

EN



Buteo XC

MANUAL

Version 1.0 / 2018

1. VERIFICATION OF CHECKS AND REPAIRS



SERIENNUMMER
SERIAL NUMBER

_____/_____

STÜCKGEPRÜFT VON
FIRST CHECK BY/ICARO

____.____.____

NAME /STEMPEL
NAME ANS STAMP

CHECK (C) / REPARATUR (R)
CHECK (C)/REPAIR (R) _

POROSITÄTSWERTE DER KAPPE
POROSITY VALUE

WELCHE REPERATUR/CHECK?
WHICH REPAIR/CHECK?

LEINENFESTIGKEITSWERTE
STRENGTH VALUE OF THE LINES

CHECK GÜLTIG BIS
CHECK VALID UNTIL ____.____.____

GESAMTZUSTAND
ESTIMATED CONDITION

OPTISCH
OPTICAL

TECHNISCH
TECHNICAL

CHECK GÜLTIG BIS
CHECK VALID UNTIL ____.____.____

CHECK (C) / REPARATUR (R)
CHECK (C)/REPAIR (R) _

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TECHNICAL

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CHECK VALID UNTIL ____.____.____

CONGRATULATIONS

**ON BUYING YOUR BUTEO XC
AND WELCOME TO THE FAMILY OF ICARO - PILOTS!**

Before you get to know your glider please read the manual,
there is important information inside.

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In accordance with standard EN 926-1:2015,EN 926-2:2013,
NFL II 91/09,NFL II 60/14 your **BUTEO XC** is tested in B.

SIZES	XS	S	M	L
CERTIFICATION NUMBER	EAPR-GS-0830/18	DHV GS-01-2339-18	DHV GS-01-2338-18	DHV GS-01-2337-18
CHECK GUIDELINES	LTF 91/09 & EN 926-1:2006, 926-2:2013 / EN 926-1:2015,EN 926-2:2013, NFL II 91/09,NFL II 60/14			

According this standards the glider is a

“paraglider with good passive safety and forgiving flight characteristics. It is relatively resistant to abnormal flight conditions. Recommended for performance-oriented cross country pilots with several years of regular flying behind them and no less than 50 hours/year in combination with adequate knowledge of extreme flying training”.

On these test flights, sample-tested harnesses with the following dimensions were used:

HORIZONTAL DISTANCE OF MAIN SUSPENSION CARABINERS:

TAKE-OFF WEIGHT (AFG) <80 KG	AFG 80 KG - 100 KG	AFG 101 KG - 130 KG
38 - 42 cm	42 - 46 cm	46 - 50 cm

VERTICAL CARABINER DISTANCE OF THE MAIN SUSPENSION CARABINERS:

TAKE-OFF WEIGHT (AFG) <80 KG	AFG 80 KG - 100 KG	AFG 101 KG - 130 KG
39 - 41 cm	41 - 43 cm	43 - 45 cm

! The flight maneuvers during the certification process should not be overrated. Certification results provide only little information when you flying in thermically active and turbulent air because the glider classifications serve to inform solely with regard to the performance of a paraglider during extreme flight maneuvers in stable air conditions.

Effects of the glider after disturbances places increased demands on the pilot. He should have sufficient practical knowledge to the prevention and control of abnormal occurrences. Is this experience not sufficiently available, we recommend visiting a safety training. Here, however, the same applies as already mentioned above.

The use of this paraglider is entirely at your own risk. The glider may be only used for those purposes described in this manual and between minimum and maximum take off weight. This weight composed of the weight pilot + passenger + glider + harnesses + equipment. When you are flying with maximum take off weight the glider has more agility and dynamic.

! It is strictly prohibited to fly the **BUTEO XC**

- under the influence of drugs or alcohol,
- without guilty license,
- beyond the minimum and maximum recommended Take Off- Weight,
- the glider is not checked at regular intervals or checked by not authorized personal
- with damaged glider, lines, risers or harness
- in the rain, in snow, in the clouds, fog and in turbulent weather conditions, with motor drive and aerobatics.
- Missing mental fitness of the pilot and/ or passenger is also a risk factor.

Each paraglider can be dangerous when you are misjudging meteorological conditions. Every pilot bears the responsibility of his/her own safety. If you cannot keep your glider under control use the rescue system in good time. Always pay attention to ground distance. It is assumed that the pilot is in possession of the necessary qualifications and provisions of any relevant laws are observed. Any changes being made outside the permitted range of adjustment invalidate any and all claims under the warranty. Our products are made with great care and state of the art. Each paraglider before it is delivered to the dealer or flight school is checked by ICARO Paragliders but test flights are made only on a random basis.

On that score an approved ICARO dealer or teacher of the flight school must inflate a new ICARO Paraglider in the wind or should carry out the first flight before the wing is handed over to you. This date is entered in the identification plate and as well warranty as the first 2-year-check period starts.

In order to get to know your glider, we recommend that you practice with your glider on the ground. Pulling up in flat gradients is great practice for fine tuning your launch techniques. Here you can get to learn the reactions of your glider without any stress and hectic. Ground practice pays off in the air.

All technical data and instructions were drawn up with great care. ICARO Paragliders cannot be made responsible for any possible errors in this manual. Should you decide to sell this glider at a later date, please pass on this manual to the new owner.

Important information in this manual is highlighted in color, fat or cursive writing. Any important changes to this manual will be published on our homepage www.icaro-paragliders.de. Each alteration of the glider (lines, canopy, and riser) is dangerous and reactions of the glider are not predictable. Your glider will lose its pattern test result and warranty. The manufacturer or distributor assumes no responsibility for accidents occurring while using it. Every pilot must ensure that the paraglider is properly checked at regular intervals.

Many countries have specific regulations or laws regarding paragliding activity. It's your responsibility to know and observe the regulations of the region where you fly.

ENVIRONMENTAL ASPECTS

The materials of which a paraglider is made require a special waste disposal. So please send disused gliders back to us. We will care about a professional waste disposal without costing for you. Please do our nature-near sport in a way which does not stress nature and environment! Please do not walk beside the marked ways, do not leave your litter, do not make unnecessary loud noises and respect the sensitive balance in the mountains.

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2. TO GET TO KNOW YOUR BUTEO

ALLOWED FOR TRAINING	no	CERTIFIED / ALLOWED FOR FLYING WITH MOTOR DRIVE	no / not tested
ALLOWED FOR TOWING	yes / yes	RECOMMENDED STORAGE TEMPERATURE (°C)	+ 5 to + 30
CERTIFIED / ALLOWED FOR AEROBATICS	no / no	RECOMMENDED STORAGE HUMIDITY (% RH)	55 to 75
CERTIFIED / ALLOWED FOR TANDEM PROCESSING	no/ no		

Check interval 24 months or 150 operating hours, depending on what occurs sooner.

SIZES	XS	S	M	L
KLASSIFIZIERUNG CLASSIFICATION	EN/LTF B			
FLÄCHE AREA	21,25	23,5	25,75	28
PROJ. FLÄCHE PROJECTED AREA	18	20	21,9	23,8
AUSGEL. SPANNWEITE FLAT WINGSPAN	11,1	11,67	12,2	12,74
PROJ. SPANNWEITE PROJECTED WINGSPAN	8,7	9,2	9,63	10
STRECKUNG FLAT ASPECT RATIO	5,8	5,8	5,8	5,8
PROJ. STRECKUNG PROJ. ASPECT RATIO	4,2	4,2	4,2	4,2
GEWICHT WEIGHT	4,8 kg	5,1 kg	5,4 kg	5,9 kg
GEWICHTSBEREICH WEIGHT RANGE	70-90	80-100	90-110	100-125
PROFIL TYP PROFILE TYPE	Sharke Nose	Sharke Nose	Sharke Nose	Sharke Nose
MATERIAL	Skytex 32	Skytex 32	Skytex 32	Skytex 32
ZELLEN CELLS	82+ 80 MiniRibs	82+ 80 MiniRibs	82+ 80 MiniRibs	82+ 80 MiniRibs
BESCHLEUNIGER SPEED SYSTEM.	12cm	12,5cm	13cm	14cm
TRIMMER	No	No	No	No
V TRIM (km/h) V TRIM (km/h)	39	39	39	39
V MAX (km/h) V MAX (km/h)	50+	50+	50+	50+
SITZE SEATS	1			
MAX. SYM. STEUERWEG BEI 125 KG MAX. SYM. BRAKE LENTH AT 125 KG	60 cm			

The **BUTEO XC** is an EN-B glider settled above the Gravis. For the first time, MID EN-B Safety will go with performance a HIGH EN-C screen combined. It is designed for all cross-country pilots who attach great importance to active and passive safety. It is a single-seated paraglider with good passive safety and forgiving flight characteristics, and is reasonably resistant to abnormal flight conditions, making it suitable for pilots with regular flying experience and advanced flying skills.

Performance-oriented flying at the limit is only possible if the pilot and the aircraft form a single unit. The **BUTEO XC** enables the ambitious pilot to enter the world of extremely powerful gliders. This means that the glider has a moderate trim speed, which allows a flat turn in a gentle thermal. In addition, the **BUTEO XC** is however agile enough to turn even strong, tight beads under difficult conditions.

The 162 entry edge ribs create an extremely homogeneous top sail, guaranteeing good sliding properties in turbulent air. The whole concept was geared for best glide in accelerated flight. Cross-country flying is about the fastest way from A to B and the **BUTEO XC** shows its full potential. It is neither suitable nor approved for aerobatics.

CANOPY

By using the latest materials, the screen weight could be reduced to a minimum. In direct comparison to similarly complex umbrellas, the **BUTEO XC** is one of the lightest and weighs only 222g / m².

The **BUTEO XC** has 82 carrying ribs and an additional 80 mini-ribs along the upper sail. This arrangement corresponds to a cell count of 162 ribs, which is a design feature of EN-D gliders Sharknose with rods in the profile nose, double 3D shaping, rear-offset suspension points on the A-plane, mini ribs at the trailing edge and a completely new calculated performance profile are further features of the new **BUTEO XC**.

In the sharknose technology, the inlet opening on the lower sail migrates further to the rear and is accommodated in a concave depression. This achieves a better dynamic pressure over the entire angle of attack range, because: the higher this is, the more stable the cap is over the entire speed range.

The benefits of this profile for the pilot are:

- The glider will stall later, giving the pilot a larger steering line area.
- In high-speed flight the profile has a higher form-fidelity than with the conventional profiles and
- the reduced air resistance also brings better sliding and climbing performance.

In addition, different fabric materials reduce the weight, but still ensure the highest shape and aerodynamic stability and strength. The vents on both sides of the leech facilitate cleaning the cap inside.

LINES

The entire line system is formed from individual lines, which are sewn and looped at both ends. The lines and stitching are subject to rigorous production controls, to ensure high and consistent manufacturing quality.

The end control of all line lengths is documented for all paragliders produced by ICARO Paragliders. The complete geometry of the lines and the lengths is shown on the single line plan, which you find in the annex of the manual.

The **BUTEO XC** is delivered from the factory with the best brake position for most pilots. But tall or short pilots, or those with a harness with non-standard attachment points might consider it necessary to change the position of the brake handles.

If the brakes are to be shortened, it is extremely important to avoid the adjustment affecting the glider's trim speed. There must always be some slack in the brakes when they are fully released. This can be checked with the glider inflated above the pilot's head. There should be a noticeable bow in the brake lines, and the brakes should be having no effect on the shape of the trailing edge.

If the brake lines are to be lengthened, it is important to ensure that the pilot can still stall the canopy (i.e. during extreme manoeuvres or landing) without the need to take wraps.

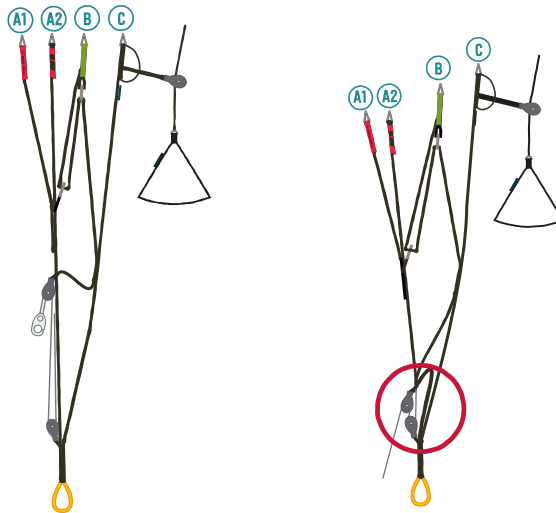
If you need to change the brake line lengths, do it maximum 5 cm at a time, and check it at an easy training hill. Check especially that both lines are the same length, as any asymmetry will lead to tiring and possible dangerous flying characteristics.

RISERS

The glider has 3 fold risers with separated A-risers and acceleration system which will be activated with a foot bar. The risers are signified. The handle of the main brake line is mounted on the C- riser. The acceleration system is mounted on the A- riser. A description of the risers you find in the annex.

How to vary the trim of the glider

The glider has an acceleration system which will be activated with a foot bar. When flying normal all risers have the same length. When using the accelerator system the risers are shortened by a constructive exactly defined length. Therefore the angle of attack of the canopy is smaller and speed increases.



The length of the accelerator is adjusted to the left and right of the foot pedal so that when your leg is fully extended, then the acceleration is at maximum – both rollers are touching.

Please pay attention that the glider will not be pre-accelerated, while the accelerator is loosened, when the acceleration ropes are set too short.

Assembling the accelerator is reliant upon the harness, e.g. numbers of return pulleys, rope guide ...

The more turbulent the weather conditions and when near the ground, the less acceleration should be used. Do not use the acceleration system and brakes at the same time! It is very dangerous to use both simultaneously as it can result in serious collapses.

HARNESSES

The **BUTEO XC** is certified for use with harnesses GH type. Practically all modern harnesses are GH type harnesses. Older harnesses with fixed cross belts (GX type) are not certified and should not be used.

The adjustment of the harness chest strap controls the distance between karabiners and affects the handling and stability of the glider. Excessive tightening the chest strap increases stability but also the risk of twists following glider collapse, and it also increases the frequency of getting collapses due to poor feedback from the glider.

The risk of twisting is also strongly affected by the seating position of pilot. Flying in a laid back (reclined) position makes it much more difficult to react in time to prevent riser twisting.

With the chest strap in a more closed position the glider also has more tendency to maintain a stable spiral, lengthening of the chest strap gives more feedback from the glider but decreases stability.

ICARO Paragliders recommends following settings:

TAKE OFF WEIGHT	< 80 KG	< 80 - 100 KG	> 100 KG
HORIZONTAL DISTANCE OF THE MAIN KARABINERS	38 CM - 42 CM	42 cm - 46 cm	46 cm - 50 cm

3. FLYING THE BUTEO

Flight preparation

- When choosing an area to lay out the glider before launching, try to find somewhere that is relatively free of stones and sharp rocks. Pay particular attention to the top surface, where the canopy touches the ground.
- Never step on your glider – stepping on it will weaken the cloth.
- We recommend keeping an eye on other pilots, spectators and smoking people near of the glider. Many of them do not appreciate the fragility of the lines and cloth.
- Whilst unfolding your paraglider check the canopy and cell walls for damage. Always take into consideration that the paraglider may have become damaged during transportation.
- Make sure that no sand, stones or snow get inside the canopy as the extra weight collected in the trailing edge may slow down or even stall the glider. Sharp edges damage the canopy.
- Check the lines for knots, twisting and damage, the brake lines for knots, kinks and their symmetric. Loose or incorrect brake knots can cause serious accidents through loss of the steering of the glider!
- Separate the line groups carefully and bring the risers in order. All lines must run freely from harness to canopy. It is equally important that the lines are un-hindered and cannot get caught up during the launch.
- There should not be any lines underneath the canopy. If the lines wrap around the canopy, this can result in injury or death!
- Check the rescue system (handle's pins fixed in the loops and the closed cover of your harness).
- Check your harness and make sure that all connections to pilot are correctly closed. Check that all karabiners are closed and can not be opened accidentally in flight and the risers are not twisted.
- Check canopy (all cells are open), wind direction and airspace.

5-POINT-CHECK

Before every launch you should carry out the standard 5-point checking procedure. Do the checks following the same sequence every time.

1. Helmet, harness, carabines closed?
2. Lines, risers and accelerator/ trimmer ok?
3. Leading edge open?
4. Wind direction and strength ok?
5. Airspace and start area ok?

LAUNCH

The most important thing during the take-off is, like at all other gliders too, not the force but the constancy of the pull.

At the start we advise to fix the accelerator with the Velcro which is attached at the front of the sitting board, in order to avoid tripping while pulling up the glider or when starting up.

Hold only the middle A risers and the handles of the brakes. When you pull on the A-risers, the lines in the middle of the wing should be under tension before the lines on the wing ends. This ensures an even easier start. Use progressive pressure on the A risers and the energy of our own bodies weight until the wing is fully inflated overhead. The canopy is inflated quickly due to the super short lines. When there is no pull from the lines and the wing is overhead, use slight pressure on the brake. Look up and make sure that the canopy is fully inflated. After a few accelerating steps and at the same time let go of the brakes gently, you will take off. Then use slight pressure again on the brakes to fly at a speed with minimal sink rate.

When there is strong wind the reverse launch technique is recommended. Holding the brakes, turn around to face the wing passing one set of risers over your head as you turn. We suggest building a „wall“ by partially inflating your glider on the ground, thus sorting out the lines thoroughly. By towing by winch there are no special techniques needed. Please pay attention to the country-specific regulations and that the towing is performed by competent staff.

During towing don't over brake and steer sensitively since the glider flies with a higher angle of attack. Avoid large brake inputs until you are reasonably high if course correction is necessary close to the ground. Do not try to climb steeply during the first part of the tow.

ACTIVE FLYING

Active flying in normal flight means that the wing is always kept at a safe angle of attack and, if at all possible, vertically above the pilot. The moving air affecting the wing often changes the angle of attack in an unwanted way. When flying into an upwind the paraglider often bucks, the wing drops back, the angle of attack increases, getting closer to a stall. In upwind the canopy pitches forward, the angle of attack is reduced and there is the risk of a collapse. Both can occur symmetrically, on both sides or asymmetrically, on one side only. It is impossible to control the angle of attack by looking to the canopy. Look in the direction you are flying, changes in the horizon inform the pilot about the canopy's movements.

Braking is also an absolute must! If the canopy pitches forward, the angle of attack decreases. In the case of strong forward pitching there is a risk of the canopy collapsing due to its insufficient angle of attack. The pilot must therefore prevent the canopy from pitching forward by pulling the controls down on both sides. Inversely, the angle of attack increases if the wing drops back behind the pilot, e.g. when entering into a thermal. The canopy is closer to stalling.

In these flight situations a significant braking movement by the pilot can lead to a spin or a stall. When the wing drops back, the pilot therefore must not brake and/or if the pilot is already holding the controls low, he must release them accordingly. Any change in the angle of attack immediately transfers in to a change in the control pressure of the brakes. The control pressure presents the pilot with immediate information on the angle of attack and on what the canopy is doing or about to do.

When using the accelerator, be careful. The accelerator should be employed, in order to compensate for high angles of attack and the associated potential risk of a stall. Do not step too quickly because your glider will dive down from the strong change in angle of attack.

Put equal pressure on the speed bar with your feet until the pulley touches the A-riser and the glider will quickly gain speed and the sink speed remains very moderate from beginning up to full speed.

The more turbulent the weather conditions and when near the ground, the less acceleration should be used. Using the accelerator decreases the angle of attack and can make the glider more prone to collapse.

Do not use the acceleration system and brakes at the same time! It is very dangerous to use both simultaneously as it can result in serious collapses.

TURNING

TA combined steering technique is suitable for every situation. The glider is agile and reacts to steering impulses quickly and directly. Strong, one sided pulling of the brakes brings the glider into an obvious side angle and the glider flies fast steep curves until spiral dive begins.

If the brake lines are pulled too fast or too far the glider will be stalled!

A one-sided stall is signaled clearly by: The curves inner side of the wing is getting soft, and nearly stops. In this case you have to release the brake lines!

LANDING

Always stand up in the harness in the landing position very early in order to be able to react as fast as possible to sudden events. Set up your final landing leg to face into the wind to minimize groundspeed. If you leave the inflated leading edge bang on the ground, this can cause the cell walls to burst!

Do not brake too much, to avoid a stall of the glider in this very low altitude! Do not reduce height by “pumping” with the brakes.

4. DESCENT TECHNIQUES

The methods described here can burden the material and structure of the glider as well as the pilots to their physical and psychological limits. They should therefore only be used for training and in emergency situations.

- Training of descent techniques and simulation of flight incidents (SFI) should only take place at professional safety training seminars with professional trainer and only while flying over water.
- Before inducing any exercise control the airspace beneath.
- During the exercises stay in contact with the canopy.
- If the glider is out of control, use your reserve parachute.

BIG & SMALL EARS

The aim of this exercise is to descend in strong thermals. Only take the outer lines of the A-risers in your hand, without releasing the brakes and pull down leaving it run through your hands (use gloves!). Sink rate increases but not the forward speed. If you use the acceleration system then higher sink speeds can be achieved.

Reopen the wing by pushing up with your hands and if necessary then pump the brakes with short symmetric movements. For directional control while using the big ears, you should use weight shift.

Never attempt tight turns or spirals with Big Ears, as the A-lines will be overstressed.

B-LINE-STALL

To enter and hold a B-line-stall requires considerable strength. It is very dangerous performing a B-line-stall incorrectly and following errors must be avoided:

- Brakes must not be shortened by twisting around your hand during the exercise.
- pulling too far on the B-line-stall aid, so that the A-lines are pulled too,
- using brakes during or directly after exiting,
- exit is too slow,
- releasing the B-line-stall aid without simultaneously pushing up with your hands,

SPIRAL DIVE

In a controlled spiral dive, the pilot applies an active flying technique in the same way as when circling in thermals.

The strong centrifugal forces in a spiral dive, however, change the control pressure. It increases by a multiple of the force. Even in moderate spirals, the pilot reaches double acceleration of gravity (2G). Subsequently, the control pressure also doubles.

To initiate a spiral dive, look in the direction you want to go, roll your body weight in that direction and at the same time smoothly pull down on the inside brake. The **BUTEO XC** will start to turn, and then drop into a spiral.

In the spiral dive an uncontrolled acceleration of the canopy must be prevented. As the canopy always accelerates via the outside of the wing, the spiral speed is controlled via the outside brake by applying the active flying technique. If the speed increases in an unwanted manner, pull the brakes further to slow down. If the wing becomes too slow, it can be speeded up by releasing the outside control.

If you pull abruptly and too far on the brakes, the canopy may enter a negative spin. When entering a spiral dive keep the brake on the outer curve released.

The glider does not have a tendency for stable spiral dive. If under certain conditions, it should go into a stable spiral dive then actively exit the maneuver by bringing your weight into a neutral position, release the brakes of the inner curve side and brake gently on the outer curve side until you notice that the wing starts to level out. Then gently brake on the inside curve for several turns until normal flights returns.

WINGOVER

The **BUTEO XC** is an agile glider, and it is quite easy to get to an excessively high angle of bank in just a few turns. Practice wingovers gently at first, as there is a chance of quite large collapses at high bank angles.

5. WHAT HAPPENS WHEN IT HAPPENS?

KNOTS AND TANGLES

The best way to avoid knots and tangles is to inspect the lines before you inflate the wing for take-off. If you notice a knot before take off, immediately stop running and do not take-off.

If you have taken-off with a knot you will have to correct the drift by leaning on the opposite side of the knot and gently apply the brake line on that side too. You can gently try to pull on the brake line to see if the knot becomes unfastened or try to identify the line with the knot in it. Try to pull the identified line to see if the knot releases. If the knot is too tight and you cannot remove it, carefully and safely fly to the nearest landing place.

Be very careful when trying to remove a knot. When there are knots in the lines or when they are tangled, do not pull too hard on the brake lines, there is an increased risk of the wing to stalling or negative turn being initiated.

DEEP / PARACHUTE STALL

Your glider has been carefully designed to resist entering deep stall. Before exiting a deep stall please ensure that the brakes are fully released. Actively exit the deep stall by reaching up and push forward with both palms on the A-risers or pull on them. Avoid flying in very humid air or in rain. A wet canopy may have very unpredictable flying characteristics, one of which is a radically increased risk of deep stall.

Never pull the brake-lines during a parachute stall, because the glider would go into a full stall immediately. If you find yourself flying in unavoidable rain we strongly recommend that you avoid any sudden movements or radical brake line input, that you do not pull Big Ears or B-Line-Stall, and that you steer clear of turbulence and avoid a deep flare on landing.

ASYMMETRIC COLLAPSE

While flying in turbulent conditions it may occur that a portion of your glider deflates. However, just like in flying in turbulences, please pull gently on both brakes. Re-inflation is speeded up by counteracting the turning movement of the canopy until normal forward flight return. Then pump the brake line on the collapsed side.

If the canopy is in front of the pilot after an asymmetrical collapse, the pilot must immediately and decisively brake down the open side to prevent an uncontrolled rotation. The same rule applies here: If the wing is ahead, braking is a must. Sometimes, however, the angle of attack on the open, not-collapsed side is relatively high and the wing is behind the pilot. Then a significant control movement would definitely cause a stall and its potentially extreme reactions.

If the collapsed part of the canopy is very big, you have to brake the open side very dosed (not too much!) to avoid a stall.

SYMMETRIC COLLAPSE

Your **BUTEO XC** normally re-inflates promptly in a symmetric collapse without pilot input. Applying the brakes symmetrically will speed things up.

EMERGENCY STEERING

Should it no longer be possible to steer your glider, for example due to a broken line, the glider may be steered by gently pulling on either rear riser.

By steering this way airspeed is reduced hardly. Therefore, for landing you must change to the rear risers to control your glider. Handling will be more direct so being careful not to pull too hard.

NEGATIVE SPIN

If the pilot abruptly applies full brake to one side of the glider while the other side is at zero brake, the faster side may fly around the braked and stalled side resulting in a spin. Alternatively, if flying very slowly with almost full brakes on both sides, if one hand releases one brake suddenly, while the other continues with full brake, the glider may enter a negative spin. To exit a spin just do “hands up” to release the brakes and the glider will return to normal flight.

If you do not have control over your glider and you are running out of altitude, immediately deploy your reserve parachute.

FRONT STALL

After a front stall of the canopy, the wing moves backwards while the pilot with his higher mass moves further ahead. Wing behind, pilot ahead, significantly high angle of attack – there is only one thing to do:

6. CARE INSTRUCTIONS, REPAIRS, INSPECTION

Care Instructions

- A new wing supplied from the factory is often compressed hard. The compression serves to reduce shipping costs but should not be repeated once the wing has been unpacked and flown for the first time.
- Note that the glider bag should not be used as a seat.
- Even with good care and maintenance, just like any item exposed to the elements, your glider can wear out after a certain amount of use. This can change flight behavior and safety. We recommend a regular safety inspection of the canopy and all lines.
- If you clean your glider it is best to use warm water and a soft sponge.
- Store your glider in a dry and dark place, ideally between 5° and 30° Celsius and humidity between 55 and 65%. Do not store it near chemicals or petrol.
- If you will not fly for longer period, store the glider releasing all compression straps and take it out of its backpack so that the fabric is not compressed, creased or stretched.
- Avoid storing your glider for days at a time in a hot car.
- Unpack your paraglider shortly before launch and pack away immediately after landing to avoid any unnecessary UV exposure.
- When unfolding the paraglider insure that neither the canopy nor the lines become too dirty. Dirt particles can damage the material and lines.
- Never use chemical cleaning agents, brushes or hard sponges on the material, as these destroy the coating and affect the strength of the cloth. The canopy will become porous and will loose structural strength.
- Never attempt to clean your paraglider in a washing machine. Even without using detergents the simple mechanical abrasion will quickly finish the canopy and render it useless.
- If you are flying near the sea most the wing may age faster because the air is humid and salty. In this case we suggest you have it checked more often than prescribed in this manual.
- Also avoid dipping it in a swimming pool; the chlorine will damage the cloth.
- If you must rinse or clean your glider do so with fresh water. Frequent cleaning will accelerate the ageing process.
- If the glider has become wet, lay it out so that air can get to all areas of the fabric.
- After landings in trees or on water you should check the length of the lines and the canopy.
- Flying all the descent or acrobatic exercises will not normally pose a structural problem but freestyle training accelerates the ageing process dramatically.

- There is no special method packing your glider. ICARO paragliders commends the “Cell to Cell-method bag because the reinforcements of the leading edge stay flex-free on top of each other and do not fold.
- When folding your glider make sure that there are no insects inside the canopy. Many insect species contain acids that could damage the cloth. Grasshoppers gnaw their way out of a folded canopy, making it full of holes in the process.
- When you did not fly for a longer period ICARO commends to check the glider (e.g. mildew stains, splice of the lines, corrosion of the shackles and carabines).

If you are not convinced of the gliders airworthiness please send your glider to an authorized ICARO dealer to check your glider. The same is commended for harnesses.

REPAIRS

Only use original ICARO parts for repairing your glider. If you don't you lose the warranty for your glider.

Small holes in the canopy (max. 20x20 mm) can be repaired by the pilot by using self adhesive sailcloth on both sides of the perforation. Damage to the lines or any other repairs should only be carried out at an authorized ICARO center. If your glider needs to be repaired, please contact your local ICARO paragliders dealer.

INSPECTION

It is important to have your glider inspected by a trained ICARO technician but it is also allowed to check your glider for yourself. In the annex you find the regulations for checks of certified gliders and items in order to perform a paraglider inspection you need.

INSPECTION INTERVAL

24 months or 150 operating hours, depending on what occurs sooner. Without regular certified inspections, your glider will loose its pattern test result and warranty.

ICARO recommends having wings that are often used for training of descent exercises, acrobatics or flying in salty or sandy conditions subjected to checkups all 100 operating hours or 12 month.

It is also important, that ground handling also will be considered. All gliders, especially gliders manufactured with light and thin material are mechanically more stressed than other gliders. Therefore ICARO recommends multiplying ground handling time with the factor 1, 5.

Not only gliders have a recurrent inspection interval. Airworthiness of harnesses, snap hooks and rescue systems must also be verified. Generally it is recommended to change aluminum snap hooks after 24 months or 200 operating hours.

According to German and Austrian aeronautical legislation the owner of a glider can check the airworthiness by his own or order a third person (for example manufacturer/importer) to do this.

To perform your own airworthiness check, ICARO paragliders must give you a briefing. Should you decide to check the wing by yourself you must make sure that our guidelines are adhered to. Failing to do so will void the certification.

ICARO paragliders highly recommend that you let the manufacturer or authorized supplier/ person do the check of airworthiness.

All inspections and repairs must be documented (manual page 2).

7. TERMS OF THE WARRANTY

ICARO warranty covers the cost of materials and workmanship on gliders accepted by ICARO Paragliders to fall under the warranty.

Paragliders: 24 month or 150 operating hours, depending on what is first
Harnesses and rescue systems: 24 month

WARRANTY IS ONLY VALID FOR ICARO PRODUCTS WITH LTF/ EN CERTIFICATION.

What is covered by the warranty?

Provided that ICARO Paragliders accept the fault the warranty contains all necessary spare parts related to the replacement or repair of defective parts and working time.

ICARO Paragliders accept no freight costs (outbound and return transportation).

What are the conditions of the warranty?

Provided that ICARO Paragliders accept the fault the warranty contains all necessary spare parts related to the replacement or repair of defective parts and working time.

- ICARO Paragliders needs to be informed immediately after the discovery of a defect and the defective product must be sent to us for testing.
- The glider/ harness/ rescue system was used in normal circumstances and maintained according to the instructions. This includes in particular the careful drying, cleaning and storage.
- The glider/ harness/ rescue system were used only within the applicable guidelines and all rules have been complied with all times.
- All flights must be accounted for within the flight book.
- There were only original spare parts used and checks, exchange and / or repairs were conducted by an authorized dealer or by ICARO Paragliders company / person and properly documented.
- The online form on **www.icaro-paragliders.com** must be sent at least 6 weeks after buying to ICARO Paragliders.

What is excluded from warranty?

- Gliders and harnesses that are used for training purposes, Acro or other official competitions,
- Gliders / harnesses who were involved in an accident,
- Rescue equipment, which has been thrown for a emergency,
- Gliders / harnesses and rescue equipment, which have been changed by yourself,
- Gliders / harnesses and rescue equipment that were not purchased from an authorized dealer / flight school,
- Gliders / harnesses and rescue equipment where the required inspection intervals were not met and the verification of the glider was not conducted by a ICARO Paragliders authorized operation / person
- Damage which has occurred due to improper treatment (i.e. storage in humidity, heat or direct sunlight)
- Parts that need to be replaced due to normal wear and tear,
- Discoloration of the cloth material used,
- Damage caused by solvents, salt water, insects, sun, sand, humidity or “debag-jumps”.
- Damage caused by force majeure.
- Damage caused by the motor (Oil, fuel, damage in cause of the prop) and towing by winch.

In case of a concluded claim the period of warranty carries on. The period of warranty and the connected claim are not prolonged and are only valid until the original date of expiry. The freight costs (transport to and from) are not paid by ICARO Paragliders.

CONCLUSION

Customer satisfaction is the first priority of our efforts. Therefore, we are open to any suggestions for improvement and constructive criticism from you because only then we can incorporate them into our new products.

We also want to be able to inform you about current technical innovations as well as information about your paraglider. But we can only do that if you register with ICARO Paragliders medium guarantee registration.

These can be found on our homepage at www.icaro-paragliders.com.

8. ANNEX

WARRANTY CARD

Please fill in the warranty card which you find on our homepage www.icaro-paragliders.com and send it.

Users needs for Inspections

You will need the following items in order to perform a paraglider inspection:

- Standardized inspection report
- Porosity meter
- Spring scale
- Equipment for measuring line lengths
- Equipment for line strength testing
- Sewing machine
- Big, clean and bright room

Technical specifications about your glider (type, serial number, size and year of production). Please call ICARO Paragliders for information.

A three week course at ICARO Paragliders, specified to a glider type together with a legal flight license is the necessary prerequisites for permission to inspect ICARO Paragliders.

INSPECTION INSTRUCTIONS

Record Information

Spread out your paraglider in a big bright room and make a note of information such as model, type and serial number.

Porosity Test

Use your porosity meter to perform porosity checks at 4 different places of the canopy. The results are recorded in the inspection protocol and are to be evaluated according to the internal guidelines of the workshop.

Visual Control of the Canopy

Hang up the canopy so that you can do a visual check of your canopy. Check for perforations in the upper and lower sailcloth, damaged stitching between the cells, and damage to the leading/trailing edge reinforcements.

Each cell must be checked.

Visual Control of the Risers and Lines

Check the risers, the trimmers, the stitching at each line loop, the brake lines, all seams and line contact points. Each line must be measured and inspected for kinks.

Strength test of the lines

One complete A-and B- line must be removed, measured and submitted to a strength test. The measured value of each individual line must be noted in the inspection protocol. The minimum of the lines strength are 125% of the normative guidelines.

Measurement of the lines

Measure every single line while stressing it with defined tractive force (5daN). Compare with the line plan. The lines must be measured between fixing point on the linelock and fixing point on the lineloop.

The results are recorded in the inspection protocol and are to be evaluated according to the internal guidelines of the workshop.

Assessment

The measurements of all procedures are noted in the inspection protocol. When all facts have been recorded, the technician must make a general assessment. Check the backpack for damage to the zips, seams and straps and repair if necessary with a sewing machine.

General Remarks

Any other repairs, corrections etc. to the general condition of the paraglider must be evaluated. A copy of the results of each inspection must be sent on to ICARO Paragliders. The technician must report any unusual faults to ICARO Paragliders within 3 days.

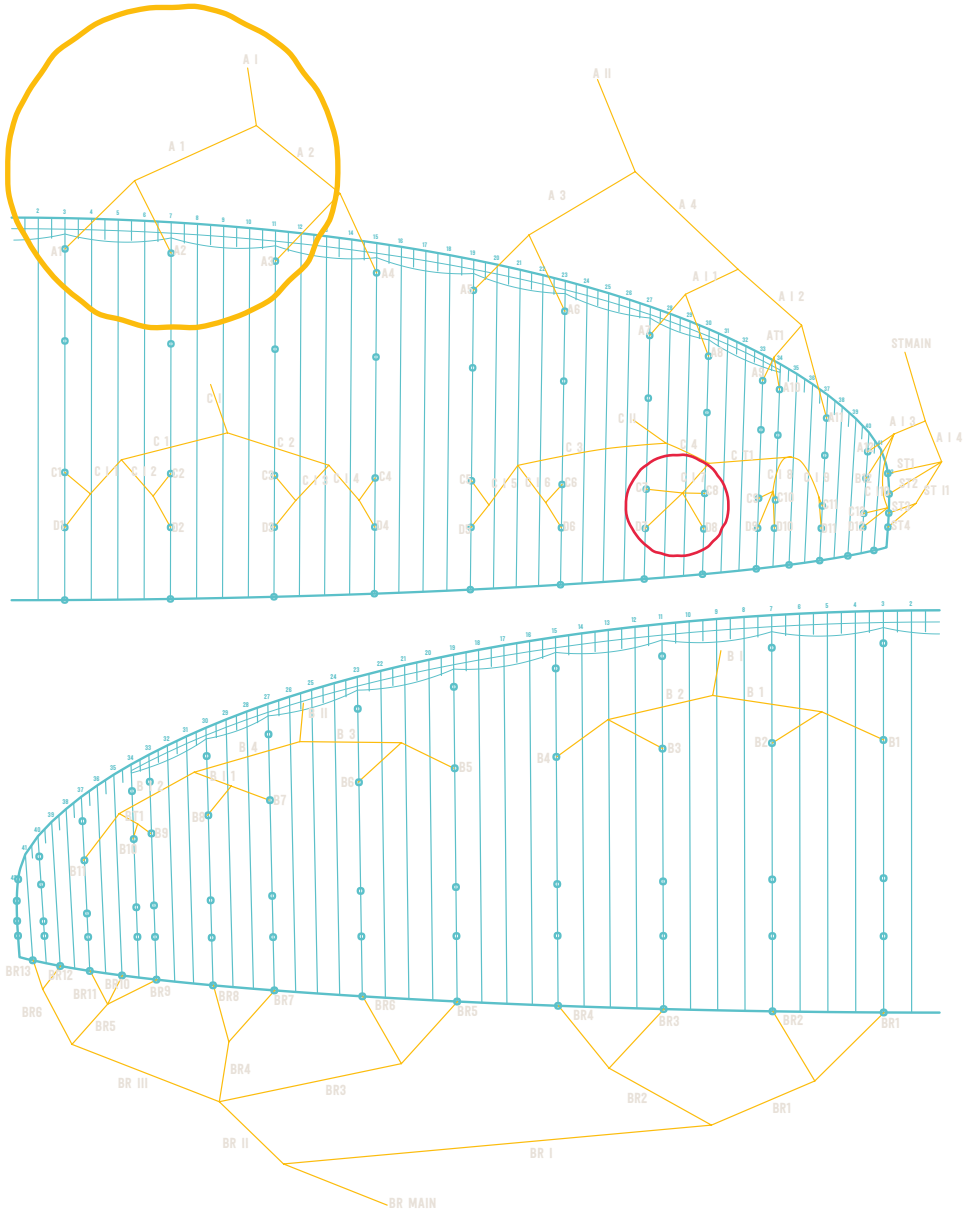
Inspection Reference

Only an authorized technician who has been trained by ICARO Paragliders is authorized to sign and date the glider type label and sign the manual.

9. PARTLIST

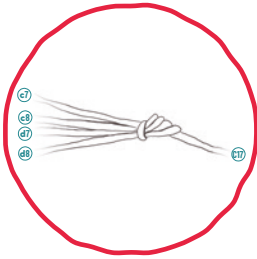
NAME	TYPE	MATERIAL	SURFACE	DIMENSION	FABRICATOR
TRIANGLE	Triangle	Edelstahl	Edelstahl	Ø 3,5 mm	Maillon
MEAN LINE (STAMM)	PPSL 275 / PPSL 200	Dyneema	jacketed	Ø 1,9 / 1,42mm	Liros
MIDDLE LINE (1 GABEL)	PPSL 160 / PPSL 120	Dyneema	jacketed	Ø 1,4 / 1,15mm	Liros
GALLERY LINE (2 GABEL)	LTC 65 / LTC 80	Aramid	not jacketed	Ø 0,7 / 0,65mm	Liros
TOP SAIL	SKYTEX 32	Nylon	laminated		Porcher Sport
Bottom sail	SKYTEX 32	Nylon	laminated		Porcher Sport
PROFIL	SKYTEX 32	Nylon	laminated		Porcher Sport
THREAD SAIL	TEX 45				A&E
THREAD RISER	TEX138				A&E
STRAPE TAPE	Schiffchenware	Nylon		12,5 mm	Schmahl
PROFILE REINFORCEMENT	Nylon Webbing	Nylon		Ø 2.7 mm	
WEBBING	NCV 20mm Mylar Tape	Mylar	90g	20 mm	Porcher Sport
BREAK MEAN LINE	DSL 350	Dyneema	jacketed	Ø 2,0 mm	Liros
BREAK MIDDLE LINE	TSL 140	Aramid	jacketed	Ø 1,3 mm	Liros
BREAK GALLERY LINE	DSL 70	Dynema	jacketed	Ø 0,95 mm	Liros
TRIANGLE CLIP	Triangle Clip	Plastic			

10. LINE PLAN ALLOVER (ALL SIZES)



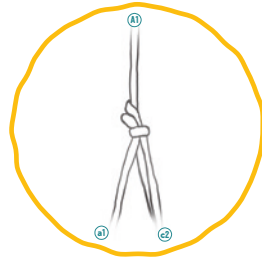
Special line connections

! Leinen müssen von der MITTE nach AUSSEN und von der EINTRITTSKANTE zur AUSTRITTSKANTE eingeschlaift werden.



EXAMPLE

Assemble d8 on top of d7, on top of c8, on top of c7



EXAMPLE

Assemble a2 on top of a1



	A		B		C		D		BR	
	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER
1	6478	6998	6398	6918	6495	7015	6566	7086	7281	7801
2	6388	6908	6307	6827	6401	6921	6474	6994	6993	7513
3	6346	6866	6267	6787	6357	6877	6424	6944	6828	7348
4	6357	6877	6284	6804	6368	6888	6430	6950	6779	7299
5	6283	6803	6219	6739	6300	6820	6358	6878	6633	7153
6	6186	6706	6135	6655	6214	6734	6271	6791	6538	7058
7	6119	6639	6078	6598	6155	6675	6197	6717	6463	6983
8	6043	6563	6011	6531	6096	6616	6140	6660	6477	6997
9	6007	6527	5981	6501	6039	6559	6072	6592	6496	7016
10	6002	6522	5978	6498	6028	6548	6062	6582	6478	6998
11	6026	6546	5996	6516	6023	6543	6048	6568	6519	7039
12	5689	6209	5667	6187	5702	6222	5729	6249	6500	7020
13	5612	6132	5595	6115	5612	6132	5636	6156	6515	7035



	A		B		C		D		BR	
	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER
1	6837	7357	6757	7277	6855	7375	6933	7453	7625	8145
2	6744	7264	6663	7183	6758	7278	6837	7357	7334	7854
3	6702	7222	6623	7143	6713	7233	6787	7307	7137	7657
4	6714	7234	6641	7161	6726	7246	6795	7315	7087	7607
5	6638	7158	6574	7094	6656	7176	6717	7237	6952	7472
6	6536	7056	6487	7007	6566	7086	6626	7146	6869	7389
7	6466	6986	6427	6947	6505	7025	6549	7069	6771	7291
8	6387	6907	6358	6878	6443	6963	6490	7010	6776	7296
9	6349	6869	6327	6847	6384	6904	6418	6938	6758	7278
10	6344	6864	6323	6843	6372	6892	6407	6927	6720	7240
11	6368	6888	6341	6861	6366	6886	6393	6913	6756	7276
12	6014	6534	5991	6511	6029	6549	6057	6577	6712	7232
13	5934	6454	5916	6436	5933	6453	5959	6479	6720	7240



	A		B		C		D		BR	
	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER
1	7179	7699	7095	7615	7198	7718	7280	7800	8059	8579
2	7084	7604	6999	7519	7098	7618	7181	7701	7756	8276
3	7041	7561	6958	7478	7052	7572	7130	7650	7552	8072
4	7055	7575	6978	7498	7067	7587	7139	7659	7500	8020
5	6976	7496	6910	7430	6995	7515	7059	7579	7256	7776
6	6871	7391	6819	7339	6902	7422	6965	7485	7170	7690
7	6798	7318	6757	7277	6839	7359	6884	7404	7068	7588
8	6715	7235	6685	7205	6774	7294	6823	7343	7074	7594
9	6675	7195	6652	7172	6711	7231	6747	7267	7051	7571
10	6669	7189	6648	7168	6699	7219	6735	7255	7012	7532
11	6695	7215	6667	7187	6692	7212	6720	7240	7049	7569
12	6325	6845	6301	6821	6341	6861	6370	6890	7004	7524
13	6240	6760	6222	6742	6240	6760	6266	6786	7012	7532



	A		B		C		D		BR	
	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER	LINE LENGTH	LINE * RISER
1	7507	8027	7419	7939	7525	8045	7611	8131	8422	8942
2	7409	7929	7320	7840	7423	7943	7510	8030	8108	8628
3	7366	7886	7280	7800	7378	7898	7459	7979	7896	8416
4	7381	7901	7301	7821	7394	7914	7469	7989	7844	8364
5	7300	7820	7231	7751	7319	7839	7386	7906	7700	8220
6	7191	7711	7137	7657	7223	7743	7288	7808	7611	8131
7	7115	7635	7073	7593	7157	7677	7205	7725	7505	8025
8	7029	7549	6998	7518	7090	7610	7141	7661	7506	8026
9	6987	7507	6963	7483	7025	7545	7062	7582	7499	8019
10	6981	7501	6959	7479	7012	7532	7051	7571	7443	7963
11	7008	7528	6979	7499	7005	7525	7034	7554	7482	8002
12	6622	7142	6597	7117	6639	7159	6669	7189	7434	7954
13	6534	7054	6515	7035	6533	7053	6561	7081	7443	7963

- The total line lengths are measured in tension of 50 N from the suturing of the loop in the lower sail of the cap to the inner edge of the line lock!
- Start the measurement in the center of the canopy!

10. DESCRIPTION OF THE RISER



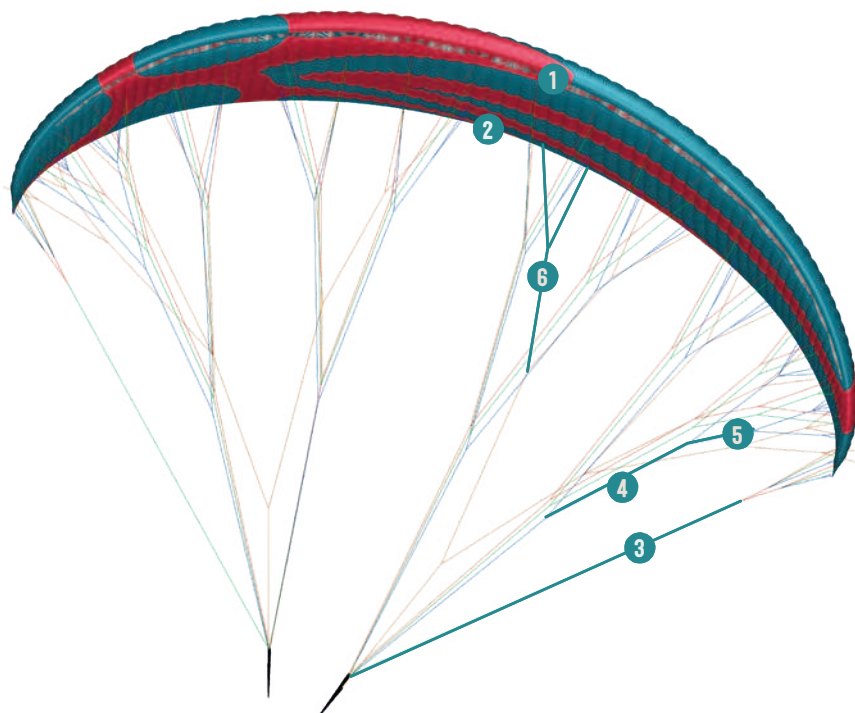


Riser lengths (mm) without line lock

SIZE	XS		S		M		L	
	N.B.	B.	N.B.	B.	N.B.	B.	N.B.	B.
A1,A2	520	400	520	395	520	390	520	380
B	520	490	520	488	520	487	520	485
C	520	520	520	520	520	520	520	520
LENGTH SPEED SYSTEM (MM)	120		125		130		140	

Line lock (alle size): 30 mm

11. DESCRIPTION OF THE GLIDER



- ① Cells upper sail
- ② Lower sail
- ③ Stable line
- ④ Mean line
- ⑤ Middle line
- ⑥ Break line



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