BI SKIN 2 P

User's manual

BI SKIN 2 P

Double delight

WELCOME

We wish to welcome you to our team and thank you for your confidence in our glider product line.

We would like to share the enthusiasm with which we created this wing and the importance and care we took in the design and manufacture of this new model in order to offer maximum pleasure on every flight with a Niviuk glider.

The BI SKIN 2 P has been certified as EN B. It is the lightest tandem wing in the world. Designed for leisure flights as well as commercial flights, this new single-skin model weighs only 3.3 kg, allowing a pilot and passenger to share the excitement of flight, hike & fly and vol-biv under one wing.

This is the user manual and we recommend you read it carefully.

The NIiviuk Team.

USER'S MANUAL

This manual provides you with the necessary information on the main characteristics of your new paraglider.

Whilst it provides information on the wing, it cannot be viewed as an instructional handbook and does not offer the training required to fly this type of paraglider.

Training can only be obtained at a certified paragliding school and each country has its own system of licensing.
Only the aeronautical authorities of respective countries can determine pilot competence.

The information in this manual is provided in order to warn you against adverse flying situations and potential dangers.

Equally, we would like to remind you that it is important to carefully read all the contents of your new BI SKIN 2 P manual.

Misuse of this equipment could lead to severe injuries or death. The manufacturers and dealers cannot be held responsible for misuse of the paraglider. It is the responsibility of the pilot to ensure the equipment is used correctly.

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SUMMARY

1. CHARACTERISTICS

1.1 WHO IS IT DESIGNED FOR?

The definition of sharing:
- experience together
- fly together.

Previously the pleasure of sharing the hike & fly experience was difficult for tandem pilots. The dream seemed unreachable. All their flying experiences excluded their partners and friends.

Now both pilot and passenger can share the adventure and thrill of hike & fly and vol-biv with total confidence and safety.

Designed for leisure flights as well as commercial flights, this EN B certified dual glider is the lightest tandem on the market. Weighing only 3.3 kg and with an extremely small packing volume, this single-surface wing has the capacity to carry up to 190 kg.

Only the aeronautical authorities of respective countries can determine pilot competence.

1.2 CERTIFICATION

The BI SKIN 2 P was certified at the Swiss testing house Air Turquoise S.A. in accordance with European norms EN 926-2:2013, EN 926-1:2015 & LTF 91/09; it successfully passed all tests and was certified as EN B. Registration number: PG 1100.2016

Shock test to 1.200 daN.
Load test to 8G 203 kg.

We recommend pilots read the flight test report by Air Turquoise. The report contains all the necessary information on how the paraglider reacts during each of the tested manoeuvres.

For further information on the flight test and the corresponding certification number, please see the final pages of this manual.

1.3 IN-FLIGHT BEHAVIOUR

Niviuk developed this wing by adopting very specific goals: to achieve optimum performance while minimising weight and volume in order to achieve an easily transportable wing; excellent handling; to facilitate more control for the pilot and, above all, to maintain a very high degree of safety.

We have succeeded in having the wing transmit the maximum feedback in an understandable and comfortable way so that the pilot can focus on piloting.

In all aspects of flight, the wing is very solid and stable. The glide is very smooth. During glide, the wing maintains altitude well and the profile remains stable. Turning is precise and does not require much physical strength. The glider is responsive to brake input. The wing is very easy to inflate even in nil-wind, it requires an extremely short takeoff (ideal especially in the mountains) and provides a smooth and precise landing.

Flying this wing is very intuitive, with with clear feedback about the airmass. It responds to the pilot's inputs effectively and even in turbulent conditions it remains stable and solid.

The BI SKIN 2 P flies efficiently. It enters thermals with sufficient speed to centre in the lift and climbs progressively. The handling is progressive and effective for even more flying pleasure under an exciting wing of extraordinary quality.

It is lightweight, even lighter in flight and easy to pilot, with outstanding

turbulence buffering and a surprising range of speed for incredible glides.

1.4 CONSTRUCION, MATERIALS

The BI SKIN 2 P has all the technological innovations used on other Niviuk gliders and is built with the most careful selection of current materials. It has all the current technology and accessories available to improve pilot comfort whilst increasing safety and performance.

Titanium Technology (TNT) – A revolutionary technique using titanium. Using Nitinol in the internal construction provides a more uniform profile and reduces the weight to gain efficiency in flight. Nitinol provides the highest level of protection against deformation, heat or breaks.

SLE - The use of the SLE considerably reduces the amount of Mylar which was used in previous Niviuk wings and this also reduces the weight of the leading edge and therefore the wing inflates more easily than one without this system.

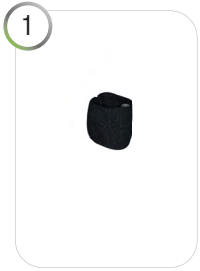
3DP - The optimal distribution of cloth tension has been achieved by cutting individual sections, paying attention to the orientation of the fabric and using 3D modelling.

3DL- There is an additional seam on the leading edge for a cleaner profile, no creases for less drag and a better load distribution.

Interlock System (IKS).- the IKS is a connection system that allows the risers to be connected to different parts of the wing, such as the lines or the harness. The IKS technology is a step towards greater lightness in wings and equipment, without sacrificing effectiveness and providing the same degree of safety and strength.

IKS1000 is included in the pack.

1

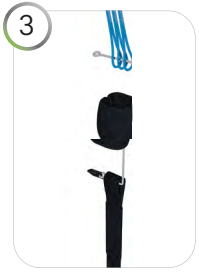


Locate the elastic sleeve's inner small diameter tube.

2

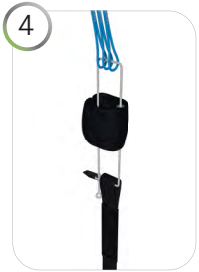
Push the IKS line through it.

3



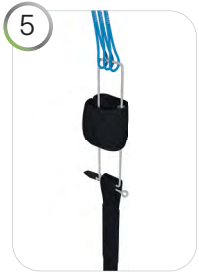
Push now the IKS line through the lines and the riser. The reinforced end with the black tab should be located on the riser side.

4



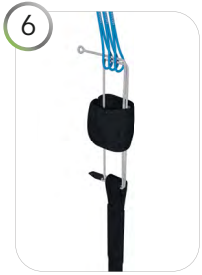
Push the upper looped end downward through the elastic sleeve (not small diameter tube) and then through the reinforced loop end where the black tab is located.

5



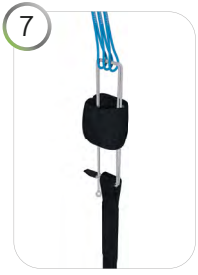
Continue with the procedure in a counterclockwise motion by pushing the looped end through the riser.

6



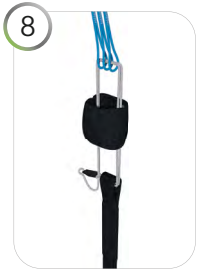
Push the looped end first upward through the elastic sleeve (not small diameter tube) and through the lines again following the same pattern.

7



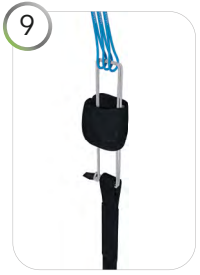
Push the looped end downward through the elastic sleeve (not small diameter tube) first, and then through the loop with the reinforced end (black tab) once more.

8



Push the reinforced end loop (black tab) through the looped end to secure them together.

9



Pull tight to secure the knot and connection.

10

Check the entire assembly.

The use of these technologies is a big technological leap forward in building wings and a big improvement in flight comfort.

For the construction process of BI SKIN 2 P we use the same criteria, quality controls and manufacturing processes as in the rest of our range.

From Olivier Nef's computer to fabric cutting, the operation does not allow for even a millimetre of error. The cutting of each wing component is performed by a rigorous, extremely meticulous automated computer laser-cutting robotic arm. This program also paints the guideline markers and numbers on each individual fabric piece, thus avoiding errors during this delicate process.

The jigsaw puzzle assembly is made easier using this method and optimises the operation while making the quality control more efficient.

All Niviuk gliders go through an extremely thorough and detailed final inspection. The canopy is cut and assembled under strict quality control conditions, facilitated by the automation of this process.

Every wing is individually checked with a final visual inspection.
The fabric used guarantees lightness, strength and durability without fading.

The lines are made from unsheathed Aramid and Dyneema.

The line diameter has been calculated depending on the workload and aims to achieve the required best performance with the least drag.

The lines are semi-automatically cut to length and all the sewing is completed under the supervision of our specialists.

Every line is checked and measured once the final assembly is concluded.

Each glider is packed following specific maintenance instructions as recommended by the fabric manufacturer.

Niviuk gliders are made of premium materials that meet the requirements of performance, durability and certification that the current market demands.

Information about the various materials used to manufacture the wing can be viewed in the final pages of this manual.

1.5 ELEMENTS, COMPONENTS

The BI SKIN 2 P is delivered with a series of accessories that will greatly assist you in the maintenance of your paraglider:

- An inner bag to protect the wing during storage and transport.
- An adjustable compression strap to compress the inner bag and reduce its volume.
- A repair kit with self-adhesive Ripstop tape in the same colour as the wing and spare parts to protect the maillons.
-A Kargo bag. It is not included in the pack, but we recommend to get it. This bag is large enough to hold all equipment comfortably and with plenty of space.

2. UNPACKING AND ASSEMBLY

2.1 CHOOSE THE RIGHT LOCATION

We recommend unpacking and assembling the wing on a training hill or a flat clear area without too much wind and free of obstacles. It will help you to carry out all the recommended steps required to check and inflate the BI SKIN 2 P.

We recommend the whole installation procedure is supervised by a qualified professional instructor or official dealer. Only they can address any doubts in a safe and professional way.

2.2 PROCEDURE

Take the paraglider out of the rucksack, open and unfold it on the ground with the lines positioned on the undersurface, oriented in the direction of inflation. Check the condition of the fabric and the lines for defects. Pay attention to the maillons and IKS connecting the lines to the risers to make sure they are fully closed and tightened. Identify, and if necessary untangle,

the A, B, C and D-lines, the brake lines and corresponding risers. Make sure that there are no knots.

2.3 CONNECTING THE HARNESS

Correctly connect the risers to the spreader bar attachment points so that the risers and lines are correctly ordered and free of twists.
Check that the carabiners are properly fastened and securely locked.
Next, the pilot's harness and then the passenger's harness must be attached.

2.4 HARNESS TYPE

The pilot should choose the type of harness to use. The BI SKIN 2 P can be flown with all current harness types, from standard tandem (heavy duty) harnesses to ultralight models.

2.5 SPEED SYSTEM - TRIMMERS

The BI SKIN 2 P is not fitted with a speed-bar.

The speed system is engaged when the trimmers are opened.

The trimmers are installed in the factory and the pilot only needs to check their proper operation and adjustment.

The BI SKIN 2P has four risers divided into four line areas. The trimmers are situated on the D-riser and have a maximum travel of 6 cm. The use of the trimmers results in changes to the speed and reactions of the wing.

The pilot is responsible for the trimmer setting.

The trimmer setting and symmetry must be constantly checked during flight and before every takeoff.

The trimmer system is set by the pilot, i.e. it does not return to its point of origin, but remains in place until the pilot decides to release/change the position.

Engaging and releasing the trimmers is effective and quick as well as sensitive and accurate.

When the trimmer is in the neutral position, the wing will fly at a lower speed with greater glide; when the trimmer is released, the wing will fly with higher speed and worse glide.

Trimmers in neutral position A, B, C, D-risers aligned

Trimmers open: Difference A= B+1.5cm, C+3cm, D+6cm
We recommend the trimmers are set in the neutral position during take off. However, sometimes the circumstances of the takeoff require releasing trimmers to adjust the speed of the wing inflation. The greater distance the trimmers are released, the faster the wing will inflate and, consequently, the pilot will have to exert more control over the wing at this stage.

Once in the air, the pilot can adjust the trimmer to the required speed: slow (trimmers closed), neutral (trim speed) or fast (trimmers open).
Using the trimmers:

The pilot must engage the trimmers manually. They are situated on both D-risers. To open the trimmers, press the trim tab inwards until the tape is released and release the trim tab when in the required position.

To close the trimmers, pull the tape down using the handle and release when you reach the required position.

Once engaged, the trimmers must be set symmetrically.

The trimmers cannot be used for steering the glider. The pilot should note

that when releasing trimmers, the brake handle rises the same distance as the trimmers travel.

2.6 INSPECTION AND WING INFLATION ON THE GROUND

After your gear has been thoroughly checked and the weather conditions deemed favourable for flying, inflate your BI SKIN 2 P as many times as necessary to familiarise yourself with its behaviour. Inflating the BI SKIN 2 P is easy and should not require a great deal of physical effort.

Inflate the wing with a little pressure from the body using the harness.

This may be assisted by using the A-lines. Do not pull on them; just accompany the natural rising movement of the wing. Once the wing is inflated to the overhead position, appropriate control with the brakes will be sufficient to hold it there.

We recommend practising inflating the wing in various wind conditions as the BI SKIN 2 P inflates much faster than conventional wings.

Groundhandling the wing is important as the rapid inflation may may surprise the pilot if the launch has not been practised before the first flight.

2.7 ADJUSTING THE BRAKES

The length of the main brake lines are adjusted at the factory and conform to the length stipulated during certification. However, they can be changed to suit the pilot's flying style. It is advisable to fly with the original setting for a period of time to get used to the actual behaviour of the BI SKIN 2 P. In case it is necessary to modify the brake length, loosen the knot, slide the line through the brake handle to the desired point and re-tighten the knot firmly.

Only qualified personnel should carry out this adjustment. You must ensure that the modification does not affect the trailing edge and slow the glider down without pilot input. Both brake lines should be symmetrical and of the same length. We recommend using a clove hitch or bowline knot.

3. THE FIRST FLIGHT

3.1 CHOOSING THE RIGHT LOCATION

For the first flight we recommend going to your usual flying area and that a qualified instructor is present and supervising the entire procedure.

When arriving at the take-off, the pilot should assess the following conditions: wind speed and direction, possible areas of rotor, take-off is clear of obstacles, etc. A defined flight plan should be formulated and this should include taking note of the topography, obstructions and risk areas to avoid. The take-off zone should be sufficiently large and free of obstacles.

Before take off, inspect the wing, harness, helmet and any other equipment.

It is essential to adapt each launch to the varying conditions and sites.

The conditions must also be suitable for the pilot's skill level and experience.

Just because the wing is fast, pilots should not make the mistake of underestimating the conditions and taking off in unsuitable and unsafe circumstances.

3.2 PREPARATION

Repeat the procedures detailed in chapter 2 UNPACKING AND ASSEMBLY to prepare your equipment.

3.3 FLIGHT PLAN

Planning a flight before taking off to avoid possible problems later is always a good idea.

3.4 PRE-FLIGHT CHECK LIST

Once ready, but before taking off, conduct another equipment inspection. Conduct a thorough visual check of your gear with the wing fully open, the lines untangled and properly laid out on the ground to ensure that all is in working order. Be certain the weather conditions are suited to your flying skill level.

3.5 WING INFLATION, CONTROL, AND TAKE-OFF

Smoothly and progressively inflate the wing. Inflating of the BI SKIN 2 P is easy and does not require a lot of energy. The wing rises fast and the pilot must anticipate this in order to have control during this phase. The wing will take the load immediately, making it easier to take off in rough terrain.

If the wind permits, we recommend a reverse launch, as this allows a better visual inspection of the wing during inflation. In “strong” winds, the BI SKIN 2 P is especially easy to control using this launch technique. Winds of 25 to 30 km/h are considered strong for paragliding.

Correctly setting up the wing on the ground before take off is especially important. Choose an appropriate location facing the wind. Position the paraglider in a crescent configuration to facilitate inflation. A clean wing layout will ensure a trouble-free take off.

3.6 LANDING

The BI SKIN 2 P lands excellently, it converts the wing speed into lift at the pilot’s demand, allowing an enormous margin of error. Wrapping the brake lines around your hand to get greater braking efficiency is not necessary.

3.7 PACKING

The BI SKIN 2 P has a complex leading edge, manufactured using a variety of different materials and it must be packed carefully. A correct folding method is very important to extend the useful life of your paraglider.

It should be concertina-packed, with the leading edge reinforcements flat and the flexible rods stacked one on top of the other. This method will keep the profile in its original shape and protect the integrity of the wing over time. Make sure the reinforcements are not bent or folded. It should not be folded too tightly to avoid damage to the cloth and/or lines.

At Niviuk we have designed the NKare Bag, a bag designed to assist you with rapid packing which helps maintain the integrity of the leading edge and its internal structures in perfect condition.

4. IN FLIGHT

We recommend that you read the certification test report.

The report contains all the necessary information on how the BI SKIN 2 P reacts during each of the tested manoeuvres.

It is important to point out that the appropriate response to each adverse manoeuvre can vary from size to size; even within the same size at maximum or minimum load the behaviour and reactions of the wing may vary.

Having the knowledge that the testing house provides through the test report is fundamental to learning how to deal with possible situations.

To become familiar with the manoeuvres described below, we recommend practising within the auspices of a competent training outfit.

4.1 FLYING IN TURBULENCE

The BI SKIN 2 P has an excellent profile to deal with incidents; it is very stable in all conditions and has a high degree of passive safety, even in turbulent conditions.

Equally, all paragliders must be piloted for the prevailing conditions and the pilot is the ultimate safety factor.

We recommend active flying in turbulent conditions, always taking measures to maintain control of the wing, preventing it from collapsing and restoring the speed required by the wing after each correction.

Do not correct the glider (braking) for too long in case this provokes a stall. If you have to take corrective action, make the input then re-establish the correct flying speed.

4.2 POSSIBLE CONFIGURATIONS

To become familiar with the manoeuvres described below, we recommend practising within the environment of a competent training outfit. The pilot must adapt their use of the brakes depending on the wing-loading and avoiding over-steering.

It is important to note that the type of reaction to a manoeuvre can vary from one size of wing to another and even within the same size the behaviour and reactions may be different depending on the wing-loading.

In the test report, you will find all the necessary information on how to handle your new wing during each of the tested manoeuvres. Having this information is crucial to know how to react during these manoeuvres in real flight, so you can deal with these situations as safely as possible.

Asymmetric collapse

In spite of the BI SKIN 2 P's profile stability, strong turbulent air may cause the wing to collapse asymmetrically, especially if the pilot is unable to fly actively and prevent the collapse. In this case the glider conveys a loss of pressure through the brake lines and the harness. To prevent the collapse from happening, pull the brake handle corresponding to the affected side of the wing. It will increase the incidence of the wing (angle of attack).

If the collapse does happen, the BI SKIN 2 P will not react violently, the turning tendency is gradual and easily controlled. Weight-shift toward the open, flying side (the opposite side of the collapse) to keep the wing flying straight, while applying light brake pressure to that side if necessary.

Normally, the collapsed side of the wing should then recover and reopen by itself. If it does not, then pull the brake handle on the collapsed side decisively and quickly all the way (100%) down. You may have to repeat this pumping action to provoke the re-opening of the deflated glider side.

Do not over-brake or slow down the flying side of the wing (control the turn). Once the collapsed side is open make sure you return to the default flying speed.

Frontal collapse

Due to the BI SKIN 2 P's design, in normal flying conditions frontal collapses are unlikely to take place. The wing's profile has great buffering abilities when dealing with extreme incidence changes. A frontal collapse may occur in strong turbulent conditions, entering or exiting powerful thermals or when lacking experience using the speed-system without adapting to the prevailing conditions. Frontal collapses usually re-inflate without the glider turning, but a symmetrically applied quick braking action with a quick deep pump of both brakes will accelerate the re-

inflation if necessary. Release the brake lines immediately to return to default glider air speed.

Negative spin

A negative spin does not conform to the BI SKIN 2 P's normal flight behaviour. Certain circumstances however, may provoke a negative spin (such as trying to turn when flying at very low air speed whilst applying a lot of brake). It is not easy to give any specific recommendation about this situation other than quickly restoring the wing's default air speed and angle of attack by progressively reducing the tension on the brake lines. The normal wing reaction will be to have a lateral surge on the re-accelerated side with a rotation not greater than 360° before returning to default air speed and a straight flight path trajectory.

Parachutal stall

The possibility of entering or remaining in a parachutal stall has been eliminated from the BI SKIN 2 P.

A parachutal stall is virtually impossible with this wing. If it did enter into a parachutal stall, the wing loses forward motion, becomes unstable and there is a lack of pressure on the brake lines, although the canopy appears to be fully inflated. To regain normal air speed, release brake line tension symmetrically and manually push on the A-lines or weight-shift your body to any side WITHOUT PULLING ON THE BRAKE LINES.

Deep Stall

The possibility of the BI SKIN 2 P stalling during normal flight is very unlikely. It could only happen if you are flying at a very low air speed, whilst over-steering or performing dangerous manoeuvres in turbulent air.

To provoke a deep stall, the wing has to be slowed down to its minimum air speed by symmetrically pulling the brake lines all the way (100%) down until the stall point is reached and held there. The glider will first pitch rearward and then reposition itself overhead, rocking slightly, depending on how the manoeuvre was done.

When entering a stall, remain clear-headed and ease off the brake lines until reaching the half-way point of the total the brake travel. The wing will then surge violently forward and could reach a point below the pilot. It is most important to maintain brake pressure until the glider has returned to its default overhead flying position.

To resume normal flight conditions, progressively and symmetrically release the brake line tension to regain air speed. When the wing reaches the overhead position, the brakes must be fully released. The wing will then surge forward to regain full air speed. Do not brake excessively at this moment as the wing needs to accelerate to pull away from the stall configuration. If you have to control a possible frontal collapse, briefly pull both brake handles down to bring the wing back up and release them immediately while the glider is still in transition to reposition itself overhead.

Cravat

A cravat may happen after an asymmetric collapse, when the end of the wing is trapped between the lines. Depending on the nature of the tangle, this situation could rapidly cause the wing to spin. The corrective manoeuvres to use are the same as those applied in case of an asymmetric collapse: control the turn/spin by applying tension on the opposite brake and weight shift opposite to the turn. Then locate the stabilo line (attached to the wing tip) trapped between the other lines. This line has a different colour and is located on the outside position of the B-riser.

Pull this line until it is taut. This action will help to release the cravat. If ineffective, fly down to the nearest possible landing spot, controlling the

direction with both weight shift and the use of the brake opposite to the tangled side. Be cautious when attempting to undo a tangle while flying near terrain or other paragliders; it may not be possible to continue on the intended flight path.

Over-controlling
Most flying problems are caused by wrong pilot input, which then escalates into a cascade of unwanted and unpredicted incidents. We should note that the wrong inputs can lead to loss of control of the glider. The BI SKIN 2 P was designed to recover by itself in most cases. Do not try to over-correct it!

Generally speaking, the reactions of the wing, which are caused by too much input, are due to the length of time the pilot continues to over–control the wing. You have to allow the glider to re-establish normal flying speed and attitude after any type of incident.

4.3 ACCELERATED FLIGHT - OPEN TRIMMERS

The BI SKIN 2 P profile was designed for stable flight throughout its entire speed range. Open trimmers can be used in strong winds or significant sink.

When accelerating the wing, the profile becomes more sensitive to turbulence and closer to a possible frontal collapse. If a loss in internal wing pressure is felt, a slight pull on the brake lines is recommended to increase the wing's incidence angle. Remember to re-establish the air speed after correcting the incidence.

It is NOT recommended to use the trimmers close to the terrain or in very turbulent conditions. Aim to achieve a balance between trimmer and brake use. This balance is considered to be 'active piloting'.

4.4 FLYING WITHOUT BRAKE LINES

If, for any reason at all, the BI SKIN 2 P's brake lines become disabled in flight, it will become necessary to pilot the wing with the C-risers and weight shifting until landing. These risers steer easily because are not under significant tension. You will have to be careful and not handle them too heavily in case this causes a stall or negative spin. The wing must be flown at full speed during the landing approach, and the C-risers will have to be pulled symmetrically all the way down shortly before contact with the ground. This braking method is not as effective as using the brake lines, and hence the wing will land with a higher ground speed.

4.5 LINE KNOT(S) IN FLIGHT

The best way to avoid knots and tangles is to thoroughly inspect the lines as part of a systematic pre-flight check. If a knot is spotted during the take off phase, immediately abort the launch sequence and stop.

If inadvertently taking off with a knotted line, the glider drift will need to be compensated by weight-shifting to the opposite side of the wing and applying a slight brake pull to that side. Gently pull the brake line to see if the knot can be undone or try to locate the problem line. Try pulling it to see if the knot can be undone. Beware of trying to clear a knotted line or untangle a line in flight when close to the terrain. If the knot is too tight and cannot be undone, carefully and safely fly to the nearest landing zone. Be careful: do not pull too hard on the brake handles because there will be an increased risk of stalling the wing or entering a negative spin. Before attempting to clear a knot, make sure there are no other pilots flying in the vicinity.

5. LOSING ALTITUDE

Knowledge of different descent techniques could become vital in

certain situations. The most suitable descent method will depend on the particular situation.

To become familiar with the manoeuvres described below, we recommend practising within the environment of a competent training outfit.

5.1 EARS

Big ears is a moderate descent technique, able to increase the sink rate to –3 or –4 m/s and reduces the ground speed by 3 to 5 km/h. The angle of attack and effective wing-loading will also increase due to the smaller surface area of the wing.

To activate the 'Big ears' manoeuvre, take the outer '3 A 3' line on each A-riser and simultaneously, smoothly pull them outward and downward. The wingtips will fold in. To release the ears, let go of the lines and the tips should return to their normal position. If they do not re-inflate, gently pull on one of the brake lines and then on the opposite one. We recommend inflating the wing tips asymmetrically, without major change to the angle of attack, especially when flying near the ground or flying in turbulence.

Ears can be used with the trimmers in any setting.

5.2 B-LINE STALL

During this manoeuvre, the wing ceases to fly, it has no horizontal speed and the pilot has no control over the paraglider.

The airflow over the profile is interrupted and the wing enters a situation similar to a parachutal stall.

To enter this manoeuvre, the 'B' risers are grabbed below the maillons and symmetrically pulled down together (approx. 20-30 cm) and then held to this position.

The initial phase is quite physical (high pull resistance) requiring a strong tug until the wing's profile/chord deforms. The initial pulling force will then be significantly lessened. Holding the 'B' lines in the pulled down position will be necessary to maintain the configuration.

The wing will then deform, its horizontal speed will drop to 0 km/h, vertical descending speed increase to –6 to –8 m/s depending on the conditions and how the manoeuvre was performed.

To exit the manoeuvre, simultaneously release both risers. The wing will then slightly surge forward and automatically return to normal flight. It is better to let go of the lines quickly rather than slowly.

This is an easy escape manoeuvre to do, but remember that the wing will stop flying, will lose all forward horizontal speed, and its reactions will change significantly when compared to normal flight configuration.

5.3 SPIRAL DIVE

This is a more effective way to rapidly lose altitude. Beware that the wing will experience and be subjected to a tremendous amount of descending and rotating speed (g-force), which can cause a loss of orientation and consciousness (blackout). This manoeuvre must therefore be done gradually to increase one's capacity to resist the g-force exerted on the body. With practise, a pilot will fully appreciate and understand it. Only practise this manoeuvre at high altitude and with enough ground clearance.

To start the manoeuvre, first weight shift and pull the brake handle located on the inner side of the turn. The intensity of the turn can be controlled by braking slightly using the outer brake handle.

A paraglider flying at its maximum rotating speed can reach –20 m/s, or the equivalent of a 70 km/h vertical descent, and will stabilise in a spiral

dive from 15 m/s onwards. Good enough reasons to familiarise yourself with the manoeuvre and understand how to exit it.

To exit this manoeuvre, the inner brake handle (down side of the turn) must progressively be relaxed while momentarily applying tension to the outer brake handle opposite to the turn. The pilot must also weight shift and lean towards the opposite side of the turn at the same time.

The exit should be performed gradually and smoothly so that the changes in pressure and speed can be noted.

When exiting the spiral, the glider will briefly experience an asymmetrical acceleration and dive, depending on how the manoeuvre was carried out.

Practise these manoeuvres at sufficient altitude and with moderation.

5.4 SLOW DESCENT TECHNIQUE

This technique allows descent without straining the wing or taxing the pilot. Glide normally while searching for descending air and begin to turn as if climbing in a thermal, but with the intention to sink.

Common sense has to be used to avoid dangerous areas of rotor when looking for descending air. Safety is the most important consideration.

6. SPECIAL METHODS

6.1 TOWING

The BI SKIN 2 P does not experience any problem whilst being towed. Only qualified winch personnel should handle the certified equipment to carry out this operation. The wing must be inflated similarly as during a normal takeoff.

It is important to use the brakes to correct the flight path alignment, especially if the glider begins to turn. Since the wing is subject to a slow airspeed and with a high positive angle of attack, we must make any corrections with a high degree of feel and delicacy, in order to avoid a stall.

6.2 ACROBATIC FLIGHT

Although the BI SKIN 2 P was tested by expert acrobatic pilots in extreme situations, it was not designed for it. We do not recommend using this glider for acrobatic flying!

The BI SKIN 2 P does not experience any problem whilst being towed. Only qualified winch personnel should handle the certified equipment to carry out this operation. The wing must be inflated similarly as during a normal takeoff.

It is important to use the brakes to correct the flight path alignment, especially if the glider begins to turn. Since the wing is subject to a slow airspeed and with a high positive angle of attack, we must make any corrections with a high degree of feel and delicacy, in order to avoid a stall.

7. CARE AND MAINTENANCE

7.1 MAINTENANCE

At Niviuk we are firmly committed to make technology accessible to all pilots. Therefore our wings are equipped with the latest technological advances gained from the experience of our R & D team.

Careful maintenance of your equipment will ensure continued top performance. Apart from the general checks, we recommend actively maintaining your equipment.

A pre-flight check is obligatory before each flight.

If there is any damage to the equipment, you should inspect it and act accordingly.

All incidents involving the leading edge should be reviewed. A hard impact can damage the sail cloth.

Thanks to TNT the wing has more safety and performance. If any Nitinol rod is damaged, they are easily replaceable.

The fabric and the lines do not need to be washed. If they become dirty, clean them with a soft damp cloth, using only water. Do not use detergents or other chemicals.

If your wing is wet from contact with water, place it in a dry area, air it and keep it away from direct sunlight.

Direct sunlight may damage the wing's materials and cause premature aging. After landing, do not leave the wing exposed to the sun. Pack it properly and stow it away in its backpack.

If flying in a sandy environment, and sand has accumulated inside the wing, remove it before packing it away. The apertures at the wingtips facilitate easy removal of objects from the trailing edge.

If your wing is wet from contact with salt water, immerse it in fresh water and dry it away from direct sunlight.

7.2 STORAGE

It is important for the wing to be correctly folded when stored. Keep it in the in a cool, dry place away from solvents, fuels, oils.

Do not leave the gear inside a car boot, as cars left in the sun can become very hot. The inside of a rucksack can reach temperatures up to 60ºC.

Weight should not be laid on top of the equipment.

It is very important to pack the wing correctly before storage.

It is essential that the wing is properly folded and packed. In case of long-term storage it is advisable, if possible, that the wing is not compressed and it should be stored loosely without direct contact with the ground. Humidity and heating can have an adverse effect on the equipment.

7.3 CHECKS AND CONTROLS

A complete inspection must be scheduled every 100 flying hours or every 2 years, whichever comes first (EN/LTF norm).

We strongly recommend that any repairs should be done in a specialist repair shop by qualified personnel. A thorough pre-flight check must be performed before every flight.

7.4 REPAIRS

If the case of small tears, you can temporarily repair these by using the Ripstop tape included in the repair kit, as long as no stitching is required to mend the fabric. Any other tears or repairs should be done in a specialist repair shop by qualified personnel.

Damaged lines must be repaired or exchanged immediately. Please refer to the line plan at the end of this manual.

Any repair should be done in a specialist repair shop by qualified personnel. Niviuk can not be held responsible for any damage caused by incorrect repairs.

8. SAFETY AND RESPONSIBILITY

It is well known that free-flying with a paraglider is considered a high-risk sport, where safety depends on the person who is practicing it.

Wrong use of this equipment may cause severe, life-changing injuries to the pilot, or even death.
Manufacturers and dealers cannot be held responsible for your decisions, actions or accidents that may result from participating in this sport.

You must not use this equipment if you have not been properly trained to use it. Do not take advice or accept any informal training from anyone who is not properly qualified as a flight instructor.

9. GUARANTEE

The equipment and components are covered by a 2-year warranty against any manufacturing defect.

The warranty does not cover misuse of the equipment.

LEGAL WARNING: Paragliding is an activity that requires concentration, specific knowledge and common sense. Please take care! Train under the supervision and guidance of a certified school. Make sure you have the appropriate insurance and become a licenced pilot. Assess your meteorological knowledge honestly before you decide to fly.

Niviuk's liability for damages covers only its products.

Niviuk cannot be held accountable for your actions. You are responsible for your flights and assessing the risks involved.

10. ANNEXES

10.1 TECHNICAL DATA

BI SKIN 2 P			**31**
CELLS	NUMBER		39
	BOX		39
FLAT	AREA	m^2	31
	SPAN	m	13,06
	ASPECT RATIO		5,5
PROJECTED	AREA	m^2	26,17
	SPAN	m	10,39
	ASPECT RATIO		4,12
FLATTENING		%	15
CORD	MAXIMUM	m	2,94
	MINIMUM	m	0,61
	AVERAGE	m	2,37
LINES	TOTAL METERS	m	522
	HEIGHT	m	8,24
	NUMBER		394
	MAIN		3/3/4/3
RISERS	NUMBER	4	A/B/C/D
	TRIMS	m/m	60
	ACCELERATOR	m/m	NO
TOTAL WEIGHT	MINIMUM	kg	130
IN FLIGHT	MAXIMUM	kg	190
GLIDER WEIGHT		kg	3,3
CERTIFICATION	EN/LTF		B

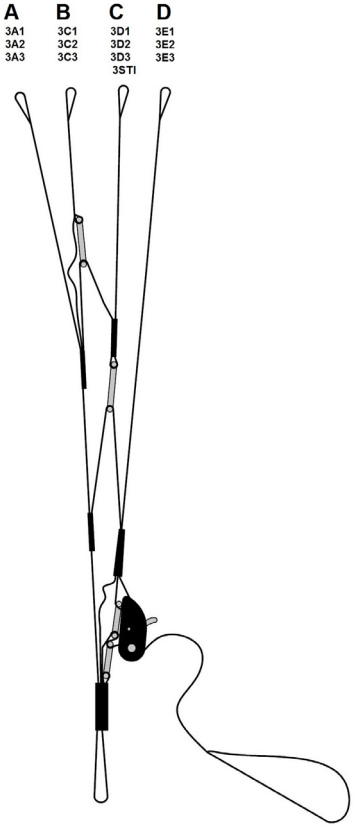
10.2 MATERIALS DESCRIPTION

CANOPY	FABRIC CODE	SUPPLIER
UPPER SURFACE LEADING EDGE	N20 DMF	DOMINICO TEX CO (KOREA)
UPPER SURFACE	2044 32 PS	DOMINICO TEX CO (KOREA)
BOTTOM SURFACE	2044 32 PS	DOMINICO TEX CO (KOREA)
RIBS	2044 32 FM	DOMINICO TEX CO (KOREA)
LOOPS	LKI - 10	KOLON IND. (KOREA)
REINFORCEMENT LOOPS	N20 DMF	DOMINICO TEX CO (KOREA)
TRAILING EDGE REINFORCEMENT	MYLAR 20	D-P (GERMANY)
RIB REINFORCEMENT	LTN-0.8 STICK	SPORTWARE CO. (CHINA)
THREAD	SERAFIL 60	AMAN (GERMANY)

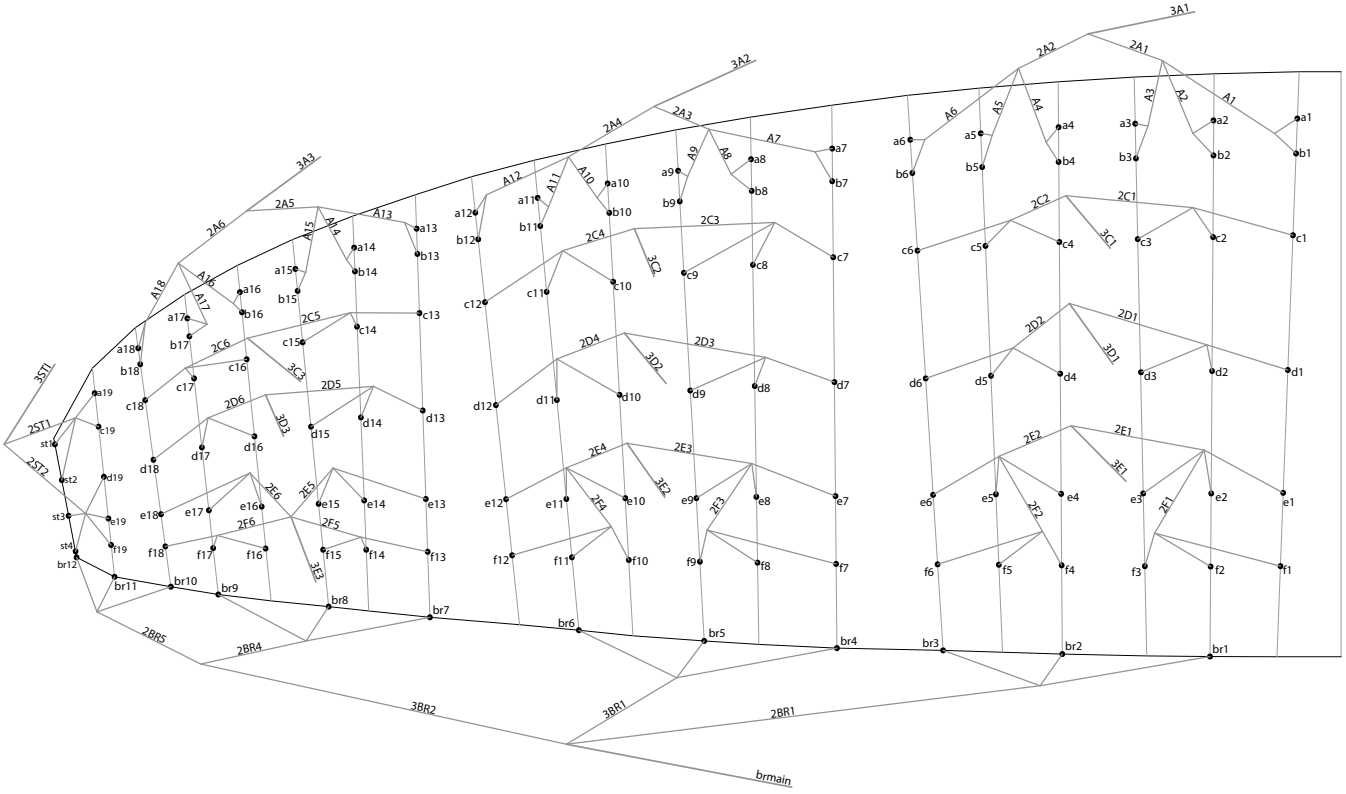
SUSPENSION LINES	FABRIC CODE	SUPPLIER
UPPER CASCADES	DC - 40	LIROS GMHB (GERMANY)
UPPER CASCADES	8000/U - 50	EDELRID (GERMANY)
UPPER CASCADES	8000/U - 70	EDELRID (GERMANY)
MIDDLE CASCADES	DC - 40	LIROS GMHB (GERMANY)
MIDDLE CASCADES	DC - 60	LIROS GMHB (GERMANY)
MIDDLE CASCADES	8000/U - 70	EDELRID (GERMANY)
MIDDLE CASCADES	8000/U - 90	EDELRID (GERMANY)
MIDDLE CASCADES	8000/U - 130	EDELRID (GERMANY)
MIDDLE CASCADES	8000/U - 190	EDELRID (GERMANY)
MIDDLE CASCADES	8000/U - 230	EDELRID (GERMANY)
MAIN	8000/U - 130	EDELRID (GERMANY)
MAIN	8000/U - 230	EDELRID (GERMANY)
MAIN	8000/U - 360	EDELRID (GERMANY)
MAIN BREAK	TNL-280	TEIJIM LIMITED (JAPAN)
THREAD	SERAFIL 60	AMAN (GERMANY)

RISERS	FABRIC CODE	SUPPLIER
MATERIAL	3455	COUSIN (FRANCE)
COLOUR INDICATOR	PAD	TECNI SANGLES (FRANCE)
THREAD	V138	COATS (ENGLAND)
IKS	12999	COUSIN (FRANCE)

10.3 RISERS PLAN



10.4 SUSPENSION PLAN



10.5 DIMENSIONS BI SKIN 2 P 31

LINES HEIGHT m/m

	A	B	C	D	E	F	br
1	7942	7916	7872	7859	7914	7933	8603
2	7864	7840	7798	7780	7821	7834	8274
3	7854	7786	7736	7726	7784	7878	8153
4	7822	7755	7703	7678	7756	7847	8087
5	7830	7808	7763	7725	7764	7775	7951
6	7899	7877	7828	7789	7819	7837	7937
7	7810	7783	7761	7732	7763	7787	7875
8	7703	7683	7658	7633	7664	7675	7747
9	7669	7613	7578	7567	7626	7708	7712
10	7640	7585	7552	7543	7599	7675	7674
11	7618	7607	7585	7567	7597	7600	7660
12	7648	7640	7619	7603	7633	7643	7719
13	7571	7543	7507	7477	7490	7502	
14	7438	7414	7378	7357	7370	7371	
15	7350	7307	7269	7269	7307	7362	
16	7270	7220	7187	7187	7222	7272	
17	7181	7167	7148	7137	7152	7154	
18	7140	7138	7120	7101	7112	7124	
19	6921		6894	6887	6892	6903	
20			6826	6837	6837	6870	

RISERS LENGTH m/m

	A	B	C	D	
	380	380	380	380	STANDARD
	380	395	410	440	TRIMMER OPENED
	0	15	30	60	ACCELERATED

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