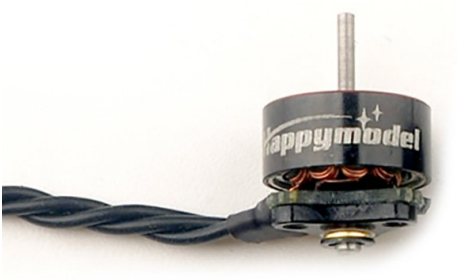
SE0702 23000Kv

Happymodel

Brushless motor for 1S whoops – user manual



Read the safety instructions in Chapter 2 before installation and first start-up. The motor is designed for single-cell (1S) power only.

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1. Product description

1.1 Intended use

The Happymodel SE0702 23000Kv is a very light brushless motor of size 0702, designed for small whoop-type FPV drones with propeller guards (ducts). The motor is designed exclusively for single-cell Li-Po / LiHV (1S) power and for propellers with a diameter of 31–40 mm.

The motor comes with a factory-soldered cable terminated with a three-pin connector, so it can be plugged without soldering into a flight controller (FC) or electronic speed controller (ESC) with a matching motor socket. It is used as a replacement or upgrade motor – a set of four drives a complete drone.



SE0702 motors with cables and connectors (illustrative photo, set of several pieces)

1.2 Technical data and package contents

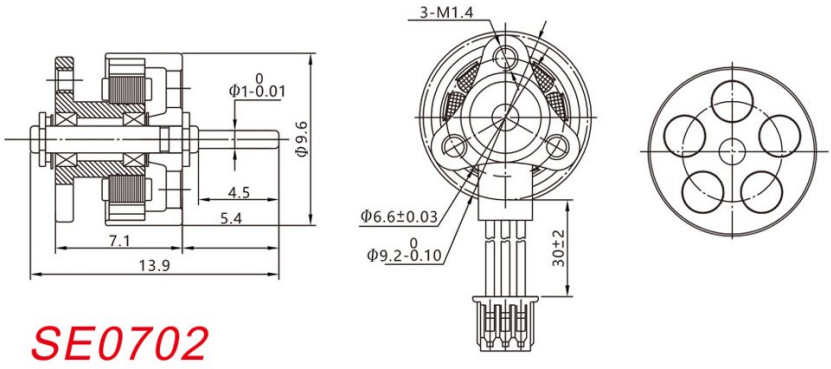
Product designation	Happymodel SE0702 23000Kv
Size	0702
KV	23000
Configuration	9N12P
Stator diameter	7 mm
Stator height	2 mm
Shaft diameter	Φ1 mm
Motor dimensions (diameter × length)	Φ9.5 mm × 14 mm
Weight	1.5 g (including cable)
Power supply	1S Li-Po / LiHV only
Recommended propellers	31–40 mm

Mounting	3× M1.4 thread
Cable length	30 ± 2 mm (per manufacturer's drawing)

Package contents: 1× Happymodel SE0702 23000Kv motor with cable and connector.

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

1.3 Dimensional drawing



Dimensional drawing of the SE0702 according to the manufacturer (dimensions in mm). Left: side section; centre: bottom view with 3-M1.4 mounting threads on a Φ6.6 mm bolt circle; right: top view.

※ The manufacturer's drawing states a bell diameter of Φ9.6 mm, the manufacturer's specification Φ9.5 mm. The difference is within manufacturing tolerance and has no effect on installation.

1.4 Manufacturer's test data

The manufacturer states the following test data for the KV23000 version. The no-load measurement was taken at 2 V; the load measurement at 3.7 V.

▶ Gemfan 31 mm two-blade propeller (no load: 0.41 A, 46,670 rpm, measured KV 23,335)

Voltage (V)	Current (A)	Thrust (g)	Efficiency (g/W)	Power (W)
3.7	0.52	5.1	2.651	1.924
3.7	1	8.9	2.405	3.7
3.7	1.53	13.1	2.314	5.661
3.7	1.99	16.3	2.214	7.363
3.7	2.5	19.3	2.086	9.25
3.7	2.86	21.7	2.051	10.582

▶ Gemfan 40 mm two-blade propeller (no load: 0.43 A, 46,290 rpm, measured KV 23,145)

Voltage (V)	Current (A)	Thrust (g)	Efficiency (g/W)	Power (W)
3.7	1	8.1	2.189	3.7
3.7	1.5	11.8	2.126	5.55
3.7	2	15.6	2.108	7.4
3.7	2.5	19.6	2.119	9.25
3.7	3	22.4	2.018	11.1
3.7	3.5	25.6	1.977	12.95
3.7	4	27.1	1.831	14.8

※ The values are the manufacturer's laboratory data. Actual thrust and current draw in a drone depend on the propeller, the duct, the battery condition and the ESC settings.

2. Safety instructions

- The motor is a component for building and repairing radio-controlled models. It is not a toy – keep it away from children without adult supervision.
- Power the motor **only from an electronic speed controller (ESC) designed for 1S**. A higher voltage (2S or more) will irreversibly damage the motor.
- A spinning propeller can cause injury, especially to eyes and fingers. When working on the drone, configuring or testing motors, **always remove the propellers** or disconnect the battery.
- Before handling the drone, always Disarm (switch off the motors) first and disconnect the battery.
- The motor heats up during operation. After a flight, let it cool down before touching it.
- Keep metal shavings, screws, sand, water and moisture out of the motor – the bell magnets attract metal particles that can jam the motor or damage the windings.
- Do not use the motor with damaged cable insulation, a bent shaft or a damaged connector.
- If the motor stalls (e.g. a propeller caught in grass), Disarm immediately, otherwise the windings and the ESC will overheat.
- When flying a drone, observe the regulations of the country in which you fly. The law of the country in which the product is operated always prevails.

3. Installation and connection

3.1 Mechanical installation



Bottom of the motor with three M1.4 mounting threads and cable exit

① Check that the frame has holes for three M1.4 screws on a Φ6.6 mm bolt circle (see the drawing in Chapter 1.3).

② Use M1.4 screws of suitable length. A screw may only reach as deep as the thread – **a screw that is too long will touch the windings** and cause a short circuit or damage the insulation.

③ Tighten the screws gently and gradually in a cross pattern. The M1.4 threads are small and strip easily.

④ Route the cable so that it does not touch the propeller or sharp edges of the frame and is not under tension.

※ The manufacturer does not state the screw length; choose it according to the thickness of the frame's mounting surface. Screws are not included.

3.2 Connecting to the electronic speed controller (ESC)

The motor is a three-phase brushless motor; the three wires end in a connector that plugs directly into the motor socket of a flight controller (FC) with integrated ESC (AIO) or of a separate ESC.

- Disconnect the battery before connecting.
- Insert the connector straight and without force; mind the correct orientation of the latch.
- If your flight controller has no motor socket, the connector can be cut off and the wires soldered directly to the motor pads. Solder quickly and briefly so as not to damage the insulation of the thin wires. This is done at your own risk.
- The order of the three wires does not matter for function – it only changes the direction of rotation (Chapter 3.3).

3.3 Direction of rotation

A quadcopter needs two motors spinning clockwise and two counter-clockwise according to the diagram shown by the flight controller configuration software (e.g. Betaflight, *Motors* tab). Set the direction of rotation of each motor in the ESC configurator – e.g. in the ESC Configurator program. If you solder the motor, the direction can also be changed by swapping any two wires.

3.4 Propellers

- Use propellers with a diameter of 31–40 mm and a hole for a Φ1 mm shaft.
- Push the propeller straight onto the shaft while supporting the motor bell from below, so that the shaft does not bend or slide out.
- Observe the propeller orientation according to the direction of rotation of each motor (CW and CCW propellers).
- Always replace a damaged or cracked propeller.

3.5 Check after installation

① Without propellers, connect the battery and in the configurator (e.g. Betaflight, *Motors* tab) briefly spin each motor individually at low throttle.

② Check that the motor runs smoothly, without rubbing, and spins in the correct direction.

③ Disconnect the battery, fit the propellers and perform a short hover test before the first flight.

4. Maintenance and troubleshooting

4.1 Maintenance

- After each flight, check that the bell turns freely and that there is no dirt, hair or grass between the bell and the stator.
- Check that the shaft is not bent (the propeller visibly wobbles) and that the mounting screws are tight.
- Remove dirt with a dry brush or compressed air. Do not wash the motor with water or solvents.
- Do not lubricate the bearings with ordinary oils – they attract dust.

4.2 Troubleshooting

Problem	Possible cause and solution
Motor spins the wrong way	Change the direction in the ESC configurator (Chapter 3.3).
Motor does not spin, only twitches or beeps	Check the connector and that it is fully inserted, wire damage, dirt in the bell. Make sure the motor is not jammed.
Motor rubs or is noisy	Dirt between the bell and stator, worn bearing or bent shaft. Clean the motor or replace it.
Motor is very hot after a flight	Propeller too large or heavy, damaged propeller, trapped dirt, unsuitable filter settings. Use a 31–40 mm propeller and check the motor.
Drone flips on take-off after motor replacement	Wrong direction of rotation or incorrectly fitted propeller. Check the procedure in Chapters 3.3 to 3.5.

5. Information for the EU and Czech Market

5.1 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

5.2 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.

6. 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 5.1.
- 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.