

FET MINI AMP ESC WITH REVERSE

Thank you for purchasing AIRTRONICS 96305Z Mini AMP 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.



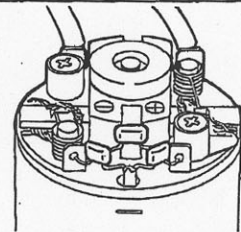
SAFETY PRECAUTIONS

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 to 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.



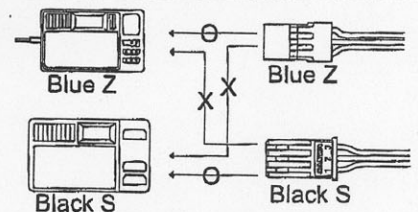
IMPORTANT

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 96305Z 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.



- | High Frequency drive on FET.
- | High performance MOS-FET.
- | One button set up ease to set Neutral, High Point, Reverse and Brake.
- | Reverse can be only achieve when the car is making a full complete stop, This is to prevent damage to the motor.
- | Heat Protector is provided to protect from abnormal high heat on FET.
- | Reverse Cancellation.
- | Overload protection.
- | When the battery volatage 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 - 8.4V
 Maximum current: 360A(Forward) 180A(Reverse)
 Continuous: 90A(Forward) 45A(Reverse)
 Loss resistance: 4.5mOHM (forward) 9mOHM(reverse)
 Dimension: 28.3mm x 33.3mm x 26.7mm
 Weight: 46gram
 Suggested Motor 18T ABOVE
 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. Able to brake the model but not able to reverse the model.	Check the reverse disable whether activated or not.
6. 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-Racer 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.

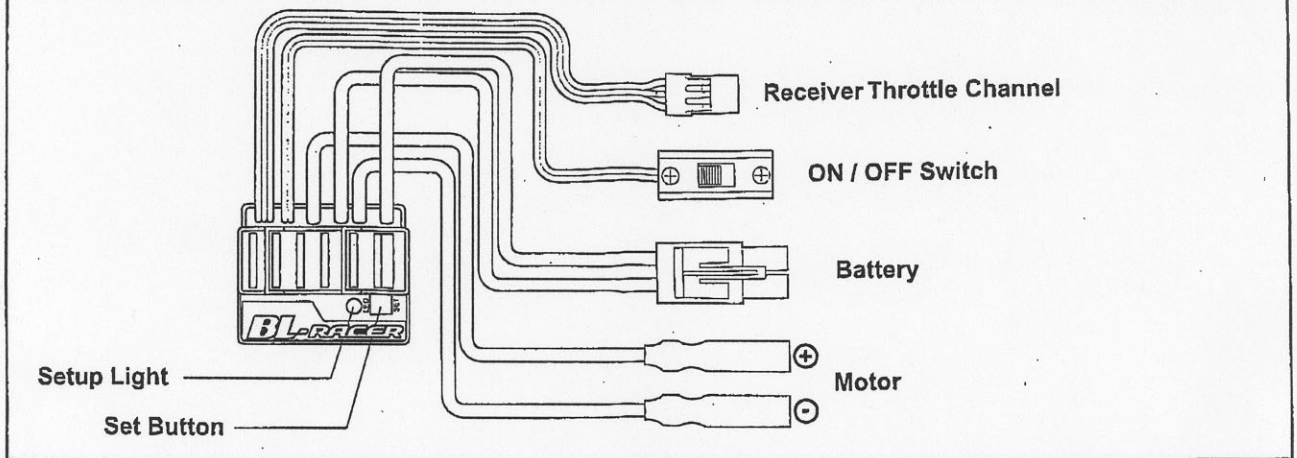
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CONNECTIONS

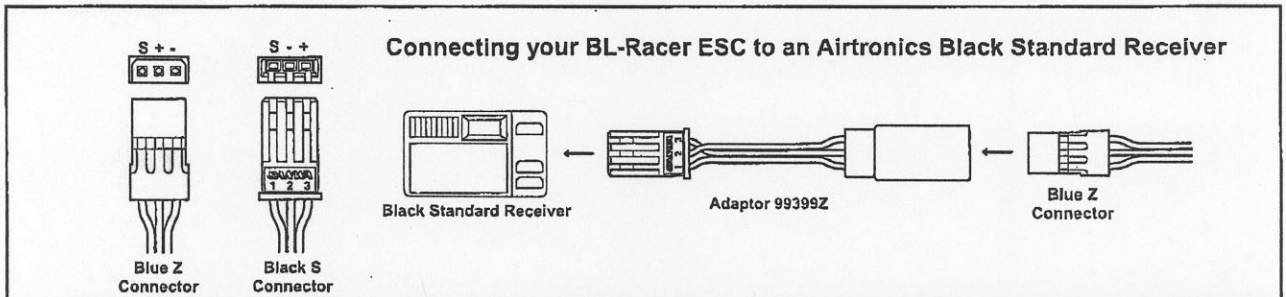


CAUTION

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

DO NOT PLUG YOUR BL-Racer 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 SETUP

How to set Neutral, High Point and reverse (brake).

Before, setting the ESC, Please adjust your Transmitter's throttle trim to the Neutral position. If the transmitter is equipped with End Point Adjustment (E.P.A.), Set both the Throttle high EPA and Low EPA to maximum position.

Be sure that you disconnect the Motor red wire on ESC. Turn On the Switch on the Transmitter then turn On the ESC switch, (To turn off, Always turn off the ESC first then Turn off transmitter).

- (1) With the throttle trigger in the (neutral position), Push the set button to set Neutral. See Step (1)
- (2) Pull throttle trigger to full and push the set button again (Full throttle position). See Step (2)
- (3) Push throttle trigger to full (reverse position), push set button again. See Step (3)

NOTE: The setting of each individual step cannot be independently set because the ESC's software only allows to store full complete setting. Therefore, if the switch is turned off during the setting, setting cannot be memorized and it will only Keep the previous setting.

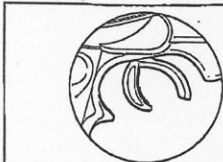
WARNING!

After completion of the ESC setting, Connect the proper ESC wires to the motor. Check if the model operates.

Gradually, pull the trigger to check that the model operates correctly. Be sure that model is lifted off the ground to avoid accidents or injuries. If the model moves in reverse when pulling the trigger, you will need to reverse the motor wires.

CONTROL SETUP CONTINUED

Step (1)



Leave throttle trigger in the neutral position and press the set button one time.
The LED will now blink once every second.



Step (2)



Pull and hold the throttle trigger. Press the Set button once.
LED will now start to blink 2 time per second.



Step (3)



Push and hold the throttle trigger forward. Press the Set button once.
LED light will stop blinking and setup is now complete and ESC will start working.

RECEIVER INSTALLATION

1. Avoid placing the receiver near the electric motor, ESC and Nicad battery.
2. If there is radio interference, try changing the position of the receiver to eliminate the interference (e.g. lengthwise, sideways, vertical or upright.)
3. Never mount the receiver with the crystal on the bottom.
4. Avoid placing the Nicad Battery wire harness or electric motor wire harness near the receiver, it may cause some radio interference.

LED CHECK LIGHT

Throttle movement can be checked with LED Light. LED light will turn on above the Neutral position and turns off at full throttle (High Point) position. Also, when the trigger is pushed to the reverse (brake), light will turn on and will go off at full reverse or the full brake position.

BRAKE AND REVERSE

When the trigger is on the reverse position, ESC will short circuit the motor to put on the brake proportionally depending on the travel of the trigger. To prevent motor wear and damage, reverse can only be achieved after one second of a full complete stop. Reverse speed can be adjustable by pushing away the throttle trigger. (Note: It is proportional reverse but the Full reverse speed cannot be achieved as full forwarding speed.)

REVERSE CANCELLATION

Reverse disable will allow full control of forward throttle and brake, but reverse will be disabled. This is required at certain competitions or club races. In order to disable reverse, Keep Pressing down the SET Push button and Turn on the power switch, Until LED light blink, Keep the SET push button depressed.
Note: Return to the previous set, Redo the same procedure. In order to determine the ESC setting, Check the LED light when the power switch is turned on. For the normal setting with reverse, LED Light will only blink once. If the LED blinks twice it is set on reverse disable.

LOW BATTERY CAUTION

When the battery voltage reaches 4.7V, it automatically reduces the motor rpm to halfway and let you know the battery is almost empty, which keeps enough voltage to the receiver to operate the model to the pit or to desired place safely. If the low battery caution is activated, LED light will keep blink once.

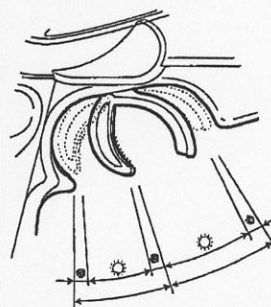
HEAT PROTECTOR

This feature will shut off the current supply to the motor from ESC unit. If it overheats due to the excessive use or high load to the FET. This is to prevent damage to the FET. Once the FET unit is allowed to cool off, it will operate normally. The ESC Unit will not reset automatically unless the Power switch is turned off and then on. If the Heat protector is activated, LED light will blink twice.

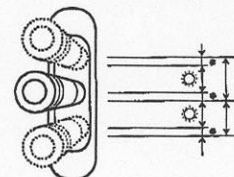
OVERLOAD PROTECTION

This feature will automatically shut down the FET unit. It detects the short circuit, Motor-locking or with high current occurred at the FET. This is to protect the FET unit. Turn off the Power switch first and Get rid of the cause of the trouble. If the Overload protection is activated, LED light will blink three times.

Pistol Grip Radios



Stick Radios



- ☉ LED Light On
- LED Light Off

REVERSE CANCELLATION SETUP

After normal setup has been completed, you can now disable or enable the reverse feature. By turning on the Reverse Cancellation feature, you will not disable the braking function.

To activate (Turn On) Reverse Cancellation.

1. Turn transmitter on.
2. Push and hold down the Set button on your ESC.
3. Turn on the ESC Power Switch.
4. LED will blink two times.
5. Release the Set Button.

To Deactivate (Turn Off) Reverse Cancellation.

1. Turn transmitter on.
2. Push and hold down the Set button on your ESC.
3. Turn on the ESC Power Switch.
4. LED will blink one time.
5. Release the Set button.

- ☉ Reverse Active
- Reverse Inactive