PS-3005P Programmable
DC Power Supply
(0-30V, 0-5A)

Part of the PS-3000 Series

User Manual

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SAFETY INSTRUCTIONS

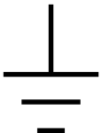
This chapter contains important safety instructions that you must follow when operating the PS-3000 series and when keeping it in storage. Read the following before any operation to ensure your safety and to keep the product in the best condition.

Safety Symbols

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

WARNING

DANGER High Voltage



Earth (Ground) Terminal

Safety Guidelines

- Do not block or obstruct the cooling fan and side vent openings. Provide free space of at least 2.5cm.
- Avoid rough handling to prevent damages.
- Avoid discharging static electricity to output terminals. The ESD safety precautions must be observed during installation and operation.
- To avoid the risk of electric shock do not attempt to open the unit, no serviceable parts inside.
- Use only power cord supplied with the unit or a cord approved for this type of appliance. The protective grounding conductor of the AC power cord must be connected to ground to provide protection against electric shock.

AC Input

- AC Input Voltage: 240V, 50 Hz
- The power cord must be connected to an earthed mains outlet/power point.

Environmental Requirements

Operation

- Location: Indoor only, no direct sunlight and dust-free. Pollution degree 2, normally non-conductive.
- Temperature Rating: 0-40°C

- Relative Humidity (non-condensing): <80%
- Altitude: <2000m above sea level

Storage

- Location: Indoor
- Relative Humidity: <80%
- Temperature: 0-60°C

FUSE

- PS-3005D and PS3005P: T3A/250V
- To avoid fire hazard replace the fuse only with the specified type and rating as per rating label.
- Disconnect the power cord before fuse replacement.
- Make sure the cause of fuse blowout is fixed before fuse replacement.

OVERVIEW

Main Features

Model	V Display	A Display	USB/RS	Resolution
PS-3005D	4 digit	4 digit	NO	10mV/1mA
PS-3005P	4 digit	4 digit	YES	10mV/1mA

Performance

- Low noise, the cooling fan speed is adjusted proportionally to the heatsink temperature.
- Compact size, light weight.

Operation

- Constant Voltage or Constant Current operation.
- Output On/Off control
- Voltage and Current digital display
- Memory function, up to 5 voltage/current settings can be stored.
- Coarse and Fine Voltage/Current adjustments from 0 to 30V and from 0 to 5A.
- Software controlled output setting through RS232 or USB port on P models
- Beep on front panel button pressing (except LOCK button) with On/Off option
- Key lock

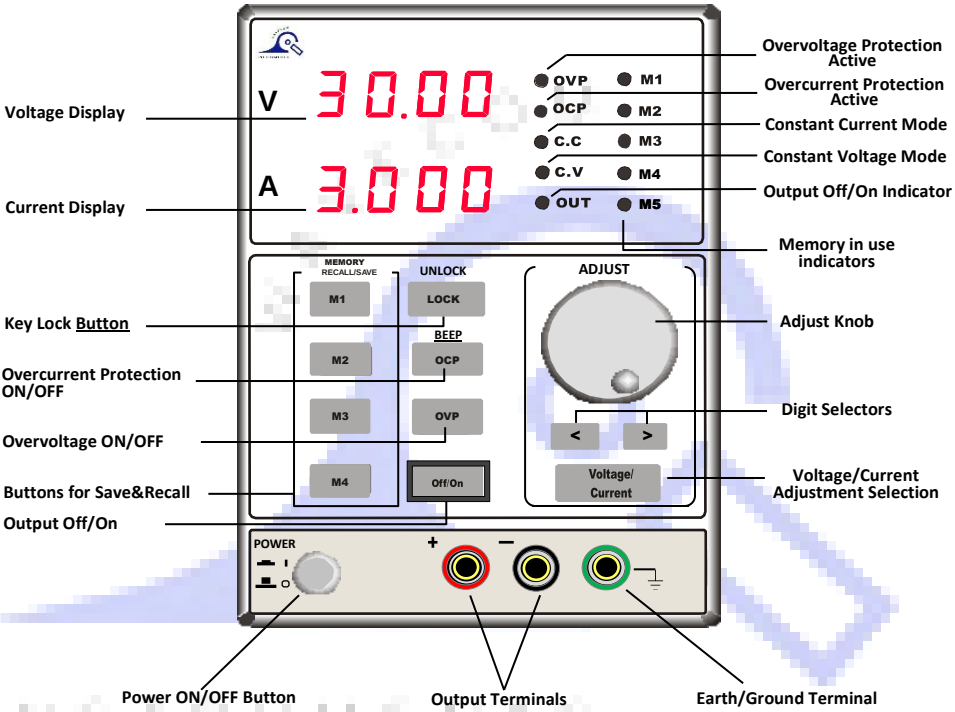
Protection

- Overcurrent (OCP) and output overvoltage protection (OVC).

Interfaces

- USB compatible and RS 232 for remote control via PC, P models only.

Front Panel Overview



The detailed description of function of particular controls, buttons and indicators is presented in the further chapters of this instruction.

Displays

V — Voltage: Displays the set value of the output voltage when output is switched off. It displays the actual output voltage when the output is on

A — Current: Displays the set value of the output current when output is switched off. It displays the actual output current when the output is on.

Status Indicators

OVP — **OVP** indicates the state of the overvoltage protection. When this function is turned on the indicator is illuminated. When the output voltage is higher than the set value due to abnormal conditions the output is switched off and **OVP** indicator flickers. The **OVP** button is to be pressed to recover the supply to its previous state

OCP — **OCP** indicates the state of the overcurrent protection. When this function is turned on the indicator is illuminated.

C.C — **C.C** is the constant current mode indicator. When power supply is in this mode the **C.C** indicator is on.

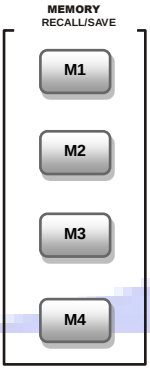
C.V — **C.V** is constant voltage mode indicator. When power supply is in this mode the **C.V** indicator is on.

OUT **OUT** is output state indicator. If it is ON there is voltage/current present between output terminals.

- M1
- M2
- M3
- M4
- M5

Indicate which memory location is being used

Front Panel Buttons and Terminals



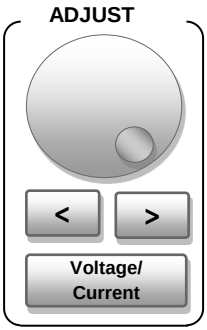
Save or recall front panel settings. Four memory locations are available through buttons **M1-M4**. The fifth is accessible by rotating the **ADJUST** knob clockwise while the **M4** location is being used. For details refer to page 16.

Front panel key lock function. For details refer to page 14.

Dual function button. Single pressure toggles the Overcurrent protection function On/Off. If depressed and held for longer than 2 seconds it toggles the Beep function On/Off.

Switches the Overvoltage protection On/Off

Switches the output Off/On.



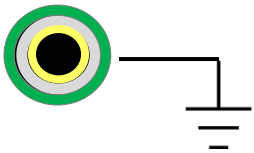
Knob for Voltage/Current adjustment. Rotating clockwise increases the value.

Digit Selection buttons. Pressing the **<** key shifts selection the left, **>** key shifts selection to the right.

Voltage ↔ Current adjustment selection button. Default is Voltage.

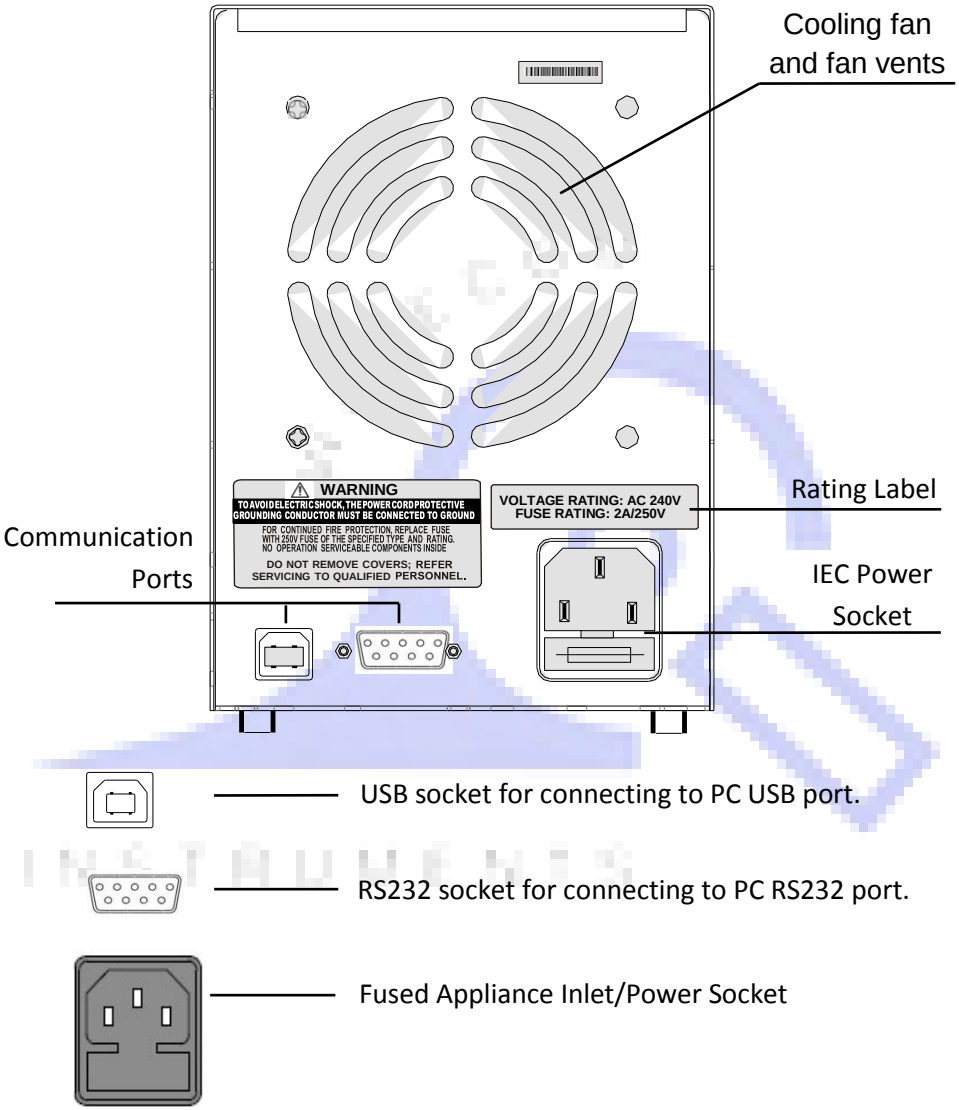
On/Off Power Switch. Power is ON when switch is pressed.

Output Terminals, 4mm banana sockets for 4mm banana plugs. The red terminal is positive (+) terminal and the black one negative (-). None of them is internally connected to mains Earth/Ground.



Ground/Earth Terminal, connected to mains supply earth.

Rear Panel Overview



Before the fuse replacement make sure power cord is disconnected from the power supply. Ensure the correct type of the fuse is used, refer to rating label and 'Fuse' chapter on page 6.

OPERATION

Manual Operation D and P models.

During manual operation the power supply is **NOT connected** to the PC.

Connect AC power cord of a proper type between the IEC socket on the back panel and mains supply outlet rated as per voltage/fuse rating label.

Power up.

- Press the **POWER** button in the front panel to switch the power supply ON.
- The displays initialize showing the settings from the **M1** memory location, the **M1** indicator is on.
- The **OVP**, **OCP**, **C.C**, **C.V** and **OUT** indicators are off. To switch the power supply off press the **POWER** button again.

Note: By default the output is off after power up.

Output On/Off

- Press the **On/Off** button to turn the output ON.
- Now the voltage as set in the memory **M1** is present between **(+)** and **(-)** terminals.
- If a load was connected to the supply the value of the output current is shown on the **A** display. If no load was connected the **A** display shows all zeros. Pressing the **Off/On** button again switches the output off.

Note: The output will automatically switch off if any of the following conditions occur:

1. **OVP** function is activated and the measured output voltage exceeds the set voltage due to external reasons.
2. Any memory **M1-M4** button is pressed or **ADJUST** knob rotated clockwise while **M4** memory location is in use.

Beep On/Off

By default the beep function is enabled. To turn off the beep:

- Press the **OCP (BEEP)** button for at least 2 seconds until a short beep is heard.
- The function is now turned off.
- To activate this function press and hold the same button for at least 2 seconds until a long beep is heard.

The state of this function is one of the parameters stored in the internal memory, common for all locations M1-M5.

Note: Pressing and holding the **OCP** button to disable the beep function toggles the OCP function On/Off as well.

Front Panel/Key Lock

- Press and hold the **LOCK** button for at least 2 seconds.
- A successful locking is confirmed by a long beep.
- All the function buttons and the **ADJUST** knob are then disabled.
- Unlocking is done by pressing the **LOCK** button again for at least two seconds.
- The unlocking is confirmed by a short beep.

Note: Locking is not switching the output off.

Setting Output Parameters

1. Select the memory location for which the settings are to be defined following instructions in Save/Recall Setup section.

2. With output switched off press the **Voltage/Current** selection button to set the output voltage. One of the digits in the **V** display will flash. By default this is the second digit from the left.

3. Adjust the voltage to the required value by rotating the **ADJUST** knob. The precision of adjustment can be changed by selecting digits in the voltage readout with the **<** and **>** buttons. Rotating the knob clockwise increases the value while anticlockwise- decreases.
   - In the constant voltage mode (CV) the set value is the desired output voltage.
   - In the constant current mode (CC) this is the output voltage limit.
   - With over-voltage protection (OVP) ON the output switches off if the voltage exceeds this value.

4. Press the **Voltage/Current** button again to adjust the current. Now

a digit in the **A** display will start flashing. Set the current using the same procedure as for voltage adjustment.

- In the constant voltage mode (CV) the set value is the current limit.
- In the constant current mode (CC) this is the output current.
- With over-current protection (OVP) on the output switches off if the current exceeds this value.

5. Press the memory button again or alternatively wait until the display stops flashing a digit. In case of **M5** just wait for the display to stop flashing. Pressing the **Off/On** button will save the setting as well.

Note 1: Adjustments of the voltage and current values is possible with the output on. In this case the output voltage or current will change on adjustment. However, pressing any of the **M1-M4** buttons will store the final values but the output will be switched off.

Note 2: If the current was set to 0 the output will not switch on upon pressing the **Off/On** button.

Constant Voltage and Constant Current operation.

- When the output current does not exceed the set value the power supply works in the constant voltage mode (C.V) with the output voltage as set and the output current depending on the impedance of the load connected. The **C.V** indicator is ON.
- When the load is causing the output current to exceed the set value the power supply switches into constant current mode (C.C) with the output current as set and the output voltage depending on the impedance of the load connected. The **C.C** indicator is ON.

Note: If the **OCP** function is switched ON the supply does not change to C.C mode but is switching the output off instead.

Save/recall setup

The following settings can be stored in one of fife memories:

- Output voltage and current
- Beep function state, on or off (for M1-M5)

The following settings are not saved. Their default state on power up is off.

- Output on/off
- Key Lock on/off
- **OCP** and **OVP** on/off
- Position of the digit to be adjusted first.

1. To select the memory to be used for save/recall press one of the **M1-M4** buttons. The corresponding **M1-M4** indicator will come on and the parameters stored in this location will be recalled. Their values can be then changed using the procedure outlined above in Setting Output Parameters.

2. To select memory **M5** select the **M4** first by pressing **M4** button then rotate the **ADJUST** knob clockwise. The **M5** indicator will come on. The parameters stored in this location will be recalled and their adjustment possible.

Note: Recalling values from any memory location switches the output off.

Remote Control

The model with suffix P can be controlled via PC through USB or RS232 interface. The USB and RS 232 ports are located on the back of the supply. For RS232 control the setting of the appropriate COM port is as follows:

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

1. Connect the RS232 or USB ports on the power supply to PC using RS232 or USB cable. (RS232 cable not provided).
2. Switch the power supply on. It will automatically establish connection - if successful a beep will be audible. Use the pre-installed PC software to set the power supply parameters.

Note: When the connection with PC is established the front panel is locked, button functions are not accessible and the power supply is controlled from PC only.

3. To exit from the Remote Control mode close the remote control application and disconnect the USB/RS 232 cable from the port on the power supply. The power supply will disconnect and a beep will confirm a successful disconnection. Then it switches itself into manual mode and unlocks the front panel.

Functionality check.

Run this query command via the PC terminal application such as MTTTY (Multi-threaded TTY):

*Idn

This should return the identification information like:
manufacturer and model name, serial number, version number in format:
PS3005, SN: XXXXXXXX, V.XX

Remote control PC application.

For details on installation and operation of the PC software refer to the used guide included with the software (for P model only).

FAQ

Q1: The panel buttons don't work after power on but the **V** and **A** displays are ON.

A1: The front panel is locked. Press and hold the **LOCK** button for at least 2 seconds, until a short beep is heard.

Q2: No output after pressing **Off/On** button with supply powered on and displays working.

A2: Current is set to 0.

Q3: Output voltage rises slowly after pressing the Off/On button

A3: No load connected or the set current is too small.

Q4: Output switches automatically off after pressing Off/On button with OCP function activated.

A4: OCP value is set too low for particular load connected. Adjust the OCP current and then press Off/On button.

SPECIFICATION

Note: The specifications below are valid under test temperature of 25°C±5°C and after power supply warm-up for at least 20 minutes.

Model	PS-3005D/P
Voltage Range	0-30V
Current Range	0-5A
Load Regulation	
Voltage	≤ 0.01%+2mV
Current	≤ 0.1%+10mA
Line Regulation	
Voltage	≤ 0.01%+3mV
Current	≤ 0.1%+3mA
Setup Resolution	
Voltage	10mV
Current	1mA
Setup Accuracy (25℃+-5℃)	
Voltage	≤ 0.5%+20mV
Current	≤ 0.5%+10mA
Ripple(20Hz-20MHz)	
Voltage	≤2mV rms
Current	≤3mA rms
Temp. Coefficient	
Voltage	≤100ppm+10mV
Current	≤100ppm+5mA

Read Back Accuracy	
Voltage	10mV
Current	1mA
Read Back Temp. Coefficient	
Voltage	≤100ppm+10mV
Current	≤100ppm+5mA

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