ROTORAMA

ECO II 2306 1700KV

EMAX brushless motor for FPV drones
User Manual



Read this entire manual, especially the safety instructions, before installing and running the motor for the first time. Keep this manual for future reference.

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1. Product description

1.1 Intended use

EMAX ECO II 2306 1700KV is a brushless motor from the EMAX ECO II series. It is used for building and repairing FPV drones: it is attached to the frame arm with four M3 screws, connected to the electronic speed controller (ESC) by three phase wires, and the propeller is mounted on its shaft. The number **2306** indicates the stator size – 23 mm in diameter and 6 mm in height.

The manufacturer designs the ECO II 2306 motors for 5" and 6" drones – for racing and freestyle flying as well as for cinematic footage. Rotorama recommends the **1700 KV** version for racing and freestyle quadcopters powered by a **6S** battery. The motor does not control its own speed; this is done by the ESC according to commands from the flight controller (FC).



EMAX ECO II 2306 motor

1.2 Specifications and package contents

Manufacturer	EMAX
Product designation	ECO II 2306 1700KV
Stator size	2306 (23 mm diameter, 6 mm height)
Speed constant	1700 KV
Recommended power	6S (Rotorama recommendation)
Frame mounting	4 × M3, 16 × 16 mm pattern
Shaft	steel; propeller secured with an M5 nut
Bearings	EZO 9 mm
Magnets	N52SH, arc-shaped
Winding	multi-strand
Wires	3 × 20 AWG silicone wire, 120 mm long
Markings on the bell	2306, CE, RoHS, crossed-out wheeled bin symbol, Made in China

※ The manufacturer does not state the weight, maximum current, maximum power or thrust curves for this motor.

▶ **Package contents**

- 1× EMAX ECO II 2306 1700KV motor
- set of M3 mounting screws in lengths of 6 mm, 7 mm and 8 mm
- 1× aluminium M5 self-locking nut for securing the propeller
- 1× washer and screw for the shaft

Not included: propellers, electronic speed controller (ESC), frame, battery or tools.



Motor with the accessories included in the package (manufacturer's illustrative photo)

2. Use

2.1 Safety instructions

- The motor is intended for modellers with knowledge of building FPV drones. **It is not a toy** and must be kept out of the reach of children.
- **Disconnect the battery** when mounting, soldering or doing any work on the drone.
- When testing the motors on the bench or in the configuration software, **always remove the propellers**.
- Never reach into a spinning motor or the propeller area. A rotating propeller can cause serious injury.
- The motor heats up during operation. Let the motor cool down after a flight before touching it.
- The magnets in the motor attract metal filings and small iron objects. Keep the motor in a clean environment.
- Do not use a motor with visibly damaged windings, a bent shaft or loose magnets.

2.2 Motor overview



View of the motor base

① M3 mounting holes (4×, 16 × 16 mm pattern)

② shaft screw that holds the motor bell on the stator

③ three 20 AWG phase wires in heat-shrink tubing

2.3 Mounting to the frame

The package contains M3 screws in three lengths so that the motor can be attached to arms of different thicknesses. Choose the length so that the screw, when tightened, **does not reach into the motor windings**.

① Place the motor on the frame arm so that the mounting holes ① line up with the holes in the arm and the wires point towards the centre of the frame.

② First screw the screws in by hand. If a screw meets resistance before its head sits on the arm, it is too long.

③ Look through the openings in the bell or under the base and check that the screw tips do not touch the windings.

④ Tighten the screws crosswise. Do not overtighten them – the thread in the motor base may be damaged.

A screw reaching into the windings damages the wire insulation and may cause a short circuit that destroys not only the motor but also the ESC or the flight controller (FC).

2.4 Connecting to the ESC

The motor has three phase wires ③. The order in which they are connected does not matter – it only determines the direction of rotation.

① Cut the wires to the required length, then strip and tin the ends.

② Solder them to the three motor pads on the ESC. The joints must be shiny and solid, with no stray strands that could short to the neighbouring pad.

③ Route the wires along the arm so that they do not touch the propeller or sharp edges of the frame.

The direction of rotation must match the drone configuration (the *Motor direction* setting in Betaflight). To reverse it, swap any two motor wires or – if the ESC supports it – change the direction in the ESC configuration software.

EMAX states that the **motor timing** setting in the ESC depends on the combination of motor, propeller and ESC. In general, smaller motors with higher KV tend to prefer medium to higher timing, while larger motors with lower KV tend to prefer medium to lower timing.

2.5 Mounting the propeller

① Mount the propellers only after checking the direction of rotation of all motors.

② Place the propeller intended for the motor's direction of rotation on the shaft, with the labelled side facing up.

③ Secure the propeller with the aluminium M5 self-locking nut from the package and tighten it firmly; the propeller must not slip on the shaft.

※ A self-locking nut gradually loses its locking ability. If it can be screwed on by hand without resistance after repeated use, replace it.

2.6 First start-up

① With the propellers removed, connect the battery and in Betaflight, on the *Motors* tab, briefly spin up each motor one by one at low speed.

② Check the direction of rotation and smooth running. The motor must not grind, vibrate or make squeaking noises.

③ After the first short flight, check the motor temperature. The motor may be warm, but not hot.

3. Maintenance and troubleshooting

3.1 Regular inspection and maintenance

- After every flight, and especially after a crash, check that the mounting screws and the propeller nut are tight.
- Turn the bell by hand: it must rotate easily and evenly, without grinding or play.
- Remove dirt, sand, grass and metal filings from the gap between the stator and the magnets.
- Check that the shaft is straight and the magnets are firmly held in the bell.
- Check the wire insulation and the solder joints on the ESC.
- Replace a motor with a bent shaft or damaged windings.

3.2 Troubleshooting

Problem	Possible cause and solution
The motor overheats (you cannot keep your hand on it for more than 3 seconds)	A mounting screw reaches into the windings – use a shorter screw. Loose magnets – stop using the motor. Dirt between the stator and the magnets – clean it.
The motor stutters or loses synchronisation (desync)	Unsuitable motor timing in the ESC – adjust the setting. Damaged winding or broken wire – check the windings and solder joints.
The motor spins in the wrong direction	Swap any two motor wires, or change the direction in the ESC configuration.
The motor grinds or is noisy	Dirt in the motor, worn bearing or a shaft bent in a crash – clean it or replace the motor.
Loose magnet in the bell	Stop using the motor and contact the seller. Damage caused by an impact or crash is not a manufacturing defect.

4. Information for the EU and Czech Market

4.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.com

4.2 Disposal of electrical equipment



- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu.

5. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 4.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.