



User's manual



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[www.supair.com](http://www.supair.com)





Thank you for choosing to fly our SORA tandem. We are delighted to have you on board and to share our passion for paragliding.

SUP'AIR has been designing producing and selling accessories for free flying activities since 1984. By choosing a SUP'AIR product you benefit from almost thirty years of expertise, innovation and customer care. This is our philosophy : working endlessly

We hope you will find this user's manual comprehensive, explicit and hopefully enjoyable as well. We advise you to read it carefully.

You will find the latest information and updates on this product on our website : [www.supair.com](http://www.supair.com). If however you have any further questions, do not hesitate to ask one of our dealers. And of course the entire SUP'AIR team remains at your disposal on [info@supair.com](mailto:info@supair.com)

We wish you many safe and enjoyable flying hours, and happy landings.

Team SUP'AIR

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Welcome to tandem flying : a world of shared passion in comfort and security.

Your SORA tandem is a glider which meets all the requirements of a modern tandem wing. It is designed for intensive professional use and will give both the pilot and his passengers a high level of in-flight comfort over the seasons. The construction techniques and materials were selected with longevity very much in mind.

Your SORA is certified EN / LTF B. It may be used with most models of harnesses available on the market but for better comfort and optimal feeling we recommend that you use a pilot and passenger harness from the SUP'AIR range.

After reading this manual we advise you to inflate & check your wing on a training hill first.

N.B. : The following three icons will help you to read this manual



Advice



Caution !



Danger !!

Model	tandem glider SORA
Size (m <sup>2</sup> )	41
Number of cells	54
Flat surface area (m <sup>2</sup> )	41,2
Span (m)	14,9
Chord (m)	3,47
Flat Aspect Ratio	5,35
Projected surface area (m <sup>2</sup> )	35,1
Projected span (m)	11,7
Projected aspect ratio	3,9
Glider weight (kg)	7,5
In-flight weight range (kg)	120 - 220
Trim speed (km/h)	38
Max. speed (km/h)	52
Certification	Class B, EN : 926-2 : 2013 & 926-1 : 2015, LTF : 2. DV LuftGerPV §1, Nr 7 c



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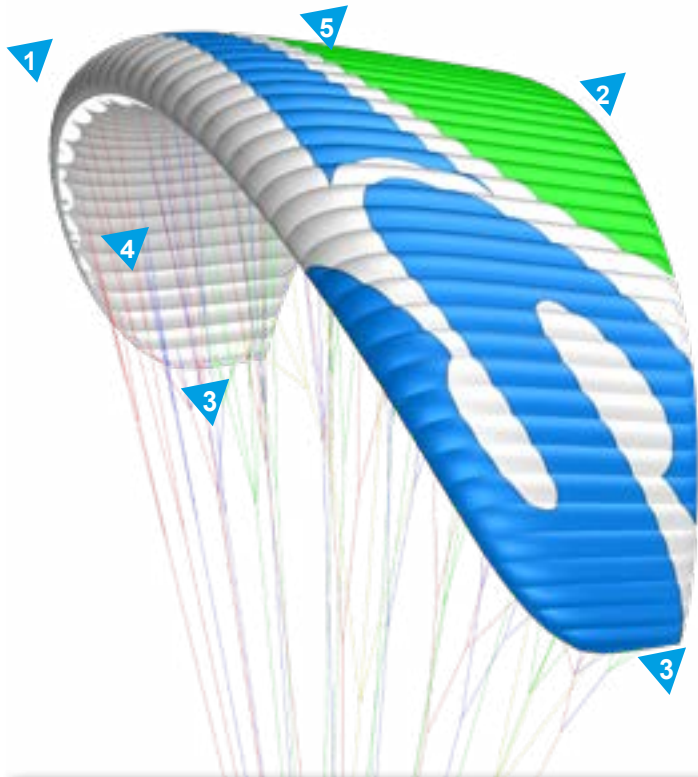


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# Equipment overview



- 1 Leading edge
- 2 Trailing edge
- 3 Stab
- 4 Inner Surface
- 5 Outer surface
- 6 A riser
- 7 A' riser (for big ears)
- 8 B riser
- 9 C riser
- 10 D riser
- 11 Brake line
- 12 Brake retaining strap
- 13 Brake handle
- 14 Ear blocker
- 15 Trim bridle with magnet
- 16 Riser hook-up loop

Options included in the « SORA tandem pack »



- 17 Spreader hook-up loop
- 18 Pilot hook-up loop
- 19 Passenger attachment loop
- 20 Reserve riser cover
- 21 BIRD 150 L Carry bag



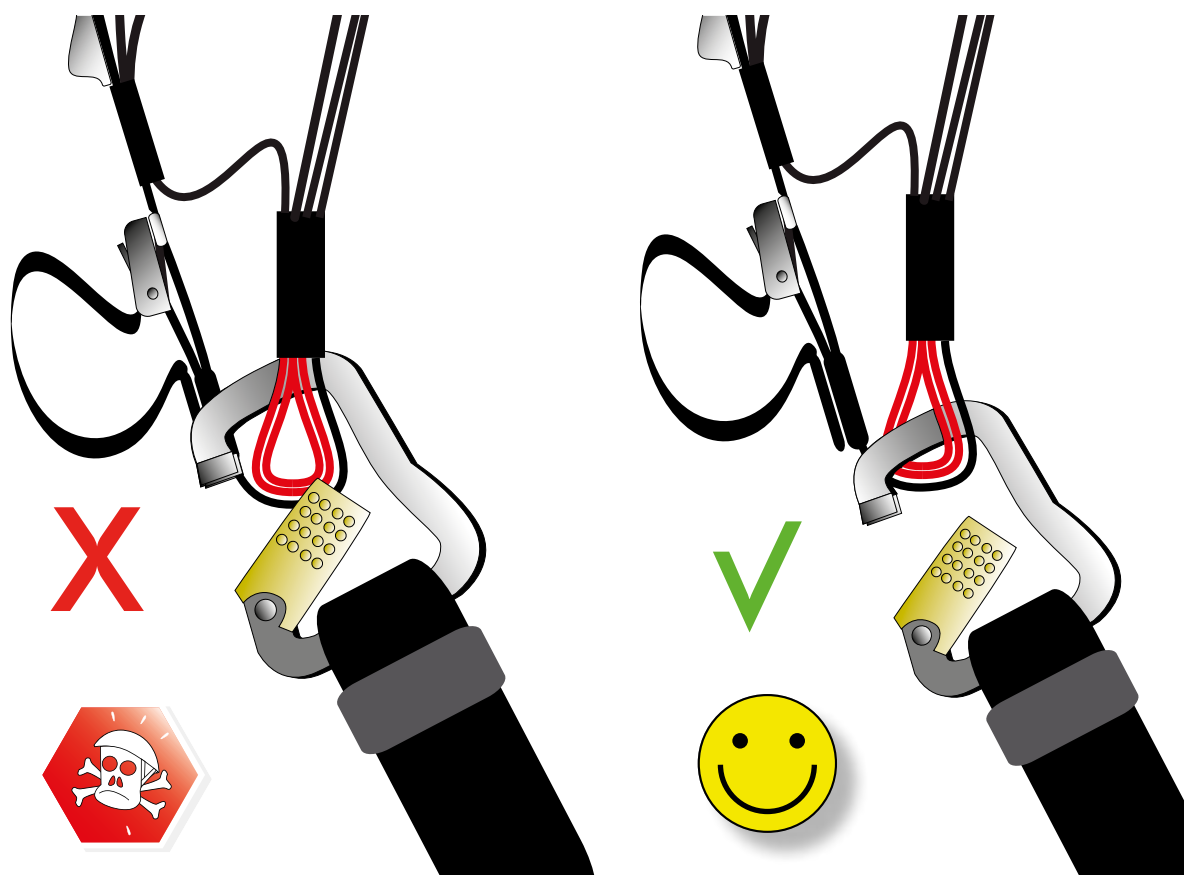
## Connecting to spreaders

The bottom loop on the risers must be connected to the attachment points on the spreaders, using karabiners with appropriate resistance for a tandem load. You must ensure that the A risers are on top, without any twists or obstruction.

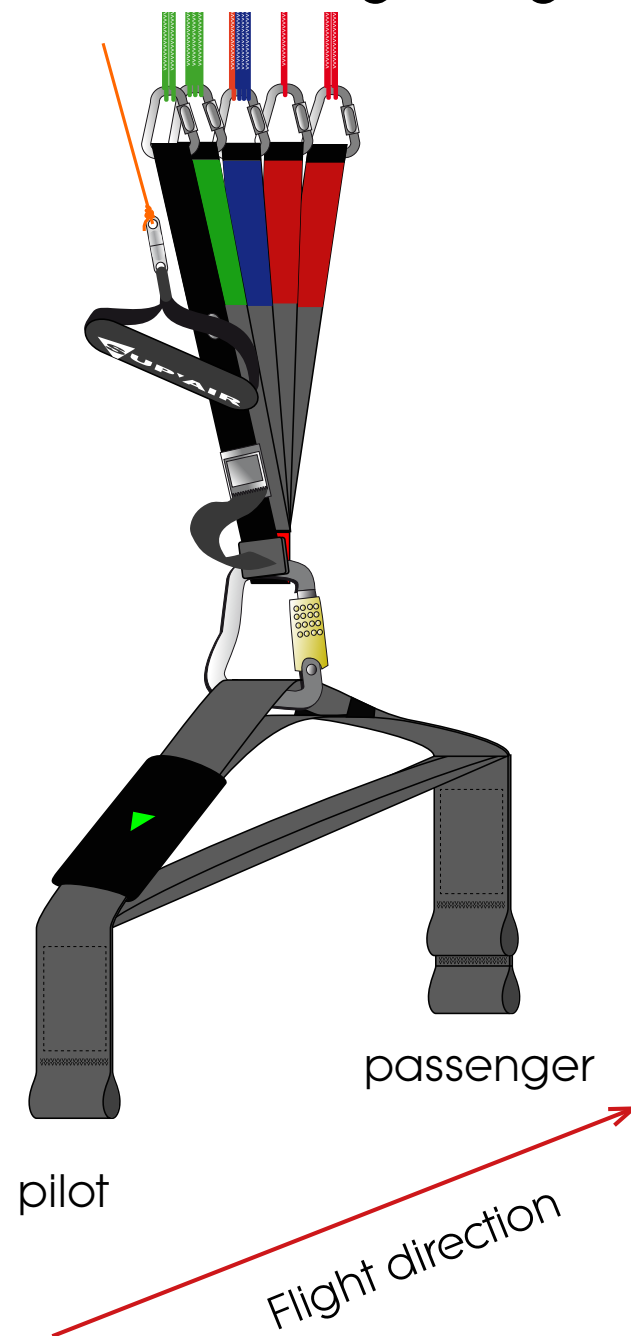
NEVER connect the glider to any other point.

The pilot then connects his harness to the rear loops on the spreaders and connects his passenger's harness to the forward loops.

For the connection between the glider and spreaders, we recommend SUP'AIR 45mm steel karabiners.



## Connecting the glider



## Brake line length

Brake line lengths are set in the factory to allow optimal glider control. However, if the setting does not suit you, it is possible to modify brake line length.

We advise you to use a fisherman's knot and to keep your length changes to a minimum (approx 5cm at a time).

The height of the brake retaining strap is adjusted as follows :

- Undo the knot on the brake line and pull it out through the ring.
- Move the brake retaining strap to the desired position using the straps on the riser and fix it with a loop.
- Feed the brake line through the ring.

- Connect the brake line with the handle on the mark with a fisherman's knot.

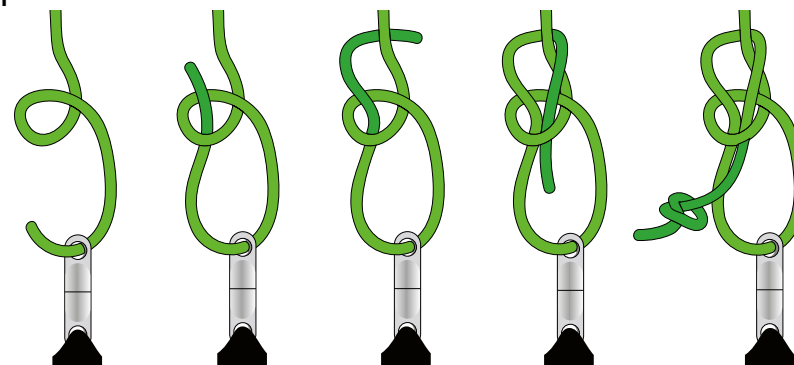


Be careful not to suppress the "bow" in the brake line when flying hands up so that the canopy does not deform or the trims cannot function correctly (if the trailing edge is pulled tight).

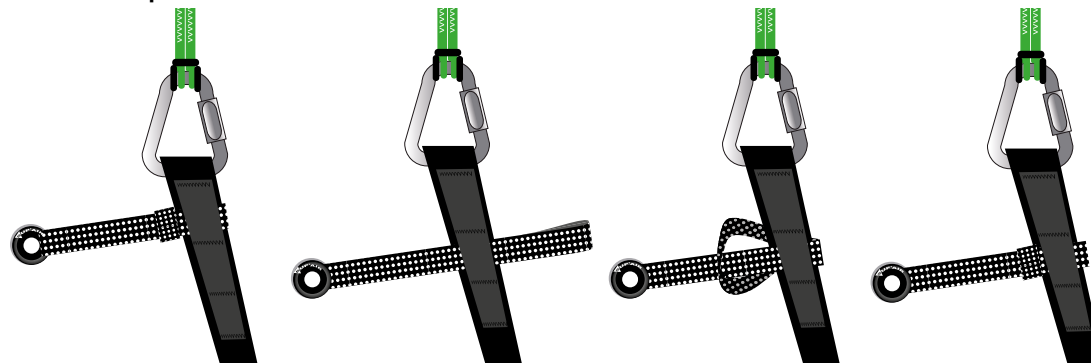
The bow in the brake lines must be checked with trimmers fully released. The trailing edge must not be affected in this position.

## Connecting the glider

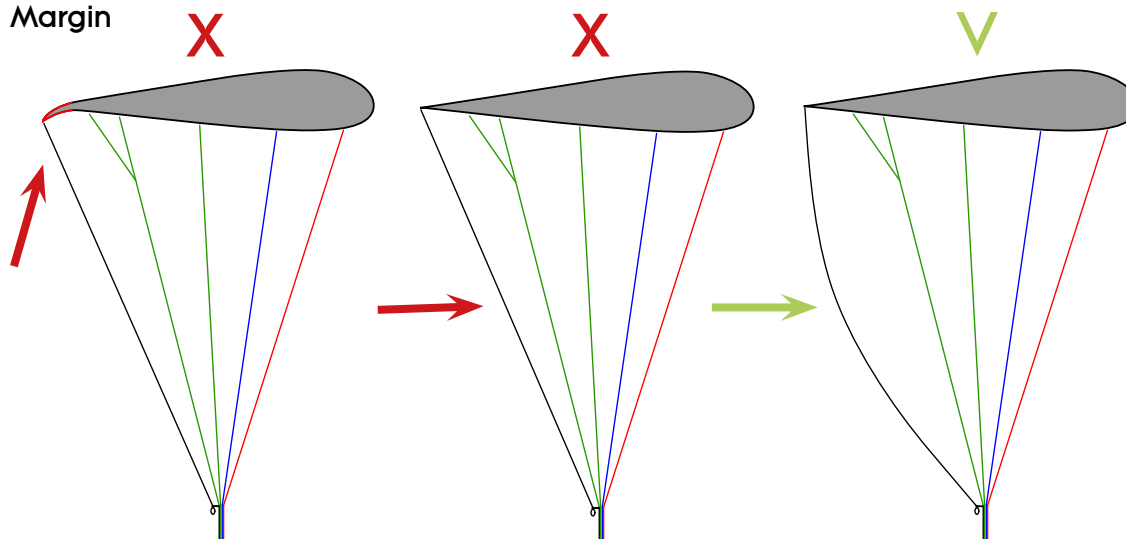
fisherman's knot



Brake strap



Margin

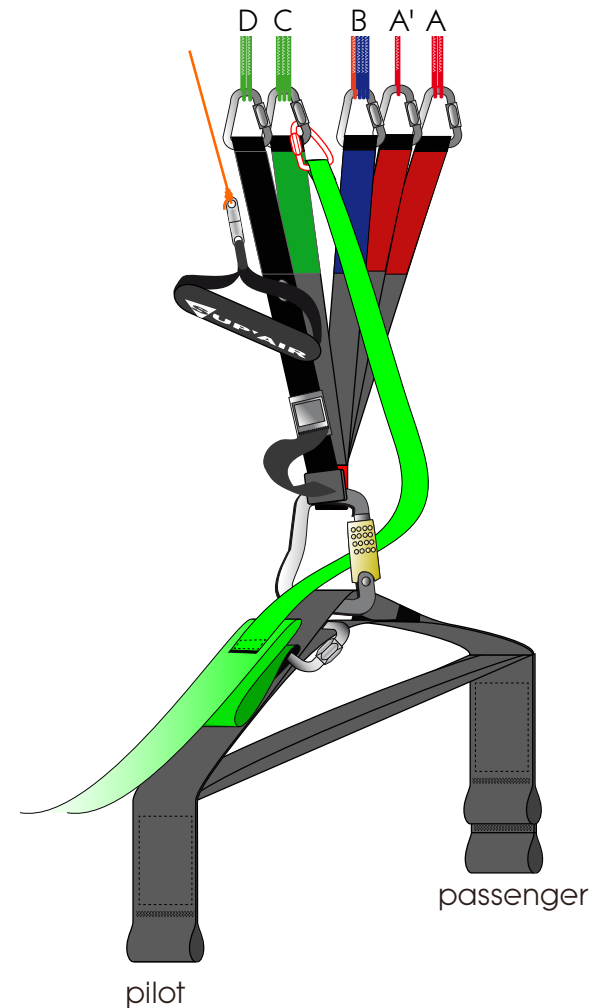
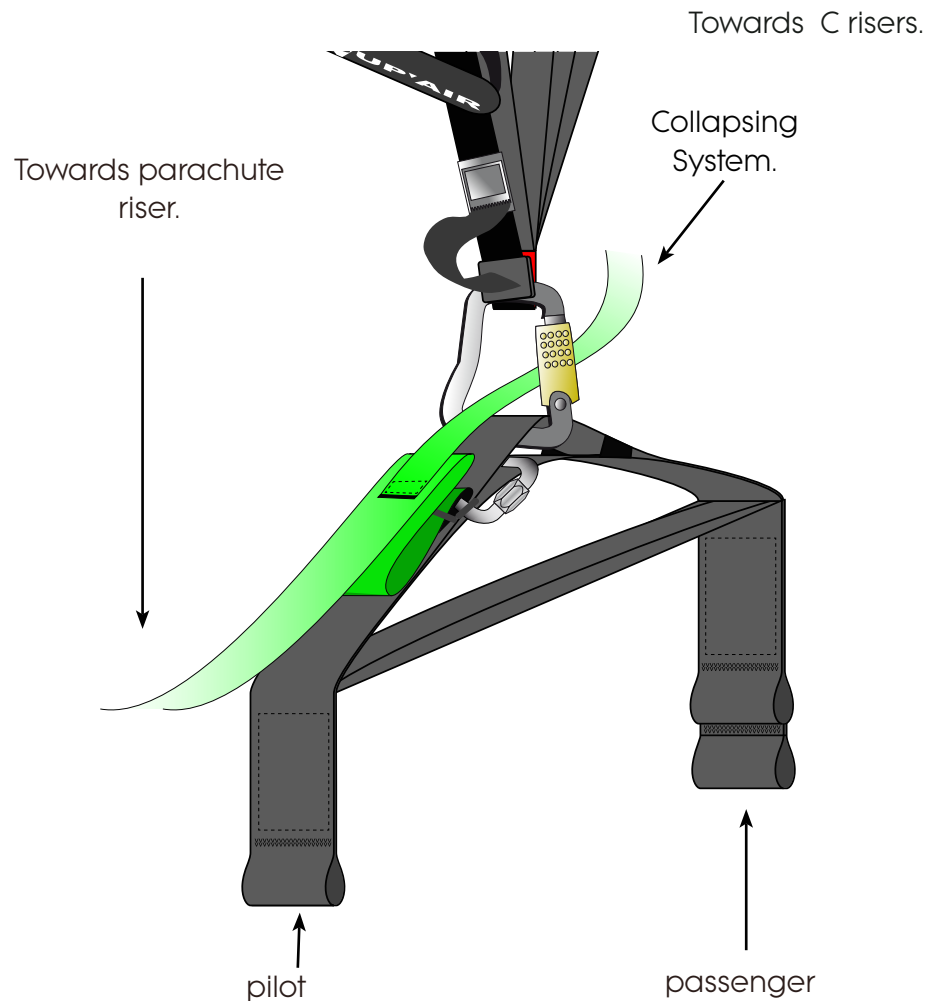




# Installing the reserve parachute and the automatic collapse system on the risers

**1.** Connect the risers on top of each spreader bar (at the main loop), with the rectangular stainless steel maillons and the flexible elastic rings.

**2.** On both sides, push the small collapsing bridle through the main paraglider carabiner, and connect it to the top of the « C » riser using a triangular maillon.



Unfold the glider then place it on its upper surface in an arc.

Separate A,B,C and D risers and brake line ; make sure that the risers and lines do not have any knots or twists and are not catching anything (stones, twigs, etc).

Check that both trims are in a symmetrical position.



**Caution !**

It is crucial to carry out a thorough pre-flight check and in particular to ensure that the passenger and pilot are correctly fastened in their harnesses and that the harnesses are correctly connected to the spreaders.

Before every take-off, check the following :

- that harnesses and karabiners are in good working order
- that the reserve parachute container is correctly closed and that the handle is in the correct position
- that your personal settings have not been changed
- that the glider is correctly connected to the karabiners and that they are safely locked

The design team has strived to produce optimum characteristics for easy inflation in all conditions, whether in light or high winds you will enjoy the progressive behaviour while launching. However before the first flight, practice ground-handling in order to become familiar with your new glider. It is possible to inflate with the front- or reverse-launch methods.

## Forward launch

In order to inflate the glider, take the A risers in your hands at the maillons and move forward slowly and progressively. Once the glider is above your head, apply brakes as necessary and perform a visual check before you accelerate for take-off.

## Reverse launch

In moderate to high wind speeds, we recommend that you use the reverse launch method in order to facilitate visual control. The pilot should turn around to face the glider, leaving the passenger facing forward, pull gently on the A risers. After a slight pull to inflate the canopy, move towards the glider at the appropriate speed in order to prevent any overshooting or dragging. Once the glider has stabilised, the pilot turns around to face forward and both persons move forward together to take off. Note : it is not necessary to use the A' riser.

## Trim position

We recommend to set the trims to « neutral » for take-off, which is identified by the red mark on the strap. However you may adapt the trim position according to wind strength, the take-off slope or the weight of your passenger.

Note : do not alter the trim position by more than one increment at a time.



Caution !

Before take-off, always ensure that airspace is clear and conditions are suitable for your level of skill and experience.

The BIPLACE is designed for experienced pilots qualified to fly tandem and fully capable to adapt to various conditions. We recommend that the first flights should take place in gentle conditions in order to get familiar with the glider.

The following tips will help you to get optimum performance from your SORA tandem :

### « Hands up » speed or trim speed

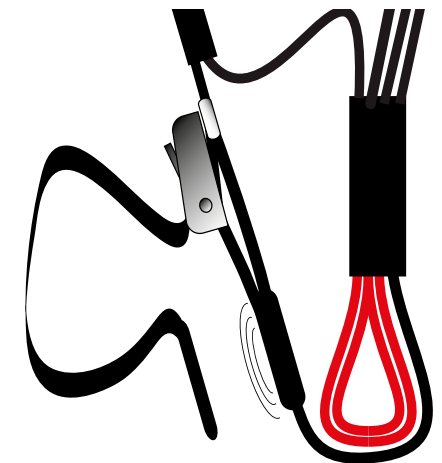
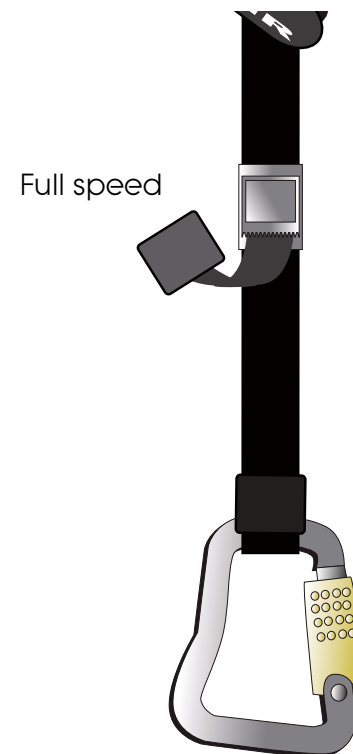
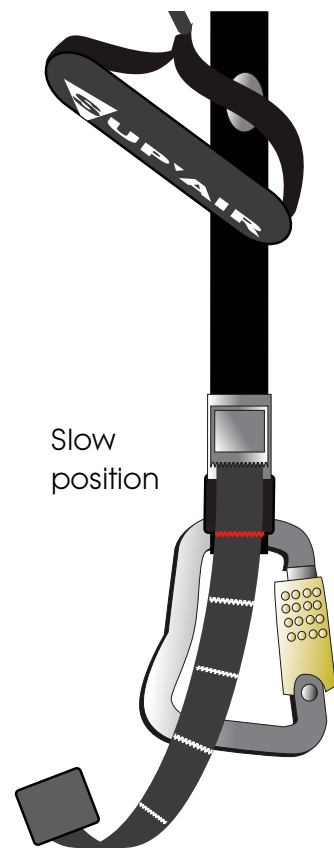
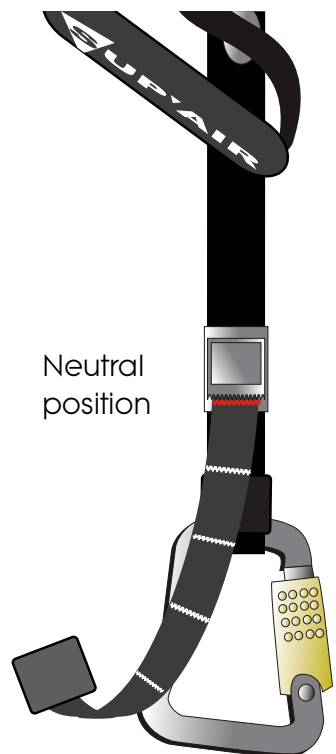
Flying « hands up » will achieve the best glide ratio in nil wind.

### Use of trimmers

If you require more speed, releasing the trimmers will allow you to accelerate. The glide ratio will not deteriorate much until the half-way point. If you wish to slow down the glider or to improve your sink rate, pull down the trimmers to bring them to the minimum speed position.



We advise you to use maximum speed (trimmers fully released) prudently and not to fly close to terrain in turbulent conditions in this configuration.



## Turning

To produce a turn, once you have checked that the airspace is clear, lean into the harness inside the turn – you may also ask the passenger to do likewise – and progressively pull down the brake on the side where you wish to turn until you have achieved the desired angle of bank. You can then modulate the speed and radius of the turn by using the external brake. If you are flying at low speed, initiate the turn by releasing the outside brake first. This will avoid the risk of spinning.

## Landing

Always make sure that you have sufficient height to prepare your approach according to the conditions and the particularities of the landing field. During the approach, do not use sharp turns or radical manoeuvres. Always land facing into wind, with the pilot and passenger standing upright and ready to run if necessary. During the final glide, fly as fast as possible according to the conditions then brake the glider gradually using the full range of brake travel to completely slow it down as you touch the ground. Be careful not to brake too early or too late. An excessive surge or dive would cause a hard landing.

If you land in high winds, as soon as you make contact with the ground you will have to turn around with the passenger to face the glider and move towards it while braking symmetrically. You may also use the C risers to collapse the canopy.

The following techniques should only be used in emergencies and require prior training. Appropriate analysis and anticipation of the conditions will often prevent the need to use fast descent techniques. We advise you to practice in still air and preferably above water.

## Big Ears

Pulling big ears increases the glider's sink rate. We do not recommend the use of big ears close to the ground. In order to pull in big ears, grab the specific riser (outer A riser) while keeping the brakes in hand and lower it until the wintip collapses. It is preferable to collapse one side after the other and not simultaneously in order to prevent a frontal collapse.

To reopen big ears, release both risers symmetrically. You may apply brake on one side and then the other to facilitate reopening.

It is possible to combine big ears with the use of trimmers in order to further increase the sink rate and speed. Once you have induced big ears as described above, release trimmers fully. Reopen big ears first before pulling the trimmers down to return to normal flight.

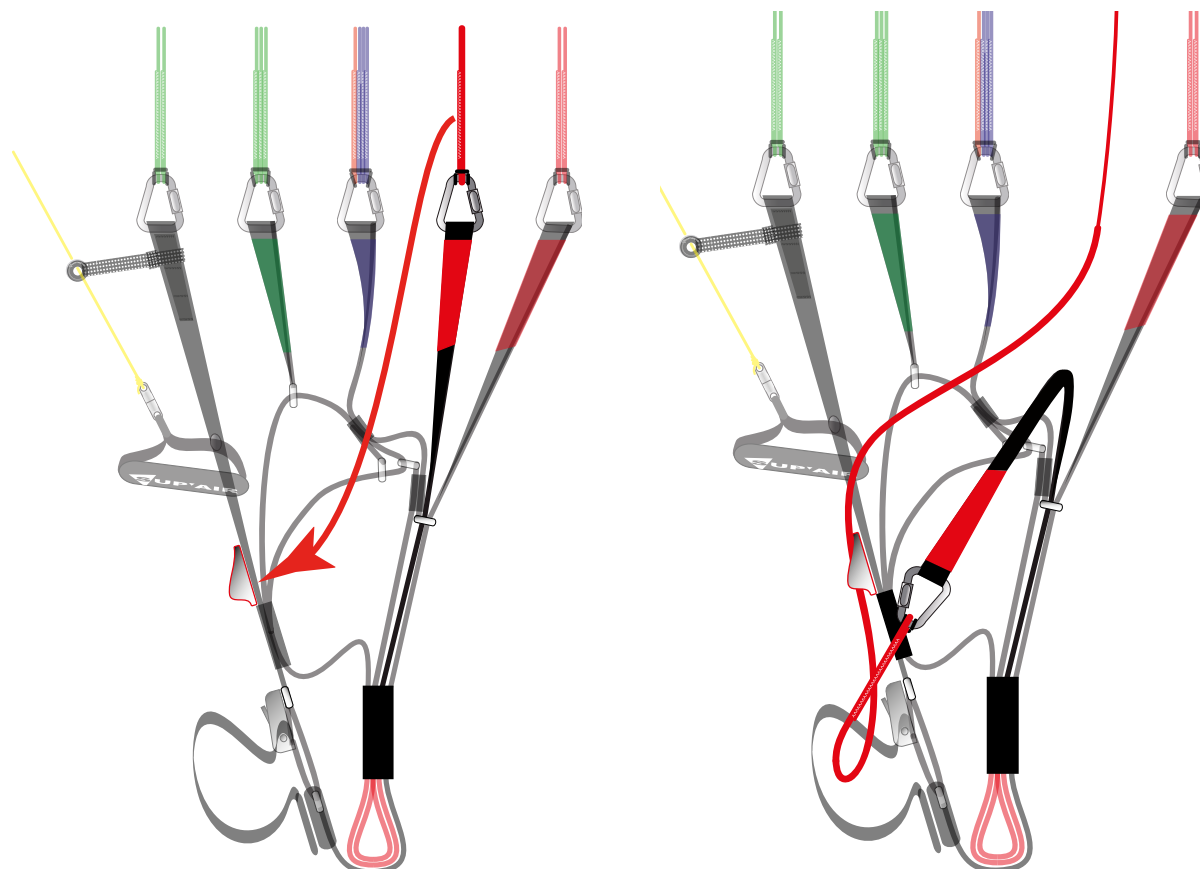
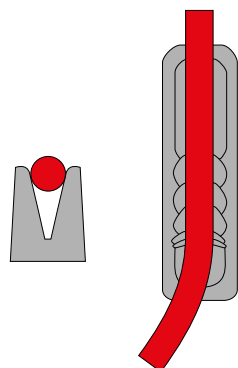
## Ear blocker

A system for blocking big ears is positioned on the rear riser. It will allow you to lock big ears in and continue to pilot the wing with the brakes.

To produce big ears, use the dedicated line (A') and insert it directly into the blocker at the desired length.

You will need to adjust your flying, as the wing has more inertia when turning in this configuration. Make sure you anticipate the reopening by liberating the line early, in particular before landing.

Ear blocker



## B-line stall

This technique is generally very hard to use on a tandem wing due to the high force needed to pull in the B lines. The design of the SORA does not allow to perform a B-line stall and this technique has not been tested during certification.

## 360° spiral dives

To begin a spiral dive, make sure airspace is clear then lean into the turn and gradually apply brake on the same side. The glider will perform a full turn and then accelerate and enter into a spiral. You may use the outside brake to manage your sink rate

In order to exit the rotation, return to a neutral (centered) position in the harness – including the passenger - and gradually release the inside brake. You need to keep the glider in a turn as it decelerates in order to limit the surge as you exit the spiral. If your exit is too radical the glider will surge aggressively then perform a big dive, which you will need to keep under control. Gradually slowing down the rotation with the outside brake will allow you to exit in a controlled manner.



So as to avoid stressing the paraglider, we do not recommend combining spiral dives and big ears.



As per EN Standards, the SORA shows no tendency to stay in a spiral and will return to normal flight in less than 2 turns.



**DANGER** This manoeuvre places a lot of stress on the glider. The high speed and G force might be disorientating for you and your passenger and, in extreme cases, cause you to “blackout” and lose consciousness. Practice gradually with altitude and a large safety margin and be conscious of your passenger’s comfort.



## Asymmetric collapses

Any paraglider might occasionally collapse due to turbulence or a piloting error. In the event of an asymmetric collapse, your priority must be to stay clear of terrain and regain level flight. To achieve this, apply weight shift on the open side and, if necessary, help the action by applying an appropriate amount of brake on the same side.

If the collapsed side does not automatically open, apply deep brake on the collapsed side and release immediately. Repeat this action as many times as necessary until the wingtip reopens. In the event of a "cravat" (where the wingtip gets caught up in the lines), you may use the big-ears technique described above by pulling on the tangled line in order to release the wingtip.

## Front collapses

During a front collapse, according to the certification standard the glider is designed to reopen on its own. Make sure you do not apply brake, in order to facilitate the return to normal flight.

## Parachutal stall

Even though this configuration only occurs very rarely, you might at some point be in a situation where the glider descends vertically with no forward speed, which is a parachutal stall. If this happens, release the brakes fully and release the trims symmetrically, if necessary you might also need to push the A risers forward. Make sure that you have regained normal flight before using the brakes.

## Stall

This technique is not recommended as it requires very high forces. It is not a safe technique for fast descents.

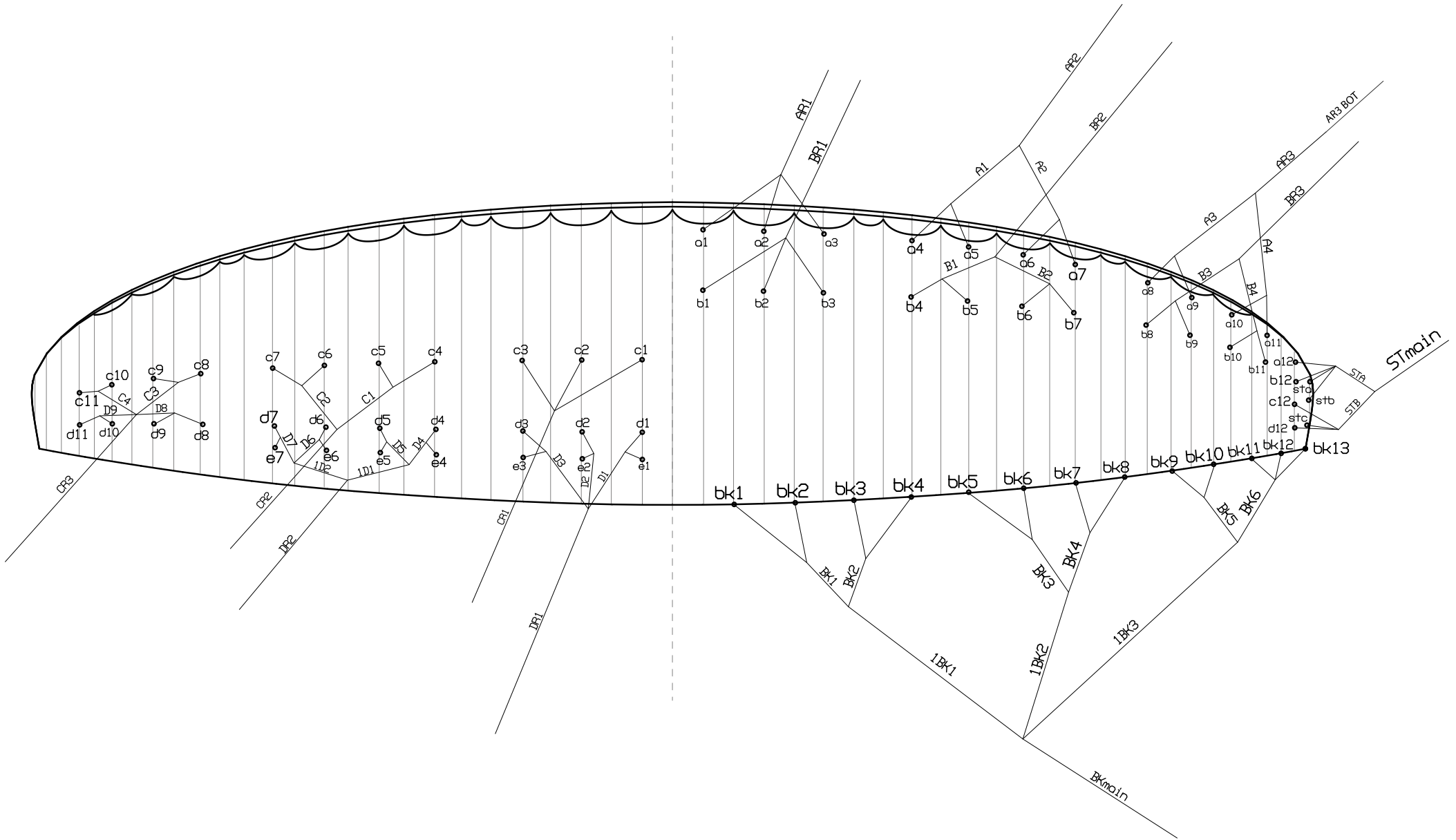
## Spin / asymmetric stall

A spin will only occur because of a piloting error. If so, release the brake fully on the stalled side and make sure you keep the glider in check during the ensuing dive.

# Towing

The SORA tandem may be used for towing. Make sure you only use certified towing equipment and with a qualified tow operator. You must also go through appropriate training. The traction force must be appropriate to the in-flight weight and the towing action must only start once the glider is fully inflated and stable above the pilot.

# LINE LAYOUT DIAGRAM



Fabrics	Producer	Reference
Outer surface	Porcher Sport	Skytex 38 Universal - 9017E25
Inner Surface	Porcher Sport	Skytex 32 Universal - 70032E3W
Supported ribs	Porcher Sport	Skytex 40 Hard - 9017E29
Compression straps and D ribs	Porcher Sport	Skytex 32 Hard - 70032E4D
Unsupported ribs	Porcher Sport	Skytex 32 Hard - 70032E4D
Rib reinforcements	Porcher Sport	SR 170

Main lines	Producer	Reference
Top cascade	Liros	PPSL 160 - PPSL 120
Upper middle cascade	Liros	PPSL 200 - PPSL 160
Lower middle cascade	Liros	PPSL 160
Lower cascade	Edelrid	A7343-420 & A7343-280
Lower AR3	Liros	PPSL 350 kg

Stabilo lines	Producer	Reference
Top cascade	Liros	PPSL 120
Middle cascades	Liros	PPSL 120
Lower cascade	Edelrid	A6843-160

Brake lines	Producer	Reference
Top cascade	Liros	DSL 70
Upper middle cascade	Liros	PPSL 120
Lower middle cascade	Liros	PPSL 200
Lower cascade	Edelrid	785ox - 240
Mailons	Peguet	MAILLON RAPIDE DELTA INOX 3.5MM

## SORA tandem size 41 Checked line sheet

		A	B	C	D	E	Brake
Centre	1	8590	8500	8539	8697	8756	9945
	2	8506	8410	8443	8592	8652	9579
	3	8541	8453	8493	8652	8707	9312
	4	8509	8429	8475	8623	8679	9185
	5	8428	8350	8392	8531	8582	8997
	6	8407	8336	8380	8515	8564	8863
	7	8440	8382	8433	8573	8611	8807
	8	8268	8230	8287	8367		8839
	9	8125	8101	8152	8228		8747
	10	7982	7979	8034	8110		8684
	11	7876	7892	7949	8026		8656
Stabs	12	7690	7646	7688	7762		8534
Wingtip	13	7545	7589	7643			8503

## Riser length

risers	closed	red mark	open
A	395	395	395
A'	395	395	395
B	382	395	434
C	371	395	476
D	360	395	515
	<b>range</b>	<b>160.0</b>	mm



AIR TURQUOISE SA certified by



Class: **B**

In accordance with EN standards 926-2:2005 & 926-1:2006: **PG\_0815.2013**

Date of issue (DMY): **28. 12. 2013**

Manufacturer: **Sup'Air**

Model: **Sora 41**

Serial number:

## Configuration during flight tests

### Paraglider

Maximum weight in flight (kg)	<b>220</b>
Minimum weight in flight (kg)	<b>120</b>
Glider's weight (kg)	<b>7.6</b>
Number of risers	<b>4</b>
Projected area (m2)	<b>35.1</b>

### Accessories

Range of speed system (cm)	<b>0</b>
Speed range using brakes (km/h)	<b>11</b>
Range of trimmers (cm)	<b>155</b>
Total speed range with accessories (km/h)	<b>19</b>

### Harness used for testing (max weight)

Harness type	<b>ABS</b>
Harness brand	<b>Advance</b>
Harness model	<b>Bi Pro 2</b>
Harness to risers distance (cm)	<b>49</b>
Distance between risers (cm)	<b>55</b>

### Inspections (whichever happens first)

every 24 months or every 100 flying hours  
 Warning! Before use refer to user's manual  
 Person or company having presented the glider for testing: **Sebe Victor**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24  
**A A B A 0 0 A A B B A A A B A A A A A B 0 A A 0**

## Washing and glider maintenance.

It is a good idea to wash your glider from time to time. We recommend using a soft solvent (such as soap) use a brush and rinse thoroughly.

## Storage and transport.

When not using your glider, store it inside your paragliding rucksack in a dry cool and clean place protected from UV exposure. If your harness is wet please dry thoroughly before storing. If your glider is wet or humid make sure you dry it out properly

## Product longevity.

Irrespective of pre-flight checks, you must have the glider serviced regularly. We recommend that the wing should be checked every 2 years or every 100 flight hours, and in particular :



- Lines (no excessive wear, no breakages or folds), maillons and karabiners
- Materials selected for the SORA ensure the best compromise for lightness and longevity. However in certain conditions, for example excessive exposure to UV or abrasion or exposure to chemical products, the glider must be submitted to a full check in a qualified facility. Your safety is at stake.



- Carabiners must be replaced by new ones every five ( 5 ) years by identical models or models recommended by the manufacturer ( SUPAIR ).

## Repair

Even if we have used the best quality materials, your glider may be subject to wear and tear. In this case you must have it checked by a qualified workshop.



SUP'AIR also offers the possibility for its products to be repaired beyond the end of the warranty period. Please contact us either by telephone or by E-mail [sav@supair.com](mailto:sav@supair.com) in order to receive a quote.

## Recycling

All our materials are selected for their technical and environmentally friendly characteristics. None of the components found in our products will harm the environment. Most of them are recyclable.

If your SORA has reached the end of its life, you can separate all metallic and plastic parts from the cloth and sort out refuse according to your country's practices. We advise you to contact appropriate organisations for the recycling of textile parts.

## Mandatory controls



Your glider must be checked every 2 years or every 100 flight hours by a qualified operator.

We advise you to take this opportunity to have your reserve repacked.

## Warranty

SUP'AIR takes the greatest care in the design and production of its product line hence offers a 3 years limited warranty from the purchase date against any manufacturing defect or design issues occurring during normal use. Any damage or degradation resulting from incorrect or abusive use abnormal exposure to aggressive factors including but not limited to; high temperature intense sun exposure high humidity etc. will invalidate this warranty.

## Disclaimer



Paragliding is an activity requiring, skills, specific knowledge and sound judgement. Be safe by learning in certified schools, subscribe and obtain an adequate insurance policy as well as a flying license while always making sure your flying skills are up to the task in various weather flying conditions. SUP'AIR cannot be held responsible for your paragliding decisions or activities.



This SUP'AIR product has been designed exclusively for paragliding. Any other activity such as skydiving or BASE jumping is absolutely forbidden.

## Pilot's gear

This is essential that you passenger and you carry a helmet suitable boots and clothing. Carrying a reserve parachute suitable for your weight and correctly connected to your harness is also very important.



Optional fully compatible accessories are available for your SORA tandem glider.

Function	Code	Description	Weight
PILOT Walibi2 harness	SELPWALIBI2	S, M, L ; leg straps, wooden seatplate, airbag, minibump, sold with 30mm karabiners	3.61 kg
PILOT Walibi LITE harness	SELPWALIBILITE	S, M, L ; leg straps, delivered with 30mm karabiners	1.77 kg
PILOT EVASION2 harness	SELPEVASION2	S, M, L ; leg straps, wooden seatplate, airbag, minibump, sold with 30mm karabiners	3.99 kg
PASSENGER MINIMAX2 harness	SELPMINIMAX2	S, M, L ; leg straps, wooden seatplate, airbag under seat, sold with 45mm karabiners	3.19 kg
PASSENGER VIP2 harness	SELPVIP2	One size only, removable seatplate, air bag under seat	3.04 kg
PASSENGER VIP LITE harness	SELPVIPLITE	One size only, sold with 30mm karabiners	1.8 kg
PASSENGER KINDER harness	SELPKINDER	For children of 8 to 13, wooden seat plate, bumpair, sold with 30mm karabiners	2.10 kg
PASSENGER LOUSTIC harness	SELPLOUSTIC	For children of 3 to 7, wooden seat plate, bumpair, sold with 30mm karabiners	1.38 kg
TANDEM Xtralite RESERVE	PARXTRALITEBI	SUP'AIR Xtralite tandem reserve, max load 210kg, sold with 190cm risers + 2 square stainless 6mm karabiners, EN12490	2.8kg
TANDEM RESERVE RISERS	ELEBI	Y or H bridles with collapse risers	140g (Pair)
Carry bag BIRD	SACBIRD	Tandem carry bag	1.28 kg
TANDEM Storage BACKPACK	SACSTORAGEBI	Tandem stuff bag	1,38 kg
Hard spreaders	ECABIC ou ECABIL	Short 20cm or Long 30cm hard spreaders	600 g
Light hard spreaders	ECABILITE	Ligth hard spreaders, 230g lighter than standard model	370 g
Light soft spreaders	ECABILSITE	Ligth soft spreaders, 430g lighter than standard model	170 g
Reserve connection karabiners	MAILCARIN 6 ou 7	Square stainless Maillons Rapides® 6 or 7 mm (pair)	42g ou 65g (Unit)
Glider – spreader connecting karabiners	MAILMOUSAC	Automatic steel karabiners 2500 daN resistance	130g (Unit)

All necessary technical information comes with the product and/or is easily accessible via our website at [www.supair.com](http://www.supair.com)



# SORAT

TANDEM GLIDER

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