RIGOL
Quick Guide

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DP800 Series Programmable Linear DC Power Supply

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RIGOL TECHNOLOGIES CO., LTD.

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E-mail: service@rigol.com
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Safety Requirement

General Safety Summary

Please review the following safety precautions carefully before putting the instrument into operation so as to avoid any personal injury or damage to the instrument and any product connected to it. To prevent potential hazards, please use the instrument only specified by this manual.

Use Proper Power Cord.
Only the power cord designed for the instrument and authorized for use within the local country could be used.

Ground the Instrument.
The instrument is grounded through the Protective Earth lead of the power cord. To avoid electric shock, it is essential to connect the earth terminal of the power cord to the Protective Earth terminal before connecting any inputs or outputs.

Connect the Probe Correctly.
If a probe is used, the probe ground lead must be connected to earth ground. Do not connect the ground lead to high voltage. Improper way of connection could result in dangerous voltages being present on the connectors, controls or other surfaces of the oscilloscope and probes, which will cause potential hazards for operators.

Observe All Terminal Ratings.
To avoid fire or shock hazard, observe all ratings and markers on the instrument and check your manual for more information about ratings before connecting the instrument.

Use Proper Overvoltage Protection.
Ensure that no overvoltage (such as that caused by a bolt of lightning) can reach the product. Otherwise, the operator might be exposed to the danger of an electric shock.

Do Not Operate Without Covers.
Do not operate the instrument with covers or panels removed.

Do Not Insert Anything into the Holes of Fan.
Do not insert anything into the holes of the fan to avoid damaging the instrument.

Use Proper Fuse.
Please use the specified fuses.

Avoid Circuit or Wire Exposure.

Do not touch exposed junctions and components when the unit is powered.

Do Not Operate with Suspected Failures.
If you suspect that any damage may occur to the instrument, have it inspected by **RIGOL** authorized personnel before further operations. Any maintenance, adjustment or replacement especially to circuits or accessories must be performed by **RIGOL** authorized personnel.

Provide Adequate Ventilation.
Inadequate ventilation may cause an increase of instrument temperature which would cause damage to the instrument. So please keep the instrument well ventilated and inspect the intake and fan regularly.

Do Not Operate in Wet Conditions.
To avoid short circuit inside the instrument or electric shock, never operate the instrument in a humid environment.

Do Not Operate in an Explosive Atmosphere.
To avoid personal injuries or damage to the instrument, never operate the instrument in an explosive atmosphere.

Keep Product Surfaces Clean and Dry.
To avoid dust or moisture from affecting the performance of the instrument, keep the surfaces of the instrument clean and dry.

Prevent Electrostatic Impact.
Operate the instrument in an electrostatic discharge protective environment to avoid damage induced by static discharges. Always ground both the internal and external conductors of cables to release static before making connections.

Use the Battery Properly.
Do not expose the battery (if available) to high temperature or fire. Keep it out of the reach of children. Improper change of a battery (lithium battery) may cause an explosion. Use the **RIGOL** specified battery only.

Handle with Caution.
Please handle with care during transportation to avoid damage to keys, interfaces, and other parts on the panels.

Do Not Provide Power for the Active Load.
To avoid the anti-irrigation current which leads to the power control loop out of control and damages the powered device, this power supply can only provide power for the pure load without the current output function.

Safety Terms and Symbols

Safety Notices in this Manual:

WARNING
Indicates a potentially hazardous situation or practice which, if not avoided, will result in serious injury or death.

CAUTION
Indicates a potentially hazardous situation or practice which, if not avoided, could result in damage to the product or loss of important data.

Safety Terms on the Product:

DANGER It calls attention to an operation, if not correctly performed, could result in injury or hazard immediately.

WARNING It calls attention to an operation, if not correctly performed, could result in potential injury or hazard.

CAUTION It calls attention to an operation, if not correctly performed, could result in damage to the product or other devices connected to the product.

Safety Symbols on the Product:


Hazardous Voltage


Safety Warning


Protective Earth Terminal


Chassis Ground


Test Ground

Care and Cleaning

Care
Do not store or leave the instrument where it may be exposed to direct sunlight for long periods of time.

Cleaning
Clean the instrument regularly according to its operating conditions.

1. Disconnect the instrument from all power sources.
2. Clean the external surfaces of the instrument with a soft cloth dampened with mild detergent or water. Avoid having any water or other objects into the chassis via the heat dissipation hole. When cleaning the LCD, take care to avoid scarifying it.

CAUTION
To avoid damage to the instrument, do not expose it to caustic liquids.

WARNING
To avoid short-circuit resulting from moisture or personal injuries, ensure that the instrument is completely dry before connecting it to the power supply.

Environmental Considerations

The following symbol indicates that this product complies with the WEEE Directive 2002/96/EC.

Product End-of-Life Handling
The equipment may contain substances that could be harmful to the environment or human health. To avoid the release of such substances into the environment and avoid harm to human health, we recommend you to recycle this product appropriately to ensure that most materials are reused or recycled properly. Please contact your local authorities for disposal or recycling information.

Document Overview

This manual is used to guide users to quickly understand the front panel, rear panel, user interface and basic operating methods of DP800 series programmable linear DC power supply. You can download the newest version of this manual from **RIGOL** official website (www.rigol.com).

Format Conventions in this Manual

1. **Key**
   The function key on the front panel is denoted by the format of "Key Name (Bold) + Text Box" in the manual. For example, **Utility** denotes the "Utility" key.

2. **Menu**
   (1) The menu item can be denoted by the format of "Menu Word (Bold) + Character Shading". For example, **SysInfo** denotes the "SysInfo" menu item under **Utility**.
   (2) The menu item can be denoted by the screenshot of the menu, for example,  .

3. **Operation Step**
   The next step of the operation is denoted by an arrow "→" in the manual. For example, **Utility** → **System** denotes that first press **Utility** on the front panel and then press **System**.

Content Conventions in this Manual

DP800 series programmable linear DC power supply includes the following models. Unless otherwise noted, this manual illustrates DP800 series and its basic operations by taking DP832 as an example.

Model	Number of Channels	Channel Output Voltage/Current
DP832	3	30V/3A, 30V/3A, 5V/3A
DP831	3	8V/5A, 30V/2A, -30V/2A
DP822	2	20V/5A, 5V/16A
DP821	2	60V/1A, 8V/10A
DP813	1	Range1: 8V/20A; Range2: 20V/10A
DP811	1	Range1: 20V/10A; Range2: 40V/5A

Contents

Quick Start

General Inspection

1. **Inspect the packaging**
   If the packaging has been damaged, do not dispose the damaged packaging or cushioning materials until the shipment has been checked for completeness and has passed both electrical and mechanical tests.

   The consigner or carrier shall be liable for the damage to the instrument resulting from shipment. **RIGOL** would not be responsible for free maintenance/rework or replacement of the instrument.

2. **Inspect the instrument**
   In case of any mechanical damage, missing parts, or failure in passing the electrical and mechanical tests, contact your **RIGOL** sales representative.

3. **Check the accessories**
   Please check the accessories according to the packing lists. If the accessories are damaged or incomplete, please contact your **RIGOL** sales representative.

Appearance and Dimensions

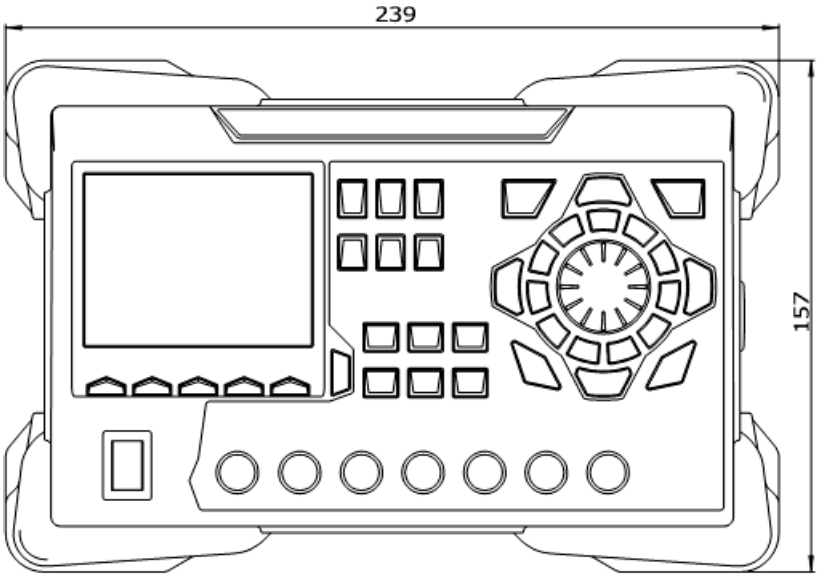


Figure 1 Front View Unit: mm

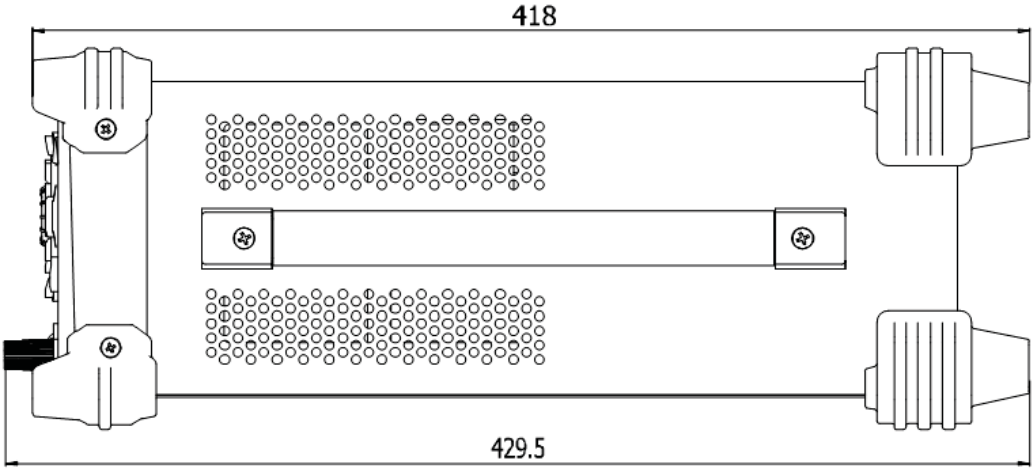


Figure 2 Side View Unit: mm

Front Panel

This section introduces the front panel of DP800 series by taking DP832 (as shown in the figure below) as an example. The differences of different models are introduced separately.

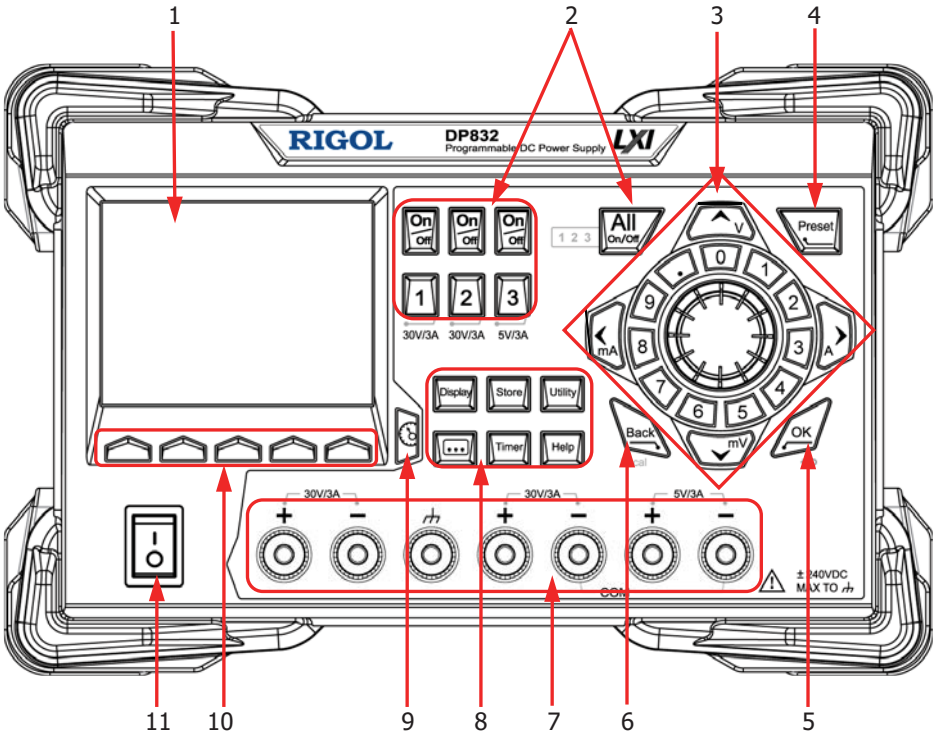


Figure 3 DP832 Front Panel

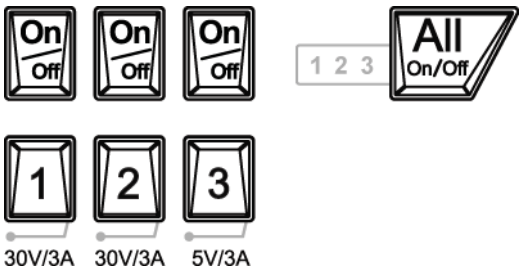
1. LCD

3.5-inch TFT display. It is used to display system parameter settings, system output state, menu options, prompt messages, etc.

2. Channel (Range) Selection and Output Switch

For the multi-channel model, the function of this part is channel selection and output switch. For the single-channel model, the function of this part is range selection and output switch.

Multi-channel models (take DP832 as an example):



Press this key to select CH1 as the current channel and you can set the parameters of this channel, such as voltage, current and overvoltage/overcurrent protection.

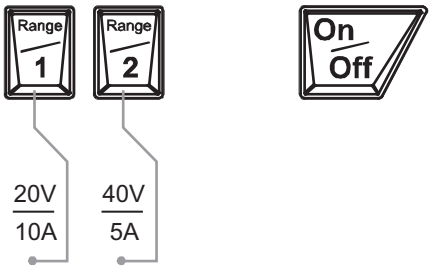
Press this key to select CH2 as the current channel and you can set the parameters of this channel, such as voltage, current and overvoltage/overcurrent protection.

Press this key to select CH3 as the current channel and you can set the parameters of this channel, such as voltage, current and overvoltage/overcurrent protection.

Press this key to enable or disable the output of the corresponding channel.

Press this key and the prompt message asking whether to enable the outputs of all the channels will be displayed. Press **OK** to enable the outputs of all the channels. Pressing this key again will disable the outputs of all the channels.

Single-channel model (take DP811 as an example):



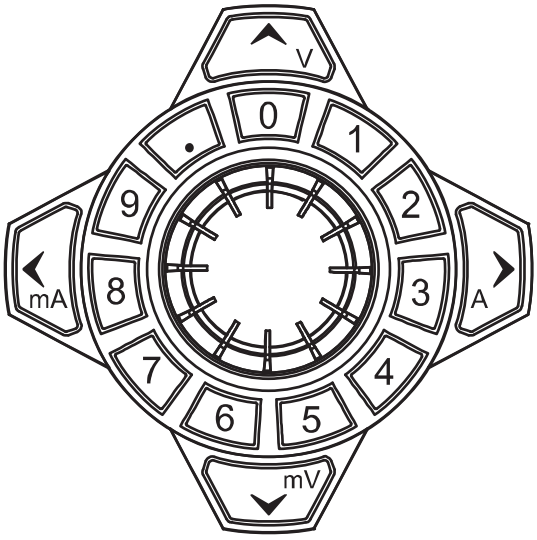
Press this key to select 20V/10A range as the current range and you can set the parameters of the channel, such as voltage, current and overvoltage/overcurrent protection.

Press this key to select 40V/5A range as the current range and you can set the parameters of the channel, such as voltage, current and overvoltage/overcurrent protection.

Press this key to enable or disable the output of the channel.

3. Parameter Input Area

The parameter input area is as shown in the figure below. This area includes the arrow keys (unit selection keys), numeric keyboard and knob.



(1) Arrow keys and unit selection keys
Arrow keys: used to move the cursor. When setting parameters, use the up/down arrow key to increase or reduce the value at the cursor.

Unit selection keys: when using the numeric keyboard to input parameters, the keys are used to enter the voltage units (V and mV) or the current units (A and mA).

(2) Numeric Keyboard
Ring-type numeric keyboard: include numbers 0-9 and the decimal point. Press the corresponding key to input the number or decimal point.

(3) Knob
When setting parameters, rotate the knob to increase or reduce the value at the cursor.
When browsing the setting objects (timing parameters, delay parameters, filename input, etc), rotate the knob to quickly move the cursor.

4. Preset

Restore all the settings of the instrument to default values or recall the user-defined channel voltage/current configurations.

5. OK

Confirm the parameter setting.
Press and hold this key to lock the front panel keys; at this point, the front panel keys (except the output on/off key 

of each channel and the power switch key ) are not available. When the keyboard lock password is disabled, press and hold this key again to unlock the front panel keys. When the keyboard lock password is enabled, you need to input the correct password (2012) to unlock the front panel keys.

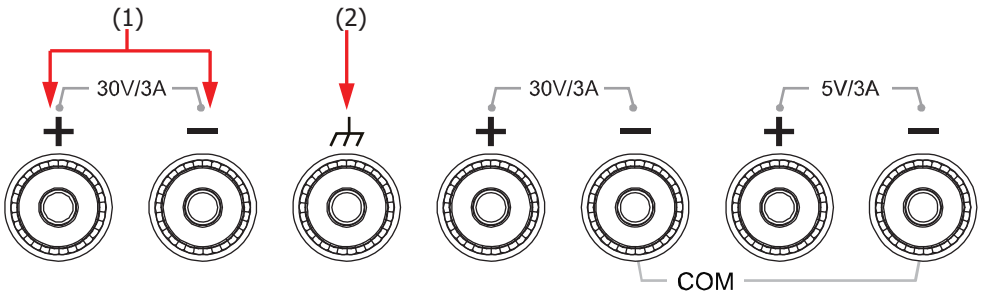
6. Back

Delete the character currently before the cursor.
When the instrument is in remote mode, press this key to return to local mode.

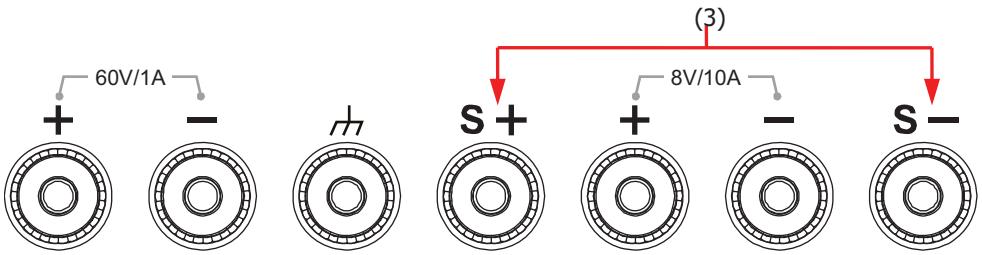
7. Output Terminals

The output terminals of different models of DP800 series are different.

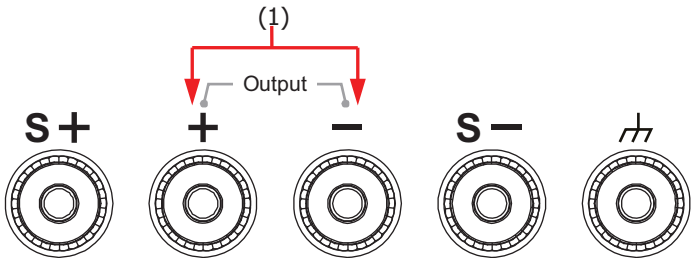
DP832:



DP822/DP821:



DP813/DP811:

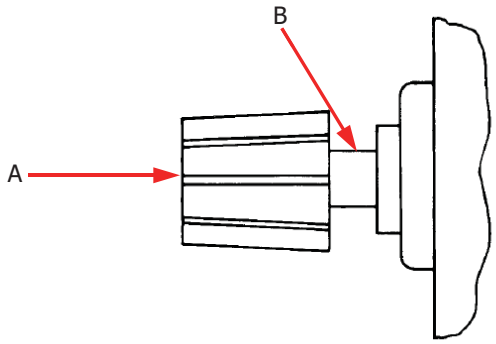


(1) Channel output terminals: used to output the voltage and current of the channel.

(2) Ground terminal: this terminal is connected to the instrument chassis and ground wire (the ground terminal of the power cord) and is in grounded state.

(3) Sense terminals: used to detect the actual voltage at the load terminal so as to compensate for the voltage drop caused by the load lead.

Connection methods of the output terminal:

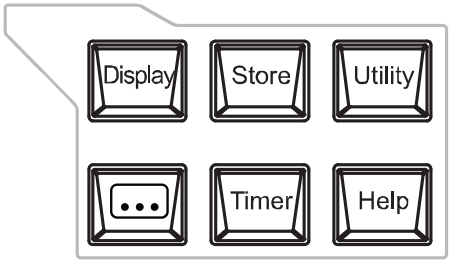


Method 1:
Connect the test lead to A of the output terminal.

Method 2:
Rotate the outer nut of the output terminal counterclockwise and connect the test lead to B of the output terminal; then, rotate the outer nut of the output terminal clockwise. This connection method can eliminate the error caused by the resistance of the output terminal.

Note: Connect the positive terminal of the test lead with the (+) terminal of the channel output and connect the negative terminal of the test lead with the (-) terminal of the channel output.

8. Function Menu Area



Press this key to enter the display parameter setting interface. Users can set the brightness, contrast, RGB luminance, display mode and display theme. Besides, you can also define the start-up interface.

Press this key to enter the file store and recall interface. You can save, read, delete, copy and paste files. The file types available for storage include state file, record file, timer file, delay file and bitmap file. The instrument supports internal and external storage and recall.

Press this key to enter the system utility function setting interface. Users can set the remote interface parameters, system parameters and print parameters. Besides, users can also calibrate the instrument, view system information, define the recall configuration of **Preset** and install options.

Press this key to enter the advanced function setting interface. Users can set the recorder, analyzer (option), monitor (option) and trigger (option) parameters.

Press this key to enter the timer and delayer interface. Users can set the timer and delayer parameters as well as enable and disable the timer and delayer functions.

Press this key to open the built-in help system and press the desired key to get the corresponding help information. For detailed introductions, refer to "**To Use the Built-in Help System**".

9. Display Mode Switch Key

Switch between the current display mode and dial display mode. Besides, when the instrument is in a function interface (any interface under **Timer**, , **Display**, **Store** and **Utility**), press this key to exit the function interface and return to the main interface.

10. Menu Keys

The menu keys correspond to the menus above them. Press any menu key to select the corresponding menu.

11. Power Switch Key

Turn on or off the instrument.

Rear Panel

This section introduces the rear panel of DP800 series by taking DP832 and DP811 (as shown in the figures below) as examples. The introduction of each part is as shown in Table 1.

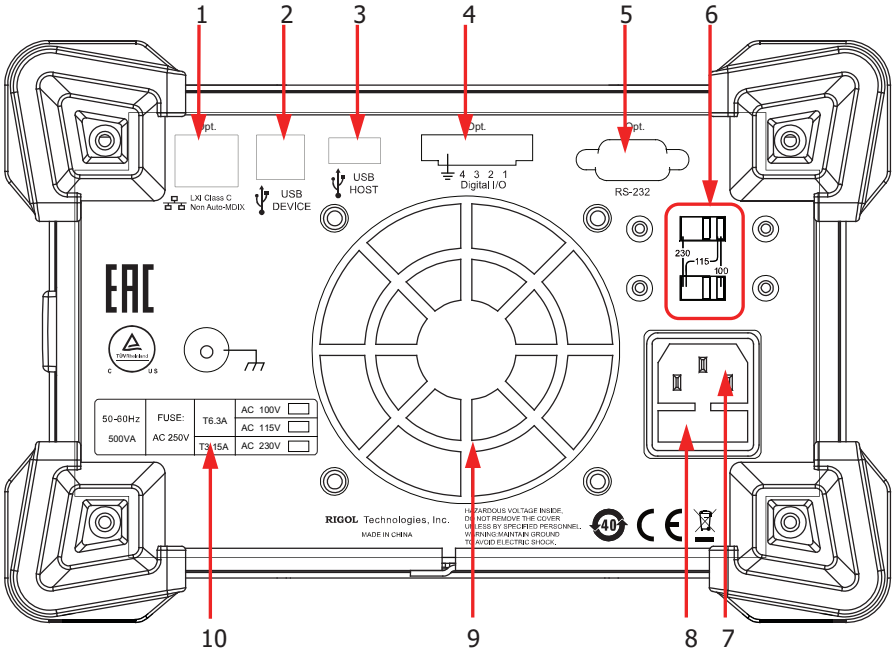


Figure 4 DP832 Rear Panel

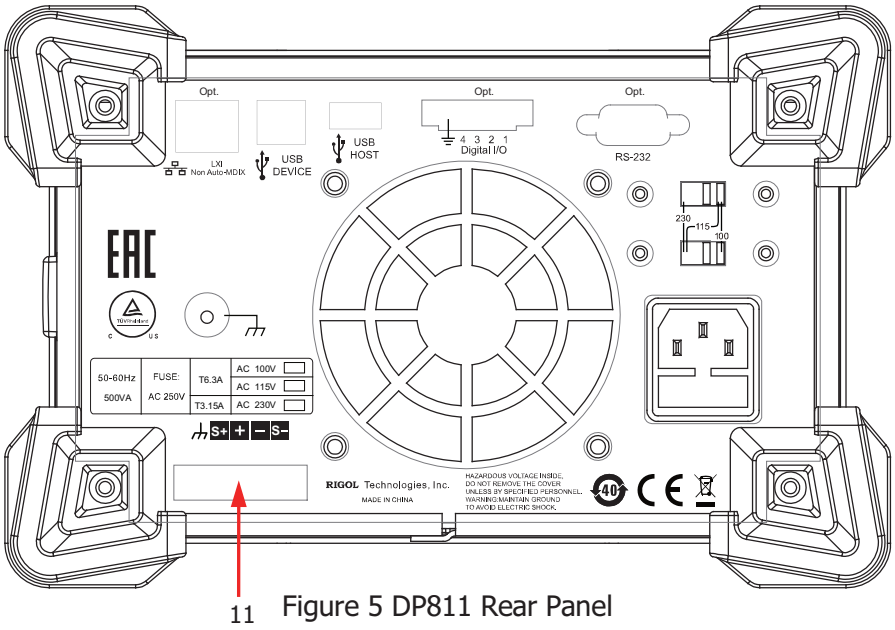


Figure 5 DP811 Rear Panel

Table 1 DP800 Rear Panel Explanation

No.	Name	Explanation
1	LAN Interface (option)	Connect to the local network via the RJ45 interface
2	USB DEVICE	Connect the instrument (as "slave device") to external USB device (such as, PC)
3	USB HOST	Connect the instrument (as "host device") to external USB device (such as, USB storage device); extend a GPIB interface for the power supply using USB-GPIB interface converter (option)
4	Digital I/O (option)	Digital I/O interface
5	RS232 Interface (option)	Serial communication interface
6	Voltage Selector	Select the specification of the input voltage (100, 115 or 230; please refer to Table 2)
7	Power Socket	AC power input interface
8	Fuse	The specification of the fuse is related to the instrument model and actual input voltage (please refer to the "Input Power Requirements" on the rear panel of the instrument or refer to Table 3).
9	Fan	
10	Input Power Requirement	Corresponding relations of the AC input power frequency, voltage, and the specification of the fuse.
11	Output Interface	Only DP813 and DP811 provide this interface. The function of this interface is the same as that of the "**Output Terminals**" on the front panel.

Note: The "Output Terminals" on the front panel and "Output Interface" on the rear panel cannot be used for output at the same time. You can only select one of them for output at each time (wherein, the output terminals on the front panel provide higher output accuracy).

To Connect to Power

DP800 series power supply supports various AC power supply inputs. The voltage selector setting on the rear panel differs when the input power connected is different, as shown in the table below.

Table 2 AC Input Power Specifications (including voltage selector settings)

AC Input Power	Voltage Selector Setting
100Vac±10%, 50Hz to 60Hz	100
115Vac±10%, 50Hz to 60Hz	115
230Vac±10% (250Vac maximum), 50Hz to 60Hz	230

Please connect the power following the steps below.

1. **Check the input power**
   Make sure that the AC power to be connected to the instrument fulfills the requirements in Table 2.

2. **Check the voltage selector on the rear panel**
   Make sure that the voltage selector setting (110, 115 or 230) on the rear panel of the instrument matches the actual input voltage (for the matching relations, refer to Table 2).

3. **Check the fuse**
   When the instrument leaves factory, the specified fuse is installed. Please check whether the fuse matches the actual input voltage according to the "Input Power Requirements" on the rear panel of the instrument or Table 3.

4. **Connect the AC power**
   Connect the instrument to AC power supply using the power cord provided in the accessories.

WARNING
To avoid electric shock, make sure that the instrument is correctly grounded.

Power-on Inspection

Press the power switch on the front panel and the instrument executes self-test. If the instrument passes the self-test, the welcome interface will be displayed; otherwise, the corresponding self-test failure information (including the top board, bottom board, fan, and temperature) will be displayed.

Tip
When powering on the instrument after powering it off, make sure that the time interval between the two operations is greater than 5s.

To Replace the Fuse

The fuse specification is related to the instrument model and actual input voltage, as shown in the table below. You can also refer to the "Input Power Requirements" on the rear panel of the instrument.

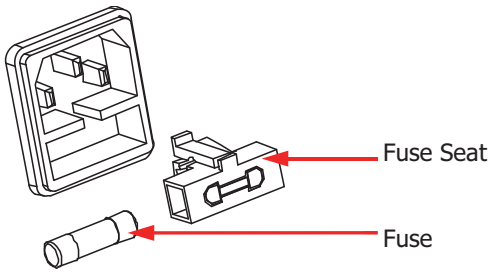
Table 3 Fuse Specifications

Input Voltage	Fuse Specification
DP832/DP822/DP813/DP811	
100Vac/115Vac	T6.3A
230Vac	T3.15A
DP831/DP821	
100Vac/115Vac	T5A
230Vac	T2.5A

To replace the fuse, follow the steps below.

1. Turn off the instrument and remove the power cord.

2. Insert a small straight screwdriver into the slot at the power socket and pry out the fuse seat gently.



3. If needed, adjust the power voltage selector manually to select the voltage scale

(please refer to Table 2) that matches the actual input voltage.

4. Take out the fuse and replace it with a specified one (please refer to the "Input Power Requirement" on the rear panel of the instrument or Table 3).

5. Re-insert the fuse seat into the power socket (pay attention to the direction).

WARNING
To avoid personal injuries, cut off the power supply before replacing the fuse; to avoid electric shock or fire, select the power supply specification that matches the actual input voltage and replace a fuse corresponding to this specification before connecting to power.

User Interface

DP800 series power supply provides three kinds of display modes (normal, waveform and dial). The default is normal. You can press **Display** → **Disp Mode** to select different display mode. This section introduces the user interface layout under the normal display mode (as shown in the figure below and Table 4 on the next page).

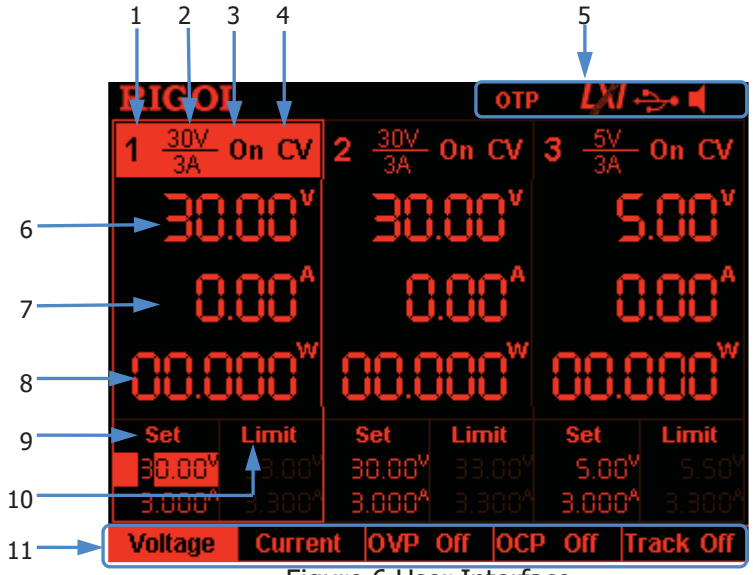


Figure 6 User Interface

Table 4 User Interface Explanation

No.	Explanation
1	Channel Number
2	Channel Output Voltage/Current
3	Channel Output State
4	Channel Output Mode
5	Status Bar, display the system status labels. OTP: over-temperature protection is enabled. : the front panel is locked. : the network is connected. : the USB device is recognized. : the beeper is enabled. : the beeper is disabled. : the instrument is working in remote mode.
6	Actual Output Voltage
7	Actual Output Current
8	Actual Output Power
9	Voltage and Current Setting Values
10	Overvoltage Protection and Overcurrent Protection Setting Values
11	Menu Bar

Tip

When the current display mode is "Normal" or "Waveform", press  on the front panel to quickly switch between the current display mode and dial display mode.

To Use the Built-in Help System

The built-in help system provides help information for any front panel key (except the parameter input area) and menu keys for users to quickly obtain the function prompts of the function keys or menus.

Obtain the help information of any key

Press **Help** to illuminate it and press the desired key or menu key to get the corresponding help information; at the same time, the backlight of **Help** goes off. You can press  to exit the help system.

Built-in help interface

Press **Help** to illuminate it and press **Help** again to open the built-in help interface. Use the up/down arrow key or knob to select the desired help topic and press **View** to view the corresponding help information.

The help topics include:

1. View the last displayed message.
2. View error queue of the remote commands.
3. Get the help information of a key.
4. Storage management.
5. Abbreviation list.
6. Series-parallel Help.
7. Get technical support from **RIGOL**.

Troubleshooting

The commonly encountered failures and their solutions are listed below. When you encounter those problems, please solve them following the corresponding steps. If the problem remains still, please contact **RIGOL** and provide your device information (**Utility** → **SysInfo**).

1. **The instrument does not start.**
   (1) Check the power cord connection.
   (2) Check whether the power switch on the front panel is turned on.
   (3) Remove the power cord and check whether the voltage selector is at the proper scale and whether the fuse specification is correct and the fuse is in good condition. To replace the fuse, refer to "**To Replace the Fuse**".
   (4) If the problem persists, please contact **RIGOL**.

2. **The constant voltage output is abnormal.**
   (1) Check whether the maximum output power of the scale selected fulfills the load requirement. If yes, turn to the next step.
   (2) Check whether the cable connecting the load and power supply is short-circuited and whether it is in good contact.
   (3) Check whether the load works normally.
   (4) Check whether the current setting value of this scale is proper; if it is too low, increase the current setting value properly.
   (5) If the problem persists, please contact **RIGOL**.

3. **The constant current output is abnormal.**
   (1) Check whether the maximum output power of the scale selected meets the requirement of the load. If yes, turn to the next step.
   (2) Check whether the cable connecting the load and power supply is short-circuited and whether it is in good contact.
   (3) Check whether the load works normally.
   (4) Check whether the voltage setting value of this scale is proper; if it is too low, increase the voltage setting value properly.
   (5) If the problem persists, please contact **RIGOL**.

4. **The USB storage device cannot be recognized.**
   (1) Check whether the USB storage device can work normally.
   (2) Make sure the USB storage device used is Flash storage type, as this instrument does not support hardware storage type USB storage device.
   (3) Restart the instrument and insert the USB storage device to check it.
   (4) If the USB storage device still cannot work normally, please contact **RIGOL**.