



EN

Falco

MANUAL

Version 1.0 / 2018



1. VERIFICATION OF CHECKS AND REPAIRS

SERIENNUMMER
SERIAL NUMBER

_____/_____

STÜCKGEPRÜFT VON
FIRST CHECK BY/ICARO

____.____.____

NAME /STEMPEL
NAME AND 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) _

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) _

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 ____.____.____

CONGRATULATIONS

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

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

CONTENT

1. Verification of checks and repairs	2
2. To get to know your FALCO	8
3. Flying with the FALCO	12
Flight preparation	12
Launch	13
Active flying	14
Turning	15
Landing	15
4. Descent techniques	16
Big & small ears	16
B-line stall	16
Spiral dive	17
Wingover	17
5. What happens when it happens?	18
Knots and tangles	18
Deep / parachute stall	18
Asymmetric collapse	18
Symmetric collapse	19
Emergency steering	19
Negative spin	19
Front stall	19
Full stall	19
6. Care instructions, repairs, inspections	20
7. Terms of the warranty	23
8. Annex	25
9. Partlist	27
10. Description risers	32
11. Description canopy	34

Your **FALCO** is pattern tested in A.

SIZES	XS	S	M	L
CERTIFICATION NUMBER	DHV GS-01-2413-18	DHV GS-01-2412-18	DHV GS-01-2411-18	DHV GS-01-2414-18
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			

Therefore, the glider is a “paraglider with good passive safety and forgiving flight characteristics. It is relatively resistant to abnormal flight conditions. It is appropriate for all pilots including pilots of all training levels.”

! 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.

The use of this paraglider is entirely at your own risk. It may be only used for those purposes described in this manual.

! It is strictly prohibited to fly the **FALCO**

- 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.

If you cannot keep your glider under control use the rescue system in good time. Always pay attention to ground distance.

Our products are made with great care and state of the art. Each glider before it is delivered to the dealer or flight school is checked by ICARO Paragliders (incoming test). This date is entered in the identification plate and as well guarantee as the first 2-year-check period starts. The incoming test must also be documented in the manual. 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 guarantee as the first 2-year-check period starts. If this seal is missing, it must be assumed that this glider is not identical in construction with the model tested at the specification center. The use of this paraglider is entirely at your own risk. Every pilot bears the responsibility of his/her own safety.

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.

This manual is copyrighted. Partial reproduction is allowed only after prior approval by ICARO Paragliders, all other rights are reserved.

2. TO GET TO KNOW YOUR FALCO

ALLOWED FOR TRAINING	yes	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 A			
FLÄCHE AREA	21,5	23,5	25,5	27,5
PROJ. FLÄCHE PROJECTED AREA	18,17	19,86	21,55	23,24
AUSGEL. SPANNWEITE FLAT WINGSPAN	10,57	11,05	11,51	11,95
PROJ. SPANNWEITE PROJECTED WINGSPAN	8,21	8,58	8,94	9,28
STRECKUNG FLAT ASPECT RATIO	5,2	5,2	5,2	5,2
PROJ. STRECKUNG PROJ. ASPECT RATIO	3,71	3,71	3,71	3,71
GEWICHT WEIGHT	4,3 kg	4,5 kg	4,7 kg	4,9 kg
GEWICHTSBEREICH WEIGHT RANGE	62,5 - 75	72,5 - 85	82,5 - 95	92,5 - 112,5
PROFIL TYP PROFILE TYPE	Sharke Nose	Sharke Nose	Sharke Nose	Sharke Nose
MATERIAL	DOKDO 20 / 30	DOKDO 20 / 30	DOKDO 20 / 30	DOKDO 20 / 30
ZELLEN CELLS	38+ 36 MiniRibs	38+ 36 MiniRibs	38+ 36 MiniRibs	38+ 36 MiniRibs
BESCHLEUNIGER SPEED SYSTEM.	9cm	10cm	10cm	11cm
TRIMMER	No	No	No	No
V TRIM (km/h)	38	38	38	38
V MAX (km/h)	45	45	45	45
SITZE SEATS	1			

CANOPY

The sharknose-canopy of the **FALCO** with Miniribs on the trailing edge, sticks in the profile nose is made of synthetic fabric with different strengths.

In this technology, the apertures of the canopy are on the under further back and is housed in a concave recess. Thereby a better back pressure over the entire pitch angle is achieved, because the higher it is, the more stable the cap is over the entire speed range.

The advantages that result from this profile for the pilot are:

- The glider will stall later and gives the pilot greater control leash area,
- in high speed flight profile has a higher dimensional stability than the conventional profiles and
- the reduced air resistance also brings a better gliding and climbing performance.

Upper sail DOKDO 30 lower sail DOKDO 20, V- und tension tapes and Ribs guarantees highest mechanical strength- und aerodynamic stability.

The coating makes the fabric water-repellent, UV-stabile and air-impermeable. Between the single groups of main lines are taut ribbons sewn in, which are regulating the tension of the sail.

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 **FALCO** 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.

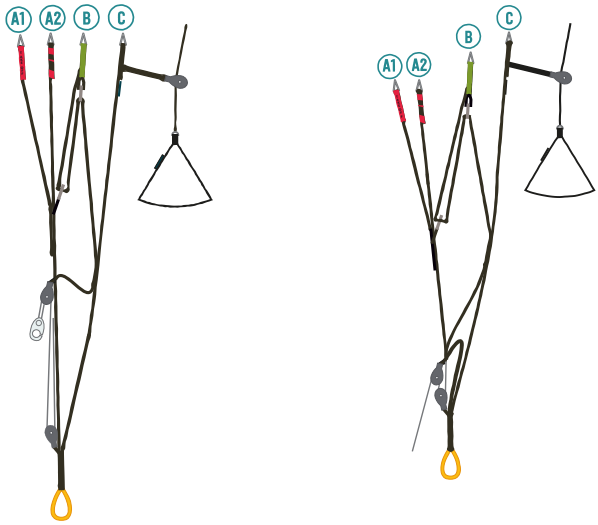
There should be a noticeable bow in the brake lines, and the brakes should be having no effect on the shape of the trailing edge.

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 an acceleration system which will be activated with a foot bar. The risers are signified. The main break line comes through a return pulley; the handle of the main break line is mounted on the C-riser. The acceleration system is mounted on the A- riser. To fix it with the foot bar you must connect the brummel hooks of the foot bar with the brummel hook of the acceleration system.



ACCELERATION SYSTEM

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 **FALCO** 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 FALCO

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 unhindered 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 **FALCO** 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 **FALCO** 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 **FALCO** 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 months.

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 line loop.

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.

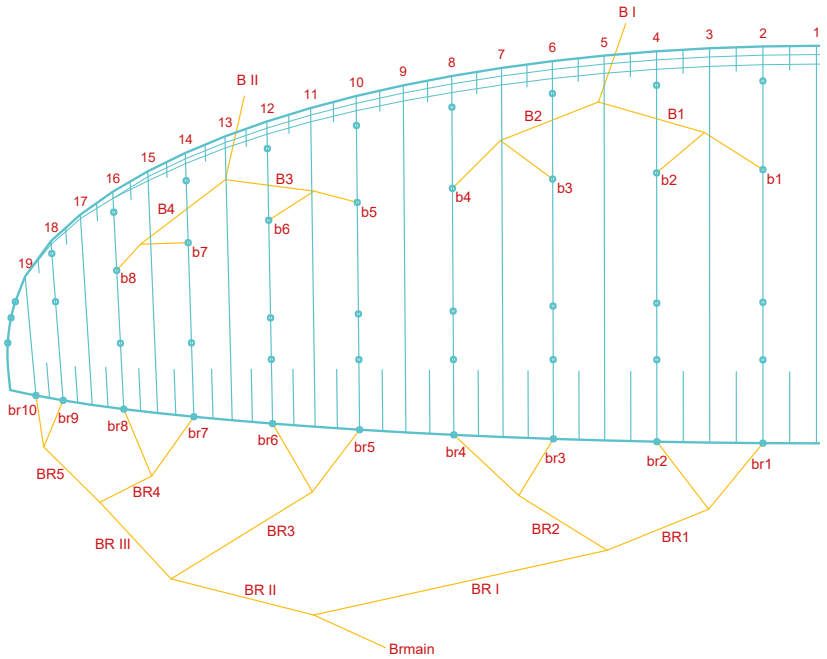
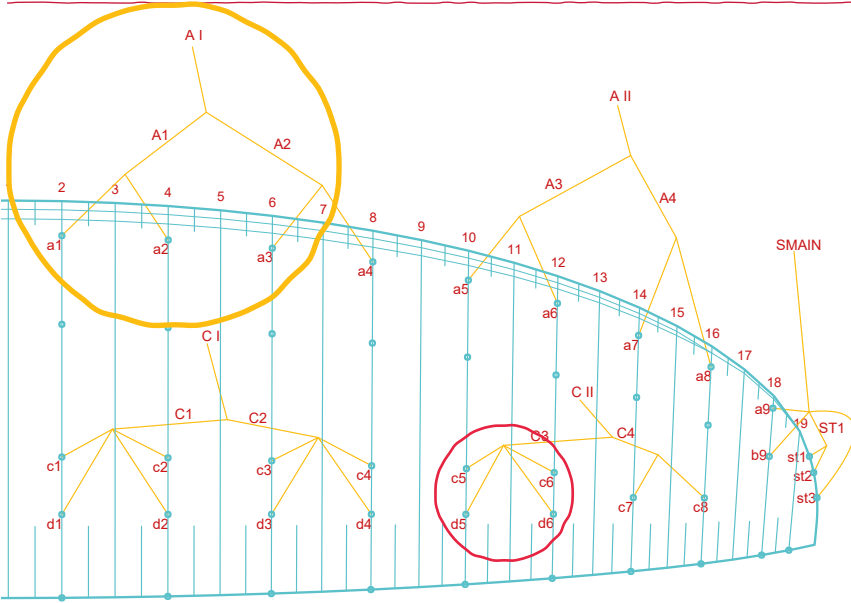
Inspection Reference

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

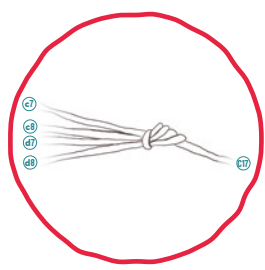
NAME	TYPE	MATERIAL	SURFACE	DIMENSION	FABRICATOR
TRIANGLE	Triangle	Edelstahl	Edelstahl	Ø 3,5 mm	Maillon
MEAN LINE (STAMM)	PPSL 275 / PPSL 200	Dyneema	jacketed	Ø 1,9 / 1,42mm	Liros
MIDDLE LINE (1 GABEL)	PPSL 160 / PPSL 120	Dyneema	jacketed	Ø 1,4 / 1,15mm	Liros
GALLERY LINE (2 GABEL)	PPSL 120 / DSL 70	Dyneema	jacketed	Ø ,15 / 0,95mm	Liros
TOP SAIL	DOKDO 30	Nylon	laminated		Dominiko
Bottom sail	DOKDO 20	Nylon	laminated		Dominiko
PROFIL	SKYTEX 40 HARD	Nylon	laminated		Dominiko
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)



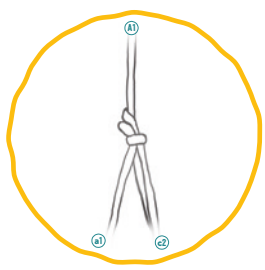
Special line contections

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



EXAMPLE

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



EXAMPLE

Assamble a2 on top of a1



	A	B	C	D	BR
	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH
1	6379	6313	6411	6494	7162
2	6302	6233	6325	6408	6859
3	6271	6203	6287	6361	6664
4	6283	6220	6298	6365	6618
5	6213	6154	6207	6263	6476
6	6129	6078	6133	6185	6420
7	6022	5991	6052		6371
8	5911	5888	5939		6316
9	5617	5609	5469		6279
10	5470	5460			6259



	A	B	C	D	BR
	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH
2	6590	6602	6705	6791	7408
3	6558	6518	6614	6701	7173
4	6570	6487	6575	6652	6978
5	6497	6505	6587	6657	6921
6	6410	6436	6491	6549	6772
7	6298	6356	6414		6714
8	6181	6265	6329		6662
9	5874	6157	6210		6605
10	5721	5866			6566



	A	B	C	D	BR
	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH
1	6949	6877	6984	7074	7722
2	6865	6790	6890	6980	7472
3	6831	6757	6849	6929	7259
4	6844	6776	6861	6934	7209
5	6768	6704	6761	6822	7054
6	6677	6621	6681	6738	6994
7	6560	6526	6593		6940
8	6439	6414	6469		6880
9	6119	6110	5958		6840
10	5959	5948			6818



	A	B	C	D	BR
	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH	LINE LENGTH
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

- 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



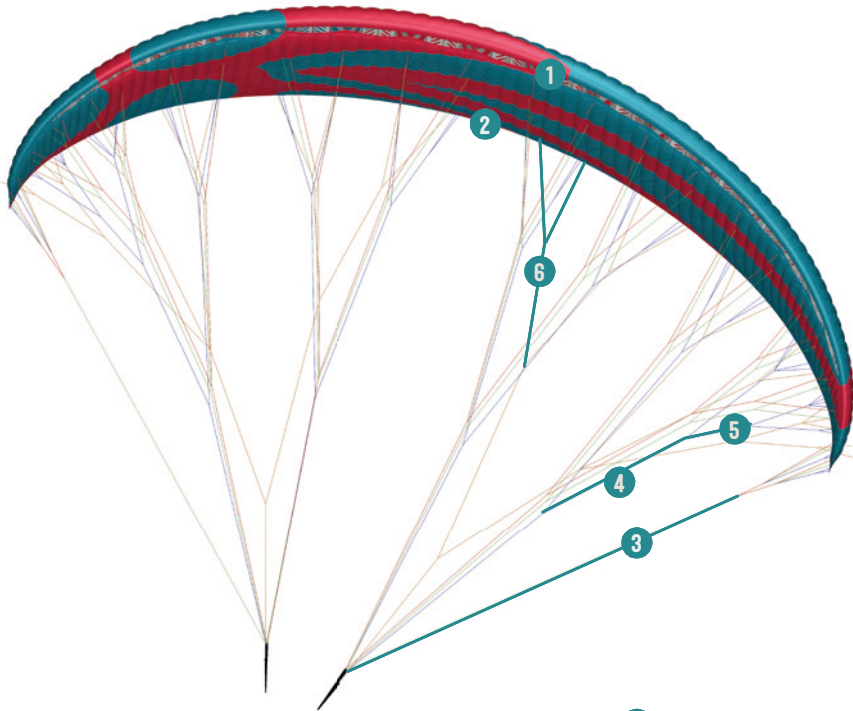
- ① Brummelhook
- ② Pulley brakeline
- ③ Handle
- ④ Accellorator
- ⑤ Center loop

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



ICARO Paragliders

is a division of Adventure Design GmbH
Selnecker Str. 20
04277 Leipzig / Germany

icaro@icaro-paragliders.com

+49 (0) 8034 / 909 700

www.icaro-paragliders.com