EM3115 900KV

GEPRC – brushless motor for long-range FPV drones
User manual



Read the entire manual before installation and first start-up. Always test the motor without a propeller.

Rotorama, s.r.o. · www.rotorama.com

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1. Safety instructions

1.1 Before you start

The GEPRC EM3115 900KV motor is intended to be installed in a multicopter (FPV drone). It is not a finished product in itself – the safety of the resulting aircraft depends on correct installation and on the choice of electronic speed controller (ESC), propeller and battery.

- Have the motor installed and set up by a person experienced in building FPV drones. The product is not a toy and is not intended for children.
- Use only components that match the technical data in Chapter 2.3 – in particular a **6S LiPo** power supply, a **60–80 A** speed controller and **8–10 inch** propellers.
- Keep this manual and pass it on to the next user when handing over the motor or the drone.

1.2 Rotating propellers and mechanical hazards

- The motor reaches high speeds and, with a propeller, produces up to approximately 4 kg of thrust (according to the manufacturer's measurements). A rotating propeller can cause **serious cuts** and damage property.
- Whenever you work on the drone (configuration, motor testing, soldering), **remove the propellers** and disconnect the battery.
- Before connecting the battery, make sure the drone is disarmed (motors off) and that nobody is within reach of the propellers.
- Never reach into the propeller area or touch the rotating motor bell. Do not use damaged, cracked or bent propellers.
- Check the propeller nut and motor screws before every flight – a loose propeller can detach in flight.

1.3 Electrical and thermal hazards

- The motor is designed to be powered from a **6S LiPo** battery (25.2 V fully charged). A higher voltage can destroy the motor and the speed controller.
- Charge LiPo batteries only with a suitable charger, under supervision and on a non-flammable surface. Do not use a damaged, swollen or overheated battery.
- The connections between the motor wires and the speed controller must be properly soldered and insulated. A short circuit between phases will damage the speed controller and may cause a fire.
- The motor gets very hot under heavy load. After a flight, do not touch the motor bell until it has cooled down.
- The motor contains strong magnets – keep it away from sensitive instruments, payment cards and pacemakers. Metal filings and small screws must not get into the motor.

2. Product description

2.1 What the motor is for

The GEPRC EM3115 900KV is a brushless motor (BLDC) from the EM series, which the manufacturer designed mainly for **long-range FPV drones** with 8–10 inch propellers and a 6S LiPo power supply. It has a 5 mm steel shaft with an M5 thread, N52H magnets, NSK/NMB bearings and a single-strand copper winding.

The motor is attached to the frame arm with four M3 screws and its three wires are soldered to the speed controller (ESC). It is sold individually.

2.2 Package contents

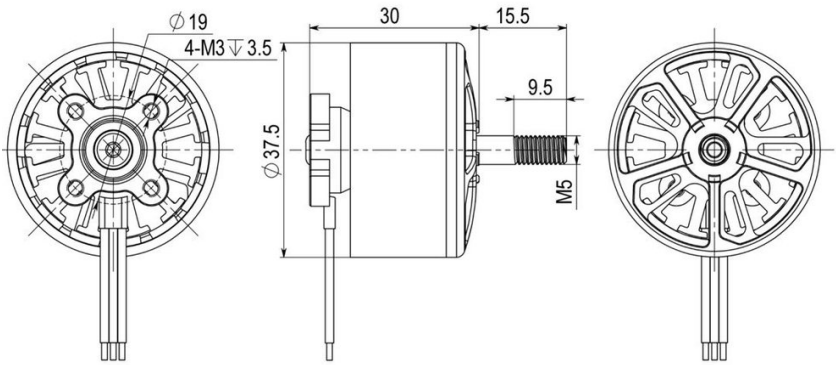
Qty	Item
1	GEPRC EM3115 900KV motor with 310 mm / 18 AWG wires
4	M3 × 11 round head screw
1	M5 flange nut for securing the propeller

Not included: propeller, speed controller (ESC), frame, battery or connectors.

2.3 Technical data

KV rating	900 KV
Maximum power	1620 W
Peak current	65 A
Phase-to-phase resistance	46 mΩ
Input voltage	25.2 V (6S LiPo)
Recommended speed controller (ESC)	60–80 A
Recommended propellers	8–10 inch
Configuration	12N14P
Magnets	N52H
Bearings	NSK/NMB
Winding	single-strand copper
Dimensions	ø 37.5 × 30 mm
Shaft	ø 5 mm, M5 thread, steel
Shaft protruding length	15.5 mm
Mounting holes	4× M3, 19 × 19 mm
Wires	310 mm / 18 AWG
Weight	115 g (including wires)

2.4 Dimensional drawing



Dimensions in mm (GEPRC drawing)

- Mounting holes in the base: **4× M3**, thread depth **3.5 mm**.
- The M5 shaft protrudes 15.5 mm from the bell, of which the threaded part is 9.5 mm.
- Motor diameter 37.5 mm, body height 30 mm.



Bottom view of the motor – base with four M3 holes and wire exit

2.5 Manufacturer's test data

The manufacturer tested the motor with two Hoprop propellers at a supply voltage of approximately 23.5–24.1 V. The values are a guide for choosing the propeller and speed controller; actual values depend on the propeller, battery, speed controller and temperature.

Voltage (V)	Throttle (%)	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)	Temp. (°C)
24.05	20	0.34	92	8.2	11.22	
24.03	30	2.76	386	66.79	5.78	
24.01	40	5.42	730	131.91	5.53	
23.99	50	9.17	1071	221.73	4.83	
23.88	60	15.31	1566	368.54	4.25	71
23.85	70	24.47	2191	588.59	3.72	
23.58	80	37.94	2911	902.22	3.23	
23.58	90	40.87	3062	963.7	3.18	
23.52	100	43.2	3190	1016.1	3.14	
24.08	20	0.48	117	11.56	10.12	
24.05	30	2.9	472	70.15	6.73	
23.91	40	6.6	907	159.04	5.7	
23.87	50	15.31	1665	370.64	4.49	
23.8	60	27.81	2439	667.24	3.66	97
23.77	70	42.69	3152	1023.36	3.08	
23.52	80	61.72	3866	1464.2	2.64	
23.52	90	64.39	3972	1514.4	2.62	
23.47	100	66.71	4032	1565.7	2.57	

Rows 1–9: Hoprop MQ9X4.5 propeller · rows 10–18: Hoprop MQ10X5 propeller · the temperature is the value stated by the manufacturer for the whole test series

※ With the 10 × 5 inch propeller the manufacturer measured 66.71 A at full throttle, i.e. more than the stated peak current of 65 A. With this propeller, choose a speed controller from the upper end of the recommended range and keep full throttle short.

3. Legal conditions of operation

3.1 The law of the country where you fly applies

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

3.2 The motor as part of a drone

- The motor itself is not subject to the rules for unmanned aircraft operation. However, the rules do apply to **the drone in which you install it**.
- A drone assembled from individual components has no C0–C4 class. In the Czech Republic it can generally be operated in the open category as a **privately built** unmanned aircraft system; a drone weighing 250 g or more, for which this motor is intended, falls into subcategory **A3** (flying far from people and at least 150 m from residential, commercial, industrial and recreational areas).
- The operator of a drone weighing 250 g or more or of a drone with a camera must register with the Civil Aviation Authority (ÚCL) and the pilot must hold the relevant competency. Observe the maximum height of 120 m and the geographical zones.
- Flying with FPV goggles is only possible with an observer who keeps the drone in direct sight at all times.
- Liability insurance is compulsory in the Czech Republic for drones in category A3 above 4 kg; we strongly recommend it for lighter drones too.

4. Installation

4.1 What else you need

- a frame for 8–10 inch propellers with 19 × 19 mm / M3 motor mounting holes (a drone needs four motors),
- a 60–80 A speed controller (ESC) per motor for 6S power and a 6S LiPo battery,
- 8–10 inch propellers with a 5 mm shaft hole,
- a soldering iron for 18 AWG wires, solder, heat-shrink tubing, tools for M3 screws and the M5 nut.

4.2 Mounting on the frame arm

① Place the motor on the arm so that the M3 holes in the base line up with the holes in the arm and the wires point towards the centre of the frame.

② Choose the screw length: arm thickness + thread in the motor. The thread in the base is only **3.5 mm** deep – a screw that is too long will press against the winding and **damage it** (a short circuit in the winding destroys both the motor and the speed controller). Use the supplied M3 × 11 screws only if they comply with this rule.

③ Tighten the screws evenly in a cross pattern. You can apply a drop of medium-strength threadlocker to the thread.

④ After tightening, turn the bell by hand – it must spin freely without rubbing. If it rubs, the screws are too long or the motor is not seated straight.

※ Always check the screw length before tightening. Damage to the winding caused by a screw that is too long is not a product defect.

4.3 Connecting to the electronic speed controller (ESC)

① Route the wires along the arm and secure them so that they cannot get into the propeller and do not rub against the edges of the frame.

② Cut the wires to the required length, strip and tin them.

③ Solder them to the three phase pads of the speed controller. The order of the wires does not matter – the direction of rotation is set later (Chapter 5.2).

④ Check for solder bridges between pads and for exposed copper outside the joints.

4.4 Mounting the propeller

Mount the propeller **only after** setting and checking the direction of rotation (Chapter 5).

① Fit the propeller on the M5 shaft with the label facing up and check that its type (CW / CCW) matches the direction of rotation of the motor in that position.

② Screw on the supplied M5 flange nut and tighten it firmly with a wrench while holding the motor bell.

③ Check that the propeller has no play.

5. Start-up

5.1 Flight controller (FC) settings

- In the flight controller configuration (e.g. Betaflight, *Motors* tab), set the number of motor poles to **14** (12N14P configuration = 14 magnets). This is necessary for correct RPM readings and for RPM-based filtering (RPM filter).
- Set the speed controller protocol according to the speed controller used (usually DShot).
- After the first connection, check in the *Motors* tab without propellers that the individual motors spin up in the correct positions.

5.2 Checking and changing the direction of rotation

① Remove the propellers. Connect the battery and briefly spin each motor at low throttle in the flight controller configuration.

② Compare the direction of rotation with the frame diagram and with the flight controller setting (*Props in / Props out*).

③ If a motor spins the wrong way, change the direction in the speed controller configuration (e.g. BLHeli, Bluejay or AM32 configurator), or swap any two of the three motor wires.

※ Always test the motors without propellers. During a test with propellers the drone may take off unexpectedly.

6. Operation

6.1 Pre-flight check

- Use a **fully charged** 6S LiPo battery: 25.2 V (4.20 V/cell).
- Check that the motor screws and the propeller nut are tight.
- Turn each motor by hand – the bell must spin freely, without rubbing, grinding or play.
- Check that the propellers are not damaged and the wires are neither chafed nor within reach of the propeller.
- Make sure the drone is disarmed before connecting the battery.

6.2 Motor load and temperature

- End the flight at the latest when the voltage under load drops to **3.5 V/cell (21.0 V for 6S)**.
- Do not exceed the maximum power of 1620 W or the peak current of 65 A. Check your choice of propeller against the table in Chapter 2.5.
- After the first flights, check the motor temperature. If the motors are too hot to touch after a normal flight, choose a smaller propeller or one with a lower pitch and check the filter and PID settings.
- After a crash, always check the motor as described in Chapter 7.1 before flying again.

7. Maintenance and troubleshooting

7.1 After every flight

- Disconnect the battery and let the motors cool down.
- Remove dust, sand, grass and other dirt from the motors – ideally with compressed air. Check that no metal particles have got between the magnets and the winding.
- Turn the bell by hand. Rubbing, grinding or play indicates damaged bearings or a bent shaft.
- Check the shaft – a bent shaft causes vibration and further damage. Do not continue using a motor with a bent shaft.
- Check the wire insulation and the soldered joints at the speed controller.

7.2 Storage

- Store the motors in a dry place, away from moisture and metal filings.
- Store the drone batteries at the storage voltage of **3.8 V/cell (22.8 V for 6S)**, disconnected from the drone.

7.3 Troubleshooting

Problem	Possible cause and solution
Motor spins in the wrong direction	Change the direction in the speed controller configuration or swap two motor wires (Chapter 5.2).
Motor does not spin, only twitches or beeps	Cold solder joint or broken wire – check the soldering of all three phases. Check the speed controller protocol setting.
Bell rubs or turns stiffly	Mounting screws too long, dirt between the bell and the stator, or damaged bearings.
Strong vibration	Bent shaft, damaged or unbalanced propeller, loose propeller nut or motor screws.
Motor overheats	Propeller too large or pitch too high, unsuitable filter/PID settings, damaged winding. Check the winding for signs of overheating.
Smell of burnt varnish, short circuit	Damaged winding – stop using the motor immediately; it may also have damaged the speed controller.

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 (EM3115/900KV) is printed on the motor housing (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.