Datura 2105.5 3650KV

Foxeer – brushless motor for FPV drones
User manual



Read the entire manual carefully before installation and first use, especially the safety instructions. Keep this manual for future reference.

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Contents

1. Safety instructions

1.1 General principles

1.2 Li-Po and LiHV batteries

1.3 Drone operation and legal regulations

2. Product description

2.1 What the motor is for

2.2 Parts description

2.3 Technical data

2.4 Dimensions

2.5 Package contents

3. Installation

3.1 What else you need

3.2 Mounting the motor on the frame

3.3 Connecting to the ESC

3.4 Mounting a T-mount propeller

4. Putting into operation

4.1 Flight controller (FC) and ESC settings

4.2 Motor test without propeller

4.3 Choosing a battery

5. Operation and load data

6. Maintenance and storage

7. Troubleshooting

8. Information for the EU and Czech Market

9. Warranty and rights arising from defective performance

1. Safety instructions

1.1 General principles

- The motor is intended for installation in radio-controlled models, especially FPV drones. The product **is not a toy** and must be kept out of the reach of children.
- Always carry out installation, soldering and setup **without propellers fitted** and with the **battery disconnected**.
- A spinning propeller can cause serious injury. Do not touch the motor or the propeller during operation and keep a safe distance from people and animals.
- The motor may be powered **only through an electronic speed controller (ESC)**. Never connect it directly to a battery or a power supply.
- The motor heats up during operation. In the manufacturer's tests it reached up to 83 °C after 3 s at full throttle (see chapter 5.1). Do not touch the motor after a flight until it has cooled down.
- The bell contains strong neodymium magnets. Keep the motor away from payment cards, pacemakers and sensitive instruments.

1.2 Li-Po and LiHV batteries

The motor is designed to be powered from a **3S to 4S Li-Po** battery. Li-Po and LiHV batteries can catch fire if handled incorrectly.

- Charge them only with a suitable charger, under supervision and on a non-flammable surface.
- Do not use swollen, mechanically damaged or overheated batteries.
- Do not discharge the battery below the voltage given in the table – this damages it irreversibly.

State	Per cell Li-Po	Per cell LiHV	3S (Li-Po / LiHV)	4S (Li-Po / LiHV)
Fully charged	4.20 V	4.35 V	12.6 V / 13.05 V	16.8 V / 17.4 V
End the flight	3.5 V	3.5 V	10.5 V	14.0 V
Storage	3.8 V	3.8 V	11.4 V	15.2 V

1.3 Drone operation and legal regulations

The motor is part of a drone whose operation is subject to aviation regulations. Regulations (EU) 2019/947 and 2019/945 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 transmitting power. The drone operator is responsible for compliance with the regulations. **The law of the country in which you operate the drone always prevails.**

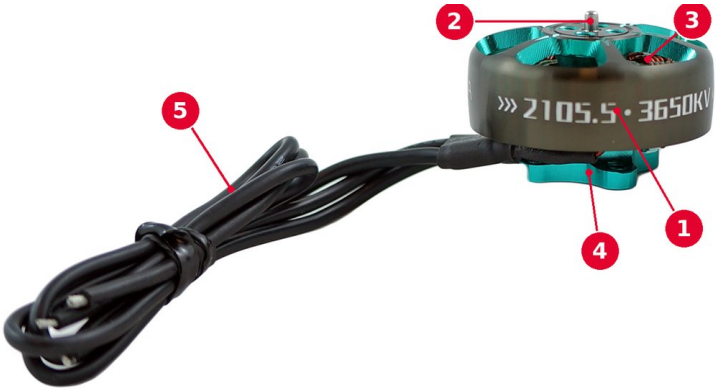
2. Product description

2.1 What the motor is for

The Foxeer Datura 2105.5 3650KV is a brushless motor with a 21 × 5.5 mm stator and a constant of 3650 KV for 3S to 4S Li-Po batteries. It is suitable for 3–3.5" cinewhoops, powerful 4" quads or 5" ultralight builds.

The motor uses arc N52H magnets and windings rated up to 260 °C. It has a 1.5 mm external shaft for propellers with a **T-mount** hub, which are used mainly on cinewhoops.

2.2 Parts description



Foxeer Datura 2105.5 3650KV

① **Bell (rotor)** – carries the N52H magnets; the top side has threaded holes for fixing a T-mount propeller.

② **External shaft 1.5 mm** – centres the T-mount propeller (the inner motor shaft has a diameter of 3 mm).

③ **Stator with windings** – 12N14P configuration, diameter 21 mm, height 5.5 mm.

④ **Base** – 4 M2 threaded holes in a 12 × 12 mm pattern for mounting on the frame.

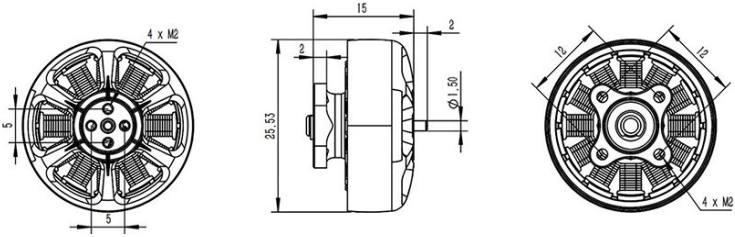
⑤ **Phase wires** – three wires for connection to the ESC.

2.3 Technical data

Designation	Foxeer Datura 2105.5 3650KV
KV	3650 KV
Configuration	12N14P
Stator diameter / height	21 mm / 5.5 mm
Shaft diameter	3 mm (inner), 1.5 mm (external, T-mount)
Motor dimensions (diameter × height)	Ø 25.53 × 15 mm
Mounting on the frame	4× M2, 12 × 12 mm pattern
Weight	20.5 g (with 3 cm wires)
Idle current at 10 V	1.9 A
Number of cells (Li-Po)	3–4S
Max. continuous power (3S)	543 W
Internal resistance	45 mΩ
Max. current (3S)	36.7 A
Max. efficiency current	3–6 A (efficiency > 85%)
Magnets	arc N52H
Windings	rated up to 260 °C

Data according to the manufacturer's data sheet.

2.4 Dimensions



Manufacturer's dimensional drawing (dimensions in mm): bell view, side view and base view.

2.5 Package contents

- 1× Foxeer Datura 2105.5 3650KV motor
- 1× set of M2 mounting screws

The package does **not** include propellers (or screws for fixing them), an ESC, a battery or a frame. The motor is supplied in packaging without the brand logo or graphics; it is a genuine original product.

3. Installation

3.1 What else you need

- a frame with motor holes in a **12 × 12 mm** pattern (M2 screws),
- an ESC for 3–4S batteries rated at least for the maximum motor current (36.7 A according to the manufacturer),
- propellers with a **T-mount** hub for a 1.5 mm shaft and screws for fixing them,
- a soldering iron, solder, heat-shrink tubing and a suitable screwdriver.

3.2 Mounting the motor on the frame

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

② Fasten the motor with four M2 screws from the set. Choose the screw length according to the thickness of the arm.

③ Tighten the screws evenly in a cross pattern without stripping the threads. We recommend a medium-strength threadlocker.

④ After tightening, turn the bell by hand – it must rotate freely, without rubbing and without noise.

A screw that is too long will pierce the winding insulation and destroy the motor. Before connecting the battery, always check that no screw touches the stator windings.

3.3 Connecting to the ESC

① Shorten the motor wires to the required length, strip and tin them. Do not damage the enamel insulation of the windings.

② Solder the three wires to the three phase pads of the corresponding ESC output. The order of the wires is arbitrary – it only affects the direction of rotation.

③ Check the joints for short circuits and cold joints. Secure the wires so that they cannot get into the propeller.

Change the direction of rotation in the ESC configurator, in Betaflight (*Motors* tab, *Motor direction is reversed*) or by swapping any two wires.

3.4 Mounting a T-mount propeller

① After checking the direction of rotation (chapter 4.2) and with the battery disconnected, fit the T-mount propeller onto the 1.5 mm shaft, aligning the hub holes with the threaded holes in the bell.

② Fasten the propeller with its screws. Tighten with care – the threads in the bell are small.

③ Check that the screws do not touch the windings and that the propeller matches the direction of rotation.

4. Putting into operation

4.1 Flight controller (FC) and ESC settings

The motor has a 12N14P configuration, i.e. **14 magnetic poles**. Enter this value in Betaflight in the *Motor poles* field on the *Motors* tab. The correct number of poles is required for RPM-based filtering (RPM filter) to work properly and for RPM to be displayed correctly.

4.2 Motor test without propeller

① Remove the propellers and connect the drone to a computer running the Betaflight configurator.

② Connect the battery and enable motor control on the *Motors* tab.

③ Spin up each motor in turn at low throttle and check that it runs smoothly and in the correct direction according to the frame layout.

④ Stop any motor that stutters, rubs or does not spin immediately and check the wiring (chapter 7).

Never run the motor without a propeller at full throttle.

4.3 Choosing a battery

Use a **3S or 4S Li-Po** battery. Always insert a **fully charged** battery before flying (3S: 12.6 V, 4S: 16.8 V; LiHV 13.05 V or 17.4 V respectively). With a 4S battery the motor delivers more thrust, but also draws more current and runs hotter – see chapter 5.1.

5. Operation and load data

5.1 Manufacturer's test results

The manufacturer tested the motor with several propellers at 11.1 V (3S) and 14.8 V (4S). The temperature was measured after 3 s at full throttle.

Propeller	U (V)	Thr. (%)	I (A)	F (g)	P (W)	Efficiency (g/W)	Temperature
GFD76×5	11.1	50	5.2	210	57.7	3.638	62 °C
		100	22.7	560	252.0	2.222	
	14.8	50	8.8	330	130.2	2.534	79 °C
		100	33	845	488.4	1.730	
GFD90×3	11.1	50	5.8	295	64.4	4.582	64 °C
		100	24	676	266.4	2.538	
	14.8	50	9.4	415	139.1	2.983	81 °C (hot)
		100	33.9	997	501.7	1.987	
GF4024R	11.1	50	4.5	222	50.0	4.444	61 °C
		100	21	664	233.1	2.849	
	14.8	50	7.4	374	109.5	3.415	79 °C
		100	32.6	1027	482.5	2.129	
DAL3528×3	11.1	50	6.2	241	68.8	3.502	75 °C
		100	25.1	623	278.6	2.236	
	14.8	50	9.4	385	139.1	2.767	83 °C (hot)
		100	36.7	966	543.2	1.778	

※ U = voltage, I = current, F = thrust, P = power. Values stated by the manufacturer. Actual current, thrust and temperature depend on the propeller, frame, battery, settings and flying style.

5.2 Operating principles

- The manufacturer marked operation on 4S with GFD90×3 and DAL3528×3 propellers as "hot". Check the motor temperature after the first flights with a new propeller.
- A motor that is too hot to touch after a flight is overloaded. Use a smaller propeller or a lower-voltage battery, or check the tuning and vibrations.
- Do not run the motor at full throttle for long periods with the drone on the ground – there is no cooling airflow.
- After a crash, always check the motor, shaft and propeller before the next flight (chapter 6).

6. Maintenance and storage

- **After every flight** turn the bell by hand. The motor must rotate freely and quietly, without rubbing and without play.
- Metal filings, sand or grass easily get between the bell and the stator – the magnets attract metal debris. Carefully remove any dirt, for example with compressed air.
- Check that the motor and propeller screws are tight and that the wire insulation is intact.
- Do not straighten a bent shaft or a cracked bell – replace the motor.
- Noisy or rough bearings indicate wear. Do not continue to use a motor with damaged bearings.
- After flying in wet conditions, let the motor dry thoroughly.
- Store in a dry place at room temperature, away from magnetically sensitive objects.

7. Troubleshooting

Problem	Possible cause and solution
Motor does not spin or only stutters	Cold joint or broken wire – check the soldering. Screw reaching into the windings – check the screw length. Incorrect ESC settings – check the configuration.
Motor spins in the wrong direction	Change the direction in the ESC configurator or in Betaflight, or swap two wires (chapter 3.3).
Motor overheats	Propeller too large or voltage too high – see chapter 5. Vibrations or unsuitable filter tuning. Damaged bearing or dirt in the motor.
Vibrations, noise	Damaged or unbalanced propeller, bent shaft, worn bearings, loose screws.
Bell rubs against the stator	Dirt between the bell and the stator, bent shaft or damaged bell – clean the motor or replace it.
Incorrect RPM in the OSD or RPM filter not working	The correct number of poles is not set in Betaflight – enter 14 (chapter 4.1).

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 (Foxeer Datura 2105.5 3650KV) is printed on the motor bell.

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.