Digital-Control DC Power Supply

Multiple channel Series User Manual

TENMA® **72-10495 & 72-10500 & 72-10505 User Manual**

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TENMA
Multiple channel Series User Manual

SAFETY SYMBOLS

This chapter contains important safety instructions that you must follow when operating 72-10495,72-10500,72-10505 and when keeping it in storage. Read the following before any operation to insure your safety and to keep the best condition for 72-10495,72-10500,72-10505 .

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℃

FUSE

Model	110V/120V	220V/230V
72-10495	T10A/250V(20x5mm)	T5A/250V(20x5mm)
72-10500	T8A/250V(20x5mm)	T4A/250V(20x5mm)
72-10505	T8A/250V(20x5mm)	T4A/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.

Series Lineup/Main Features

Model	V Meter	A Meter	Resolution
72-10495	4digit	4digit	10mV/1mA
72-10500	4digit	4digit	10mV/1mA
72-10505	4digit	4digit	10mV/1mA

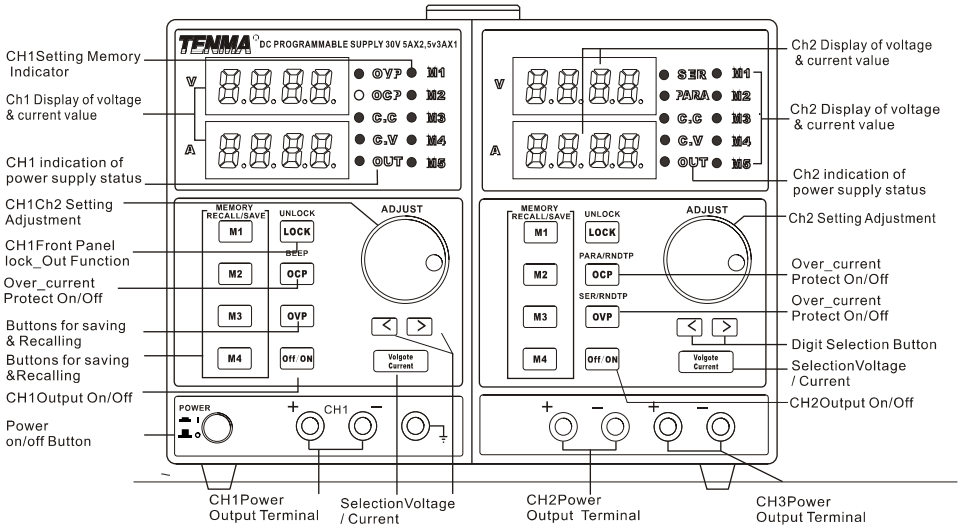
Main Features

Performance
- Low noise: cooling fan controlled by Heatsink temperature;
- Compact size, light weight.

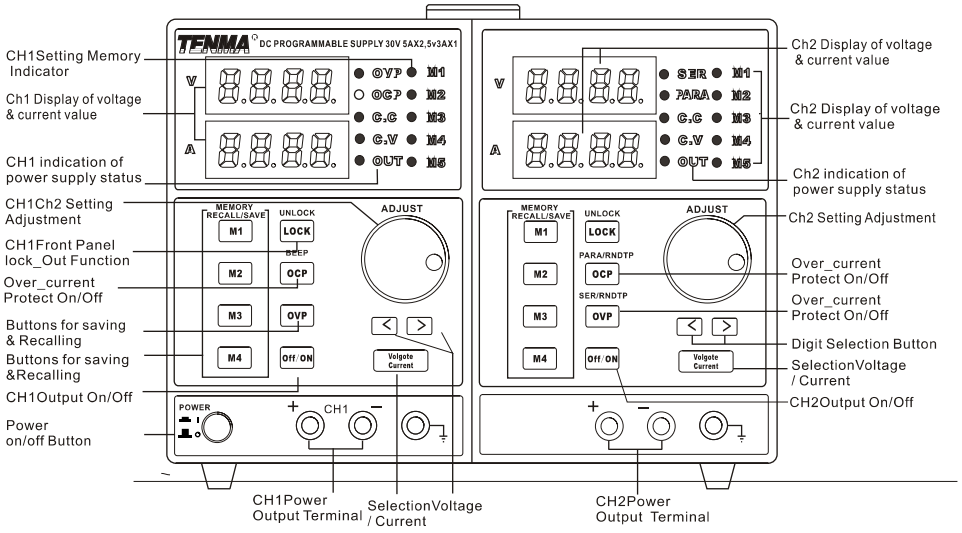
Operation
- Constant voltage / constant current operation
- Output On / Off Control
- Digital panel control
- 4 pairs of panel setup save / recall
- Coarse and fine Voltage / Current control
- Software calibration
- Beep output
- Key lock function

Protection
- Overload protection
- Reverse polarity protection
- Short Circuit Protection

Front Panel Overview



72-10505



72-10495, 72-10500

DISPLAY

Voltage level V

Voltmeter displays the setup value of output voltage .

Current level A

Displays the setup value of output current .

Condition Indication

● OVP

OVP is the indicator of overvoltage protection. When overvoltage function is turned on, ● OVP indicator lights on; when output voltage is higher than protection setup value due to unexpected conditions, output cuts off and OVP indicator flickers; Press the key OVP again, and the power supply recovers.

● OCP

OCP is OCP indicator. When overcurrent function is turned on, ○ OCP indicator lights on,when means OCP modes of CH1 and CH2 both enable

● C.C

C.C is constant current indicator. When power supply is in the mode of constant current, this light is on.

● C.V

C.V is constant voltage indicator. When power supply is in the mode of constant voltage, this light is on,when means OCP modes of CH1 and CH2 both enable.

● OUT

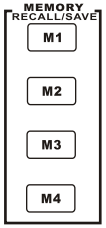
OUT is output indicator. If light on, there is voltage output in the output terminal.

Storage Indication

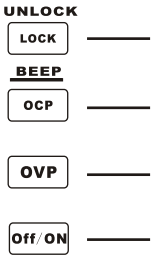
- M1
- M2
- M3
- M4
- M5

Indication of saving and recalling 5 setups stored internally;

Brief Introduction of Panel Operation



Saves or recalls panel settings. For settings, 1 ~ 4 are available. For save / recall details, see Page 13.

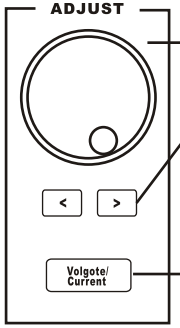


Front panel lock_out function. For details, see Page 11.

Over-Current protect on/off.Pressing this key for more than 2 seconds will make beep On/OFF.

Over-votage Protect On/Off

Output On/Off。



Voltage-Current Setting Adjustment

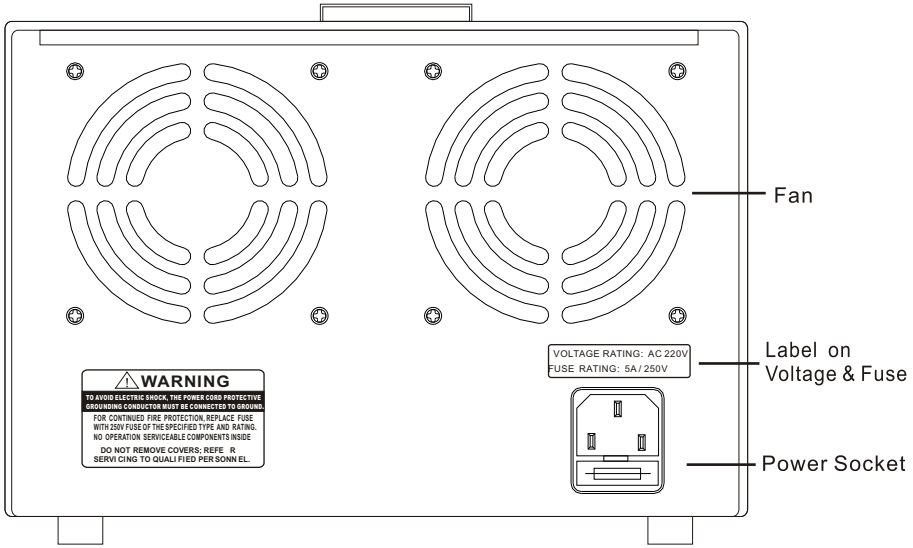
Digit Selector Buttons

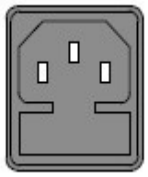
Selection Voltage / Current for Adjustment Pressing the key, the volt indicator starts to flicker; pressing it again, the ampere indicator starts to flicker. Then turn the key ADJUST and the settings of the setted voltage or current can be adjusted.

On / Off main power. For power up sequence, see Page 10.

Outputs voltage and current.

Connects the ground (earth) terminal.



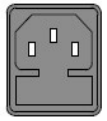


The power cord socket mainly accepts AC values: 115V / 230V, 50 / 60 Hz. Please refer to the fuse parameters on the back fuse label to replace the specified fuse.

Make sure the correct type of fuse is installed before power up

OPERATION

Connect AC power cord



Connecting AC power cord and selecting the corresponding AC voltage according to the back label on voltage; then connecting the AC power cord to the socket on the back panel.

power on

Press the power switch to make power on. The display initializes, showing the model of the machine and then showing the setting level recalled the last time.

power off

Press the power switch again to make power off.

Output On / Off

Panel Operation

Pressing the Output key to turn on output; and the key LED also turns on. Pressing the Output key again to turn off the output and the key LED.

Note: If there are any of the following conditions, the output will automatically turn off.

1. OVP turns on and there are unusual OVP on the output terminal.
2. The setting voltage is more than that of the OVP.
3. Recalling other setups from the memory.

Beep On / Off

Panel Operation

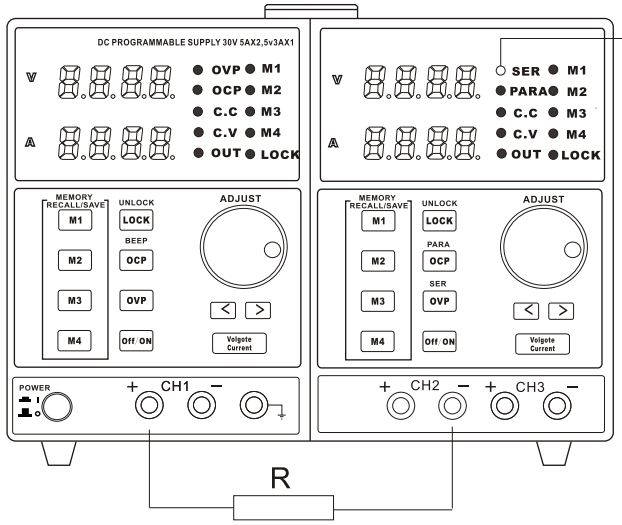
By default, the beep sound is enabled. To turn off the beep, press the OCP(BEEP) key for 2 seconds. A beep comes out and the beep setting will be turned off. To enable the beep, press the OCP(BEEP) key again for 2 seconds.

Operation of Series and Parallel Connections

Series Operation

Press the button SER/INDEP for over 2 seconds to enter series mode and then the indicator SER lights on. In the output of series mode, CH2 is the main control, where operation will be finished while Ch1 will be shielded.
The output of power supply will be automatical series through internal relay. After it is in the mode of series, the voltage drop will output from "CH1 anode" (red connector) and "CH2 cathode" (black connector).
The way of output connection in series mode is as follows:

Series Indication



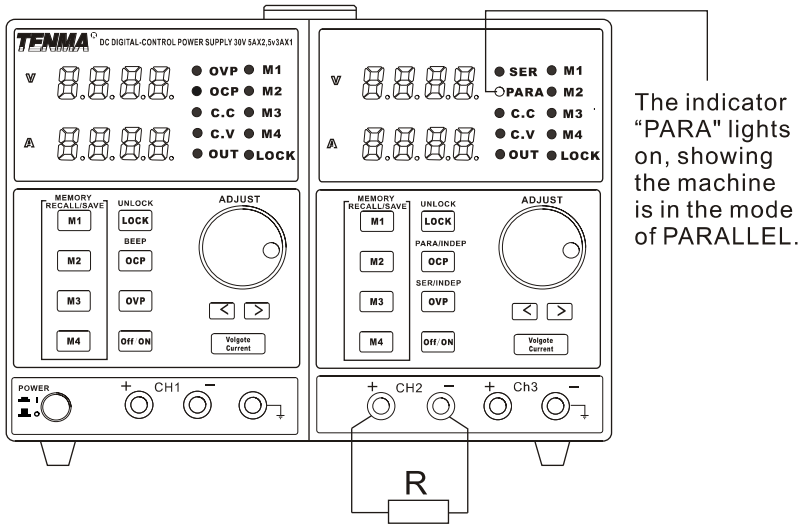
The indicator "SER" lights on, showing the machine is in the mode of SERIES.

Load Connection Figure of Series Mode

Parallel Operation

Press the button PARA/INDEP for over 2 seconds to enter parallel mode and then the indicator PARA lights on. In the output of parallel mode, CH2 is the main control, where operation will be finished while CH1 will be shielded. The output of power supply will be automatical parallel through internal relay. After it is in the mode of parallel, the voltage drop will output from "CH1 anode" (red connector) and "CH2 cathode" (black connector). The way of output connection in parallel mode is as follows:

Parallel Indication



The indicator "PARA" lights on, showing the machine is in the mode of PARALLEL.

Load Connection Figure of Parallel Mode

Note: In the mode of series or parallel, OVP and OCP will be shielded.

Output Set

Panel operation

1. Connecting the load to the front port, CH 1 + / - .
2. Setting output voltage and current.
   Press the key Voltage/Current selection to switch voltage adjustment and current adjustment. Adjusting voltage and current with Voltage / Current Adjustment knob. By default, the Voltage and Current knob work in the coarse mode. To activate the fine mode, press the keys to select the coarse mode or the fine mode.
3. Turning on the output and pressing the output key.
   The key LED turns on and displays CV or CC mode.

SAVE / RECALL SETUP

Save Setup

Background

The front panel settings can be stored into one of the four internal memories.

Contents

The following list shows the setup contents.

- Fine / coarse knob editing mode
- Beep on / off
- Output voltage / current level

The following settings are always saved as "off".

- Output on / off
- Front panel lock on / off

Panel operation

Press one of the 4 buttons(M1,M2,M3,M4) and the LED light turns on accordingly.After you adjust the value,it is saved automatically once it stops blinking.

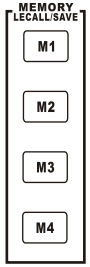
Front Panel Lock

Panel operation

Press the LOCK key to lock the front panel key operation. The key LED turns on. To unlock, press the LOCK key for 2 seconds.

Recall Setup

The front panel settings can be recalled from one of the four internal memories.



Press any button of M1 to M4, and take M1 for example; the memory of panel settings is recalled in M1. After you recall M4, rotate the shuttle knob and then M5 is recalled.

○ M1
● M2
● M3
● M4
● M5

It means the current memory is recalled that the memory indicator on the panel lights on accordingly.

Note When a setting is recalled, the output automatically turns off.

FAQ

Q1: The panel buttons don't work when power on.

A1: The panel is locked. Press the key LOCK/UNLOCK for over 2 seconds, and then the panel will unlock.

Q2: Pressing ON/OFF, there is no output when power on.

A2: Current setup is 0.

Q3: Output voltage rises slowly when output button is on.

A3: Current setup is too small.

Q4: Making OCP on and pressing output switch; and then the output is automatically shut off.

A4: Current protection value setup is too small. You could press output switch and then make OCP on.

Specifications

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

Models	72-10500,72-10505	72-10495
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

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Reaction Time		
Voltage Rise	≤100mS	≤100mS
Voltage Drop	≤100mS (10% Rated load)	≤100mS (10% Rated load)
Load Regulation of Parallel		
Voltage	≤0. 1%+0.5V	
Load Regulation of Series		
Voltage	≤0. 1%+0.1V	
Ch3 Specifications(only for 72-10505)		
Voltage Range	5V	
Current Range	3A	
Voltage Accuracy	±50mV	
Load Regulation	±50mV	
Accessories supplied		
User manual 1 PC,UK power cord 1PC, Euro power cord 1PC		
Weight and Dimensions(mm)		
220(W)*156(H)*260(D), 72-10500x6.5kg,72-10505 x 6.7kg, 72-10495 x 9.1kg		