KORAD

Digital-Control and Programmable DC Power Supply

User Manual
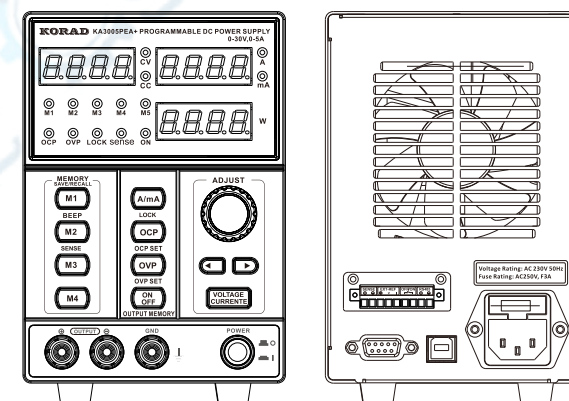
Models:

KA3003DS, KA3003DE, KA3003DEA, KA3003PS, KA3003PE, KA3003PEA, KA3003PE+,KA3003PEA+

KA3005DS, KA3005DE, KA3005DEA, KA3005PS, KA3005PE, KA3005PEA, KA3005PE+,KA3003PEA+

KA6005DS, KA6005DE, KA6005DEA, KA6005PS, KA6005PE, KA6005PEA, KA6005PE+,KA3003PEA+

KA3010DS, KA3010DE, KA3010DEA, KA3010PS, KA3010PE, KA3010PEA, KA3010PE+,KA3003PEA+

KA6002DS, KA6002DE, KA6002DEA, KA6002PS, KA6002PE, KA6002PEA, KA6002PE+,KA3003PEA+

KA6003DS, KA6003DE, KA6003DEA, KA6003PS, KA6003PE, KA6003PEA, KA6003PE+,KA3003PEA+

IMPORTANT SAFETY INFORMATION

Please read these instructions carefully before use and retain for future reference.

The following safety symbols may appear in this manual or on the series:

Symbol	Meaning
⚠	Warning
⚡	Danger - High Voltage
⏚	Earth(Ground) terminal

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

AC INPUT

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

OPERATION ENVIRONMENT

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

STORAGE ENVIRONMENT

Location	Indoor
Relative Humidity	< 70%
Temperature	−10-70℃

FUSE

Model	110V / 120V	220V / 230V
KA3003DS / KA3003DE / KA3003DEA	T4A / 250V (20x5mm)	T2A / 250V (20x5mm)
KA3005DS / KA3005DE / KA3005DEA	T4A / 250V (20x5mm)	T2A / 250V (20x5mm)
KA3003PS / KA3003PE / KA3003PEA / KA3003PEA+	T4A / 250V (20x5mm)	T2A / 250V (20x5mm)
KA3005PS / KA3005PE / KA3005PEA / KA3005PEA+	T5A / 250V (20x5mm)	T3A / 250V (20x5mm)
KA6005DS / KA6005DE / KA6005DEA	T10A / 250V (20x5mm)	T5A / 250V (20x5mm)
KA3010DS / KA3010DE / KA3010DEA	T10A / 250V (20x5mm)	T5A / 250V (20x5mm)
KA3010PS / KA3010PE / KA3010PEA / KA3010PEA+	T10A / 250V (20x5mm)	T5A / 250V (20x5mm)
KA6005PS / KA6005PE / KA6005PEA / KA6005PEA+	T10A / 250V (20x5mm)	T5A / 250V (20x5mm)
KA6002DS / KA6002DE / KA6002DEA	T5A / 250V (20x5mm)	T3A / 250V (20x5mm)
KA6003DS / KA6003DE / KA6003DEA	T5A / 250V (20x5mm)	T3A / 250V (20x5mm)
KA6002PS / KA6002PE/ KA6002PEA / KA6002PEA+	T5A / 250V (20x5mm)	T3A / 250V (20x5mm)
KA6003PS / KA6003PE / KA6003PEA / KA6003PEA+	T5A / 250V (20x5mm)	T3A / 250V (20x5mm)

- Avoid the risk of fire by only replacing the fuse with the specified type and rating.
- Disconnect the power before replacing the fuse.
- Make sure the cause of the fuse blowout is fixed before replacing the fuse.
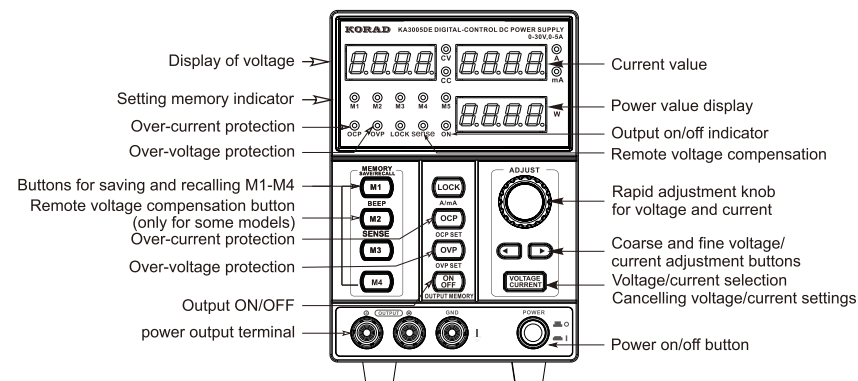
Correspondence Table of Models and Functions

mode	V meter	A meter	Resolution	Current Read Resolution (C>0.5A) and (C<=0.5A)	External interface	Analog control interface	RS232 USB
KA3003DS KA3005DS	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	No	No	No
KA3003DE KA3005DE	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	No	No
KA3003DEA KA3005DEA	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	Yes	No
KA3003PS KA3005PS	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	No	No	Yes
KA3003PE KA3005PE	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	No	Yes
KA3003PEA KA3005PEA	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	Yes	Yes
KA3010DS KA6005DS	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	No	No	No
KA3010DE KA6005DE	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	No	No
KA3010DEA KA6005DEA	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	Yes	No
KA3010PS KA6005PS	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	No	No	Yes
KA3010PE KA6005PE	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	No	Yes
KA3010PEA KA6005PEA	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	Yes	Yes
KA6002DS KA6003DS	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	No	No	No
KA6002DE KA6003DE	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	No	No
KA6002DEA KA6003DEA	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	Yes	No
KA6002PS KA6003PS	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	No	No	Yes
KA6002PE KA6003PE	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	No	Yes
KA6002PEA KA6003PEA	4 digit	4 digit	10mV/1mA	1m A and 0.1mA	Exter switch and voltage compensation	Yes	Yes

KA3003PE+, KA3005PE+, KA6002/3PE+, KA3010PE+, KA6005PE+, KA3003PEA+, KA3005PEA+, KA6002/3PEA+, KA3010PEA+, KA6005PEA+, RS485 and MODBUS communication functions are added on the 12 models based on the according functions on the above table.
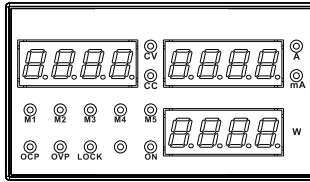
Main Features:

- Low noise: the cooling fan is controlled by the radiator temperature.
- High-precision voltage and current output (see parameter table), and maximum resolution 0.1mA of current reading.
- Constant Voltage/Constant Current operation
- Output ON/OFF control
- Voltage, current and power display
- Digital panel control
- 4 pairs of saving/recalling panel settings
- Coarse and fine voltage/.current control
- Software calibration
- Keyboard LOCK function
- Over-Voltage and Over-Current Protections that can set parameters
- Reverse polarity protection
- Short circuit protection
- Analog control interface and external switch control interface (only for some models)
- Output terminal voltage compensation (only for some models)
- USB/RS232 for remote control (only for some models)
- RS485 control interface (only for some models)

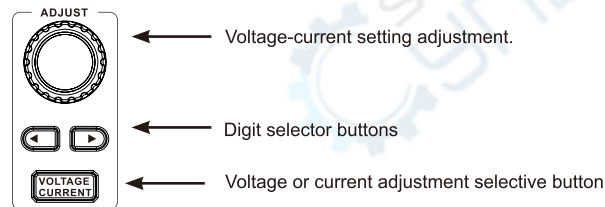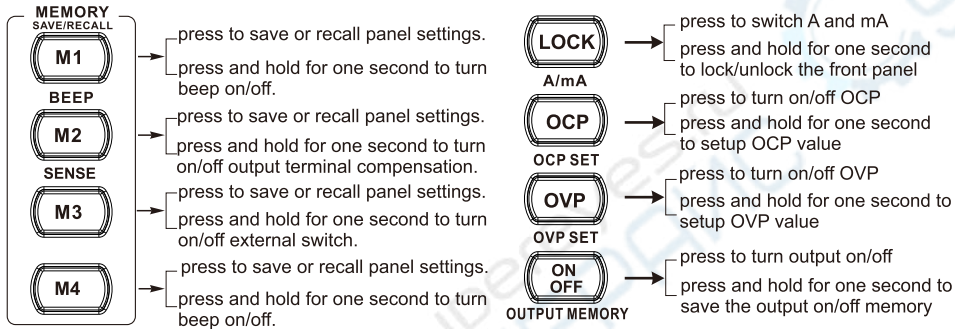### FRONT PANEL OVERVIEW

- Display of voltage
- Setting memory indicator
- Over-current protection
- Over-voltage protection
- Buttons for saving and recalling M1-M4
- Remote voltage compensation button (only for some models)
- Over-current protection
- Over-voltage protection
- Output ON/OFF
- power output terminal
- Current value
- Power value display
- Output on/off indicator
- Remote voltage compensation
- Rapid adjustment knob for voltage and current
- Coarse and fine voltage/current adjustment buttons
- Voltage/current selection Cancelling voltage/current settings
- Power on/off button

DISPLAY

Voltage setting value or voltage output value

Voltage setting value or voltage output value

Power output value

CONDITION INDICATION

◎ CC	when this light is ON, it means that the output of the power supply is constant current.
◎ CV	when this light is ON, it means the power output is constant voltage.
◎ A	A, this light is always ON, indicating that the unit of the current measurement value is A.
◎ mA	mA, this light is always ON to indicate that the unit of the current measurement is mA.
◎ OCP	When this light is always ON, it means that OCP is turned on, and when this light is flashing, it means OCP parameter setting.
◎ OVP	OVP, when this light is always ON, it means that OVP is turned on, and when this light is blinking, it means OCP parameter setting.
◎ ON	This light is lit to indicate that the output is turned on, and this light is bickering to indicate that the output shutdown memory is turned on.
◎ SENSE	SENSE, this lights up to indicate that the output voltage compensation function is enabled.
◎ LOCK	LOCK, this light illuminates to indicate that the keyboard is locked.
◎ M1 ◎ M2 ◎ M3 ◎ M4 ◎ M5	M1 – M5, save/recall indicators

BRIEF INTRODUCTION OF PANEL OPERATION

MEMORY SAVE/RECALL

M1 → press to save or recall panel settings.
BEEP → press and hold for one second to turn beep on/off.

M2 → press to save or recall panel settings.
SENSE → press and hold for one second to turn on/off output terminal compensation.

M3 → press to save or recall panel settings.
→ press and hold for one second to turn on/off external switch.

M4 → press to save or recall panel settings.
→ press and hold for one second to turn beep on/off.

LOCK A/mA → press to switch A and mA
→ press and hold for one second to lock/unlock the front panel

OCP OCP SET → press to turn on/off OCP
→ press and hold for one second to setup OCP value

OVP OVP SET → press to turn on/off OVP
→ press and hold for one second to setup OVP value

ON OFF OUTPUT MEMORY → press to turn output on/off
→ press and hold for one second to save the output on/off memory

ADJUST

← Voltage-current setting adjustment.

← Digit selector buttons

VOLTAGE CURRENT ← Voltage or current adjustment selective button

Rear Panel and Interfaces of Machine and Control Terminal

Fan
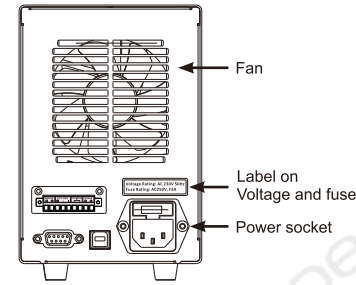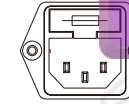
Label on Voltage and fuse

Power socket

Diagram of Rear Panel

The power cord socket accepts AC values: 115V/230V, 50/60Hz. Please refer to the fuse parametrs on the back of the fuse label, in order to replace the fuse with the specified fuse.

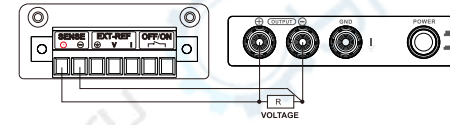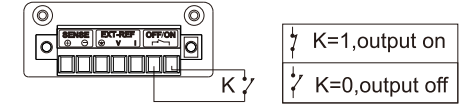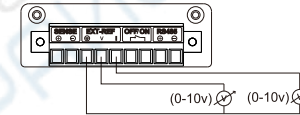Ensure the correct type of fuse is installed prior to powering up.
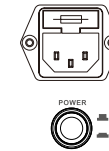
Diagram of Rear Panel
(only for some models)

K=1,output on
K=0,output off

Wiring Diagram of External Switch Control
(only for some models)

(0-10v) (0-10v)

Wiring Diagram of AnalogInterface
(only for some models)

OPERATION

Connect the AC power cord and select the corresponding AC voltage according to the back label, the connect the AC power cord to the socket on the back panel.

press the power switch to turn the pwer on.The display initialises, showing the model of the machine and the the setting level,which is recalled from the last use.
press the power switch again to turn the power off.

Output Control and Output Shutdown Memory of Power Supply

- press ⬜ON OFF ,Output will be turned on, the positive and negative terminals will output according voltage and the output indicator light will be lit ON.
- Press and hold ⬜ON OFF for one second, and then the output indicator will be lit ON. At this time, the machine will memorize the output status before shutting down, and the last status will be exactly what the power supply is when you power ON next time.

Note: If there are any of the following conditions, the output will automatically turn off:
- OVP turns on and then there is unusual voltage on the onput terminal which is more than the setting voltage;
- OCP turns on and then there is unusual current on the ouput terminal which is more than the setting current;
- Recalling other setups from the memory.

BEEP ON/OFF

- By default, the beep sound is enabled.
- To turn off the beep, press the [M1] key for one seconds.
- A beep sounds, meaning the beep setting will be turned off.
- To enable the beep, press the [M1] key for one seconds again.

FRONT PANEL LOCK

Press the [LOCK] key for one seconds to lock the front panel key operation. The key LED will turn on. To unlock, press and hold the LOCK key for one seconds.

OUTPUT SET

Panel Operation

- Connect the load to the front pore,
- Voltage or current adjustment selective button, press for the first time, and then the voltage setting value will blink. At this time, you can adjust the voltage setting value by rotating the adjustment knob. Then press the Voltage/Current button again to make the current setting value bicker, and then to adjust the current setting value through rotating the knob. And the setting blinking time is around 8 seconds. If you want to end the setting blinking, press and hold the button for 0.5 second.
- By default, the voltage and current knob work in coarse mode. In order to activate in ýne mode, press the key to choose between coarse or ýne mode.
- Turning on the output and pressing the output key will turn on the key LED and display CV or CC mode.

SAVE SETUP

Contents	The following list shows the setup contents: • Fine/coarse knob editing mode • Beep on/off • Output voltage/current level • Output on/off (The shutdown memory must be set to make it saved)
Panel Operation	Press one of the four buttons (M1, M2, M3, M4) and the LED light turns on accordingly. After adjusting the value, it is automatically saved, once the LED light stops blinking.

RECALL SETUP

The front panel settings can be recalled from one of the four internal memories.
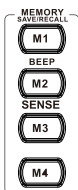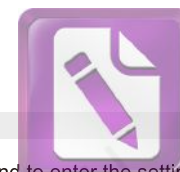
Press any button of M1 to M4.
For example, the memory of the panel setting is recalled in M1.
After you recall M4, rotate the shuttle knob and then M5 is recalled.
If the memory indicator is lit on the panel of lights, then the current memory is recalled.
Note: When a setting is recalled the output automatically turns off.

Setting of Function Menu

Press and hold the button M4 (menu) for one second to enter the setting interface of function menu. Press the left and right key to switch into different settings. To exit, press and hold the button M4 (MENU) for one second. And the instructions of menu settings are as follows:

Function Serial No.   Split symbol and function code   Parameter settings
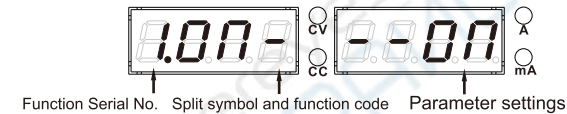
### Function Descriptions of Serial Number:

1. External switch control – turn the knob to change the setting, and ON parameter indicates enabling the external output switch while OFF indicates turning off the external control switch.
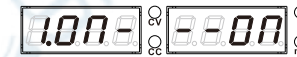
2. Connection terminal compensation setting – turn the knob to change the parameter setting, and ON parameter means turning on the output terminal compensation while OFF means turning off the output terminal compensation.
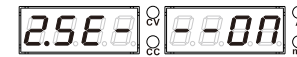
3. External setting of analog control setting – turn the knob to change the parameter setting, 0 refers to turning off this function; 1 means the external analog voltage control, and current value is subject to fixed setting; 2 refers to the external analog current control, and the voltage value is subject to fixed setting; 3 means the voltage and current are controlled respectively by the external analog control.
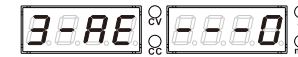
4. The communication baud rate setting – the baud rate can be set to 9600, 18400, 39600, 115200 by adjusting the knob.
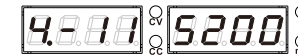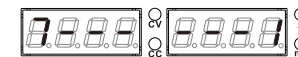
5. 485 communication mode is turned on – adjust the knob to change the 485 communication mode (ON or OFF).

6. 485 communication address setting – turn the knob to set 485 communication address.

7. 485 communication format settings – 485 communication format can be set by adjusting the knob.

0: Low-Endian
1: High-Endian
2:Low-Endian data exchange mode
3:High-Endian data exchange mode

REMOTE CONTROL

All models can be connected to a computer through interfaces USB/RS232 on the back of the machine and controlled by the remote control.

COM setting

Set up the COM port inside the computer according to the following list:

- Baud rate: 9600,19200,38400,57600,115200
- Parity bit: None
- Data bit:8
- Stop bit:1
- Data pow control: None

Functionality Check

- Run this query command via the terminal application, such as MTTTY (Multi-threaded TTY).
- This should return the idenitiýcation information: Manufacturer, model name, serial number, KORAD KA3005PS VX.X SN: xxxxxxxxx

Entering the Remote Control Mode:

- Connect the USB.
- The power supply will automatically connect. After a normal connection, there will be a tweet from the power supply itself.
- The panel keys are locked, so the power supply can only rely on the remote control.

Exiting from the Remote Control Mode:

- Close the remote control software.
- Disconnect the USB from the back.
- The power supply disconnects. You will hear a beep, which hints that the remit control is over.
- The power supply automatically comes in the panel control mode.

SPECIFICATIONS

Note: The specifications in the table below have all been tested in temperature ranging from 25℃ down to -5℃, and after being warmed up for 20 minutes.

Model	KA3003DS/ KA3003DE/ KA3003DEA/ KA3003PS/ KA3003PE/ KA3003PEA/ KA3003PEA+	KA3005DS/ KA3005DE/ KA3005DEA/ KA3005PS/ KA3005PE/ KA3005PEA/ KA3005PEA+	KA6002DS/ KA6002DE/ KA6002DEA/ KA6002PS/ KA6002PE/ KA6002PEA/ KA6002PEA+	KA6003DS/ KA6003DE/ KA6003DEA/ KA6003PS/ KA6003PE/ KA6003PEA/ KA6003PEA+	KA3010DS/ KA3010DE/ KA3010DEA/ KA3010PS/ KA3010PE/ KA3010PEA/ KA3010PEA+	KA6005DS/ KA6005DE/ KA6005DEA/ KA6005PS/ KA6005PE/ KA6005PEA/ KA6005PEA+
Voltage Range	0-30V	0-30V	0-60V	0-60V	0-30V	0-60V
Current Range	0-3A	0-5A	0-2A	0-3A	0-10A	0-5A
Load Regulation						
Voltage Current	≤0.01%+2mV ≤0.1%+5mA ≤0.1%+10mA	≤0.01%+2mV ≤0.1%+5mA	≤0.01%+2mV ≤0.1%+5mA	≤0.01%+2mV ≤0.1%+5mA	≤0.01%+3mV ≤0.1%+20mA	≤0.01%+2mV ≤0.1%+10mA

Line Regulation						
Voltage Current	≤0.01%+3mV ≤0.1%+3mA	≤0.01%+3mV ≤0.1%+3mA	≤0.01%+3mV ≤0.1%+3mA	≤0.01%+3mV ≤0.1%+3mA	≤0.01%+3mV ≤0.1%+3mA	≤0.01%+3mV ≤0.1%+3mA
Setup Resolution						
Voltage Current	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA
Setup Accuracy (25℃ to -5℃)						
Voltage Current	≤0.5%+20mV ≤0.5%+3mA	≤0.5%+20mV ≤0.5%+5mA	≤0.5%+30mV ≤0.5%+3mA	≤0.5%+30mV ≤0.5%+3mA	≤0.5%+20mV ≤0.5%+10mA	≤0.5%+30mV ≤0.5%+5mA
Ripple (20-20m)						
Voltage Current	≤1mVrms ≤3mVrms	≤2mVrms ≤3mVrms	≤1mVrms ≤3mVrms	≤1mVrms ≤3mVrms	≤2mVrms ≤5mVrms	≤1mVrms ≤3mVrms
Temperature Coefficient						
Voltage Current	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm
Read Back Accuracy						
Voltage Current	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA
Read Back Temperature Coefficient						
Voltage Current	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm
Reaction Time						
Voltage Rise Voltage Drop	≤100mS ≤100mS (10% rated load)	≤100mS ≤100mS (10% rated load)	≤100mS ≤100mS (10% rated load)	≤100mS ≤100mS (10% rated load)	≤100mS ≤100mS (10% rated load)	≤100mS ≤100mS (10% rated load)

Analog Programming: 0-10V control (only for some models)

External voltage control output voltage	Accuracy and linearity: ±0.1% of rated output voltage+15mv.
External voltage control output current	Accuracy and linearity: ±0.5% of rated output current+5mA.

Size and weight

Model	Dimensions	Weight
KA3003DS / KA3003DE / KA3003DEA / KA3003PS / KA3003PE / KA3003PEA / KA3003PEA+	262*110*160mm	3.7kg
KA3005DS / KA3005DE / KA3005DEA / KA3005PS / KA3005PE / KA3005PEA / KA3005PEA+	262*110*160mm	4.3kg
KA6002DS / KA6002DE / KA6002DEA / KA6002PS / KA6002PE / KA6002PEA / KA6002PEA+	262*110*160mm	4.2kg
KA6003DS / KA6003DE / KA6003DEA / KA6003PS / KA6003PE / KA6003PEA / KA6003PEA+	262*110*160mm	4.6kg
KA3010DS / KA3010DE / KA3010DEA / KA3010PS / KA3010PE / KA3010PEA / KA3010PEA+	305*110*160mm	8.0kg
KA6005DS / KA6005DE / KA6005DEA / KA6005PS / KA6005PE / KA6005PEA / KA6005PEA+	305*110*160mm	8.3kg

Remote Control Syntax V4.0

KA3000-6000PS, PE, PE+, PEA, PEA+ Series

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**
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?**
Returns the CH1 output voltage

7. BEEP<Boolean>

Description: Turns on or off the beep. Boolean: boolean logic.
Example: **BEEP1**   Turns on the beep.

8. OUT<Boolean>

Description: Turns on off the output.
Boolean: 0 OFF, 1 ON
Example: **OUT1**   Turns on the output

9. STATUS?

Description: reading the status of the power supply returning
Contents: 8 bits follow the below formats

Bit	Content	Description
0	CH1	0=CC mode, 1=CV mode
1	CH2	0=CC mode, 1=CV mode
2, 3	Tracking	01=independent, 11=serial connection, 10=parallel connection
4	Beep	0=OFF, 1=ON
5	OCP	0=OCP OFF, 1=OCP ON
6	Output	0=OFF, 1=ON
7	OVP	0=OVP OFF, 1=OVP ON

10. *IDN?

Description: Returns the KA3005PEA identification.
Example ***IDN?**
Contents KORAD KA3005PEA V4.0 (Manufacturer, model name,).

11. RCL<NR1>

Description: Recalls a panel setting.
NR1 1-5: Memory number 1 to 5
Example **RCL1**   Recalls the panel setting stored in memory number1

12. SAV<NR1>

Description: Stores the panel setting.
NR1 1-5: Memory number 1 to 5
Example **SAV1**   Stores the panel setting stored in memory number1

13. OCP<Boolean>

Description: Stores the panel setting.
Boolean: 0 OFF, 1 ON
Example: **OCP1**   Turns on the OCP

14. OVP<Boolean>

Description: Turns on the OVP.
Boolean: 0 OFF, 1 ON
Example: **OVP1**   Turns on the OVP

15. POWER?

Description: Output power reading
Example: POWER?   Turns on the power

16. CURRENTA
CURREN MA

Description:Switch the current display unit to A or mA
Example: CURRENT A   Turns on the power

17. ANALOGE1

Description:External analog signal controls output
Example:ANALOGE1 Turns on External analog signal controls output

18. Read analog signal setting

NAALOGE? reading data 1 means turning ON, and 0 means turning OFF.

19. External switch control

Description: Turns on external switch control
Example: EXON:1   Turns on external switch control

20.Connection terminal compensation setting

Description:Connection terminal compensation setting
Example: SENSE:1   Open Connection terminal compensation

Modbus Protocol

The upper computer sends instructions						
Slave Address	Function Code	Set an address	Data length/setting content	CRCL	CRCH	Instructions
01H	01H	0000H	N-16bit	XXH	XXH	Function: read machine status Address:000H-CC/CV 　0001H-ON/OFF indicates the output 　0004H- beep 　0005H-LOCK indicates the lock 　0006H-OVP 　0007H-OCP 　000AH-SENSE external compensation 　000CH-ON/OFF external switch
01H	05H	0001H	FF00H	XXH	XXH	Function: set machine status Address: 0001H-ON/OFF indicates the output 　0004H-beep 　0005H-indicates the lock 　0006H-OVP ON/OFF 　0007H-OCP ON/OFF 　0008H- indicates the AUTO mode 　000AH-SENSE external compensation 　000CH-ON/OFF external switch Setting content: FF00H-turning ON 0000H-turning OFF
01H	03H	0000H	N-16bit	XXH	XXH	Functionn: read the voitage and current values of the device Address: 0000H-0001H output voltage 　0002H-0003H output current 　0004H-0005H set voltage 　0006H-0007H set current 　0008H-0009H set OVP 　000AH-000BH set OCP
01H	010H	0004H	N-16bit (How many addresses to write) / The length is 2N bytes -8bit	XXH	XXH	Function: set voltage and current values of the device Address: 0004H-0005H set voltage 　0006H-0007H set current 　0008H-0009H set OVP

The lower computer responds						
Slave Address	Function Code	Data length	Data	CRCL	CRCH	Instructions
01H	01H	(N+7)/8 -8bit	XXH	XXH	XXH	Address:0000H-BIT0 　0001H-BIT1……
01H	05H	set an address 0001H -16bit	FF00H -16bit	XXH	XXH	Return the commands of upper computer
01H	03H	2N - 8bit	2N data	XXH	XXH	Function: return the data value to be read Data: a data integer of 16-bit floating-point
01H	010H	Starting and ending addresses -16bit	N-number of writing addresses -16bit	XXH	XXH	Function: return function code, start address, address length