



# PS-3005/3010D-3CH Digital Control

**Dual DC Power Supplies  
With Extra Fixed Voltage Output**  
(2X 0-30V: 0-5A/0-10A, 1X 5V: 3A)

## User Manual



**Revision 2013-01**

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## **SAFETY INSTRUCTIONS**

This chapter contains important safety instructions that you must follow when operating the PS-3005D-3CH or PS-3010D-3CH and when keeping them in storage. Read the following before any operation to ensure your safety and to keep the product in the best condition.

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### **Safety Symbols**

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



**WARNING, Important safety information.**



**Caution! Hot Surface. Avoid contact.**



**DANGER High Voltage**



**Earth (Ground) Terminal.**



**Conforms to European Union directives.**

## **Safety Guidelines**

- Do not block or obstruct the top and side vent openings. Do not block or obstruct fan vents on PS-3010 and provide appropriate air space around heat-sinks on PS-3005. A free space of at least 2.5cm is recommended in all instances.
- 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.
- In case of extensive usage the heat-sinks on PS-3005 may become hot. Caution must be observed in handling and placing of the appliance.
- The voltage as set on the master and slave controls is immediately present between the output terminals after powering up the appliance. Do not connect loads to the terminals before adjusting the output parameters to desired levels.

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## **AC Input**



- AC Input Voltage Range: 207V-253V, 50 Hz
- The power cord must be connected to an earthed mains outlet/power point.

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## **Environmental Requirements**

- 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%

## **FUSE**



- PS-3005D-3CH: T4A L 250V  $\Phi$ 5X20
- PS-3010D-3CH: T8A L 250V  $\Phi$ 5X20
- 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.
- The fuse is located in the drawer in the power input socket (appliance inlet).

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## **OVERVIEW**

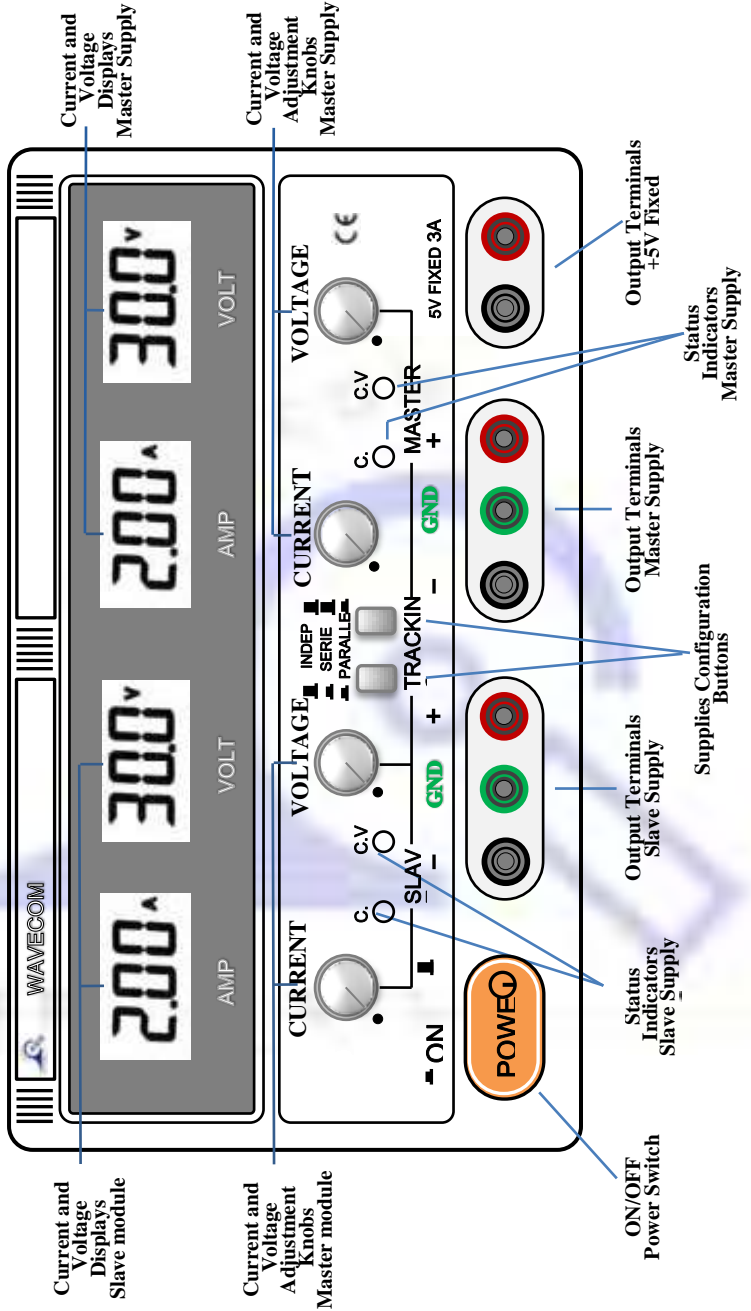
### **Main Features**

Model	V Display	A Display	USB/RS	Resolution
PS-3005D	3 digit	3 digit	NO	100mV/10mA
PS-3010D	3 digit	3 digit	NO	100mV/10mA

- Dual Supply with an extra fixed 5V/3A output.
- Constant Voltage or Constant Current operation.
- Voltage and Current digital display.
- Possibility of serial or parallel configuration of Master and Slave supplies.
- Voltage/Current adjustments from 0 to 30V and from 0 to 5A (3005 model) or 10A (3010 model).
- Overcurrent protection on Master and Slave supplies.

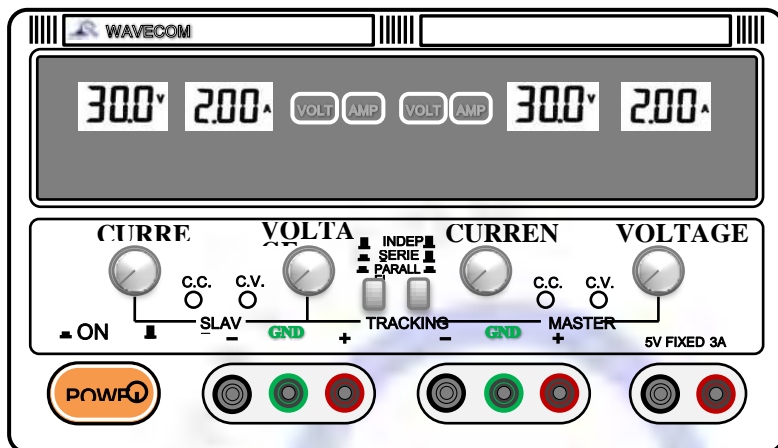
# Front Panel Overview

PS-3010D-3CH MODEL SHOWN



### PS-3005D-3CH model.

The front panel of this model differs only by the digital display layout. The control panel is the same. See the drawing below.



## Displays

**VOLT** Voltage: Displays the set value of the output voltage in the CV (Constant Voltage) mode or actual voltage in CC (Constant Current) mode.

**AMP** Current: Displays the set value of the output current in the CC mode or the actual output current in CV mode.

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## Status Indicators

**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.

## Front Panel Buttons and Terminals

■ INDEP ■  
■ SERIE ■  
■ PARALLE ■



TRACKI

Tracking buttons are used for setting the Master and Slave supplies into one of three possible configurations. The right-hand side button is associated with Master and the left-hand side button with Slave supply. ■ indicates that the button is NOT pressed. ■ indicates that the button is pressed. For further explanations on configuration of supplies see chapter



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



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



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.

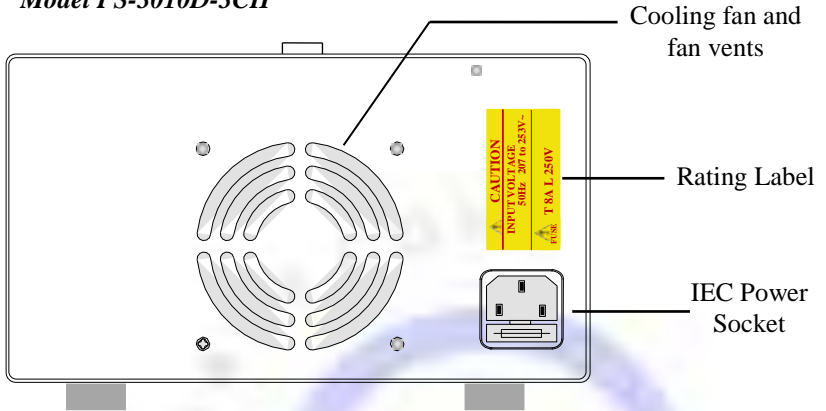


Ground/Earth Terminal, connected to mains supply earth.

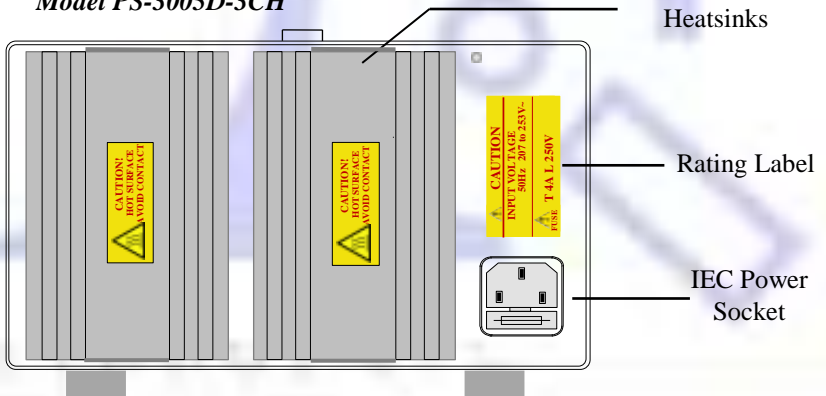


## Rear Panel Overview

*Model PS-3010D-3CH*



*Model PS-3005D-3CH*



**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.**

## OPERATION

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.

### Constant voltage mode, independent supplies.

- Check the positions of the **TRACKING** buttons. Set them both to NOT pressed position as shown on page 8 for INDEP configuration.
- Before switching the power ON set the **CURRENT** adjustment knobs fully clockwise to maximum current position.
- Turn the **VOLTAGE** adjustment knobs fully counter-clockwise to minimum voltage position.
- With no load connected to any output press the **POWER** button in the front panel to switch the power supply ON.
- The **VOLT** displays initialize showing the voltage values close to 0. The current **AMP** displays should also indicate 0 current as no load is connected. The **C.V** status indicators will be illuminated. Note that if the supply is switched on with knobs in different positions than advised above the voltage may be, depending on the knobs position, immediately present between the (+) and (-) terminals of the outputs. There is always +5VDC present on the **FIXED** output.
- Adjust the **VOLTAGE** knobs to desired values for **SLAVE** and/or **MASTER** supply respectively. The **AMP** digital displays will show 0 or near 0 as no load is still connected.
- Connect load to chosen supply, the value of the corresponding output current is now shown on the **AMP** display.

**Note:** In the configuration as above if the output/load current exceeds the specified maximum current for particular model the power supply in use will switch to **C.C** mode.

***Setting the overcurrent protection, Constant Voltage Mode.***

- In configuration as for C.V switch the supply ON using **POWER** button.
- Turn the **CURRENT** knobs first fully counter-clockwise to minimum current position then a bit clockwise so the **C.C** indicator is not illuminated but **C.V** indicator is ON.
- Adjust the **VOLTAGE** knobs on MASTER and SLAVE supplies to voltage level of approx. 1.5V.
- On MASTER and SLAVE outputs short (+) terminals with (-) terminals correspondingly using a piece of short wire at least 10A rated.
- Adjust the **CURRENT** knobs clockwise to set the overcurrent protection level to desired value. This value is displayed on the **AMP** displays. The set values can be different for MASTER and SLAVE supplies as they are working independently in this configuration of **TRACKING** buttons. The **C.C** indicator is on during the setting.
- Remove the wire link(s) and connect the load to the output terminals.
- The supplies work now back in C.V mode but when the output current exceeds the set overcurrent protection value the protection is activated and the supply changes to C.C mode with the output current equal to the set protection current.

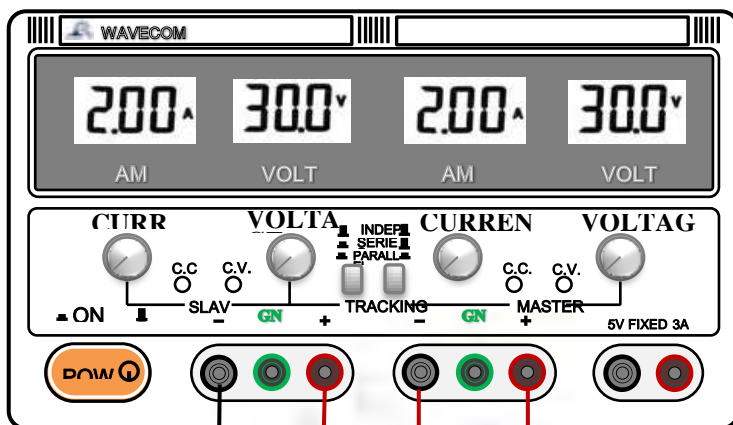
Note: If during normal operation in the C.V mode the **CURRENT** knob for supply for which the protection current was set is turned then the set protection current value will change.

### **Constant current mode, independent supplies.**

- Check the positions of the **TRACKING** buttons. Set them both to not pressed position as shown on page 8 for INDEP configuration.
- Before switching the power ON set the **CURRENT** adjustment knobs fully counter-clockwise to minimum current position.
- Turn the **VOLTAGE** adjustment knobs fully clockwise to maximum voltage position.
- With no load connected to any output press the **POWER** button in the front panel to switch the power supply ON.
- The VOLT displays initialize showing random values possibly close to maximum rated output voltage. The AMP current displays should indicate 0 current as no load is connected. There is always +5VDC present on the FIXED output.
- Connect load to chosen supply, the value of the corresponding output current, if any, is now shown on the **AMP** display. This value will be normally close to zero.
- Adjust the **CURRENT** knobs to desired values for SLAVE and/or MASTER supply respectively. The **AMP** digital displays will show the set current. This is also the current that is supplied to the load. The **C.C** status indicator will illuminate.
- The **VOLT** displays will show the value of the voltage that is now present on the load connected. This value will depend on the load.

### **Serial Configuration of Supplies.**

With the appliance powered down connect the MASTER and SLAVE supplies as shown in the drawing below.



The positive terminal (+) of SLAVE supply must be connected to negative terminal (-) of MASTER supply with a wire at least 10A rated

■ **SERIE** ■

Ensure the TRACKING buttons are set as shown for SERIES configuration. The button for SLAVE supply is pressed while the one for MASTER is NOT.

**Constant Voltage mode without Overcurrent Protection.**

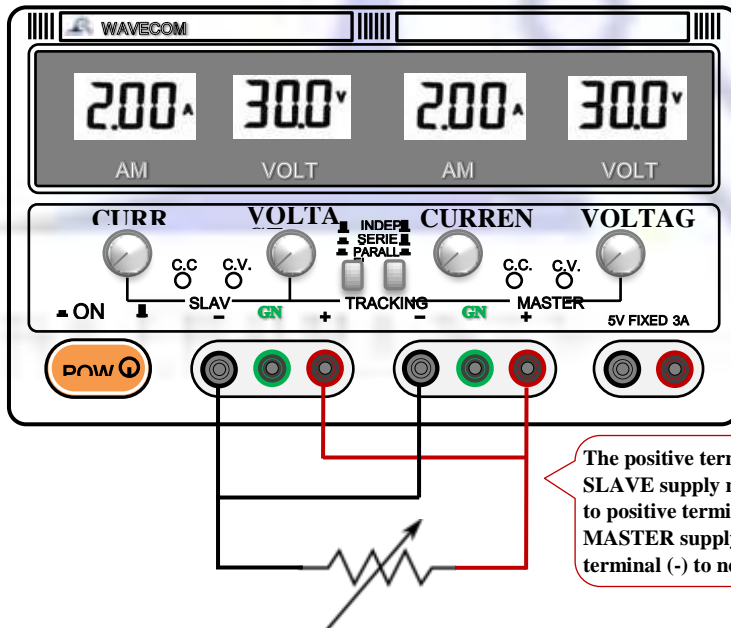
- Turn the **CURRENT** knob for SLAVE supply fully clockwise to maximum current position.
- Press the **POWER** button to start the supply like before.
- Set the **VOLTAGE** and **CURRENT** knobs of the **MASTER** supply to the desired positions.
- In this mode the output voltage and output current of SLAVE supply will follow the voltage and current as set on the MASTER supply.
- The effective output voltage that is supplied to the load will be twice the voltage set on MASTER supply.
- In this mode the **VOLTAGE** knob of **SLAVE** supply is disabled.

### Constant Voltage mode with Overcurrent Protection.

- Turn the **CURRENT** knob for **SLAVE** supply fully clockwise but NOT to maximum current position.
- Press the **POWER** button to start the supply like before.
- Set the **VOLTAGE** and **CURRENT** knobs of the **MASTER** supply to the desired positions.
- In this mode the operation of supplies is the same as before but when the load current reaches the current set on the SLAVE supply the C.C indicator of SLAVE supply will be illuminated. In this case the output voltage of the SLAVE supply will NOT follow the setting from the MASTER supply.
- The effective output voltage that is supplied to the load will be sum of the output voltages from both supplies.
- In this mode the **VOLTAGE** knob of **SLAVE** supply is disabled

### Parallel Configuration of Supplies.

With the appliance powered down connect the MASTER and SLAVE supplies as shown in the drawing below.



## ■ PARALL ■

Ensure the TRACKING buttons are set as shown for PARALLEL configuration. The buttons for both SLAVE and MASTER supplies are pressed.

- In parallel configuration both **CURRENT** and **VOLTAGE** knobs of the **SLAVE** supply are disabled.
- Press the **POWER** button to start the supply like before.
- Set the **VOLTAGE** and **CURRENT** knobs of the **MASTER** supply to the desired positions.
- In this mode the output voltage and output current of **SLAVE** supply will follow the voltage and current as set on the **MASTER** supply.
- The maximum output current that can be supplied to the load will be twice the current set on **MASTER** supply.



## **SPECIFICATION**

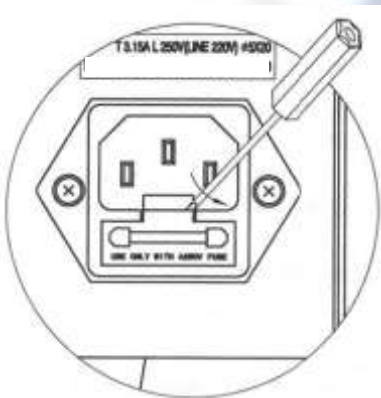
Note: The specifications below are valid under test temperature of  $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$  and after power supply warm-up for at least 15 minutes. Values given are for both adjustable outputs.

Model	PS-3005D-3	PS-3010D-3
Voltage Range	0-30V	0-30V
Current Range	0-5A	0-10A
Fixed Output	$5\text{V}\pm 2.5\%$ , 3A	$5\text{V}\pm 2.5\%$ , 3A
<b>Load Regulation</b>		
Voltage ( $I\leq 3\text{A}$ )	$\leq 0.01\%+2\text{mV}$	$\leq 0.01\%+2\text{mV}$
Voltage ( $I>3\text{A}$ )	$\leq 0.01\%+5\text{mV}$	$\leq 0.01\%+5\text{mV}$
Current ( $I\leq 3\text{A}$ )	$\leq 0.2\%+3\text{mA}$	$\leq 0.2\%+3\text{mA}$
Current ( $I>3\text{A}$ )	$\leq 0.2\%+5\text{mA}$	$\leq 0.2\%+5\text{mA}$
Fixed Output	$\leq 0.1\%$	$\leq 0.1\%$
<b>Line Regulation</b>		
Voltage	$\leq 0.01\%+2\text{mV}$	$\leq 0.01\%+2\text{mV}$
Current	$\leq 0.2\%+2\text{mA}$	$\leq 0.2\%+2\text{mA}$
Fixed Output	$\leq 0.01\%+1\text{mV}$	$\leq 0.01\%+1\text{mV}$
<b>Setup Resolution</b>		
Voltage	100mV	100mV
Current	10mA	10mA
<b>Setup Accuracy ( <math>25^{\circ}\text{C}\pm 5^{\circ}\text{C}</math> )</b>		
Voltage	$\leq 1\%+2$ digits	$\leq 1\%+2$ digits
Current	$\leq 2\%+2$ digits	$\leq 2\%+2$ digits



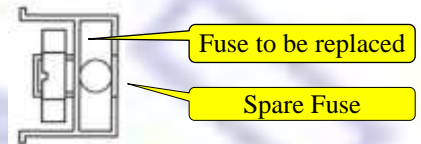
Ripple&Noise		
Voltage ( $I \leq 3A$ )	$\leq 0.5mV$ r.m.s	$\leq 0.5mV$ r.m.s
Voltage ( $I > 3A$ )	$\leq 1.0mV$ r.m.s	$\leq 1.0mV$ r.m.s
Current ( $I \leq 3A$ )	$\leq 3.0mA$ r.m.s	$\leq 3.0mA$ r.m.s
Current ( $I > 3A$ )	$\leq 6.0mA$ r.m.s	$\leq 6.0mA$ r.m.s
Fixed Output	$\leq 0.5mV$ r.m.s	$\leq 0.5mV$ r.m.s
Read Back Accuracy		
Voltage	100mV	100mV
Current	10mA	10mA

## Fuse Replacement



Rating Label show for illustration purposes only!!

- Disconnect the power cord from the power socket.
- Using appropriate screwdriver or similar tool open the fuse drawer and remove it from the socket.



- Remove the blown fuse from the holder and insert the new one.
- Before applying power and reconnecting the supply make sure that the reason for blowing the fuse was found and rectified.



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