Multiple Channel digital control and programmable DC power supply

KA3000 Series User Manual

KORAD User Manunl

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SAFETY SYMBOLS

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

Safety Symbols

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



WARNING



DANGER High Voltage



Earth (ground) Terminal

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 (only for 72-2645)		
Voltage Range	5V	
Current Range	3A	
Voltage Accuracy	±50mV	
Load Regulation	±50mV	
Accessories supplied		
User manual 1 PC, power cord 1 PC, USB cable 1 PC, Software Cdx1 (only for programmable models KA3303P & KA3305P)		
Weight and Dimensions(mm)		
250(W)*150(H)*380(D) KA3303D x 7.7kgs, KA3303P x 7.9kgs, KA3305D x10.55kgs, KA3305P x10.6kgs		
Interfaces		
USB, RS232		

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 Current	≤0.01%+3mv ≤0.1%+5mA	≤0.01%+5mv ≤0.1%+10mA
Line Regulation		
Voltage Current	≤0.01%+3mv ≤0.1%+3mA	≤0.01%+3mv ≤0.1%+3mA
Setup Resolution		
Voltage Current	10mV 1mA	10mV 1mA
Setup Accuracy (25℃+−5℃)		
Voltage Current	≤0.5%+20mV ≤0.5%+5mA	≤0.5%+20mV ≤0.5%+10mA
Ripple (20-20M)		
Voltage Current	≤1mVrms ≤3mArms	≤2mVrms ≤3mArms
Temp. Coefficient		
Voltage Current	≤150ppm ≤150ppm	≤150ppm ≤150ppm
Read Back Resolution		
Voltage Current	10mV 1mA	10mV 1mA
Read Back Temp. Coefficient		
Voltage Current	≤150ppm ≤150ppm	≤150ppm ≤150ppm

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
- Input power: KA3303D - 349W, KA3303P - 353W
  KA3305D - 525W, KA3305P - 529W
- Input current: KA3303D - 2.04A, KA3303P - 2.05A (220V)
  KA3305D - 3.08A, KA3305P - 3.09A (220V)
- 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	T6A/250V(20x5mm)	T3A/250V(20x5mm)
KA3305	T10A/250V(20x5mm)	T5A/250V(20x5mm)

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

OVERVIEW

Introduction

KA3000 series are multiple-channel digital control and programmable power supplies, which reflect a variety of features about digitalcontrol, 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
- Low ripple & low noise
- Series and parallel functions
- Constant voltage/constant current

13. 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

14. 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

15. OCP<Boolean>
Description: turn OCP ON or OFF
Boolean: 0 OFF, 1 ON
Example: OCP1 Turns on the OCP

16. OVP<Boolean>
Description: turn on or off the OVP
Boolean: 0 OFF, 1 ON
Example: OVP1 Turns on the OVP

17. OCPSET<X>:<NR2>
Description: Setting the value of current protection
Example: OCPSET1: 5.100

18. OVPSET<X>:<NR2>
Description: Setting the value of voltage protection
Example: OVPSET1: 31.00

7. VOUT<X>?

Description: Returns the actual output voltage.

Example: **VOUT1?**

Returns the CH1 output voltage

8. OUT<Boolean>

Description: Turns on or off the output.

Boolean: 0 OFF: 1 ON

Example: OUT1 Turns on the output

9. BEEP<Boolean>

Description: Turns on or off the beep

Boolean: boolean logic

Example: BEEP1 Turns on the beep

10. 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	Tracking	00=Independent
		01=Tracking series
		10=Tracking parallel
4	OVP	0 OFF, 1 ON
5	OCP	0 OFF, 1 ON
6	CH1	0 CH1 OUT OFF, 1 CH1 OUT ON
7	CH2	0 CH2 OUT OFF, 1 CH2 OUT ON

11. *IDN?

Description: Returns the KA3305P identification.

Example: *IDN?

Contents KORAD KA3305P V2.0 (Manufacturer, model Name).

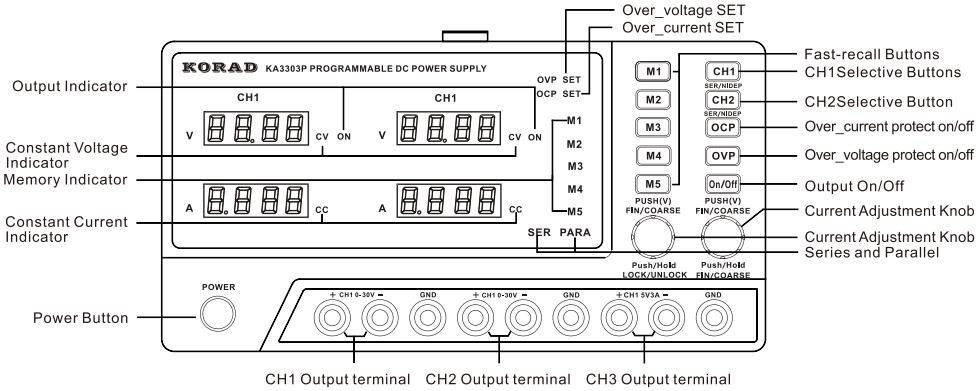
12. RCL<NR1>

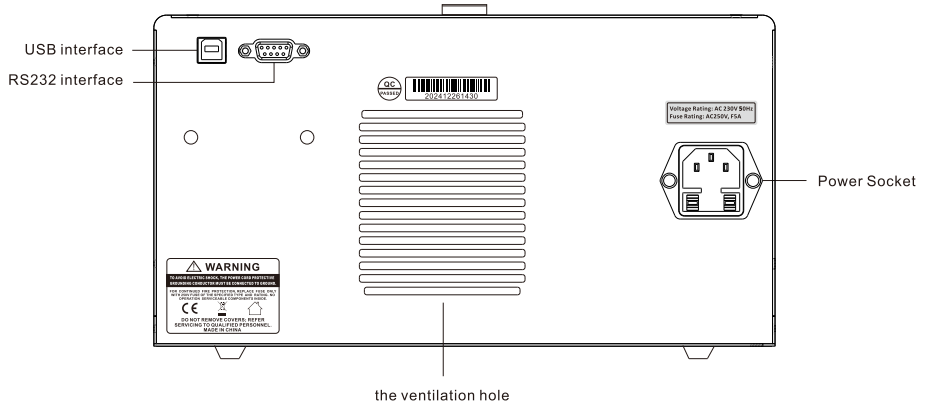
Description: Recalls a panel setting.

NR1 1-5: Memory number 1 to 5

Example: RCL1 recalls the panel setting saved in memory number 1

Front Panel Overview



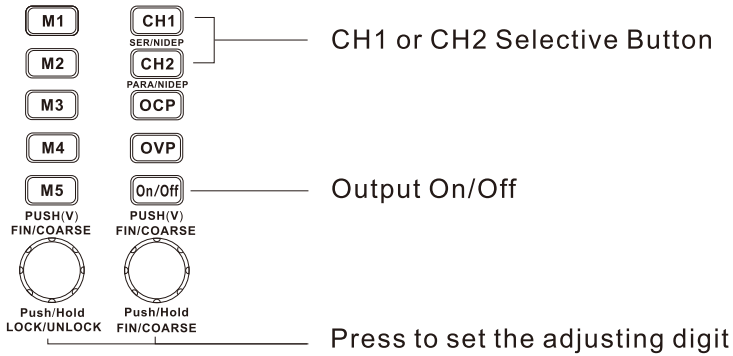


FUNCTION INTRODUCTION

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 currnet 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 the ON indicator will be switched off.



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

Connand Details:

1. LOCK<NR2>

Description: LOCK or UNLOCK the front panel.
Example: **LOCK1**
LOCK the front panel
Example:LOCK0
UNLOCK the front panel

2. ISET<X>:<NR2>

Description: Sets the output current.
Example: **ISET1: 2.225**
Sets the CH1 output current to 2.225A

3. ISET<X>?

Description: Returns the output current setting.
Example: **ISET1?**
Returns the CH1 output current setting.

4. VSET<X>:<NR2>

Description: Sets the output voltage.
Example: **VSET1:20.50**
Sets the CH1 voltage to 20.50V

5. VEST<X>?

Description: Returns the output voltage setting.
Example: **VSET1?**
Returns the CH1 voltage setting.

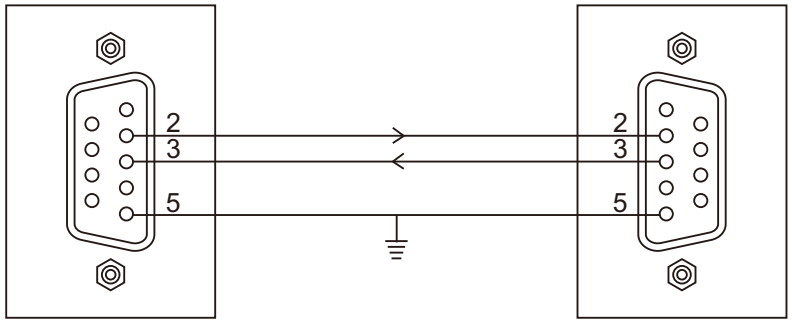
6. IOUT<X>?

Description: Returns the actual output current.
Example: **IOUT1?**
Returns the CH1 output current

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 Defintion of Interface RS232

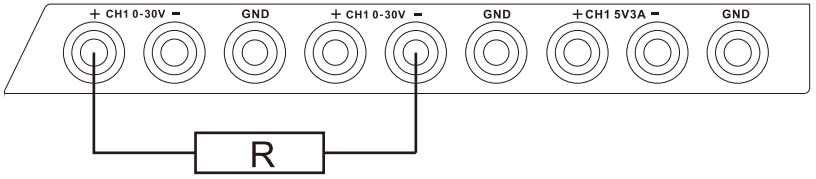


KA3305P DC POWER SUPPLY

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

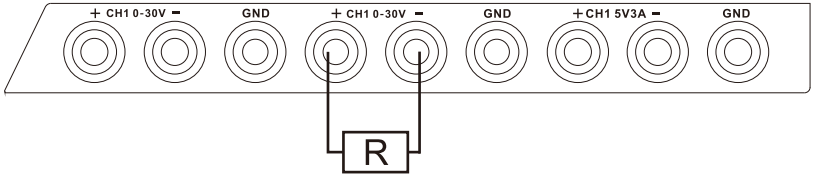
2. The Series and Parallel Operation

① The Series Operation: Press and hold the button CH1 for 1 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:



Max voltage in series: KA3303D/KA3303P/KA3305D/KA3305P - 60V
Max current in series: KA3303D/KA3303P - 3A
KA3305D/KA3305P - 5A

② The Parallel Operation: Press and hold the button CH2 for 1 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:

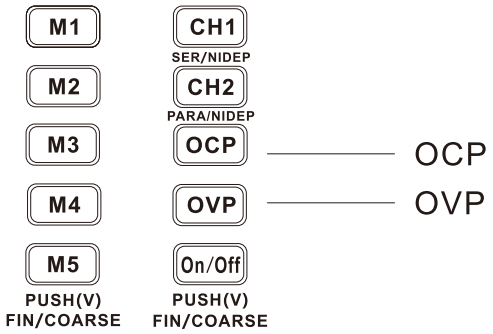


3. Recall to output

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 1 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 1 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 1 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 1 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 1 seconds, and then the front panel will be locked; press and hold it again for 1 seconds, and then it will be unlocked.

7. Beep ON/OFF

Press and hold the current adjustment knob for 1 seconds, and then the beep will be turned off. press and hold it again for 1 seconds, it will be turned on.