

# KORAD



Programmable DC Power Supply

KWR Series User Manual

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## Product Features

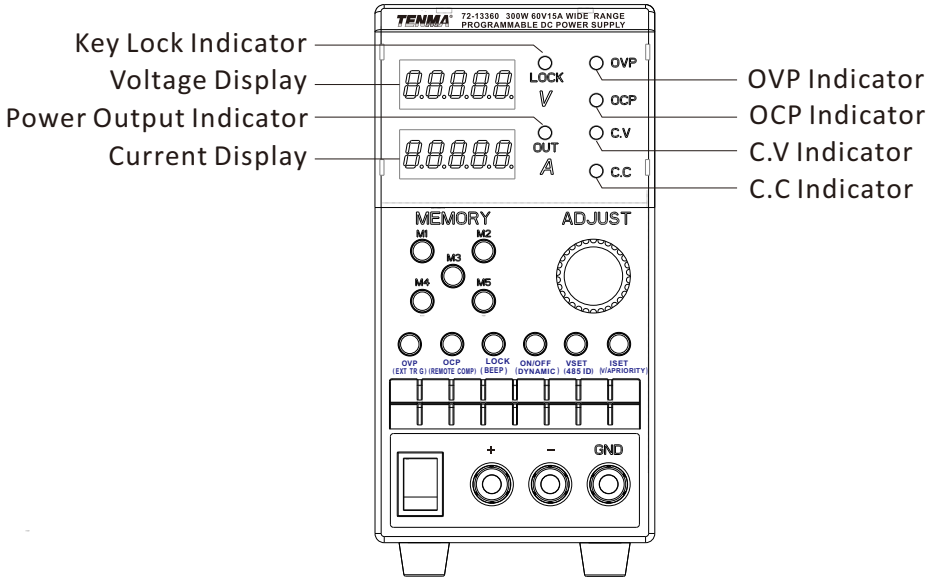
- 0 30V/0 60V, 0 30A/0 15A, 300W wide range output
- 5 digit current and voltage display with high accuracy
- The voltage output slope can be set
- Convenient fast recall
- The OCP & OVP parameters can be set
- Various control interfaces: LAN, USB, RS232 & USB
- Supporting the stand alone dynamic output mode
- External trigger and external switch interface

## Product Series

KWR102 0 30V 0 30A 300W

KWR103 0 60V 0 15A 300W

# Front Panel Description



OVP function and External trigger function



OCP function and Remote compensation function



Key lock function and Buzzer setting function



ON/OFF output and Dynamic output function



RS485 ID setting function

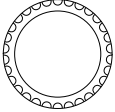


Voltage and current priority function

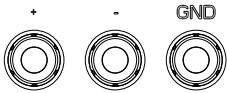


M1-M5 quick recall / storage function and Dynamic output function

ADJUST

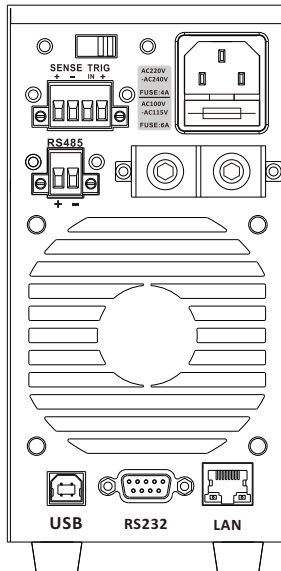


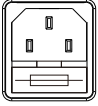
Press: turn off the flashing while setting  
Press and hold: set the slope and press again to exit the setting. And the unit is V/100uS.



Front output terminal: the max output current of the secondary terminal is 10A. And the output of the power supply will be automatically cut off if the current exceeds 10A.

## Rear Panel Description





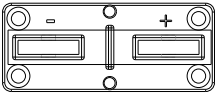
AC input



AC input 115V/230V switch



SENSE: Remote Monitoring Port  
TRIG : trigger port

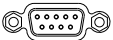


Output terminal, max output current 30A



USB

USB communication port



RS232

RS232 communication port



LAN

Ethernet communication port

# operating instruction

## 1. M1-M5 quick recall / storage function

### 1.1 M1-M5 quick recall function

Instruction: Short press M1 M5 keys to quickly recall the contents stored in 1 5.

### 1.2 M1-M5 quick storage function

Instruction: Adjust the stored voltage and current value and long press the M key to store the current value in the memory of the selected M key.

## 2. OVP function

### 2.1 Set the OVP value

Instruction: Short press OVP to activate the OVP value setting function, adjust the OVP value to be set through the knob and the VSET key, and short press the OVP to save and exit.

### 2.2 Turn on / off OVP function

Instruction: When the OVP is at the OFF state, short press the OVP key and then short press the ON/OFF key to enable this function. When the OVP is at the ON state, short press the OVP key and then short press the ON/OFF key to disenable this function.

## 3. OCP function

### 3.1 Set the OCP value

Instruction: Short press the OCP to activate the OCP value setting function, adjust the OCP value to be set through the knob and the ISET key, and short press the OCP to save and exit.

### 3.2 Turn on / off OCP function

Instruction: When the OCP is at the OFF state, short press the OCP key and then short press the ON/OFF key to enable this function. When the OCP is at the ON state, short press the OCP key and then short press the ON/OFF key to disenable this function.

#### **4. External trigger function**

Instruction: Long press the OVP key until there is a decimal point shown in the right corner of the last digital code of the voltage display digital tube, meaning that the external trigger function is activated. At this time, the power output can be turned on by shorting two rear interfaces of TRIG.

#### **5. Remote compensation function**

Instruction: Long press the OCP key until there is a decimal point shown in the right corner of the last digital code of the current display digital tube, meaning that the remote compensation function is activated. At this time, the rear SENSE terminal can be used as the voltage compensation terminal.

#### **6. Key lock function**

Instruction: Long press the LOCK key that can be locked when the LOCK lamp is lit, and repeat this action to unlock the key.

#### **7. Buzzer setting function**

Instruction: Short press the LOCK key to turn on or off the buzzer.

#### **8. RS485 ID setting function**

Instruction: Long press the VSET to activate the RS485 ID setting function, turn the knob until the required ID occurs, and long press the VSET to save and exit.

#### **9. Voltage and current slope setting function**

Instruction: Long press the knob to activate the voltage and current slope setting function, turn the knob to increase or decrease the value, select the voltage and current slope through VSET and ISET, and long press the knob to exit the setting function, with unit / 100us.

#### **10. Dynamic output function**

##### **10.1 Dynamic setting function**

Instruction: Step 1: Long press the ON/OFF to activate the dynamic setting



function. At this time, M1 M5 key indicators are all off and M1 M5 show digits 1 5. Set the dynamic steps with M1 M5 digit combination.

**Step 2:** When M1 M5 indicators are all off, Step 0 starts. At this time, the voltage is displayed as a dynamic cycle number and the current is displayed a dynamic step. Change the value through the knob, and switch to the different item through VSET and ISET.

**Step 3:** Press M1. At this time, Step 1 starts when M1 indicator is lit. Set the value of the first step. Change the voltage / current value through knob and switch to the different item through VSET and ISET, press the knob to switch to the required voltage slope and time. Change the value through the knob, and switch to the different item through VSET and ISET.

**Step 4:** Press M1 to close M1 and press M2 to set the value required in Step 2, with the setting method same with that used in Step 2. The M1-M5 key combination is required when the Step number is greater than 5. For example, M5+M1 is used in the Step 6. M5+M4+M3 is used in Step 12.

**Step 5:** Long press ON/OFF after setting to save the set value and exit the setting function.

## **10.2 Dynamic Setting Recall**

Instruction: Short press M5 and turn the knob to increase, so that the dynamic function can be recalled. Turn on ON/OFF for output.

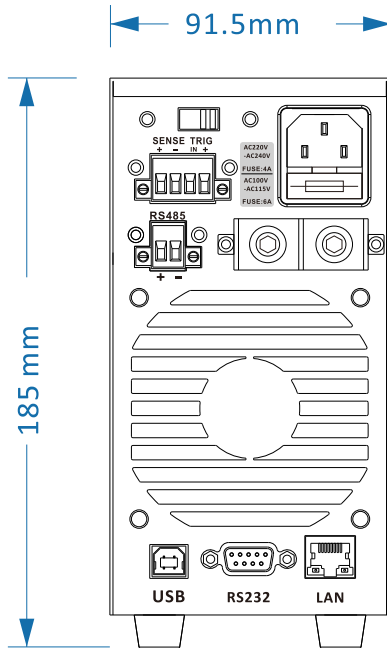
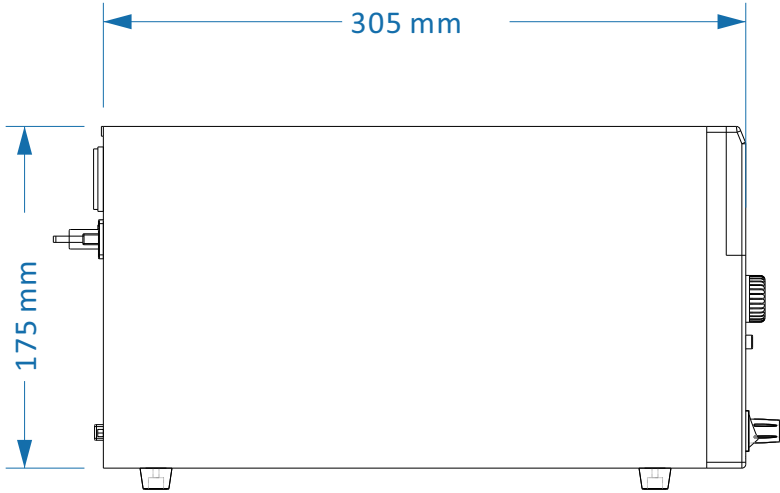
## **11. Voltage and current priority function**

Instruction: Long press ISET to activate the voltage and current priority setting function. Turn the knob to set 0 as voltage priority and set 1 as current priority, and long press ISET to save and exit.

## **12. Communication with PC**

Please refer to the communication protocol file.

# The External Size of the Power Supply



## Characteristics of the Voltage Output

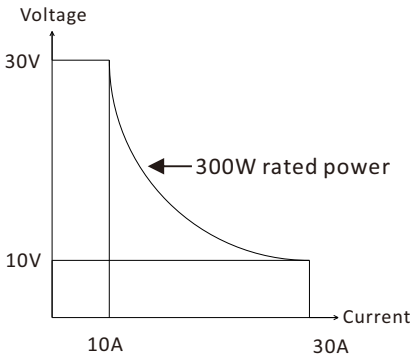
The KWR power supplies are regulated DC power supplies with a high voltage and current output. These operate in CC or CV mode within a wide operating range limited only by the output power.

The operating area of each power supply is determined by the rated output power as well as the voltage and current rating.

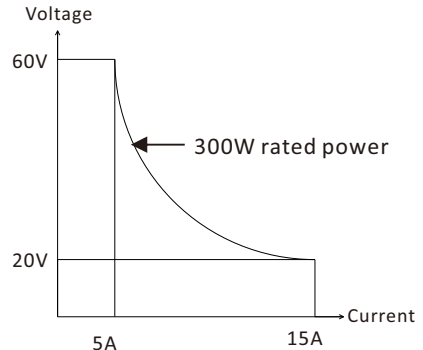
When the power supply is configured so that the total output (current \* voltage output) is less than the rated power output, the power supply functions as a typical constant current, constant voltage power supply.

If however, the power supply is configured such that the total output (current \* voltage output) exceeds the rated power output, the effective output is actually limited to the power limit of the unit. In this case the output current and voltage then depend purely on the load value.

Below is a comparison of the operating areas of each power supply.



KWR102



KWR103

# Specifications

Note: the specifications below are tested under the conditions of temperature  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$  and the warm up for 5 minutes.

Models	KWR102	KWR103
POWER	300W	300W
Voltage	0-30V	0-60V
Current	0-30A	0-15A
<b>Load Regulation</b>		
Voltage	$\leq 0.01\% + 3\text{mv}$	$\leq 0.01\% + 2\text{mv}$
Current	$\leq 0.1\% + 5\text{mA}$	$\leq 0.1\% + 5\text{mA}$
<b>Line Regulation</b>		
Voltage	$\leq 0.01\% + 3\text{mv}$	$\leq 0.01\% + 3\text{mv}$
Current	$\leq 0.1\% + 3\text{mA}$	$\leq 0.1\% + 3\text{mA}$
<b>Setup Resolution</b>		
Voltage	1mV	1mV
Current	1mA	1mA
<b>Read Back Resolution</b>		
Voltage	1mV	1mV
Current	1mA	1mA
<b>Setup Accuracy(<math>25^{\circ}\text{C} \pm 5^{\circ}\text{C}</math>)</b>		
Voltage	$\leq 0.5\% + 3\text{mV}$	$\leq 0.5\% + 5\text{mV}$
Current	$\leq 0.5\% + 5\text{mA}$	$\leq 0.5\% + 3\text{mA}$
<b>Voltage Rise Time</b>		
Rise Time	$\leq 50\text{ms}$	$\leq 65\text{ms}$
Fall time	$\leq 50\text{ms}$	$\leq 50\text{ms}$
<b>Ripple(20-20M)</b>		
Voltage	$\leq 1\text{mVrms} + 0.03\%$ of current output	$\leq 1\text{mVrms} + 0.03\%$ of current output
Current	$\leq 3\text{mArms}$	$\leq 3\text{mArms}$
<b>Temp. Coefficient</b>		
Voltage	$\leq 150\text{ppm}$	$\leq 150\text{ppm}$
Current	$\leq 150\text{ppm}$	$\leq 150\text{ppm}$
<b>Read Back Temp. Coefficient</b>		
Voltage	$\leq 150\text{ppm}$	$\leq 150\text{ppm}$
Current	$\leq 150\text{ppm}$	$\leq 150\text{ppm}$
<b>Accessories</b>		
User manual *1, Power cord*1, USB*1		
<b>Weight and Dimension</b>		
KWR102, KWR103: 91.5mm(W)*175mm(H)*305(D) KWR102x3.9Kg, KWR103x3.9Kg		

Note: Specifications are subject to change without notice.

## Communications

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

- Baud rate: 9600/19200/38400/57600/115200 (the factory baud rate of the power supply: 115200)
- Parity bit: None
- Data bit: 8
- Stop bit: 1
- Data flow control: None

**RS485 communication commands add the address after the command letters. Taking ID equalling 5 for example:**

**ISET05:10.5**

Set the current to 10.5A

**ISET05?**

Query the current setting value of the current

**VSET05:12.5**

Set the voltage to 12.5V

**VSET05?**

Query the current setting value of the voltage

**IOUT05?**

Query the current output value of the current

**VOUT05?**

Query the current output value of the voltage

**BEEP05:**

BEEP:1 turn on the buzzer,BEEP:0 turn off the buzzer

**OUT05:**

OUT:1 turn on the output,OUT:0 turn off the output

**OUT05?**

Returning the output status of the machine, 0 is output OFF while 1 is output ON.

**STATUS05?**

Query the device status BIT0:CC/CV, BIT1:output, BIT2:V/C priority, BIT4:the buzzer, BIT5:LOCK, BIT6:OVP status, BIT7:OCP status.

**\*IDN05?**

Query the serial No. of the device

**RCL05:5**

Recall M5 as the current value (the value is 1 5)

**RCL05:6**

Recall LIST dynamic value

**SAV05:5**

The current value is stored in M5 (the value is 1 5)

**OCP05:12.5**

Set the OCP current value to be 12.5A

**OCP05: ON/OFF**

open/close OCP

**OCP05?**

Query the OCP current value

**OVP05:15.5**

Set the OVP voltage value to be 12.5A

**OVP05: ON/OFF**

open/close OVP

**OVP05?**

Query the OVP voltage value

**VSLOPE05:31.5**

Set the output voltage slope to be 31.5V/100uS

**VSLOPE05?**

Query the output voltage slope

**ISLOPE05:1.5**

Set the slope of the output current to be 1.5A/100uS

**ISLOPE05?**

Query the set output current slope

**LIST0500:25, 6**

Set the times of repetitions of LIST to be 25 and LIST sets 6 dynamic values

**LIST0500?**

Query the times of repetitions of LIST and the number of dynamic values

**LIST0502:25.6, 2.5, 6.5, 5.8**

Set the second dynamic value of LIST: voltage to be 25.6V, current 2.5A, slope 6.5V/100uS and time 5.8s  
Query the voltage, current, slope and time of the second dynamic value of LIST

**LIST0502?**

Query the voltage, current, slope and time of the second dynamic value of LIST

**EXIT05:**

EXIT1: 0 turn off the external trigger, EXIT1:1 turn on the external trigger

**EXIT05?**

Query the status of the external trigger

**COMP05:**

COMP1:0 turn off the external compensation, COMP1:1 turn on the external compensation

**COMP05?**

Query the status of the external compensation

**LOCK05:**

LOCK:0 unlock the buttons, LOCK:1 lock the buttons

**VASTEP05:1, 30, 0.1, 1**

Starting voltage 1V, ending voltage 30V, each step 0.1V and the interval 1s

**VASTOP05**

Voltage stops automatically

**VSTEP05:1**

Set the step voltage 1V

**VUP05**

The step voltage set by the voltage increase

**VDOWN05**

The step voltage set by the voltage decrease

**IATEST05:1, 3, 0.1, 1**

Starting current 1A, ending current 3A, each step 0.1A and interval 1s

**IASTOP05**

Current stops automatically

**ISTEP05:1**

Set the step current 1A

**IUP05**

The step current set by the current increase

**IDOWN05**

The step current set by the current decrease

**PRIORITY05:1**

Set the priority of voltage and current, 0 is voltage priority while 1 is current priority.





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