [I-set] [(] until the display shows "Parameter Delay" to enter the output delay time setting.

Method: Press the number key and then press the [Enter] key to set the output delay time.

For example: set the output delay time to 99999s.

Press [9] [9] [9] [9] [9] [Enter].

Note: This Delay setting only works when the auto loop is executed, so when the memory is stored, this Delay setting will be stored in the memory location at the same time.

## 2.8 Function settings

Press [Shift] [1] to enter the Utility function setting.Then press the [(] or [(]] key to cycle through the options under the current function.

### 2.8.1 Power On Settings

Press the [(] key until "Utility INIT" is displayed, set all the power settings to the factory defaults, and use the knob to select on or off.

Press the [(] key until "Utility OUT RECALL" is displayed, set the output state when the power is turned on, and use the knob to select on or off.

- On: Sets the output state of the power supply to the state that was memorized at the last shutdown.
- Off: Sets the power output status to the default state.

### 2.8.2 op association settings

Press the [(] key until "Utility OP Limit" is displayed, set OVP, OCP is related to Voltage, Current, and use the knob to select on or off.

- ON: When the OVP status is ON, the maximum value of the Voltage input is the OVP value; when the OCP status is ON, the maximum value of the Current input is the OCP value;
- OFF: OVP, OCP is not associated with Voltage, Current.

### 2.8.3 rs232 baud rate setting

Press the [(] key until "Utility Baud" is displayed, set the code corresponding to the baud rate, so that the device meets the baud rate requirement of the computer remote control.

The following table shows the code table corresponding to the baud rate:

| Code | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|------|------|------|------|-------|-------|-------|-------|-------|--------|
| Baud rate | 1200 | 2400 | 4800 | 9600 | 14400 | 19200 | 28800 | 38400 | 57600 | 115200 |

Method 1: Press the 0~9 number keys and press the [Enter] key to set the code value.

Method 2: Turn the knob to set the code value.

### 2.8.4 Buzzer settings

Press the [(] key until "Utility Beep" is displayed, use the knob to select on or off.

### 2.8.5 Quick Function Key Settings

Press the [(] key until "Utility HotKey" is displayed, use the knob to select on or off.

After this function is enabled, you can call the corresponding 0~9 group settings in the memory by pressing the 0~9 number keys.

### 2.8.6 Voltage Self-Test Function Setting

Press the [(] key until "Utility VSelfTest" is displayed, use the knob to select on or off.

When this function is turned on, the output voltage value is automatically monitored, the output is

adjusted, and the deviation from the set voltage value is reduced.

### 2.8.7 Instrument Address Settings

Press the [(] key until "Utility Address" is displayed, enter the 0~99999 number keys, and then press the [Enter] key.

### 2.8.8 Remote Sensing Function Settings

When the load consumes a large amount of current, a voltage drop occurs across the connection line from the power supply to the load terminals.In constant voltage conditions, remote sensing automatically compensates for the voltage drop across the load line.

Before using the remote sensing function, you must first set the power to the remote sensing mode, and you must turn on the remote sensing function when the output is off.It is best not to twist the Sense leads with the load wires.

Press the [(] key until "Utility Sense" is displayed, use the knob to select on or off.

Wiring diagram of power supply remote measurement:
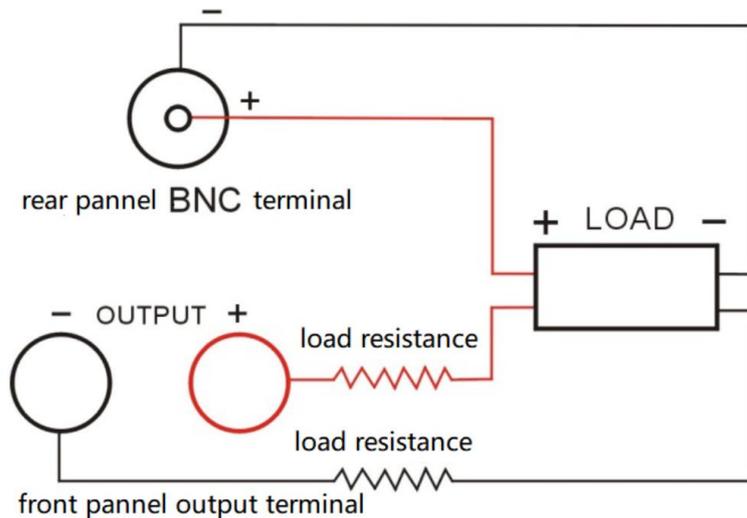


### 2.8.9 External analog control (optional)

Press the [(] key until "Utility Ext-Ctrl" is displayed, use the knob to select on or off.

The rear panel has a 9-pin air interface as an analog control interface, which can control the output voltage and current, and can also operate multiple parallel power supplies of the same specification.
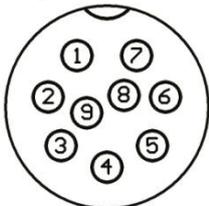


The aviation interface pins are defined as follows:

1 - +5vdc, providing a 5v voltage reference voltage.

2——The analog output regulates the output voltage, the external voltage is 0-5v or the potentiometer is 0-5kω, which is equivalent to adjusting the output voltage to 0-100% of the rated maximum voltage.

3——The analog output regulates the output current, the external voltage is 0-5v or the potentiometer is 0-5kω, which is equivalent to adjusting the output current to 0-100% of the rated maximum current.

4 - gnd, the analog public land.

5——When "Analog Ctrl" is ON, the ON/OFF input is controlled. When the ground (GND) is shorted, the output is ON, and when it is OFF, it is OFF. When "Analog Ctrl" is OFF, it is ON/OFF. The output signal is 0V when ON, and 5V when OFF.

6——Power supply OK, indicating whether the power output is normal. If it is normal, it will output 5V. If the power is protected or damaged, it will output 0V.

7——Indicating the working state of the power supply cv/cc. In the cv state, the voltage of this pin to ground (gnd) is 5v; in the cc state, the voltage of this pin to ground (gnd) is 0v.

8——Monitor the voltage value corresponding to the actual output voltage, and monitor the voltage value 0-5v, corresponding to the rated maximum voltage of 0-100%.

9——Monitor the voltage value corresponding to the actual output current, and monitor the voltage value 0-5v, corresponding to the rated maximum current of 0-100%.

### 2.8.10 Trigger source selection

Press the [(] key until "Utility TRISOU" is displayed, use the 0~99 number keys or knob to select the trigger source.

1 ext triggers for an external button.

3 Pulse is the TTL trigger on the rear panel.

0 IMM is triggered by the "TRIGger:IMMediate" command, and other trigger modes are invalid.

2 Bus triggers for the communication interface.

### 2.8.11 Trigger function selection

Press the [(] key until "Utility TRIFUN" is displayed, and use the 0~99 number keys or knob to select the trigger function.

0 Output is the switch output status.

1 List is a single step running timing output step.

### 2.8.12 Parameter display selection

Press the [(] key until "Utility Disp" is displayed, use the 0~99 number keys or knob to enter the parameters and select the third display parameter.

0 Power The third parameter is shown as power

1 Resistor The third parameter is shown as load resistance

2 Time The third parameter is displayed as output timing

### 2.8.13 Cumulative boot time

Press the [(] key until "Utility Uptime" is displayed, the cumulative power-on time of the power supply is displayed.

## 2.9 Storage/Recall Operation

### 2.9.1 Storage Operations

The power supply can save some commonly used parameters in 100 sets of non-volatile memory for users to take out easily and quickly.The stored contents include output voltage value, output current value, over voltage protection value, over current protection value, over voltage protection status, over current protection status, and delay time.

Press the [Save] key until "Utility Store" is displayed, enter the 0~99 number keys, and then press the [Enter] key to store the power parameters in the specified storage area.

For example: store settings to a memory address of 5.

Press [5] [Enter].

### 2.9.2 Retrieving operations

Press [Recall] until "Utility Recall" is displayed, enter 0~99 number keys, and then press [Enter] to call the parameters of the specified storage area. After the call, the output will be automatically closed.

For example: call the setting, the memory address is 5.

Press [5] [Enter].

## 2.10 Automatic execution mode operation

### 2.10.1 setting status

After pressing the [Shift] [1] key, the display shows "Auto Status", and the automatic execution mode status setting option is entered.Press the [(] or [(] key to cycle through the options under the current function. Use the knob to select On or Off.

### 2.10.2 Setting the start address

Press the [(] key until the display shows "Auto Start" to set the starting memory address.
Method 1: Press the 0~9 number keys and press the [Enter] key to set the starting memory address.
Method 2: Turn the knob to adjust the starting memory address.
For example: set the start execution memory address to 0.
Press [0] [Enter].

### 2.10.3 Setting the end address

Press the [(] key until the display shows "Auto End" to set the end memory address.
Method 1: Press the 0~9 number keys and press the [Enter] key to set the end memory address.
Method 2: Use the [(] or [(] key to move the cursor to the specified position and rotate the knob to adjust the end memory address.
For example, set the end execution memory address to 8.
Press [8] [Enter].

### 2.10.4 Setting the number of cycles

Press the [(] key until the display shows "Auto Cycle" to set the number of cycles.
Method 1: Press the 0~9 number keys and press the [Enter] key to set the number of cycles that can

be executed (0~99999). When you enter 0, it means that you can cycle indefinitely.

Method 2: Use the rotary knob to adjust the number of cycles.

For example: set the number of loop executions to 99.

Press [9] [9] [Enter].

### 2.10.5 Setting the operating mode

Press the [(] key until the display shows "Auto Mode", set the mode of automatic operation, use the knob to select, "0 Continous", continuous operation mode; "1 Step" single-step operation mode, trigger one-step output.

### 2.10.6 Entering/Exiting the Auto Execution Mode Status

When the "Auto Status" status is ON, "I

The status indicator is on, indicating that the automatic execution mode is entered.

In the continuous mode, the third parameter of the display shows the remaining time information of the current group parameter. After pressing [On/Off], the output is turned on and the output is automatically executed.

In the single-step mode, after pressing [On/Off], the output is turned on, triggering a new set of data output.

## 2.11 Accessibility

There is a battery charging function in the auxiliary function, which can be extended according to user requirements.

### 2.11.1 Battery curve charging function

This series of power supply can charge the battery curve, as shown below, which can effectively protect the battery.
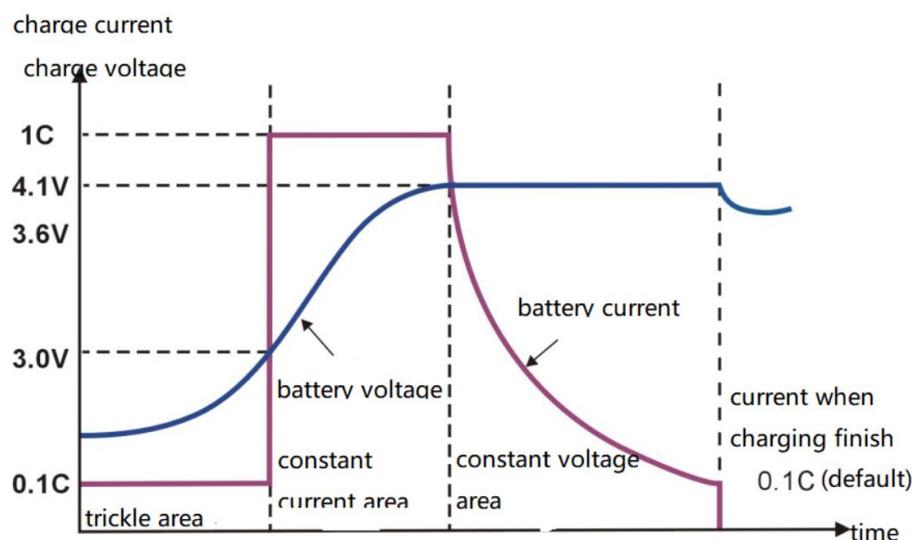


Press the [Shift] [8] key, the display shows "Battery Status", turn the knob to select ON to turn on the charging function, and then press the [(] key to cycle through the options under the current function.

Battery charging parameter description:

| parameter name | Menu name |
|---|---|
| Trickle charge threshold voltage | UnderV |
| Floating charge | StatuV |
| Trickle charging current | Trickle |
| Standard charging current | Charge Curr |
| Termination current threshold | I Off |
| Charging time | TIME |

## 2.12 output switch

The [On/Off] key on the front panel controls the output on and off.

## 2.13 adjustment knob

The cursor position can be switched by pressing the adjustment knob.

## 2.14 Protection function

The instrument is provided with over voltage, over current, over power and over temperature protection.

The overvoltage can be used to set the overvoltage protection point of the power supply through the buttons on the panel. The overcurrent can be used to set the overcurrent protection point of the power supply through the buttons on the panel.

Over-power protection is the protection that is implemented when the power exceeds the maximum power of the instrument itself.

Over temperature (otp) protection.When the instrument is operated, the instrument will automatically turn off the output when abnormal temperature is generated to ensure the safe use of the instrument.

## 2.16 Operating mode description

### 2.16.1 Constant voltage operation mode

(1) Connect the load to the output

For safety in use, connect the load to the (+) and (-) terminals of the output with the output turned off.

(2) Enter the current limit value to be set

Press [I-set] to enter the current set value input mode.In this input mode, you can use the numeric keypad or knob input to set the current setpoint to be changed.

(3) Enter the voltage value to be output

Press [V-set] to enter the voltage set value input mode.In this input mode, you can use the numeric keypad or knob input to set the voltage setting to be changed.

(4) Start output

After pressing [On/Off], the output turns on, and the display shows the actual output measurement

value.

(5)　Confirm that the power supply is in constant voltage mode

Please confirm the cv status flag to ensure that the output operates in constant voltage operation mode.If the cc status is identified, the current limit value needs to be increased to ensure that the output operates in the constant voltage mode of operation.

## 2.16.2 Constant current operation mode

(1)　Connect the load to the output

For safety in use, connect the load to the (+) and (-) terminals of the output with the output turned off.

(2)　Enter the voltage limit to be set

Press [V-set] to enter the voltage set value input mode. In this input mode, you can use the numeric keypad or knob input to set the voltage set value to be changed.

(3)　Enter the current value to be output

Press [I-set] to enter the current set value input mode. In this input mode, you can use the numeric keypad or knob input to set the current set value to be changed.

(4)　Start output

After pressing [On/Off], the output turns on, and the display shows the actual output measurement value.

(5)　Confirm that the power supply is in constant current mode

Please confirm the cc status flag to ensure that the output operates in constant current mode of operation.If the cv status is flagged, the voltage limit value needs to be increased to ensure that the output operates in the constant current mode of operation.

## 2.16.3 Constant voltage / constant current state switching

In the output state, when the output current is less than the current set value, the power supply is in a constant voltage state, and the constant voltage indication flag is on.The output voltage is stable at the set value until the output current reaches the current set value, and enters the constant current state, and the constant current indication flag is on.The power supply automatically switches between constant current and constant voltage depending on the load.

# 3. Remote control

This series of power supply supports remote control mode, provides RS232 interface to communicate with the computer, and realizes all functions on the panel through the host computer software.

## 3.1 Interface Settings

### 3.1.1 interface

Install the RS232 interface on the rear panel of the instrument as shown below.



RS232 interface

### 3.1.2 Communication settings

Set the com port in the PC according to the following
(1) Baud rate: 9600
(2) Check digit: None
(3) Data bits: 8
(4) Stop position: 1
(5) Data outflow control: None

Note 1: If the power supply does not respond during remote control, please check:
● Whether the interface line itself is disconnected.
● Is the connection between the interface cable, power supply and pc corresponding pin correct?
● Is the interface cable connection tight?
● The communication parameter setting of the remote control program is consistent with 3.1.2.
● Whether the command terminator of the remote control program is a newline (hex 0x0a).

Note 2: When using the software to control the instrument, to return to the panel operation mode, press the [Shift] [7] key, the power returns to the panel operation mode.

## 3.2 SCPI programming instruction set

Please refer to the programming manual for the detailed scpi programming instruction set.

# 4. Maintenance

## 4.1 Regular inspection

● In order to ensure that the product can achieve its best working condition during the use of the product, please do regular inspection.

● Check if the power supply power input socket is burned out.Check if the power output terminals are loose.

## 4.2 Replacement of fuse

step:       (1)  Remove the power cord and use a small screwdriver to remove the fuse box.
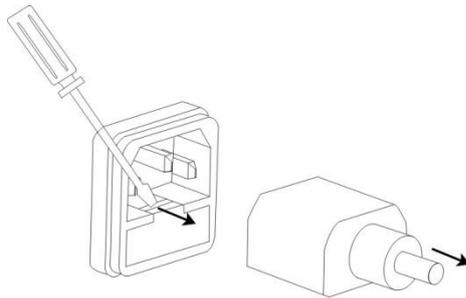
      (2)  Replace the fuse.
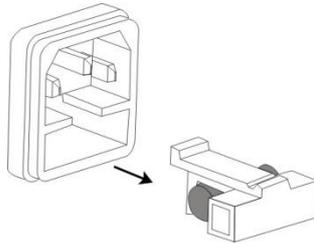
Fuse specifications:   220v : t4al/250v (for 30V10A, 20V/30A, 30V/20A, 60V/10A)
                  T8al/250v (for 15V/60A, 20V/45A, 30V/30A, 60V/15A, 80V/11A)

# 5. Product specifications

### 6. When using this specification, be sure to turn it on for more than 30 minutes.

**Table I**

| model | PDS-3010 | PDS-2030 | PDS-3020 | PDS-6010 |
|---|---|---|---|---|
| **Rated DC output (0°C~40°C)** | | | | |
| Voltage | 0~30V | 0~20V | 0~30V | 0~60V |
| Current | 0~10A | 0~30A | 0~20A | 0~10A |
| Overvoltage protection | 0.1~34V | 0.1~24V | 0.1~34V | 0.1~64V |
| Overcurrent protection | 0.1~12A | 0.1~34A | 0.1~24A | 0.1~12A |
| **Voltage output** | | | | |
| Power effect | ≤0.01%+4mV | | | |
| Load effect | ≤0.1%+5mV | | | |
| Recovery Time | ≤1.5ms (50% load change) | | | |
| Chopping and noise | 2mVrms, 30mVpp | | | |
| Temperature Coefficient | ≤300ppm/℃ | | | |
| Setting accuracy | ±(0.03% of reading + 10mV) (25±5℃) | | | |
| Set resolution | 1mV | | | |
| **Current output** | | | | |
| Power effect | ≤0.2%+3mA | | | |
| Load effect | ≤0.2%+5mA | | | |
| Chopping and noise | ≤10mArms | | | |
| Setting accuracy | ±(0.3% of reading + 10mA) (25±5℃) | | | |
| Set resolution | 1mA | | | |
| **display** | | | | |
| Voltage | 5 digits display | | | |
| Current | 5 digits display | | | |
| Voltage resolution | 1mV | | | |
| Current resolution | 1mA | | | |
| Reading accuracy | ±(0.02% of reading +5mV) (25±5℃)；±(0.05% of reading +10mA) (25±5℃) | | | |
| **protection** | Overload protection, polarity reverse protection, overvoltage protection, overcurrent protection, over temperature protection | | | |
| **Remote sensing** | Maximum compensation voltage 0.1v | | | |
| **Charging batteries** | Lithium battery curve charging | | | |
| **interface** | Standard　RS232 interface, support scpi instruction set, analog control interface (optional) | | | |
| **Storage recall** | 100 groups | | | |
| **Insulation** | Between the output terminal and the chassis or other terminals: ≤60vdc | | | |
| **Operating environment** | Indoor use　　　Altitude: ≤2000m　　Ambient temperature: 0~40°C　　　Relative humidity≤80%　　nstallation level: ii　　Pollution degree: 2 | | | |
| **Storage environment** | Ambient temperature: -10~70°C Relative humidity: ≤70% | | | |
| **power input** | AC 220V±10%, 50/60Hz | | | |
| **annex** | 1 manual, 1 power cord, 1 PC software CD, 1 rs232 interface cable | | | |
| **size** | 412(D)×215(W)×89(H)mm | | | |
| **weight** | 4.5kg | | | |

**Table II**

| model | PDS-1560 | PDS-2045 | PDS-3030 | PDS-6015 | PDS-8010 |
|---|---|---|---|---|---|
| **Rated DC output (0°C~40°C)** | | | | | |
| Voltage | 0~15V | 0~20V | 0~30V | 0~60V | 0~80V |
| Current | 0~60A | 0~45A | 0~30A | 0~15A | 0~10A |
| Overvoltage protection | 0.1~18V | 0.1~23V | 0.1~34V | 0.1~64V | 0.1~88V |
| Overcurrent protection | 0.1~62A | 0.1~50A | 0.1~34A | 0.1~17A | 0.1~12A |
| **Voltage output** | | | | | |
| Power effect | ≤0.01%+4mV | | | | |
| Load effect | ≤0.1%+5mV | | | | |
| Recovery Time | ≤1.5ms (50% load change) | | | | |
| Chopping and noise | 2mVrms, 30mVpp | | | | |
| Temperature Coefficient | ≤300ppm/℃ | | | | |
| Setting accuracy | ±(0.03% of reading + 10mV) (25±5℃) | | | | |
| Set resolution | 1mV | | | | |
| **Current output** | | | | | |
| Power effect | ≤0.2%+3mA | | | | |
| Load effect | ≤0.2%+5mA | | | | |
| Chopping and noise | ≤10mArms | | | | |
| Setting accuracy | ±(0.3% of reading + 10mA) (25±5℃) | | | | |
| Set resolution | 1mA | | | | |
| **display** | | | | | |
| Voltage | 5 digits display | | | | |
| Current | 5 digits display | | | | |
| Voltage resolution | 1mV | | | | |
| Current resolution | 1mA | | | | |
| Reading accuracy | ±(0.02% of reading +5mV) (25±5℃)；±(0.05% of reading +10mA) (25±5℃) | | | | |
| **protection** | Overload protection, polarity reverse protection, overvoltage protection, overcurrent protection, over temperature protection | | | | |
| **Remote sensing** | Maximum compensation voltage 0.1v | | | | |
| **Charging batteries** | Lithium battery curve charging | | | | |
| **interface** | Standard rs232 interface, support scpi instruction set, analog control interface (optional) | | | | |
| **Storage recall** | 100 groups | | | | |
| **Insulation** | Between the output terminal and the chassis or other terminals: ≤60vdc | | | | |
| **Operating environment** | Indoor use     Altitude: ≤2000m     Ambient temperature: 0~40°C     Relative humidity≤80%     nstallation level: ii     Pollution degree: 2 | | | | |
| **Storage environment** | Ambient temperature: -10~70°C Relative humidity: ≤70% | | | | |
| **power input** | AC 220V±10%, 50/60Hz | | | | |
| **annex** | 1 manual, 1 power cord, 1 PC software CD, 1 rs232 interface cable | | | | |
| **size** | 412(D)×215(W)×89(H)mm | | | | |
| **weight** | 5.5kg | | | | |

# Warranty Card

## What the warranty covered:
If the machine break down due to its defectiveness, MATRIX will provide free maintenance during warranty period. If the machine break down due to wrong operation or carelessness, then Matrix provide paid service within warranty period.

## How long does this warranty last:
This warranty lasts for 3 years from the date of original purchase of all MATRIX branded products.

## Who is covered:
This warranty covers only the original purchaser of this product. This warranty is not transferable to subsequent owners or purchasers of this product.

## What do customers need to do to get repairs/service under the warranty policy?
If the machine get problem, please contact our local distributor. If you cannot find the local distributor, you can contact us directly, our email is service@szmatrix.com, our telephone No. is 0086 755 2836 4276.

## What information do customers need to supply?

| | |
|---|---|
| Model No. | |
| Serial No. | |
| Problem description | |
| Picture | |
| Video if necessary | |