Quick Start

RSPD3303C

Programmable DC Power Supply

CE

General Safety Summary

Please review the following safety precautions carefully to avoid personal injury or damage to this product or any product connected to it. To prevent potential danger, please use the instrument as specified.

Use proper power cord
Only the power cord designed for the instrument and authorized by local country could be used.

Power supply
AC Input Voltages: 100V/110V/220V/230V ±10%, 50/60Hz.

Use proper fuse
The fuse types: 100V/110V(T6.3A/250V) 220V/230V (T3.15A/250V)
Make sure to use the correct type of fuse before turning on the instrument.
Do not connect the power cord before replacing the fuse.
Find out the reason why the fuse burned out before replacing the fuse.

Ground the instrument
The instrument is grounded through the protective terra conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to the earth. Make sure that the instrument is properly grounded before any inputs or outputs.

Observe all terminal ratings
To avoid fire or electric shock, please observe all ratings and symbols on the instrument. Read this guide carefully to know more details about the ratings before connection.

Keep proper ventilation

Inadequate ventilation may cause an increase of temperature, which will lead to further damage. Please keep proper ventilation and check the fan and air-vents regularly when using the instrument.

Operate condition

Location: indoor, no strong light, almost no Interfering pollution

Comparative humidity: <80%

Altitude: <2000m

Temperature: 0℃ to 40℃

Do not operate in an explosive atmosphere

To avoid personal injury or damage to instrument, please do not operate in an explosive atmosphere.

Keep surface of the product clean and dry

To avoid dust or moisture in the air, which may influence the performance of the instrument, please keep surface of the product clean and dry.

Safety Terms and Symbols

Terms may appear on the product:

DANGER: Indicates direct injury or hazard that may happen.

WARNING: Indicates potential injury or hazard that may happen.

CAUTION: Indicates potential damage to the instrument or other property that may happen.

Symbols may appear on the product:

Hazardous Voltage	Protective Earth Ground	Warning	Earth Ground	Power Switch

Brief Introduction

RSPD3303C LED series Programmable DC Power Supply is convenient, flexible and multi-function. It is designed with three groups of independent output terminals, the output voltage of two groups is adjustable and another group is fixed to select: 2.5V, 3.3V, and 5V. The instrument also provides output short circuit and overload protection.

Main Features

☐ Three independent output channels, two of which are controllable, with a total power up to 195W

☐ Compatible design for power voltage: 100V, 110V, 220V and 230V to satisfy different power network

☐ Capable of saving and recalling set parameters

☐ Perfect PC software to realize the real-time control through USBTMC.

Chapter 1 Quick Guide

In this chapter, we mainly introduce the panel display interface and inspecting the new machine. Reading the following steps will give you a quick understanding on operation.

General Inspection

1. Inspect the shipping container.

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

2. Inspect the instrument.

If there are instruments found damaged, defective or failure in electrical and mechanical tests, please contact us.

3. Check the accessories.

Please check the accessories according to the packing list. If the accessories are incomplete or damaged, please contact us
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Safety Considerations

To ensure that the instrument can work normally, please conduct necessary inspection before using the RSPD3303C.

Input Power Requirement

The RSPD3303C allows a 50Hz/60Hz frequency, and four levels of AC power: 100V/120V/220V/230V. You can select required power voltage with the "DIP Switch" at the rear panel according to the actual demand.

⚠️ **Warning**

To switch to the required power voltage, please disconnect the power cord first.

Electrical Check

Please use the power cord provided and connect the instrument to AC power. Check the power as follows.

1. Connect the power supply

⚠️ **Warning**

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

2. Turn on the power switch

   Press the button POWER to enter boot interface, the system then returns to the default setting.

The Front Panel

NO.	Description	NO.	Description
1	Logo	9	CH3 DIP Switch
2	LED Display	10	Power Switch
3	Model	11	CH1 Output Terminal
4	Configuration button	12	Ground Terminal
5	Multi-function knob	13	CH2 Output Terminal
6	Fine Adjust button	14	CV/CC Indicator Light
7	Voltage/Current button	15	CH3 Output Terminal
8	Channel Control button		

Instruction for Buttons

Buttons for setting parameters

NO.1- 5 : Press the button to choose the storage location

SER : Press the button to set series mode of CH1/CH2.

PARA : Press the button to set parallel mode of CH1/CH2.

LOCK : Long press the button to turn on/off the keylock function.

SAVE : Press the button to enter the storage system for saving files.

RECALL : Press the button to enter the storage system for recalling files.

Buttons for controlling the channel

CH1 : Press the button to select CH1 as the current channel

CH2 : Press the button to select CH2 as the current channel

ON/OFF : Press the button to turn on/off output of the current channel

CH3 ON/OFF : Press the button to turn on/off the CH3 output.

ALL ON/OFF : Press the button to turn on/off all channels

Other buttons

FINE : Press the button to open the fine adjust function and modify the parameter in the minimum step

V **A** : To select between voltage and current.

The Front Panel Terminals

The positive/negative output terminals of CH1, CH2, CH3, and the common GND for CH1, CH2 are located on the front panel. Refer to later "control panel operation" for wiring method details.
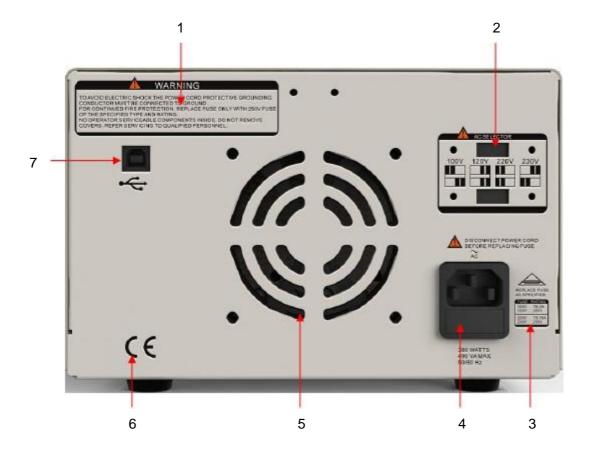
User Interface

1: Channel Logo

2 : Voltage set/Readback value

3 : Current set/Readback value

The Rear Panel

Description:

1 Warning message

2 AC power DIP switch

3 Instruction for the AC input voltage

4 AC power socket

5 Fan vent

6 CE certification mark

7 USB interface

Output Checking

To ensure the instrument is operating correctly,

please check the output voltage and current before load is connected.

1. **Output voltage checking**
   (1) With the instrument no load, turn on the power, and make sure the current value displaying is not zero
   (2) Check the output voltage of CH1/CH2
   Turn on CH1/CH2 channel and the instrument will work in CV mode. Check whether the voltage value is adjustable from 0V to 32V.

2. **Current output check**
   (1) Turn on the power.
   (2) Check the output current of CH1/CH2.
   Use an insulated wire to connect the positive and negative terminal of CH1/CH2
   (3) Turn on CH1/CH2
   Select voltage and revolve the knob to set the value to 32V
   Select current and revolve the knob to set the value to 0A
   Check whether the current value is adjustable from 0A to 3.2A.

Chapter 2 Control Panel Operation

In this chapter，the function and operation of RSPD3303C control panel will be introduced in detail to give you an all-around understanding of it.

Brief introduction

Output Summary

CH1/CH2 Independent Output

CH3 Independent Output

Parallel Output

Series Output

Save and Recall

Output Summary

RSPD3303C is designed with three independent outputs, two of which are adjustable in voltage value and the other includes a set of selectable voltage values: 2.5V, 3.3V or 5.0V.

Independent/Parallel/Series

RSPD3303C has three output modes: independent, parallel and series that could be selected through the track switch on the front panel. In independent mode, the output current and voltage are controlled respectively. In parallel mode, the current value is twice that of single channel. In the series mode, the voltage value is twice that of single channel.

Constant Current/Voltage

In constant current mode (series/track mode), the current value is rated. When the voltage value are under its rating, the indicator light displays red. The instrument will automatically return to constant voltage mode when the current value is under rated. In parallel 1 mode, the accessory channel remains in constant current mode neglecting shift of the current value.

In constant voltage mode, the voltage value is rated. When the current value are under its rating, the indicator light dispays green.

The instrument will turn to constant current mode when the current value returns to its rating.

CH1/CH2 Independent Output

Instruction CH1 and CH2 are working in independent mode and insulated from the ground.

Output ratings   0~30V/0~3A (Max: 32V, 3.2A)

Operation steps

1. Make sure that parallel/series mode is off.
2. Connect load to the positive and negative terminals of CH1/CH2.
3. Set the voltage (current) value of CH1/CH2: Firstly, press V (or A) to select the voltage (current) parameter needed to modify. Then revolve the multi-function knob to set the wanted value (You could press FINE to make accurate adjusting).
   Coarse adjusting: 0.1V or 0.1A each step.
   Fine adjusting: the least precision each step.
4. Open output: Press ON/OFF button to turn on the output, the channel works in CC or CV mode and its indicator light gets lit immediately.

CH3 Independent mode

Instruction CH3 works independently from CH1, CH2, and its voltage and current ratings are: 2.5V, 3.3V, 5V, 3A.

Output ratings   2.5V/3.3V/5V, 3A

Operation steps:

1. Connect the load to the positive and negative terminal of CH3 channel.
2. Select the required voltage value by moving the "DIP switch" of CH3.
3. Open the output: Press ON/OFF button to turn on the channel and the indicator light gets lit immediately.

CV → CC

When the current value gets higher than 3A, the overload indicator light turns red and the working mode of CH3 turns to CC mode from CV mode.

Note: "Overload" does not mean abnormal operation.

CH1/CH2 Series Mode

Instruction：In the series mode, CH1 and CH2 are linked internally into one channel controlled by CH1. The output voltage value is twice compared with that of single channel.

Output ratings   0~60V/0~3A (Max: 64V, 3.2A)

Operation steps：

1．Press the SER to start the Series mode, and the indicator light turns bright

2. Connect the load to the positive terminal of CH2 and the negative terminal of CH1

3. Turn on CH1 and set its current value to 3A. In the default setup, the instrument works in "Coarse", you can turn to "Fine" by pressing FINE

   Coarse: 0.1V or 0.1A each step

   Fine: the least precision each step

4. Turn on CH1and set the output voltage/current value by revolving the multi-function knob

5. Press ON/OFF button to open the output.

Note: You can identify the current working state "CC" or "CV" by referring to the indicator light.(red means CV, green means CC).

CH1/CH2 Parallel Mode

Instruction In the parallel mode, CH1 and CH2 are linked internally into one channel controlled by CH1. The output current value is twice as much as the single channel.

Output ratings   0~30V/0~6A (Max: 32V, 6.4A)

Operation steps:

1. Press the ⎡PARA⎤ button to start Parallel mode, and the indicator light turns bright immediately
2. Connect the load to the positive and negative terminals of CH1
3. Press ⎡ON/OFF⎤ button to open the output and the indicator light turns bright.
   Turn on CH1 and set its output voltage/current value by revolving the multi-function knob. In the default setup, the instrument works in "Coarse", you could turn to "Fine" by pressing ⎡FINE⎤ button.

Note: You can identity the current working state "CC" or "CV" refer to the indicator light.(red means CV, green means CC). In parallel mode, CH2 only works in CC mode.

Save and Recall

Five groups of setups can be saved in memory. Contents of setups including:

☐   Independent/series/parallel mode

☐   Output voltage/current value

Steps for saving setup

1. Set the state needed to save
2. Press $\boxed{\text{SAVE}}$ to enter the save interface
3. Select the wanted file group by pressing   NO.1-5
4. Press $\boxed{\text{SAVE}}$ again to save the current state to the specified file group.

Steps for recalling setup

1. Press $\boxed{\text{RECALL}}$ to enter the recall interface
2. Select the wanted file group by pressing   NO.1-5
3. Press $\boxed{\text{RECALL}}$ again to read the previously saved file.

Version Upgrade

The software of the instrument is upgraded with a fixed name file via PC management software with USBTMC. The upgrade method is below:

Upgrade in normal Interface

1. Open the EasyPower software after correct connection of the USB cable with the instrument.
2. Select version in the menu bar, and then choose upgrade in the Drop-down menu to enter USB firmware upgrade interface:
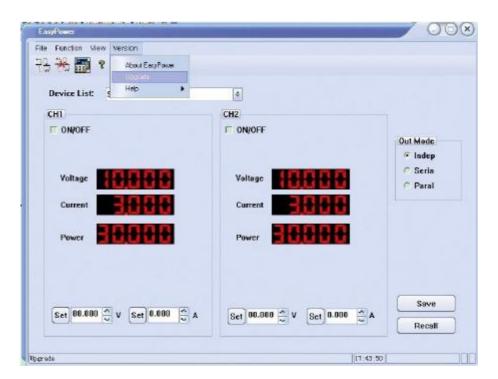

Figure 1

3. Click the "Normal Mode" option, then select the "ugf" format upgrade file.

Figure 2

Figure 3

4. As shown in figure 4, click "Upgrade" to start upgrading.
   The instrument will run the upgraded software as soon as the upgrading completed.

Figure 4

Upgrade via the Guiding Procedure

Upgrading via the guiding procedure can be used if the previously detailed method failed.

Specific steps:

1. Press the power button to start the instrument, and it will enter the guide procedure mode.
2. As illustrated in figure 2, select the "Firmware Mode" option instead , then follow the upgrade steps detailed previously.

Chapter 3 Remote Control

SCPI Commands can be used to conduct remote control on the RSPD3303C Power Supply through the USBTMC. To utilise the remote control, the installation of EasyPower or NI（Measurement & Automation） software is required prior to connecting the instrument with a USB cable.

Command List

1. *IDN?

2. *SAV

3. *RCL
4. INSTrument {CH1|CH2}

5. INSTrument ?

6. MEASure:CURRent?

7. MEAsure:VOLTage?

8. [SOURce:]CURRent <current>

9. [SOURce:]CURRent ?

10. [SOURce:]VOLTage <volt>

11. [SOURce:] VOLTage?

12. OUTPut

13. OUTPut:TRACk

14. SYSTem:ERRor?

15. SYSTem:VERSion?

16. SYSTem: STATus?

Command Description

1.*IDN?

Command format	*IDN?
Description	Query the manufacturer, product model, series NO. and software version.
Return Info	Manufacturer, product model, series NO., software version.
Example	RSPD3303C, SPD00001130025, .01.01.02.

2.*SAV

Command format	*SAV <name>
Description	Save the current state in nonvolatile memory with the specified name.
Example	*SAV 1

3.*RCL

Command format	*RCL <name>
Description	Recall state that previously saved.
Example	*RCL 1

4. INSTrument

Command format INSTrument <CH1|CH2>

Description Select the channel that will be operated.

Example INSTrument CH1

Command format INSTrument?

Description Query the current operating channel

Example INSTrument?

Return Info CH1

5. MEASure

Command format MEASure: CURRent? < CH1|CH2>

Description Query current value for specified channel, if there is no specified channel, query the current channel.

Example MEASure: CURRent? CH1

Return Info 3.000

Command format MEASure: VOLTage? < CH1|CH2>

Description Query voltage value for specified channel, if there is no specified channel, query the current channel.

Example MEASure: VOLTage? CH1

Return Info 30.000

6. SOURce

Command format	\<SOURce:\>CURRent \<value\>
	\<SOURce\>:={CH1 | CH2}
Description	Set current value for the current channel
Example	CH1:CURRent 0.5

Command format	\<SOURce\>: CURRent?
	\<SOURce\>:={CH1 | CH2}
Description	Query the current value for the current channel.
Example	CH1: CURRent?
Return Info	0.5

Command format	\<SOURce\>: VOLTage \<value\>
	\<SOURce\>:={CH1 | CH2}
Description	Set voltage value for the current channel
Example	CH1: VOLTage 25

Command format	\<SOURce\>: VOLTage?
	\<SOURce\>:={CH1 | CH2}
Description	Query the voltage value for the current channel.
Example	CH1: VOLTage?
Return Info	25

7. OUTPut

Command format	OUTPut <SOURce>, <state>
	<SOURce>:={CH1 | CH2} <state>:={ON | OFF}
Description	Turn on/off the specified channel.
Example	OUTPut CH1, ON

Command format	OUTPut: TRACK <NR1>
	<NR1>:={**0**[Independent] | **1**[Series] | **2**[Parallel]}
Description	Select the operation mode
Example	OUTPut: TRACK 0

8. SYSTem

Command format	SYSTem: ERRor?
Description	Query the error code and the information.

Command format	SYSTem: VERSion?
Description	Query the software version.
Example	SYSTem: VERSion?
Return Info	1.01.01.02

Command format	SYSTem: STATus?
Description	Query the current working state.
Example	SYSTem: STATus?
Return info	0x0224
Instruction	The return info is in Hexadecimal format, which means that you must translate the return info into binary format.

The correspondence relationship is as shown below.

Bit NO.	Corresponding State
0	0: CH1 CV mode 1: CH1 CC mode
1	0: CH2 CV mode 1: CH2 CC mode
2,3	01: Independent mode 10: Parallel mode
	11: Series mode
4	0: CH1 OFF 1: CH1 ON
5	0: CH2 OFF 1: CH2 ON

Specification

Test conditions: warm-up for about 30minitus, with temperature between +20℃~+30℃.

Output Ratings	CH1/CH2 independent	0～30V , 0～3A
	CH1/CH2 series	0～60V , 0～3A
	CH1/CH2 parallel	0～30V , 0～6A
	CH3	2.5V/3.3V/5.0V , 0～3A
Constant Voltage Mode	power change rate	≤0.01%+3mV
	Load change rate	≤0.01%+3mV(rating current ≤ 3A) ≤0.02%+5mV(rating current ＞ 3A)
	Ripple and noise	≤2mVrms（5Hz ～ 1MHz）
	Recover time	≤100μs(50% load change ,minimum load 0.5A)
	Temperature coefficient	≤300ppm/℃
Constant Current Mode	Power change rate	≤0.2%+3mA
	Load change rate	≤0.2%+3mA
	Ripple and noise	≤3mArms
CH3	Power change rate	≤5mV
	Load change rate	≤15mV
	Ripple and noise	≤2mVrms（5Hz ～ 1MHz）
Tracking Operation	Track error	≤0.5%+10mV of Master(No Load)
Parallel Mode	Power change rate	≤0.01%+3mV
	Load change rate	≤0.01%+3mV(rating current≤3A) ≤0.02%+5mV(rating current＞3A)
Series Mode	Power change rate	≤ 0.01%+5mV
	Load change rate	≤ 300mV
Resolution	Voltage	Voltage: 10mV
	Current	Current: 10mA
Display	Ammeter	3.2A full scale, 3 digits LED display
	Voltmeter	32V full scale, 4 digits LED display
Accuracy	Set precision	Voltage：±（0.5% of reading + 1digit） Current：± (0.5% of reading + 1digit)
	Readback precision	Voltage：±（0.5% of reading + 1digit） Current：± (0.5% of reading + 1digit)
Insulation	Between base and terminal	20MΩor above (DC 500V)
	Between base and AC power cord	30MΩor above (DC 500V)

Operating environment	Indoor	
	Altitude	≤2000 m
	Environment temperature	0 ~ 40℃
	Comparative humidity	80%
	Installation level	Ⅱ
	Pollution level	2
Storage environment	Environment temperature	-10 ~ 70℃
	Comparative humidity	≤ 70%
Power supply	AC 100V/120V/220V/230V±10%, 50/60HZ	
Volume	275mm x 225mm x 136mm	
Weight	7.5kg	