

TENMA®



Digital Control & Programmable DC Power Supply

**Models: 72-2685, 72-2690, 72-2695, 72-2700
72-2705, 72-2710, 72-2715 & 72-2720**

IMPORTANT SAFETY INFORMATION

When using electrical appliances, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons or property.

Read all instructions before using the appliance and retain for future reference.

- Check that the voltage indicated on the rating plate corresponds with that of the local network before connecting the appliance to the mains power supply.
- Do not operate this appliance with a damaged plug or cord, after a malfunction or after being dropped or damaged in any way.
- Check the product before use for any damage. Should you notice any damage on the cable or casing, do not use.
- This appliance contained no user-serviceable parts. All repairs should only be carried out by a qualified engineer. Improper repairs may place the user at risk of harm.
- This product must be grounded through the earth connection in the mains lead for safe operation and to reduce ripple and noise.
- Do not block or obstruct the cooling vent opening.
- Avoid severe impacts or rough handling that leads to damage.
- Do not discharge static electricity.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children should be supervised to ensure that they do not play with the appliance.
- Always disconnect from the mains when the product is not in use or before cleaning.
- Do not use the appliance for any purpose other than that for which it is designed.
- Do not operate or store in an environment of high humidity or where moisture may enter the product as this can reduce insulation and lead to electric shock.

PRODUCT OVERVIEW

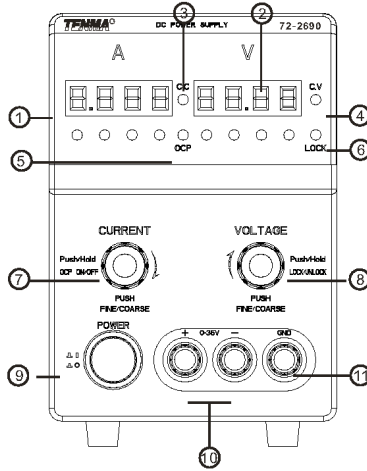
Main Features

- 4-digit display
- Low noise
- Cooling fan controlled by Heatsink temperature
- Constant voltage
- Digital panel control
- Software calibration
- Over Current Protection
- 2 adjusting modes of voltage and current
- Button lock function

WHAT'S INCLUDED

- Power Supply Unit
- Mains power lead
- User Manual
- Remote Control Interface

OVERVIEW



Front panel controls

1. Displays the setup value of the output current.
2. Voltmeter displays the setup value of the output voltage.
3. Constant current mode.
4. Constant voltage mode
5. Over current protection active.
6. Panel LOCK indicator.
7. Adjustment knob for current.
8. Adjustment knob for voltage.
9. Power ON/OFF button.
10. Output terminals.

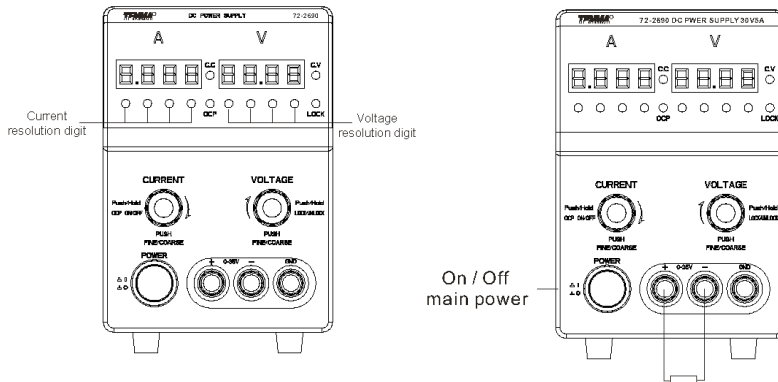
Voltage and Current Adjustment Knob Operation

- There are two adjustment modes for the voltage and current levels - Mode 1 and Mode 2.
Mode 1: before setting, press the controls to adjust the voltage and current levels.
Mode 2: adjust directly, there is no need to press the controls.
- These two modes can be switched between by pressing the voltage adjustment control and the current adjustment control at the same time and holding for two seconds.

OPERATION

Mode 1 (fine adjustment)

- Voltage adjustment control: Push the voltage adjustment control and then one of the voltage indicators will light up, the voltage output can be changed by adjusting the control.
Pushing the voltage control again changes the digit for fine adjustment.
- Current adjustment control: Push the current adjustment control and then one of the current digit indicators will light up, the current output can be changed by adjusting the control.
Pushing the voltage control again changes the digit for fine adjustment.



Mode 2 (coarse adjustment)

- In Mode 2, rotate the adjustment knobs to adjust the voltage and current values. The default resolution of the voltage initial settings is 1V while that of the current is 100mA. The voltage and current adjusting resolution can be changed by pressing the controls.

Lock Function

Press and hold the voltage control for three seconds to lock the front panel and then press again and hold for 3 seconds to unlock.

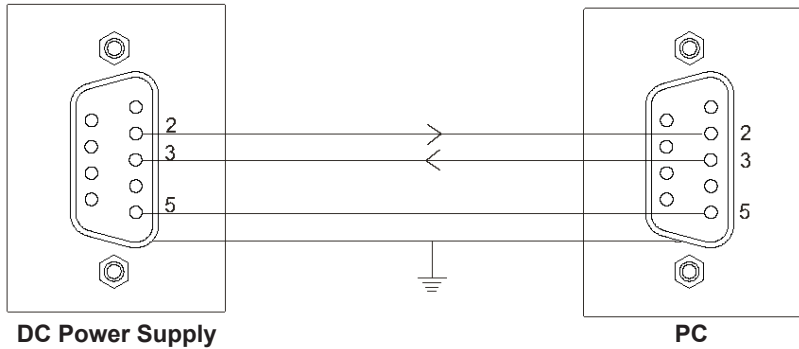
Operation of Over Current Protection

Press and hold the current control for three seconds to start OCP mode, where the output will be cut off when the output current reaches the set power. In the OCP mode, press the control to recover the output.

PC Remote Control

COM setting: Configure the COM port settings on PC according to the following list:

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



RS232 Interface Definition

Functionality check

Run this query command via the terminal application:- *DIN?

This should return the identification information: Manufacturer, model name and software version.

ie:- TENMA 72-2705 Vx.xx

KD 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?

Returns the CH1 output voltage.

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

1,2,3,4,5 N/A

6. Output 0=OFF, 1=ON

7. N/AN/A

9. *IDN?

Description: Returns the 72-2685 identification.

Example: *IDN?

10. RCL<NR1>

Description: Recalls a panel setting.

NR1 - 5: Memory number 1 to 5.

Example: RCL1 recalls the panel setting stored in memory number 1.

11. SAV<NR1>

Description: Stores the panel setting.

NR1 - 5: Memory number 1 to 5

Example: SAV1 stores the panel setting in memory number 1.

12. OCP<NR1>

Description: Over current.

Example: OCP1 OCP OPEN.

SPECIFICATIONS

Models	72-2685/72-2705	72-2960/72-2710	72-2695/72-2715	72-2700/72-2720
Voltage	0-30V	0-30V	0-60V	0-60V
Current	0-3A	0-5A	0-2A	0-3A
Load Regulation				
Voltage	≤0.01%+2mV	≤0.01%+2mV	≤0.01%+2mV	≤0.01%+2mV
Current	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA	≤0.1%+5mA
Line Regulation				
Voltage	≤0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV	≤0.01%+3mV
Current	≤0.1%+3mA	≤0.1%+3mA	≤0.1%+3mA	≤0.1%+3mA
Setup Resolution				
Voltage	10mV	10mV	10mV	10mV
Current	1mA	1mA	1mA	1mA
Setup Accuracy (-5°C to 25°C)				
Voltage	≤0.5%+20mV	≤0.5%+20mV	≤0.5%+30mV	≤0.5%+30mV
Current	≤0.5%+5mA	≤0.5%+10mA	≤0.5%+5mA	≤0.5%+5mA
Ripple (20-20m)				
Voltage	≤1mVrms	≤2mVrms	≤1mVrms	≤1mVrms
Current	≤3mA _{rms}	≤3mA _{rms}	≤3mA _{rms}	≤3mA _{rms}
Temperature Coefficient				
Voltage	≤150ppm	≤150ppm	≤150ppm	≤150ppm
Current	≤150ppm	≤150ppm	≤150ppm	≤150ppm
Read Back Resolution				
	10mV 1mA	10mV 1mA	10mV 1mA	10mV 1mA
Read Back Temperature Coefficient				
	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm	≤150ppm ≤150ppm
Interfaces				
	USB RS232, for models 72-2705, 72-2710, 72-2715 & 72-2720			
Weight & Dimensions				
(WxHxD)	110x156x260mm			
	4kg	4kg	4.8kg	4.8kg

MAINTENANCE

Cleaning

- Use a damp cloth and a small amount of liquid detergent if necessary.
- Never submerge the power supply in liquid or allow any liquid to enter the case.
- Do not use any chemicals, abrasives or solvents that could damage the power supply casing.

Changing the fuse

- Replace the fuse only with one of exactly the same type and rating.
- Disconnect the mains power and unplug the mains lead before replacing the fuse.

Model	110/120V	220/230V
72-2685/72-2705	T4A/250V	T2A/250V
72-2690/72-2710	T5A/250V	T3A/250V
72-2695/72-2715	T5A/250V	T3A/250V
72-2700/72-2720	T5A/250V	T3A/250V



INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT.

When this product has reached the end of its life it must be treated as Waste Electrical & Electronic Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Contact your local authority for details of recycling schemes in your area.



Made in China. PR2 9PP

Man Rev 1.0