ROTORAMA

XING2 2506 1500KV

Brushless motor for FPV drones
User Manual



Read the entire manual before installation and first start-up. Never test the motor on the workbench with a propeller fitted.

www.rotorama.com

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1. Safety instructions

1.1 Before you start

The iFlight XING2 2506 1500KV motor is a high-performance component intended for installation in an FPV drone. Installation, wiring and commissioning require experience with soldering, with configuring the flight controller (FC) and electronic speed controller (ESC), and with handling Li-Po batteries. If you do not have this experience, ask an experienced modeller for help.

- This product is not a toy and is not intended for children.
- Before installation, check that the motor, shaft and leads are not damaged.
- Keep this manual and hand it over to the next user together with the product.

1.2 Rotating propellers and mechanical hazards

- With a propeller fitted, the motor reaches high speeds and produces high thrust. A rotating propeller can cause serious cuts and damage property.
- Whenever you work on the drone (wiring, configuration, motor testing), keep the **propellers removed**.
- Connect the battery only just before the flight and disconnect it immediately after landing. As long as the battery is connected, treat the motors as live.
- Before Arm (enabling the motors), make sure nobody is near the drone.
- Do not use damaged propellers or a motor with a bent shaft – they may break apart or cause uncontrolled vibration.

1.3 Electrical and thermal hazards

- The motor is powered exclusively through an ESC. Never connect it directly to a battery or any other voltage source.
- When soldering the leads, make sure the joints are of good quality, without short circuits between phases and properly insulated. A short circuit or a cold joint can damage the ESC and cause a fire.
- The motor heats up during operation. After a flight, do not touch the bell or stator until they have cooled down.
- Charge Li-Po batteries only with a suitable charger, under supervision and on a non-flammable surface. Do not use a damaged, swollen or overheated battery.
- The strong neodymium magnets in the bell attract metal objects and small metal debris. Do not handle the motor near metal filings or sensitive items (magnetic cards, pacemakers).

1.4 Operating the finished drone and regulations

The motor itself is not an unmanned aircraft. However, the drone in which you install it is subject to Regulations (EU) 2019/945 and 2019/947. These regulations apply in all Member States of the European Union, but national implementing rules differ from country to country – registration portals, minimum pilot age, geographical zones, mandatory insurance, permitted frequency bands and maximum transmit power. **The law of the country in which you operate the drone always prevails.** In the Czech Republic, the Civil Aviation Authority (www.caa.cz) provides information on the operating rules.

2. Product description

2.1 Intended use

The iFlight XING2 2506 1500KV is a 2506-size brushless motor intended for heavier freestyle and long-range FPV drones carrying, for example, an action camera. It performs best in combination with a 6S battery and a 6" propeller.

The motor bell is made of 7075 aluminium alloy, the rotor uses centre-slotted N52H curved arc magnets and the 5 mm shaft is made of titanium alloy. The motor runs on NSK 10×4×4 mm bearings, the bearing gap is protected by an O-ring and the leads are covered by a protective sleeve. The motor is dynamically balanced.

2.2 Package contents

Not included: propeller, ESC, flight controller (FC), frame, battery and connectors. The data in this manual apply to the **1500KV** version.



Package contents

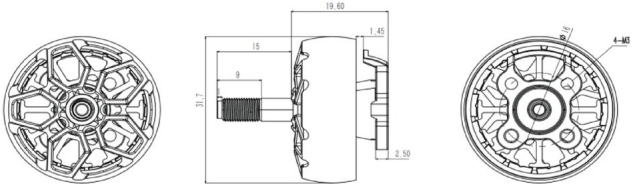
1×	iFlight XING2 2506 1500KV motor (black)
4×	M3 × 8 mm screw for mounting the motor on the frame
1×	M5 flanged nylon-insert lock nut for securing the propeller

2.3 Specifications

Parameter	Value
Model	XING2 2506 1500KV (Black)
KV	1500 KV
Weight (including leads)	38.2 g
Motor dimensions (diameter × height)	φ 31.7 × 19.6 mm
Overall height including shaft	34.6 mm
Interphase resistance	74.88 mΩ
Input voltage	25.2 V
Peak current	33.26 A
Maximum power	817.5 W
Mounting holes	16 × 16 mm, 4× M3
Rotor design	Unibell (one-piece bell)
Shaft diameter	5 mm
Shaft protruding length	15 mm
Leads	160 mm, 20 AWG
Magnets	N52H, curved
Configuration	12N14P
Bearings	NSK, φ 10 × φ 4 × 4 mm
Winding	single-strand copper wire

Data provided by the manufacturer iFlight. The overall height of 34.6 mm is the sum of the motor height of 19.6 mm and the protruding shaft length of 15 mm.

2.4 Dimensions and mounting holes



Manufacturer's dimensional drawing (mm): top, side and bottom view with four M3 holes on a φ 16 mm pitch circle

2.5 Measured performance data

The manufacturer tested the motor on 6S power with two types of 6-inch tri-blade propellers. The values are intended as guidance for choosing the propeller and ESC; actual in-flight values depend on the battery condition, propeller, ESC and ambient temperature.

▶ HQ 6×2.5×3 propeller – motor temperature after test 82 °C

Throttle (%)	Voltage (V)	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)
50	25.17	5.57	532	140.2	3.792
60	25.14	8.90	761	223.7	3.401
70	25.04	12.88	1006	322.5	3.120
80	24.92	18.39	1293	458.3	2.822
90	24.76	24.36	1558	603.2	2.583
100	24.60	31.81	1860	782.5	2.376

▶ Gemfan 6030-3 propeller – motor temperature after test 80 °C

Throttle (%)	Voltage (V)	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)
50	25.19	6.33	594	159.5	3.723
60	25.12	9.82	829	246.7	3.359
70	25.02	14.16	1080	354.3	3.047
80	24.88	19.72	1352	490.6	2.756
90	24.76	25.91	1607	641.5	2.505
100	24.58	33.26	1872	817.5	2.289

Source: iFlight test report for the XING2 2506 1500KV.

3. Choosing the power system

3.1 Electronic speed controller (ESC)

- The motor is a three-phase brushless motor and requires a brushless ESC rated for the voltage of the battery used.
- Choose an ESC whose continuous current rating covers the motor's peak current of **33.26 A with a margin** (manufacturer's figure, measured at full throttle with a Gemfan 6030-3 propeller).
- A propeller with a higher pitch or larger diameter than those used in the manufacturer's test draws more current. In that case, verify the current by measurement.

3.2 Battery

The manufacturer specifies an input voltage of **25.2 V**, which corresponds to a fully charged **6S Li-Po** battery. Batteries with a higher voltage (for example 6S LiHV, 26.1 V fully charged) exceed this manufacturer's figure.

Li-Po battery state	Per cell	6S
Fully charged	4.20 V	25.2 V
End the flight	3.5 V	21.0 V
Storage	3.8 V	22.8 V

Before every flight, insert a **fully charged** battery into the drone.

3.3 Propellers



XING2 2506 motor with a 6-inch propeller fitted

- The motor is intended for 6" propellers. The manufacturer tested it with HQ 6×2.5×3 and Gemfan 6030-3 propellers (see chapter 2.5).
- The propeller must have a mounting hole for a 5 mm shaft.
- Use undamaged propellers only. Always replace a bent, cracked or chipped propeller.

4. Installation

4.1 Mounting the motor on the frame

① Place the motor on the frame arm so that the M3 holes in the motor base (16 × 16 mm pattern) line up with the holes in the arm and the leads point towards the centre of the frame.

② Fasten the motor with the four supplied M3 × 8 mm screws. Tighten the screws gradually in a cross pattern.

③ After tightening, turn the bell by hand. It must rotate freely, without rubbing or clicking.

The screw must not touch the stator windings inside the motor. If the frame arm is thin and the screw would protrude into the motor, use a shorter screw. Always check before tightening that the screw does not reach the windings – damaged windings cause a short circuit and destroy both the motor and the ESC.

We recommend using medium-strength threadlocker on the screws. Make sure no threadlocker gets into the bearings.

4.2 Connecting to the ESC



Bottom of the motor with mounting holes and leads

① The motor has three 160 mm (20 AWG) phase leads. Cut them to the required length so that they are neither under tension nor in the way of the propeller.

② Strip and tin the ends of the leads and solder them to the three phase pads of the ESC. The order of the leads only determines the direction of rotation (see chapter 5.2).

③ Check that there is no short circuit between adjacent pads and that no strand is sticking out.

④ Secure the leads on the arm (with a cable tie or heat-shrink tubing) so that they cannot get into the propeller.

4.3 Fitting the propeller

Fit the propeller only after a successful test without propellers and after checking the direction of rotation (chapter 5).

① Place the propeller on the shaft with its markings facing up, matching the direction of rotation of the motor.

② Secure the propeller with the M5 flanged lock nut. Tighten the nut firmly but do not overtighten – you could damage the propeller or the shaft thread.

③ A nylon-insert lock nut loses its locking effect after repeated use. Replace a worn nut.

5. Commissioning

5.1 Test without propellers

- Connect the battery for the first time **without propellers**, ideally through a current limiter (smoke stopper).
- Spin up the motors in the flight controller configurator (Betaflight, *Motors* tab) or in the ESC configurator. The motor must start smoothly, without stuttering or unusual noises.
- If the motor does not spin up or only twitches, disconnect the battery immediately and check the solder joints (chapter 7.4).

5.2 Direction of rotation

Each motor must spin in the direction that matches the motor layout configured in the flight controller (for example *Props in* or *Props out*). Check the direction during the test without propellers – for example by lightly touching the bell with a strip of paper.

- Reverse the direction of rotation by **swapping any two of the three phase leads**, or by reversing the direction in the ESC configuration (for example in the ESC configurator).
- If the flight controller is set to reversed motor direction (*Motor direction is reversed*), the direction in the ESCs must match.

5.3 Betaflight settings

- The motor has a 12N14P configuration, i.e. **14 magnetic poles**. When using bidirectional DShot and RPM filtering, set *Motor poles* to **14** on the *Motors* tab in Betaflight.
- Other settings (protocol, filters, PID) depend on the complete drone build. Follow the documentation of the flight controller and ESC.

6. Operation

6.1 Pre-flight check

- Insert a **fully charged** battery into the drone (6S Li-Po: 4.20 V/cell, 25.2 V).
- The motor is firmly screwed in place and the bell turns freely without rubbing or play.
- The shaft is not bent and the propeller nut is tight.
- The propellers are undamaged and fitted in the correct direction.
- The leads are secured and cannot get into the propeller.
- The battery is firmly attached; the connector and cables are undamaged.

6.2 Motor load and temperature

- End the flight no later than at **3.5 V/cell (21.0 V for 6S)**.
- After the first flights with a new build, check the motor temperature. A motor that is noticeably hotter than the others after a normal flight, or that you cannot briefly keep your hand on, is overloaded or poorly tuned.
- Overheating is usually caused by an oversized propeller, a damaged bearing, unsuitable filter and PID settings or frame vibration.
- Overheating can permanently weaken the magnets and damage the winding insulation. Such damage is not a product defect.

7. Maintenance and troubleshooting

7.1 After every flight

- Disconnect the battery and let the motors cool down.
- Remove grass, sand and other debris from the motor. The magnets attract small metal particles – keep the gap between the bell and the stator clean.
- After a crash, check the shaft, bell, mounting screws and leads. Turn the bell by hand and listen for grinding bearings.

7.2 Bearings and shaft

- The motor uses NSK bearings of φ 10 × φ 4 × 4 mm. A worn bearing shows itself by noise, play or rubbing.
- Do not lubricate the motor with oil or spray – lubricant attracts dirt.
- Do not straighten a bent shaft. Do not continue to use a motor with a bent shaft.

7.3 Storage

Store the motor in a dry place, away from dust and metal filings, at room temperature. Store batteries at 3.8 V/cell (22.8 V for 6S).

7.4 Troubleshooting

Problem	Possible cause and solution
Motor does not spin up, only twitches or beeps	Cold joint or broken lead on one phase – check and resolder the joints. Check whether a screw has damaged the windings.
Motor spins the wrong way	Swap two phase leads or reverse the direction in the ESC configuration (chapter 5.2).
Motor is very hot after flight	Oversized propeller, unsuitable filter and PID settings, damaged bearing or frame vibration. Check that *Motor poles* = 14.
Vibration, noise, grinding	Damaged propeller, bent shaft, worn bearing or debris in the gap between the bell and the stator.
Motor is loose on the frame	Tighten the mounting screws and secure them against loosening.

8. Information for the EU and Czech Market

8.1 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

8.2 Product conformity

CE

- 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@rotorama.cz.
- **Product identification:** the type designation (XING2 2506 1500KV) is stated on the product packaging.

8.3 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.

9. 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 8.1.
- 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.