

Himax Brushless

HC6320-250 / HC6332-230 Power Pack

Himax Brushless Power Packs make setting up a model a simple project. Just choose the appropriate power system to match the model or replace an engine. The packs listed below will fly sport models weighing 17 lbs. to leisurely models weighing 30 lbs. These packages are chosen toward sport models to provide lively performance.

The power systems as shipped will be suitable for 3D models, sport, and leisurely models. **Please use caution when experimenting with other propellers and/or battery packs.** Be sure to measure current draw to prevent failure of the speed control and or motor due to excessive current. Please read the motor manual for more information.



	Combo-90	Combo-120
Motor	HC6320-250	HC6332-230
Glow Equiv.	.90	1.20
Weight Max, lbs.		
3D	10	12
Sport	17	22
Leisure	22	30
Prop	17x10E	19x10E
ESC	PH85HV	PH85HV
Current, Amps	53	75
Watts, Approx.	1600	2200
Thrust, oz. Approx	250	350
System		
Weight, oz.	23	34
Suggested		
Battery(20C)	5S5000x2 (10S)	5S5000x2 (10S)

Amps	Minimum Battery Size, mAh						
	C rating	8C	10C	12C	15C	20C	30C
5A		630	500	420	330	250	150
10A		1250	1000	830	670	500	300
15A		1880	1500	1250	1000	750	450
20A		2500	2000	1670	1330	1000	600
25A		3130	2500	2080	1670	1250	750
30A		3750	3000	2500	2000	1500	900
40A		5000	4000	3330	2670	2000	1200
50A		6250	5000	4170	3330	2500	1500
60A		7500	6000	5000	4000	3000	1800
90A							3000

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Combo Power Pack



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EZ Electric Conversion

Electric motors for Glow people

by Greg Kamysz

Electric motors provide a clean and reliable power source for models. Selecting a motor is not much different than selecting an engine when you look at the fundamental requirements. The basic principles that make aircraft fly should be used to select a power plant for the performance desired. Power to weight ratio and flight speed envelope make up the aircraft's performance. This translates to thrust to weight ratio and pitch speed. Considering power and propeller choosing an electric motor doesn't have to be a challenge.

The power loading is the first parameter to consider. Power to weight ratio for electric models is generally quoted in watts per pound (W/Lb). This is basically a performance gauge. More power available per pound results better the aircraft performance. Power loading holds true for models all the way up to full scale. Some examples are listed below. 1 Horsepower (HP) = 746 Watts (W)

Piper Cub	65HP	1220Lb	40W/Lb
B-17	4800HP	65000Lb	55W/Lb
Pitts Special	260HP	1626Lb	120W/Lb
Spitfire IV	1440HP	5000Lb	215W/Lb

The chart shows that high performance requires a high power loading. The Cub flies sedately at 40W/Lb and so will a model with this power loading. Follow the chart below for model aircraft.

Mild ROG Performance	50W/Lb
Mild Aerobatics	75W/Lb
Aggressive Aerobatics	100W/Lb
3D or High speed	125-150W/Lb
Competition	300+W/Lb

There are many aircraft designed for internal combustion or glow engines. We can also approximate the required power based on engine displacement. A survey of available engines resulted in the chart below in terms of watt per cubic inch displacement(W/ci)

Sport 2 or 4 Cycle	1250W/ci
BB 2 Cycle	1500W/ci
High Perf. 2C/4C	1800W/ci
Racing, Ducted Fan	4000W/ci

Multiply the displacement of the recommended engine by the W/ci rating to find the amount of power required of the electric motor system. For example; a .40 plain bearing engine will make $.40ci \times 1250W/ci = 500W$ of power. Consider that many .40 size trainer models weigh 6Lb, the power loading works out to 83W/Lb.

Once the required power is known we can look at the motor and battery. Look at the motor specifications for power rating. Choosing a motor with a power rating equal to the requirement is safe. Erring on the safe side one would choose a motor capable of slightly more than is required. The motor must be able to handle the required power and the torque to turn a propeller appropriate for the model. A high-speed model will work best with a small prop at high RPM, while a slower model will work better with a larger prop at lower RPM. Power is a product of RPM and torque. For a given amount of power one can have a lot of torque and low RPM, or high RPM and low torque. Getting a lot of both requires more power. RPM and torque is related to the flight speed of the model. Take a look at the list of Himax motors. Find the ones that meet the power requirements. Now look again at the prop size. Choose a motor that uses a prop size suitable for the model. Assume that the smaller props work best with models designed to fly fast. On test flights it is best to try several props in the suggested range which draws an acceptable amount of current to see what works best. A difference of an inch in diameter or a couple inches in pitch can change the way a model flies drastically. If prop size doesn't narrow the selection to one motor consider gearboxes or the simplicity of an outrunner motor direct drive. Also consider the voltage required to see what kind of battery is needed. The battery must be able to support the current requirement of the motor with the chosen prop. Check the current rating of the battery to make sure it will not be over-worked. The ESC must also be sized to handle the voltage and current requirements.

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