User's Guide

数英仪器 Digital Instruments

SK 3323/3325

Programmable DC Power Supply

06/2015

Introduction of SK 3323/3325 Programmable DC Power Supply

SK3323/3325 programmable power supply is a new generation of programmable DC power supplies of our factory. The power supply has RS232 programmable interface and optional USB interface, supports to output regulated current as preset time, the working state displayed on the LCD. Adopting LIC, three channels of output are supplied. It is of programmable CV/ CC adjustable step. The two working states, CV and CC, can be switched varying with the load. Series/Parallel and independent working selection can be realized. The CH3 supports 1.8V, 2.5V, 3.3V and 5V outputs voltage with overload protection. It is of small volume, reliable characteristics and convenient operation.

SK3323/3325 programmable power supplies are widely applied in national defense, institution, university and factory, especially in the areas of computer measuring and automatic control system as DC power supply.

Main function characteristics

- All digital control, low drift, series/parallel output and be trackable.
- Large screen, LCD, Data saving and recalling
- CV/CC protection. Working under short-circuit available.
- Adjust by digital knob roughly or finely. Convenient setting and direct output
- Timer function to output the voltage/current as preset time
- Standard configuration: RS232 interface
- Optional configuration: USB device

Packing List

- Programmable Power Supply 1
- Power Cord 1
- CD (User's Guide) 1
- RS232 interface cable 1

Optional

- USB interface and cable 1

Content

Notice: please excuse any modification of the contents without special notification. Besides, it is unavoidable for not-so-adequate description and wrong printing. The present document will not warrant in any form including, but not limited to, those for special aims.

Chapter 1 Prepare to use power supply

1.1 Check the list of supplied items

Check whether the meter and the accessories are complete and ready. If the package is badly damaged, please keep it until the meter passes the performance testing.

1.2 Connect the power

To guarantee the safe operation of the meter, the following conditions should be achieved.

Voltage： AC 230 (198 ~ 242)V

Frequency： 50 (45 ~ 60) Hz

Surrounding temperature: 0-40℃

Relative humidity: 20% ~ 90%RH (40℃)

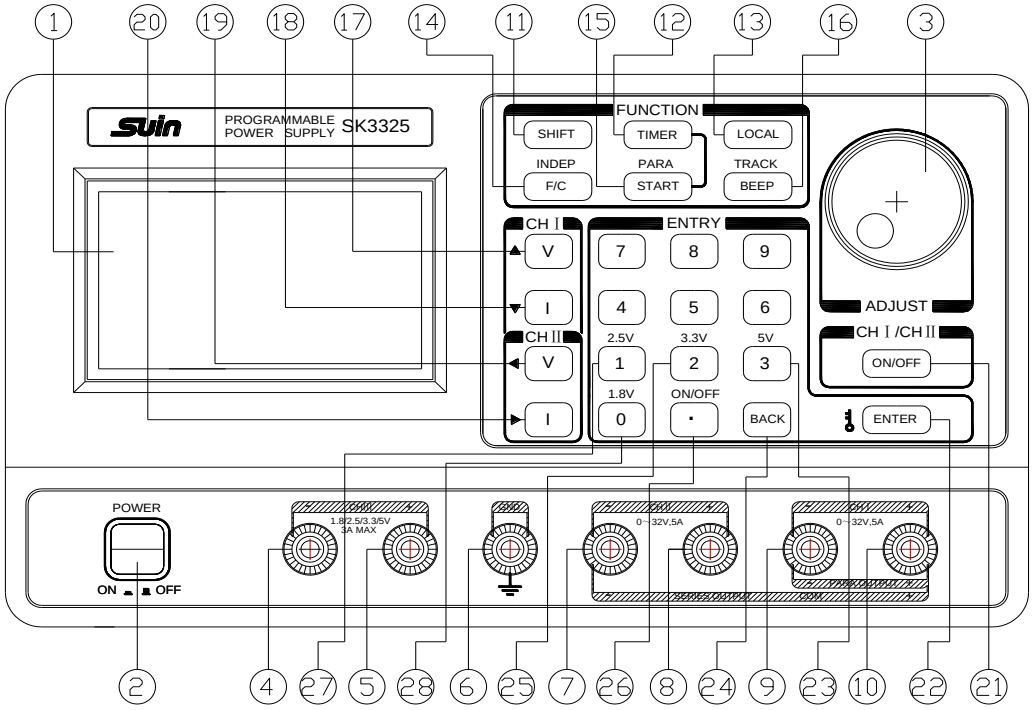
Insert the power plug into the power socket with AC voltage 230V and earthing wire, then press the power switch on the panel to make the device connected to power source. Now the initialization of the power supply begins.

Warning: in order to ensure the security of the operator, triple- core socket outlet with the safe earthing wire must be used.

Chapter 2 Operation Instruction

User will get detail learning about functions and usage of the power supply through this chapter.

2.1 Front panel overview



2.2 Keyboard Instruction

(1) LCD: Display the value of voltage/current, output the value of voltage/current and setting state, display the state.

(2)【POWER】: Power switch, press it to connect AC power.

(3) Adjust knob: to adjust the value size for required items.

(4) (CH III) ＋: Positive polar of CH3 output

(5) (CH III) —: Negative polar of CH3 output

(6) ⏚: earthling.

(7) (CH I) －: Negative polar of CH1 output, negative polar in parallel mode, public output connector in track mode

(8) (CH I) ＋: Positive polar of CH1 output, positive polar in parallel and track mode

(9) (CH II) －: Negative polar of CH2 output, negative polar in track mode

(10) (CH II) ＋: Positive polar of CH2 output

(11)【SHIFT】: Shift key, ↑status icon is shown on screen when pressing to enable the second function of keys

(12)【TIMER】: Time setting key

(13)【LOCAL】: Press the key of 【LOCAL】 to cancel the remote control if LOCAL display in status bar and operate by the keyboard. Press the key of 【LOCAL】 again to enter into remote control mode. The remote control can be realized by RS232 interface.

(14)【F/C】(INDEP): Switch of fine /coarse adjusting for the knob. F is selected for fine adjusting and C for coarse adjusting. Second function: to set independent output mode. INDEP status icon is shown on screen to enable the independent output mode.

(15)【START】(PARA): Start key of timer function. To start the output as preset time while press the key, the status icon ⏱ shown. Press again to disable the output, the icon disappears. Second function: to set the parallel output mode, the status icon PARA is shown when press the key, CH1 and CH2 is on parallel mode.

(16)【BEEP】(TRACK): beep on/off. The status icon ◄ is shown when press the key. Second function: to set the track output mode, the status icon TRACK is shown when press the key, CH2 settings change along with CH1 on TRACK mode.

(17) (CH 1)【V】(▲): the voltage setting switch of CH1, to select line up when timing setting

(18) (CH 1)【I】(▼): the current setting switch of CH1, to select line down when timing setting

(19) (CH II)【V】(◄): the voltage setting switch of CH2, to select page up when timing setting

(20) (CH II) 【I】(►):the current setting switch of CH2, to select page down when timing setting

(21) 【OUT/OFF】: the toggle key of output state and setting state

(22) 【ENTER】( ): the enter key. Second function: to lock the keypad, the status icon shown when press the key, all the other function key are invalid. Press again to enable the function keys.

(23) 【3】(5V): enter 3 for current/voltage settings. Second function: status icon 5V is shown when press the key, 5V output is selected for CH3.

(24) 【BACKE】: go back to Preset state.

(25) 【2】(3.3V): enter 2 for current/voltage settings. Second function: status icon 3.3V is shown when press the key, 3.3V output is selected for CH3.

(26) 【.】(ON/OFF): enter decimal point **.** for current/voltage settings. Second function: on/off key for CH3 output.

(27) 【1】(2.5V): enter 1 for current/voltage settings. Second function: status icon 2.5V is shown when press the key, 2.5V output is selected for CH3.

(28) 【0】(1.8V): enter 0 for current/voltage settings. Second function: status icon 1.8V is shown when press the key, 1.8V output is selected for CH3.

2.3 Basic Operation

2.3.1 Setting of output voltage

Press 【V】key then two methods for user to set the output voltage,

Method 1: Use the number keys to set. Press【V】key, then enter voltage value by the number keys on the front panel. Press the key of 【ENTER】 to save the setting. So the voltage value of channel 1 in the interface is the entered value.

For example：Set the voltage value to be 32.00V.

Press the keys of【V】【3】【2】【.】【0】【0】【ENTER】 in turn.

Method 2: Use the knob to set. Pressing the key of【V】, and the voltage value will be varied with the rotating of the knob.

2.3.2 Setting of maximum output current

Press 【I】key to set the maximum output current.

Method 1: Press 【I】key, then enter current value by the number keys on the front panel. Press the key of 【ENTER】 to save the setting. So the current value of channel 1 in the

interface is the entered value.

For example：Set the maximum output current to be 1.000A.

Press the keys of【I】【1】【.】【0】【0】【0】in turn.

Method 2: Pressing the key of 【I】, and the current value will be varied with the rotating of the knob. Then press【ENTER】key to save the settings.

Set the protective current value to be 1.000A. As load increasing, the instrument will in CC state if output current is greater than 1.000A, while the instrument will in CV state if output current is within the range of 1.000A.

2.3.3 Setting of output current/voltage

In the case of setting, press the key of【OUTPUT】 to enter into the state of output. The voltage will be output from CH1 and CH2. The output voltage or current will be displayed in the screen. If pressing this key again and back to preset state, no any output from CH1 and CH2.

2.3.4 Track output mode

Pressing the keys of 【SHIFT】+【BEEP】 (TRACK), enter into the series track mode. Letter "TRACK" will be displayed in the interface. In this mode, channel 1 is the main channel and channel 2 is the secondary one. Channel 2 (secondary channel) will changing as adjusting output of Channel 1(main channel), and the output will remain unchanging if only changing output of the Channel 2.

For example：

1) Channel 1： VOLTAGE=10V；CURRENT=2A；
2) Channel 2： VOLTAGE=20V；CURRENT=3A；
3) Press the keys of【SHIFT】+【BEEP】to enter into the track mode.
4) The output is:

   Channel 1：VOLTAGE=10V；CURRENT=2A

   Channel 2：VOLTAGE=10V；CURRENT=2A

5) +/- output terminals under track mode: VOLTAGE=±10V；CURRENT=±2A

2.3.5 Parallel output mode

Pressing the keys of 【SHIFT】+ 【START】 (PARA), enter into the parallel mode. Letter "PARA" will be displayed in the interface. In this mode, channel 1 is the main

channel and channel 2 is the secondary one. Channel 2 (secondary channel) will changing as adjusting output of Channel 1(main channel), and the output will remain unchanging if only changing output of the Channel 2.

For example：

1) Channel 1: VOLTAGE=10V；CURRENT=2A；
2) Channel 2: VOLTAGE=20V；CURRENT=3A；
3) Press the keys of【SHIFT】+【START】to enter into the parallel mode.
4) The output is:

   Channel 1：VOLTAGE=10V；CURRENT=2A

   Channel 2：VOLTAGE=10V；CURRENT=2A

5) +/- output terminals under parallel mode: VOLTAGE=10V, CURRENT=4A

2.3.6 Independent output mode

Pressing the keys of【SHIFT】+【F/C】(INDEP), enter into the independent mode. Letter "INDEP" will be displayed in the interface. In this mode, channel 1 and channel have independent output as its own setting. Only change one channel, the other channel will not change along with.

For example：

1) Channel 1： VOLTAGE=10V；CURRENT=2A；
2) Channel 2： VOLTAGE=20V；CURRENT=3A；
3) Press the keys of【SHIFT】+【F/C】to enter into the independent mode.
4) The output is:

   Channel 1：VOLTAGE=10V；CURRENT=2A

   Channel 2：VOLTAGE=20V；CURRENT=3A

2.3.7 Setting of Timer Output

Press【TIMER】key to enter Timer model. 'TOTAL:5' means there are totally 5 groups of value, 'F/C' means fine /coarse adjusting, 'T1/2/3/4/5' means which group of current displayed value. In the case of setting, press CH I【V】(▲) key to select previous line and CH I【I】(▼) key to select next line, press CH II 【V】(◀)key to select previous group value and CH II【I】(▶)key to select next group value. If one value is selected, of which

cursor will be flicker and ◄ appears in the behind of value. For how to setting, please refer to 2.3.1 setting of output voltage.

Note: User can set five items for each group values: voltage value of CH1, current value of CH1, voltage value of CH2, current value of CH2, timing time.

For example, if T1 corresponds five values 32.00, 1.000, 28.00, 3.000 and 64800, which means within 64800 seconds (equals to 18 hours), CH1 output 32V/1A max., CH2 output28V/3A max.

2.3.8 Enable/disable timer output

Press 【START】key to enter timer output model, of which interface is similar to the interface of output mode, the difference is that the balance time will of voltage/ current output will display below of interface, press 【START】key again to exit timer output mode and back to preset mode. After enabling the timer mode, the output will begin with first group of voltage/current value, then jump to next group of voltage/current value until the setting time for this group is come to end. After the five group of voltage/current values are all over, the timer output will be stop and back to preset mode.

2.3.9 Setting for the output of three channels

After power on the device, the default output is 1.8V for three channels. Press 【SHIFT】+【5V】key to select 5V output, the status of which will be displayed at upper right of screen. Press 【SHIFT】+【3.3V】to select 3.3V output, the status of which will be displayed at the upper right of screen. Press 【SHIFT】+【2.5V】to select 2.5V output, the status of which will be displayed at the upper right of screen. Press 【SHIFT】+【1.8V】to select 1.8V output, the status of which will be displayed at the upper right of screen.

2.3.10 Close output of three channels

Press 【SHIFT】+【ON/OFF】key to enable the output of three channels, 1.8V/2.5V/3.3V/5V in the top right corner won't blinking. Press 【SHIFT】+【ON/OFF】key again to close the output of three channels, 1.8V/2.5V/3.3V/5V in the top right corner will blinking continuously.

2.3.11 Beeper On/Off

Press 【BEEP】to enable the beeper, the icon ◄ at top right of corner does not

blink. Press the key again to close the beeper and the icon will blink continuously.

2.3.12 To set the adjusting knob

Press【F/C】to select fine or coarse adjusting, F is fine and step is 1mA/10mV. C is coarse and step is 100mA/1V.

2.13.13 TO lock the keypad

Press 【SHIFT】+【ENTER】key to enable the lock function, the icon at top right of corner will be displayed and all keys does not work. Press 【SHIFT】+【ENTER】key again to disable the lock function and all keys come back to its function.

2.13.14 To set the remote control mode

Press 【Local】key to select local mode for device, the letter L at top right of corner will be displayed. Device is controlled by keypad. Press 【Local】key again to select remote control mode for device, the letter R at top left of corner will be displayed. Device is controlled through RS232 interface.

2.3.15 Knob function

To set the voltage: press【V】key to change the voltage by knob, the output voltage changes along with setting and is confirmed by pressing of 【ENTER】key.

To set the current: press 【I】key to change the current by knob, the output current changes along with setting and is confirmed by pressing of 【ENTER】key.

To set the timer: select the setting as desired by adjusting knob and confirm it by pressing of 【ENTER】key, as described in chapter 2.3.7.

Chapter 3 Programmable Interface

Press 【LOCAL】to enter remote control mode, the function of other keys will disable under this mode.

3.1 To set the series port

Baud Rate: 9600, Check: No parity, Word Length: 8, Stop bit: 1

3.2 Programmable Commands

SCPI Commands	*Description*
*IDN?	Query the device identification Return SUIN,SK3325, BJA7.820.1894B,V1.2 / SUIN,SK3323, BJA7.820.1894B,V1.2
SYSTem:VERSion?	Query the device firmware version, Return 1.2
:REMote	Set remote control mode
:LOCal	Set local control mode
:RWLock	Select lock function
VOLTage <NRf>,(@chanlist)	Specify the channel for output voltage
MINimum,(@chanlist)	To output minimum voltage for specified channel
MAXimum,(@chanlist)	To output maximum voltage for specified channel
CURRent <NRf>,(@chanlist)	Specify the channel for output current (only CH1, 2)
MINimum,(@chanlist)	To output minimum current for specified channel
MAXimum,(@chanlist)	To output maximum current for specified channel
OUTPut OFF	Turn off the output of CH1 and CH2
ON	Turn on the output of CH1 and CH2
OFF,(@3)	Turn off the output of CH3
ON,(@3)	Turn on the output of CH3
:MODel:TRACk	Set track mode for output
:INDependent	Set independent mode for output
:PARallel	Set parallel mode for output
OUTPut?(@3)	Query output status of CH3, Return 1, 0
OUTPut?	Query output status of CH1 and CH2, Return 1. 0
MEASure?	Query voltage/current of CH1 and CH2
MEASure:CURRent?(@chanlist)	Query current of specified channel (only CH1, 2)
:MINimum?(@chanlist)	Query minimum current of specified channel (only CH1, 2)
:MAXimum?(@chanlist)	Query maximum current of specified channel (only CH1, 2)
:VOLTage?(@chanlist)	Query voltage of specified channel
MINimum?(@chanlist)	Query minimum voltage of specified channel
:MAXimum?(@chanlist)	Query maximum voltage of specified channel
:MODel?	Query output mode, Return TRACk/INDep/PARal

Chapter 4 Maintenance

4.1 Cleaning

In the case of disconnecting of power, the apparatus can be cleaned by soft cloth with neutral washing liquid and clear water. It is forbidden to spray the washing liquid directly on the apparatus in case that the apparatus is damaged resulted from the leaking.

4.2 Daily maintenance

For safety, the following instructions are only for professional technicians.

4.2.1 Replacing of fuse

If the apparatus cannot work properly because that the fuse is burnt out, first find the reason and correct, and then replace the fuse according to the original model. It is forbidden to use a temporary one or to short meeting the fuse block.

4.2.2 As the apparatus is in malfunction and needs to repair, disconnect the power.

4.2.3 Please do not adjust the potentiometers inside the apparatus randomly.

Warning：To insure the effective protection，only specific model fuse with the rating of 250V can be replaced. The power must be disconnected before replacing. And the power wire must also be taken off.

Chapter 5 Service and support

5.1 Warranty

Shijiazhuang Suin Instruments Co., Ltd. will give one year's warranty to maintaining or replacing since consignment for the verified quality problem of the product.

Except for this explanation and the description in the warranty card, the company has no other warranty, in proclamation or in implication. Under no circumstances, the company will responsible for the direct, indirect or other secondary loss.

5.2 Contact us

If you have any questions or inconvenience during the use of our products please do not hesitate to contact us.

Monday to Friday 8: 00-17: 00

Telephone: 86-311-86086971(after service) Fax: 86-311-86018511

86-311-86014314(technical support)

E-mail address: export@suintest.com

Website: http://www.suintest.com

Chapter 6 Specifications

6.1 Control range of adjusting:

CH1 & CH2: 0~32V step: 10mV

SK3323: 0~3A step: 1mA

SK3325: 0~5A step: 2mA

CH3: 1.8V/2.5V/3.3V/5V switchable

Max. Current 3A

6.2 Source effect：

CH1&CH2: CV≤1×10^{-4}+5mV

CC≤1×10^{-2}+3mA

CH3: ≤5mV

6.3 Load effect：

CH1&CH2: CV≤1×10^{-4}+5mV

CC≤1×10^{-2}+5mA

CH3: ≤5mV

6.4 Period and random deflection (PARD)(rms)：

CH1&CH2: CV ≤1mV

CC≤3mA

CH3: ≤2mV

6.5 Display resolution： 10mV 1mA (SK3323)

10mV 2mA (SK3325)

6.6 Voltage accuracy:

CH1&CH2: ≤ ± (0.2% + 30mV)

CH3: ≤ ± (2% + 50mV)

Current accuracy:

CH1&CH2: ≤ ± (0.5%+5mA) (SK3323)

≤ ± (0.5%+10mA) (SK3325)

CH3: ≤ ± (5% + 50mA)

Note: if output less than rated 5%, 5 digits added to accuracy for SK3323, 10 digits added for SK3325

6.7 Double Group Synchronism Deviation:

CV ≤ ± (0.4%+60mV)

CC≤ ± (1%+10mA) (SK3323)

≤ ± (1%+20mA) (SK3325)

6.9 General parameters

Voltage： AC230 (198~242) V

Rated Power: 0.8kVA (SK3323)

1.2kVA (SK3325)

Frequency: 50 (45 ~60) Hz

Working Environment: Indoors

Surrounding temperature: 0~40℃

Relative humidity: 20 ~90%RH (40℃)

Warm-up time: ≤15min

6.8 Programmable Interface

RS232 (standard); USB (option)

6.10 DC outputs, Dimensions and Weight

Model	Channel	Independent	Series	Parallel	Weight(kg)	Dimension(mm^3)
SK3323	3	0-32V/0-3A×2 1.8-5V/3Amax×1	0-64V 0-3A	0-62V 0-6A	8.5	227×140×330
SK3325	3	0-32V/0-5A×2 1.8-5V/3Amax×1	0-64V 0-5A	0-32V 0-10A	10.5	227×140×380