

Operating Instruction Brushless Controller Item No. . 906006

Prescribed use

The product is connected to a receiver for radio remote controls of model vehicles and serves as variable speed control of a brushless electric motor, see section "Technical data".

Take note of all the safety notes in these operating instructions!

This product meets the requirements of current European and national guidelines.

Scope of delivery

- Brushless controller
- Operating instructions

Specifications

Controller type:	for brushless motors, 3-pole connection
Continuous current:	20A
Surge current:	25A for a short time
For cells:	NiCd/NiMH 5-10
LiPo:	2-3
Input voltage:	6-12V=
BEC:	5V=/2A
Dimensions:	Approx. 38*26*16mm
Weight incl. cable:	approx. 24.5g
Frequency:	8kHz
Connection:	Graupner / JR
Reverse gear:	yes, can be switched off



Safety instructions

In the case of any damages which are caused due to the failure to observe these operating instructions, the guarantee will expire! We do not assume any liability for resulting damages!

Nor do we assume liability for damage to property or personal injury, caused by improper use or the failure to observe the safety instructions!

The guarantee will expire in any such case.

- The unauthorized conversion and/or modification of the product is inadmissible because of safety and approval reasons (CE).
Never disassemble the controller, there are no components inside the housing that need to be set or serviced by you. Furthermore, the guarantee/warranty would also expire in such a case!
- Do not leave packaging material unattended. It may become a dangerous toy for children!
- The product is not a toy and is not suitable for children under 14 years.
- When dealing with vehicles, rechargeable batteries, cruise controls and electric motors, make sure that there are never any parts of the body or objects in the rotating parts.
- Never exceed the technical limits of the controller (e.g. continuous current).
- Only operate the controller with rechargeable batteries, never via a mains adapter.
- Pay attention to the correct connection; otherwise the controller and the connected receiver will be destroyed. Furthermore, there is a danger of fire and explosion!
- Only connect one single brushless motor to the controller.
- The controller is not suitable for the operation of conventional electric motors with two connections. Only a brushless motor suitable for that is to be connected and operated with the controller.
- For the installation, keep the biggest possible distance between receiver and controller in order to avoid interaction. The same applies for the distance between controller and motor.
- Do not lay the aerial line of the receiver in parallel to the current-carrying cables.
- Only switch on the electric model when you have made sure that the transmitter is on and that the control stick for the motor control (throttle lever) is in the neutral position.
- When switching off, switch off the controller first (turn the switch in the "OFF" position) and then disconnect the rechargeable battery. Only now switch off the transmitter.
- Always carry out a transmission check also when the motor is running.



- During operation of the model, sufficient cooling has to be provided for the controller as well as the motor. Do not cover the cooling element of the controller; do not use the cooling element for fixing, e.g. with an adhesive tape.
- Protect the controller from dirt and humidity. The controller is neither waterproof nor watertight!
- Regularly check the controller and the cables with the plug-in connections for damages. If the controller is damaged, do not use it any longer.
- Before recharging the rechargeable battery it has to be disconnected from the controller.
- Do not impede the motor, do not hold it on and do not block it.
- Keep metal objects away from the soldering contacts of the connecting cables of the controller; risk of fire/short-circuit, and the rechargeable battery might explode!
- The capacitor located outside the housing with a short cable must not be removed; do not damage it.

Installation and connection

- Do not shorten the motor and rechargeable battery cables since tin-plating the cables again may get difficult.
- Connect the three motor cables with the brushless electric motor. If the rotating direction is to be reversed later on, two of the three cables have to be interchanged.
- For the connection of the rechargeable battery, the controller is delivered with so called "open" cable ends. Depending on what connector system is used on the battery, a suitable connector plug has to be attached.
- When installing the plug, always make sure the polarity is correct since otherwise the controller will inevitably get destroyed. The polarity of the rechargeable battery cables is colour-coded: **red = positive (+); black = negative (-)**.
- The switch is for switching the controller on/off.
- Connect the controller to the receiver output for motor control (pay attention to correct orientation!).
- Install the controller as far as possible from the receiver and the aerial cable. Make sure that no cables can get into movable parts (e.g. servos, servo rods, drive axles, etc.). Fix the controller and cable in your model.
- Secure the electric motor and/or the entire model in a way so that nothing will get loose even at full motor capacity and in the case of vibrations or that nothing can move on its own. Make sure that moving parts can rotate freely. Keep hands and other body parts away from the drive, do not touch any moving parts, risk of injury!

Please note:

The BEC system built into the controller supplies the connected receiver and all servos with the necessary voltage/current (+5V=, 2A max.) directly from the rechargeable battery. You have to use a separate receiver battery in the case of higher current consumption of your servos. The red cable has to be removed

from the 3-pin connector plug of the controller, secure it with insulation tape. The simultaneous operation of receiver battery and BEC system is not permitted!

During motor operation, the voltage of the rechargeable battery is continuously monitored by the controller. If the voltage value drops to a certain value, the electric motor is automatically switched off, irrespective of the position of the control stick on the remote control. The residual capacity saved in the rechargeable battery is now only used to supply the receiver and the connected servos in BEC operation.

The controller comprises an integrated voltage monitoring. That is why the used rechargeable battery type has to be programmed on the controller (possible is: NiCd/NiMH, 2-cell LiPo, 3-cell Lipo). With NiCd/NiMH, the controller is switched off at approx. 0.8V per cell, with LiPo at approx. 3V per cell in order to protect the rechargeable battery.

Therefore, the connected rechargeable battery type always has to be programmed first before using the controller (the setting is kept also after having switched off/disconnected the rechargeable battery).

Otherwise, this might lead to the damaging of the rechargeable battery in the case of a total discharge (especially with LiPo batteries)!

Programming of the speed controller / Setup

1. Control lights during operation

The speed controller is equipped with one green and one red LED. During operation they are shining in following order:

- a. Forward with reverse, green LED on.
- b. Forward only, red LED on.
- c. If the battery current reaches cut off voltage, the speed controller stops the motor, and status LED begins to flash; this means in 'forward with reverse' mode: Green LED flashes, in 'forward only' mode: Red LED flashes.

2. Default setting

In delivery state the controller is set to the values below

- | | |
|------------------|----------------------|
| a. Mode: | Forward with reverse |
| b. Battery type: | NiCd |
| c. TIMING: | 4 |
| d. Brake: | Proportional |

3. Calibration

To coordinate R/C unit with the speed controller calibration as below has to be carried out. Put your vehicle on a stable stand so that wheels can rotate freely; switch on the transmitter and then the receiver.

- a. Press the set button on the switch case and hold it, turn the ESC switch to 'ON', and as soon as red LED is shining permanently, release the button.
- b. Pull throttle to full power, red LED goes out and green LED lights up.
- c. Push throttle to maximum brake, green LED flashes then green and red LED turns on.
- d. Put throttle to neutral, red and green LED are then flashing red or green whereas the other LED turns on (if in 'forward only mode', red LED on, if in 'forward with reverse' mode, green LED turns on).

4. How to set your speed controller.

In operation mode, press the set button and hold it, watch the LED, until LED status shows the pattern of the item which you want to set, then release the button. For example, if you want set brake strength, you press and hold the button, until red LED lights up, then release the button, whereupon the red LED begins to flash, and as it flashes one time, press the button two seconds, this will set the ESC to Proportional. If you want set to ABS, you should press the button quickly, whereupon the red LED starts flashing twice, if you now press the button two seconds, the ESC be set to ABS.

If you do not press the button within 10 seconds, the ESC returns to operation mode automatically.

After setting is finished, turn the switch off; if you then switch on again, the ESC will run in new setup.

Below you find a diagram of setting possibilities and LED status belonging to them.

- a. Forward / forward with reverse -- Representative LED and status: one LED on, another flash.
 - I. Red LED on, green LED flashes: Forward with reverse.
 - II. Green LED on, red LED flashes: Forward only.
- b. Brake set -- Representative LED and status: red LED on.
 - I. Red LED flashes once: Proportional.
 - II. Red LED flashes twice: ABS.
- c. Battery set -- Representative LED and status: Green LED on.
 - I. Green LED flashes once: NiCd.
 - II. Green LED flashes twice: 2 Cell-Lipo.
 - III. Green LED flashes three times: 3 Cell-Lipo.
- d. Timing set -- Representative LED and status: Red and green LED on.
 - I. Red and green LED flashes once: 2°.
 - II. Red and green LED flashes twice: 4°.
 - III. Red and green LED flash three times: 6°.
 - IV. Red and green LED flash four times: 8°.
- e. Default set -- Representative LED and status: Red and green LED flash alternately.

Press the button until red & green LED flash alternately, release button, whereupon press button around two seconds, then the ESC will be set to default.

Getting started

Carry out the programming first as described above. First, program the position of the throttle lever (forward/reverse/neutral position), then the rechargeable battery type used.

This is necessary so that the controller can switch off in the case of under-voltage as to prevent a total discharge and damage to the rechargeable battery.

For switching on, proceed as follows:

1. Switch on the transmitter (do not connect the rechargeable battery with the controller yet!).
2. Move the throttle lever into the neutral position.
3. Now connect the rechargeable battery with the controller.
4. Switch on the controller ("ON").
5. You can now put the vehicle in operation and control it via the remote control.

For switching off, proceed as follows:

1. Stop the drive operation.
2. Switch off the controller (switch position "OFF").
3. Disconnect the rechargeable battery from the controller.
4. Switch the transmitter off.

Disposal

Please note and understand the symbols on this product, packaging or instructions. Electronic components are valuable materials and at the end of their useful life should not be disposed with household waste! Help us to protect the environment and safeguard our resources by discarding this equipment at a dedicated recycling point. The authority responsible for waste disposal or your retailer will be able to answer any questions you may have in this respect.



Service-Hotline:
(8.00 Uhr -17.00 Uhr)
(01805) 73 33 00
12 ct/min

Dickie-Tamiya GmbH & Co KG
Mittlere Motsch Str. 9
96515 Sonneberg