ROTORAMA

Volador II VX5 O4

FlyfishRC — 5" freestyle FPV drone frame
User and build manual



Read this entire manual carefully before building and before the first flight, and keep it for future reference. The frame is a kit intended for experienced users.

www.rotorama.com

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1. Safety instructions

1.1 Before you start

Volador II VX5 O4 is a **frame (kit)** for building a 5" FPV drone. It does not fly on its own — you install the electronics, motors, propellers and battery yourself. Building requires experience with soldering, with wiring FPV drone electronics and with configuring them in a configuration program.

- The product is not a toy. It is not intended for children; operate the finished drone only as an adult, properly instructed person.
- If you have no experience with building drones, ask an experienced pilot or modeller for help.
- The person who built the drone is responsible for its correct assembly, wiring and configuration.
- Do not modify the frame or its parts (drilling, sanding, cutting) — this weakens its strength.

1.2 Safety during building and operation

- The carbon plates have chamfered edges, but handle them with care anyway. Damaged carbon may have sharp splinters.
- Carbon dust is harmful to health and electrically conductive. Do not sand or drill carbon; if it is exceptionally necessary, work wet, wear respiratory and eye protection and remove the dust thoroughly.
- Carbon is **electrically conductive**. No wire, solder joint or electronics board may touch the frame with an uninsulated part — risk of short circuit.
- When soldering, use a soldering iron stand, a ventilated workplace and eye protection. Do not inhale solder or flux fumes.
- Tighten screws with suitable tools and reasonable force. Overtightening will strip the thread or damage the carbon plate.

▶ **Rotating propellers and mechanical hazards**

- Rotating propellers can cause serious injury. Whenever you work on the drone with a battery connected, keep the **propellers removed**.
- Connect the battery only immediately before the flight and only when all persons are out of reach of the propellers.
- After a crash, first Disarm (stop the motors) and disconnect the battery; only then approach the drone.
- Never fly with a damaged frame, a cracked arm or a damaged propeller.

1.3 Li-Po and LiHV batteries

The battery is not included. When handling Li-Po and LiHV batteries, observe these rules:

- Charge only with a suitable balance charger, on a non-flammable surface and under supervision.
- Do not use a swollen, punctured or otherwise damaged battery. After a hard impact, observe it for some time in a safe place.
- Always insert a **fully charged** battery before the flight and end the flight at the latest at the voltage given in the table.
- Do not short-circuit the battery; check the polarity of the XT60 connector already when soldering the power leads.

State	Per cell (Li-Po / LiHV)	4S Li-Po / LiHV	6S Li-Po / LiHV
Fully charged	4.20 V / 4.35 V	16.8 V / 17.4 V	25.2 V / 26.1 V
End flight	3.5 V	14.0 V	21.0 V
Storage	3.8 V	15.2 V	22.8 V

Choose the battery cell count according to the motors and electronics used; the 4S and 6S values are given as examples.

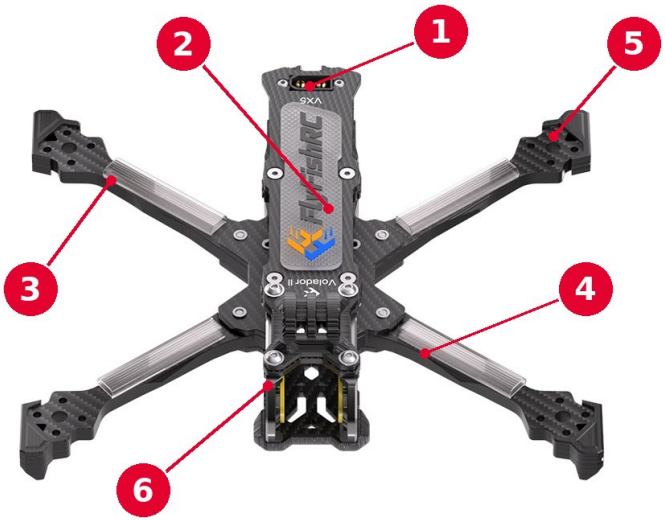
2. Product description

2.1 What the frame is for

FlyfishRC Volador II VX5 O4 is the second generation of the Volador freestyle frame for 5" propellers in a **Squashed X** layout. It is made of T700 carbon fibre plates, complemented by CNC aluminium alloy parts and TPU parts. The arms are individually replaceable and the design minimises frame resonance.

The O4 version is designed for the DJI O4 Air Unit Pro digital video system: the camera is mounted in CNC side plates with silicone dampers that reduce image vibration (jello). The frame is also compatible with 19 mm and 20 mm format cameras and with analogue and other digital systems. The XT60 connector is fixed in the rear part of the top plate, so the power leads cannot be hit by the propellers.

2.2 Parts overview



Top view (colour of TPU parts may vary)

① XT60 connector integrated in the top plate

② Anti-slip battery pad on the top plate

③ T700 carbon fibre arm (6 mm thick)

④ Motor wire protection tube

⑤ Motor mounting holes 16 × 16 mm

⑥ CNC camera side plates with silicone dampers

2.3 Specifications

Model	Volador II VX5 O4 (FlyFishRC)
Layout	Squashed X
Material	T700 carbon fibre, CNC aluminium alloy parts, TPU parts
Propeller size	5–5.1"
Wheelbase (diagonal)	225 mm
Overall dimensions	177 × 165 mm
Weight	177.4 g (incl. TPU parts)
Arm thickness	6 mm
Top / middle / bottom plate	2.5 mm / 2.5 mm / 2.5 mm
Keystone	5 mm
Side plates	2 mm
CNC camera side plates	5 mm
Camera	19 mm / 20 mm; DJI O4 Air Unit Pro
Stack mounting (FC/ESC)	20 × 20 mm / 30.5 × 30.5 mm (M3)
Video transmitter mounting	20 × 20 mm / 25.5 × 25.5 mm (M2)
Motor mounting	16 × 16 mm (φ 3 mm)
Screws	grade 12.9, with Loctite threadlocker pre-applied
Power connector	XT60 integrated in the top plate
Colour of TPU parts	black

2.4 Package contents

- 1× Volador II VX5 O4 frame (carbon plates and arms, CNC parts)
- 1× XT60 connector
- 1× anti-slip battery pad
- 2× battery strap
- 1× set of TPU parts (incl. arm guards and an antenna mount in two versions — with and without GPS mount)
- 1× hardware set (screws and standoffs)

※ Motors, flight controller (FC), electronic speed controllers (ESC), video transmitter, camera, receiver, propellers, battery and tools are NOT included.

3. Building the drone

3.1 What else you need

- 4× motor with 16 × 16 mm mounting and M3 screws of suitable length,
- a flight controller (FC) and electronic speed controllers (ESC) as a 20 × 20 mm or 30.5 × 30.5 mm stack with M3 holes,
- a video system — e.g. DJI O4 Air Unit Pro, another digital system, or a 19/20 mm analogue camera with a 20 × 20 mm or 25.5 × 25.5 mm video transmitter (VTX),
- a receiver and a radio transmitter,
- 5–5.1" propellers,
- a Li-Po or LiHV battery with an XT60 connector and a charger,
- a soldering iron, solder, heat-shrink tubing, cable ties and hex keys or screwdrivers matching the supplied screws.

3.2 Assembly guidelines

The building procedure depends on the components used. Follow these general guidelines:

① Before assembly, lay out all parts, check them and sort the screws by length.

② Fit the arms between the frame plates and tighten evenly in a cross pattern. The screws have threadlocker pre-applied — do not add more as long as the original layer is effective.

③ Mount the stack (FC/ESC) in the 20 × 20 or 30.5 × 30.5 mm holes using the rubber grommets supplied with the electronics. The orientation arrow on the FC must point in the direction of flight; otherwise set the board orientation in the configuration program.

④ Mount the motors in the 16 × 16 mm holes. **The motor screw must not touch the windings** — there must be clearance after screwing in; otherwise use a shorter screw.

⑤ Route the motor wires through the protection tubes on the arms and secure them so that they cannot be hit by a propeller or chafe on the frame edge.

⑥ Insert the XT60 connector into the cutout in the top plate (the cutout is symmetrical, the connector can be fitted in both orientations) and solder the power leads to the stack with **correct polarity**.

⑦ Stick the anti-slip pad onto the clean, degreased top plate and thread the battery straps through.

3.3 Camera, video transmitter and antennas

- Mount the DJI O4 Air Unit Pro camera in the CNC side plates with silicone dampers; the dampers reduce the transfer of vibrations into the image. 19 mm and 20 mm format cameras are mounted in the same side plates.
- Mount the video transmitter in the 20 × 20 or 25.5 × 25.5 mm (M2) holes in the rear part of the frame.
- Route the video transmitter and receiver antennas through the TPU antenna mount. The mount is supplied in two versions — with and without a GPS module mount.
- Never power the video transmitter without an antenna connected — it may be damaged.
- Place the antennas out of reach of the propellers and as far as possible from the power leads.

3.4 Checks after building

- Before connecting the battery for the first time, check with a multimeter that there is no short circuit between the positive and negative power terminals. We recommend using short-circuit protection (smoke stopper).
- Check that no wire or board touches the carbon and that no cable reaches into the propeller path.
- Without propellers, verify in the configuration program the flight controller orientation, the motor order and direction of rotation, and the receiver function including failsafe.
- Only then fit the propellers in the correct direction of rotation and tighten them.

4. Operating the finished drone

4.1 The law of the country where you fly applies

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 powers. 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.

4.2 Drone classification and operator registration

- A drone built on this frame has no C0–C4 class label. It is operated as a **privately built unmanned aircraft system** in the open category, or within a model aircraft club or association.
- A privately built drone with a maximum take-off mass below 250 g may be operated in subcategory A1, otherwise only in subcategory **A3**. The frame alone weighs 177.4 g, so the finished drone will usually exceed this limit. Always weigh the actual take-off mass including the battery and accessories. Subcategory A2 is not available.
- A drone with a camera requires **operator registration** regardless of its mass. In the Czech Republic, registration is done with the Civil Aviation Authority (ÚCL); mark the registration number on the drone.
- The pilot must hold a valid certificate for the relevant subcategory (online training and test at ÚCL).

▶ Operating limits and flying with FPV goggles

- Maximum flight height 120 m above ground, flight within visual line of sight (VLOS).
- No flying over assemblies of people; in subcategory A3 fly at least 150 m from residential, commercial, industrial and recreational areas and without endangering uninvolved persons.
- When flying with FPV goggles, an **observer** must stand next to the pilot and watch the drone directly without optical aids.
- Respect geographical zones and airspace restrictions.
- Liability insurance is compulsory in the Czech Republic in subcategory A3 for drones over 4 kg; for a lighter drone it is not compulsory, but we strongly recommend it. Respect people's privacy and personal data protection.

4.3 Radio frequencies and transmit power

The frame itself does not transmit, but the video transmitter and receiver you install do. In the Czech Republic the following limits apply to the bands used (general authorisations of ČTÚ):

Band	Limit	Regulation
2400–2483.5 MHz	25 mW e.i.r.p.	VO-R/10, Art. 3(j)
5725–5875 MHz	25 mW e.i.r.p.	VO-R/10, Art. 3(k)
5150–5250 MHz	indoors only; UAS must not be operated in the 5150–5170 MHz range	VO-R/12, point b1)

※ The user is responsible for setting the transmit power and frequency. Outside the Czech Republic the limits of the respective country apply.

5. Pre-flight check, maintenance and troubleshooting

5.1 Pre-flight check

- The frame, arms and plates are intact, without cracks or delamination; screws are tight.
- Propellers are undamaged, correctly oriented and tight.
- Cables are secured and do not reach into the propeller path; antennas are connected.
- The battery is **fully charged**, undamaged and firmly held by the straps on the anti-slip pad.
- Failsafe is set and verified; the flying area is safe and clear.

5.2 After every flight

- Disconnect the battery and let the motors and electronics cool down.
- Check the arms and plates — especially after a crash. Replace a cracked or delaminated arm; do not repair it with glue.
- Check the propellers, TPU parts, silicone camera dampers and the XT60 connector mounting.
- Remove dirt, grass and moisture from the frame.

5.3 Screws, joints and storage

- Regularly check that the arm, motor and stack screws are tight. Loose screws cause vibrations and degrade flight performance.
- When refitting a screw whose original threadlocker is worn off, apply new medium-strength threadlocker. Do not apply threadlocker into plastic parts.
- Replace damaged screws with screws of the same length and strength.

▶ Storage

- Store in a dry place, away from direct sunlight and heat sources and out of reach of children.
- Store batteries disconnected, at a storage voltage of 3.8 V/cell, in a fire-resistant bag.

5.4 Troubleshooting

Problem	Cause and solution
Image vibration (jello)	Loose arm or motor screws, damaged silicone camera dampers, damaged propeller. Tighten the screws, replace the dampers or the propeller.
Vibrations and noise in flight	Bent motor shaft, loose stack, cracked arm. Check and replace the damaged part.
Battery comes loose in a crash	Worn anti-slip pad or loose strap. Tighten the strap, replace the pad.
Short circuit or power loss	A wire touches the carbon, damaged insulation, wrong XT60 polarity. Disconnect the battery immediately and fix the fault.
Motor wire cut by a propeller	The wire is not routed through the protection tube or is not secured. Repair and secure the wire.

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 identification

- **Type designation:** Volador II VX5 O4; manufacturer FlyFishRC (www.flyfish-rc.com).
- The frame contains no electrical or electronic components; CE marking does not apply to it. The electronic components you install in the frame must meet the requirements applicable to them and bear their own CE marking.

6.3 Disposal of the product



- The frame itself (carbon plates, aluminium alloy parts, steel screws, TPU and silicone parts) **is not electrical equipment**. At the end of its service life, dispose of it according to the waste management rules of your municipality; metal parts belong in metal collection.
- The electronic components you have installed in the frame (motors, flight controller, ESCs, video transmitter, camera, receiver, power leads with XT60 connector) are electrical equipment. The crossed-out wheeled bin symbol means that they **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.
- Do not dispose of batteries in mixed waste or in fire; hand them over at a battery take-back point.
- 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.