

Measuring Power Output with a Multimeter:

These small DC motors do not make much power. Especially because we do not spin them very fast. Unless you gear up these small motors or use a special type of circuit that doubles the voltage you will probably be unable to light a bulb or an LED.

Power (W) = Voltage (V) x Current (A) <-- Watch Your Units
Make sure you are recording volts and amps (not milli or microvolts unless you want to!)

Voltage

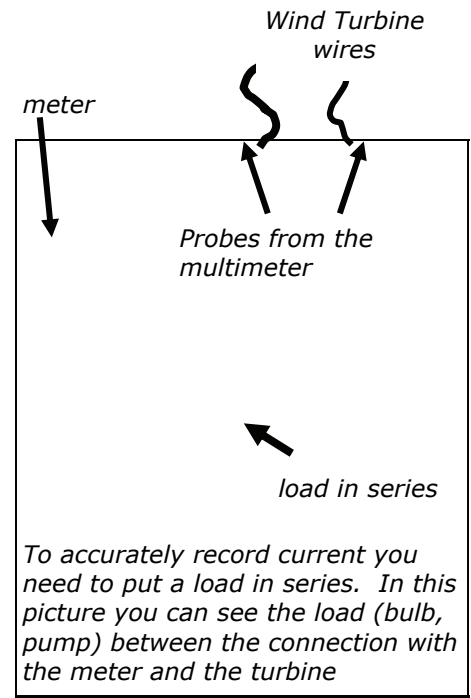
1. Attach the wires from the generator to the multimeter.
2. To check the voltage select DC Volt (V) and choose a the whole number setting say up to at least 5 volts.
3. Place your turbine out in the wind or in front of a fan and let it run up to speed. It is normal for the readings to fluctuate. Power output is not steady because the wind is not steady.
4. If you are using the geared PVC turbine, a set of very well designed blades may produce about 3.0 volts Typical blades will be in the 1-2.5 volt range.
5. When you are measuring voltage you are measuring how fast the DC generator is spinning. The faster it spins the higher the voltage. As there is no load on the generator it has very little resistance so it can spin very fast. If you look closely when you add a load (like a light bulb) the RPM may drop as will your voltage.

Set at 20 DC Volts

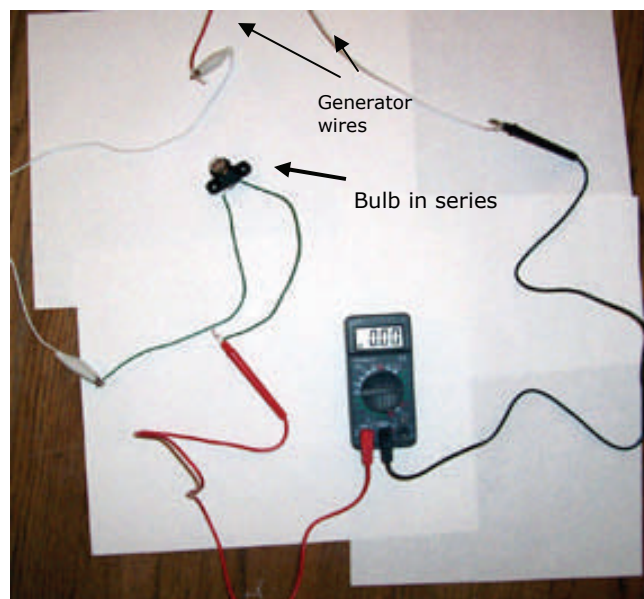


Amperage

1. To get a more accurate picture of the power output of your turbine you should measure amperage as well. To accurately measure the amperage you need to hook up your multimeter differently.
2. You need to place a load (or a resistive object - small bulb, resistor, pump etc.) in series with the meter so that the generator is "loaded" and has to do work.
3. A set of very well designed blades will make around .15 amps (150 milliamps) with the basic motor. Typical blades will be in the .03-.07 amp (30 -70 milliamp) range. With the geared turbine, A set of very well designed blades will make around 0.4 amps (400 milliamps). Typical blades will be in the .1-.3 amp (200 -300 milliamp) range. This will vary based on your resistive load.



4. When you are measuring amperage you are measuring how many electrons your turbine can push. This relates to how much torque your blades are generating. This becomes important because when you attach your turbine to a load, add gearing or large generators to your turbine you'll need more torque!



To accurately record amperage you need to put a load in series. In this picture you can see the small bulb between the connection with the meter and the turbine

Power is expressed in Watts (W). To calculate how many watts you are producing, multiply your voltage (V) times your amperage (A).

DON'T FORGET!

TURN OFF THE METER WHEN YOU ARE DONE OR THE BATTERY WILL DIE!!