NSP -2050/3630/6016 SWITCHING MODE POWER SUPPLY

USER MANUAL

Keep this manual in a safe place for quick reference at all times.

This manual contains important safety and operation instructions for correct use of the power supply. Read through the manual and pay special attention to the markings and labels of this unit and equipment to be connected.

Pay special attention to these two types of notices used in this manual

WARNING :
Failure to observe this warning may cause injury to persons and damage to power supply or connected equipment.

CAUTION :
Failure to observe this warning may result in damage to equipment and Improper functioning of the power supply.

WARNING :

1. Do not use this power supply near water.
2. Do not operate or touch this power supply with wet hands.
3. Do not open the casing of the power supply when it is connected to ac mains.
4. Refer all servicing to qualified service personnel only.
5. Before replacing the AC fuse at AC socket, find out and clear up the cause first.
6. Replace the AC fuse with the same type and rating as the original fuse.
7. The max. output voltage of Model NSP-6016 is 60VDC, avoid touch the metal contact part of the output terminals.

CAUTION:

1. Use a grounded 3 pin AC source.
2. This unit is for indoor use only.
3. Do not operate or place this unit in a humid, dusty, in direct sunlight location or near any heat source.
4. Before plugging into local AC mains, check with the rating label at the back of the unit.
5. Do not block any ventilation openings of the unit.
6. This unit must be used within the specified rating, regular excessive continuous loading may cause damage to the power supply.
7. The gauge size of input power cable must be at least 0.75mm^2 and the total length of power cable must not exceed 3m.

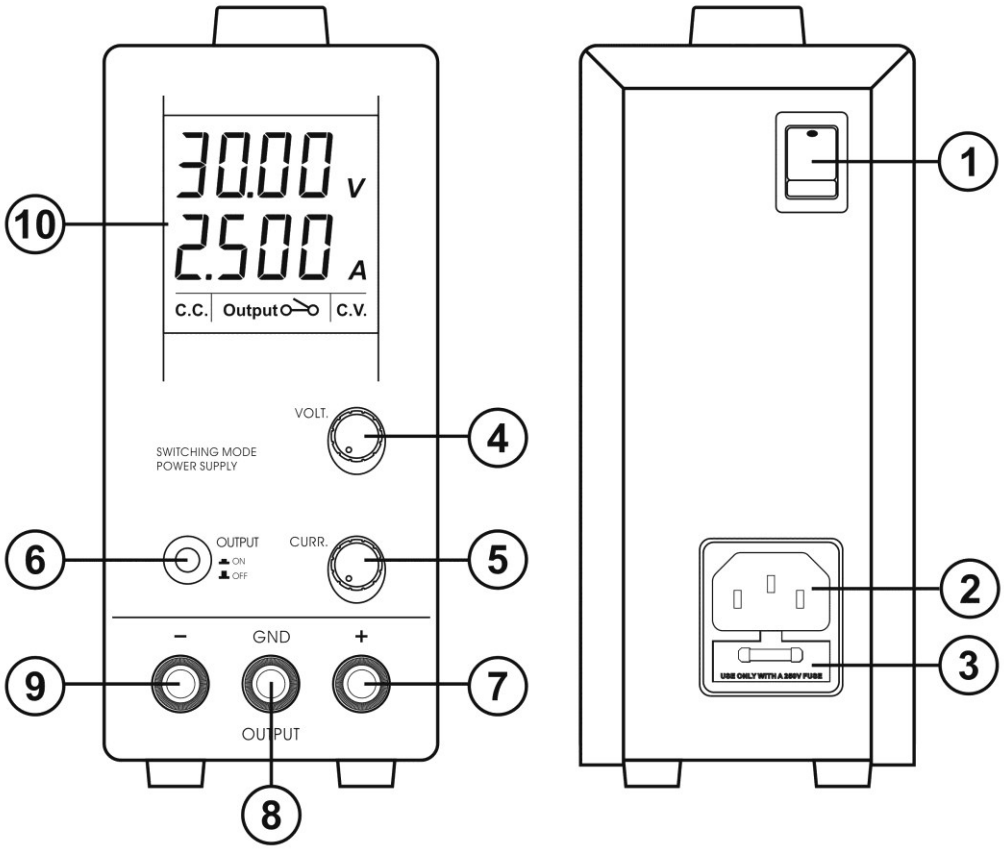
OPERATION ENVIRONMENTAL CONDITION

- 10-80% R.H.
- Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- Altitude up to 2000m
- Installation category: CAT 2
- Pollution degree: 2
- Mains supply voltage fluctuation up to ±10% of the normal voltage

INTRODUCTIONS

This series of 100W Switching Mode Power Supplies with Current Limiting Control is designed with the objectives of high accuracy, compactness and easy portability. Rotary encoder tuning with MCU are used for voltage and current control. 4 digit display LCD of voltage and current for high precision.

CONTROLS AND INDICATORS



① Power Switch:
Turns the power supply on–off, when it is on the front display lights up.
② AC Input Socket with Fuse
③ Concealed Fuse box (ply open the cover to get to the fuse)
④ Output Voltage Tuning knob. (Quick push the knob to toggle the coarse and fine tuning)
⑤ Output Current Tuning knob. (Quick push the knob to toggle the coarse and fine tuning)
⑥ Output On/Off push button
⑦ Output Terminal Positive (+) Red color.
⑧ GND Terminal (⏚) Green color
Chassis ground terminal, normally this is to be short to (+) or (-) as required by user.
⑨ Output Terminal Negative (-) Black color.
⑩ LCD Display panel showing:
4 digit voltage, current meter, (CV) constant voltage mode, (CC) constant current mode,
Output Terminal on/off state Output

OPERATIONS

Ground Connection

Depending on the application, the power supply output terminals can be grounded in any one of the following grounding conditions :

Negative ground – black (-) negative terminal is shorted with green GND terminal.
Positive ground – red (+) positive terminal is shorted with green GND terminal.
Floating ground – green terminal is not shorted with any of the output terminals.

Remarks:

When operating this power supply as a floating ground, high impedance leakage can exist between the power supply circuitry and the chassis ground.

Basic Mode of Operation

This power supply is designed to operate as a constant voltage source or as a constant current source. Automatic crossover to either mode of operation occurs when the load condition changes as following:

Constant Voltage (CV), Automatic crossover & Constant Current (CC)

The power supply functions as a constant voltage source (CV) as long as the load current is less than the preset current limiting value. When the load current is equal to or greater than the preset current limiting value, the power supply will automatically cross over to the constant current mode, voltage will drop, (CC) will show on the LCD display panel and it will operate as a constant current source.
When the load current drops below the preset current limiting value, the supply returns to constant voltage (CV) mode.

Set the Output Voltage and Presetting Current Limiting Value (CC)

Turning the voltage or current knob to set your desired values.
Quick pushes on the knobs will move the decimal place for fast tuning.
Turn the knob when the desired number column is flashing otherwise you need to repeat quick pushes again.

One quick push on the current knob to see the preset current limiting value.

Precaution

Always use quick pushes to the voltage or current knob.
Do not push any of the knobs more than 3 seconds

Connection and Operation Procedure

1. After checking with the rating label plug in to AC mains.
2. Switch on the power supply and the LCD display should be on at the same time.
3. The (CV) icon should be shown on the display.
4. Turn to current volume knob ⑤ to maximum clockwise if you do not require lower Current limiting value, otherwise do the preset the (CC) limiting procedure.
5. Set your desired output voltage and then turn off the output terminal by push button ⑥.
6. Connect to your load positive to positive and negative to negative.
7. Turn on the output terminal again and check if display shows (CV).
8. If display shows (CC), either your preset current limiting value is too low or your load requires more voltage and current. You need to re-access the voltage and current requirement of your load and increase the voltage or current accordingly until (CV) appears.

Tracking Output Over Voltage Protection (OVP)

This is to protect the connected load in the event that the output voltage control circuit mal-functions, the maximum output voltage will not exceed 30% of the adjusted voltage value at the time of the operation.

Over Temperature Protection

When the temperature inside the power supply becomes higher than a pre-determined value, the output voltage and current of the power supply will automatically decrease to zero to prevent damage to power supply. When the temperature inside the power supply returns to about 65°C then the power supply will automatically return to operation again.

SPECIFICATIONS

	NSP - 2050	**NSP-3630**	**NSP-6016**
Input Voltage (Jumper Selection)	90 - 130 / 180 - 264Vac, 50 / 60Hz~		
Full Load Input Current at 230Vac	0.83A		
Output Voltage Adjustable Range	1.0 - 20Vdc	1.0 – 36Vdc	1.0 - 60Vdc
Output Current Adjustable Range	0.25 - 5A	0.25 - 3A	0.25 - 1.6A
Voltage Regulation			
Load from 10% to 100% Variation	120mV	50mV	50mV
Line from 180 to 264Vac Variation	20mV		
Ripple & Noise in r.m.s.	5mV		8mV
Ripple & Noise (peak to peak)	30mV	50mV	100mV
Current Regulation			
Load from 10% to 100% Variation	20mA		
Line from 180 to 264Vac Variation	20mA		
Ripple & Noise (peak to peak)	70mA	20mA	20mA
Switching Operation Frequency	80KHz to 120KHz		
Power Factor	0.65		
Efficiency at Maximum Power	84%	83%	81%
Volt and Amp Control Type	Rotary Encoder		
Voltmeter and Ammeter Display	4 Digit		
Voltmeter Accuracy	±0.5% +5counts for range V≤5V	±0.5% +5counts for range V≤10V	±0.5% +5counts for range V≤20V
	±0.5% +3counts for range V>5V	±0.5% +3counts for range V>10V	±0.5% +3counts for range V>20V
Ammeter Accuracy	±0.5% +5counts for range I≤2A	±0.5% +5counts for range I≤1A	±0.5% +5counts for range I≤0.5A
	±0.5% +3counts for range I>2A	±0.5% +3counts for range I>1A	±0.5% +3counts for range I>0.5A
LCD Indication	CC, CV, Amp, Volt, Output ON-OFF		
Protection	Short Circuit, Overload, Over Temperature, Tracking OVP		
CE Approvals	LVD : EN 61010 , EMC : EN 55011		
Cooling System	Natural Convection		
Dimensions in mm (WxHxD)	70 x 150 x 250mm / 2.8 x 6.0 x 9.8in.		
Weight in Kg	2Kgs / 4.4Lbs		
Remarks	All the data are based on 230V 50Hz~		

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