

# YGE 40 and 60 electronic speed controller (V5) Governor preprogrammed (mode 2)

## Technical data:

- The specified current is the maximum continuous full power current with adequate cooling.
- 2 to 6s LiPo, with under voltage protection by power reduction.
- Disconnectable under voltage detection.
- Switching BEC: 5.5V, 3A continuous, 5A peak.
- Speed regulation (Governor mode).
- Vbar governor ready with speed sense output.
- Soft start.
- Active free-wheel, allowing unlimited part load operation.
- Automatic or 6 step adjustable timing.
- 3 steps adjustable back EMF brake.
- Switching rate: 8 to 16 kHz.
- Speed limit: 240,000 RPM (2-Pole motors).
- Temperature and overload warning.
- Anti sparking circuit: reduces connection sparkles.
- Mode - Programming

Type	40A	60A
Overall dimensions in mm	62 x 25 x 8	62 x 25 x 8
Weight in g without/with wires	19 / 35	19 / 35
Cable diameter Battery/Motor	2.5 <sup>2</sup> /2.5 <sup>2</sup>	2.5 <sup>2</sup> /2.5 <sup>2</sup>

## Mode 2:

This controller is already programmed for governor use. You do not have to program anything. The throttle end points are set to 1.1 ... 1.9ms. This throttle curve will then correspond from 0 to 100% with the transmitter.

If you want to fly different rpms and switch them in flight ,you have to start the model with the highest rpm.

## Mode 3:

Gov-Store you have to switch once to the highest possible rpm (100%) in order to learn in the motor parameters. Afterwards you can start with the lowest rpm and switch in flight if you want.

Information to mode 1...3

The Gov function starts from 50% of the throttle opening. That is why we do not recommend to operate the heli under 50%.

We recommend the following throttle openings:

Hover (Low RPM)	55 ... 60%
Standard	70%
3D	80 ... 85%

In case rotation is too high with the recommended throttle openings, you should choose a lower pinion or a motor with less kv.

## Initial setup:

**For security and liability reasons we strongly recommend the use of a buffer-battery for the receiver system. 4 cell NiMh battery with minimum 800mAh or any back-up guard must be connected to the receiver or FBL-system in parallel to the BEC.**

Connect the master J/R cable to the receiver throttle channel or FBL System and the red/brown Slave into an empty slot or using an Y-link parallel to a servo output. If you want to use the Vbar governor, connect the orange Slave to the Vbar sensor input.

Once you have connected the battery (red = positiv, black = neg.), you will hear 3 descending beeps. Thereafter you will hear a number of beeps according to the cell number of the connected Lipo battery. In case the transmitter stick is in the throttle off position, you will now hear 3 ascending tones. You need to connect the motor to hear the beeps, as it is the motor itself which acts as a speaker.



--- The ESC is ready for use. ---







If the motor turns in the wrong direction, exchange simply 2 of the 3 motor wires.

Use only clean and tight gold connectors for motor and battery. Pay attention for the battery connector to choose a polarity safe system. Exchange low-friction or oxidized plugs and sockets. Because only tight sitting contacts will ensure a high current flow, protect the speed controller against dangerous voltage peaks and avoid disturbances. With all ESC types, the entire wire length, from the controller to the battery, may not exceed 25cm. If longer wires are necessary, a Low ESR switching capacitor of 330µF/25V should be soldered between plus and minus wires every 20cm. You might also consider using our capacitor module YGE Cap's typ 5. Likewise the motor wires can be extended. Then please twist the 3 lines, in order to minimize interference emission.


**Note: Inverting the battery polarity leads to severe damage and the loss of warranty!!!**

## Mode Programming:

1. For safety reasons remove ALL rotor blades!
2. Switch on TX and move the throttle stick to maximum
3. Connect the battery to the ESC → wait for the interval beep:  after 20 beeps the setup menu is entered: confirmation .
4. Move the throttle stick to minimum and choose the mode:

	Vbar - gov	Mode 1
	Gov - mode	Mode 2
	Gov - store	Mode 3
	Glider with folding propeller and brake	Mode 4
	Motor plane without brake	Mode 5
5. Once you selected a mode, move the throttle stick to maximum: confirmation .

If no mode was selected, the mode programming starts again with Vbar - Gov - mode.

6. Once a mode is selected, move the throttle stick to minimum: confirmation .

Now the ESC is armed and ready for use.

For more information see back of the page.

When activating one of the modes, all relevant heli parameters are set to default. The default will fit nearly all setups. You do not have to program anything else.

Here is a list of the default settings (mode 2):

- Timing = 18°
- Brake off
- cut off type / accutype = slow down / Lipo
- cells = none = automatically cell count
- Act. Freew. on / Gov on
- P-Gain = 0,9
- I-Gain = 0,05
- Startup Speed = Heli middle
- PWM-Frequency = 9 kHz
- Startup Power = Auto 1-32

If it is necessary to change the settings, you need the YGE programming card.

In case another mode is selected, all settings are back on default.

#### **Autorotation (AR) and bailout:**

To use the bailout, the motor should not be switched off during autorotation! Or the ESC uses normal soft start if switched back to flight mode. The motor needs some rpm for the bailout, therefore set the rpm very low: the helicopter should not be able to lift off. We recommend 10 ... 20% throttle opening. If set too low, the motor or ESC might overload.

Always makes the bailout at a safe height!

As soon as the model is on the ground, the motor has to be switched off completely, otherwise there is no soft-start and bailout is active!

#### **Lipo protection / under-voltage protection:**

Because of the tension driven load adjustment, it is possible to fly further with low power, since the battery will recover with a smaller load. However, if the tension continues to break in, the motor will switch off.

#### **Active free-wheel:**

The unlimited partial load capability refers to the maximum full power current .

#### **Temperature / overload warning:**

If the Esc, while being operated, gets too hot, the motor will be reduced to 75% of the current throttle opening. After landing a warning signal will be issued. (3 single beeps).

The partial load operation between half and nearly full power is the most difficult area for an ESC. In case of repeated temperature warnings, better cooling should be provided or the current should be reduced.

These warnings are to be regarded as overload warnings and **not as normal operating conditions**. Because at high temperature the components are strongly stressed, this leads to a decreased life time.

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In order to avoid heat built-up, you will achieve better cooling not just through sufficiently dimensioned air intake, but even more efficiently through a larger air escape.

You achieve smaller currents by using a smaller propeller or a one cell smaller battery.

If the speed controller's temperature exceeds its limit, after landing and/or motor stop, a warning signal is issued (3 Beeps

in the interval). But the motor is **not switched off** in flight unless the temperature becomes extremely critical, then the motor will switch itself off!

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#### **BEC:**

In addition to the use of the BEC, a receiver buffer battery can be connected through a switch cable into a free plug of the receiver or a through Y-cable.

The buffer battery avoids tension drops on hard servo maneuvers, protecting the receiver's functionality.

Make sure that no discharged receiver battery is used, because this would load the BEC additionally by charging the battery. A half or fully loaded Battery will not be charged and is only discharged in extreme conditions. The plus (red) wire of the receiver cable does not need to be disconnected.

You can use an additional BEC; the output voltage should be set at least 0,1V higher than the voltage set-up on the jumper.

Several YGE Escs can be connected to a **single** receiver without any special precautions (Parallel use of all the BECs). The total available maximum load is the sum of the individual BECs.

A configuration without BEC and with galvanic separation is also possible. For that disconnect the red wire or use our opto coupler module.

#### **Caution:**

Basically it is important to make sure that no objects are within the propeller circle when batteries are connected. The use of this speed controller is therefore allowed only in situations where material and personal damage can be excluded. A damaged governor (e.g. broken, damaged by polarity inversion or humidity) should not be reused under any circumstances. Otherwise, malfunctions or failures might occur subsequently. The ESC should only be powered by batteries, the use of power supplies is not allowed.

#### **Trouble shooting:**

- 2 Beeps/flashes: Under-voltage identification
- 3 Beeps/flashes: Temperature rise warning
- 5 Beeps/flashes: Receiver signals failed
- 6 Beeps/flashes: start up failed

The ESC signals any error that happened during flight acoustically (motor) and optically with a blinking LED code.

#### **Warranty:**

We give 6 months warranty on this speedcontroller. Any other requirements are excluded. That applies in particular to requirements for damage or injuries compensation due to malfunction or failure. For damages to property or personal injuries and their consequences, which developed from our supply or craftsmanship, we do not take any liability, since we have no control on handling and use.