

RIGOL

快速指南

DP800 系列可编程线性直流电源

2015 年 03 月

RIGOL Technologies, Inc.

保证和声明

版权

© 2012 北京普源精电科技有限公司版权所有。

商标信息

RIGOL 是北京普源精电科技有限公司的注册商标。

文档编号

QGH04004-1110

声明

- 本公司产品受中国及其它国家和地区的专利（包括已取得的和正在申请的专利）保护。
- 本公司保留改变规格及价格的权利。
- 本手册提供的信息取代以往出版的所有资料。
- 本手册提供的信息如有变更，恕不另行通知。
- 对于本手册可能包含的错误，或因手册所提供的信息及演绎的功能，以及因使用本手册而导致的任何偶然或继发的损失，**RIGOL** 概不负责。
- 未经 **RIGOL** 事先书面许可，不得影印、复制或改编本手册的任何部分。

产品认证

RIGOL 认证本产品符合中国国家产品标准和行业产品标准及 ISO9001:2008 标准和 ISO14001:2004 标准，并进一步认证本产品符合其它国际标准组织成员的相关标准。

联系我们

如您在使用此产品或本手册的过程中有任何问题或需求，可与 **RIGOL** 联系：

电子邮箱：service@rigol.com

网址：www.rigol.com

安全要求

一般安全概要

了解下列安全性预防措施，以避免受伤，并防止损坏本产品或与本产品连接的任何产品。为避免可能的危险，请务必按照规定使用本产品。

使用正确的电源线。

只允许使用所在国家认可的本产品专用电源线。

将产品接地。

本产品通过电源电缆的保护接地线接地。为避免电击，在连接本产品的任何输入或输出端子之前，请确保本产品电源电缆的接地端子与保护接地端可靠连接。

正确连接探头。

如果使用探头，探头地线与地电势相同，请勿将地线连接至高电压。

查看所有终端额定值。

为避免起火和过大电流的冲击，请查看产品上所有的额定值和标记说明，请在连接产品前查阅产品手册以了解额定值的详细信息。

使用合适的过压保护。

确保没有过电压（如由雷电造成的电压）到达该产品。否则操作人员可能有遭受电击的危险。

请勿开盖操作。

请勿在仪器机箱打开时运行本产品。

请勿将异物插入风扇的排风口。

请勿将异物插入风扇的排风口以免损坏仪器。

使用合适的保险丝。

只允许使用本产品指定规格的保险丝。

避免电路外露。

电源接通后，请勿接触外露的接头和元件。

怀疑产品出故障时，请勿进行操作。

如果您怀疑本产品出现故障，请联络**RIGOL**授权的维修人员进行检测。任何维护、调整或零件更换必须由**RIGOL**授权的维修人员执行。

保持适当的通风。

通风不良会引起仪器温度升高，进而引起仪器损坏。使用时应保持良好的通风，定期检查通风口和风扇。

请勿在潮湿环境下操作。

为避免仪器内部电路短路或发生电击的危险，请勿在潮湿环境下操作仪器。

请勿在易燃易爆的环境下操作。

为避免仪器损坏或人身伤害，请勿在易燃易爆的环境下操作仪器。

请保持产品表面的清洁和干燥。

为避免灰尘或空气中的水分影响仪器性能，请保持产品表面的清洁和干燥。

防静电保护。

静电会造成仪器损坏，应尽可能在防静电区进行测试。在连接电缆到仪器前，应将其内外导体短暂接地以释放静电。

正确使用电池。

如果仪器提供电池，严禁将电池暴露于高温或火中。要让儿童远离电池。不正确地更换电池可能造成爆炸（警告：锂离子电池）。必须使用 **RIGOL** 指定的电池。

注意搬运安全。

为避免仪器在搬运过程中滑落，造成仪器面板上的按键、旋钮或接口等部件损坏，请注意搬运安全。

请勿使用本电源给有源负载供电。

为避免电流回灌导致电源控制环路失控，进而损坏被供电设备，仅能使用本电源给不具备电流输出功能的纯负载供电。

安全术语和符号

本手册中的术语。以下术语可能出现在本手册中：



警告

警告性声明指出可能会危害操作人员生命安全的条件和行为。



注意

注意性声明指出可能导致本产品损坏或数据丢失的条件和行为。

产品上的术语。以下术语可能出现在产品上：

DANGER

表示您如果不进行此操作，可能会立即对您造成危害。

WARNING

表示您如果不进行此操作，可能会对您造成潜在的危害。

CAUTION

表示您如果不进行此操作，可能会对本产品或连接到本产品的其他设备造成损坏。

产品上的符号。以下符号可能出现在产品上：



高电压



安全警告



保护性接地端



壳体接地端



测量接地端

保养与清洁

保养

请勿将仪器放置在长时间受到日照的地方。

清洁

请根据使用情况经常对仪器进行清洁。方法如下：

1. 断开电源。
2. 用潮湿但不滴水的软布（可使用柔和的清洁剂或清水）擦拭仪器外部的浮尘。清洁带有液晶显示屏的仪器时，请注意不要划伤 LCD 显示屏。



注意

请勿使任何腐蚀性的液体沾到仪器上，以免损坏仪器。



警告

重新通电之前，请确认仪器已经干透，避免因水分造成电气短路甚至人身伤害。

环境注意事项

以下符号表明本产品符合 WEEE Directive 2002/96/EC 所制定的要求。



设备回收

本产品中包含的某些物质可能会对环境或人体健康有害，为避免将有害物质释放到环境中或危害人体健康，建议采用适当的方法回收本产品，以确保大部分材料可正确地重复使用或回收。有关处理或回收的信息，请与当地权威机构联系。

文档概述

本手册用于指导用户快速了解DP800系列可编程线性直流电源的前后面板、用户界面以及基本操作方法。您可登陆**RIGOL**官网 (www.rigol.com) 下载本手册的最新版本。


文档格式的约定

1. 按键

使用“按键字符（加粗）+文本框”表示前面板功能按键，如 **Utility** 表示“Utility”按键。

2. 菜单

(1) 使用“菜单文字（加粗）+字符底纹”表示一个菜单选项，如 **系统信息** 表示 **Utility** 按键下的“系统信息”菜单选项。

(2) 使用菜单的实际截图表示菜单，如 。

3. 操作步骤

使用箭头“→”表示下一步操作，例如：**Utility** → **系统设置** 表示按下前面板上的 **Utility** 功能键后，再按 **系统设置** 菜单键。

文档内容的约定

DP800系列可编程线性直流电源包含以下型号。如无特殊说明，本手册以DP832为例介绍DP800系列及其基本操作。

型号	通道数	输出通道电压/电流
DP832	3	30V/3A、30V/3A、5V/3A
DP831	3	8V/5A、30V/2A、-30V/2A
DP821	2	60V/1A、8V/10A
DP811	1	档位1：20V/10A；档位2：40V/5A

目录

保证和声明	I
安全要求	II
一般安全概要	II
安全术语和符号	IV
保养与清洁	V
环境注意事项	V
文档概述	VI
快速入门	1
一般性检查	1
外观尺寸	2
前面板	3
后面板	12
连接电源	14
开机检查	14
更换保险丝	15
用户界面	16
使用内置帮助系统	18
故障处理	19

快速入门

一般性检查

1. 检查运输包装

如运输包装已损坏，请保留被损坏的包装或防震材料，直到货物经过完全检查且仪器通过电性和机械测试。

因运输造成仪器损坏，由发货方和承运方联系赔偿事宜。**RIGOL**公司恕不进行免费维修或更换。

2. 检查整机

若存在机械损坏或缺失，或者仪器未通过电性和机械测试，请联系您的 **RIGOL** 经销商。

3. 检查随机附件

请根据装箱单检查随机附件，如有损坏或缺失，请联系您的**RIGOL**经销商。

外观尺寸

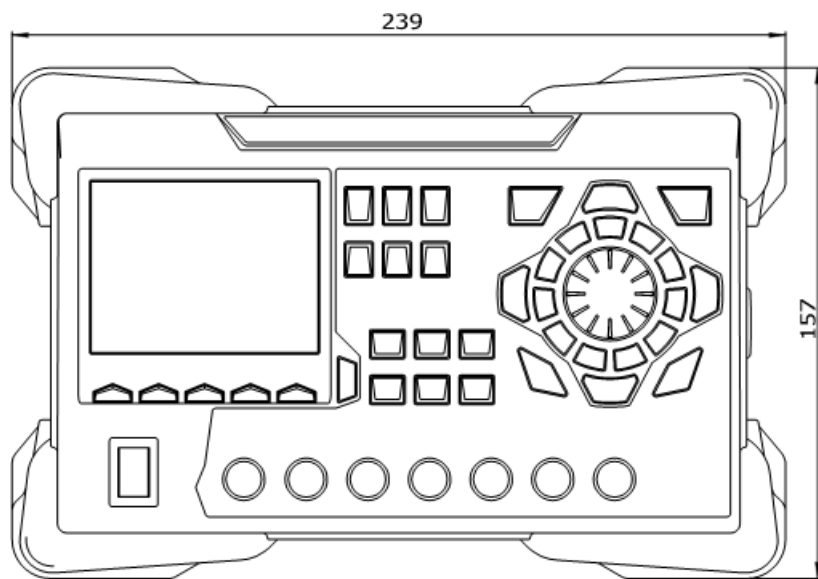


图 1 正视图

单位: mm

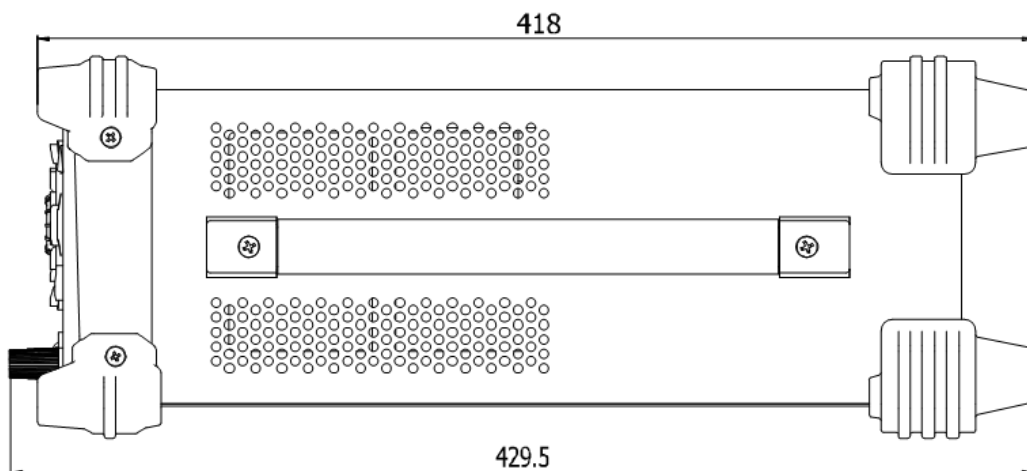


图 2 侧视图

单位: mm

前面板

本节主要以 DP832（如下图所示）为例介绍 DP800 系列的前面板。对于不同型号的不同之处，将分别进行介绍。

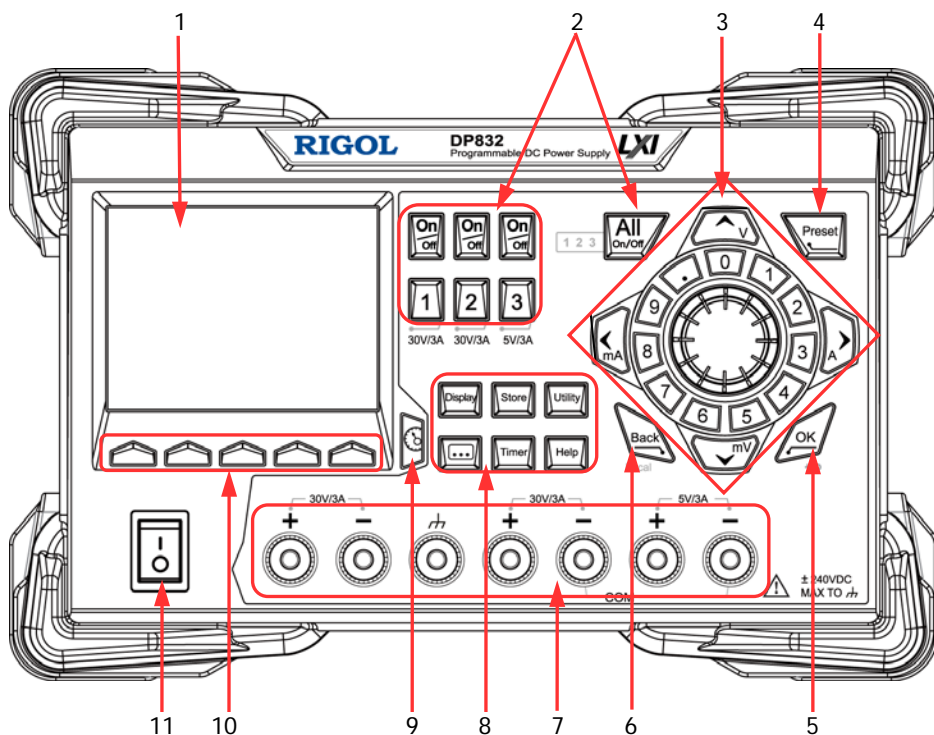


图 3 DP832 前面板

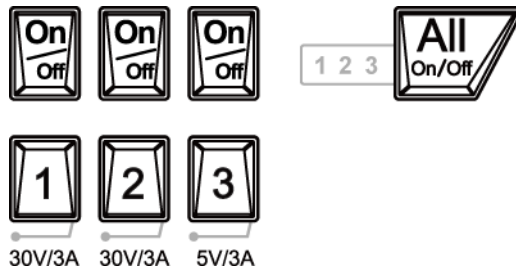
1. LCD

3.5 英寸的 TFT 显示屏，用于显示系统参数设置、系统输出状态、菜单选项以及提示信息等。

2. 通道（档位）选择与输出开关

对于多通道型号，此处为通道选择与输出开关。对于单通道型号，此处为档位选择与输出开关。

多通道型号（以 DP832 为例）：



按下该键，选择通道 1 为当前通道并可设置该通道的电压、电流、过压/过流保护等参数。



按下该键，选择通道 2 为当前通道并可设置该通道的电压、电流、过压/过流保护等参数。



按下该键，选择通道 3 为当前通道并可设置该通道的电压、电流、过压/过流保护等参数。

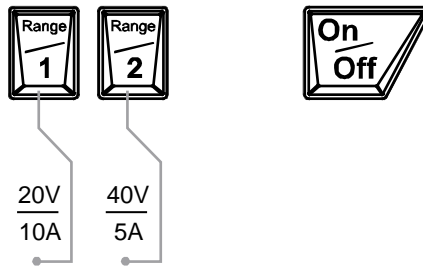


按下该键，可打开或关闭对应通道的输出。



按下该键，仪器弹出是否打开所有通道输出的提示信息，按 **确认** 可打开所有通道的输出。再次按该键，关闭所有通道的输出。

单通道型号 (DP811):



按下该键，选择 20V/10A 档位为当前档位并可设置通道的电压、电流、过压/过流保护等参数。



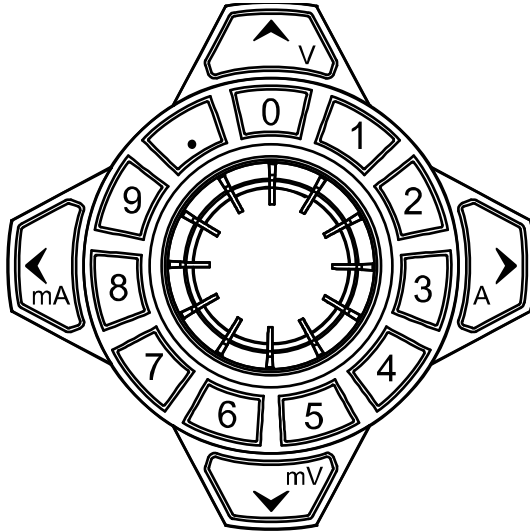
按下该键，选择 40V/5A 档位为当前档位并可设置通道的电压、电流、过压/过流保护等参数。



按下该键，可打开或关闭通道的输出。

3. 参数输入区

参数输入区如下图所示，包含方向键（单位选择键）、数字键盘和旋钮。



(1) 方向键和单位选择键

方向键：用于移动光标位置；设置参数时，可以使用上/下方向键增大或减小光标处的数值。

单位选择键：使用数字键盘输入参数时，用于选择电压单位（V、mV）或电流单位（A、mA）。

(2) 数字键盘

圆环式数字键盘：包括数字 0-9 和小数点，按下对应的按键，可直接输入数字或小数点。

(3) 旋钮

设置参数时，旋转旋钮可以增大或减小光标处的数值。



浏览设置对象（定时参数、延时参数、文件名输入等）时，旋转旋钮可快速移动光标位置。

4. Preset

用于将仪器所有设置恢复为出厂默认值，或调用用户自定义的通道电压/电流配置。

5. OK

用于确认参数的设置。

长按该键，可锁定前面板按键。此时，除各通道对应的输出开关键  和电源开关键  之外，前面板其它按键不可用。键盘锁密码关闭时，再次长按该键，可解除锁定；键盘锁密码打开时，解锁过程中必须输入正确的密码（2012）。

6. Back

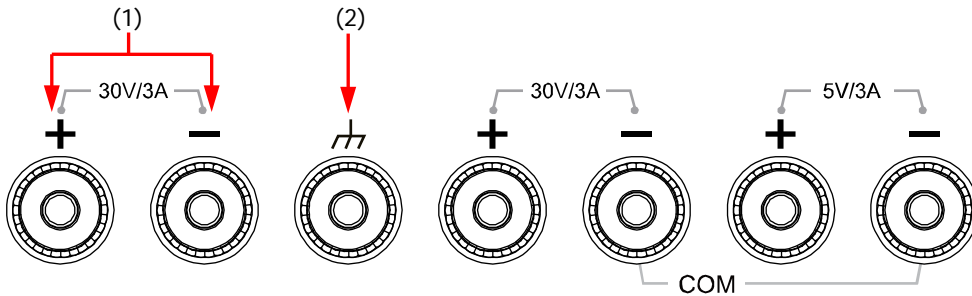
用于删除当前光标前的字符。

当仪器工作在远程模式时，该键用于返回本地模式。

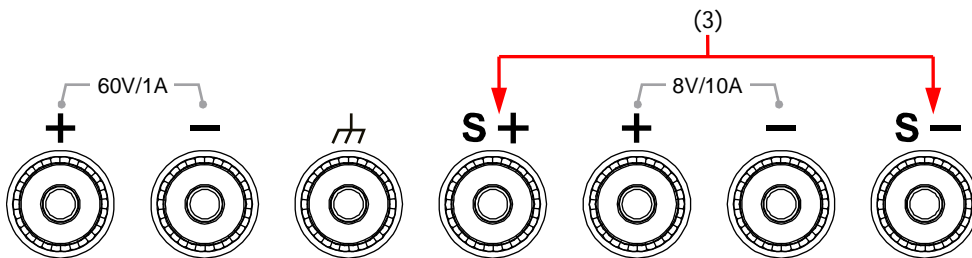
7. 输出端子

DP800 系列不同型号的输出端子有所不同。

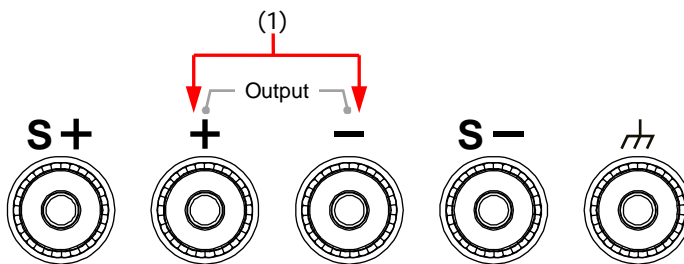
DP832:



DP821:

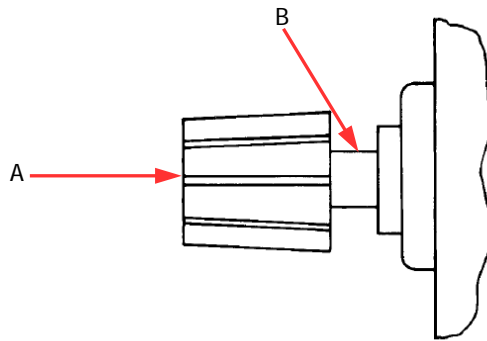


DP811:



- (1) 通道输出端子：用于输出通道的电压和电流。
- (2) 接地端子：该端子与机壳、地线（电源线接地端）相连，处于接地状态。
- (3) Sense 端子：用于检测负载端实际电压以补偿负载引线引起的电压降。

输出端子的连接方法:



方法 1:

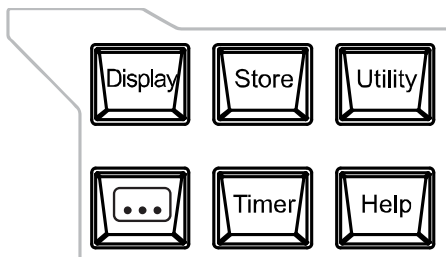
将测试引线 with 输出端子的 A 端连接。

方法 2:

逆时针旋转输出端子外层螺母，将测试引线 with 输出端子的 B 端连接，顺时针拧紧输出端子的外层螺母。该方法可避免由输出端子自身电阻引入的误差。

注意：将测试引线的正端与通道输出的 (+) 端连接，将测试引线的负端与通道输出的 (-) 端连接。

8. 功能菜单区



按下该键进入显示参数设置界面，可设置屏幕的亮度、对比度、颜色亮度、显示模式和显示主题。此外，您还可以自定义开机界面。



按下该键进入文件存储与调用界面，可进行文件的保存、读取、删除、复制和粘贴等操作。存储的文件类型包括状态文件、录制文件、定时文件、延时文件和位图文件。仪器支持内外部存储与调用。



按下该键进入系统辅助功能设置界面，可设置远程接口参数、系统参数、打印参数等。此外，您还可以校准仪器、查看系统信息、定义 **Preset** 键的调用配置、安装选件等。



按下该键进入高级功能设置界面，可设置录制器、分析器（选件）、监测器（选件）和触发器（选件）的相关参数。



按下该键进入定时器与延时器界面，可设置定时器和延时器的相关参数以及打开和关闭定时器和延时器功能。



按下该键打开内置帮助系统，按下需要获得帮助的按键，可获取对应的帮助信息。详细介绍请参考“使用内置帮助系统”一节。

9. 显示模式切换键



可以在当前模式和表盘模式之间进行切换。

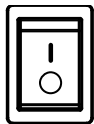
此外，当仪器处于各功能界面时（**Timer**、**...**、**Display**、**Store**、**Utility** 下的任一界面），按下该键可退出功能界面并返回主界面。

10. 菜单键



与其上方的菜单一一对应，按任一菜单键选择相应菜单。

11. 电源开关键



可打开或关闭仪器。

后面板

本节主要以 DP832 和 DP811（如下图所示）为例介绍 DP800 系列的后面板，各部分的说明如表 1 所示。

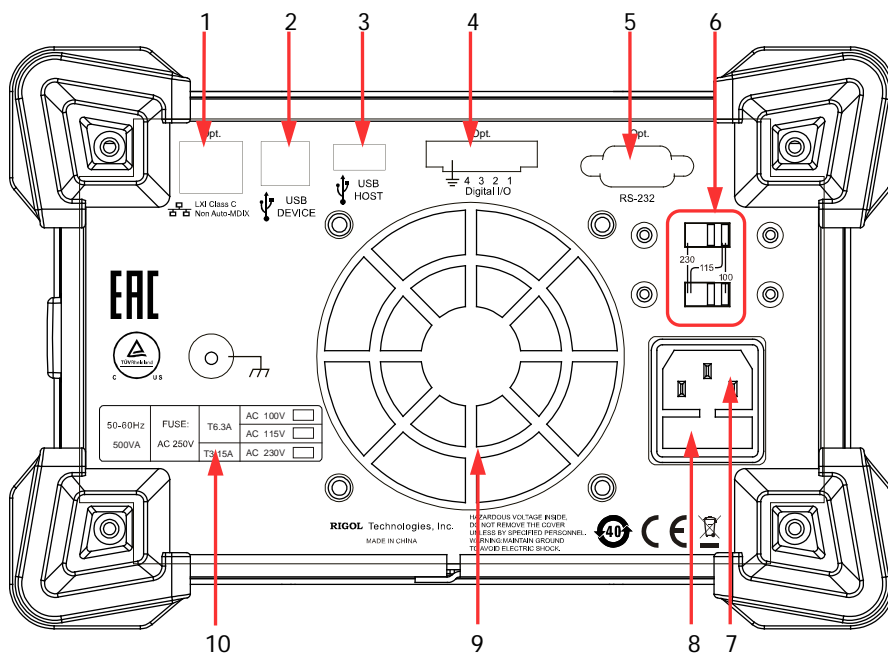


图 4 DP832 后面板

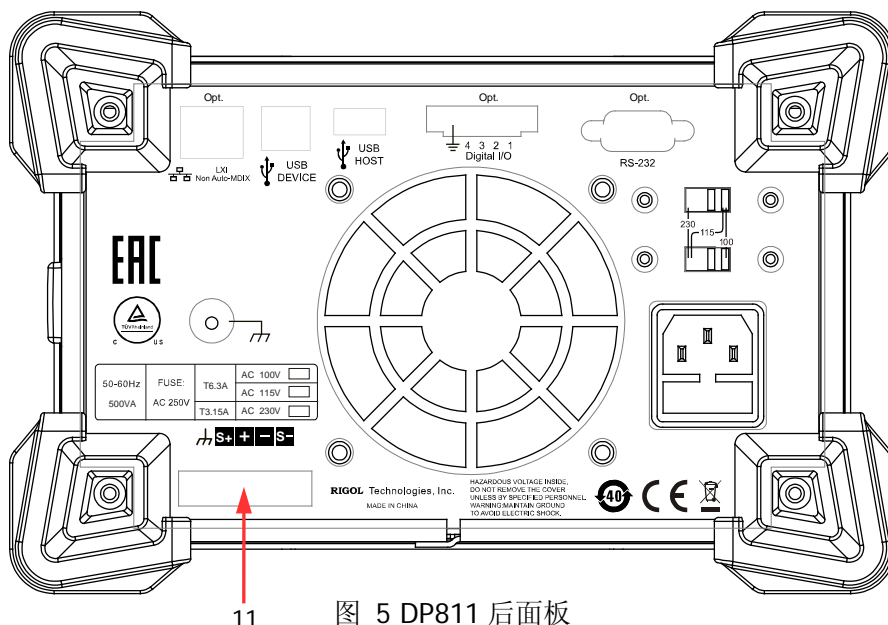


图 5 DP811 后面板

表 1 DP800 后面板说明

编号	名称	说明
1	LAN 接口（选件）	通过 RJ45 接口接入局域网
2	USB DEVICE	仪器作为“从设备”与外部 USB 设备（如计算机）连接
3	USB HOST	仪器作为“主设备”与外部 USB 设备（如 U 盘）连接； 通过 USB-GPIB 接口模块（选件）为电源扩展出 GPIB 接口
4	Digital I/O（选件）	数字 I/O 接口
5	RS232 接口（选件）	串行通信接口
6	电压选择器	用于选择输入电压的规格（100、115 或 230，请参考表 2）
7	电源插孔	交流电源输入接口
8	保险丝	所需的保险丝规格与仪器型号和实际的输入电压有关（请参考仪器后面板“输入电源要求”的说明或表 3）
9	风扇	
10	输入电源要求	交流输入电源的频率、电压与保险丝规格的对应关系
11	输出接口	仅 DP811 提供该接口，该接口的功能与前面板“输出端子”功能相同

注意：前面板“输出端子”和后面板“输出接口”不可同时进行输出，同一时刻只能选择其中一种方式进行输出（前面板输出端子的输出精度更高）。

连接电源

DP800 系列电源支持多种规格的交流电源输入，连接不同规格的输入电源时，后面板电压选择器的设置也不同，如下表所示。

表 2 交流输入电源规格（包含电压选择器设置）

交流输入电源	电压选择器设置
100Vac±10%，50Hz~60Hz	100
115Vac±10%，50Hz~60Hz	115
230Vac±10%（最大 250Vac），50Hz~60Hz	230

请严格按照如下步骤连接电源。

1. 检查输入电源

请确保欲连接到仪器的交流电源符合表 2 中的要求。

2. 检查后面板电压选择器

请确保仪器后面板电压选择器的设置（100、115 或 230）与实际输入电压相匹配（匹配关系请参考表 2）。

3. 检查保险丝

仪器出厂时，已安装指定规格的保险丝。请参考仪器后面板“输入电源要求”的说明或表 3，确保保险丝与实际输入电压相匹配。

4. 连接交流电源

请使用附件提供的电源线将仪器连接至交流电源。



警告

为避免电击，请确认仪器已经正确接地。

开机检查

按下前面板电源开关键，仪器启动并执行自检操作，若自检通过，屏幕会显示开机界面，否则，系统会提示相应的自检失败信息（包括模拟板 1、模拟板 2、风扇、温度）。

提示

关机后若再次开机，请保证与上次关机的时间间隔大于5s。

更换保险丝

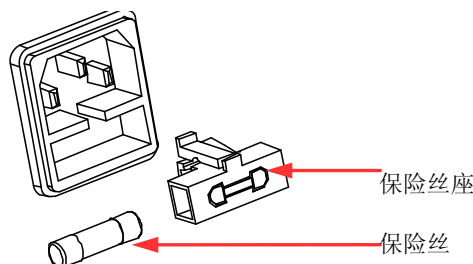
所需保险丝的规格与仪器型号和实际的输入电压有关，如下表所示。您也可以参考仪器后面板的“输入电源要求”。

表 3 保险丝规格

输入电压	保险丝规格
DP832/DP811	
100Vac/115Vac	T6.3A
230Vac	T3.15A
DP831/DP821	
100Vac/115Vac	T5A
230Vac	T2.5A

如需更换保险丝，可按如下步骤进行操作：

1. 关闭仪器，移除电源线。
2. 使用小一字螺丝刀插入电源插口处的凹槽，轻轻撬出保险丝座。



3. 若需要，请手动调节电源电压选择器选择与实际输入电压相匹配的电压档位（请参考表 2）。
4. 取出保险丝，更换指定规格的保险丝（请参考仪器后面板的“输入电源要求”或表 3）。
5. 将保险丝座重新插入电源插口（请注意方向）。



警告

为避免人身伤害，更换保险丝前，请先切断电源；为避免电击或火灾，连接电源之前，请选择与实际输入电压相匹配的电源规格，并更换该规格下适用的保险丝。

用户界面

DP800 系列电源提供三种显示模式：数字、波形和表盘，默认为数字显示模式。按 **Display** → **显示模式**，可切换选择不同的显示模式。本节介绍数字显示模式下用户界面的布局，如下图和表 4（见下页）所示。

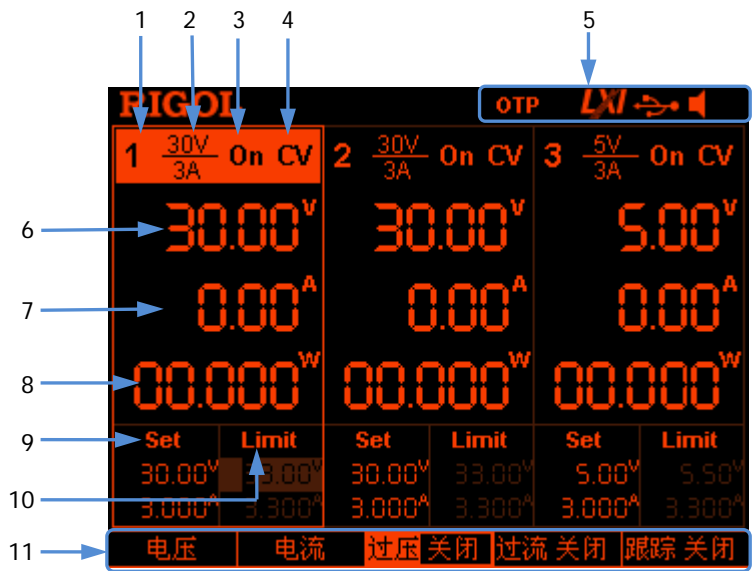



图 6 用户界面（数字显示模式）

表 4 用户界面说明

编号	说明
1	通道编号
2	通道输出电压/电流
3	通道输出状态
4	通道输出模式
5	状态栏，显示系统状态标志。  : 打开过温保护。  : 前面板已锁定。  : 网络已连接。  : 已识别 USB 设备。  : 打开蜂鸣器。  : 关闭蜂鸣器。  : 仪器工作在远程模式。
6	实际输出电压
7	实际输出电流
8	实际输出功率
9	电压、电流设置值
10	过压保护、过流保护设置值
11	菜单栏

提示

当前显示模式为“普通”或“波形”时，按前面板，可在当前显示模式和表盘显示模式之间切换。

使用内置帮助系统

内置帮助系统提供前面板任意按键（除参数输入区）及菜单键的帮助信息，方便用户快速获取功能按键或菜单的功能提示。

获得任一按键的帮助信息

按 **Help** 键将其点亮后，按下需要查看其帮助信息的按键或菜单键，即可获得相应的帮助信息，同时 **Help** 键背灯熄灭。按  可退出帮助系统。

内置帮助界面

按 **Help** 键将其点亮后，再次按 **Help** 键可打开内置帮助界面。使用上/下方向键或旋钮选择所需的帮助主题后，按 **查看** 可查看相应的帮助信息。

帮助主题包括：

1. 查看显示的最后一条信息
2. 查看远程命令错误队列
3. 获得任意键的帮助
4. 存储管理
5. 缩略语清单
6. 串并联帮助
7. **RIGOL** 技术支持

故障处理

本仪器在使用过程中可能出现如下故障，请首先按照下述方法处理，如果故障依然存在，请与**RIGOL**联系，同时请提供您仪器的设备信息（获取方法：**Utility** → **系统信息**）。

1. 仪器无法开机。

- (1) 检查电源线是否已正确连接。
- (2) 检查前面板电源开关键是否打开。
- (3) 拔掉电源线，检查电压选择器（Voltage Selector）是否处在正确的档位，保险丝的规格是否正确及是否完好无损。如需更换保险丝，请参考“**更换保险丝**”。
- (4) 如果故障仍然存在，请与**RIGOL**联系。

2. 恒压输出不正常。

- (1) 检查所选档位的最大输出功率是否满足负载要求。若满足，请进行下一步。
- (2) 连接负载与电源的线缆是否有短路现象，是否接触良好。
- (3) 查看负载是否出现问题。
- (4) 查看该档位的电流设置值是否合适，如果过低，可以适当加大电流设置值。
- (5) 若问题仍无法解决，请与**RIGOL**联系。

3. 恒流输出不正常。

- (1) 检查所选档位的最大输出功率是否满足负载要求。若满足，请进行下一步。
- (2) 连接负载与电源的线缆是否有断路现象，是否接触良好。
- (3) 查看负载是否出现问题。
- (4) 查看该档位的电压设置值是否合适，如果过低，可以适当加大电压设置值。
- (5) 若问题仍无法解决，请与**RIGOL**联系。

4. 无法正确识别U盘。

- (1) 检查U盘是否可以正常工作。
- (2) 确认使用的为闪存型U盘，本仪器不支持硬盘型U盘。
- (3) 重新启动仪器后，再插入U盘进行检查。
- (4) 如果仍然无法正常使用U盘，请与**RIGOL**联系。

RIGOL

Quick Guide

DP800 Series Programmable Linear DC Power Supply

**Mar. 2015
RIGOL Technologies, Inc.**

Guaranty and Declaration

Copyright

© 2012 RIGOL Technologies, Inc. All Rights Reserved.

Trademark Information

RIGOL is a registered trademark of RIGOL Technologies, Inc.

Publication Number

QGH04104-1110

Notices

- **RIGOL** products are covered by P.R.C. and foreign patents, issued and pending.
- **RIGOL** reserves the right to modify or change parts of or all the specifications and pricing policies at company's sole decision.
- Information in this publication replaces all previously corresponding material.
- Information in this publication is subject to change without notice.
- **RIGOL** shall not be liable for either incidental or consequential losses in connection with the furnishing, use or performance of this manual as well as any information contained.
- Any part of this document is forbidden to be copied, photocopied or rearranged without prior written approval of **RIGOL**.

Product Certification

RIGOL guarantees this product conforms to the national and industrial standards in China as well as the ISO9001:2008 standard and the ISO14001:2004 standard. Other international standard conformance certification is in progress.

Contact Us

If you have any problem or requirement when using our products or this manual, please contact **RIGOL**.

E-mail: service@rigol.com

Website: www.rigol.com

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, do not connect the ground lead to high voltage since it has isobaric electric potential as the ground.

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.

Make sure that no overvoltage (such as that caused by a thunderstorm) can reach the product, or else the operator might be exposed to the danger of electrical 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 damage occurs 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.

Keep Well 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.

In order to avoid short circuiting to the interior of the device or electric shock, please do not operate the instrument in a humid environment.

Do Not Operate in an Explosive Atmosphere.

In order to avoid damage 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 the air, please keep the surface of the device clean and dry.

Electrostatic Prevention.

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.

Proper Use of Battery.

If a battery is supplied, it must not be exposed to high temperature or in contact with fire. Keep it out of the reach of children. Improper change of battery (note: lithium battery) may cause explosion. Use **RIGOL** specified battery only.

Handling Safety.

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

Do Not Provide Power for the Active Load.

In order 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

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



WARNING

Warning statements indicate conditions or practices that could result in injury or loss of life.



CAUTION

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

Terms Used on the Product. These terms may appear 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.

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



Hazardous Voltage



Safety Warning



Protective Earth Terminal



Chassis Ground



Test Ground

Allgemeine Sicherheits Informationen

Überprüfen Sie die folgenden Sicherheitshinweise sorgfältig um Personenschäden oder Schäden am Gerät und an damit verbundenen weiteren Geräten zu vermeiden. Zur Vermeidung von Gefahren, nutzen Sie bitte das Gerät nur so, wie in diesem Handbuch angegeben.

Um Feuer oder Verletzungen zu vermeiden, verwenden Sie ein ordnungsgemäßes Netzkabel.

Verwenden Sie für dieses Gerät nur das für ihr Land zugelassene und genehmigte Netzkabel.

Erden des Gerätes.

Das Gerät ist durch den Schutzleiter im Netzkabel geerdet. Um Gefahren durch elektrischen Schlag zu vermeiden, ist es unerlässlich, die Erdung durchzuführen. Erst dann dürfen weitere Ein- oder Ausgänge verbunden werden.

Anschluss eines Tastkopfes.

Die Erdungsklemmen der Sonden sind auf dem gleichen Spannungspegel des Instruments geerdet. Schließen Sie die Erdungsklemmen an keine hohe Spannung an.

Beachten Sie alle Anschlüsse.

Zur Vermeidung von Feuer oder Stromschlag, beachten Sie alle Bemerkungen und Markierungen auf dem Instrument. Befolgen Sie die Bedienungsanleitung für weitere Informationen, bevor Sie weitere Anschlüsse an das Instrument legen.

Verwenden Sie einen geeigneten Überspannungsschutz.

Stellen Sie sicher, daß keinerlei Überspannung (wie z.B. durch Gewitter verursacht) das Gerät erreichen kann. Andernfalls besteht für den Anwender die Gefahr eines Stromschlages.

Nicht ohne Abdeckung einschalten.

Betreiben Sie das Gerät nicht mit entfernten Gehäuse-Abdeckungen.

Betreiben Sie das Gerät nicht geöffnet.

Der Betrieb mit offenen oder entfernten Gehäuseteilen ist nicht zulässig. Nichts in entsprechende Öffnungen stecken (Lüfter z.B.)

Passende Sicherung verwenden.

Setzen Sie nur die spezifikationsgemäßen Sicherungen ein.

Vermeiden Sie ungeschützte Verbindungen.

Berühren Sie keine unisolierten Verbindungen oder Baugruppen, während das Gerät in Betrieb ist.

Betreiben Sie das Gerät nicht im Fehlerfall.

Wenn Sie am Gerät einen Defekt vermuten, sorgen Sie dafür, bevor Sie das Gerät wieder betreiben, dass eine Untersuchung durch **RIGOL** autorisiertem Personal durchgeführt wird. Jedwede Wartung, Einstellarbeiten oder Austausch von Teilen am Gerät, sowie am Zubehör dürfen nur von **RIGOL** autorisiertem Personal durchgeführt werden.

Belüftung sicherstellen.

Unzureichende Belüftung kann zu Temperaturanstiegen und somit zu thermischen Schäden am Gerät führen. Stellen Sie deswegen die Belüftung sicher und kontrollieren regelmäßig Lüfter und Belüftungsöffnungen.

Nicht in feuchter Umgebung betreiben.

Zur Vermeidung von Kurzschluß im Geräteinneren und Stromschlag betreiben Sie das Gerät bitte niemals in feuchter Umgebung.

Nicht in explosiver Atmosphäre betreiben.

Zur Vermeidung von Personen- und Sachschäden ist es unumgänglich, das Gerät ausschließlich fernab jedweder explosiven Atmosphäre zu betreiben.

Geräteoberflächen sauber und trocken halten.

Um den Einfluß von Staub und Feuchtigkeit aus der Luft auszuschließen, halten Sie bitte die Geräteoberflächen sauber und trocken.

Schutz gegen elektrostatische Entladung (ESD).

Sorgen Sie für eine elektrostatisch geschützte Umgebung, um somit Schäden und Funktionsstörungen durch ESD zu vermeiden. Erden Sie vor dem Anschluß immer Innen- und Außenleiter der Verbindungsleitung, um statische Aufladung zu entladen.

Die richtige Verwendung des Akku.

Wenn eine Batterie verwendet wird, vermeiden Sie hohe Temperaturen bzw. Feuer ausgesetzt werden. Bewahren Sie es außerhalb der Reichweite von Kindern auf. Unsachgemäße Änderung der Batterie (Anmerkung: Lithium-Batterie) kann zu einer Explosion führen. Verwenden Sie nur von **RIGOL** angegebene Akkus.

Sicherer Transport.

Transportieren Sie das Gerät sorgfältig (Verpackung!), um Schäden an Bedienelementen, Anschlüssen und anderen Teilen zu vermeiden.

Vermeiden Sie das Einprägen von Strom und Spannung an den Testklemmen.

Das DP800 Power Supply kann hierdurch zerstört werden, keine aktive Last. Das DP800 kann nur Strom und Spannungen liefern.

Sicherheits Begriffe und Symbole

Begriffe in diesem Guide. Diese Begriffe können in diesem Handbuch auftauchen:



WARNING

Die Kennzeichnung WARNING beschreibt Gefahrenquellen die leibliche Schäden oder den Tod von Personen zur Folge haben können.



CAUTION

Die Kennzeichnung Caution (Vorsicht) beschreibt Gefahrenquellen die Schäden am Gerät hervorrufen können.

Begriffe auf dem Produkt. Diese Bedingungen können auf dem Produkt erscheinen:

- DANGER** weist auf eine Verletzung oder Gefährdung hin, die sofort geschehen kann.
- WARNING** weist auf eine Verletzung oder Gefährdung hin, die möglicherweise nicht sofort geschehen.
- CAUTION** weist auf eine Verletzung oder Gefährdung hin und bedeutet, dass eine mögliche Beschädigung des Instruments oder anderer Gegenstände auftreten kann.

Symbole auf dem Produkt. Diese Symbole können auf dem Produkt erscheinen:



Gefährliche
Spannung



Sicherheits-
Hinweis



Schutz-erde



Gehäusemasse



Erde

General Care and Cleaning

General 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. 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 damage to the instrument, do not expose it to caustic liquids.



WARNING

To avoid short-circuit and personal injury resulting from moisture, make sure the instrument is completely dry before reconnecting it to power supply.

Environmental Considerations

The following symbol indicates that this product complies with the requirements in 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. 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 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. Button

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 “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 denote 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 pressing **Utility** at the front panel and then pressing **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
DP821	2	60V/1A, 8V/10A
DP811	1	Range1: 20V/10A; Range2: 40V/5A

Contents

Guaranty and Declaration	I
Safety Requirement	II
General Safety Summary.....	II
Safety Terms and Symbols	IV
Allgemeine Sicherheits Informationen	V
Sicherheits Begriffe und Symbole.....	VII
General Care and Cleaning.....	VIII
Environmental Considerations.....	VIII
Document Overview	IX
Quick Start	1
General Inspection	1
Appearance and Dimensions	2
Front Panel.....	3
Rear Panel.....	10
To Connect to Power	12
Power-on Inspection.....	13
To Replace the Fuse	13
User Interface.....	14
To Use the Built-in Help System.....	16
Troubleshooting	17

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

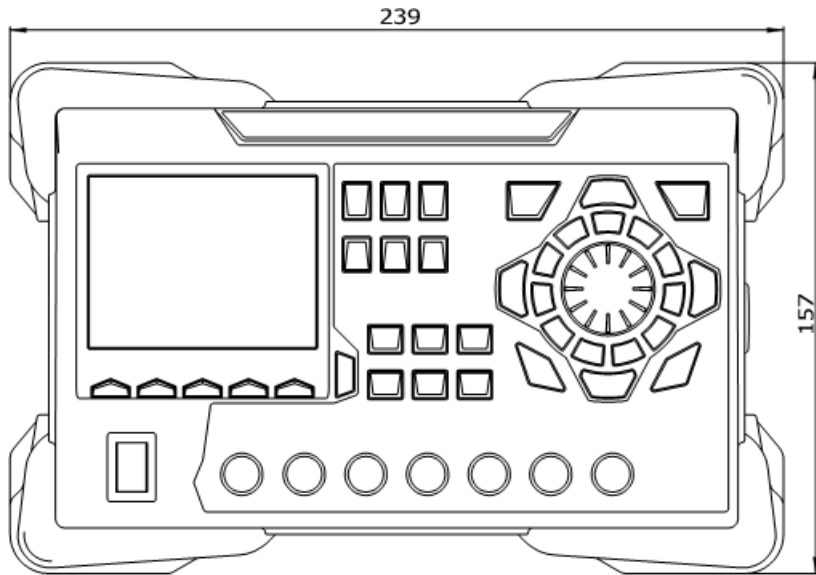


Figure 1 Front View

Unit: mm

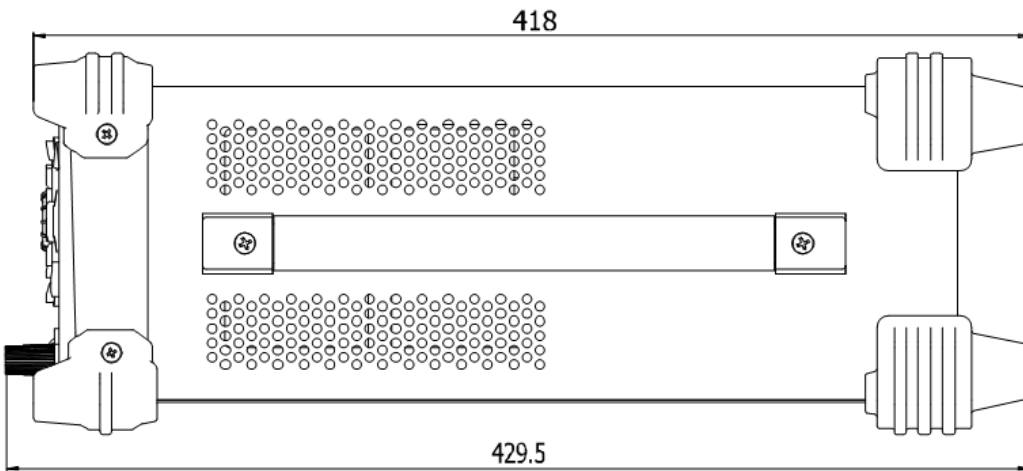


Figure 2 Side View

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.

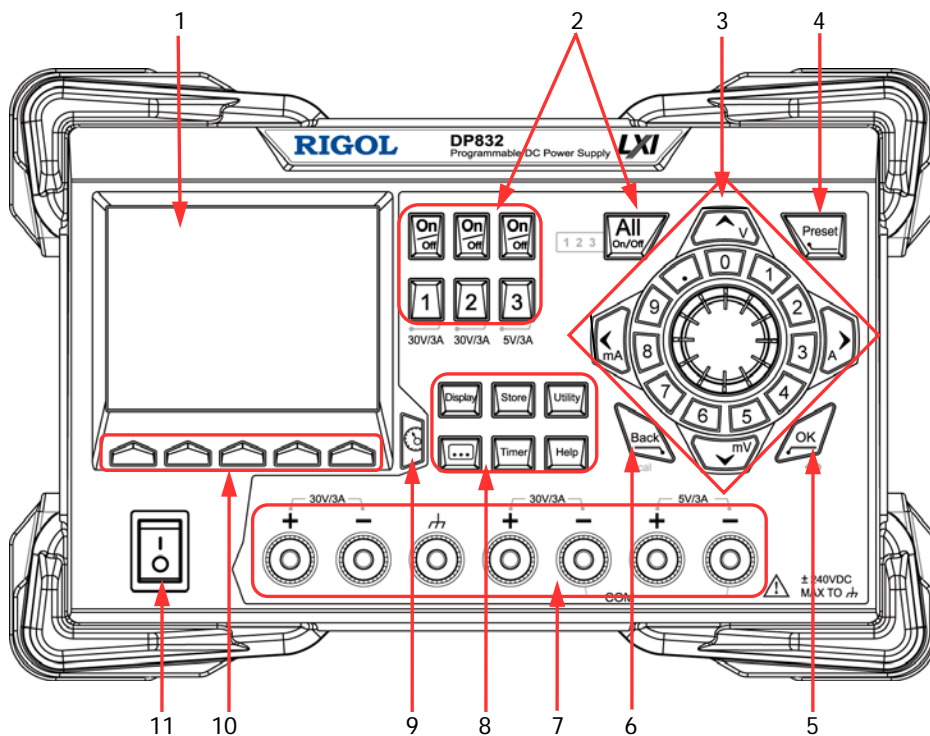


Figure 3 DP832 Front Panel

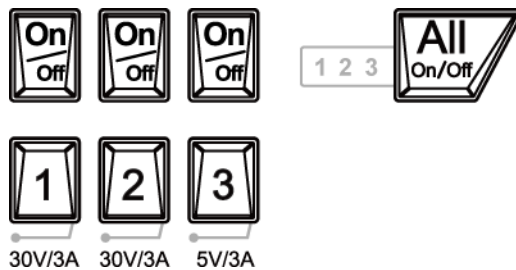
1. LCD

3.5 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, 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.

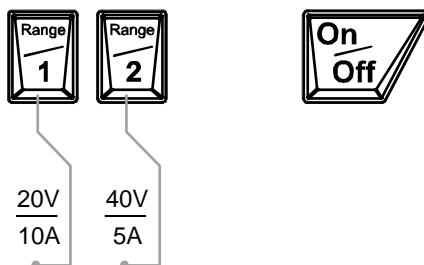


Press this key to enable or disable the output of the corresponding channel.



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 (DP811):



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.



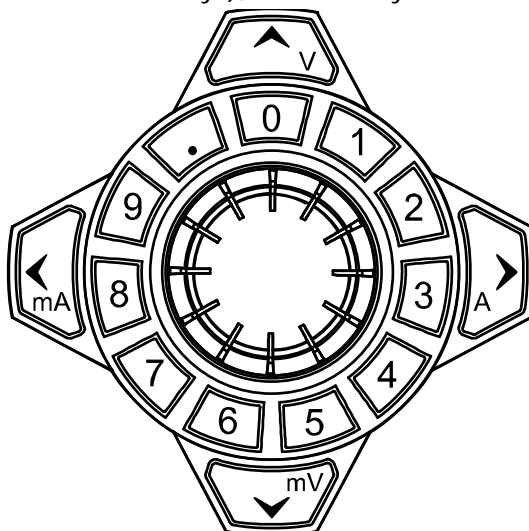
Press this key to select 40V/5A range as the current range and you can set the parameters of the channel, such as voltage, current and overvoltage/overcurrent protection.



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 direction keys (unit selection keys), numeric keyboard and knob.



- (1) Direction keys and unit selection keys
 Direction keys: used to move the cursor. When setting parameters, use the up/down direction 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**



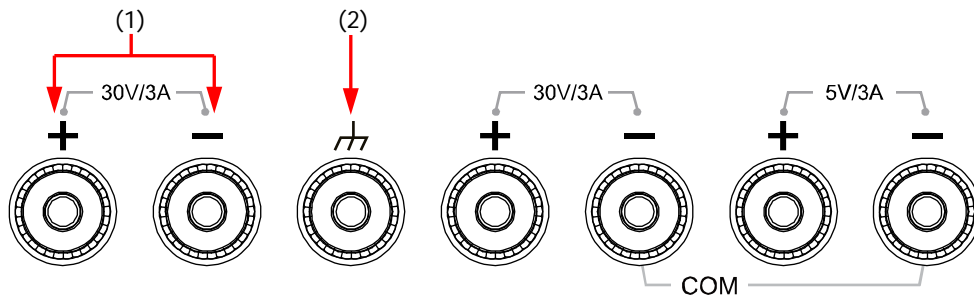
Delete the character currently before the cursor.

When the instrument is in remote mode, press this key to return to local mode.

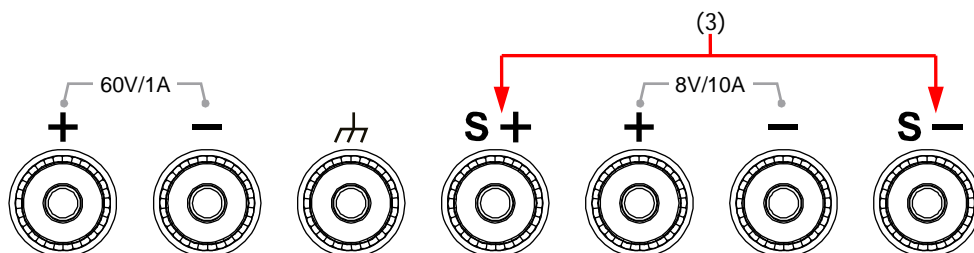
7. Output Terminals

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

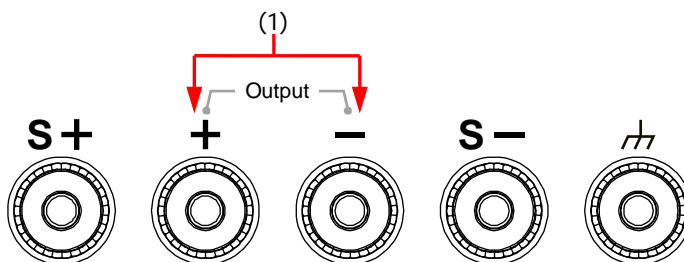
DP832:



DP821:

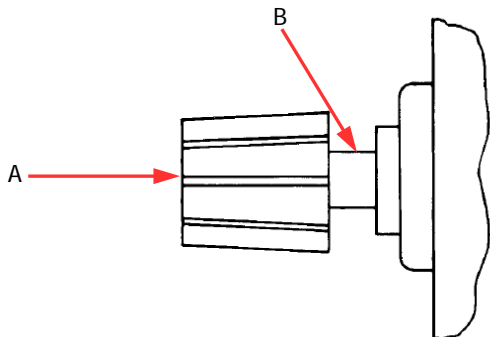


DP811:



- (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:

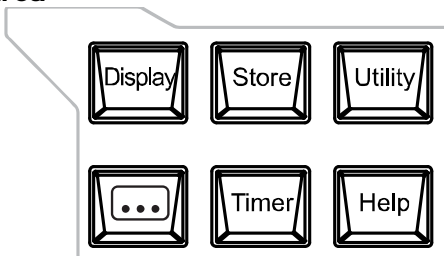



Method 1:
Connect the test lead to A of the output terminal.


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.

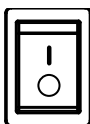
Besides, when the instrument is in a function interface (any interface under **Timer**, **...**, **Display**, **Store** and **Utility**), press this key to exit the function interface and return to the main interface.

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.

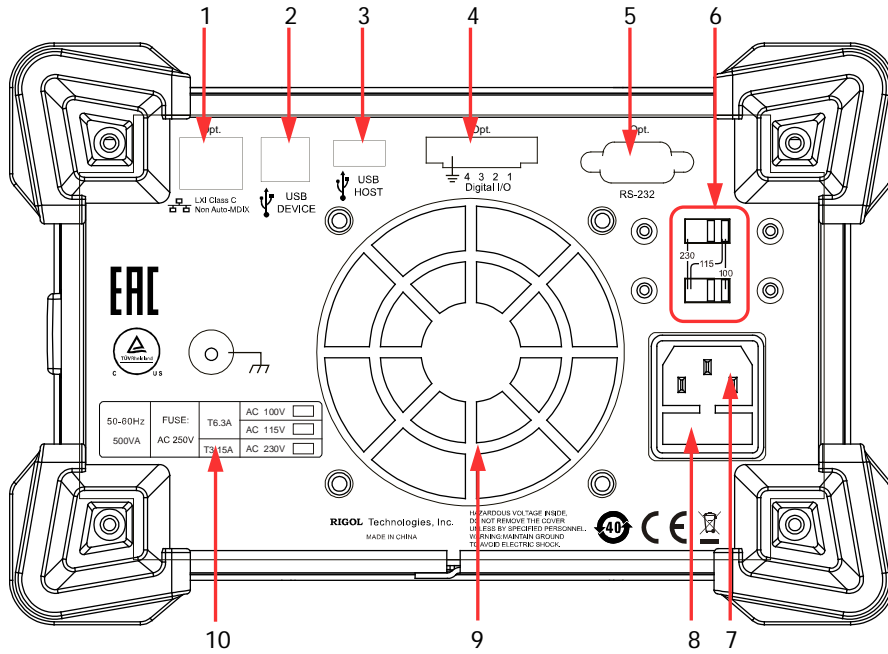


Figure 4 DP832 Rear Panel

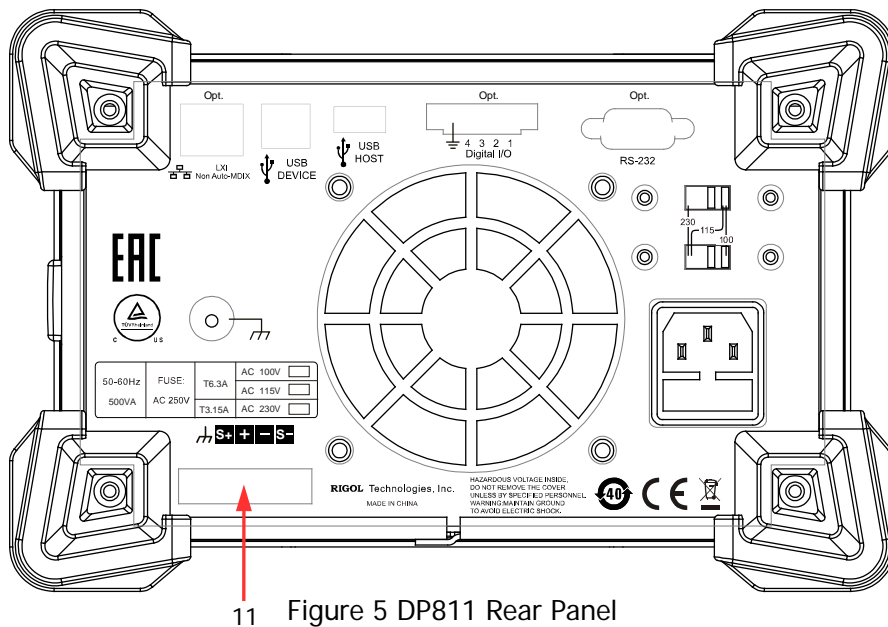


Figure 5 DP811 Rear Panel

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" at 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 DP811 provides this interface. The function of this interface is the same as that of the " Output Terminals " at the front panel.

Note: The "Output Terminals" at the front panel and "Output Interface" at 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 at 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 at 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 at the rear panel

Make sure that the voltage selector setting (110, 115 or 230) at 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" at 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 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

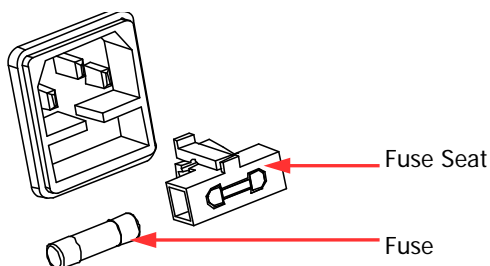
The fuse specification is related to the instrument model and actual input voltage, as shown in the table below. You can also refer to the "Input Power Requirements" at the rear panel of the instrument.

Table 3 Fuse Specifications

Input Voltage	Fuse Specification
DP832/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 prize 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" at 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).

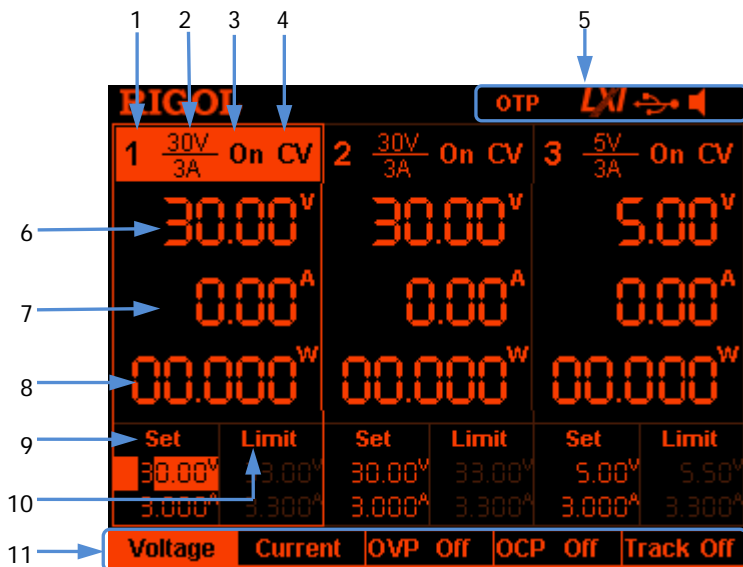










Figure 6 User Interface

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.  : 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  at 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 direction 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. Abbreviations 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.

- (5) Check the power cord connection.
- (6) Check whether the power switch at the front panel is turned on.
- (7) 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**”.
- (8) If the problem remains, 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 remains, 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 remains, 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**.