Ace R/C Super Pacer

There are a couple different ways of sizing motors for electric conversions. One is the direct conversion based on the displacement of the engine. 1 cubic inch of 2-stroke glow power is roughly equivalent to 2000 watts of electric power, so based on that 2000 x 0.25 cubic inches gives you 500 watts of power to replicate a .25 2-stroke engine.

The second method is based on aircraft weight and power level for different types of models. For Pattern type planes, around 150 watts per pound (330 watts per Kg) is a good number to shoot for. With your plane weighing 1.7 Kg, if you take 330 x 1.7 you get 561 watts of power, which using the earlier method is the power of a .28 2-stroke glow engine. So as you can see, both methods point to a motor in the 500-560 watt range. For the sake of the remaining calculations we will use 550 watts of power.

If you get this much power from a 3-cell battery, which makes 11.1 volts under load, you have to pull 550 ÷ 11.1 or 49.5 amps, which is kind of high to be pulling from a 3-cell pack. If you made the same power with a 4-cell battery, which produces 14.8 volts under load, the required current would be equal to 550 ÷ 14.8 which is 37.2 amps.

Now we just need to find a motor that will make around 550 watts of power while spinning a 10x6 or 10x7 prop. If you wanted to go with a BadAss motor, and use 4 cells, then the BA-2814-980Kv motor would be an excellent choice. With the APC 10x6 and 10x7 props you get these full throttle performance numbers.

With the 10x6-E Prop

Volts – 14.8

Amps – 33.3

Watts – 493

RPM – 11,229

Thrust – 69.4 ounces (1967 grams)

Speed – 64 MPH

With the 10x7-E Prop

Volts – 14.8

Amps – 38.3

Watts – 567

RPM – 10,745

Thrust – 69.0 ounces (1956 grams)

Speed – 71 MPH

This motor has a maximum current rating of 46 amps, so our BadAss Rebel V2 50-amp ESC would be a good match for it. For a battery, depending on how long you wanted to fly per charge, a 4-cell pack in the 2600 to 3300mah range would be good. Here are links to the items needed for the 4-cell set-up.

BA-2814-980Kv Motor: https://innov8tivedesigns.com/badass-2814-980kv-brushless-motor.html

BadAss Rebel V2 50-amp ESC: https://innov8tivedesigns.com/badass-rebel-v2-series-brushless-esc-50a.html

BadAss 4-cell LiPo Batteries: https://innov8tivedesigns.com/products/batteriescharging/badass-lipos/4s-lipo-14-8v.html

APC 10x6-E Prop: https://innov8tivedesigns.com/apc-b10x6e-propeller.html

APC 10x7-E Prop: https://innov8tivedesigns.com/apc-b10x7e-propeller.html

If you did want to stick with a 3-cell battery, you could do that, you just need a motor with a higher Kv value to get the same prop speeds on lower voltage. For that, the BA-2814-1300Kv motor would get you nearly identical performance from the same props, you just pull more current with the lower voltage to make the same level of power. Once again, here are the performance numbers for the 10x6-E and 10x7-E props running on this motor on 3 cells.

With the 10x6-E Prop

Volts – 11.1

Amps – 47.0

Watts – 522

RPM – 11,226

Thrust – 69.1 ounces (1959 grams)

Speed – 64 MPH

With the 10x7-E Prop

Volts – 11.1

Amps – 53.0

Watts – 588

RPM – 10,759

Thrust – 69.6 ounces (1973 grams)

Speed – 71 MPH

This motor has a maximum current rating of 60 amps, so the 60-amp ESC would work well in this application. To get the same flight times, with the 3-cell pack you would need to use a 4000 to 5000mah capacity. Here are the items needed for a 3-cell set-up.

BA-2814-1300Kv Motor: https://innov8tivedesigns.com/badass-2814-1300kv-brushless-motor.html

BadAss Rebel V2 60-amp ESC: https://innov8tivedesigns.com/badass-rebel-v2-series-brushless-esc-60a.html

BadAss 3-Cell LiPo Batteries: https://innov8tivedesigns.com/products/batteriescharging/badass-lipos/3s-lipo-11-1v.html

APC 10x6-E Prop: https://innov8tivedesigns.com/apc-b10x6e-propeller.html

APC 10x7-E Prop: https://innov8tivedesigns.com/apc-b10x7e-propeller.html

Hopefully that gets you all the information that you were looking for, with options for both 3-cell and 4-cell LiPo batteries. If you need a spinner for your aircraft, we have both the solid cone style and the AirFlow cone style available in 5 different colors in a wide range of sizes at the following links.

Standard Plastic Cone Spinners: https://innov8tivedesigns.com/products/spinners/plastic-spinners.html

AirFlow Plastic Cone Spinners: https://innov8tivedesigns.com/products/spinners/plastic-turbo-spinners.html