EM2810 1280KV

GEPRC – brushless motor for long-range FPV
User manual



Read this entire manual carefully before installation and first start-up. Keep it for future reference.

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1. Safety instructions

The GEPRC EM2810 1280KV is a powerful brushless motor designed to drive FPV drones. Improper installation or operation may cause serious injury or damage to property.

- The motor may only be installed and operated by a person familiar with building and operating FPV drones. This product is not a toy and must be kept away from children.
- Always carry out installation, soldering and configuration with the battery disconnected.
- Only operate the motor with the electronic speed controller (ESC), supply voltage and propellers specified in chapter 2.3.
- Do not continue to use a damaged motor (bent shaft, damaged bell, chafed wire insulation or windings).

1.1 Rotating parts and propellers

- With a 7–8" propeller the motor spins at very high speed. A rotating propeller can cause deep cuts.
- During bench tests, configuration and checking the direction of rotation, **always keep the propellers removed**.
- Before connecting the battery, make sure the drone is in the Disarm state (motors off) and that nobody is within reach of the propellers.
- Never reach into the propeller area while the battery is connected.

1.2 Power supply and Li-Po batteries

The manufacturer specifies an input voltage of **25.2 V (6S Li-Po)**. The following values apply to Li-Po batteries:

Battery state	per cell	6S Li-Po
fully charged	4.20 V	25.2 V
end the flight	3.5 V	21.0 V
storage	3.8 V	22.8 V

- Do not exceed the 6S Li-Po voltage. A higher voltage increases the speed, current and heating of the motor beyond the values it is designed for.
- Handle Li-Po batteries according to the instructions of their manufacturer. Do not use a damaged, swollen or overheated battery.

1.3 Temperature and operating environment

- The motor gets very hot during operation. Do not touch it after a flight until it has cooled down.

- The motor contains strong neodymium magnets. Protect it from metal filings and small metal objects that can get caught between the bell and the stator.
- Do not use the motor in rain, in wet grass, in sand or in dusty environments. Water and dirt damage the bearings and windings.

1.4 Drone operation and 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, compulsory insurance, permitted frequency bands and maximum transmission power. If you operate a drone fitted with this motor, you must comply with the regulations of the country in which you fly. In the Czech Republic, operator registration and pilot examinations are handled by the Civil Aviation Authority (www.caa.gov.cz).

2. Product description

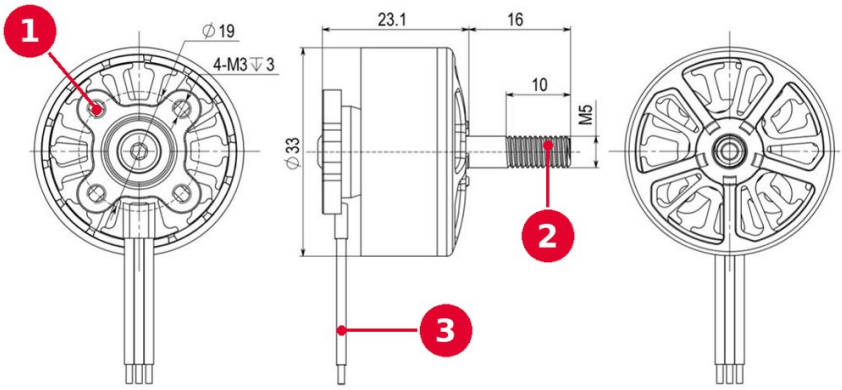
The GEPRC EM2810 1280KV belongs to the EM series, which the manufacturer designed for long-range FPV drones with 7–8" propellers. The motor has a 5 mm steel shaft, N52H magnets, NSK/NMB bearings and single-strand winding. It is mounted with four M3 screws in a 19 × 19 mm pattern.

2.1 Package contents

Qty	Item
1×	GEPRC EM2810 1280KV motor
4×	M3×9 round-head screw
1×	M5 flange nut (anti-slip)

※ Propellers, electronic speed controller (ESC), flight controller (FC) and battery are not included.

2.2 Parts description



Manufacturer's drawing – bottom, side and top view (dimensions in mm)

① Mounting holes – 4× M3 thread, thread depth 3 mm, 19 × 19 mm mounting pattern (Ø 19 mm circle in the drawing)

② Ø 5 mm shaft with M5 thread for mounting the propeller – the shaft protrudes 16 mm, the thread is 10 mm long

③ Three-phase lead wires, 18 AWG, 260 mm long

2.3 Technical data

Parameter	Value
Designation	GEPRC EM2810 1280KV
KV	1280 KV
Maximum power	1160 W
Peak current	54 A
Phase-to-phase resistance	46 mΩ
Recommended propellers	7–8"
Input voltage	25.2 V (6S Li-Po)
Recommended ESC	50–60 A
Configuration	12N14P
Magnets	N52H
Bearings	NSK/NMB
Winding	single-strand copper wire
Motor dimensions	Ø 33 × 23.1 mm
Shaft	Ø 5 mm, steel, protrudes 16 mm
Mounting holes	19 × 19 mm, 4× M3
Lead wires	260 mm, 18 AWG
Weight	69.5 g (including wires)

※ Data provided by the manufacturer GEPRC.

2.4 Manufacturer's test data

For the EM2810 1280KV motor, the manufacturer GEPRC has published test results with three types of propellers at a voltage of approximately 24 V. The values are a guide for choosing a propeller; actual values depend on the battery, ESC, propeller and flight conditions.

▶ Hoprop 7×3.7×3 propeller – temperature during the test 74 °C

Throttle (%)	Voltage (V)	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)
20	24.05	0.48	106	11.53	9.19
30	24.04	3.25	396	78.64	5.04
40	24.03	6.39	694	155.41	4.47
50	23.93	10.35	994	249.72	3.98
60	23.99	15	1298	362.83	3.58
70	23.8	22.94	1758	550.59	3.19
80	23.55	34.96	2302	830.26	2.77
90	23.52	37.39	2411	886.96	2.72
100	23.49	39.72	2512	933.02	2.69

▶ Gemfan 8040×3 propeller – temperature during the test 109 °C

Throttle (%)	Voltage (V)	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)
20	24.12	1.02	140	24.59	5.69
30	24.1	3.46	460	83.96	5.48
40	23.99	7.64	890	184.77	4.82
50	23.88	13.89	1335	334.43	3.99
60	23.91	24.4	1959	588.26	3.33
70	23.66	37.11	2530	885.46	2.86
80	23.47	53.18	3126	1258.66	2.48
90	23.36	55.26	3158	1301.9	2.39
100	23.32	56.72	3055	1322.7	2.31

▶ **Gemfan 7535×3 propeller – temperature during the test 87 °C**

Throttle (%)	Voltage (V)	Current (A)	Thrust (g)	Power (W)	Efficiency (g/W)
20	24.11	0.48	103	11.53	8.93
30	24.07	3.25	397	78.81	5.04
40	24.02	6.6	740	159.76	4.63
50	24.01	10.69	1044	259.86	4.02
60	23.99	16.07	1425	388.7	3.67
70	23.82	24.96	1907	599.6	3.18
80	23.6	36.97	2394	880.11	2.72
90	23.58	39.33	2488	935.24	2.66
100	23.55	40.92	2553	963.67	2.66

※ With the Gemfan 8040×3 propeller at 80–100 % throttle, the motor reached a current of 53–57 A and a temperature of 109 °C, i.e. values at or above the specified peak current of 54 A. Do not use sustained full throttle with this propeller.

3. Installation

▶ **What else you need**

- a frame with a 19 × 19 mm motor mounting pattern for M3 screws,
- an electronic speed controller (ESC) with a recommended current of 50–60 A per motor,
- a flight controller (FC) with FPV drone firmware (e.g. Betaflight) and a 6S Li-Po battery,
- 7–8" propellers with a 5 mm shaft hole,
- a soldering iron for 18 AWG wires, solder, heat-shrink tubing, tools for the M3 screws and the M5 nut, and medium-strength threadlocker (recommended).

3.1 Mounting the motor to the frame

1. Place the motor on the frame arm so that the mounting holes ① on the underside of the motor line up with the holes in the arm. Route the wires along the arm towards the ESC.
2. Fasten the motor with the four M3 screws supplied. Tighten the screws evenly in a cross pattern.
3. After tightening, turn the motor bell by hand. It must rotate easily, smoothly and without rubbing.

※ The thread depth in the motor is 3 mm. If a screw is too long for the thickness of the arm, it will hit the stator windings and damage them. Always choose the screw length according to the arm thickness of your frame.

- When using threadlocker, apply only a small amount to the screw thread, not into the motor.
- Do not overtighten the screws – the M3 thread in the motor can strip.

3.2 Connecting to the electronic speed controller (ESC)

The motor has three phase wires ③. The order in which the wires are connected to the ESC pads does not matter – it only changes the direction of rotation, which can be adjusted later (chapter 4.2).

- Shorten the wires to the required length with a small reserve, strip and tin the ends.
- Solder quickly with a sufficiently powerful soldering iron so that neither the wire insulation nor the ESC overheats.
- Check the joints – no wire may touch a neighbouring pad or the frame.
- Secure the wires on the arm (cable tie, heat-shrink tubing) so that they cannot get into the propeller or chafe against the edges of the carbon-fibre frame.

4. Start-up

Carry out all steps in chapters 4.1 and 4.2 with the propellers REMOVED.

4.1 Flight controller and ESC settings

- The motor configuration is 12N14P – the motor has **14 magnets (poles)**. For correct RPM measurement (RPM filter, telemetry), set the number of motor poles to 14 in the flight controller configurator (in Betaflight: *Motors* tab, *Motor poles*).
- Set the ESC protocol and other parameters according to the instructions for your flight controller and ESC.
- Make sure the ESC matches the motor manufacturer's recommendation (50–60 A) and 6S voltage.

4.2 Checking the direction of rotation

1. Remove the propellers, connect the drone to the computer, open the flight controller configurator and connect the battery.
2. In the *Motors* tab, confirm that the propellers are removed and briefly spin each motor in turn at low speed.
3. Compare the direction of rotation of each motor with the diagram in the configurator (*Props in* / *Props out*).
4. If a motor spins the wrong way, change the direction in the ESC settings (e.g. in the ESC configuration software), or swap any two of the three motor wires.

4.3 Mounting the propeller

1. Fit the propeller matching the direction of rotation of the motor onto the shaft ②, printed side up.
2. Secure the propeller with the supplied M5 flange nut and tighten it firmly with a wrench.
3. Check that the propeller sits straight and does not touch the frame, wires or antennas.

※ The M5 nut wears with repeated use. Replace a loose or damaged nut.

5. Operation and maintenance

5.1 Pre-flight check

- Always insert a **fully charged** 6S Li-Po battery (4.20 V/cell, 25.2 V).
- Check that the motor screws and propeller nuts are tight.
- Turn each motor by hand – it must rotate easily, without rubbing, squeaking or play.
- Check that the propellers are undamaged and mounted in the correct direction.
- Check that no wire can get into a propeller.

5.2 Motor load and temperature

- The motor is designed for 7–8" propellers. Larger propellers or propellers with a significantly higher pitch overload the motor.
- Do not exceed the peak current of 54 A and the maximum power of 1160 W specified by the manufacturer. Long flights at full throttle overheat the motor.
- After the first flights with a new combination of propeller and battery, check the motor temperature. If a motor is too hot to hold in your hand after landing, use a smaller propeller or one with a lower pitch, or fly more gently.
- End the flight at the latest when the voltage drops to 3.5 V/cell (21.0 V for 6S).

5.3 After-flight care and storage

- Disconnect the battery and let the motors cool down.
- Remove grass, dust and dirt from the motor. Check that no metal particles are caught between the magnets and the stator.
- Turn the bell by hand and listen to the bearings. Do not continue to use a motor that rubs, squeaks or has play.
- After a crash, check that the shaft is not bent – otherwise the propeller wobbles and the drone vibrates.
- Store the motor in a dry place at room temperature, away from dust and metal objects.
- Store the drone batteries at a storage voltage of 3.8 V/cell (22.8 V for 6S).

5.4 Troubleshooting

Problem	Possible cause and solution
Motor does not start, only twitches or beeps	Broken or cold solder joint on one of the three wires – check the soldering. Check the ESC and protocol settings.
Motor spins in the wrong direction	Change the direction in the ESC settings or swap two motor wires (chapter 4.2).
Motor rubs or turns stiffly	Dirt or metal particles in the motor, mounting screw too long, damaged bearing. Clean the motor and check the screw length.
Strong drone vibrations	Damaged propeller, bent shaft or loose propeller nut. Replace the propeller, check the shaft and tightness.
Motor overheats	Propeller too large or too high pitch, long flight at full throttle, damaged bearing or winding. Adjust the propeller and flying style (chapter 5.2).
Incorrect RPM in telemetry / filter	The number of motor poles is not set to 14 in the configurator (chapter 4.1).

6. Information for the EU and Czech Market

6.1 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

6.2 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 (EM2810 1280KV) is printed on the motor housing.

6.3 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.

7. 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 6.1.
- 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.