MACFLY

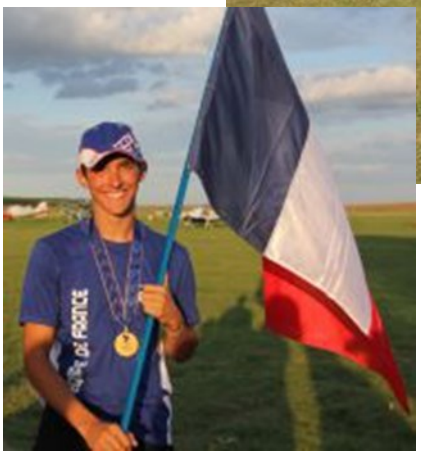
MACFLY user manual

Congratulations for purchasing your MACFLY powered paraglider.

This paramotor is the result of 20 years of experience in the paramotoring sector, in national and international competitions, as well as in the field for the training of future pilots of all sizes and experiences. Our frames are constantly evolving to provide the best equipment nowadays.

We hope you'll find the same pleasure to fly with our machines as we've had while testing them during all these years.

The MACFLY team



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1 – Caution / regulations

Paramotoring is a risky sport, however it isn't a dangerous sport. The training program is rather flexible in most countries and the teaching methods are different from one training center to another.
The specific regulations in each country must be thoroughly studied before flying, that's the reason why the Macfly company isn't responsible in case of accident due to misuse of the PPG and we really advise you to follow the recommendations of this user manual.

1.1 Licence certificate and insurances

According to the countries and states, paramotoring must comply with specific regulations or not.
Passing a certificate or a licence specific to each country must be done before flying with your paramotor.
Moreover, some countries require a compulsory insurance.

1.2 Identification/ registration

In some countries or states, the paramotor is considered as a means of transport, or even a vehicle, and it requires an identification or a specific registration.
Get some information at your ministry or federation before flying with your paramotor

1.3 Wing connection

There are different types of wings more or less adapted to the practice of paramotoring.
Some haven't been designed specifically for this sport but rather for paragliding.
Ask for the manufacturer's advice before trying a non-validated assembly.
Check the compatibility with powered paragliding in the user manual.

2 - Technical characteristics of the different engines on the Macfly frame

We currently assemble 3 different engines on our frames and the same brand in order to keep a coherence in our range.

POLINI Thor 130

POLINI Thor 200

POLINI Thor 250

	Macfly Thor 130	Macfly Thor 200	Macfly Thor 250
Displacement	125 cm3 (54x54)	193 cm3 (64x60)	244 cm3 (72x60)
Carburetor	Polini PWk24	Polini PWk28	Polini PWk28
Power	21,5 HP at 8800 rpm	29 HP at 7400 rpm	36 HP at 7500 rpm
Ignition	Electronic	Electronic	Electronic
Starting	Manual with « Flash starter»	Manual with « Flash starter»	Manual with « Flash starter»
Static thrust	64 KG with propeller 130	80 KG with propeller 130	90 KG with propeller 130
Gear reduction unit	Helical teeth in oil bath with 3.43 reduction ratio	Helical teeth in oil bath with 2,8 reduction ratio	Helical teeth in oil bath with 2,8 reduction ratio
Propeller	Wooden propeller 125 cm	Carbon propeller 125 or 130	tripale carbon propeller125 or 130
Cooling	Forced air	Forced air	Liquid cooled
Clutch	Centrifugal in oil bath	Centrifugal in oil bath	Centrifugal in oil bath
Fuel	premium gasoline leaded or unleaded	premium gasoline leaded or unleaded	premium gasoline leaded or unleaded
Oil	2% synthetic oil	2% synthetic oil	2% synthetic oil
Fuel tank	12 liters	12 liters	12 liters
Consumption	3 to 4 liters/hour	3 to 4 liters/hour	3 to 4 liters/hour
Frame	Titanium cage diameter 138 cm, removable cage 4 quarters	Titanium cage diameter 138 cm, removable cage 4 quarters	Titanium cage diameter 138 cm, removable cage 4 quarters
Harness	SUP'AIR , size S - M - L	SUP'AIR , size S - M - L	SUP'AIR , size S - M - L
Recommended pilot weight / maximum recommended	65 kg/90 kg	75 kg/110 kg	95 kg/130 kg
Electric start option	No	Yes	Yes
Propeller option	Carbon 125 or 130	tripale carbon propeller125 or 130	quadripale carbon 125 or 130
Accessory option	cage bag, travel bag, covers propeller, reserve parachute pocket	cage bag, travel bag, covers propeller, reserve parachute pocket	cage bag, travel bag, covers propeller, reserve parachute pocket

For more information about Polini engines, please consult polini.com website

3 - Handling of the Macfly powered-paraglider

3.1 Presentation of the frame / cage, assembly and disassembly

The Macfly frame is made of titanium material which combines the lightness of aluminium and the resistance of stainless steel. Grade 2 titanium was chosen in order to be TIG welded if needed. Nevertheless, you'll have to equip with a special welding rod that Macfly can provide you.

Your cage is composed of 4 parts, fixed on the frame. Begin the assembly with the 2 quarters of the lower cage, assemble the parts and fasten the velcro straps (2 for each lower cage quarter)

Set up the supporting arch of the upper frame, then the 2 quarters of the upper cage, without forgetting the hand starter shackle on the upper part, between the 2 cages. You can also fix this shackle to the titanium buckles welded on the upper part of the frame.

Then, finish fastening the Velcro straps. There is an additional Velcro strap on the side of the throttle handle, to prevent it from getting through the 2 cages and to avoid contact with the propeller.

Proceed in reverse order for the disassembly.
If you have selected the propeller protective cover options, "cages bag" or travel bag, proceed as indicated in the photos.

3.2 - Movable arms, adjustments and disassembly.

The gooseneck movable arms will enable you to have both comfort and harness reactivity. Neither too high nor too low.

The two movable arms have a slight torsion on the left, in order to reduce the engine torque when the propeller is rotating clockwise.

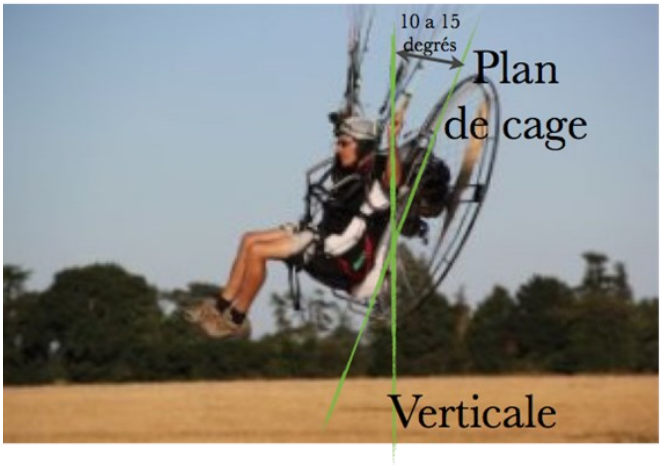
The movable arms are delivered with the manufacturer's standard adjustment and the position of the aluminium rings is identified by the marks on the tube.

The attachment point of the left ring is slightly different from the right one. This setting adjusts the effects of engine torque (difference between 10 and 20 mm).

You may have to change this adjustment slightly for different reasons such as comfort, pilot's weight, or tandem flight which could slightly change your flight position or also to adjust your engine torque.

To do that, proceed as follows:

A - Adjustment of the propeller thrust axis :



The cage must be inclined from about 10 to 15 degrees according to the vertical of the level flight.

If you are rather at zero degrees (you are too upright), you'll have to move **the two rings** a few millimeters forward according to the standard adjustment.

If you go beyond the 15 degrees (you are too backward), you'll have to move **the two rings** a few millimeters backward according to the standard adjustment.

Here is a small non-exhaustive table to give you an idea of your adjustment which is really customizable.

Pilot weight	Thor 130	Thor 200	Thor 250
50 kg to 60 kg	-10 mm to -20 mm	-10 mm to -20 mm	Pilot weight not advised
60 kg to 80 kg	Standard	Standard	Standard
80 kg to 100 kg	+10 mm to +20 mm	+10 mm to +20 mm	+10 mm to +20 mm
100 kg and more	+20 mm to 30 mm	+20 mm to 30 mm	+20 mm to 30 mm

B - Adjustment of the anti-torque :

Once your adjustment of the propeller thrust axis is correct, you can fine-tune and accentuate your anti-torque.

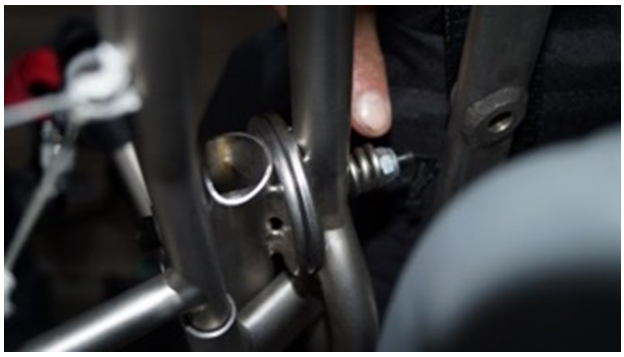
To do that, move the ring **of the left movable arm** from 10 to 20 millimeters forward.

Be careful, when you increase your anti-torque, the position will be more comfortable at full throttle but you'll feel a slight torque on the other side when you'll reduce throttle.

The "standard" adjustment seems to be the best compromise.

You can disassemble these movable arms to save storage space during a trip for example.

During the reassembly, be careful not to fully tighten the nut on the axis. Make sure you leave some slight slack in the spring.



3.3 Presentation of the harness and setting up on the frame.

The comfortable Sup'Air harness was specially designed for paramotoring. It includes different adjustments that we'll explain in detail later in the chapter "harness adjustments". It is equipped with two removable side pockets. (You may replace one side pocket by a specific pocket to install a pocket with a reserve parachute).

Attachment points of the harness on the frame :

- On the upper part of the frame, with two straps.

- On the lower part of the frame, with two straps.
These straps are used for the lateral stability of the frame on the back, particularly during take off when torque is more perceptible during the acceleration phase.
The straps must be properly tightened.

- With 2 quick release buckles on the lower part of the frame. These straps are carrying straps and provide a backpack comfort, the frame doesn't slide anymore on the lower back and it is well carried on the shoulders.

On the two moveable arms to fix the risers.
It is the centering axis of the machine.

At the end of the moveable arms, this is where the pilot's weight is mainly spread to the frame.
(See the assembly in the pictures)

For further information, please refer to this link:
http://supair.com/document/notices/paramoteur_evo_fr.pdf

3.4 Setting up the reserve parachute

Please have your reserve parachute packed and installed by an expert

There are different types of rescue parachutes with their own peculiarities concerning packing, ripcord and deployment.
Please refer to the brand user manual to pack it and fine-tune the assembly, but especially to know how it works in case you need it one day!

Remove the harness side pocket (preferably, on the right for torque, but you can install it on the left if you are left-handed).
Replace the pocket with the container holding the parachute.
Place the parachute risers along the harness, then at the top of the harness.
Connect the risers to the shoulder straps, on the loop provided for this purpose.
Use a "square link" specific to reserve parachutes.

It should be noted that installing a reserve parachute requires further attention during the pre-flight checks: *check that your parachute container is properly closed.*

For further information, please refer to this link:

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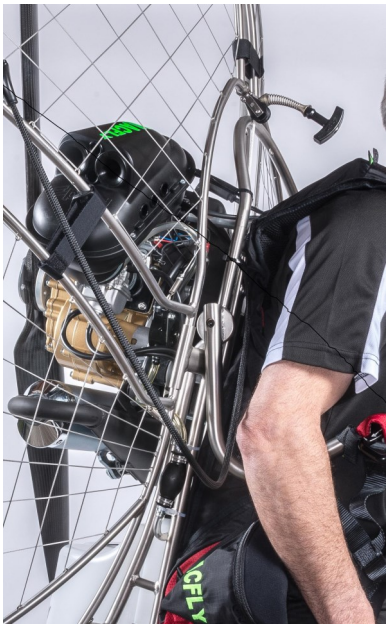
3.5 Handling and moving on the ground

You can carry your paramotor with your hands on the frame between the two cages, facing the harness. For a long distance on foot, we advise you to carry it on your back, with the two shoulder straps to prevent the premature wear of one carrying strap.



3.6 Storage

Avoid running the engine with mixed petrol that is older than one month.
In that case, empty the old mixture and replace it with some new one.
We advise you to disconnect your PPG battery (if equipped), as well as the spark plug noise suppressor when you move or store your PPG.

4 – Pre-flight checks

Harness

- Pockets closed (pilot's pockets too)
- Straps in good condition
- Attachment points of the upper harness / lower harness / movable arms.
- The rescue parachute container is closed properly. Straps properly positioned, attachment point.

Frame

- No deformation, sufficient propeller passage
- Cages assembly
- Velcro straps
- Condition and tension of the net
- Check the flash starter shackle and pulley
- Rubber mounts attachments toward the engine

Engine (follow the fuel lines)

- Tank (petrol, cap closed)
- Condition of the fuel lines, no leak, far from the hot parts
- Carburetor and air box properly attached, secured, good condition of the bridles
- Noise suppressor properly fitted, spark plug screwed
- Muffler, no crack, no leak, spring tension, rubber mounts
- Propeller, hub screws, no suspicious play or noise on the blades, good condition of the leading edge
- Throttle handle, the throttle lever and cable move smoothly and return naturally at idle, stop button.

See the video on : macflyparamoteur.com

5 – Engine starting

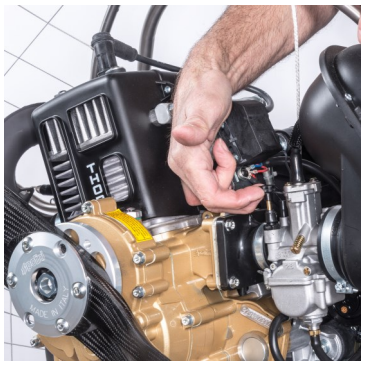
We strongly advise you not to start your engine on the ground, without taking all the necessary cautions to prevent any accident.
We emphasize that starting the engine on the back is much less risky.

- Ground starting process (not recommended, only if the engine doesn't start on the back)

Put the PPG down in a stable position, check that there is nobody around within a reasonable (10 meters)
Check for objects on the ground (gravel, sand, tools) or straps which might be "sucked in" by the rotating propeller
Anticipate also an emergency exit area in case the engine races and if you couldn't hold it back.

During a cold start, turn ON the choke.

Place your left hand as indicated in the photo, holding vertical and the throttle handle as indicated.
No throttle during the first engine start attempts.
Pay particular attention to the position of your thumb near the stop button.



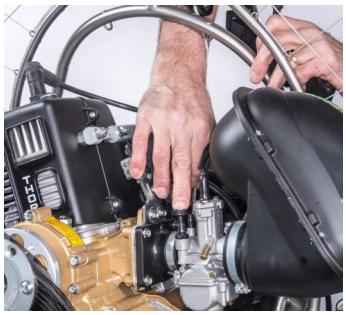
Your thumb mustn't be stuck in the throttle handle strap.

Don't pull the flash starter without having the handle in a good position, with the stop button immediately accessible.

Take the flash starter handle with your left hand,
we advise you to hold it on the spring, as indicated in the photo, in order to have more strength and more resistance to compression.
Pull the starter cord slowly until you feel resistance, until you find compression stroke

Then pull quickly and the engine should start. Reiterate the operation until the engine runs.
Beware of compression kick-back especially with big engines (such as 200 and 250).

After starting the engine, you can move the choke lever to the "OFF" position after a few seconds.
Don't take off with the choke in the "ON" position !



In order to reduce the risks of accidents, you shouldn't completely warm up your engine on the ground.

Ground warming up aims at identifying any potential engine malfunctions (noise, vibration) but especially to make sure to start the engine easily on your back.

Starting process on the back

Straps closed, take the throttle handle in your right hand, and tighten properly the velcro strap on the back of your hand.

Incline the engine slightly on the right, to take easily the flash starter handle.

Take the flash starter handle between the thumb and the forefinger of your right hand. You can use your ringfinger or little finger to accelerate slightly during starting. With your left hand, grasp the spring on the flash starter cord

Don't pull the flash starter without having the handle in a good position, with the stop button immediately accessible.

Pull the starter cord slowly until you feel resistance, until you find compression stroke, then pull quickly straight ahead. Your two arms must be stretched. After the compression stroke, your engine should start. After starting the engine, don't let the flash starter cord shoot back abruptly but let if rewind slowly. If you let go the flash starter handle abruptly, it might damage the flash starter mecha-nism.

If you have chosen the option "left hand handle", proceed as described with the opposite hand.

6 – Installation and adjustment of the harness

Get down on your knees or crouch to place the 2 shoulder straps. Get back on your feet carefully, without inclining too much the engine forward to avoid fuel going up through the overflow fuel line.

Adjust your shoulder straps symmetrically and comfortably (the PPG must be carried comfortably on your back and not on your lower back).

Fasten your leg straps and check that the seat board extension isn't turned under the harness, then fasten your chest strap.
The adjustment of your chest strap will have an effect on your piloting through your weight shift (turning by shifting your weight), as well as the transfer of information wing/pilot.
More concretely, if you loosen the chest strap, you will control the harness more easily, but you will be more "shaken" in case of turbulence.

There is a small strap above the chest strap that must be closed, it only aims at preventing shoulder straps slipping during take-off and landing phases.

We advise you to tighten the leg straps pulling them down towards your knees (slightly leaning forward) in order to sit more easily after take off

For further information, please refer to this link :
http://supair.com/document/notices/paramoteur_evo_fr.pdf

7 – Check list / Vital actions

You are ready for take-off. One last check is necessary to forget nothing :

Engine running and controls in your hands :

- Leg straps closed
- Chest strap closed
- Main quick links locked
- A-risers in your hands, no twists
- Brake toggles in your hands, no knot, brake lines passing directly through the pulley
- Helmet fastened
- Radio volume and frequency
- Last engine warm up avoiding blowing the wing which might suck a line.
- Current weather and aerology, wind direction and force
- Airspace clearance

HAVE A NICE FLIGHT !