RIGOL

Quick Guide

DP800A Series Programmable Linear DC Power Supply

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RIGOL Technologies, Inc.

Guaranty and Declaration

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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 injuries or damages 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 by 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 power cord to the Protective Earth terminal before any inputs or outputs.

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.

Use Proper Overvoltage Protection.
Make sure that no overvoltage (such as that caused by a thunderstorm) can reach the product, or else the operator might expose to danger of electrical shock.

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

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 damage occurs to the instrument, have it inspected by qualified service personnel before further operations. Any maintenance, adjustment or replacement especially to circuits or accessories must be performed by **RIGOL** authorized personnel.

Keep Well Ventilation.
Inadequate ventilation may cause increasing of temperature or damages to the device. So please keep well ventilated and inspect the intake and fan regularly.

Do Not Operate in Wet Conditions.
In order 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.
In order 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 and/or moisture in air, please keep the surface of device clean and dry.

Electrostatic Prevention.
Operate in an electrostatic discharge protective area environment to avoid damages induced by static discharges. Always ground both the internal and external conductors of the cable to release static before connecting.

Handling Safety.
Please handle with care during transportation to avoid damages to buttons, knob interfaces and other parts on the panels.

Safety Terms and Symbols

Terms in this Manual. These terms may appear in this manual:

⚠ **WARNING**
Warning statements indicate the conditions or practices that could result in injury or loss of life.

⚠ **CAUTION**
Caution statements indicate the conditions or practices that could result in damage to this product or other property.

Terms on the Product. These terms may appear on the Product:

DANGER indicates an injury or hazard may immediately happen.
WARNING indicates an injury or hazard may be accessible potentially.
CAUTION indicates a potential damage to the instrument or other property might occur.

Symbols on the Product. These symbols may appear on the product:

⚡	⚠	⏚	⏚	⏚
Hazardous Voltage	**Safety Warning**	**Protective Earth Terminal**	**Chassis Ground**	**Test Ground**

General Care and Cleaning

General Care:
Do not store or leave the instrument in where the instrument will be exposed to direct sunlight for long periods of time.

Cleaning:
Clean the instrument regularly according to its operating conditions. To clean the exterior surface, perform the following steps:
1. Disconnect the instrument from all power sources.
2. Clean the loose dust on the outside of the instrument with a lint- free cloth (with a mild detergent or water). When cleaning the LCD, take care to avoid scarifying it.

> ⚠ **CAUTION**
> To avoid damages to the instrument, do not expose them to liquids which have causticity.

> ⚠ **WARNING**
> To avoid injury resulting from short circuit, make sure the instrument is completely dry before reconnecting to a power source.

Environmental Considerations

The following symbol indicates that this product complies with the applicable European Union requirements according to Directives 2002/96/EC on waste electrical and electronic equipment (WEEE) and batteries.

Product End-of-Life Handling
The equipment may contain substances that could be harmful to the environment or human health. In order to avoid release of such substances into the environment and harm to human health, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately. 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 DP800A series programmable linear DC power supply. You can download the newest version of this manual from www.rigol.com.

Format Conventions in this Manual

1   Buttons
The function key at the front panel is denoted by the format of "Button Name (Bold) + Text Box" in the manual, for example, **Utility** denotes the "System Auxiliary Function Setting" key.

2   Menu
The menu item is denoted by the format of "Menu Word (Bold) + Character Shading" in the manual, for example, **Sys Info** denotes the "System Information" item under **Utility**.

3   Operation Steps
The next step of the operation is denoted by an arrow "→" in the manual. For example, **Utility** → **System** denotes pressing **Utility** at the front panel and then pressing **System**.

Content Conventions in this Manual

DP800A series programmable linear DC power supply includes the following models. In this manual, DP831A is taken as an example to illustrate the functions and operating methods of DP800A series.

Model	Channel	Channel Output Voltage/Current
DP831A	3	8V/5A, 30V/2A, -30V/2A
DP832A	3	30V/3A, 30V/3A, 5V/3A
DP821A	2	60V/1A, 8V/10A
DP811A	1	20V/10A (Range 1), 40V/5A (Range 2)

Contents

Quick Start

General Inspection

1. Inspect the shipping container for damage
Keep the damaged shipping container or cushioning material until the contents of the shipment have been checked for completeness and the instrument has passed both electrical and mechanical tests.

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

2. Inspect the instrument
In case of any damage, or defect, or failure, notify your **RIGOL** sales representative.

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

Appearance and Dimensions

For DP800A series, the dimensions of all models are same. But the design of the front and rear panels are not exactly the same (about the differences, please refer to "**Front Panel**" and "**Rear Panel**"). In this section, DP831A is taken as an example to introduce the appearance and dimensions of DP800A series (as shown in Figure 1and Figure 2).

Figure 1 Front View   Unit: mm
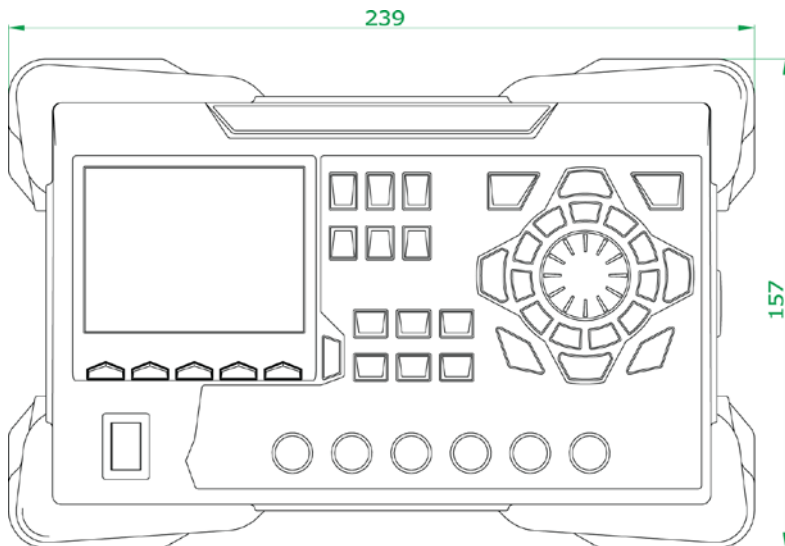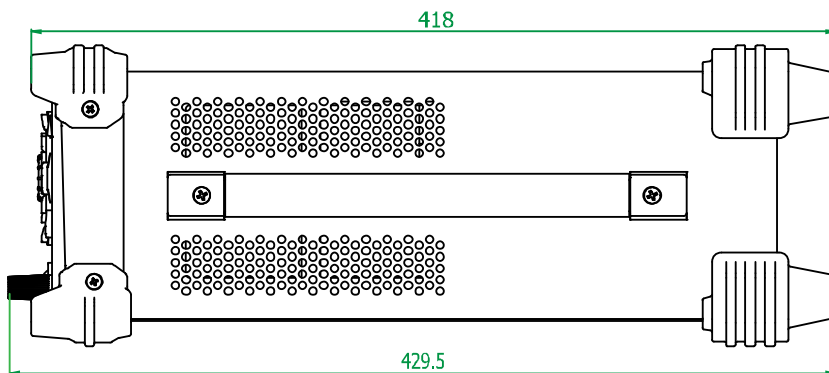
Figure 2 Side View   Unit: mm

Front Panel

The front panels of different models of DP800A series are shown in the figures below. In this section, DP831A (as shown in Figure 3) is taken as an example to introduce the front panels of DP800A series.
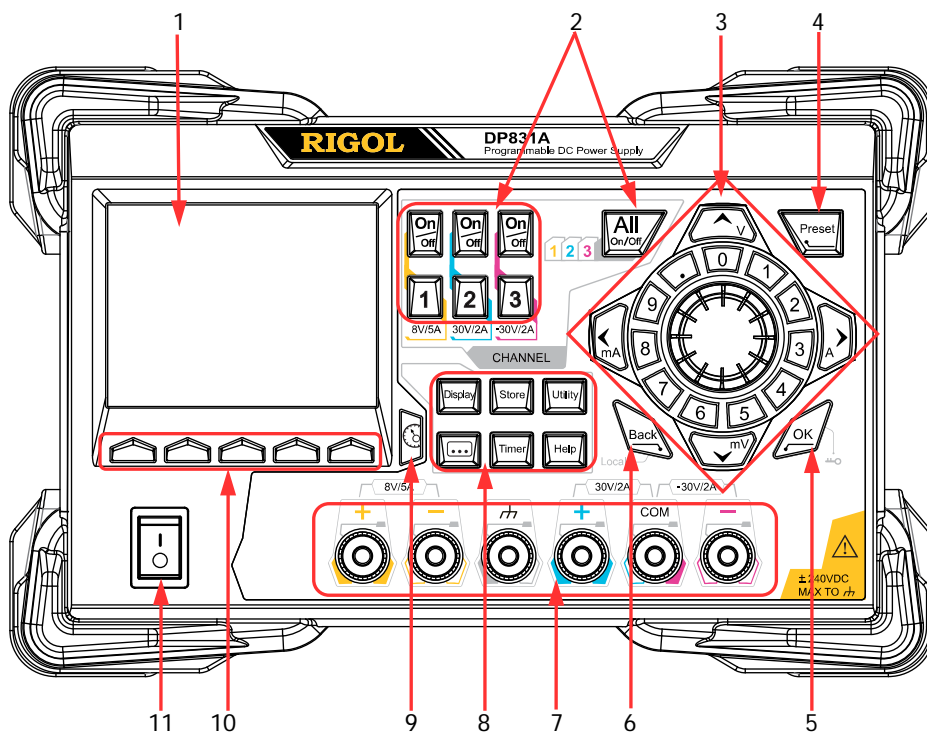
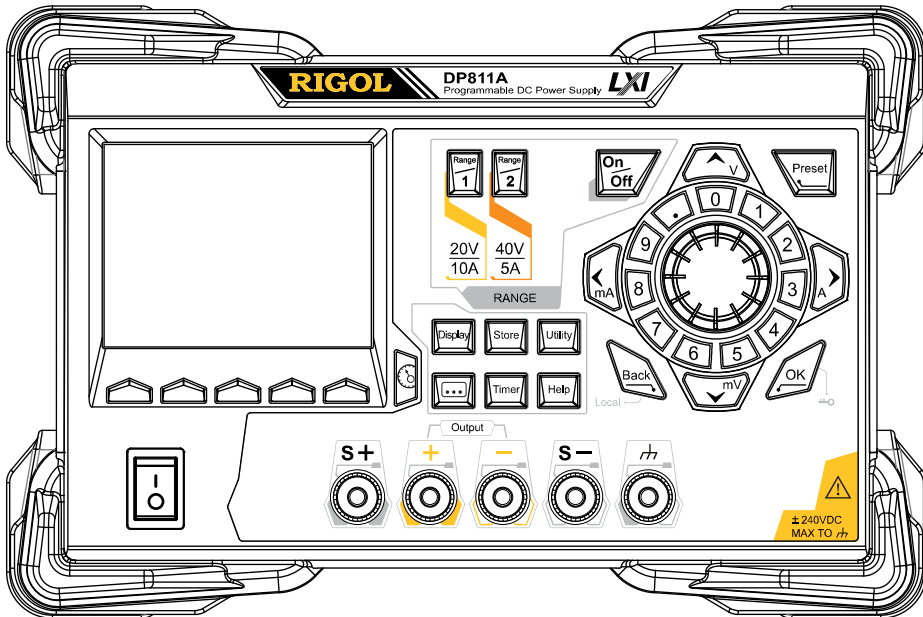Figure 3 DP831A Front Panel
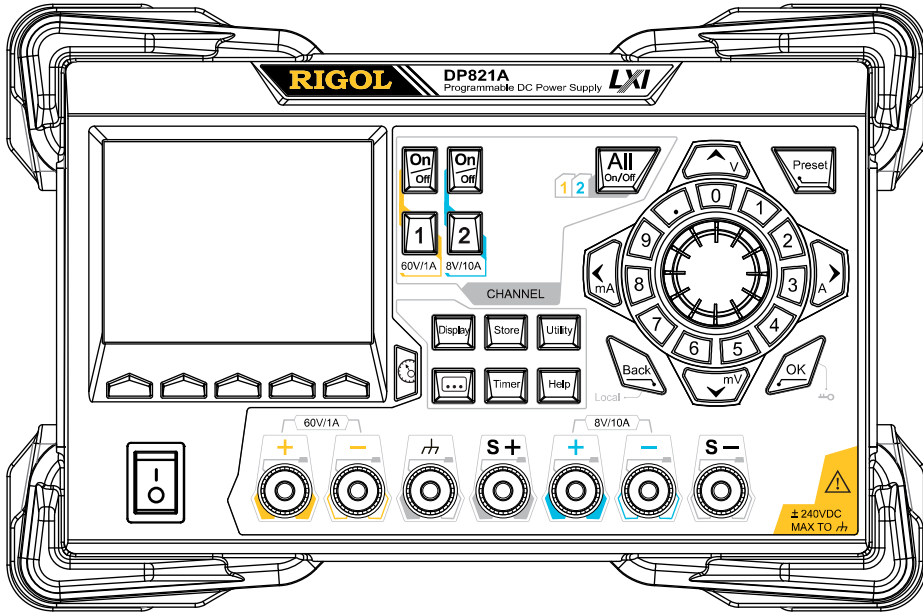
Figure 4 DP821A Front Panel

Figure 5 DP811A Front Panel

1. **LCD**

   3.5 inches 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 (DP811A), the function of this part is range selection and output switch.

   Multi-channel Model (takes DP831A as the example):
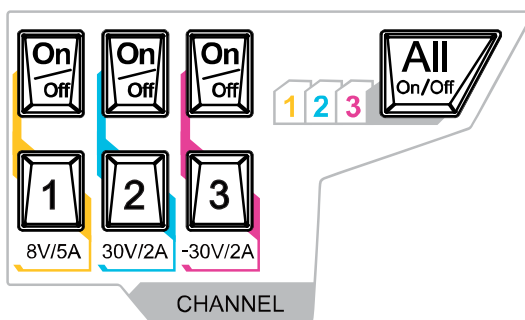
Press this key to select CH1 and set the parameters of this channel, such as voltage, current and overvoltage/overcurrent protection.

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

Press this key to select CH3 and set the parameters of this channel, such as voltage, current and overvoltage/overcurrent protection.
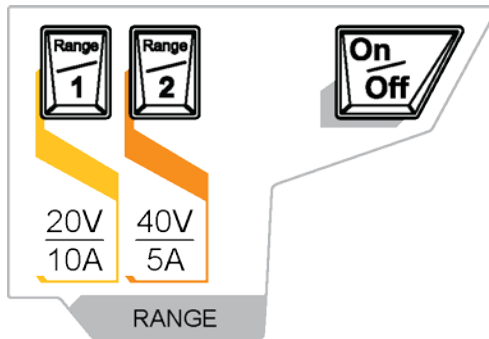
Press this key to enable or disable the output of the corresponding channel.

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. Press this key again to disable the outputs of all the channels.

Single Channel Model (DP811A):

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

Press this key to select the 40V/5A range. Users 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 direction keys (unit selection keys), numeric keyboard and knob.
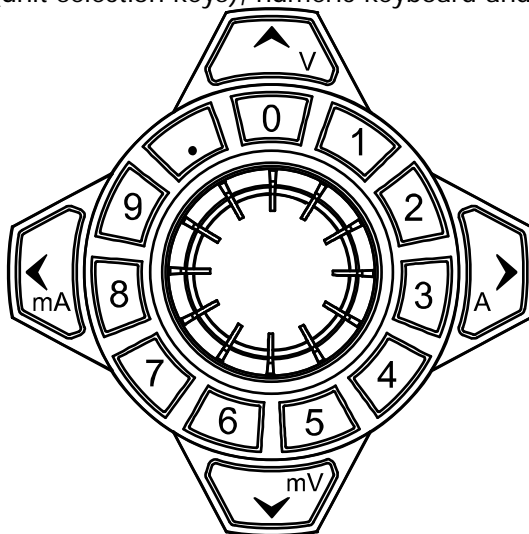
(1) Direction keys and unit selection keys
Direction keys: move the cursor.
Unit selection keys: when using the numeric keyboard to input parameters, the keys are used to select the voltage units (V and mV) and the current units (A and mA).

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

(3) Knob
When setting parameters, rotate the knob to increase or decrease the value of the digit 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) are not available. Press and hold this key again to unlock the front panel keys. When the keyboard lock password is enabled, users need to input the correct password (2012) to unlock the front panel keys.
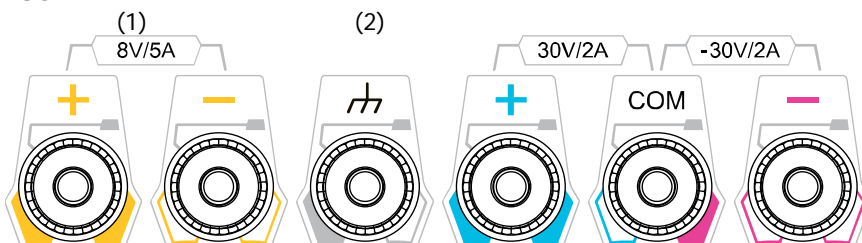
6. Back

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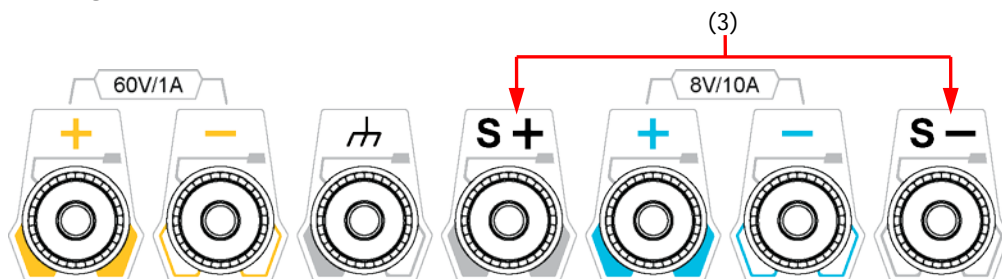When the instrument is in remote mode, press this key to return to local mode.

7. Output Terminals

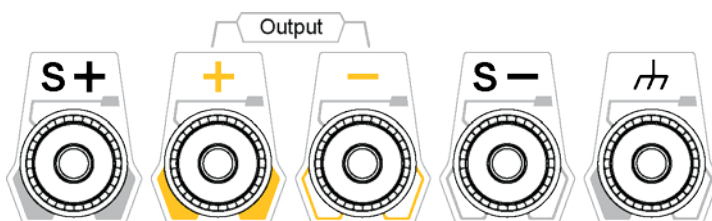For DP800A series, the output terminals of different models are not exactly the same.

DP831A:

DP821A:

DP811A:

(1) Used to output the voltage and current of the channel.
(2) This terminal is connected to the instrument chassis and ground wire (power cord ground terminal) and is in grounded state.
(3) Used to sense the actual voltage at the load to compensate the voltage drop caused by the leads between the power supply and the load.

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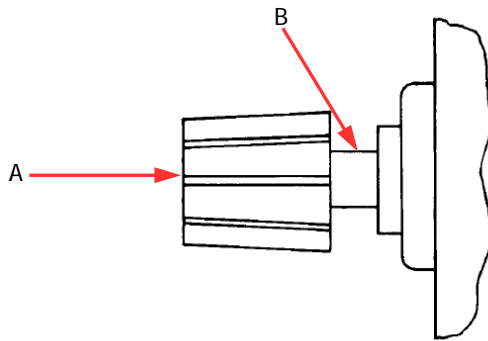
Method 1:
Connect the test lead to A of the output terminal.

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
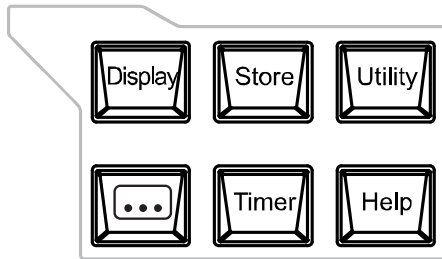
Press this key to enter the display parameter setting interface. Users can set the brightness, contrast, RGB luminosity and display mode.

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, delayer file and bitmap file. The instrument supports internal and external storage and recall. Wherein, external storage supports FAT32 file management system.

Press this key to enter the system auxiliary 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 and define the recall configuration of **Preset**.

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

Press this key to enter the timer and delayer setting interface. Users can set the timer and delayer parameters as well as turn on or off the timer and delayer.

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/Return to the Main Interface

Switch between the current display (normal or waveform) mode and dial display mode. Besides, in various function interfaces, press this key to exit the current 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
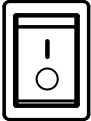
Turn on or off the instrument.

Rear Panel

The rear panels of the various models of DP800A series are as shown in the figures below. In this section, DP831A (as shown in Figure 6 and Table 1) is taken as an example to introduce the rear panels of DP800A series.
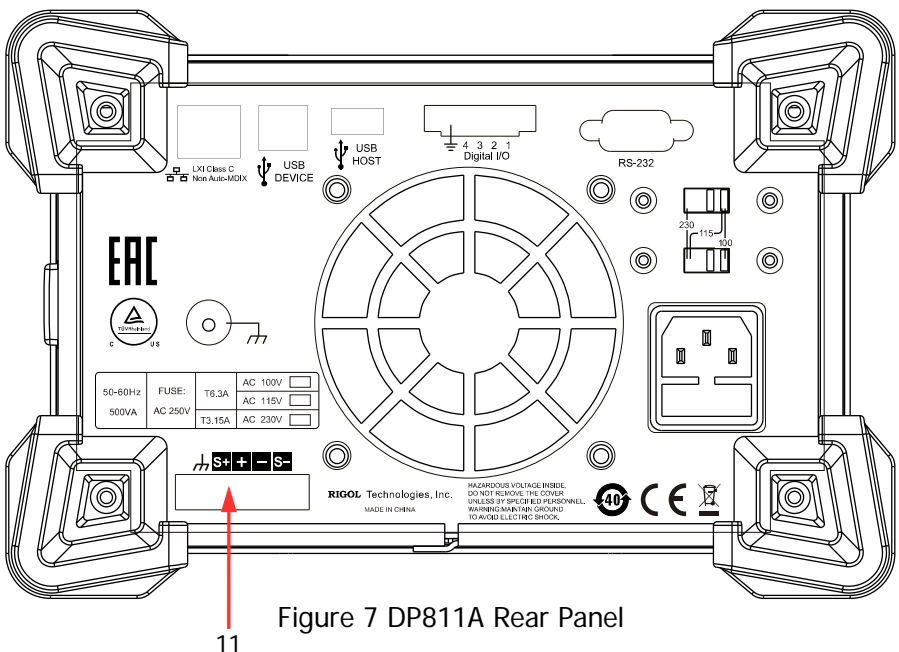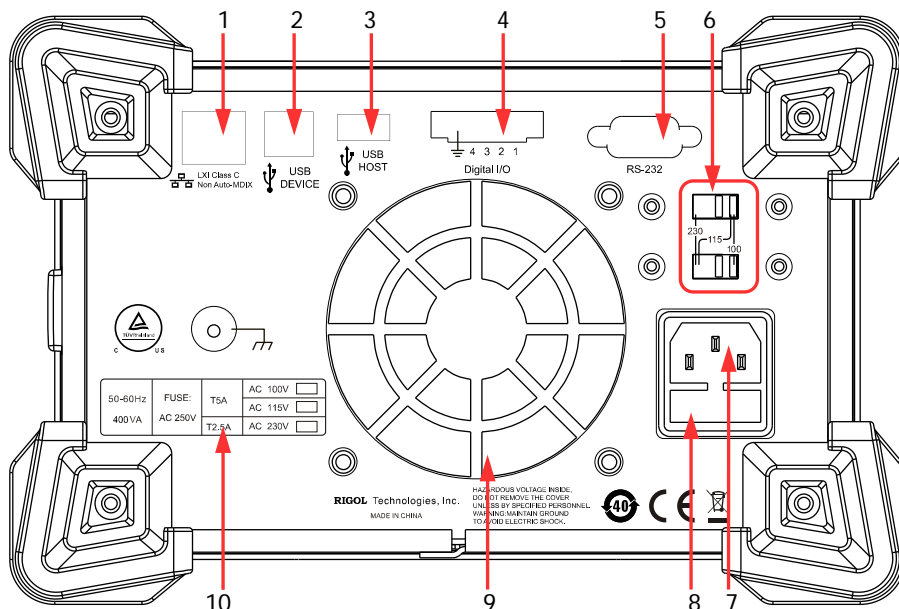

Figure 6 DP831A Rear Pannel

Figure 7 DP811A Rear Panel

Table 1 DP800A Rear Panel Explanation

No.	Name	Explanation
1	LAN Interface	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)
4	Digital I/O	Digital I/O interface
5	RS232 Interface	Serial communication interface
6	Voltage Selector	Select the specification of the input voltage (100V, 115V, 230V)
7	Power Socket	AC power input interface
8	Fuse	For different models of instrument or when different input voltages are selected, the specifications of the fuses are different
9	Fan	
10	Input Power Requirement	Corresponding relations of the input power frequency, voltage and fuse
11	Output Interface	Only DP811A provides this interface which has the same function as that of the "**Output Terminals**" at the front panel

Note: The "Output Terminals" at the front panel and the "Output Interface" at the rear panel cannot output at the same time. Only one of the two can be selected to output at any one time (the "Output Terminals" at the front panel has higher accuracy).

To Connect to Power

1.   Input power requirement
DP800A series power supply can accept three kinds of AC power supplies: 50Hz–60Hz frequency; 100V, 115V and 230V voltages.

2.   Check the voltage selector at the rear panel
Before connecting to power, make sure that the setting voltage of the voltage selector at the rear panel matches the input voltage.

3.   Check the fuse
When the instrument leaves factory, proper fuse is installed. Please check whether the fuse matches the input voltage according to the "Input Power Requirement" at the rear panel.

4.   Connect the instrument power cord
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 at 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 TopBoard, BottomBoard, Fan and Temperature) will be displayed.
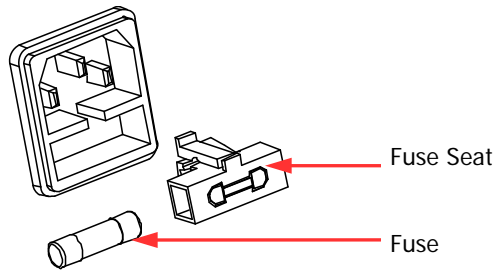
Tip
When turn the instrument on again after turn it off, please make sure the time between the two operations are larger than 5s.

To Replace the Fuse

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 prize out the fuse seat gently.

Fuse Seat

Fuse

3. Adjust the power voltage selector manually to select the correct voltage scale.

4. Take out the fuse and replace it with a specified fuse (for the corresponding relations between the input voltage and fuse specification, refer to the "Input Power Requirement" at the rear panel).

⚠️ **WARNING**
To avoid personal injuries, cut off the power supply before replacing the fuse; to avoid electric shock or fire, select the proper power supply specification and replace a fuse corresponding to this specification before connecting to power.

User Interface

DP800A series power supply provides three kinds of display modes (normal, waveform and dial). The default is normal and press **Display** → **Disp Mode** to set the display mode to "Waveform" or "Dial". In this section, DP831A is taken as an example to introduce the interface layout under the normal display mode (as shown in Figure 8 and Table 2).
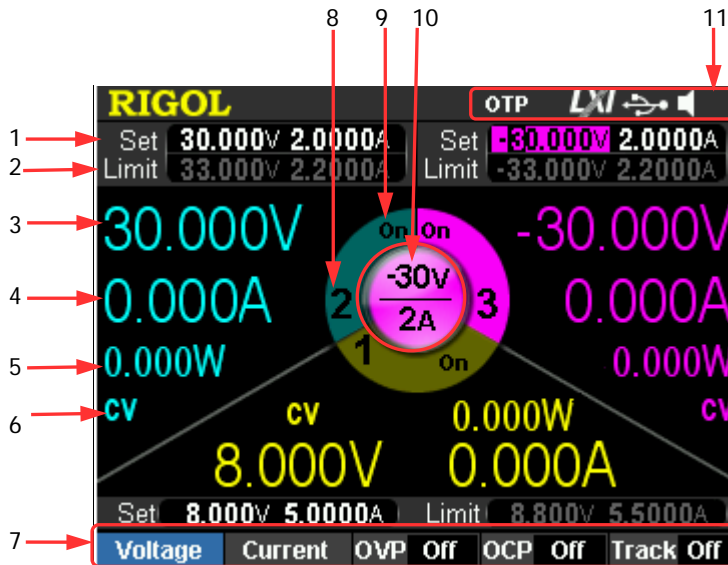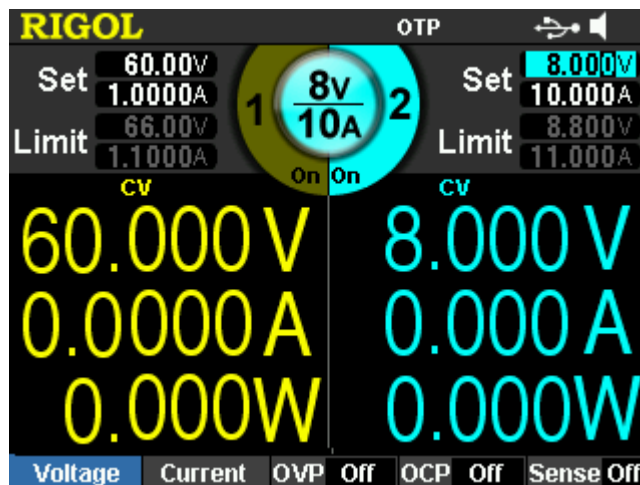

Figure 8 DP831A User Interface (Normal)

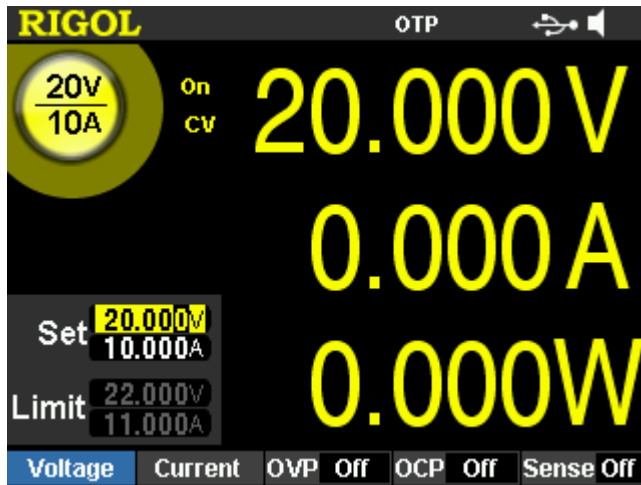Figure 9 DP821A User Interface (Normal)

Figure 10 DP811A User Interface (Normal)

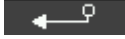Table 2 DP800A User Interface Explanation

1	Voltage and current setting values
2	Overvoltage and overcurrent protection setting values
3	Actual output voltage
4	Actual output current
5	Actual output power
6	Channel output mode
7	Menu bar
8	Channel number
9	Channel output status
10	Channel currently selected
11	Status bar, display the system status indicators. OTP : over-temperature protection is enabled. 🔒 : the front panel is locked. LXI : LAN is connected successfully. ↔ : USB device is recognized. ◀ : system sound is enabled. ✕ : system sound is disabled. ♪ : remote control is connected

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 to get the corresponding help information; at the same time, the backlight of **Help** goes off. 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 as shown in the figure below. Press the up/down direction keys to select the desired help topic and press **View** to view the corresponding help information.
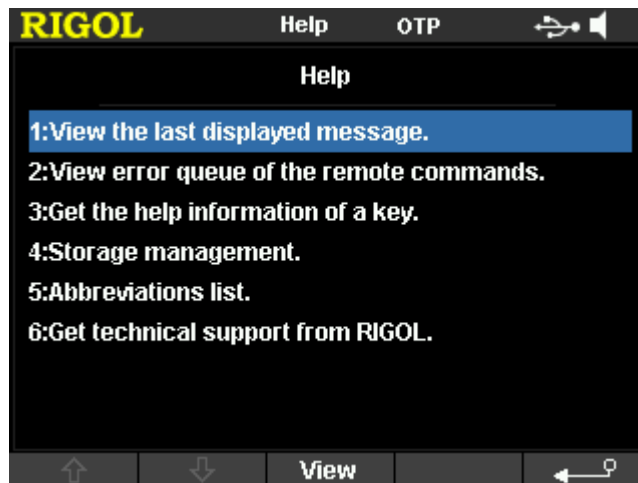

Figure 11 Built-in Help Interface

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** →**Sys Info**).

1. **The instrument can not start up.**
   (1) Check whether the power is correctly connected.
   (2) Check whether the power switch at the front panel is really on.
   (3) Remove the power cord and check whether the voltage selector is at the proper scale, whether the specification of the fuse is correct and whether the fuse is intact. If the fuse needs to be changed, refer to "**To Replace the Fuse**".
   (4) If the problem remains, please contact **RIGOL**.

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

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

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