

FET ESC WITH REVERSE

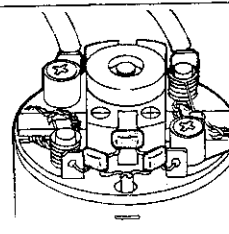
Thank you for purchasing AIRTRONICS 96310Z FET ESC.
Please read through these instructions carefully and take note of cautions and handling of this ESC in order to achieve full performance.
Please keep this instruction with you for quick reference.

**SAFETY PRECAUTIONS**

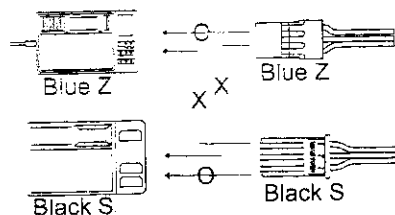
1. This device is designed for Airtronics Radio Control systems. Functionality of another radio manufacturer may differ from Airtronics radio control systems. Carefully check the function of the radio when a brand other than Airtronics is used.
2. Never reverse the polarity of the NiCd battery connection to this ESC. Reverse connection will cause significant damage.
3. Never operate your radio control car in wet conditions (i.e. During rain, traveling through water puddles, etc.) Water or any type of liquid will cause damage to this ESC.
4. If the electric motor installed on your model is worn out or damaged, it may cause some damage or trouble to the ESC. Provide necessary maintenance on your motor periodically not to damage the ESC unit.
6. Please do not use a motor below 18T, if the electric current becomes too high, it may activate the Anti-over current fail safe or heat protector inside the unit. Also note that a 18T motor is only a suggested Turn figure as the load of the motor may vary depending on the weight of the model, gear ratio or condition of your model. So even with 18T or large number of turns, the ESC may malfunction depending on your model's condition. In this case, please exchange your motor with a larger turn motor which is a more suitable combination for your model and ESC.
7. Be sure to disconnect the NiCd battery from the ESC when not in use.

**IMPORTANT**

Counter measure for noise from electric motor. Always use the noise suppressing capacitors which are included on this ESC unit. Solder three of the noise suppressing capacitors to the motor's terminals as indicated on the drawing. NEVER take off these noise suppressing capacitors from electric motor unit. Diodes should never be used with reversible ESC. Using a Schottky diodes will damage the ESC.

**CAUTION**

This 96310Z unit is equipped with Z-connector.
Previous S-connector(Black connector) has different polarity. If using the Airtronics Black receiver then the S to Z adapter part number 99399Z must be used or damage to the electronic components will occur.

**FEATURES**

- | High Frequency drive on FET.
- | High performance MOS-FET.
- | EZ Setup and go Feature
- | Adjustable Braking Power with Reverse
- | Heat Protector is provided to protect from abnormal high heat on FET.
- | Overload protection.
- | When the battery voltage reaches 4.7V, it automatically reduces the motor r.p.m to halfway to let you know the battery is almost empty.

SPECIFICATIONS

POWER SUPPLY: 7.2V Ni-Cd / Ni-Mh
 Maximum current: 600A(Forward) 240A(Reverse)
 Continuous: 150A(Forward) 60A(Reverse)
 Loss resistance: 6.2mOHM (forward) 7.6mOHM(reverse)
 Dimension: 1.2" x 1.2" x 0.80" (without switch holder)
 Weight: 1.52 oz
 Motor Turns Limit: 18T
 Z-Connector system

TROUBLE SHOOTING GUIDE

Problem	Possible Cause
1. NO Forward or Reverse (First time operation)	Check the transmitter batteries for proper position. Check the capacity of the Transmitter battery. Check the switch on Transmitter and ESC to be sure they are turned on. Check the Battery connections for proper connections. Check the Capacity of running battery. Check the motor unit.
2. Motor does not stop on Neutral	Check the Neutral position with LED Check Light. Check the trim position on the transmitter.
3. Model runs slowly.	Check the capacity of the running battery. Check the battery condition. Use new battery if necessary. Check the motor whether it is worn out ? Use new motor if necessary. Check the LED check light whether it might be on at full throttle. (high point) Reset the ESC setting.
4. Forward and Reverse Control moves in reverse	Check the Transmitter's Throttle servo reverse switch Check the motor connection wire on positive and negative.
5. Sudden stop of the model during running (or overheats on FET)	Check all of the wiring connection of motor, battery, connectors. If they are properly connected, Heat Protector is activated. Check the motor Check the model's running part (i.e. Ball bearings, gear units) whether it runs smoothly or not. Check the FET unit if it is overheated or not. Motor Limit performance may be beyond the ESC performance. Change the Motor Limit with higher Turns.

WARRANTY

Your BL-Force Electronic Speed Controller carries a 90 day warranty. Failure to read and follow warnings can result in the destruction of your ESC and will void any stated or implied warranty, so please read them carefully prior to installation. Any warranty repair must be sent to Airtronics, Inc. and must include a copy of your sales receipt before any warranty work can be done.

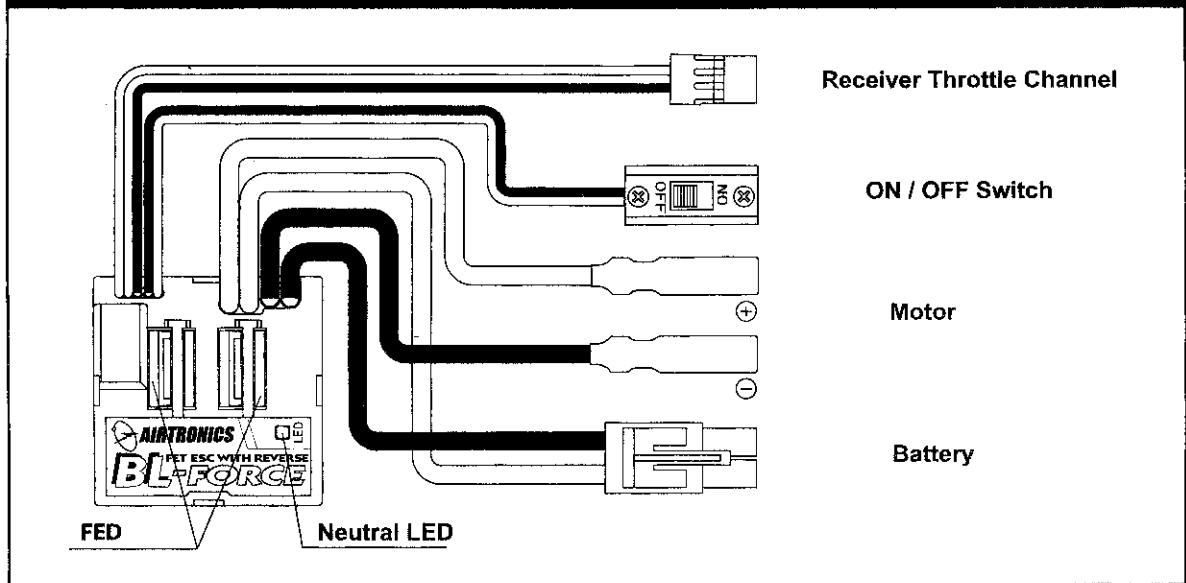
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CONNECTIONS



CAUTION

Your BL-Force ESC is equipped with the blue Z-connector. The Z-connector makes it possible to plug your BL-Force directly into any blue Z receiver as well as other manufactures receivers.

DO NOT PLUG YOUR BL-Force DIRECTLY INTO A BLACK AIRTRONICS RECEIVER.

Previous S-connector (Black connector) has different polarity. If using the Airtronics Black receiver then the S to Z adapter part number 99399Z must be used or damage to the electronic components will occur.

ESC SPEED CONTROL INSTALL and SETUP

You can install your BL-Force with or with out using the switch plate adaptor. When using the switch plate adaptor, position the ESC into the adaptor that will best fit in the model and to have the switch positioned to best fit your needs when turning the switch on or off. Use a good grade double sided foam tape and cut it to the same size as the switch adaptor. Install the ESC into the switch adaptor and install the double sided foam tape. This will hold and secure both the ESC and switch plate when installed in your model. Do not have any wires connected at this time.

After installing your ESC in your model, connect the 3 wire blue connector into the throttle channel of your receiver. Make sure the ESC switch is in the OFF position before connecting the 2 wire white connector to your battery.

Turn your transmitter on and adjust your H-EPA and L-EPA to maximum. On computer transmitters, set both H-EPA and L-EPA to 100%.

(when using a stick radio, use the neutral position of the throttle stick in the down position.)

Adjust your Throttle trim and or sub trim to its neutral position.

At this time, make sure the 2 motor wires are not connected from the ESC to the motor.

Now turn on your ESC using the ESC switch. If the neutral LED lights up on the ESC, adjust the trim or sub trim on your transmitter until the LED light turns off.

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ESC SETUP (CONTINUED)

Now place your model on a object that will allow all the wheels to be off any surface. This will allow you to finish your setup with out the model moving by its own power.

Connect the 2 motor wires from the ESC to the motor. If the neutral position was set properly, the motor should not turn. If the motor starts to turn, adjust the neutral position again on your transmitter to make the motor stop.

Gently pull the throttle trigger to see if the wheels start to turn in the direction that will make the model move forward. If not, disconnect the motor, change the direction of the servo reverse switch, or on computer transmitters, change it from NOR to REV and adjust the neutral position again so that the ESC LED light turns off. Reconnect the 2 wires from the ESC to the motor. Gently pull the trigger again to verify the tires are turning the proper direction.

Setup is now complete.

BRAKE and REVERSE

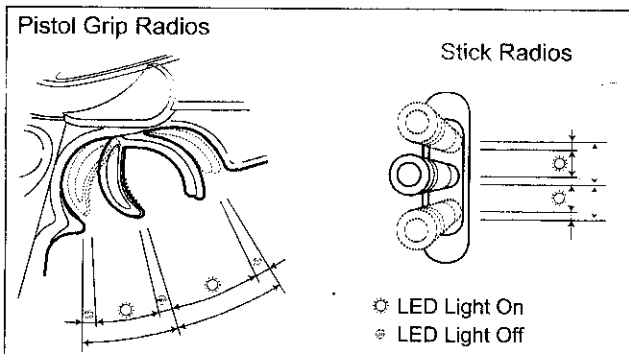
Your BL-Force is equipped with a brake and reverse feature. The brake feature will allow you to slow down the model from a forward motion and the braking power is adjustable using the L-EPA feature on your transmitter.

To increase or decrease braking power, adjust the L-EPA on your transmitter. Test the braking power and adjust as needed for your model.

The Reverse feature will only operate after the throttle trigger has been pushed forward a second time. This will allow you to first slow your model down with the first push of the trigger and than if needed, you can let the trigger return to the neutral position and push the trigger again to activate the reverse feature.

ESC LED LIGHT

After your initial setup, you can use the ESC LED light to verify all your settings are good. Use the diagram below as a reference to how the LED light should work when properly setup. If the light stays on when at full forward or reverse, your not getting full speed from your ESC. Adjust the H-EPA and L-EPA so the LED will turn off when the trigger is in full forward or full reverse positions. In the transition from neutral to brake/reverse, the LED will blink.



LED Light

Neutral Position	Light OFF
Transition to forward	Light ON
Full forward	Light OFF
Neutral Position	Light OFF
Transition to B/R	Light BLINKS
Full Brake / Reverse	Light OFF

ESC Switch

