



ECO II 2807 1300KV

EMAX – brushless motor for FPV multicopters
User manual



Read the entire manual before installation and first use. Always remove the propellers and disconnect the battery when working on the model.

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1. Safety instructions

1.1 General principles

Read this entire manual before installing and first running the motor, and keep it for future reference. The motor is designed to drive the propeller of a radio-controlled model (FPV multicopter). Installation and operation should be carried out by a person with basic knowledge of electronics and model building; inexperienced users should work under the supervision of an experienced modeller.

- This product is not a toy. Keep it out of the reach of children – small parts (screws, nuts, washers) can be swallowed.
- Operate the motor only with a suitable electronic speed controller (ESC). Never connect it directly to a battery or a power supply.
- Do not exceed the permitted battery cell count, peak current or maximum power given in Chapter 2.4.
- Do not modify or disassemble the motor beyond the routine maintenance described in this manual.

1.2 Rotating propellers

A rotating propeller can cause serious injury. During any work on the model (assembly, soldering, configuration, motor testing) keep the propellers removed and the battery disconnected.

- Before connecting the battery, make sure the transmitter is switched on and the model is disarmed (Disarm – motors off).
- While the motor is running, stay out of the propeller's plane of rotation and keep hands, hair and loose clothing away from it.
- Use only undamaged propellers. Replace a cracked, bent or chipped propeller immediately.
- Before every flight, check that the propeller nut and the motor screws are tight.

1.3 Electrical and thermal hazards

- At full load, a high current flows through the motor leads. Joints must be properly soldered and insulated; a short circuit can damage the ESC and the battery and cause a fire.
- The motor heats up during operation. After a flight, do not touch its housing until it has cooled down.
- Overload (an oversized propeller, a blocked rotor, excessive voltage) can overheat the windings and destroy both the motor and the ESC.
- The rotor magnets attract metal objects. Keep the motor away from metal filings and small ferrous objects, and away from magnetically sensitive devices and media.

2. Product description

2.1 Intended use

The EMAX ECO II 2807 1300KV is a brushless motor of the ECO II series for FPV multicopters. The manufacturer specifies it for 3–6S batteries and 6"–7" propellers. The motor has a steel shaft, N52 magnets and multi-strand windings.

The 1300KV version is suited above all to long-range quads with 7" propellers. Rotorama recommends combining it with a **6S** battery.

2.2 Package contents

- 1× EMAX ECO II 2807 1300KV motor with leads
- 5× M3×10 screw
- 5× M3×8 screw
- 1× aluminium M5 self-locking nut (nylock) for the propeller
- 1× washer and screw for the shaft



Package contents (manufacturer's illustrative photo)

Not included: speed controller (ESC), propellers, frame, flight controller (FC) or battery.

2.3 Parts



Motor parts

- ① Shaft with M5 thread for the propeller
- ② Rotor (bell) with N52 permanent magnets
- ③ Stator with windings
- ④ Base with 4 M3 mounting holes

Three 18 AWG leads, 200 mm long, exit from the motor base for connection to the speed controller (ESC).

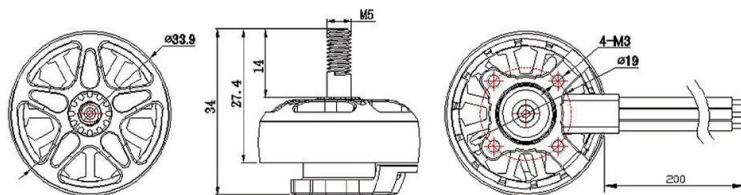
2.4 Specifications

Manufacturer	EMAX
Type	ECO II 2807 1300KV
Configuration	12N14P
Kv	1300
Motor dimensions	Ø 33.9 × 34 mm
Shaft	Ø 4 mm in bearings, M5 thread
Mounting	4× M3 on a Ø 19 mm bolt circle
Leads	18 AWG silicone, 200 mm long
Weight	47.6 g (without silicone leads)
Magnets	N52
Battery cell count	3-6S
Propeller	6"-7"
Idle current (10 V)	1.3 A
Internal resistance	58 mΩ
Peak current (6S)	52 A
Max. power (6S)	1310 W

Data as specified by EMAX.

2.5 Dimensions

ECOII-2807



Manufacturer's dimensional drawing (dimensions in mm)

The overall height of the motor is 34 mm and the M5 threaded shaft is 14 mm long. The 4× M3 mounting holes lie on a Ø 19 mm bolt circle.

2.6 Performance data

The manufacturer measured the motor at **25.2 V** (fully charged 6S battery) with the propellers listed below. The last row of each table corresponds to full throttle; the manufacturer does not state the speed for it. The values are indicative – actual thrust and current draw depend on the propeller, battery condition, ESC and ambient conditions.

► Propeller Gemfan 7042, 2-blade

Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)	Speed (RPM)
2.2	300	55.44	5.41	8440
4	500	100.80	4.96	10550
5.4	700	136.08	5.14	12370
9.3	900	234.36	3.84	13960
12.4	1100	312.48	3.52	15360
47.9	2190	1207.08	1.81	max

► Propeller Gemfan 7040, 3-blade

Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)	Speed (RPM)
2.3	300	57.96	5.18	8920
4.1	500	103.32	4.84	11000
6.4	700	161.28	4.34	12800
9.3	900	234.36	3.84	14400
12.5	1100	315.00	3.49	15700
45.2	2490	1139.04	2.19	max

► Propeller HQ 7×3.5×3, 3-blade

Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)	Speed (RPM)
2.1	300	52.92	5.67	7990
4	500	100.80	4.96	10100
6.4	700	161.28	4.34	11700
9.2	900	231.84	3.88	13200
12.4	1100	312.48	3.52	14600
47.1	2580	1186.92	2.17	max

► Propeller HQ 7×4×3, 3-blade

Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)	Speed (RPM)
2.2	300	55.44	5.41	6550
4.2	500	105.84	4.72	9600
6.5	700	163.80	4.27	11100
9.4	900	236.88	3.80	12500
13.4	1100	337.68	3.26	13900
51.2	2640	1290.24	2.05	max

3. Installation

3.1 What else you need

- **Speed controller (ESC)** rated for the voltage of the battery used and for the motor current – the manufacturer states a peak current of 52 A at 6S.
- **Frame** with 4× M3 motor holes on a Ø 19 mm bolt circle.
- **Propellers** 6"-7" in diameter with a hub for an M5 shaft.
- **Battery** Li-Po 3-6S (we recommend 6S for this version).
- Solder, a soldering iron with sufficient power, heat-shrink tubing, a hex key and a wrench for the M5 nut. We recommend medium-strength threadlocker (e.g. blue Loctite).

3.2 Mechanical installation

- ① Place the motor on the frame arm with the leads pointing towards the centre of the frame and align the holes.
- ② Choose screws to suit the arm thickness: M3×8 and M3×10 screws are included. The screw must engage the thread in the base but must not touch the stator windings.
- ③ Secure the screws with medium-strength threadlocker and tighten them evenly in a cross pattern. Do not overtighten – you could strip the thread in the base.
- ④ After tightening, turn the rotor by hand. It must spin freely, without rubbing and without foreign particles between the rotor and the stator.

A screw that is too long can damage the winding insulation and cause a short circuit that destroys both the motor and the ESC. Always check the length before tightening.

3.3 Connecting to the speed controller (ESC)

- The motor has three equivalent leads. Connect them to the three ESC outputs for that motor in any order – the order only determines the direction of rotation (see 3.4).
- You can shorten the leads to the required length. Strip and tin the ends and solder quickly with a sufficiently powerful iron so as not to damage the insulation.
- Check that the finished joints do not touch adjacent pads and insulate them if necessary.
- Route the leads along the arm and secure them with a cable tie so that they cannot reach the propeller or chafe on the frame edges.

3.4 Direction of rotation

The direction of rotation of each motor must match the motor layout in the flight controller (FC) configuration. You can change the direction in one of these ways:

- by swapping any two motor leads,
- by reversing the direction in the ESC configuration (e.g. in the ESC firmware configurator or in Betaflight on the *Motors* tab using the motor direction function).

Always check the direction of rotation with a motor test **with the propellers removed** (Chapter 4.1).

3.5 Fitting the propeller

- ① Check that the propeller type (CW / CCW) matches the motor's direction of rotation – the leading edge of the blade must go first in the direction of rotation.
- ② Fit the propeller on the shaft and screw on the M5 self-locking nut.
- ③ Tighten the nut firmly with a wrench while holding the rotor, not the propeller.
- ④ A self-locking nut loses its locking effect with repeated use. If it screws on without resistance, replace it.

The included screw and washer secure the shaft from the underside of the motor. If it comes loose, the rotor can slide off the shaft in flight – so check that it is tight during inspections.

4. Commissioning

4.1 Motor test without propellers

- ① Remove all propellers.
- ② Connect the flight controller to a computer and open the configurator (e.g. Betaflight Configurator), *Motors* tab.
- ③ Connect the battery, confirm the safety notice and spin up each motor in turn at low throttle.
- ④ Check that the correct motor spins, in the correct direction, smoothly and without unusual noise or vibration.
- ⑤ Disconnect the battery and only then fit the propellers.

4.2 Flight controller and ESC settings

- The motor has a 12N14P configuration, i.e. **14 magnetic poles**. Enter this value in the *Motor poles* parameter in Betaflight (*Motors* tab), otherwise RPM filtering (RPM filter) and the RPM readout will not work correctly.
- Set the FC-ESC protocol (e.g. DShot) and other ESC parameters according to the manuals of your flight controller and speed controller.

4.3 First flight and temperature check

- Before flying, fit a fully charged battery (Li-Po 4.20 V/cell, 25.2 V for 6S) and check that the propellers are tight.
- After a first short flight, land, Disarm (motors off), disconnect the battery and carefully check the motor temperature. A very hot motor indicates overload (an oversized or aggressive propeller), poor filter settings or a faulty joint.
- End the flight at 3.5 V/cell (21.0 V for 6S) at the latest.

5. Maintenance and troubleshooting

5.1 After-flight check

- Remove grass, dust and dirt from the motor. The rotor magnets attract metal particles that can damage the windings – especially after landing in sand or soil.
- Turn the rotor by hand. Rubbing, grinding or noticeable play indicate a damaged bearing or a foreign object in the motor.
- Check for a bent shaft (the propeller wobbles when spinning) and check that the motor screws, the propeller nut and the shaft retaining screw are tight.
- Check the insulation of the leads and the solder joints on the ESC.

5.2 Storage

Store the motor in a dry place, away from moisture, dust and metal filings. Protect it from drops and impacts, which can bend the shaft or damage the bearings. After flying in damp conditions, let the motor dry thoroughly before storing it.

5.3 Troubleshooting

Problem	Possible cause and solution
Motor spins the wrong way	Swap two leads or reverse the direction in the ESC configuration (Chapter 3.4).
Motor does not spin, only beeps or twitches	Cold or broken joint, short between leads, faulty ESC output. Check the soldering. Make sure the rotor turns freely.
Rubbing, grinding, noise	Foreign particles between rotor and stator, damaged bearing or a mounting screw that is too long. Clean the motor, check the screws.
Strong vibration	Bent shaft, damaged or unbalanced propeller, loose propeller nut. Replace the propeller, check the shaft.
Motor overheats	Oversized or aggressive propeller, unsuitable filter and PID settings, damaged windings. Use a smaller propeller and check the settings.
Rotor has play or has slipped	Loose shaft retaining screw. Tighten it with threadlocker.

6. Information for the EU and Czech Market

6.1 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@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.com

6.2 Product conformity



- The product bears the **CE** marking and complies with the requirements of the applicable European Union harmonisation legislation.
- A copy of the **EU Declaration of Conformity** is available from the importer at the address stated above or at the e-mail address info@rotorاما.cz.
- **Product identification:** the type designation (EMAX ECO II 2807 1300KV) is given on the packaging; the size (2807) and the Kv rating are marked on the motor.

6.3 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>.

7. 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 6.1.
- 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.