

# MiniMOT

Micro-Light Paramotor

## Manual

rev.01 13/11/2022

### Take care of your little plane...

It's really important to read and follow this manual and its procedures strictly, in order to avoid any issue and have a safe use of this product.



### MiniMot characteristics

- weight: 13kg
- cage dimension: 90cm
- propeller dimension: 82.5cm
- engine power: 17.5HP
- thrust: 45 kg at ISA (international standard atmosphere)
- electric start

### **YES, you can fly with him!**

It looks strange that a small paramotor like this can lift everyone, but yes, and it's not magic, just simple physics and a good project overall.

## The story behind the MiniMot concept

This project comes from a simple intuition of its designer, **Raffaele Benetti**. In the past, when the first pioneers started to develop a powered propulsion for their paraglider ('80), their concepts were really close to the MiniMot design: small cage, direct driven propeller, but with heavy components, due to the old technology they had in that time. Then, to reduce the weight, the idea of using small engines with less power but bigger propellers, introducing gear or belt reductions.

Another step was made with the introduction of the innovative Reflex profile, which was a great innovation but, due to the very low glide ratio, required more power to be flown. And then bigger engines arrived as compensation for this issue.

But now? Now we have incredible high performance wings that have a really high glide ratio and low power required to do level flight or climb.

### Do we still need all that power to fly?

The answer is NO. And finally we can fly with a really light and small machine, without the risks connected to having a big size propeller and more thrust that we can't control easily or in a totally safe way.

Of course it's nice to have a big amount of power, like we do with motorbikes, cars boats, snowmobiles etc, but the danger is always proportional to it, so if you are looking for a safe and easy and not painful way to fly, **MiniMot** is the machine for you!

## MiniMot advantages and disadvantages

What makes the MiniMot better than anything else?

- Light weight on your back, that makes all the flight procedures, from take off to land, really easy and relaxed.
- No torque or gyroscopic effect at all! Due to the small propeller and low power, there isn't any perception of torque tendency.
- Electric start. This solution increases safety and makes everything easy and less painful.
- No vibrations. It's also the secret of its low weight. MiniMot is equipped with a boxer twin cylinder engine. Each piston counterbalances the other one and their crankshaft is

ultralight, because no mass is required to balance the alternate movement of the pistons.

- Indestructible. Small equals Strong. We use the same size of metal tubes that are present on our standard paramotors. In this case the geometry and strength become ten times stronger.
- Freedom. You know how problematic a forward launch is, when lines push on the cage, or how dangerous a power start can be, with risk of prop strike. On MiniMot, due to the small cage size, this doesn't exist. Your wing lines never touch your cage!
- Safety. Because of the size of the cage, touching the propeller accidentally or in case of a crash is almost impossible. Anyway, never trust this statement too much!
- Transportation. MiniMot can be dismounted but it's not necessary: it can fit in a car completely assembled. Then you can be ready to fly in a few minutes, and zero risks of forgetting something at home.

#### Negative aspects of the MiniMot

MiniMot is louder compared with a standard paramotor, this because it's a twin cylinder engine, then it has two exhausts instead of one, and because the propeller is direct drive, then it rotates faster and that higher speed generates noise. For this reason don't fly close to people and don't fly immediately over them. When you fly 150 meters far, no one will say anything, then respect this simple rule.

Engine life. Engine life depends the most on the rpm of use. Because this paramotor generates a small amount of thrust, it is easy to keep the engine at the upper rpm rate if you don't mind it. Remember this and reduce the power when possible, and look for the lowest rpm necessary to keep the level flight. This will also reduce the fuel consumption for a longer XC capability.

## FRAME STANDARD CHECK PROCEDURES



Before any flight, perform a complete inspection of the frame, looking for any evidence, like fractures on the paint surface, that could hide fractures on the welded connections.

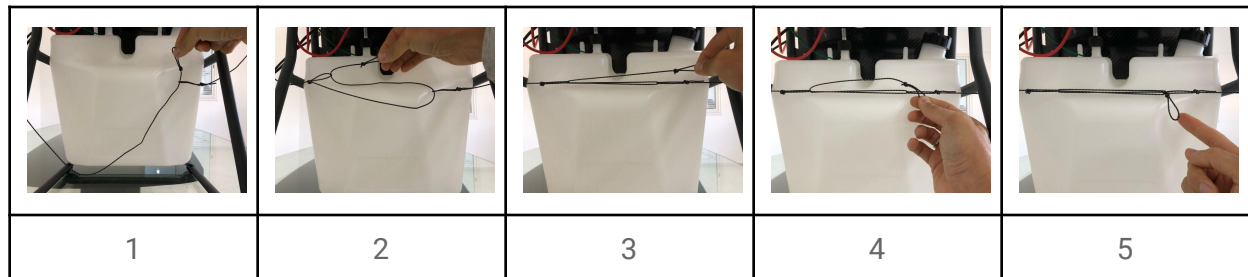
Check all the push pins that are present on the cage. They have to be completely outside to guarantee a rigid connection.



Check the net tension. After a period of time the net loses its tension, and requires little adjustments.

### Net tensioning

Follow this sequence to connect the line and tension the net protection.



### Harness connection

Before every flight, verify every connection between the frame and the harness. MiniMot has a special quick connection that uses push pins. Verify their integrity. In case of any issue, don't fly!

Verify also the functionality of belly and leg straps.

### Carabiners

Inspect your carabiners before every flight, looking for scratches or issues in the closing system. If you hit a carabiner against a hard surface, like a stone for example, change it. A good rule is to change them periodically, we can say every two years. Remember that carabiners are the most important point of connection between you and your wing! Take care of them.

## ENGINE STANDARD PROCEDURES

### FUEL MIXING

The MiniMot runs with mixed fuel (3% oil), never exceeding this value or the engine could be damaged.

#### Oil

Full synthetic oil is mandatory. We recommend the Motul800 "off road".

#### Gasoline

Unleaded 98 (or higher) Octane Fuel without Ethanol

### Break-In

The break-in procedure required 2 hours of running at about 3000 rpm. No additional oil is required in the mixed fuel, keep 3% as explained before.

### Starting Procedure

Before attempting to start the engine, prime the fuel circuit using the manual pump located on the left side of the frame, paying attention introducing a small amount of fuel in the carburettor. To prime is also necessary to push the membrane in the carburettor, using the plastic string located under the air filter.

Check the choke lever position, if it's present. Must be not engaged, positioned 30 degrees forward. (7 hours on the clock). Choke is necessary only in really cold conditions.

Check the carburettor butterfly valve for a free movement and the idle position (screw had to be touched by the butterfly valve lever).

At this stage don't touch the throttle lever and push the start button for a maximum of 5 seconds. If the engine doesn't start, wait 10 seconds and try again. If it doesn't start, add a little bit of fuel with the primer and wait a few seconds before pushing the start button again for a maximum of 5 seconds. Repeat this procedure if necessary.

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When the engine starts, let it run at idle for at least 20 seconds, then increase the power gently.

Warm up the engine, increasing the power gradually not exceeding 5000 rpm.

Just before the take off attempt, increase the power to the maximum rpm for a few seconds, in the way to verify the correct operativity of the engine and to clean up the spark plugs.

### Carburation

Standard configuration for both high rpm and low rpm needles is 1.25 turns, starting from the completely close position. Don't go lower than this if you are not completely sure of what you are doing. If you are not a mechanical expert, please don't operate on the carburettor in any case. Any little mistake on its setting can damage the engine and no warranty will be released! Be aware of that.

Precision setting: (only for expert)

Adjusting the high needle to reach the maximum rpm. If the engine slows down at full throttle or dies, it's a sign of lean carburation. Open the high needle a little bit (minutes on a clock) and try again. When the correct high needle setting is reached, adjust the low needle in the way to find a smooth idle and a reliable transition to high rpm. If the engine dies while applying power, the mixture is likely too lean, if the engine stumbles while applying power, the mixture is likely too rich. An after setting check can be performed checking the color of the spark plug electrode, that has to be light brown or yellow.

### ALERT!

**Never let the engine rotate with the battery connected and the spark plugs disconnected!**

**This will irreparably damage the electronic ignition.**

**If you need to clean the engine from and exceed fuel, always disconnect the battery.**

**If you want to check the spark plugs functionality, always connect both of them to the engine body mass (ground).**

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## Spare parts available

- This section will be upgraded soon