Multiple Channel digital control and programmable DC power supply

KA3000 Series User Manual

KORAD

User Manual

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SAFETY SYMBOLS

This chapter contains important safety instructions that you must follow when operating the KA3000-Series and when keeping it in storage. Read the following before any operation to insure your safety and to keep the best condition for the KA3000-Series.

Safety Symbols

These safety symbols may appear in this manual or on the series.

WARNING

DANGER High Voltage。

Earth (ground) Terminal

SAFETY INSTRUCTION

Safety Guidelines

- Do not block or obstruct the cooling fan vent opening.
- Avoid severe impacts or rough handling that leads to damage.
- Do not discharge static electricity .
- Do not disassemble unless you are qualified as service personnel.

AC INPUT

- AC Inut Voltage: 110V / 120V / 220V / 230V , 50 / 60 Hz
- Connect the protective grounding conductor of the AC power cord to an earth ground, to avoid electrical shock.

Operation Environment

- Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (note below)
- Relative Humidity: < 80%
- Altitude: < 2000m
- Temperature: 0-40℃

Storage environment

- Location: Indoor
- Relative Humidity: < 70%
- Temperature: -10-70℃ –

FUSE

Model	110V/120V	220V/230V
KA3303	T8A/250V(20X5mm)	T4A/250V(20x5mm)
KA3305	T10A/250V(20X5mm)	T5A/250V(20x5mm)

- To ensure fire protection, replace the fuse only with the specified type and rating.
- Disconnect the power cord before fuse replacement.
- Make sure the cause of fuse blowout is fixed before fuse replacement.

Reaction Time		
Voltage Rise Voltage Drop	≤100mS ≤100mS (10% Rated load)	≤100mS ≤100mS (10% Rated load)
Load Regulation of Parallel		
Voltage	≤0. 1%+0.1V	
Load Regulation of Series		
Voltage	≤0. 1%+0.1V	
CH3 Specifications		
Voltage Range	5V	
Current Range	3A	
Voltage Accuracy	±50mV	
Load Regulation	±50mV	
Accessories		
User manual 1 PC, power cord 1PC USB cable 1PC, Software CD X 1(only for programmable models KA3303P , KA3305P)		
Weight and Dimensions(mm)		
252(W)*135(H)*370(D), KA3303x6.5kg, KA3305 x 9.1kg		
Interfaces		
USB , RS232		

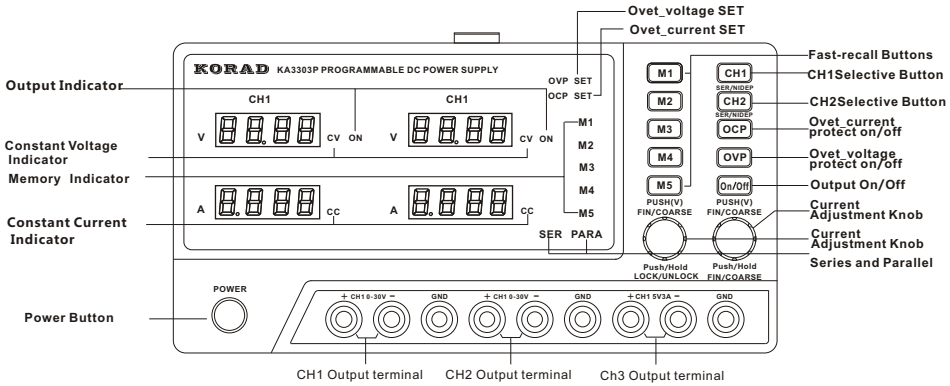
Introduction

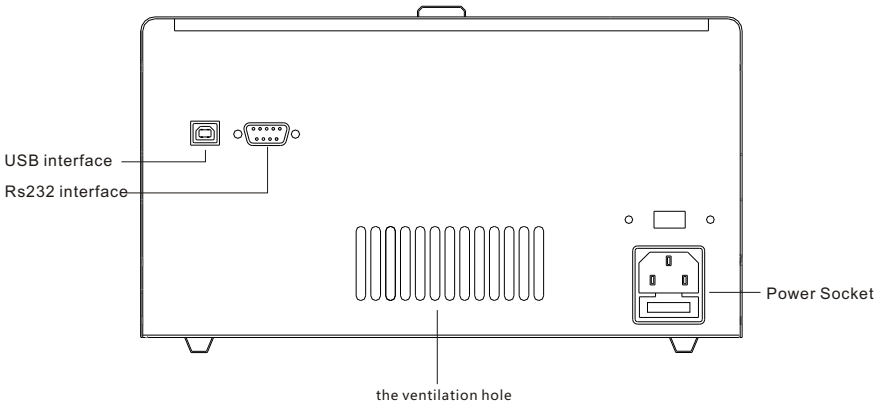
KA3000 series are multiple-channel digital control and programmable power supplies, which reflect a variety of features about digital control, such as the fast recall, and the parameters' setting of Overcurrent Protection and Overvoltage Protection independently to provide the convenient and reliable operation environment. They use efficient radiators and low-speed & stepless-speed fan, which is quiet and efficiently cooling during operation. Furthermore, the machine employs an industrial design, and can work reliably and uninterruptedly for a long time. And they can be used in the laboratory, the plant aging and the testing.

Main Features

- 4digit displays, and accurate outputs
- Parameters settings on Overcurrent Protection and Overvoltage Protection
- 5 groups of memories for fast recall
- Shutdown memory function
- Software calibration
- Keyboard Lock
- Low-speed and stepless-speed fan
- Overtemperature Protection

Front Panel Overview





Specifications

Note: The specifications below are tested under the conditions of temperature 25℃+-5℃ and the warm-up for 20 minutes.

Models	KA3303	KA3305
Voltage Range	0-30V	0-30V
Current Range	0-3A	0-5A
Load Regulation		
Voltage	≤0. 01%+3mv	≤0.01%+5mv
Current	≤0. 1%+5mA	≤0.1%+10mA
Line Regulation		
Voltage	≤0. 01%+3mv	≤0.01%+3mv
Current	≤0. 1%+3mA	≤0.1%+3mA
Setup Resolution		
Voltage	10mV	10mV
Current	1mA	1mA
Setup Accuracy (25℃+-5℃)		
Voltage	≤0.5%+20mV	≤0.5%+20mV
Current	≤0. 5%+5mA	≤0.5%+10mA
Ripple(20-20M)		
Voltage	≤1mVrms	≤2mVrms
Current	≤3mArms	≤3mArms
Temp. Coefficient		
Voltage	≤150ppm	≤150ppm
Current	≤150ppm	≤150ppm
Read Back Accuracy		
Voltage	10mV	10mV
Current	1mA	1mA
Read Back Temp. Coefficient		
Voltage	≤150ppm	≤150ppm
Current	≤150ppm	≤150ppm

13.**TRACK<NR1>**

Description: Sets the output of the power supply working on indepent or tracking mode. NR1:0=INDEP, 1=SER, 2=PARA

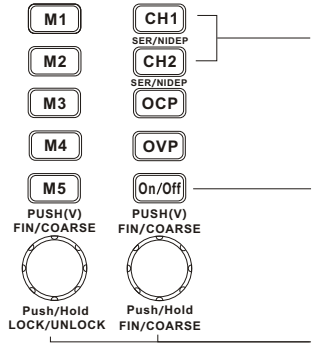
Example : TRACK1

Function Introduction

1. The Operation and Outputs of Voltage and Current

1. Press the button CH1 and then the CH1 display indicator blinks; press CH1 again and then some voltage digit on the channel 1 blinks. At this time, the voltage value can be set by adjusting the voltage adjustment knob. Then press the button CH1 again while the voltage digit is blinking to switch into the current digit blinking, when the current value can be set by adjusting the current adjustment knob. Furthmore, when the voltage or current digit blinks, press the voltage or current adjustment knob and the blinking digit (i.e. the adjusting digit) can be changed.

2. After the voltage and current values are set, press the button ON/OFF to turn on the output, when the ON indicator on the display will be switched on; press the button ON/OFF again to turn off the output and at this time the ON indicator will be switched off.



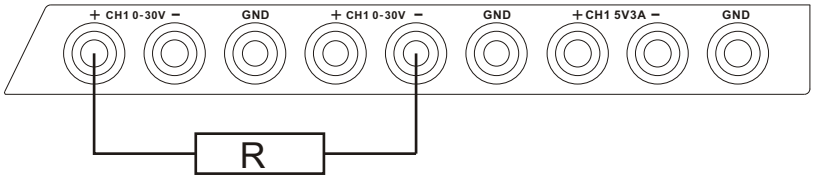
CH1 or CH2 Selective Button

Output On/Off

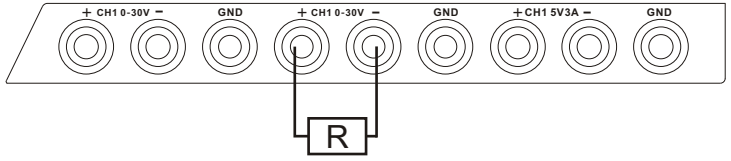
Press to set the adjusting digit

2. The Series and Parallel Operation

1. The Series Operation: Press and hold the button CH1 for 3 seconds to be in the series mode. When the SER indicator on the display lights on, it means the power supply is in the series mode now. At this mode, CH2 is the master operation while CH1 is the slave operation, when the CH1 operation is shielded. At this time, press the button ON/OFF and then the output can be turned on or off. And the output connection is as shown in the figure:



2. The Parallel Operation: Press and hold the button CH2 for 3 seconds to be in the parallel mode. When the PARA indicator on the display lights on, it means the power supply is in the parallel mode now. At this mode, CH2 is the master operation while CH1 is the slave operation, when the CH1 operation is shielded. At this time, press the button ON/OFF and then the output can be turned on or off. And the output connection is as shown in the figure:



7. **OUT<Boolean>**
Description: Turns on or off the output.
Boolean: 0 OFF,1 ON
Example: **OUT1** Turns on the output

8. **STATUS?**
Description: Returns the POWER SUPPLY status.
Contents 8 bits in the following format

Bit	Item	Description
0	CH1	0=CC mode, 1=CV mode
1	CH2	0=CC mode, 1=CV mode
2,3,4,5	N/A	
6	Output	0=Off, 1=On
7	N/AN/A	

9. ***IDN?**
Description: Returns the KA3305P identification.
Example ***IDN?**
Contents KORAD KA3305P V2.0 (Manufacturer, model name,).

1**0**. **RCL<NR1>**
Description: Recalls a panel setting.
NR1 1 5: Memory number 1 to 5
Example **RCL1** Recalls the panel setting stored in memory number 1

1**1**. **SAV<NR1>**
Description: Stores the panel setting.
NR1 1 5: Memory number 1 to 5
Example : **SAV1** Stores the panel setting in memory number 1

12. OCP**<NR1>**
Description: Over current
Example : OCP**1** OCP OPEN

KA3000 Series Remote Control Syntax V2.0

Command format： VSET<X>:<NR2>

1. VSET: command header
2. X: output channel
3. : separator
4. NR2: parameter

Command Details:

1. **ISET<X>:<NR2>**
   Description： Sets the output current.
   Example:**ISET1:2.225**
   Response time 50ms
   Sets the CH1 output current to 2.225A
2. **ISET<X>?**
   Description： Returns the output current setting.
   Example: **ISET1?**
   Returns the CH1 output current setting.
3. **VSET<X>:<NR2>**
   Description：Sets the output voltage.
   Example **VSET1:20.50**
   Sets the CH1 voltage to 20.50V
4. **VSET<X>?**
   Description：Returns the output voltage setting.
   Example **VSET1?**
   Returns the CH1 voltage setting
5. **IOUT<X>?**
   Description：Returns the actual output current.
   Example **IOUT1?**
   Returns the CH1 output current
6. **VOUT<X>?**
   Description：Returns the actual output voltage.
   Example **VOUT1?**

3. Recall to output
   In any state, just press the buttons M1- M5 and then the according memories can be recalled.

4. The Operation of Overcurrent Protection

Press and hold the button "OCP" for 3 seconds to enter the mode of OCP setting, when the indicator "OCP SET" lights on. And the current values on both CH1 and CH2 display the OCP values accordingly. By adjusting the current knob, the OCP value can be changed. Press and hold the button "OCP" again for 3 seconds to exit. Furthermore, press the button "OCP" to switch on the Overcurrent Protection (OCP) mode and the indicator "OCP" is turned on; press the button "OCP" again to shut down the OCP mode and the indicator "OCP" will be turned off. When the OCP mode is on, if the current value on the load or the setting current is more than that in the OCP SET, the output will be cut off.

5.The Overvoltage Protection (OVP) Setting and Switching on

Press and hold the button "OVP" for 3 seconds to enter the mode of OVP setting, when the indicator "OVP SET" lights on. And the voltage values on both CH1 and CH2 display the OVP values accordingly. By adjusting the voltage knob, the OVP value can be changed. Press and hold the button "OVP" again for 3 seconds to exit. Furthermore, press the button "OVP" to switch on the Overvoltage Protection (OVP) mode and the indicator "OVP" is turned on; press the button "OVP" again to shut down the OVP mode and the indicator "OVP" will be turned off. When the OVP mode is on, if the voltage value on the load or the setting voltage is more than that in the OVP SET, the output will be cut off.

6. Keyboard Lock

Press and hold the voltage adjustment knob for 3 seconds, and then the front panel will be locked; press and hold it again for 3 seconds, and then it will be unlocked.

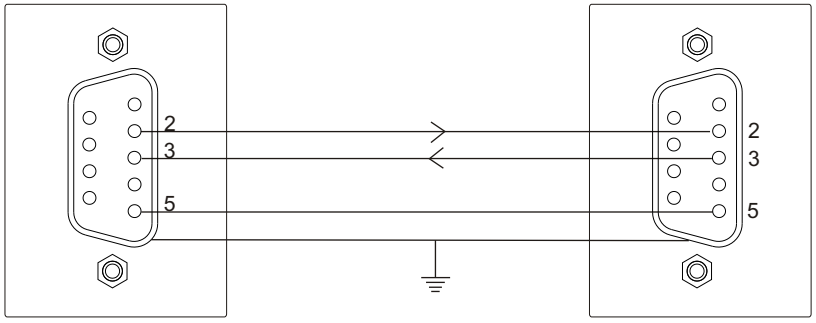
7. Beep ON/OFF

Press and hold the current adjustment knob for 3 seconds, and then the beep will be turned off. Press and hold it again for 3 seconds, it will be turned on.

COM setting Set up the COM port inside the PC according to the following list.

- Baud rate: 9600
- Parity bit: None
- Data bit: 8
- Stop bit: 1
- Data flow control: None

The Definition of Interface Rs232



KA3305P DC POWER SUPPLY PC

Functionality check Run this query command via the terminal application such as MTTTY (Multi-threaded TTY).
*DIN?
This should return the identification information:
Manufacturer, model name, software version.
KORAD KA3305P Vx.xx