

RIGOL

Quick Guide

English

中文

DP700 Series Programmable Linear DC Power Supply

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RIGOL TECHNOLOGIES, INC.

Guaranty and Declaration

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RIGOL guarantees that 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 certifications are 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

General Safety Summary

1. Only the exclusive power cord designed for the instrument and authorized for use within the local country could be used.
2. Ensure that the instrument is safely grounded.
3. Observe all terminal ratings.
4. Use proper overvoltage protection.
5. Do not operate without covers.
6. Do not insert objects into the air outlet.
7. Use the proper fuse.
8. Avoid circuit or wire exposure.
9. Do not operate the instrument with suspected failures.
10. Provide adequate ventilation.
11. Do not operate in wet conditions.
12. Do not operate in an explosive atmosphere.
13. Keep instrument surfaces clean and dry.
14. Prevent electrostatic impact.
15. Handle with caution.
16. Do not use this instrument to provide power for the active load.

Safety Notices 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. 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.

Document Overview


This manual introduces some basic information that you should know when you use the DP700 series power supply for the first time. It contains the following contents: out-of-box inspection method, product overview, how to connect the instrument to the AC power, procedures for carrying out the power-on inspection and output inspection, as well as remote control overview.

Tip

For the latest version of this manual, download it from **RIGOL** official website (www.rigol.com).

Format Conventions in this Manual

Key

- (1) The key on the front panel is denoted by the format of "Key Name (Bold) + Text Box" in the manual. For example, **On/Off** denotes the "On/Off" key.
- (2) Use the screen shot to indicate the key. For example,  denotes the Power key.

Content Conventions in this Manual

DP700 series programmable linear DC power supply includes the following models. Unless otherwise specified, this manual takes DP711 as an example to illustrate DP700 series power supply and its basic operation.

Model	No. of Channels	Output Voltage/Current
DP711	1	30 V/5 A
DP712	1	50 V/3 A

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.

Product Overview

DP700 series power supply is a type of affordable programmable linear DC power supply with high performance. With superb performance specifications, pure and reliable output, and clear user interface, the DP700 series supports timing output and trigger function, and provides a remote communication interface, enabling you to meet your diversified test requirements.

For descriptions of the front panel, refer to Figure 1; for descriptions of the rear panel, refer to Figure 2; and for descriptions of the main interface (display screen), refer to Figure 3.

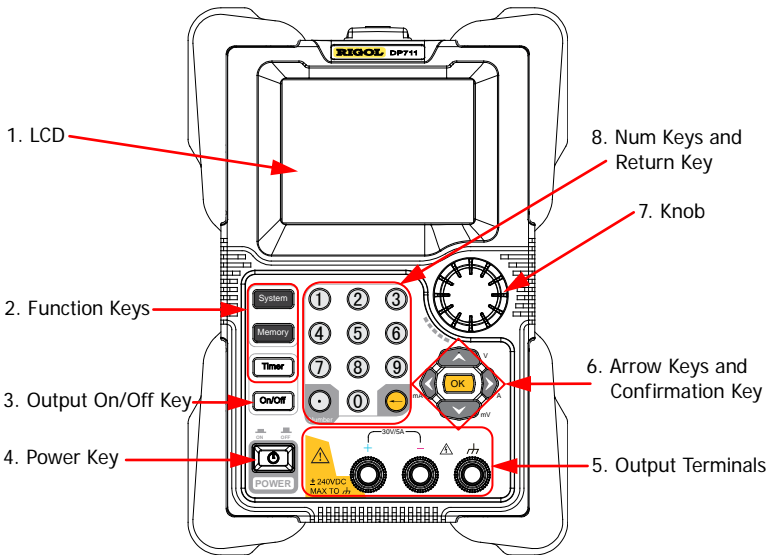


Figure 1 Front Panel

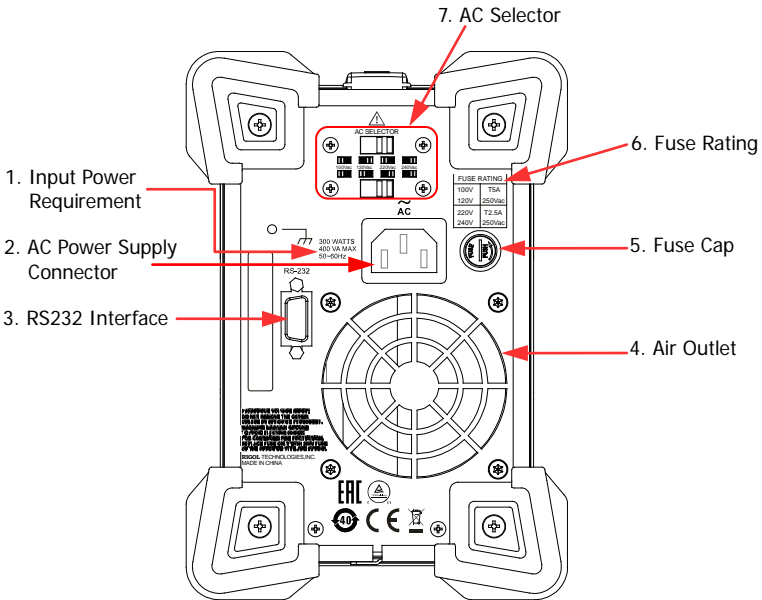


Figure 2 Rear Panel

Note: Pin 7 and Pin 8 of the RS232 interface are not used in remote communication. They are used in the trigger function (optional).

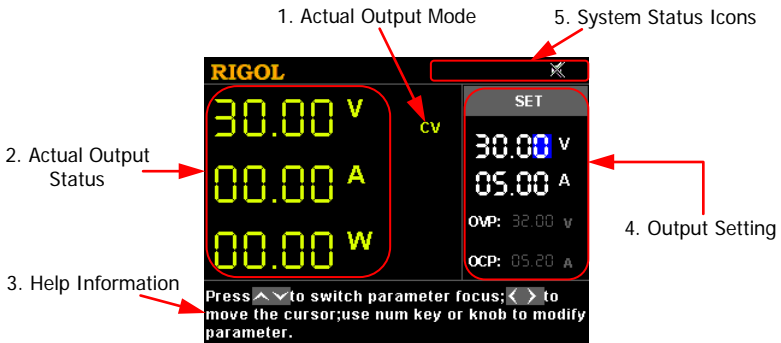


Figure 3 Main Interface

Power-on Inspection

DP700 series power supply supports various specifications of AC input power. When the DP700 series is connected with different AC power supplies, the AC selector setting on the rear panel of the instrument is different, as shown in the table below.

Table 1 AC Input Power Specification and AC Selector Setting

AC Input Power	AC Selector
100 Vac x (100% ± 10%), 50 Hz to 60 Hz	100Vac
120 Vac x (100% ± 10%), 50 Hz to 60 Hz	120Vac
120 Vac x (100% ± 10%), 50 Hz to 60 Hz	220Vac
240 Vac x (100% ± 10%) (max: 253 Vac), 50 Hz to 60 Hz	240Vac

Please strictly follow the steps below to connect the instrument to the power supply, and perform the power-on inspection and output inspection.

1. Check the input power

Ensure that the AC power to be connected to the instrument conforms to the AC input power requirement specified in Table 1.

2. Check the AC selector

Ensure that the AC selector setting on the rear panel of the instrument matches with the actual AC input power (refer to Table 1).

3. Check the fuse

When leaving the factory, the instrument has installed a fuse that conforms to the local standard. When the input voltage is 100 Vac or 120 Vac, Fuse T5A is used; when the input voltage is 220 Vac or 240 Vac, Fuse T2.5A is used.

4. Connect the AC power


Plug the specified power cord available in the accessories into the AC power supply connector of the instrument, and then connect the instrument to the properly grounded AC power.



WARNING

To avoid electric shock, ensure that the instrument is correctly grounded.

5. Power on the instrument

Press the Power key , and then the instrument is launched and begins to perform the self-inspection. If the instrument passes the self-inspection, the welcome interface is displayed; otherwise, self-inspection failure information about corresponding items (including the analog board, OVP, OCP, fan, and temperature) will be displayed.

Tip



After powering off the instrument, please wait for at least 2 s to power it on again.

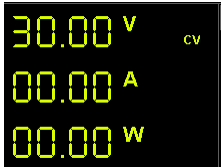
6. Perform the output check

Perform the output check to ensure that the power supply can output the rated values and properly respond to the operations on the front panel.

Note: Before checking the current output, you should complete the voltage output check first.

Check the voltage output: verify the basic voltage functions without a load.

- (1) Press  to power off the instrument.
- (2) Ensure that no load is connected to the channel output terminals on the front panel. Then, press  to power on the instrument, and check whether the voltage between the positive terminal (+) and negative terminal (-) of the channel output is 0 V.
- (3) Press **On/Off** to turn on the channel output. At this time, the actual output status (actual output voltage (V), actual output current (A), and actual output power (W)) on the left section of the interface is highlighted, and the actual output mode (CV) is displayed.


- (4) Set the output voltage to 0 V (For setting methods, refer to the descriptions of the help information below the interface or descriptions on Page 11.), and check whether the actual output voltage displayed on the left section of the interface is approximately 0 V, the actual output current approximately 0 A. Set the output voltage to 30 V (max. rating value), and check whether the actual

output voltage is approximately 30 V, the actual output current approximately 0 A.


- (5) Press **On/Off** to turn off the channel output.

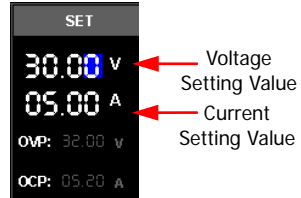
Check the current output: verify the basic current functions with a short across the power supply's output.

- (1) Connect a short across the positive terminal (+) and negative terminal (-) of the channel output with an insulated test lead (18 AWG), and then press **On/Off** to turn on the channel output. At this time, the actual output status (actual output voltage (V), actual output current (A), and actual output power (W)) on the left section of the interface is highlighted, and the actual output mode is displayed. (Note that the actual output mode is determined by the resistance of the test lead.)
- (2) Set the output voltage to 2 V (For setting methods, refer to the descriptions of the help information displayed below the interface or refer to the descriptions on Page 11.) and ensure the output mode to be CC.
- (3) Set the output current to 0 A (For setting methods, refer to the descriptions of the help information below the interface or descriptions on Page 11.), and check whether the actual output current displayed on the left section of the interface is approximately 0 A, the actual output voltage approximately 0 V. Set the output current to 5 A (max. rating value), and check whether the actual output current is approximately 5 A (the actual output voltage indicates the voltage drop arising from the test lead).
- (4) Press **On/Off** to turn off the channel output.

Setting Methods for Output Voltage/Output Current:

Method 1:

- (1) Press the Up/Down arrow key to switch the parameter focus to "Voltage Setting Value" or "Current Setting Value".
- (2) Enter a value by using the num key. While entering a value, press  to delete the unwanted character if necessary.
- (3) When setting the output voltage, press the Up arrow key or **OK** to set the voltage unit to V; or press the Down arrow key to set the voltage unit to mV. When setting the output current, press the Left arrow key to set the current unit to mA; or press the Right arrow key or **OK** to set the current unit to A.







Method 2:

- (1) Press the Up/Down arrow key to switch the parameter focus to "Voltage Setting Value" or "Current Setting Value".
- (2) Press the Left/Right arrow key to move the cursor to a desired position.
- (3) Rotate the knob to modify the value.

Remote Control

DP700 series power supply can be connected to the PC via the RS232 interface to set up communication and realize remote control through the PC. The remote control can be realized by using SCPI (Standard Commands for Programmable Instruments) commands. DP700 series power supply supports two ways of remote control: user-defined programming and PC software (e.g. **RIGOL** Ultra Sigma).

When the instrument is in remote control, the  icon is displayed on the user interface. The keys on the front panel are locked (except , **On/Off**, and ). At this time, you can press  to exit the remote mode.

More Product Information

1. Obtain the device information

Press **System**, and then press the Left/Right arrow key or use the knob to select the "Info." tab. Then, you can obtain the device information, including the device model, serial number, and software version.

2. Check the option installation

Press **System**, and then press the Left/Right arrow key or use the knob to select the "Option" tab. Then, you can check the installation status of all the options.

For more information about this instrument, refer to the relevant manuals by logging in to the official website of **RIGOL** (www.rigol.com) to download them.
DP700 User's Guide: introduces the functions of the instrument and the operation methods, remote control methods, possible failures and solutions in using the DP700 series power supply, specifications, and order information;
DP700 Programming Guide: provides detailed descriptions of SCPI commands and programming instances of the instrument.
DP700 Datasheet: provides the main features and technical specifications of the instrument.

RIGOL

快速指南

中文

DP700 系列可编程线性直流电源

2016 年 3 月
RIGOL TECHNOLOGIES, INC.

保证和声明

版权

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文档编号

QGH05001-1110

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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

一般安全概要

1. 请使用所在国家认可的本产品专用电源线。
2. 请确保产品可靠接地。
3. 查看所有终端额定值。
4. 请使用合适的过压保护。
5. 请勿开盖操作。
6. 请勿将异物插入排风口。
7. 请使用合适的保险丝。
8. 避免电路外露。
9. 怀疑产品出故障时，请勿进行操作。
10. 请保持适当的通风。
11. 请勿在潮湿环境下操作。
12. 请勿在易燃易爆的环境下操作。
13. 请保持产品表面的清洁和干燥。
14. 请注意防静电保护。
15. 请注意搬运安全。
16. 请勿使用本电源给有源负载供电。

安全术语和符号

本手册中的安全术语：



警告

警告性声明指出可能会造成人身伤害或危及生命安全的情况或操作。



注意

注意性声明指出可能导致本产品损坏或数据丢失的情况或操作。

产品上的安全术语：

DANGER
WARNING
CAUTION

表示您如果不进行此操作，可能会立即对您造成危害。

表示您如果不进行此操作，可能会对您造成潜在的危害。

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。

产品上的安全符号：



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

请根据使用情况定期对仪器进行清洁。方法如下：

1. 断开电源。
2. 用柔和的清洁剂或清水浸湿软布擦拭仪器外部。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。

文档概述


本文档介绍初次使用DP700系列电源时需要了解的信息，包括开箱检查方法，产品简介，连接电源、开机检查和输出检查的具体步骤以及远程控制概述等。

提示

本手册的最新版本可登陆 **RIGOL** 网址 (www.rigol.com) 进行下载。

文档格式的约定

按键

- (1) 使用“按键字符（加粗）+文本框”格式表示前面板按键，如 **On/Off** 表示“On/Off”按键。
- (2) 使用按键的实际截图表示按键，如 （电源开/关键）。

文档内容的约定

DP700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DP711为例说明DP700系列及其基本操作。

型号	通道数	输出电压/电流
DP711	1	30 V/5 A
DP712	1	50 V/3 A

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。

中文

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。

产品简介

DP700 系列电源是一款高性价比、经济型的可编程线性直流电源，它拥有优异的性能指标、纯净可靠的输出和清晰的用户界面，支持定时输出和外触发功能，提供远程通信接口，可满足多样化的测试需求。

中文

前面板、后面板和主界面（显示屏）的简要介绍请分别参考图 1、图 2 和图 3。

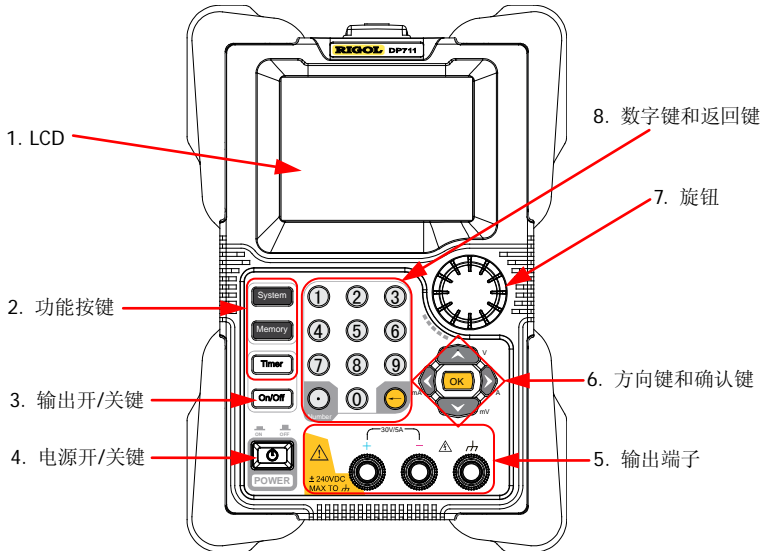


图 1 前面板

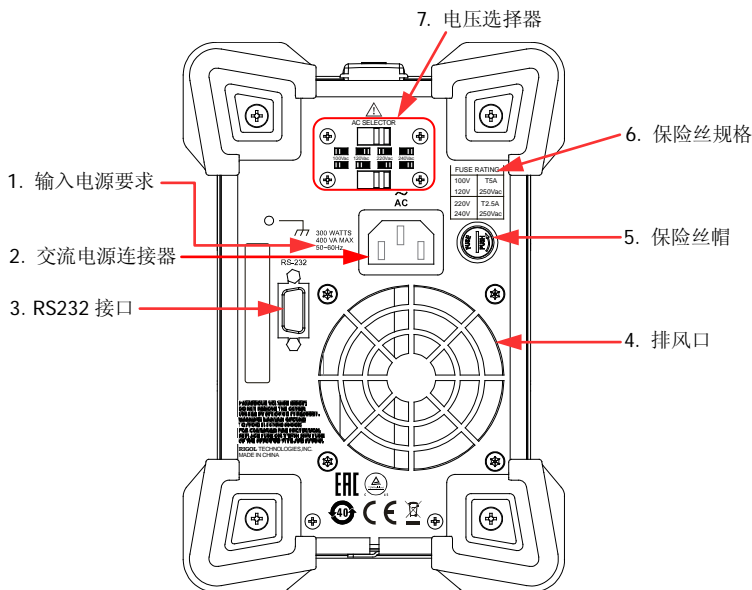


图 2 后面板

注：通过 RS232 接口进行远程通信时，不使用 RS232 接口的引脚 7 和引脚 8。引脚 7 和引脚 8 用于触发器功能（选配）。

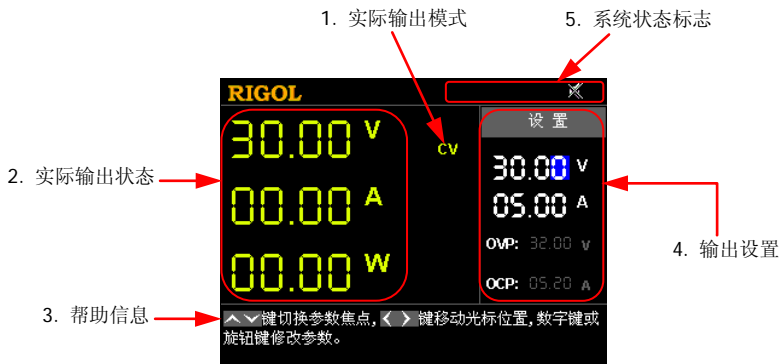


图 3 主界面

开机检查

DP700 系列电源支持多种规格的交流输入电源。连接不同规格的输入电源时，后面板电压选择器的设置不同，如下表所示。

表 1 交流输入电源与电压选择器设置

交流输入电源	电压选择器
100 Vac x (100% ± 10%), 50 Hz ~ 60 Hz	100Vac
120 Vac x (100% ± 10%), 50 Hz ~ 60 Hz	120Vac
220 Vac x (100% ± 10%), 50 Hz ~ 60 Hz	220Vac
240 Vac x (100% ± 10%) (最大 253 Vac), 50 Hz ~ 60 Hz	240Vac

请严格按照如下步骤连接电源并执行开机检查和输出检查。

1. 检查输入电源

请确保欲连接至仪器的交流电源符合表 1 中的交流输入电源要求。

2. 检查电压选择器

请确保仪器后面板电压选择器的设置与实际交流输入电源相匹配（请参考表 1）。

3. 检查保险丝

仪器出厂时，已安装符合所在国标准的保险丝。输入电压为 100 Vac 或 120 Vac 时，必须使用 T5A 保险丝；输入电压为 220 Vac 或 240 Vac 时，必须使用 T2.5A 保险丝。

4. 连接交流电源


请使用附件提供的电源线将仪器连接至正确接地的交流电源。



警告

为避免电击，请确认仪器已经正确接地。

5. 开机

按电源开/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、OVP、OCP、风扇和温度）。

提示


关机后，请至少等待2 s后再开机。


6. 执行输出检查

请执行输出检查以确保电源能够输出额定值并正确响应前面板操作。

注意：完成电压输出检查之后，才能进行电流输出检查。

检查电压输出：验证空载时的基本电压功能。

(1) 按  关闭仪器。

(2) 请确保前面板输出端子未连接任何负载。然后，按  打开仪器，并检测通道输出（+）端和（-）端之间的电压是否为 0 V。

(3) 按 **On/Off** 键打开通道输出。此时，仪器界面左侧的通道实际输出状态（实际输出电压（V）、实际输出电流（A）和实际输出功率（W））点亮；实际输出模式（CV，恒压）显示在仪器界面中。



(4) 设置输出电压为 0 V（设置方法请参考仪器界面下方帮助信息中的说明或下一页中的介绍），检查显示在仪器界面左侧的实际输出电压是否接近 0 V 以及实际输出电流是否接近 0 A；设置输出电压为 30 V（最大额定值），检查实际输出电压是否接近 30 V 以及实际输出电流是否接近 0 A。

(5) 按 **On/Off** 键关闭通道输出。

检查电流输出：验证电源输出短路时的基本电流功能。


(1) 使用绝缘的测试导线（18 AWG）将通道输出（+）端和（-）端短接，然后按 **On/Off** 键打开通道输出。此时，仪器界面左侧的通道实际输出状态（实际输出电压（V）、实际输出电流（A）和实际输出功率（W））点亮；实际输出模式显示在仪器界面中（注意实际输出模式取决于测试导线的电阻）。

(2) 设置输出电压为 2 V（设置方法请参考仪器界面下方帮助信息中的说明或下一页中的介绍），以确保通道输出模式为 CC（恒流）模式。

- (3) 设置输出电流为 0 A（设置方法请参考仪器界面下方帮助信息中的说明或下文中的介绍），检查显示在仪器界面左侧的实际输出电流是否接近 0 A 以及实际输出电压是否接近 0 V；设置输出电流为 5 A（最大额定值），检查实际输出电流是否接近 5 A（实际输出电压为测试导线引起的压降）。
- (4) 按 **On/Off** 键关闭通道输出。

输出电压/输出电流设置方法：

方法 1：

- (1) 使用上/下键切换参数焦点至“电压设置值”或“电流设置值”。
- (2) 使用数字键直接输入所需的数值。
输入过程中，按  可删除已输入的数字。
- (3) 设置输出电压时，按上键或 **OK** 键选择电压单位 V，或按下键选择电压单位 mV；
设置输出电流时，按左键选择电流单位 mA，或按右键或 **OK** 键选择电流单位 A。







方法 2：

- (1) 使用上/下键切换参数焦点至“电压设置值”或“电流设置值”。
- (2) 使用左/右键移动光标位置至所需的位。
- (3) 旋转旋钮修改该位的数字为所需的值。

远程控制

DP700 系列电源支持通过 RS232 接口与计算机进行通信从而实现远程控制。远程控制基于 SCPI (Standard Commands for Programmable Instruments) 命令集实现。DP700 系列电源支持两种远程控制方式：用户自定义编程和使用 PC 软件 (如 **RIGOL** Ultra Sigma)。

中文

当仪器处于远程控制状态时，用户界面显示  图标，前面板按键被锁定 ( 键和  除外)。此时，您可以按  退出远程模式。

更多产品信息

1. 获取设备信息

按 **System** 键，然后使用左/右键或旋钮选择“信息”选项卡，即可获取设备信息，包括设备型号、设备序列号以及软件版本号。

2. 查看选件安装状态

按 **System** 键，然后使用左/右键或旋钮选择“选件”选项卡，即可查看所有选件的安装状态。

欲了解本产品更多信息，请查阅相关手册（您可登录**RIGOL**网站 (www.rigol.com) 下载）。

《DP700用户手册》：提供本产品的功能介绍及操作方法、远程控制方法、在使用过程中可能出现的故障及处理方法、性能指标以及订货信息；

《DP700编程手册》：提供本产品的SCPI命令集以及编程实例；

《DP700数据手册》：提供本产品的主要特色和技术指标。