

YGE 90 LV, 120 LV and 120 LV K (V3) electronic speed controller (ESC) Governor preprogrammed (mode 2)

Technical data:

- The specified current is the maximum continuous full power current with adequate cooling.
- 3 to 6s LiPo, with under voltage protection by power reduction.
- disconnectable under voltage detection.
- switching BEC: 5.7V / 7.4V / 8.0V, 8A continuous, 18A peak.
- 2 BEC cables (Master and Slave)

Please follow the instructions in this manual regarding the BEC!

- 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	90 LV	120 LV	120 LV K
Overall dimensions in mm	72 x 32 x 13	72 x 32 x 13	72 x 32 x 19
Weight in g without/with wires	53/83	55/85	68/98
Cable diameter Battery/Motor	4 ² / 4 ²	4 ² / 4 ²	4 ² / 4 ²

Mode 2:

The controller is programmed for governor use. You do not have to program anything else. The throttle end points are set to 1.1 ... 1.9ms. This throttle curve will then correspond to 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:

In Gov-Store you have to switch once to the highest possible rpm (e.g. 90%) in order to learn in the motor parameters. Thereafter you can start with the lowest rpm and switch in flight if you want.

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

Information to mode 1...3

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:

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 to 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 to the battery connector and choose a safe polarity 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 to minimize interference emission.

Note: Inverting the battery polarity leads to heavy damage and to 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 are in the wanted mode, move the throttle stick to maximum: confirmation .

If no mode was selected, the mode programming starts again with mode 1 = Vbar - gov.

6. Once a mode was 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 almost all setups. You don't need 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 condition**. Because at high temperature the components are strongly stressed, this leads to a decreased life time.

A high temperature the components are strongly stressed; this leads to a decreased life time.

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 off!

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 the components are strongly stressed at high temperature, this leads to a decreased life time.

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.

BEC:

Please look at the label holding the 3 yellow cables to the right-hand side. There you will find 3 possible BEC voltages, which can be set-up with the Jumper and 4-pole male multi-point connector.

YGE 90 LV and 120 LV

On delivery, the Jumper is on level 5,7V. (Now the top two male connectors are linked). If you connect the two male connectors in the middle, the BEC is on 7,4V. If you connect the two lower male connectors, the BEC will be on 8V.

YGE 120 LVK

On delivery, the Jumper is on level 5,7V. (Now the two lower male connectors are linked). If you connect the two male connectors in the middle, the BEC is on 7,4V. If you connect the top two male connectors, the BEC will be on 8V.

YGE 90 LV, 120 LV and 120 LVK

In case you do not connect any of the male connectors or you loose the Jumper for whatever reason, 5,7V will be set automatically due to safety reasons. Even 8V servos will work smoothly.

If you use a receiver battery, the jumper must needs to be set on the right level. For reasons of safety fix the jumper with glue or tape before using the controller.

You can use different batteries for backup!

- Step 5,7V 4-cell NiMH
- Step 7,4V 2-cell Li-Io / Li-Po
- Step 8,0V 2-cell Li-Po

The receiver battery can be connected through a switch cable into a free plug of the receiver or through a y-cable.

Make sure no discharged backup battery is used, because this would load the BEC additionally by charging the battery. A fully loaded battery will not be charged.

In case you want to use a Backup-Guard, follow the manual of the manufacturer.

You can also use the ESC without the BEC. Here you have to separate the thin plus- wire of the Master cable or use an YGE opto-coupler. The Slave-cable will not be used.

Caution:

As a rule it is important to make sure that no objects are within the propeller circle when batteries are connected. The speed controller can therefore only be used when damage and personal injuries cannot be sustained. A damaged governor (e.g. broken, damaged by polarity inversion or humidity) must never be used again. Otherwise malfunctions or failure might occur. The ESC may only be powered by batteries, it is not allowed to use power supplies.

Trouble shooting:

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

- 2 Beeps/flashes: Under-voltage identification
- 3 Beeps/flashes: Power-part temperature rise warning
- 5 Beeps/flashes: Receiver signals failed
- 6 Beeps/flashes: start up failed
- 7 Beeps/flashes: BEC temperature rise warning

Warranty:

There is 6 months warranty on the speedcontroller. Any other requirements are excluded. In particular, this applies to the requirements for damage or injuries compensation due to malfunction or failure. For damage to property or personal injuries and their consequences, which are based on our supply or craftsmanship, we do not take any liability, since we have no control over handling and/ or use.

