

# **flexus**

Paramotor wing

You can  
fly



**SOL**

PARAGLIDERS  
[www.solparagliders.com.br](http://www.solparagliders.com.br)



Version  
may / 2015

<b>WELCOME TO THE SOL TEAM!</b>	<b>4</b>
<b>ABOUT SOL</b>	<b>5</b>
<b>PHILOSOPHY</b>	<b>6</b>
<b>INTRODUCTION</b>	<b>6</b>
<b>FLEXUS - POWER GLIDER</b>	<b>6</b>
<b>FLEXUS - CHARACTERISTICS</b>	<b>7</b>
<b>FLEXUS - THE PROJECT</b>	<b>7</b>
<b>FLEXUS - TECHNICAL DATA</b>	<b>8</b>
FLEXUS - DATA	8
FLEXUS - MATERIALS	9
<i>Top / Bottom</i>	9
<i>Profiles and Internal Diagonal Reinforcements</i>	9
<i>Reinforcements</i>	9
<i>Lines</i>	9
<i>Risers</i>	9
<i>Quick Links</i>	9
<i>Pulleys</i>	9
MATERIALS AND LIMITS OF USE	9
FLEXUS - OVER ALL VISION	10
FLEXUS - LINE PLAN	11
FLEXUS - SUSPENSION SYSTEM	12
FLEXUS - RISERS	13
FLEXUS - TRIMMER AND ACCELERATOR	14
FLEXUS - ADJUSTING YOUR SPEED SYSTEM	15
FLEXUS - BRAKE TOGGLES	16
FLEXUS - CHANGING THE TRIMMER TAB	17
<b>FLEXUS - FLIGHT</b>	<b>18</b>
FIRST FLIGHT	18
THE POWER ENGINE	18
TAKEOFF PRE-FLIGHT CHECKLIST - DO NOT FORGET	19
TAKEOFF WITH PARAMOTOR	19
<i>Forward Takeoff</i>	19
<i>Reverse Takeoff</i>	20
TAKEOFF WITH TRIKE	20
CLIMBING	20
PERFORMANCE	20
TURNS	21
ACCELERATED FLIGHT	21
FLIGHT IN TURBULENT CONDITIONS	21
ACTIVE FLIGHT	22
LANDING WITH PARAMOTOR	23
LANDING WITH TRIKE	23
<b>FLEXUS - FAST DESCENT MANEUVERS</b>	<b>24</b>
EARS	24
POSITIVE SPIRAL	24
B-STOLL	25
<b>FLEXUS - BEHAVIOR IN EXTREME MANEUVERS AND COLLAPSES</b>	<b>26</b>
POWER INDUCED OSCILLATIONS	26



LATERAL ASYMMETRIC CLOSING .....	26
LINE-OVER .....	27
FRONTAL SYMMETRIC CLOSING .....	27
PARACHUTAL .....	27
FULL STALL .....	28
NEGATIVE TURNS .....	28
EMERGENCY FLYING .....	29
WINGOVER .....	29
<b>FLEXUS - UP-KEEP, MAINTENANCE AND REPAIRS.....</b>	<b>30</b>
STORAGE .....	30
BACKPACK.....	30
FOLDING .....	30
CLEANING .....	31
MAINTAINS AND INSPECTION .....	31
PULLEYS.....	31
RECOMMENDATIONS FOR A LONG LIFE .....	31
REPAIRS .....	33
TEARS .....	33
LINE BREAKAGE .....	33
SEALING.....	33
<b>MAINTAIN OF THE POWER ENGINE.....</b>	<b>33</b>
<b>FLEXUS - NATURE AND ENVIRONMENT AND OUT OF USE.....</b>	<b>33</b>
<b>FLEXUS - WARRANTY .....</b>	<b>34</b>
WARRANTY TERMS .....	34
WARRANTY PRE-REQUISITES.....	34
THIS WARRANTY DOES NOT COVER .....	35
<b>FLEXUS - GOLDEN RULES .....</b>	<b>36</b>
<b>FINAL WORDS .....</b>	<b>37</b>
<b>FLEXUS - FLIGHT LOG .....</b>	<b>38</b>
<b>FLEXUS - INSPECTION .....</b>	<b>39</b>





## WELCOME TO THE **SOL** TEAM!

Thank you for selecting a **SOL** Paragliders. You have just acquired a high quality product, manufactured under one of the most demanding industry standards worldwide.

We trust your **Flexus** will bring you many great life memories you will cherish forever.

We would like you to read this manual carefully and thoroughly. In it, you will find important information about using your new equipment.

In the event you should have any questions about its usage or should you wish to be updated on the latest news at **SOL**, we remain at your disposal:

Phone: 0055 47 3275 7753

Mail: [export@solsports.com.br](mailto:export@solsports.com.br) or [info@solsports.com.br](mailto:info@solsports.com.br).

**Don't forget to access our website often at**

<http://www.solspowergliders.com.br>.

to keep current on the latest models' launchings, results and news from the world of paragliding.

*Welcome to the SOL Team!*



## Attention

Please read this manual carefully and note the following details:

- This power glider meets at the time of delivery the requirements of the LTF certification or of the EN!
- The manufacturer and its representatives are not liable and therefore not responsible for any misuse nor mishandling of this equipment.
- It is a basic assumption that the pilot is certified to fly this power glider.
- Every pilot is responsible for the maintenance and assessment of equipment usability.
- This manual offers information about your power glider. It is not a training manual.
- It is a assumption that the pilot respects the law and order of aviation and that his skills are up to the challenge of this particular equipment!



## About **SOL**

Founded in **1991**, after six months of research and many visits to several manufacturing facilities and suppliers, **SOL** began its production in partnership with the European brands Condor, Comet and Nova.

**SOL** became autonomous in **1999** with its own testing and development centers. From the beginning **SOL** has adopted the philosophy of utilizing certified designs, manufactured with imported materials of the highest quality by specialized and skilled-trained staff.

In early **2004** **SOL** became certified by DHV, which is the most respected regulating body of free-flying worldwide. Its mandate is to make sure its members have the capacity to reproduce faithfully the certified equipment on an industrial scale. Few facilities in the world possess this certification in their manufacturing process. **SOL** was one of the firsts to obtain it!

In **1995**, the company moved to its current facility, occupying an area of 4.000 m<sup>2</sup> and has at its disposal a team of about 140 employees, of which are about 20% pilots. **SOL** provides a comprehensive benefits package such as Health Plan, Life Insurance, partnerships with pharmacies, transportation vouchers, incentive getaways to employees who outperform each month, and education grants. At **SOL**, we take extreme measures to maintain our machinery and manufacturing equipment current with the world market. This way, we safeguard our accuracy everyday in the production process, control and assuring the high quality of **SOL** brand and products throughout more than 70 countries around the world.



## Philosophy

**SOL's** philosophy is to introduce products that are considerably better than current ones, in order to guarantee significant advancements in four aspects: Safety, Performance, Ease of Operation and Innovation.

**Safety:** The new product has to offer a level of safety that is at par or better than the one it is replacing.

**Performance:** The new product must perform better than the one it is replacing.

**Ease of Operation:** The new product must display higher levels and better operational ease than the one it is replacing.

**Innovation:** New products must display real benefits to the user, facilitating free-flying, increased safety, or both.

The development process and design of every new product begins at the computer. Drawing Software, 2D, 3D modeling and simulation are utilized before the actual manufacturing of prototypes, in order to ensure greater accuracy in each new design.

## Introduction

**SOL** is producing a complete line of modern gliders: from teaching to competition and acro all pilots will find their gliders.

Since we are often in the air - testing our gliders, for fun or breaking world or national records - it was only logic to develop our own power glider to assure the evolution in safety, performance, ease of operation and innovation.

As in any other product of **SOL**, we are using always the best and most carefully chosen materials, they are granting a long life and a high security standard. All **SOL** gliders are manufactured in our own industrial park.



## **FLEXUS** - Power glider

**Flexus** was projected and built with the reflex technology, searching for the best security level, speed, performance and easy handling within his category. This power glider is very fast and has a high performance for pilots who wish to enjoy a simple flight or to long distance flights.



## Flexus - Characteristics

The **Flexus** was built and developed with an extra portion of attention. The team who created the power glider has received a large number of suggestions from all over the world. See the results:

**Risers** - new design for easy use of the trimmer, accelerator and brakes.

**Takeoff** - easy inflagem within little space.

**Landing** - The effect of delay makes the moment of landing easy.

**Closing** - The reflex technology is diminishing the possibility of closings.

**Speed** - Increase of speed because of the reflex technology.

## Flexus - The Project

The **FLEXUS** combines our technology of performance, safety and long life:



- **HPAR** - High Project Aspect Ratio: higher A/R in each class.



- **FHT** - Full Hybrid Technology: Hybrid utilization of different types of fabric, combining durability with low deformation resistance and less weight.



- **LCT** - Laser Cut Technology: Panels, profiles and parts cutting with Laser equipment.



- **HTM** - High Tech Materials – highest technology materials guarantee durability - Technora Lines, Diax Laminates, Inox Hardware, Polyester of High Tenacity.



- **BT** - Battens Technology: Flexible battens applied in order to maintain the profile characteristics in every moment of the flight.



- **PBP** - Pressure Booster Profile: New profile design who maintains form and pressure. This increases the performance in all velocities.



- **SMSR** - **SOL** Maxi Stable Reflex: Reflex profile with great stability and suspension. The reflex profile relocates the weight distribution to the front of the profile. This let the power glider fly in front of the pilot angle, creating speed, stability and safety in turbulence.



- **Mini Ribs** - Profiles between the cells of the trailing edge, which improve performance and handling.

The **Flexus** consists of 53 cells and has internal crossed diagonals applied at the profiles to distribute the weight uniformly. This maintains the canopy very shapely and cleans and reduces the induced drag.



## FLEXUS - Technical data

### FLEXUS - Data

LOTUS <sup>One</sup>	XS	S	M	L	XL	XXL	unid.
Zoom/Zoom Zoom/Zoom	0,9	0,93	0,965	1	1,035	1,08	
Células/Cells Zellen/Cellules	42	42	42	42	42	42	
Envergadura porj./Projected span Projizierte Spannweite/Envergure projetée	8,53	8,82	9,15	9,48	9,81	10,24	m
Área projetada/Projected surface Projizierte Fläche/Surface projetée	18,62	19,88	21,40	22,97	24,62	26,81	m²
Alongamento projetada/Projected A/R Projizierte Streckung/Allongement projetée	3,91	3,91	3,91	3,91	3,91	3,91	
Envergadura real/Real span Reale Spannweite/Envergure réelle	10,53	10,88	11,29	11,70	12,11	12,64	m
Área real/Real surface/ Reale Fläche/Surface réelle	21,41	22,86	24,61	26,41	28,31	30,82	m²
Alongamento real/Real A/R Reale Streckung/Allongement réelle	5,18	5,18	5,18	5,18	5,18	5,18	
Diâmetro das linhas/Line Diameter Leinendurchmesser/Diamètre suspente	1 - 1,5 - 2,1 - 2,5						mm
Altura/Height Leinenlänge/Suspentage	680	701	725	750	775	806	cm
Perfil max./Max. profile Max. Profiltiefe/Profil max.	2,49	2,58	2,67	2,77	2,87	2,99	m
Perfil min./Min. profile Min. Profiltiefe/Profil min.	0,61	0,63	0,66	0,68	0,70	0,73	m
Peso da vela/Weight Gewicht/Poids	4,9	5,3	5,7	6,1	6,5	7,1	kg
Peso de decolagem/Take off weight Startgewicht/Poids total Volant	65-95 ---	80-110 ---	95-125 ---	110-140 ---	125-155 ---	140-170 ---	<kg ---
	143-209	176-242	209-275	242-308	275-341	308-374	<lbl
Afundamento min./Min. sinkrate Min. Sinkrate/Taux de chute min.	1,1	1,1	1,1	1,1	1,1	1,1	m/s
Velocidade min.* Min. Speed* Min. Geschwindigkeit* Vitesse min.*	24-26	24-26	24-26	24-26	24-26	24-26	km/h
Vel.max. trimmers fechado* Max. speed trimmers closed* Max. Geschwindigkeit trimmer geschlossen* Vitesse max trim fermé*	40-44	40-44	40-44	40-44	40-44	40-44	km/h
Vel. max. trimmers aberto* Max. speed trimmers open* Max. Geschwindigkeit Trimmer offen* Vitesse max trim ouvert*	49-53	49-53	49-53	49-53	49-53	49-53	km/h
Vel. max. trimmers aberto + acelerador* Max. speed trimmers open + accelerator* Max. Geschw. Trimmer offen + Beschleuniger* Vitesse max trim ouvert + accélérateur*	56-60	56-60	56-60	56-60	56-60	56-60	km/h
Planeio/Glide Gleitzahl/Finesse	8,6	8,6	8,6	8,6	8,6	8,6	
Assentos/Seat Sitzplätze/	1	1	1	1	1	1	
Certificação/Certification Certification/Certification	DGAC	DGAC	DGAC	DGAC	DGAC	DGAC	

\* The takeoff weight alters the speed range.





## **Flexus - Materials**

### **Top / Bottom**

Wtx40 PU+Silicon Coating 40 gr/m<sup>2</sup>

### **Profiles and Internal Diagonal Reinforcements**

Pro-Nyl High Tenacity

Nylon Rip-Stop Hard finish 42gr/m<sup>2</sup>

### **Reinforcements**

2.5 mm Nylontabs

### **Lines**

The lines are made of technora and polyester. They are known for its high grade of resistance and low stretching overtime. The bottom lines have a diameter of: 2.5 / 2.1 / 1.5 / 1.0 mm. The upper lines have a diameter of: 2.1 / 1.5 / 1.0 mm.

### **Risers**

Premium 19 x 2,0 mm Flat Multi 1600kg

### **Quick Links**

Ansung Precision 22 mm BI 800 kg

### **Pulleys**

Sol PL14

All components are made of high quality materials and were selected for a long life purpose.

### **Materials and limits of use**

Avoid storing the power glider for long periods in areas with high humidity, heat or extreme cold, this causes premature aging of the materials and could influence the flight characteristics of your glider.

The LTF Norm quotes:

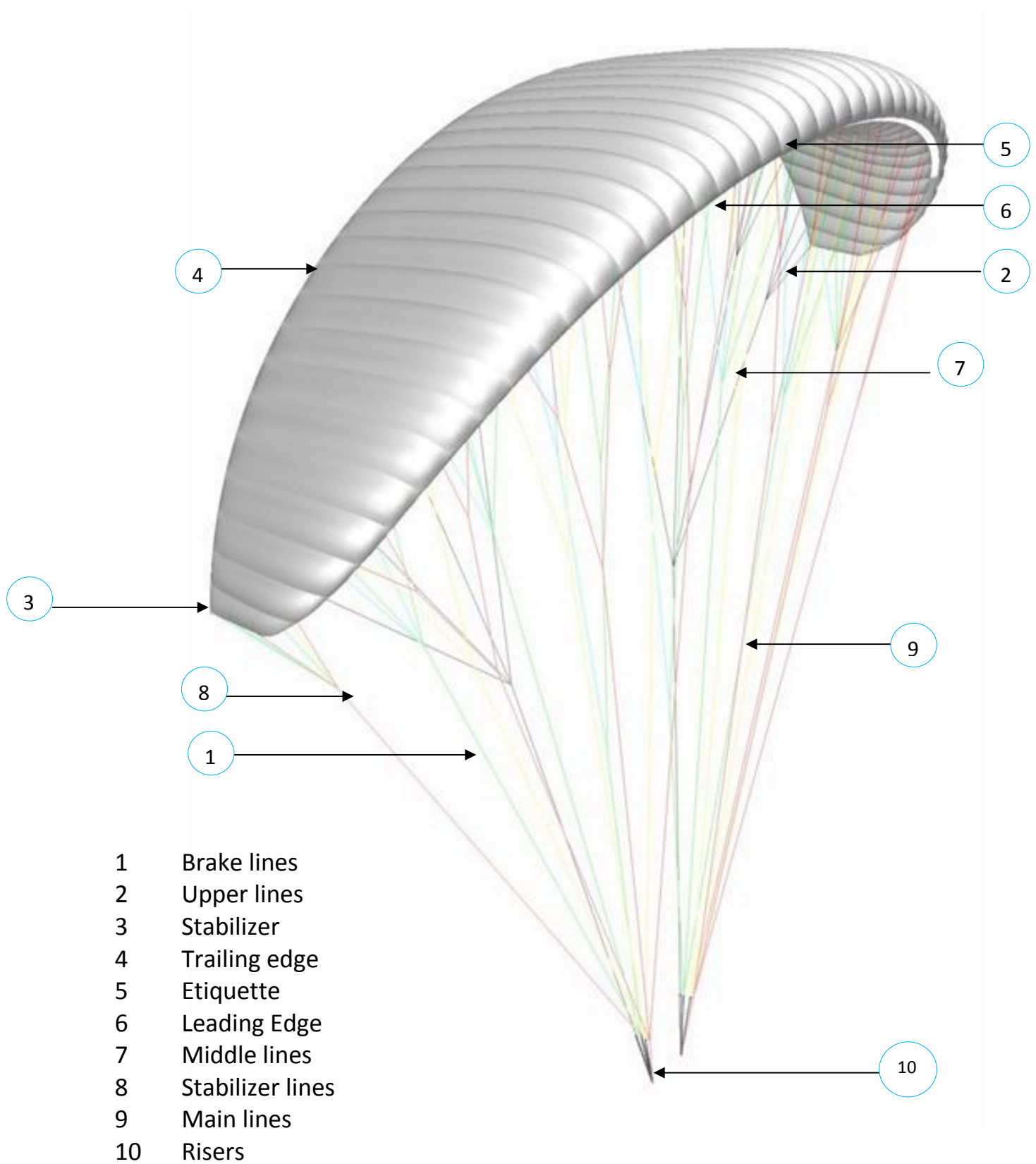
\* Temperatures from -30°C to +70 °C during the storage should not interfere with the security during the use of the equipment.

\* Temperatures from -30°C to +50 °C and oscillation of the relative air humidity between 25% and 100% during use should not interfere with the security.

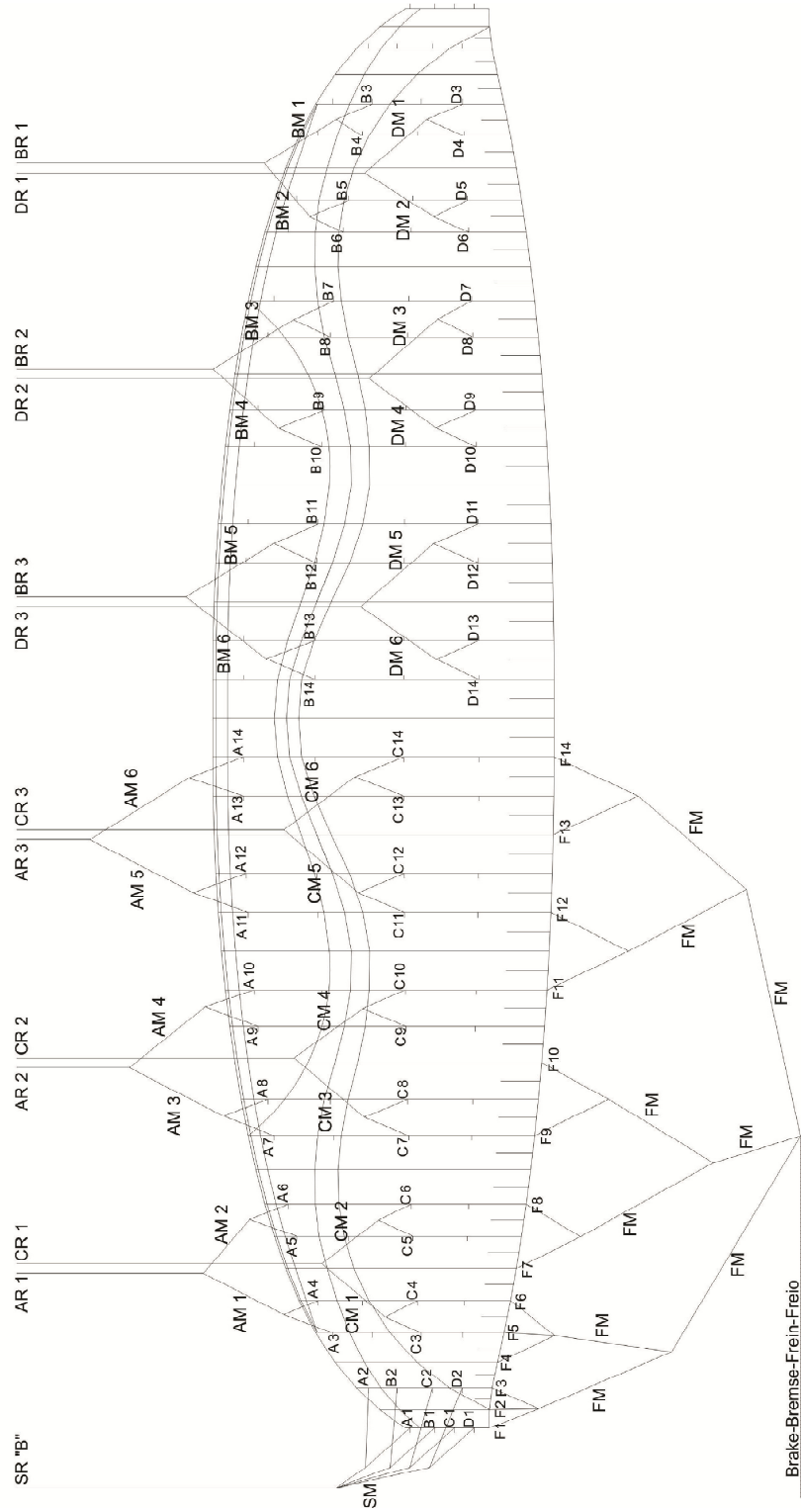
Remember, you have acquired a high quality product which has been produced with carefully chosen materials. Think carefully about the storage and handling of your power glider.

**The permission of use expires with -30° C.**



**FLEXUS** - Over all vision

# FLEXUS



Brake-Bremse-Frein-Freio



### **FLEXUS - Suspension system**

The **Flexus** lines consist of a beige technora core of high resistance to tension and has low distortion rate, covered by a layer of colored polyester. The set is made of individual lines, with sewn ties on both extremities.

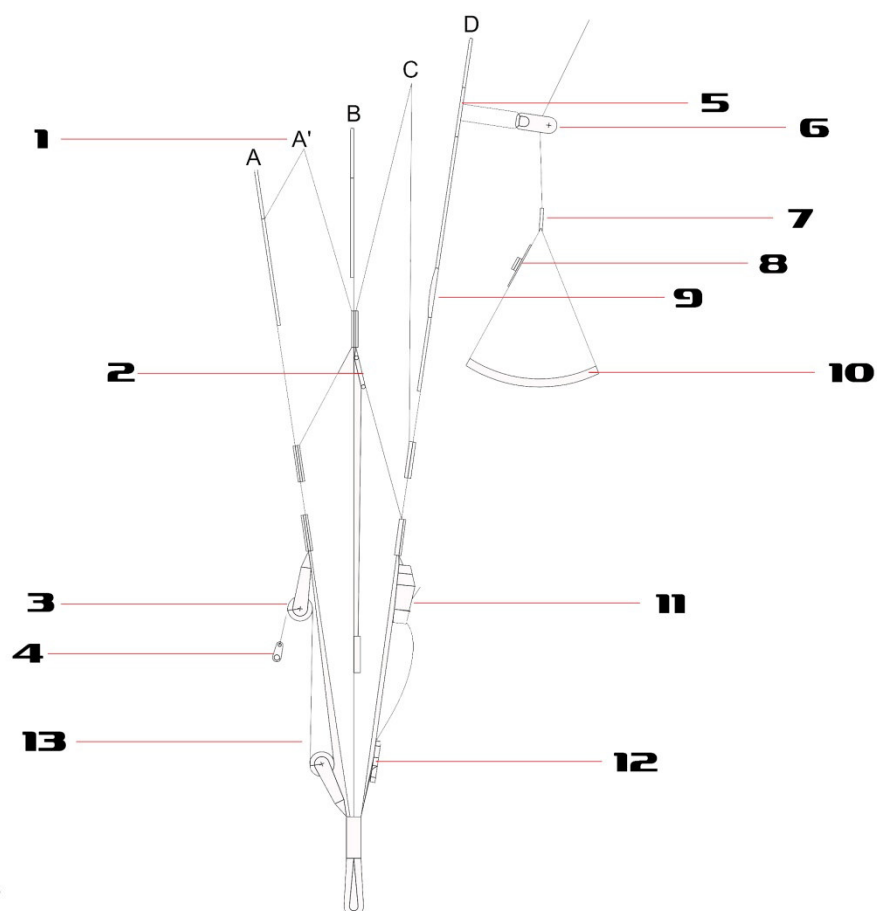
The upper lines distinguish themselves (next to the inside layer) and the main lines, which are connected to the Quick Links. These, in turn connect to the main lines on the risers. The stabilizers' lines are connected to the same Quick Links of riser B.

The brake lines come out of the trailing edge, through the master line and are linked to the toggles, passing through a pulley attached to the D riser.

The brake lines are of different color in order to facilitate takeoff preparation. The Quick Links are triangular shaped and are made of inox.

On the brakes' master lines, there is a mark at the ideal setting point, at which height the toggles are affixed. This setting should not be altered as it ensures adequate and sufficient path and room for the toggles in case of emergency situations during flight and landing.



**FLEXUS - Risers**

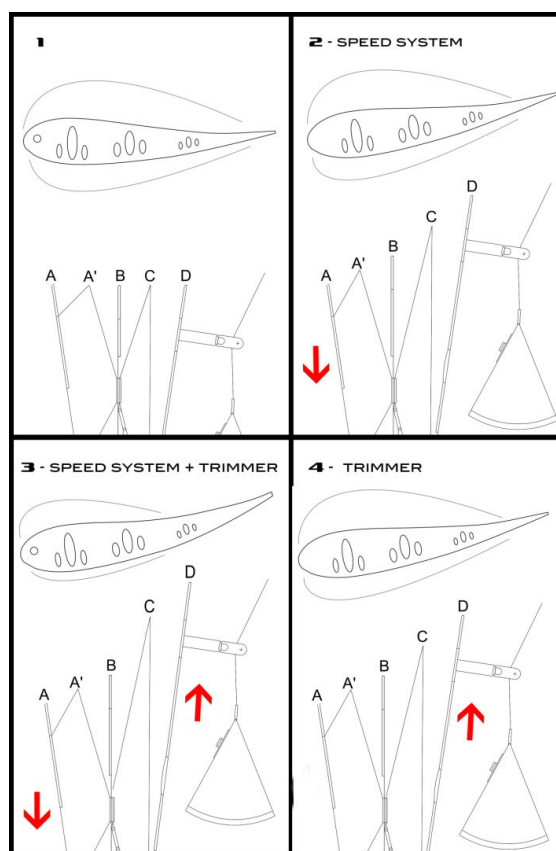
- 1** - Ears
- 2** - Progressive speed control system
- 3** - Pulley
- 4** - Clip acelerador
- 5** - Regulagem da altura do batoque
- 6** - Brake pulley
- 7** - Swivel
- 8** - Magnetic clip
- 9** - Progressive speed control system
- 10** - Toggle
- 11** - Trimmer
- 12** - System to change trimmer webbing
- 13** - Speed system





### **FLEXUS - Trimmer and accelerator**

The risers of the **FLEXUS** have a system of an accelerator and a trimmer (11, 12, page 13).



**Figure 1:** Neutral point = Best glide and most passive safety.

Risers	A	A1	B	C	D
Length cm.	45	45	45	45	45

**Figure 2:** Accelerator in action = More speed, less passive safety and heavy handling.

Risers	A	A1	B	C	D
Length cm.	37	38	39	42	45

**Figure 3:** Accelerator and trimmer in action = Max. speed, lowest passive safety and heavy handling.

Risers	A	A1	B	C	D
Length cm.	37	38	39	46	53

**Figure 4:** Trimmer in action = More speed, less passive safety and heavy handling.

Risers	A	A1	B	C	D
Length cm.	45	46	47	50	53



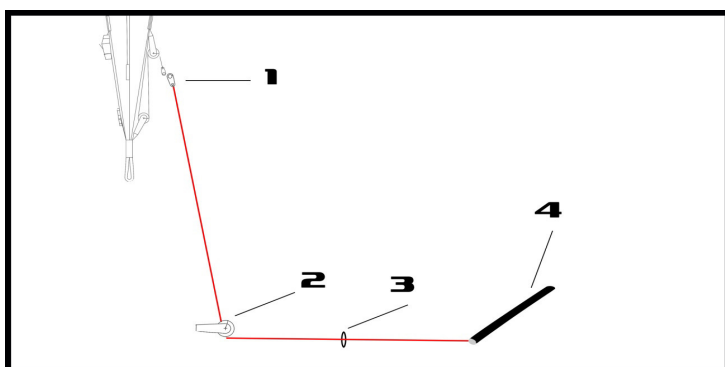


## Attention

- The use of the trimmer simultaneously with the accelerator makes your power glider more vulnerable for closings. We recommend not to use both in turbulence.
- In case of closing the reaction of the power glider could be aggressive if the pilot is using the trimmer or the accelerator or both. Avoid using them with little space over ground.

### **FLEXUS - Adjusting your speed system**

The majority of the latest harnesses have pulleys for assembling the Foot Speed System. In the eventuality the pulleys are not there, it is important to attach such pulleys (sewing them) in such way to make the operation of the speed system softer. The little chord on the speed system must be firmly attached (by a non-slippery knot) to the stirrup (aluminum bar). The other end of the cable is fed through the harness' pulleys and comes out vertically, and firmly attached to a Quick Link with a strong coil, a quick hook-up or preferably closed by a nut. In order to adjust the Speed System, we suggest that you connect the harness and the risers together, suspended from the ground. Ask a friend to pull the risers 'A' upwards. At this time, adjust the length right to the bar in such way to be easily reachable with your feet in flight and by stretching the legs, make sure to allow for a clear path to maximize the accelerator usage.



- 1 - Clip
- 2 - Pulley
- 3 - Elastic ring
- 4 - Foot steer for accelerator



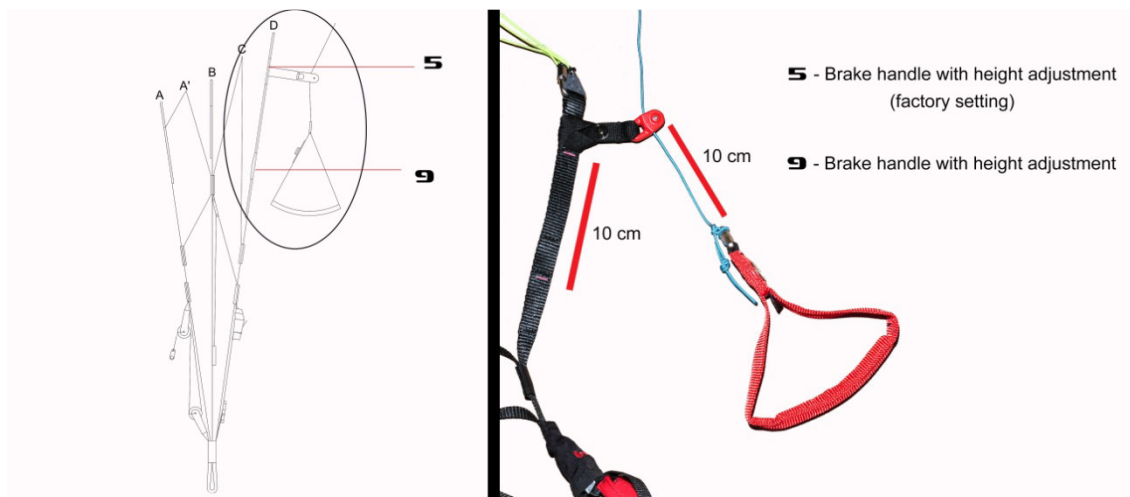
## Attention

- An incorrect system assembly, that allows for different measurements other than the indicated could cause accidents!
- Remember that when using the speed system, the angle of attack decreases which may result in the collapse of the paraglider, consequently, the use of the speed system close to the ground should be avoided. We do not recommend the use of the speed system in turbulent conditions.
- Never use the speed system in extreme maneuvers.
- In the event the canopy collapses, release the stirrup immediately and make the appropriate corrections.
- Never let go of the toggles!



### **FLEXUS - Brake toggles**

In case you switch to another power unit it might be that you have to readjust the lengths of the brake lines. This adjustment can easily be made on the riser, in the figure number 5 is the original adjustment which works with most of the power units on the market. Number 9 readjusts the toggles by 10 cm.



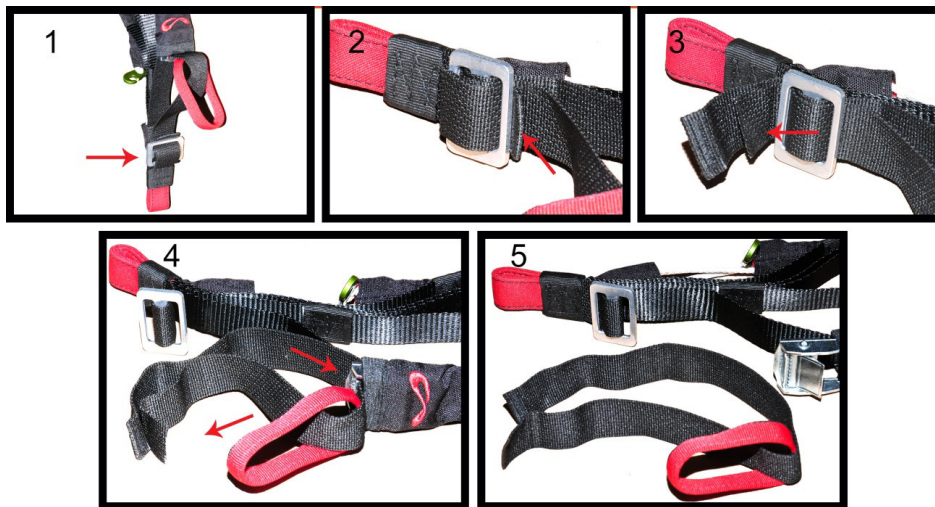
### **Attention**

- In case of readjustment of the pulley position from 5 to 9 don't forget to readjust the brake line on the toggle by 10 cm.
- Confirm that both sides are symmetric.
- Make the necessary readjustments and fill the glider on the ground to make sure that the brakes are working fine before flying with your power glider.



**FLEXUS - Changing the trimmer tab**

The trimmer tab may be damaged after hours and hours of use. The riser of the **FLEXUS** permits an easy change of the tab.



## Flexus - Flight

### First Flight

A careful First Flight is necessary with every power glider, the **Flexus** is no exception. This flight must take place on a practice hill.

After unpacking the power glider and laying out it in a horseshoe shape position, the following steps must be taken:

- The power glider must be laid out in such a way that, when tension is applied to risers 'A', the canopy center should be extended before the extremities. This allows for an easy takeoff with good directional stability.
- Special attention must be taken to the wind's direction upon the lifting of the canopy, so that the two halves are inflated symmetrically.
- All lines must be organized and completely free of any entanglements. Special attention must also be given to the lines 'A', which must be free right from the risers 'A' (with the red mark) to the canopy.
- Same priority and care must be given to the brake lines, which must also be completely free and without any possibility of entanglement on any obstacle during takeoff.
- All lines should be checked and all the risers in appropriate order. When the risers are aligned and not twisted, the brake lines will be free from the pulleys (on the rear risers) to the canopy's rear edge.
- It is extremely important that no entanglements nor bunched lines are present. Any line going under the canopy or tie may result in disastrous consequences.
- Before and after each flight the lines, risers and canopy must be checked for any possible damage.
- In case there is any damage present, as insignificant as it may be, the canopy should not be flown!

### **Attention**

It is not advisable to fly the **Flexus** in rainy days or with a wet power glider, since the in-flight maneuvers become more sensitive and a reserve deployment may occur upon exiting a B-Stoll or in the event of excessive usage of breaks.

### The power engine

To manage and maintain your engine and components read the manual of your provider carefully.





### **Takeoff Pre-flight Checklist - DO NOT FORGET**



- Make sure reserve is OK! Opening device and pins activated?
- Helmet?
- Carbines closed?
- Harness – Connected all Locks closed?
- 'A' risers in hands?
- Untangled brakes in hand?
- Are you in the center of the canopy?
- Takeoff path is clear?
- Power glider and pilot aligned with the wind?
- Airspace ahead of takeoff area is clear?
- Distance between carbines is correct?

### **Takeoff with paramotor**

#### **Forward Takeoff**

It's very easy to fly the *Flexus*. When ready to takeoff, the pilot must take risers 'A' together with the toggles. In order to differentiate between the lines, line 'A' and risers 'A' inclusive are marked with a different color.

Before takeoff, a last check is required to ensure all the equipment is laid out properly. The arms must be extended to the side, as if they are extensions of risers 'A'. A decisive run allows for a quick and stable inflation.

Canopy overtakes are not common. After the initial inflation momentum, the pilot must keep the tension forward on risers 'A' (pushing them ahead, and not pulling them downwards), until the canopy is above your head.

At this point, the brakes must be carefully activated, ensuring room for the possibility of directional changes. A move to underneath the center of the power glider is the best method for corrections, provided there is room for it. The pilot glances at last upwards to ensure the canopy is properly located above, completely unobstructed and inflated. At this point, the pilot decides whether or not to takeoff. When the glider is beginning to sustain the engine, apply carefully power.



#### **Attention**

If you apply power before the canopy is properly located above and before the glider is sustaining the engine you are at risk that the engine is pushing you forward to the ground. Injuries could be consequences. Always apply power carefully at the moment the canopy is properly located above you.



### Reverse Takeoff

Reverse takeoffs in strong wind conditions are also very easy to execute. Due to risk of takeoff with entangled lines (twist), it is highly recommended to take some time and practice reverse takeoffs on a small, leveled hill initially.

### Takeoff with trike

For launching with a trike you need a long flat runway. A second person could be helpful. This helper could push your trike to inflate the canopy whilst engine idling. If the glider is rising let the engine accelerate more and pull the glider up slowly. After visual check accelerate until you take off.



### Attention

We are advising not to fill up the canopy with the power of the engine.

### Climbing

Once you are safely airborne, continue heading against the wind, using brakes to correct the direction. **Do not try to climb too steeply.** In powered flight the *Flexus* behaves more like an airplane than a paraglider, and it is a good idea to regard it as such. If there are no obstacles present, it is by far safer to fly level for a while after take-off, clearing the ground gradually, gaining some speed before converting it to height with a brief pull on the brakes.

Another reason not to try climbing too steeply is the risk connected with engine failure at low altitude. *Flexus* in a steep climb does not stay behind as much as conventional paragliders. The weight and force prevent or delay possible stall, but low speed at low altitude carries inherent danger of stall which will not be able to fully prevent. Besides, you should always be able to land safely in case of engine malfunction, so it's better not to take unnecessary chances and always fly with a safe margin of speed and height. Depending on the power unit geometry, it is possible that after take-off you will notice a propeller torque (known as P-factor). It will try to turn you around, so counter-steer with a brake and trimmer set. Open the trimmer of the right side if the canopy is turning right and open the trimmer of the left side if the canopy is turning left.

### Performance

The *Flexus* in its normal flight, performs better with the hands lifted, applying 50 cm the canopy enters safely the minimum speed range. In order to accelerate, use the speed stirrup and trimmer.



### Attention

Rough accelerating in horizontal flight can cause the glider to swing. This can happen to trikes with big distance between the engine and the glider attachment points. Slow down your speed and stabilize the glider by pulling the brakes slightly. With smooth acceleration and light braking you avoid this effect.



### Turns

The **Flexus** is very sensitive, responding instantly to turn commands. Leveled turns can be achieved with the shifting of weight on the risers with minimum altitude loss. A combination of weight shifting and breaking technique is the most efficient way of executing turns in any situation. The given brake utilized determines the radius of turns.

By activating the brakes on the outside edge of the turns, as well as applying maximum weight shifting on the risers, the efficiency and resistance to collapse in turbulences (at the edge of thermals) is increased.

In case it becomes necessary to perform turns in a constrained space with the **Flexus**, we recommend you to release the outside brake in the given turn and pull a little more the brake on the inside of the turn.

The **Flexus** glides best when no brakes are applied.



### **Attention**

By pulling either brake too strongly or suddenly, there is a danger of creating a negative spiral!

### Accelerated Flight

It is recommended to use the accelerator when flying against the wind or in descending current zones. Due to a decreased angle of attack, the canopy may collapse easier than when set at the normal position. The pilot must remember that the higher the speed, the more dynamic the collapse response or symmetric closing will be.

### Flight in turbulent conditions

In turbulent conditions it is not recommended to fly the power glider with full speed, cause the **Flexus** is than more sensitive to deformation and closing. The pilot must remember that the higher the speed, the more dynamic the collapse response or symmetric closing will be.



### **Attention**

The **Flexus** requires active flying in turbulences! This can avoid canopy closings and deformations.



### **Active flight**

For best performance during your flight, it is important to be always sensitive to what your canopy is trying to communicate. The key elements of active flying are the advancements and tension control.

When the canopy moves ahead of you, carefully apply the brakes, so that the canopy returns to be above you, and if the canopy moves behind you, you must release the brakes.

Flying with the brakes lightly applied (+ - 20 cm) allows the canopy to fly slightly behind. In turbulent circumstances the internal power glider tension may change, which you will feel on the brakes. The idea is to maintain a constant tension, and in case you feel loss of tension, apply the brake.

These adjustments will make for a more controlled flight, and help in eliminating the possibility of collapse.

Avoid flying excessively with the brakes on because you might brake to the point of stopping the canopy from flying. Always consider your aerodynamic speed. Your movements can be symmetric or asymmetric and both or one brake can be applied.

We suggest that you do ground practice runs and advancing simulations. Tension loss can be simulated well on the ground.



### **Attention**

Neither pilot nor any power glider are immune to collapses; therefore active flying will decrease the chances of happening. When flying in turbulent conditions, be more active and avoid great advancements of the canopy by anticipating yourself too quickly with your response movements. Always maintain altitude awareness and do not get into excessive commanding mode. We advise you to maintain brake tension and avoid flying in extreme turbulent conditions.



### **Landing with paramotor**

It's very easy to land with the *Flexus*. Before landing switch off the engine. The final approach stage must be done in straight line upwind. During this final glide, the power glider must be decelerated slowly and at about 1 m from the ground the pilot must stall the canopy, according to the conditions.

With a strong nose wind, the pilot should break only slightly or eventually don't even brake at all, and utilizing just the risers 'C' to de-inflate and overcome the canopy after the landing. By breaking during a landing in strong wind conditions, you may expose the canopy to the wind, which could lead to the pilot being dragged backwards.

The final approach must be done always in a straight line. Sharp and alternating turns may produce a dangerous pendulum movement close to the ground.



### **Attention**

We strongly recommend never to land with a working engine. Always switch off the power first.

### **Landing with Trike**

Make a flat approach with the engine idling, then level out and lose the speed before final flare. Immediately on landing, switch off the engine. The main advantage of this procedure is of course the possibility of going around with the wing again (repeating the approach) if anything goes wrong.

Still, if you forget to switch off the ignition before the wing falls down, there is a considerable risk of damaging propeller, catching lines in it or even suffering injuries connected with falling on your running engine.



### **Attention**

Remember for launching and landing with Trike you need more space.



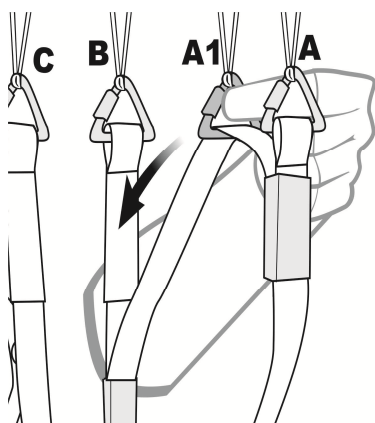


## Flexus - Fast descent maneuvers



### Attention

- All fast descent maneuvers are to be executed with the engine switched off or with motor idling.
- All fast descent maneuvers must be executed in light conditions and at sufficient altitude, so that they can be performed as necessary under extreme flying conditions.
- 'Full Stalls' and negative spirals must be avoided, regardless of the power glider being flown. Incorrect recoveries and exits can result in disastrous consequences.
- The best flight technique is to fly safely and correctly. This way you will never need to descend rapidly!



### Ears

By pulling simultaneously the external riser 'A1' at about 18 cm, the canopy tips will close. The canopy remains completely maneuverable through the activating of unilateral brakes or the shifting of weight towards the risers, flying at a fast descending rate (up to approximately 5m/s). In order to recover, the pilot must release the external riser 'A1' lines. Usually the canopy re-opens by itself, but the pilot can assist with a long and quick pumping.



### Attention

**SOL** does not recommend combining of ears and spirals, as this may exceed the allowable load.

### Positive Spiral

When the pilot activates just one brake, slowly and progressively, the **Flexus** inclines sideways in a sharp angle and enters a steep and quick turn, which may become a positive spiral.

During a spiral the rotation radius can be controlled by the greatest or smallest force applied to the inside brake. In order to come out of it, the pilot must release the brake slowly and shift his/her weight lightly to the outside of the turn. A sudden exit may result in an exaggerated momentum forward of the canopy, and collapsing it. For this reason, on exiting the last turn, the inside brake of a given turn must be softly applied again.

In case the canopy collapses during this process, the spiral must be counter-acted, as the active canopy area will be reduced.

Spirals carry a high rate of descent. Therefore high accelerations (G) make it impossible to hold them for an extended period of time. The spiral force may cause the pilot to



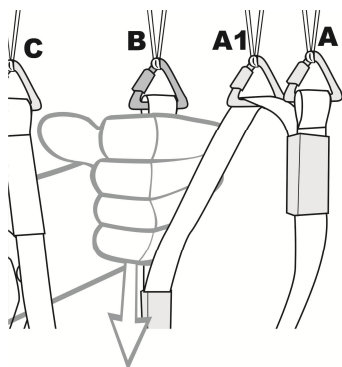
faint and to lose flying controls, and crash. Furthermore, they will exert a lot of force and affect the pilot and equipment alike.

The pilot should never exercise this maneuver in turbulences or with wide lateral angles. In windy conditions, the pilot must be aware of oscillations during the maneuver.



## Attention

- Never combine ears with spirals. The canopy active area reduction plus the 'G' force, by the centrifugal effect, may result in line and/or canopy damage.
- Exiting of any spiral at great speeds must be piloted.
- This maneuver requires high altitudes (at least 600 meter over ground) and is dangerous due high descent ratio pilot can lose the altitude reference. Never do this maneuver without sufficient experience.



### **B-Stall**

To induce a 'B-Stall', the pilot must pull the risers 'B' simultaneously, between 15 and 20 cm. There will be a shift of air flow on the outer layer and the canopy will initiate a parachutal phase. By releasing the risers 'B' quickly the airflow recoils on the outer layer and the canopy returns to its normal flight position. In case the canopy does not recover to normal flight, refer to the section on Wraps. The momentum of return creates a

forward motion by the canopy. We recommend avoiding braking the power glider eliminating the possibility of a parachutal stall. The load applied on the 'B' lines during this maneuver is not beneficial to your power glider. Use this maneuver only in emergencies. In the event risers 'B' are pulled too quickly or too deeply, a horseshoe may occur towards the front. In order to regain normal flight, the pilot must apply the brakes lightly.



## **Flexus** - Behavior in extreme maneuvers and collapses



### **Attention**

- In all extreme maneuvers and collapses remember: switch off the engine or with motor idling and don't apply power.
- Extreme maneuvers must be executed under the supervision of a qualified instructor, on safe courses and with the entire infrastructure available for above ground and water flying!
- All maneuvers must be executed with closed trimmer.

### **Power induced Oscillations**

Certain combinations of weight, power, and propeller size can cause oscillation where the torque and gyro effects lift the pilot to one side, you then drop back only to swing up again. To counter this you can:

- Alter the throttle setting. And /or
- Adjust the torque strap if fitted. And/or
- Shift your weight in the harness. And/or
- Adjust the trimmers to dampen it out.

### **Lateral Asymmetric Closing**

Like any other canopy, a negative angle of attack will result in a closing. In order to maintain directional control upon a lateral asymmetric closing, the brakes must be applied on the open side.

In case of a major closing, the amount of braking must be well graduated, in such way to avoid the airflow displacement (stall) on the open section of the canopy.

To facilitate the canopy re-inflation during a collapse, the steps above must be followed in conjunction with a long and slow brake pumping action (2 seconds) with the toggle on the closed side. The shifting of weight on the opposite side riser of the closing will also assist with the re-inflation and increase safety, requiring less brake action and keeping away from the stall point.

In case the pilot does not compensate with the brakes, the **Flexus** in most situations will inflate by itself even in major asymmetric collapses. The **Flexus** can make a complete turn and in the event it does not open on its own, without action, the power glider will begin a positive spiral. The pilot must lightly apply the brake on the external side to stop a spiral and at the same time shift his/her weight on the same side until the canopy is stabilized. Exactly at this stage of pendulum effect under the canopy, it is important that the pilot controls carefully the amount of force applied on the brakes, and often it is needed to decrease the force. Once a straight flight is achieved, the closed side can be re-inflated by the pumping action.



### **Attention**

If the pilot does not actively terminate the spiral, it will continue all the way to the ground!



### **Line-Over**

In the eventuality of lines going over the canopy during flight, the pilot must take the following steps:

- Try to maintain a straight flight: Shift the weight to the open side of the power glider and assist with a light brake tension on the open side.
- To re-open: Pull the stabilizer line on the closed side (first line of riser 'B' of a different color) until the line entanglement is cleared.
- If the line-over is serious, if it's not possible to maintain a stable flight (spiral) and if there is sufficient altitude (>400 m), there is a chance of resolving this mal-function by executing a 'Full Stall'.

In case the above maneuver does not solve the problem, or if the altitude is not sufficient, the pilot can activate the emergency parachute (reserve).



### **Attention**

- Line-overs are generally the result of poor preparation before takeoff, collapses during acrobatics or lateral asymmetric closings.
- Switch of the engine or keep the motor idling.

### **Frontal Symmetric Closing**

Risers 'A' and 'A1' are tightly pulled until a complete closing of the Leading edge is achieved, then quickly release the risers until it is closed. The pilot should not hold the risers after the closing. Special attention must be given to ensure enough altitude is available.

The **Flexus**, on most instances, recovers on its own from a frontal asymmetric closing. In turbulent conditions, a head butt may occur, which must be overcome by accurate brake control.



### **Attention**

- Switch of the engine or keep the motor idling.

### **Parachutal**

The **Flexus** does not have parachutal stall tendencies and recovers on its own from an intentional parachutal stall induced by braking commands. In the event of a parachutal stall upon coming out of a B-Stall, it is enough just to pull the risers 'A' downwards or the accelerator, thus reducing the angle of attack, therefore reorganizing the air flow contact to the canopy.



### **Attention**

- Switch of the engine or keep the motor idling.



### **Full Stall**

To create a 'Full Stall', the pilot must pull both brakes to the end, and hold them tightly in this position. In this situation, the *Flexus* flies in most times on reverse, in a forward horseshoe shaped tie. The canopy must be stabilized before the procedure for normal flight re-entry is initiated. Any attempt of recover during the beginning stages of a stall, when the power glider reverses suddenly can result in a sudden push forward of the canopy.

When recovering from a 'Full Stall', both brakes must be released slowly simultaneously and symmetrically ( $> = 1$  second). The *Flexus* will move forward gradually and begin normal flying.

An asymmetric recovery (releasing one brake before the other) of a 'Full Stall' is utilized only by test pilots to simulate a power glider being expelled out of a thermal and must not be attempted by pilots!



### **Attention**

- Switch of the engine or keep the motor idling.

### **Negative Turns**

To induce a fast Negative Turn out of normal velocity (LTF) or starting from the minimum speed (EN), the pilot must pull tightly and quickly one toggle right to the end of it.

During the negative spiral, the canopy rotates relatively fast around its center, with its inner side flying backwards.

When entering an unintentional Negative Turn, the pilot must recover as soon as it is noticed by releasing the brake slightly so that the canopy will accelerate and returns to a stable flight, without losing too much altitude.

When a negative turn is intentionally prolonged, the *Flexus* accelerates forward asymmetrically. A frontal asymmetric closing should not be under-estimated. To recover from an intentional negative spiral, the pilot must release the pulled brake and pay close attention to a strong canopy surge ahead.



### **Attention**

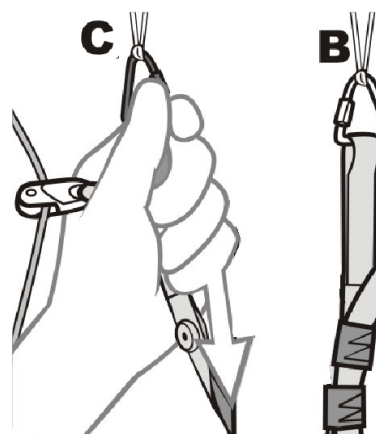
- Switch of the engine or keep the motor idling.





**Emergency Flying**

In case braking controls are impossible, the canopy can be driven by utilizing risers 'C' and eventually land. Pay close attention to the length of the command, which should be shorter than braking commands.

**Attention**

- Switch of the engine or keep the motor idling.

**Wingover**

In order to perform a 'Wingover' the pilot must generate a strong pendulum effect by alternating turns on both sides. A complete closing of the canopy is possible.

**Attention**

A turn with an incline beyond 60° is considered acrobatic.



## Flexus - Up-keep, maintenance and repairs



### Attention

A good maintenance will extend the life of your **Flexus** for many years to come.

### Storage

The power glider must be stored dry, in a dry place, protected from UV light and away from chemical products.

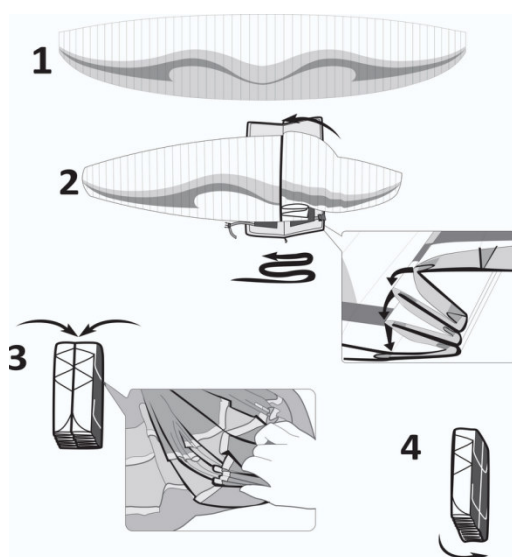
### Backpack

Your backpack was designed with comfort and practicality in mind. It's format allows for good content distribution. Shoulder straps and back support are padded so that comfort is not compromised during walks. For larger equipment capacity, your backpack has an expandable compartment, which can easily be enlarged without sacrificing the layout. Two different pocket sizes at the front allow for easy storage of small articles.

### Folding

By following each step properly, you will be helping to preserve the life span of your equipment:

- Open the canopy completely on the ground.
- Place all the lines spread by the inner layer.
- We recommend folding your power glider like an accordion. This will keep the profile reinforcements from being crumpled and/or folded. By using this folding method, the power glider will keep its takeoff and flight characteristics.
- Keep folding to approximately 50 cm.
- Remove all the air by sliding your hand from the trailing to the leading edge.
- Make sure the volume is a little smaller than the protection bag.
- Avoid multiple folds at the same place.



#### Steps:

1. Open the canopy completely.
2. Packing the power glider "accordion wise" as show in the figures.
3. Place each profile reinforcement over the corresponding cell.
4. Bring together the two parts and roll the canopy up without compressing too strongly.

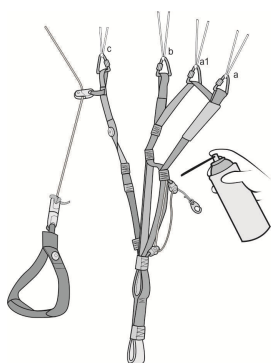


### **Cleaning**

Cleaning must be performed only when it is absolutely necessary. We recommend the use of water only with a smooth sponge or cloth. Do not use any chemical product, since it will damage the material permanently.

### **Maintains and inspection**

The first inspection check is mandatory completing 1 year or 100 flights, whichever comes first. After the first inspection any wing has to be checked after 6 months or at each 50 flights, whichever comes first. In any of these inspections may occur that a shorter period of time for the next inspection will be defined (f. ex. 4 months or 30 flights). It is of utmost importance to follow these guidelines. Without performing the mandatory inspections, the power glider loses its certification and the respective **SOL** warranty becomes null and void.



### **Pulleys**

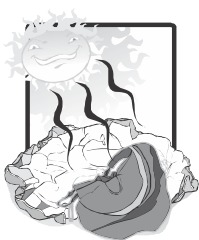
It is important you keep pulleys lubricated because in case they do not work may consume the speedy handle or axle, apply paraffin or lubricant spray, read carefully about the lubricant to avoid spots and fabric consume. Do not apply on the sewing lines.



### **Attention**

When buying the lubricant make sure that this product do not attack the material properties. This may affect the fabric and lines resistance.

### **Recommendations for a long life**



The **Flexus** fabric is made mainly out of Nylon, which like any other synthetic material is sensitive to UV light radiation, causing it to decompose, losing its mechanical resistance, and thus increasing its porosity. For this reason, the unnecessary exposure to sun light, which carries a high UV radiation level in high altitudes must be avoided. It is highly recommended to leave the power glider stored away and well protected when it's not being used.

The **Flexus** lines are made of a aramide (technora), with a Polyester cover. Individual line overloads beyond the normal range in flight must be avoided, because an excessive deformation of the line is irreversible, and becoming permanent. The same way, folding and creasing the lines must be avoided, specially the main lines. Never step over the lines or canopy, above all on hard surface.

The canopy must be opened only on a clean surface area, since dirty can penetrate in the canopy's fiber, shorten the lines or spoiling the fabric. The lines must be kept from any entanglements on takeoff to prevent excessive deformation.



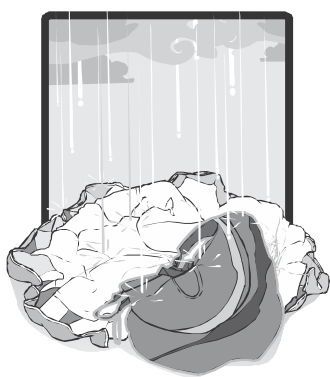
Avoid storing the power glider for long periods in areas with high humidity or heat, this causes premature aging of the materials. Keep away sand, stones or snow from entering the canopy cells because any weight on the trailing edge slows the canopy down, possibly creating a stall, furthermore, sharp corners may cut the fabric.

During takeoffs and landings in windy conditions, a run-away canopy may hit the ground strongly and the shock may rupture the material.

In case of line entanglement the brake lines may peel-off or a main line may get cut by a brake line, due to friction.

On landing, avoid letting the Leading Edge fall forward and downward towards the ground because this may damage the materials that form the front of the power glider and/or rip the sewn areas.

The manipulation of the power glider during ground takeoff, or a lot of wind speed up the aging process of your equipment.



After a tree or water landing, the lines must be checked and tested.

In case of salt-water contact, the power glider must be soaked and washed with fresh water. Salt water might decrease the lines' resistance even if soaked with fresh water. The lines must be changed after contact with salt water.

Never dry the power glider directly under the sun. This must be done in a shaded area. After drying send the power glider for inspection to the manufacturer or distributor.

A Line Plan can be found in this manual or can be obtained with the manufacturer or distributor.

After an accident or long time without using the power glider must be checked.

It is recommended that the canopy should not be folded in the same symmetric position in relation to the center, this way the center cell will not be always exposed, therefore keeping the central cell from fatigue overtime.

Avoid storing the power glider near fire and/or sharp objects. Any contact with acids should be avoided. In case of any doubts ask your distributor.



## Attention

Your **Flexus** was designed, tested and certified to perform the best. Any alteration of your power glider will nullify your certification and jeopardize your safety. For these reasons we strongly recommend you to avoid altering anything on your power glider.



### **Repairs**

Always check your equipment after an incident or in case the canopy has been stored for a long time. Repairs must be performed only by the manufacturer, distributor or authorized personnel. Minor repairs could be handled by yourself, although we recommend that repairs should be performed by the manufacturer or authorized personnel. They have the necessary materials and tools to maintain your power glider. Replace materials only with the originals. Using any other the power glider will lose his warranty.

### **Tears**

Along with your kit you get small adhesives for repair. Small tears up to 10 cm away from the line points may be fixed by you. Beyond that we advise you the maintenance be made by the manufacturer or by the registered workshop.

- Clean the spot where the adhesive will be applied with a humid cloth.
- It must be at least 2,5 cm more of the adhesive than the tear.
- Make the edges rounded to avoid to unglue after is glue.
- Apply on both sides of the tear.

### **Line breakage**

Along with your kit you get a 1.1 thickness line to make a little repair. When you repair we advise you to sew the unsowed point after you check the measure. Do not knot because it may diminish up to 80 % of the line resistance.

### **Sealing**

Along with your kit you get sealing for the carabines. Do not leave your risers without them because they avoid the movement of the screw nut making it impossible their opening.

## **Maintain of the power engine**

To manage and maintain your engine and components read the manual of your provider carefully.



## **Attention**

Oil and gasoline are harmful to the structure and components of the power glider.

## ***FLEXUS* - Nature and environment and Out of use**

Please fly in accordance to preserve nature and environment. If your power glider gets out of use remember it cannot be recycled. Please give it to your distributor or your flying-school, they should know how handle it.



## **Flexus - Warranty**

Every power glider manufactured has a Warranty of 1 year or 100 Hours of Flight, whichever comes first.

### **Warranty Terms**

1. This warranty is defined as repair or substitution of the defective power glider parts determined by the producer.
2. This warranty does not include power gliders rated for professional use (school, competitions, aerobatics, etc).

### **Warranty Pre-requisites**

1. A three-copied filled-out form: One copy to be sent to **SOL Powergliders** within 30 days after purchase; one copy to the sales person and one copy to the purchaser.
2. All flights must be logged providing information on date, place and length of flight.
3. The equipment must be kept in accordance with the instructions provided in this manual. All the storage, folding, cleaning and care instructions must be carefully taken.
4. Maintenance and inspections can only be performed by the manufacturer or authorized shop and must be properly documented.
5. The first inspection check is mandatory completing 1 year or 100 flights, whichever comes first. After the first inspection any wing has to be checked after 6 months or at each 50 flights, whichever comes first. In any of these inspections may occur that a shorter period of time for the next inspection will be defined. It is of utmost importance to follow these guidelines. Without performing the mandatory inspections, the power glider loses its certification and the respective **SOL** warranty becomes null and void.
6. The final decision on exchanging or repairing the equipment will be decided by **SOL Paragliders**.
7. All shipping and handling expenses are paid by the owner.
8. The corresponding equipment has to be sent to **SOL Paragliders** in the following way:
  - a) Accompanied by a copy of all inspections and a log of all flights.
  - b) Accompanied by a copy of the **SOL Paragliders** warranty form.





**This warranty does not cover**

- Any alterations on original fabric colors, lines and risers.
- Any damage caused by chemical products, sand, friction, cleaning products or salt water.
- Any damage caused as a result of errors during operation of the Power glider, incidents or emergency situations.
- Any damage caused by inadequate operation of the Power glider.
- Power gliders that may have been subjected of any alteration from the original design and without proper permission from **SOL Power gliders**.
- Damages caused by inappropriate transport, storage or settings of the power glider.
- Damages caused by the use of not compatible components with the power glider.
- Damages caused by the use of inappropriate packaging for the transport.
- Power gliders without original identification label and serial number.
- Handling inadequately to the instructions given in the owner's manual.



## **Flexus - Golden Rules**

1. Never place your engine downwind of your wing.
2. Check, check and re-check the fuel system for leaks.
3. Have you enough fuel to get you there? Better too much than too little!
4. Check for any loose articles that could trail or fall into the propeller while flying and fasten them securely.
5. If you spot a problem, no matter how small, deal with it NOW !
6. Always put on and fasten your helmet before clipping in to the harness.
7. Always carry out full pre-flight checks before launching. Try to control the glider on the ground facing forwards so as to keep the lines out of the prop. You should only turn to face the glider to avoid falling backwards onto the motor.
8. Don't fly into danger - over water, trees, power lines etc. where an engine failure will leave you in trouble.
9. Try not to fly into the turbulence of your own wake or that of others, especially at low altitude.
10. Avoid flying in turbulence which is caused by your own engine.
11. It is unwise to fly hands-off below about 100m.
12. Never rely on the engine: it may cut out at any moment. Always fly as if it will, so fly the wing – NOT the motor.
13. Always give attention to the sound of your engine. If hearing something different, land and check.
14. Fly in conformity of our capacity and don't trust yourself to much.
15. Remember, not everyone enjoys your engine noise.
16. Care must be taken when flying near livestock.
17. Warm up the engine before connecting the wing.
18. Always use gloves.
19. Fly with glasses to avoid insects or other objects hitting your eyes.
20. Check the helices connection.



## Final words

Safety is the major theme of our sport. In order to fly safely, pilots must train, study, practice and be alert to the dangers around us.

In order to achieve excellent safety levels, we must fly regularly as much as possible, don't go beyond our limitations and avoid exposing ourselves to unnecessary dangers. Learning to fly is a slow process and takes years, so don't pressure yourself. If conditions are not favorable, keep your equipment stored away.

Don't overestimate your skills and be honest with yourself. Every year we see many accidents which in most cases could be prevented with a minor adjustment.

We are a part of the community in which we live: friends, family and even people we don't necessarily know worry about us. Our obligation towards this community is to keep ourselves healthy and that at each landing we will be one landing happier than before. We fly so that we can feel more alive.

We wish you good and safe flights with your [Flexus](#).

*SDL Paragliding Team*



## **Flexus** - Flight Log

Size:

Serial number:

Date of purchase:

Purchased from:

Date	Duration	Site	Flight Details



## Flexus - Inspection

Owner:

Address:

Phone:

Date:

	Condition
Cells	
Dacron re-enforcements	
Top	
Bottom	
Leading Edge	
Tabs	
Upper A-Lines	
Upper B- Lines	
Upper C- Lines	
Midle A- Lines	
Midle B- Lines	
Midle C- Lines	
A-Main-Lines	
B- Main-Lines	
C- Main-Lines	
Stabilizers' Lines	
Brake-Lines	
Internal Cell Walls	
Cross Ports	
Maillon Rapides	
Toggles	
Risers	
Test of porosity	

Observations:



**Conheça nossos acessórios para paramotor:**



Paraglider  
BackPack 2 in 1



Light Paramotor  
Cage Cover



Parachute Container RS 2 Handles

Front Instrument/Reserve  
Paramotor Container



Propellers Cover (pair)

Paramotor Tandem Spreadbar  
Black 35 CM ou 45CM (par)



Propellers Case (Two Parts)



Tightener with  
Trimmer Black (pair)

Tools Folder



Paramotor  
Cage Cover



Entire Propellers Cover



Paramotor trip and  
Cage Cover



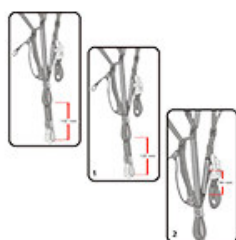
Reserve Handle

[solparagliders.com.br](http://solparagliders.com.br)



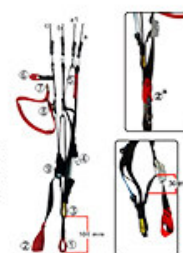


**Conheça nossos acessórios para paramotor:**



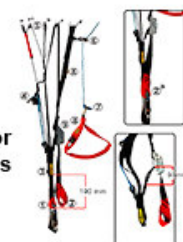
Riser 2 Stages  
Ellus 3 Paramotor

Riser 2 Stages  
Ellus 4/Ellus 5/Synergy 5  
Atmus one - 3 CM



Internal Parachute  
Container

Riser Paramotor  
2 Stages



Carabiner  
Fly Alu.



Front Instruments  
Container

Paramotor  
Carry All



Glove Sol  
Insulate

Glove Sol  
Neo Red



Quick Pack  
Express



Folder Bag  
Origami

[solparagliders.com.br](http://solparagliders.com.br)

