

## Dimension Engineering's BEC FAQ

### What is a BEC?

BEC stands for Battery Eliminator Circuit. In the old days of electric flight you had to use a separate 4.8V battery pack to power your receiver and servos. As the hobby evolved, speed controls started to include Battery Eliminator Circuits to power your receiver and servos, allowing you to get rid of the extra receiver battery pack.

### How does a BEC work?

A BEC is basically a step down voltage regulator. It will take your main battery voltage (e.g. 11.1 Volts) and reduce it down to ~5 Volts to safely power your receiver and servos.

### What are the advantages of a BEC?

If you are flying electric, a BEC is better than a battery pack in nearly all cases. On average, the BEC will weigh 10-20 times less than a receiver battery pack! Then you have to take into account the hassle of charging the receiver pack. It is another battery you have to carry around along with another charger. Did you remember to charge it after the last time you flew? Uh-oh might want to double check that!

With a BEC, you only have to worry about charging your main flight pack and then you are guaranteed to have a safe flight.

Glow planes usually need a receiver pack, but the vast majority of electric planes out there are better off with a BEC.

### I have a 3A BEC in my speed control - is that enough?

#### What is a switching BEC?

It is very common for speed controls to have BECs rated at 2 or 3A. However, what the manufacturers do not tell you is that this rating is only true for an input voltage of 6V. The BEC on your speed control is what engineers call a 'linear voltage regulator'. It works by burning up excess voltage and turning it into heat. The higher the input voltage, the more heat gets produced. If there is too much heat, then the BEC will either fry, or shut down! The result of this is that in real world situations, if you are running a 3S lithium battery pack, your ESC's BEC will only be able to provide about 0.5A before it overheats. At 4S, most ESC manufacturers don't recommend you use the BEC at all, or at best power two small servos. Dimension Engineering's BECs are a different type of voltage regulator - a switching voltage regulator. They do not care very much about what the input voltage is, and as such can provide your servos with their full current rating all the way up to 8S or more. For more information on the principles of a switching BEC, please visit our [beginner's guide to switching regulators](#).

### What are the pros and cons of Internal BECs and External BECs?

Most speed controls nowadays have an internal 5V linear BEC. It is a nice cheap, simple solution that works very well at low voltages like 2S lithium and 6 cell NiCd packs. If you are flying a 2S lithium aircraft, stick with the internal linear BEC on your speed control because it will be cheaper. 3S lithium and above is where a switching BEC starts to pay off. Since the external switching BEC will work efficiently at higher voltages you will immediately notice your speed control running cooler. You will be able to run more and more powerful servos. You will be guaranteeing reliable power to your receiver & servos. If you have ever suddenly lost power to your receiver in flight, then an external switching BEC may be the answer to your problems.

### Are there any other reasons to get an external BEC?

Some of the new Spektrum receivers draw significantly more current than a normal receiver, and are particularly sensitive to voltage fluctuations. An external switching BEC can help ensure your new receiver gets reliably powered. Our switching BECs also allow you to have a choice of output voltage - 5 volts or 6 volts.

### 5V or 6V?

One of the great things about an external switching BEC is that it allows you to choose your voltage output. Running at 5V gives you standard servo response. Running at 6V means more power will be delivered to your servos, so you will get more speed and torque. Running at 5V or 6V will depend on what you are flying, and how you personally like to fly. A simple parkflyer that isn't doing any complicated maneuvers will probably feel best at 5V. If you are doing

complicated 3D aerobatics with sharp turns, you will probably appreciate the response 6V gives you. Helicopter flyers especially like the response 6V gives them on a tail servo. If you decide you want to run at 6V, make sure your servos can handle it. Most servos can, but some really tiny ones like the Hitec HS-50 will burn up at 6V.

**How will a switching BEC affect my flight time?**

Actually, it will barely make a difference to your flight time. Compared to your main motor, your receiver & servos barely draw much power at all. On a typical flight you can expect to have ~10 seconds less flying time if you have been using a receiver pack. If you have been using a speed control's linear BEC, then a switching BEC might get you ~10 seconds more flight time. Nothing really noticeable.

**I heard that switching BECs can put out harmful radio interference, causing reduced range. Is this true?**

This is true for a lot of the switching BECs on the market. This is because it is relatively easy to make a switching BEC that gives you 5V and powers your servos, but it is *not* easy to come up with a design that is free of radio interference. This takes hundreds of man hours, dozens of design revisions, expensive test equipment and extensive beta testing. At Dimension Engineering, we put the time, money and effort into developing BECs that do not radiate. As long as you keep the BEC at least 2 inches away from your receiver, antenna and other electronics, you will not experience any glitching. We guarantee it.

**Can you help me pick out a BEC?**

Here are some general guidelines for common configurations:

Plane setup	Recommendation
Small planes with a 2S lithium pack Small planes with only 2 small analog servos and a 3S lithium pack	No external BEC needed
Parkflyers with 4 to 6 sub-micro analog servos e.g. HS-55, HS-56 and 3+S lithium packs. Parkflyers with 4 HS-81 servos and 3+S lithium packs.	ParkBEC
Small 3D/aerobatic flyers with 4 to 6 sub-micro analog servos e.g. HS-55, HS-56 and 3+S lithium packs. Small 3D/aerobatic flyers with 4 HS-81 servos and 3+S lithium packs.	ParkBEC 6V
Sport planes, glow conversions, larger 3d planes, planes with multiple high torque servos, HS-65 servos and/or digital servos. 3S to 8S lithium packs.	SportBEC

Helicopter setup	Recommendation
Tiny coaxial helis (Blade CX, Lama) with 2S lithium packs	No external BEC needed
Micro helis with sub-micro analog servos e.g. HS-55, HS-56 and 3+S lithium packs. 3xHS-56, 1xS9650 and a 401 Gyro is an especially popular combo with ParkBEC 6V.	ParkBEC 6V
Micro / mini helicopters with 3S to 8S lithium battery packs, running high speed/torque servos and/or digital servos. e.g. HS-65, HS-635, S9451, S9550	SportBEC
Big helicopters with battery packs 9S to 14S lithium (33.6V to 60V)	VHVBEC
Really big (60"+) helicopters with battery packs 9S to 14S lithium (33.6V to 60V) with 4 digital servos drawing peak currents >1A	Two VHVBECs in parallel

Contact us if you still need help choosing a product!

**Why should I get a BEC from Dimension Engineering when I can find a cheaper one elsewhere?**

A critical difference between our BECs and our competitors BECs is that our products are guaranteed to not cause radio interference. You can get a cheap imported BEC, but you'd just be paying 10 bucks to knock your plane out of the sky! Every manufacturer likes to boast that their BEC won't cause interference. **We actually have the data to prove it.** The #1 design

criterion with all Dimension Engineering BECs is that they absolutely cannot put out any harmful interference. Other guys cut costs in ways that are downright scary.

Our BECs also have a throttle pass through system, which means you can use our BECs without snipping the red wire of your speed control.

Our higher powered BECs have the world's easiest to use 5V/6V selection system. Just flick the slide switch with your finger! There are no jumpers to lose or any complicated programming procedures. An LED will indicate whether you are in 5V or 6V mode.

Finally we have great customer support for our products. In the extremely unlikely event of a problem with your BEC, we will quickly get a replacement out to you. If you are confused on how to wire things up, [send us an email](#) and we will respond. Try doing that with an imported product!

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