

## Exercise Bike Powered Light Bulb Interactive Educational Display Owner's Manual

<http://Pedal Power Generator.com>

MODEL: SPG-300-LBD-75 Educational Display

- Interactive STEM light bulb display
- Compares power consumed by LED / CFL / Incandescent
- Permanent Magnet DC Generator
- Power meter shows Volts, Amps, Watts
- Gives an educational experience on energy



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## Introduction

This educational / interactive human powered light display is extremely effective at teaching people about energy. More specifically it actually allows people to associate a physical level of exertion to a numeric value of “Watts” as related to different light bulbs. Participants are encouraged to get on a bike generator to try and power up an LED bulb, a CFL bulb, and an incandescent bulb. The big surprise that most people experience is seeing the huge difference between the bulbs.

The components of this interactive light bulb display are shown below.



This is a DC powered system with Voltage conditioning modules. The light bulbs look like regular light bulbs but they are actually 12V bulbs available on Amazon.com.

The SPG-300 generator is constructed with industrial grade heavy duty components. It is made sturdy to last a very long time. The estimated number of usable hours is over 50,000 hours.

Details on the recommended bulbs to install in this education display are shown below. Note: The total power of all three bulbs turned on at once should not exceed 75 Watts as the display could be damaged or will not work as designed.

### Recommended Bulb Configuration

- 1) 12V LED bulb consuming about 7 Watts
- 2) 12V CFL bulb (AKA compact fluorescent) consuming about 15 Watts
- 3) 12V Incandescent bulb consuming 25 Watts if small children are participating, install a 50 Watt bulb if teenagers and adults are participating.

Note: It does not matter what order these bulbs are put in.

Model: HPG-LBD-75



## Unpacking & Assembly

The exercise bike will need to be unpacked from its shipping container box and can be assembled in four steps.

1. The front support bar (2 bolts)
2. The rear support bar (2 bolts)
3. The seat post
4. The Handle bar post

Instructions in the box will give more details on how to assemble this bike.





The light box and generator box will need to be unpackaged from their shipping container box.

## Installing generator box onto the exercise bike.

The video instructions on how to install the generator box is shown in this video:  
<https://youtu.be/yopx86cDImw>



## Installing the power cable into the lightbox

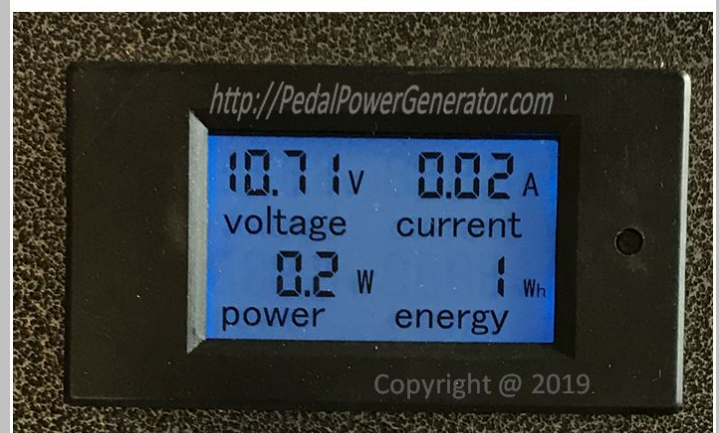
Connect the other end of the cable into the LED / Incandescent light box



## Verify Your Generator is Working

With the light switches turned off turn bike generator cranks of the human powered generator and verify that the power meter lights up on the front of the light box. In this case one can see that the generator is putting out 10.71 Volt. The current is the second number measured in “Amps” which will always be close to zero when the light switches are left off.

Now turn on an LED bulb and generate power from the human powered generator. At this point the light will turn on once you read a Voltage level of 13 Volts or so. The current will then show a value greater than zero. The power will be around 7 Watts depending on what type of LED bulb is being used.



**If a person goes extremely fast and generates a Voltage in the 50 Volt range there is no reason to be concerned. The light box has built in over voltage protection to handle this high voltage.**

## Recommended spare parts

The following items are recommended spare parts for the system:

- Generator Roller – estimated life 10,000 hours
- Bike Seat – estimated life 5,000 hours
- Bike pedals – estimate life 5,000 hours
- Generator – estimated life 100,000 hours

## Maintenance

The following maintenance items are to be performed as specified:


### Check that hand pedals are tight

Frequency	Details
Weekly	Check pedal with wrench to make sure each one is snug. The proper torque to put on this wrench is approximately 10 foot-lbs.

### Check that the generator box is snug against the fly wheel

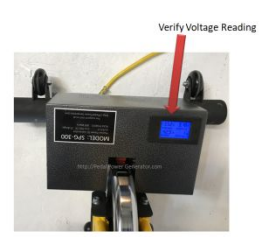
Frequency	Details
Weekly	The generator box periodically needs to be adjusted to be snugly pressed against the fly wheel of the exercise bike generator. Follow the steps in the video to readjust.

## Check that the seat is secure and at the right angle

Frequency	Details
Weekly	<p>The spin bike generator seat will often be loose and out of alignment after many people get on and off the bike. A wrench will be needed to re-adjust the seat to make sure it is level and aligned with the frame of the bike. If the nuts are not tightened down securely with 10 foot. Use a 9/16 wrench to tighten the bolt on each side of the seat evenly.</p> 

## Troubleshooting

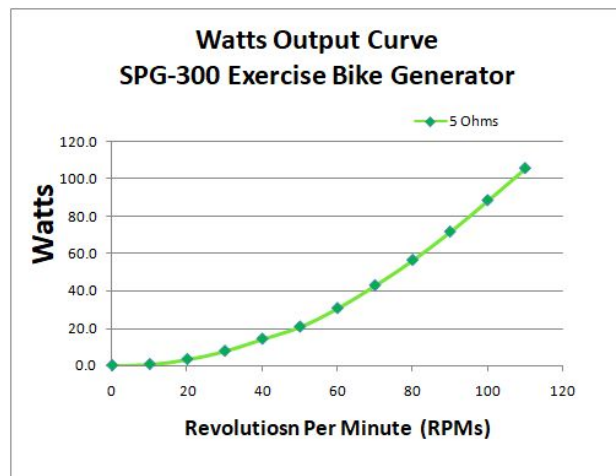
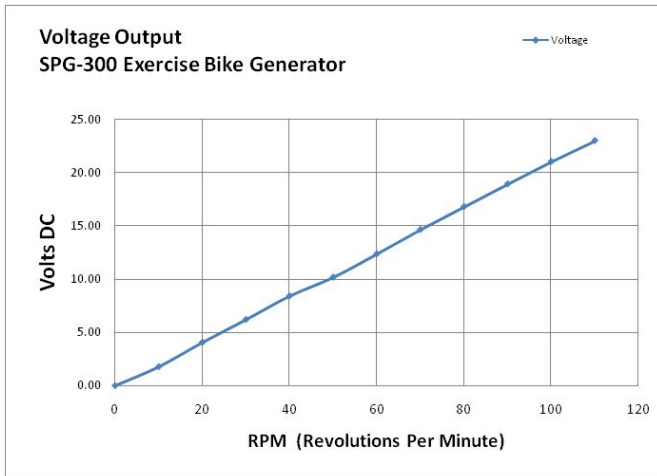
It may be necessary to perform some trouble shooting on this generator / light box system. Here is some trouble shooting scenarios.

PROBLEM DESCRIPTION	STEPS TO TAKE
<p>Power meter on light box does not light up</p>	<ol style="list-style-type: none"> <li>1) Verify that yellow power cable end is properly inserted into the back of the light box display and locked into place.</li> <li>2) Look at the meter on the exercise bike generator to make sure it is showing Voltage when the bike is pedaled.</li> </ol> 

PROBLEM DESCRIPTION	STEPS TO TAKE
<b>Bulb does not light up</b>	<p><b>If a bulb does not light up then follow this example:</b>  <b>For this example bulb 2 is a CFL bulb and bulb 1 is an LED bulb. Assume that the bulb 2 CFL bulb stops working. Swap bulbs in locations 1 and 2. Have someone power the generator 50% speed. Now if the CFL bulb still does not turn on, and the LED bulb does come on in position 2 then that proves that the CFL bulb is blown. A new one will need to be ordered.</b></p>

## SPECIFICATIONS

Below is the Voltage curve for the generator along with the power curve. The horizontal axis for each graph represents how fast you are turning the hand cranks. This speed is measured in “RPMs” which stands for revolutions per minute.



## Sales & Support

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