Flash 1804 3500KV

FlyFishRC – brushless motor for FPV drones
User Manual



Read the entire manual before installation. Always remove the propellers when mounting, soldering and testing the motors.

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1. Safety instructions

1.1 Before you start

The FlyFishRC Flash 1804 3500KV motor is a component intended to be built into an FPV drone. Installation, wiring and setup require basic knowledge of RC modelling, soldering and configuring the flight controller (FC) and electronic speed controllers (ESC). Read the entire manual before installation and keep it for future reference.

- This product is not a toy and is not intended for children.
- Use the motor only within the supply range and for the purpose stated in this manual.
- Do not continue to use a damaged motor (bent shaft, cracked bell, damaged winding or cable insulation).

1.2 Rotating parts and propellers

- The motor reaches very high speeds. A spinning propeller can cause serious cuts and damage objects nearby.
- **Always remove the propellers** when mounting, soldering, configuring and testing the motors.
- Connect the battery only just before the flight and disconnect it immediately after landing. Never reach into the propeller area while the battery is connected.
- The rotating motor bell is dangerous even without a propeller – do not touch it and make sure that hair, clothing or cables cannot get caught in it.

1.3 Electrical connection and batteries

- The motor is designed to be powered by a **4S Li-Po** battery (fully charged 4.20 V/cell, i.e. 16.8 V). Do not use a battery with a higher cell count.
- Before connecting the battery, check that the motor wires do not touch each other or the carbon frame and that no joint is short-circuited.
- When connecting the battery for the first time, we recommend using short-circuit protection (a so-called smoke stopper).
- The motor heats up during operation. Do not touch it after the flight until it has cooled down.
- When handling Li-Po batteries, follow their manufacturer's instructions – do not charge them unattended and do not use damaged batteries.

2. Product description

2.1 What it is for

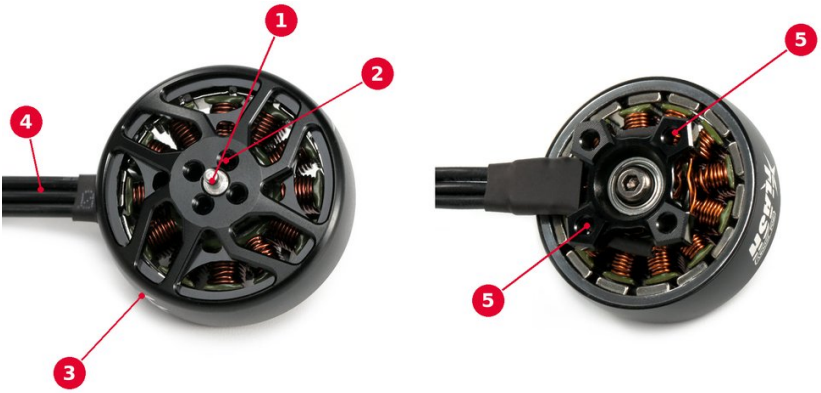
The FlyFishRC Flash 1804 3500KV is a brushless motor for FPV drones. The manufacturer designed it for frames with 3.5" propellers and 4S Li-Po power. According to the manufacturer, it offers more power and thrust than smaller 1404 and 1504 motors while keeping a compact size.

The Unibell-type motor bell is made of 7075 aluminium alloy, the shaft of titanium alloy. The motor uses NMB bearings, N52SH magnets and copper wire windings with insulation heat-resistant up to 220 °C. The motor is attached to the frame with four M2 screws and connected to the electronic speed controller (ESC) with three phase wires.



Flash 1804 3500KV motor mounted on a frame arm

2.2 Parts description



View of the motor from the top (left) and from the bottom (right)

① Shaft ⌀1.5 mm

② 4 × M2 holes for attaching the propeller

③ Bell (Unibell) with the type designation FLASH 1804 3500KV

④ Phase wires 22AWG, length 150 mm (3 pcs)

⑤ 4 × M2 mounting holes in the motor base

2.3 Package contents

- 1× FlyFishRC Flash 1804 3500KV motor
- 1× screw set

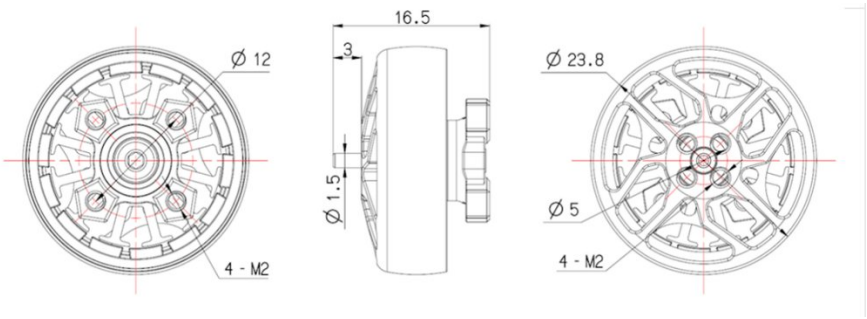
Not included: electronic speed controller (ESC), flight controller (FC), propellers, propeller nuts or screws, frame or battery.

2.4 Technical data

Parameter	Value
Manufacturer	FlyFishRC
Model	Flash 1804
KV	3500 KV
Power supply	4S Li-Po
Configuration	12N14P
Dimensions (⌀ × length)	23.8 × 16.5 mm
Shaft diameter	1.5 mm
Frame mounting	4 × M2; the manufacturer states 12 × 12 mm, the drawing shows a ⌀12 mm hole circle
Propeller mounting	4 × M2 on the bell
Wires	22AWG, 150 mm
Weight	14 g (including wires)
Max. thrust	651.27 g
Max. power (10 s)	325.47 W
Peak current (10 s)	20.73 A
Bearings	NMB
Magnets	N52SH
Bell / shaft material	7075 aluminium alloy / titanium alloy
Recommended propellers	3.5" (the manufacturer tested HQ T4×2.5×3 and HQ 76 mm × 3 propellers)

※ The manufacturer states the maximum thrust, power and current values for a test voltage of 16.8 V and an HQ T4×2.5×3 propeller. Actual values depend on the propeller, battery voltage, speed controller and temperature.

2.5 Dimensional drawing



Manufacturer's dimensional drawing (dimensions in mm). Left: base, centre: side view, right: bell. The shape of the bell spokes in the drawing may differ from the actual product.

2.6 Manufacturer's test data

For the 3500KV version, the manufacturer states the following results measured on a motor test rig:

Propeller	Throttle (%)	Voltage (V)	Current (A)	Thrust (g)	Speed (rpm)	Efficiency (g/W)
HQ T4×2.5×3	50	16.02	5.20	260.7	23,583	2.47
	60	15.99	7.67	341.7	26,932	2.13
	70	15.93	10.56	424.4	30,089	2.52
	80	15.85	13.42	511.2	32,804	2.40
	90	15.78	17.23	582.5	34,627	2.14
	100	15.71	20.73	651.3	36,974	2.00
HQ 76 mm × 3	50	16.05	4.51	202.78	24,789	2.80
	60	15.97	6.59	268.16	28,423	2.55
	70	15.97	9.26	338.64	31,616	2.29
	80	15.93	11.37	397.8	34,219	2.20
	90	15.86	15.29	486.74	37,775	2.01
	100	15.8	19.05	553.55	40,211	1.84

In the same measurement, the manufacturer states an electrical input power of 105.4 W (50 %) to 325.7 W (100 %) with the HQ T4×2.5×3 propeller and 72.4 W (50 %) to 301.0 W (100 %) with the HQ 76 mm × 3 propeller.

3. Installation

3.1 What you will need

- a frame with 4 × M2 motor mounting matching the dimensional drawing (chapter 2.5),
- a speed controller (ESC) for brushless motors, rated for 4S power and for the peak current of the motor (see chapter 2.4),
- propellers suitable for mounting on a ⌀1.5 mm shaft with four M2 screws,
- a hex key or screwdriver matching the supplied screws, a soldering iron and solder,
- optionally a medium-strength thread locker.

3.2 Mounting the motor on the frame

① Place the motor on the frame arm so that the mounting holes ⑤ line up with the holes in the frame and the wires run along the arm towards the centre of the drone.

② Before tightening, check the screw length: the screw may only reach into the thread in the motor base so far that it **does not touch the windings**. A screw that is too long damages the winding insulation and causes a short circuit.

③ Tighten the screws gradually in a cross pattern and with moderate force – M2 threads in the aluminium base strip easily.

④ After tightening, turn the bell by hand. It must rotate freely, without rubbing and without any grinding noise.

A screw touching the windings is the most common cause of a destroyed motor and speed controller. If you are not sure about the screw length, first screw it in without the motor and measure how far it protrudes above the frame arm.

3.3 Routing and shortening the wires

- Route the wires along the arm so that they cannot get into the propeller and do not run over sharp carbon edges. Secure them, for example, with heat-shrink tubing or a cable tie.
- You can shorten the wires to the required length. Strip the ends only as far as necessary and tin them before soldering.
- When soldering to the speed controller pads, work quickly so as not to damage the wire insulation or the pads. After soldering, check that no solder bridge has formed between adjacent pads.

4. Wiring and setup

4.1 Connecting to the speed controller (ESC)

Solder the three phase wires to the three output pads of the corresponding motor on the speed controller. The wire order only determines the direction of rotation, which can be changed later (chapter 4.2).

- Always connect the motor to a speed controller for brushless motors. Never connect it directly to the battery.
- Check the motor assignment (motor 1–4) in the flight controller (FC) configuration, e.g. on the *Motors* tab of Betaflight Configurator.

4.2 Direction of rotation

The direction of rotation of each motor must match the flight controller setting (usually *Props In* or *Props Out*). If a motor spins the wrong way, you have two options:

- change the direction in software – in the speed controller configuration program (e.g. ESC Configurator for BLHeli_S / Bluejay firmware or BLHeliSuite32 / AM32) or with the *Motor direction* function in Betaflight,
- or swap any two of the three phase wires.

4.3 Motor test without propellers

① Remove all propellers.

② Connect the battery (through short-circuit protection the first time) and connect the flight controller to the computer.

③ On the *Motors* tab of the configuration program, confirm the safety warning and spin up each motor one by one at low throttle.

④ Check that the correct motor spins, that it spins in the correct direction and that it runs smoothly, without vibration, stuttering or unusual noise.

⑤ After a short test, touch the motors. No motor should be noticeably warmer than the others.

4.4 Mounting the propeller

- Place the propeller on the shaft ① and fix it with four M2 screws into the holes ② in the bell. Screws are not included; use those supplied with the propellers or screws of a suitable length.
- The propeller screws must not reach the windings or the stator. After tightening, turn the bell by hand – it must not rub.
- Make sure the propeller direction (CW/CCW) is correct according to the motor position and the *Props In* / *Props Out* setting.
- Mount the propellers only after a successful motor test and just before the first flight.

5. Operation

5.1 Pre-flight check

- Before the flight, insert a **fully charged** 4S Li-Po battery (4.20 V/cell, i.e. 16.8 V).
- Check that the motor and propeller screws are tight.
- Turn the bell by hand – does it rotate freely, without rubbing, play or grinding bearings?
- Check that the propellers are not damaged and that the wires are safely routed out of reach of the propellers.

5.2 During the flight and after landing

- End the flight when the battery voltage drops to 3.5 V/cell (14.0 V for 4S).
- After landing, Disarm (switch off the motors) and disconnect the battery.
- After the flight, check the motor temperature. If the motors are too hot to touch, check the propellers, the flight controller filter settings and the mechanical condition of the motor; continue flying only after the cause has been eliminated.
- Store batteries intended for storage at a storage voltage of 3.8 V/cell (15.2 V for 4S).

6. Maintenance

6.1 After each flight and after a crash

- Remove grass, dust and dirt from the motor. The magnets attract metal particles – check the motor especially after landing in sand or soil.
- Check that the shaft is not bent: when spinning without a propeller, the motor must not visibly shake and the bell must not wobble.
- Check the insulation of the wires and windings. Replace or repair chafed or broken wires before the next flight.
- After a crash, check that all screws are tight and the condition of the mounting holes.

6.2 Bearings and storage

- Bearings are a wear part. If the bell rubs, has play or the bearing is noisy when rotating, have the bearings replaced.
- Do not wash the motor with water or solvents. Remove dirt with a dry brush or compressed air.
- Store the motor in a dry place, away from moisture and metal filings.

7. Troubleshooting

Problem	Possible cause and solution
Motor does not spin, only beeps or twitches	Cold or broken phase wire joint – check the soldering. A wire may be touching another joint – remove the short circuit.
Motor spins in the wrong direction	Change the direction in the speed controller configuration or swap two phase wires (chapter 4.2).
A different motor spins than the one selected	Adjust the motor assignment in the flight controller (FC) or speed controller configuration.
Motor rubs or is stiff	A motor or propeller mounting screw touches the windings; dirt between the bell and the stator; damaged bearing. Loosen the screws and check their length, clean the motor.
Motor overheats	Propeller too large or damaged, bent shaft, faulty bearing or unsuitable flight controller filter settings.
Drone vibrates, "jello" in the video	Damaged propeller, bent shaft or loose motor screw. Replace the propeller, check the shaft and the screws.
Smoke or burning smell	Disconnect the battery immediately. Probable short circuit in the windings or the speed controller – do not use the motor any more.

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 (FLASH 1804 3500KV) is printed on the shell of 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

Rights of the buyer under Czech law

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.