AlfaRC Apex 3

Carbon fibre frame for a 3" freestyle FPV drone
User manual



Read this entire manual before building and before the first flight. The frame is a kit part, not a ready-to-fly drone.

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1. Product description

1.1 What it is for

AlfaRC Apex 3 is a carbon fibre frame for building a small **3" freestyle FPV drone**. The arms are made of 4 mm thick carbon fibre, which makes the frame very durable. The central section has room for a flight controller and ESC stack with 20×20 mm M2 mounting holes; at the rear of the frame there are additional mounting holes with 20×20 mm M2 spacing intended for a video transmitter (VTX).

The frame is designed for **Micro (19 mm)** FPV cameras and accepts motors with 9 mm and 12 mm mounting hole patterns for M2 screws. It is a kit part – **not a ready-to-fly drone**. You choose and install the electronics, motors, propellers and battery yourself.



AlfaRC Apex 3 – assembled frame (without electronics)

1.2 Specifications and package contents

Product designation	AlfaRC Apex 3
Type	carbon frame for a 3" freestyle drone
Diagonal motor distance	147 mm
Weight	61 g
Arm thickness	4 mm
Top plate	1.5 mm
Bottom plate	2 mm
Stack mounting holes	20×20 mm, M2
VTX mounting holes	20×20 mm, M2
Motor mounting holes	9 mm / 12 mm, M2
Camera size	Micro (19 mm)
Package contents	1× frame

Not included in the package: motors, flight controller (FC), electronic speed controllers (ESC), FPV camera, video transmitter (VTX), receiver, antenna, propellers, battery or battery strap. Before building, make sure you have screws of suitable length for the motors, stack and VTX – the manufacturer does not state that they are included.

2. Build and use

2.1 What you will need

- **4 motors** with 9 mm or 12 mm mounting hole patterns for M2 screws, suitable for 3" propellers,
- **a flight controller (FC) and electronic speed controllers (ESC)** in stack format with 20×20 mm M2 mounting holes,
- **a Micro (19 mm) FPV camera**,
- **a video transmitter (VTX)** – ideally with 20×20 mm M2 mounting holes – and an antenna,
- **a receiver** compatible with your radio transmitter,
- **3" propellers**, a battery matching the chosen electronics and motors, and a battery strap,
- tools: hex keys or screwdrivers, a soldering iron, solder, cable ties, heat-shrink tubing and medium-strength threadlocker.

2.2 Build procedure

① Unpack the frame and inspect all carbon fibre parts. The arms and plates must not show any cracks or delaminated (peeling) layers.

② Carefully chamfer sharp carbon edges where cables will run, using fine sandpaper. Work wet and do not inhale the dust (see chapter 2.3).

③ Mount the motors on the arms. Use screws of such a length that, once tightened, they **do not touch the motor windings**. Route the motor wires along the arms and secure them.

④ Place the stack (ESC at the bottom, FC on top) in the central section of the frame on the 20×20 mm M2 holes. The arrow on the FC should point forward; otherwise set the orientation in the firmware configuration.

⑤ Solder the motors to the ESC and solder on the power lead with the battery connector. Make sure that no wire or solder joint can come into contact with the carbon fibre.

⑥ Fit the Micro (19 mm) camera at the front of the frame and the VTX at the rear on the 20×20 mm M2 holes. Secure the VTX antenna so that it cannot reach the propellers.

⑦ Place the receiver and its antenna out of reach of the propellers and as far as possible from sources of interference (ESC, VTX).

⑧ Before connecting a battery for the first time, use a multimeter to check that there is no short circuit between the positive and negative power terminals. For the first power-up we recommend a short-circuit protector (smoke stopper).

⑨ Configure the flight controller in a configuration program (e.g. Betaflight): FC orientation, motor direction, receiver and Arm (motors on) / Disarm (motors off). **The propellers must not be fitted while doing this.**

⑩ Only after checking the motor direction, fit the propellers in the correct direction and tighten them. Secure the battery with a strap so that it cannot shift into the propellers in flight.



View of the assembled frame

2.3 Safety, operation and maintenance

- **Carbon fibre is electrically conductive.** Contact between a wire, solder pad or component and the frame can cause a short circuit, destroying the electronics or setting the battery on fire. Mount the electronics on insulating washers or soft mounts and protect cables with heat-shrink tubing.
- **Carbon fibre dust is harmful to health.** When sanding or drilling, work wet, wear a respirator and safety glasses, and do not inhale the dust.
- Spinning propellers can cause serious injury. Connect the battery only just before flight, at a safe distance from people and animals, and never hold the drone in your hand with the propellers fitted.
- Charge Li-Po batteries only under supervision, on a non-flammable surface and with a charger designed for this cell type. Before flight, connect a **fully charged** battery (4.20 V/cell for Li-Po, 4.35 V/cell for LiHV). End the flight at the latest when the voltage drops to **3.5 V/cell**; for storage, charge or discharge the battery to **3.8 V/cell**. Do not use a damaged or swollen battery.
- After every flight, and especially after a crash, check the arms and plates for cracks. Replace cracked or delaminated carbon fibre parts – they could fail in flight.
- Regularly check that all screws are tight, especially the motor and stack screws.

▶ Legal conditions of operation

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 transmit power. **The law of the country in which you fly the drone always applies.**

A drone built on this frame is a privately built unmanned aircraft system. If it is equipped with a camera, its operator must be registered (in the Czech Republic with the Civil Aviation Authority) and the registration number must be displayed on the drone. When flying with FPV goggles, an observer must be present next to the pilot. The user is responsible for setting the transmit power of the VTX and receiver in accordance with the regulations of the country of operation.

3. Information for the EU and Czech Market

3.1 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

3.2 Disposal

- The frame is a mechanical part made of carbon fibre composite and metal hardware. **It contains no electronics or battery** and is therefore not subject to take-back of electrical equipment.
- Take an unusable frame to a municipal collection site or dispose of it according to the waste management rules in your municipality. Metal screws and standoffs can be handed in separately as scrap metal.
- If you dispose of the frame together with mounted electronics or a battery, first remove the electronics and battery and take them to a collection point for electrical equipment and batteries.

4. 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 3.1.
- 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.