

What is ESC, SBEC, UBEC, BEC and Opto?

An Explanation of Words You May See When Looking Up Motor Controllers

When doing research for your Electric Car Conversion, your search results may come up with things from the radio control (RC) world. In fact, some people have successfully used some components from the radio control (RC) world for their Electric Go Kart Conversion or their Electric Bicycle Conversion. Either way, if you come across these items when doing your research for your Electric Car Conversion, you can save time by referring to the information I have on this page which is in relation to ESC (Electronic Speed Controllers). A quick explanation for terminology about Brushless DC Motor (outrunners), like those seen in radio controlled (RC) airplanes can be found here. It should be noted that some manufacturers don't follow the definitions below when they label their controllers, so you always need to read the specifications of each controller. It should also be noted that you are unlikely to use RC (Radio Control) components for an Electric Car Conversion, but that hasn't stopped some people from using them for Electric Go Kart Conversions and Electric Bicycle Conversions.

What is ESC?

ESC stands for Electronic Speed Controller. It is an electronic motor controller which controls the speed, direction and possibly braking of a motor. This term is typically used in the radio control (RC) world, but may also appear when discussing Brushless DC (BLDC) motor controllers. In the Electric Car Conversion world, the term ESC is rarely used.

What is BEC?

BEC stands for Battery Eliminator Circuit.

In Radio Control (RC) contexts, the BEC is extra circuitry on the ESC (Electronic Speed Controller ie. Motor Controller) to provide power to the controls (such as steering, servos, receivers) to the controlled vehicle (e.g. airplane, car, helicopter, boat) so that this control circuitry does not need to carry its own battery pack. That is, it piggy backs off the battery pack used to drive the motors of the vehicle or in other words, the motor and servos share the same battery pack.

In motorcycle / ATV contexts (which use Internal Combustion Engines), BECs are sometimes used so that a battery is not required. Instead, it relies on the alternator to generate the required electricity and the BEC is used to regulate the electrical power which will be used for electrical items on the motorcycle / ATV such as lights, horn etc. If there is no battery, there is no electric starter on these machines.

What is SBEC?

SBEC usually stands for Switching Battery Eliminator Circuit. In RC (Radio Control) contexts, SBECs are improved versions of BECs as the circuitry uses battery power more efficiently.

What is UBEC?

UBEC stands for Ultimate Battery Eliminator Circuit. In RC (Radio Control) contexts, a UBEC is an improved version of a BEC. ESCs with a UBEC use circuitry that is more efficient than a ESC with a BEC, thus you save battery power. Also, ESCs with UBECs tend to run cooler than ESCs with BECs.

What is the difference between a SBEC and an UBEC?

SBECs are typically smaller in physical size and lighter than UBECs. When deciding whether to use SBECs or UBECs, you need to look at the specifications to see if it meets your requirements. Things like amp rating and battery rating are things to look out for.

What is Opto?

Opto in radio control (RC) contexts means Opto-coupler. On the ESC (Electronic Speed Controller) ie. Motor Controller, the power used to drive the motor is electrically isolated from the power used to control the servos. This is supposed to reduce radio interference between the motor and receiver as light signals are used between the motor and receiver circuits. As a result, the ESC requires separate battery packs, one for the motor and the other for the receiver