



XING2 1404 4600Kv

Brushless motor for FPV drones
User manual



Read this entire manual carefully before installation and first use, and keep it for future reference.

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1. Safety instructions

The XING2 1404 4600Kv motor is a powerful component designed to be built into an FPV drone. Incorrect installation, wiring or setup may cause injury, damage to property or a crash of the drone. The product is not a toy and is not intended for children.

- Have the installation and wiring carried out by a person experienced in soldering and building FPV drones.
- Disconnect the battery before any work on the drone.

1.1 Rotating parts and propellers

- The motor runs at very high speed. The rotating motor bell and especially the propellers can cause serious cuts.
- Always carry out all motor tests (direction check, motor test in the configuration software) **without propellers**.
- Fit the propellers only just before flying, and keep away from the propellers whenever a battery is connected, even when the motors are in Disarm state (motors switched off).
- Never use cracked, bent or otherwise damaged propellers, and never fly with a motor whose shaft is bent.
- The motor contains strong permanent magnets that attract metal objects (screws, filings, tools). Keep dirt out of the motor.

1.2 Electrical and thermal hazards

- The motor may only be powered through a speed controller (ESC) designed for brushless motors. Never connect it directly to a battery.
- The manufacturer specifies a **3S-4S** power supply. Do not use a higher voltage.
- The motor heats up during operation. Do not touch it after a flight until it has cooled down.
- Insulate bare or damaged wires (with heat-shrink tubing). A short circuit between the phase wires or to the frame can destroy the ESC and cause a fire.
- Solder in a well-ventilated area and beware of the risk of burns.

1.3 Operating the finished drone

The drone in which you install the motor is subject to the rules on unmanned aircraft – in the European Union in particular Regulations (EU) 2019/947 and 2019/945. National implementing rules, however, differ from country to country (operator registration, pilot competency, geographical zones, insurance, frequencies and transmitting power). **The law of the country in which you operate the drone always applies.** The operator and the pilot are responsible for compliance with the regulations.

2. Product description

2.1 What the motor is for

The XING2 1404 4600Kv is a brushless outrunner motor made by iFlight. The manufacturer designed it for ultralight toothpick-style builds and small FPV drones; the XING2 1404 series is made in 3000Kv, 3800Kv and 4600Kv versions – this manual applies to the **4600Kv** version.

The motor bell is made in one piece (Unibell) from 7075 aluminium alloy. The motor uses curved, centre-slotted N52H magnets, NSK bearings and an O-ring above the bearing which, according to the manufacturer, absorbs impacts in a crash and helps keep the bearing in good condition.

2.2 Package contents

Qty	Item
1×	XING2 1404 4600Kv motor (Unibell) with lead wires
4×	M2 × 5 mm screw
4×	M2 × 7 mm screw

Propellers, speed controller (ESC), frame, battery and connectors are **not** included.

2.3 Parts description



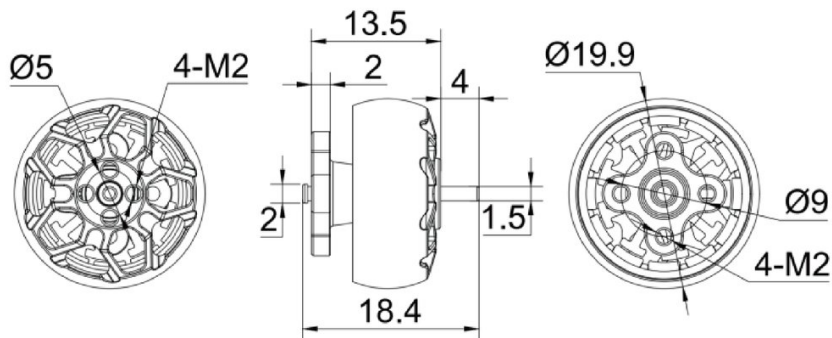
XING2 1404 motor – side view

- ① Ø 1.5 mm shaft – carries the propeller.
- ② Motor bell (Unibell rotor) with built-in magnets – rotates during operation.
- ③ Stator winding – must not be touched by the mounting screws.
- ④ Base with four M2 threaded holes for mounting on the frame arm.

2.4 Specifications and dimensions

Parameter	Value
Stator size	1404
Speed constant (Kv)	4600 rpm/V
Power supply	3S-4S
Peak current	17.99 A
Maximum power	287.8 W
Interphase resistance	159 mΩ
Weight (including wires)	9.1 g
Dimensions (diameter × height)	Ø 19.9 × 18.4 mm
Mounting	4× M2, 9 × 9 mm pattern
Shaft	Ø 1.5 mm, protruding length 4 mm
Rotor	Unibell, 7075 aluminium alloy
Magnets	N52H, curved
Configuration	9N12P (9 stator teeth, 12 magnets)
Bearings	NSK, Ø 5 × Ø 2 × 2 mm
Winding	single-strand copper wire
Lead wires	3×, 120 mm long, 26 AWG

Data according to the manufacturer iFlight. Performance values apply to the test with a 4030 propeller at 16 V (see Chapter 2.5).



Dimensional drawing according to the manufacturer (dimensions in mm). From left: base view, side view, top view.

2.5 Manufacturer's performance data

The manufacturer tested the motor with a **4030** propeller at a supply voltage of **16 V**. Motor temperature after the test: 55 °C. The data are for rough comparison only; actual values depend on the propeller, battery voltage, ESC and operating conditions.

Throttle	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)
50 %	3.12	254	49.9	5.088
60 %	5.97	382	95.5	3.999
70 %	8.22	452	131.5	3.437
80 %	10.72	491	171.5	2.863
90 %	13.74	539	219.8	2.452
100 %	17.99	574	287.8	1.994

3. Installation

3.1 What else you need

- a drone frame with motor mounting holes in a 9 × 9 mm pattern for M2 screws,
- a speed controller (ESC) for brushless motors rated for a 3S–4S supply and for the motor current (the manufacturer specifies a peak current of 17.99 A),
- propellers for a Ø 1.5 mm shaft,
- a soldering iron, solder, flux, heat-shrink tubing and an M2 screwdriver,
- a computer with the configuration software of the flight controller (FC), e.g. Betaflight Configurator.

3.2 Mounting the motor on the frame

The package contains screws of two lengths – **M2 × 5 mm** and **M2 × 7 mm**. Choose the length according to the thickness of the frame arm and any spacers.

- ① Place the motor on the arm so that the arm holes line up with the M2 threads in the base and the wires point towards the frame centre.
- ② Try the shorter screw first. The screw must engage the thread sufficiently but **must not touch the stator winding**.
- ③ Tighten the screws gently, in a crosswise pattern – the small thread in the base is easily stripped.
- ④ Turn the bell by hand: it must rotate easily, without rubbing.

✱ **A screw touching the winding damages the wire insulation and causes a short circuit that can destroy both the motor and the ESC.**

3.3 Connecting to the speed controller (ESC)

The motor has three phase wires. With a brushless motor **the order does not matter** in which you connect them to the three solder pads of the ESC – the order only determines the direction of rotation (Chapter 4.1).

- ① Route the wires along the arm and cut them to the required length with a small reserve.
- ② Strip the ends only as much as necessary and tin them as well as the ESC solder pads.
- ③ Solder each wire to one motor pad on the ESC – shiny, solid joints without solder bridges.
- ④ Secure the wires on the arm (cable tie, heat-shrink) so that they cannot get into the propeller.
- ⑤ Check for short circuits before connecting a battery for the first time; we recommend a current limiter (smoke stopper).

4. Setup and checks

4.1 Direction of rotation

Each motor must rotate in the direction that corresponds to its position on the frame and to the flight controller (FC) settings. You can change the direction of rotation in one of two ways:

- **in software** – in the ESC configuration software (depending on the ESC firmware, e.g. BLHeli_S, Bluejay, AM32) or in Betaflight on the *Motors* tab, if the ESC firmware supports it,
- **in hardware** – by swapping any two of the three motor wires on the ESC.

The software change is more convenient and requires no re-soldering.

4.2 Betaflight settings

- The motor has a **9N12P** configuration, i.e. 12 magnets (rotor poles). If you use Bidirectional DShot and RPM filtering, set the *Motor poles* parameter on the *Motors* tab to **12**.
- Select a DShot motor protocol supported by your ESC.
- Tune PID and filter settings to the whole aircraft – they depend on the frame, propellers and battery, not only on the motor.

4.3 Motor check without propellers

The propellers must be removed for this check.

- ① Connect the drone to the computer and open the *Motors* tab in Betaflight.
- ② Connect the battery (preferably through a current limiter) and confirm the safety warning of the software.
- ③ Spin up each motor in turn at low speed with the slider and check that the correct motor spins in the correct direction according to the diagram in the software.
- ④ The motor must spin up smoothly, without stuttering, unusual noise or vibration.
- ⑤ After the check, disconnect the battery and make sure that no motor is excessively warm.

5. Fitting propellers and first flight

5.1 Fitting propellers

- Use propellers designed for a **Ø 1.5 mm** shaft and fit them according to the instructions of their manufacturer.
- Each propeller must match the direction of rotation of its motor (CW / CCW).
- The propeller must sit firmly on the shaft without wobbling. A loose propeller can fly off in flight.
- The motor manufacturer gives performance data for a 4030 propeller (Chapter 2.5). A larger or higher-pitch propeller increases the current and the heating of the motor.

5.2 Power supply and battery

The motor is designed for a **3S-4S** battery. Insert a **fully charged** battery before flying and observe these values:

Li-Po battery state	per cell	3S	4S
fully charged	4.20 V	12.6 V	16.8 V
end the flight	3.5 V	10.5 V	14.0 V
storage	3.8 V	11.4 V	15.2 V

6. Maintenance and storage

- After the first short flight, land, disconnect the battery and check the motor temperature. The motor may be warm, but not so hot that you cannot keep your finger on it.
- An overheated motor indicates a propeller that is too large, oscillation (poorly tuned PID or filters), a damaged bearing or a bent shaft.
- Check that the motor and propeller screws are tight.
- After every flight, and especially after a crash, check that the shaft is not bent, the bell is not cracked or deformed and the motor turns freely and quietly.
- Remove dirt, grass and sand from the motor. Carefully remove metal particles attracted by the magnets, e.g. with adhesive tape.
- Check the wire insulation and solder joints; insulate damaged wires or replace the motor.
- Do not straighten a bent shaft – a motor with a bent shaft vibrates and stresses the bearings. Replace the motor.
- Protect the motor from moisture. After flying in damp conditions, let it dry thoroughly.
- Store in a dry place, out of the reach of children and away from metal filings and small iron objects.

7. Troubleshooting

Problem	Possible cause and solution
Motor does not spin, only twitches or beeps	Cold or broken solder joint, solder bridge between pads, damaged wire. Check the soldering. Check that no screw touches the winding.
Motor spins in the wrong direction	Change the direction in the ESC configuration or swap two motor wires (Chapter 4.1).
Drone flips over on take-off	Wrong direction of rotation, wrong motor order in the FC or propellers fitted the wrong way. Verify with the check without propellers (Chapter 4.3).
Motor very hot after flight	Propeller too large, oscillation (PID, filters), wrong number of poles for the RPM filter (should be 12), damaged bearing.
Vibration, irregular noise	Bent shaft, damaged bell, damaged propeller, worn bearing or dirt in the motor.
Motor rubs when turned by hand	Dirt or metal particles between the magnets and the stator, damaged bearing, screw too long.

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

8.2 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 (XING2 1404 4600Kv) is given in this manual and in the purchase document; the XING2 series name is marked on the motor bell. Manufacturer: iFlight Intelligent Technology Ltd., Huizhou, China, support@iflight.com.

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.