SPEEDX2 2107.5 1960KV

GEPRC – brushless motor for FPV drones
User manual



Read the safety instructions before installation. Always carry out installation, soldering and tests without propellers fitted.

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1. Safety instructions

1.1 Before you start

The GEPRC SPEEDX2 2107.5 1960KV motor is a high-performance component of an FPV drone. Read this entire manual before installation and the first flight, and keep it for future reference. If you pass the motor or the drone on to another user, include this manual.

- This product is not a toy and is not intended for children. Keep it out of the reach of children and animals.
- Installation, soldering and setup must be carried out by a person familiar with FPV equipment. If in doubt, ask an experienced pilot or a service centre.
- Use the motor only within the technical data given in Chapter 2.3 – in particular, observe the permitted battery cell count.
- Do not use a motor that is mechanically damaged, has a bent shaft, or damaged winding or lead wire insulation.

1.2 Rotating propellers and mechanical hazards

- Rotating propellers can cause serious injury. Carry out all installation, soldering, motor direction testing and setup **always without propellers fitted**.
- Disconnect the battery before any work on the drone.
- When testing with propellers fitted, stay out of the propeller plane and secure the drone.
- The propeller nut must always be properly tightened. A loose propeller may fly off in flight.

1.3 Electrical and thermal hazards

- The motor is powered from a LiPo battery via an electronic speed controller (ESC). A short circuit of the wires or connecting the motor directly to the battery may cause a fire.
- After a flight the motor may be **very hot**. Do not touch it until it has cooled down.
- The rotor contains strong neodymium magnets. Keep the motor away from pacemakers, magnetic cards and sensitive electronics; when handling it, beware of pinched fingers and of small metal objects being attracted.
- When soldering, work in a well-ventilated area on a non-flammable surface.

2. Product description

2.1 Package contents

SPEEDX2 2107.5 1960KV motor	1 pc
M5 nut	1 pc
M3×8 screw	5 pcs
M3×10 screw	5 pcs



M3 screws and M5 nut supplied with the motor

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

2.2 Parts description



SPEEDX2 2107.5 1960KV motor (titanium colour version)

① Φ5 mm shaft with M5 thread for mounting the propeller – hollow, titanium alloy.

② Rotor bell made of 7075 aluminium alloy with N52H magnets.

③ Stator winding (12N14P configuration).

④ Base with holes for 4 M3 screws (16 mm spacing).

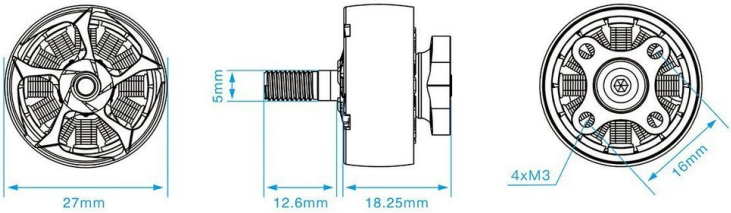
Three 20 AWG phase wires lead out of the base for connection to the electronic speed controller (ESC). According to the manufacturer, the motor contains a damping O-ring that reduces vibration and extends bearing life.

2.3 Technical data

Model	SPEEDX2 2107.5 1960KV
KV	1960 KV
Configuration	12N14P
Stator (diameter × height)	21 mm × 7.5 mm
Motor dimensions	Φ26.83 mm × 30.85 mm
Shaft diameter	Φ5.0 mm (M5 thread)
Magnets	N52H ARC
Weight	29.5 g (including 3 cm wires)
Lead wires	20 AWG, 150 mm
Internal resistance	55 mΩ
Idle current (10 V)	0.9 A
Maximum current (60 s)	39.6 A
Max. continuous power (5S)	950 W
LiPo cell count	5–6S
Recommended battery	6S LiPo, 1050–1550 mAh
Intended use	freestyle and racing FPV, frames for 5" propellers
Colour versions	orange, green, titanium, blue

※ The colour versions differ only in colour; the technical data are the same for all of them.

2.4 Dimensions and mounting



Dimensional drawing (manufacturer data)

- Bell diameter 27 mm, motor body height 18.25 mm, shaft protrusion 12.6 mm.
- Mounting: 4× M3 on a 16 mm diameter circle.

2.5 Manufacturer test data

The table shows the results of measurements by the manufacturer GEPRC with an F45A electronic speed controller. The motor temperature was measured after 5 s at full throttle at an ambient temperature of 25 °C. The values are indicative; actual results depend on the battery, ESC, propeller and condition of the motor.

Propeller	Volt. (V)	Throttle (%)	Curr. (A)	Thrust (g)	Power (W)	Efficiency (g/W)	Motor temp.
HQ Ethix S4	21	50	5.9	611	123.9	4.931	68 °C
		100	27.8	1651	583.8	2.828	
	24	50	7.7	776	184.8	4.199	75 °C
		100	33.1	1959	794.4	2.466	
HQ Ethix S5	21	50	6.7	665	140.7	4.726	70 °C
		100	32.8	1769	688.8	2.568	
	24	50	8.8	833	211.2	3.944	83 °C *
		100	39.6	2098	950.4	2.207	
DAL T5147.5	21	50	5.6	605	117.6	5.145	68 °C
		100	27.9	1721	585.9	2.937	
	24	50	6.2	719	148.8	4.832	76 °C
		100	33.9	2009	813.6	2.469	
GF 5152	21	50	6.4	618	134.4	4.598	73 °C
		100	32.5	1677	682.5	2.457	
	24	50	8.2	779	196.8	3.958	84 °C *
		100	39.6	1938	950.4	2.039	
HQ 5.1×3.1×3	21	50	6.7	679	140.7	4.826	71 °C
		100	29.4	1801	617.4	2.917	
	24	50	7.5	798	180.0	4.433	81 °C *
		100	35.2	2121	844.8	2.511	

* For these combinations the manufacturer marks the motor as hot (HOT). Prolonged full-throttle flying with these propellers on 6S may cause overheating – check the motor temperature after landing.

3. Legal conditions of operation

3.1 The law of the country of operation applies

Regulations (EU) 2019/947 and 2019/945 apply in all member states of the European Union, but national implementing rules differ from state to state – registration portals, minimum pilot age, geographical zones, compulsory insurance, permitted frequency bands and maximum transmitting power. If you operate a drone in another country, you must follow the regulations of the state in which you fly.

3.2 Operating a drone with this motor

The motor itself is not an unmanned aircraft. However, once you install it in a drone, the operation of the drone is governed by Regulation (EU) 2019/947 and the regulations of the country in which you fly. In the Czech Republic in particular:

- If the drone has a camera, **operator registration** is required (in the Czech Republic with the Civil Aviation Authority) regardless of the drone's weight; the registration number must be displayed on the drone.
- The pilot must hold the appropriate competency for the given category of operation.
- Observe the operational limits of the open category – in particular a maximum height of 120 m, flying within visual line of sight and no flying over assemblies of people. When flying with FPV goggles, an observer next to the pilot is required.
- We recommend taking out third-party liability insurance covering damage caused by operating the drone.

4. Installation

4.1 What else you need

- a frame for 5" propellers with 4× M3 / 16 mm motor mounting,
- an electronic speed controller (ESC) rated for the maximum motor current (Chapter 2.3),
- propellers for an M5 shaft (the manufacturer tested the 5" propellers listed in Chapter 2.5),
- a soldering iron, solder, heat-shrink tubing, a hex key for the M3 screws and a wrench for the M5 nut.

4.2 Mounting the motor on the arm

① Choose the screw length according to the thickness of the frame arm – M3×8 and M3×10 screws are included.

② Place the motor on the arm so that the wires point towards the ESC and fasten it with four M3 screws. Tighten the screws gradually in a cross pattern.

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

A screw that is too long for the given arm will touch the stator winding and damage its insulation. This may result in a short circuit and destroy both the motor and the ESC.

4.3 Connecting to the electronic speed controller (ESC)

The motor has three phase wires. The order in which they are connected to the ESC pads only determines the direction of rotation – it will not damage the motor or the ESC.

- Shorten the wires to the required length so that they are not under tension and cannot get into the propeller.
- Tin the wire ends and solder them to the ESC pads. The joint must be shiny and solid, with no cold joints and no bridges to neighbouring pads.
- After soldering, check that there is no short circuit between the phases and the frame (a carbon frame is conductive).

4.4 Fitting the propeller

- Fit the propeller only after checking the direction of rotation (Chapter 5.2) and with the battery disconnected.
- Make sure the orientation of the propeller matches the direction of rotation of the motor in that position.
- Secure the propeller with the supplied M5 nut and tighten it firmly. The nut protects the shaft thread; replace a damaged or worn nut.

5. Commissioning

5.1 First power-up without propellers

- Propellers must not be fitted.
- When connecting the battery for the first time, we recommend using short-circuit protection (a so-called smoke stopper).
- In the configuration software of the flight controller (FC), e.g. Betaflight, briefly spin up each motor one by one on the *Motors* tab and check its position and smooth running.

5.2 Direction of rotation

If the motor spins in the opposite direction to that required by the frame layout and the flight controller settings, change it in one of these ways:

- reverse the direction of that motor in the ESC configurator,
- or swap any two of the three motor phase wires.

If the whole drone uses reversed rotation of all motors (so-called props out), set the same in the flight controller (FC) as well – in Betaflight the *Motor direction is reversed* option.

5.3 Arm, Disarm and failsafe

- Arm (motors on) only after checking the surroundings and always from a safe distance.
- Have Disarm (motors off) assigned to a switch on the radio transmitter and verify it before the first flight.
- Verify that the motors stop when the signal is lost (failsafe).

6. Operation

6.1 Pre-flight check

- Insert a **fully charged** battery with the correct cell count (5S or 6S LiPo).
- Check that the motor screws and propeller nuts are tight.
- Turn each motor by hand – it must run freely, without rubbing or bearing play.
- Check the propellers – replace any damaged or bent propeller.
- Check that the wires are not chafed and cannot get into the propeller.

6.2 Power supply and motor load

The motor is designed for 5–6S LiPo batteries. Insert a fully charged battery before flying. The following values apply to LiPo batteries:

State	per cell	5S LiPo	6S LiPo
fully charged	4.20 V	21.0 V	25.2 V
end the flight	3.5 V	17.5 V	21.0 V
storage	3.8 V	19.0 V	22.8 V

- Do not exceed the maximum motor current of 39.6 A (60 s) and the maximum continuous power given in Chapter 2.3.
- After landing, check the motor temperature. If a motor is too hot to touch, use a lighter propeller or limit long full-throttle sections.
- After a crash, Disarm the drone immediately so that a blocked motor does not overheat.

7. Maintenance and troubleshooting

7.1 After every flight

- Disconnect the battery and let the motors cool down.
- Remove grass, dust and small metal particles from the motor – the magnets attract them. Use a dry brush or compressed air.
- Check that the bell has no play and rotates freely.

7.2 Shaft, bearings and winding

- A bent shaft causes vibration. Do not continue to use a motor with a bent shaft.
- Rough or noisy running and play in the bell indicate worn bearings.
- Damaged winding insulation (chafed or darkened coils, burnt smell) cannot be repaired – replace the motor.
- Do not disassemble the motor unless you are experienced in doing so. Interfering with the motor may affect claims for defects.

7.3 Storage

Store the motor in a dry place, away from moisture, dust and metal filings, at room temperature. Store the drone battery at a storage voltage of 3.8 V per cell.

7.4 Troubleshooting

Problem	Possible cause and solution
Motor spins the wrong way	Reverse the direction in the ESC configurator or swap two phase wires (Chapter 5.2).
Motor does not spin, only twitches or beeps	Cold joint or broken phase wire; check the soldering. Check that no screw touches the winding.
Motor overheats strongly after flight	Propeller too heavy or long full-throttle sections; choose a lighter propeller. Check the bearings and free running.
Vibration, jello in the video	Bent shaft, damaged propeller, loose motor screws or propeller nut.
Rubbing when turned by hand	Dirt between the magnets and the stator, a worn bearing or a screw that is 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@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 (SPEEDX2 2107.5 1960KV) is given on the product packaging; the motor size and KV rating (2107.5, 1960kv) are marked 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.