



Wattmeter

How to use a Wattmeter.

ELECTRIC POWERED AIRPLANE TOOLS

If you fly electric powered airplanes, a wattmeter is an essential tool to have in your toolbox.

What is a Wattmeter?

A wattmeter is a device that measures electrical parameters including volts, amps, and watts.

How is a Wattmeter installed to measure the power supplied to your motor?

The meter is connected in between the battery and the ESC as shown in the diagram above. The "source" is connected to the battery and the "load" is connected to the ESC.

What do the indications on the meter mean?

- **AMPS:** The amps indicate how much current is being drawn by your motor. This is very useful to determine if you are not drawing too much current for your motor and ESC. The ESC and motor are rated for the maximum amps that can be safely handled.
- **VOLTS:** This indicates the volts of your battery at any throttle setting. You should monitor the volts at full throttle to insure it does not drop below the cutoff voltage for your ESC. A low

voltage could mean your battery is weak or you have too much load on your system. A low voltage can also result in "brownout" signal losses in your receiver.

- **WATTS:** This indicates how much power is being used by your system. Most motors are rated for a maximum amount of watts. You should check the watts at full throttle to insure you do not overload your motor.

The AMPS drawn by your system determines the flight time you can get from your battery. The more amps you draw will reduce your flight time. So, you should strive for a low amp draw while still achieving the desired performance.

The battery voltage will drop as you increase the throttle setting. This will vary depending on the load from the motor and condition of the battery. If the voltage drop changes significantly for a specific battery, it could indicate a bad battery.

Watts is an indication of the total power being used by your power system. The power is mainly from the motor and propeller combination. The larger the propeller, more power will be drawn by the motor. In

general, a higher propeller pitch will also result in more power.

It is very important to achieve the desired power for a specific model. A general rule of thumb for electric models is the Watts per Pound rule. So, you should look for the desired watts in relation to the weight of your model.

Here are some recommended ratios:

- Less than 50W/lb - very lightweight / low wing loading slow flyer.
- 50 to 80 W/lb - light powered gliders, basic park flyers and trainers, classic biplanes, and vintage ('Old Timer') type planes.
- 80 to 120 W/lb - general sport flying and basic/intermediate aerobatics. Many scale (e.g., warbirds) planes suit this power band.
- 120 to 180W/lb - more serious aerobatics, pattern flying, 3D and scale EDF jets.
- 180 to 200+W/lb - faster jets and anything that requires cloud-punching power!

EXAMPLE: If you have a model and you want to do basic aerobatics, you should power it for about 100 watts per pound. If the model weighs 10 pounds, you should try to achieve about 1000 watts from your motor/prop combination.