# K2⁴

# Owner's Manual and Service Booklet

**Serial Number:** _____



AIRBORNE SENSATIONS
since 1972

Version 1.1
Effective: 07/2021
Updated: 07/ 2021

**Important**

The following symbols are used to draw attention to particular sections:

**WARNING!**

Failing to comply with instructions given here may lead to injury or death!

**BEWARE!**

Failing to comply with instructions given here may cause undue wear to, or even damage your new wing.

**NOTICE**

This pictogram indicates a tip or some helpful extra knowledge.

## Welcome in our team

Congratulations on the purchase of your new UP K2[4]. UP International is renowned across the globe for designing and building the finest paragliders available – paragliders characterised by maximum safety, performance and quality in every aspect.
Please take a little time to register your glider. This way we can keep you informed of all new products and developments at UP, as well as any technical information about the UP K2[4].
We would also be delighted to hear any feedback you have concerning the glider. This is only possible once we have received your product registration online. Your completed product registration is also needed should any warranty issues arise.

**http://www.up-paragliders.com/en/service/product-registration**

If you have any questions regarding your paraglider or auxiliary equipment please ask your local dealer or feel free to contact us here at UP directly.

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Have fun with your new UP K2[4]!

**UP International**

# Safety instructions

Paragliding is an extremely demanding sport requiring the highest levels of attention, judgement, maturity, and self-discipline. Due to the inherent risks in flying this or any paraglider, no warranty of any kind can be made against accidents, injury, equipment failure, and/or death. This glider is not covered by product liability insurance. Do not fly it unless you are personally willing to assume all risks inherent in the sport of paragliding and all responsibility for any property damage, injury, or death, which may result from use of this paraglider.

Please read this owner's manual thoroughly before your first flight with the UP K2$^4$ so that you are fully acquainted with your new glider. This manual gives you information on the entire specific and general flying characteristics of the UP K2$^4$, but it does not replace attending a paragliding school. It is important to note the following points:

- at the time of delivery the UP K2$^4$ conforms to LTF NFL II-91/09 and EN 926-2:2014 requirements (see certification information later in this manual),
- any changes being made outside the permitted range of adjustment invalidate any and all claims under the warranty,
- using this paraglider is exclusively at the risk of the user; the manufacturer or distributor assumes no responsibility for accidents occurring while using it,
- it is assumed that the pilot is in possession of the necessary qualifications and provisions of any relevant laws are observed,

When reselling the wing please make sure you also give this manual to the new owner. The manual is an integrated part of the paraglider and is required for the wing to keep its certification

# Correct behaviour in relation to the environment

Paragliding is a particularly nature-friendly sport. This makes it all the more important that we as paraglider pilots behave in a responsible way towards both the environment and the people sharing it with us. We encourage you to treat nature with respect, to stay on marked hiking trails when walking to takeoff or hiking out from an XC landing, to avoid unnecessary noise, to never litter and to observe all local regulations.
Please also make sure to comply with legislation regarding protected areas, privately owned property or hunting arenas – this ensures the least possible friction in relation to other users of the great outdoors, to the benefit of both yourself and the sport as a whole.

# Technical description

The UP K2$^4$ was developed by UP to satisfy the demand of tandem pilots for a fast and secure tandem paraglider with outstanding take-off attributes and easy handling.

As with all UP products, the materials used have been carefully chosen for their outstanding quality and strength, to guarantee a long and trouble-free service life.

Further construction details, including line lengths, are included in the certification specification sheets, which form part of this manual. Any technical changes will appear in the appendix and on our website.

## Purpose

According to LTF 91/09 the K2[4] is an air sport vehicle (class paraglider) with an empty weight of less than 120 kg.

## LTF and EN classification

The UP K2[4] is certified to the following classification for both sizes: LTF09/EN B

## Target group and recommended flying experience

The K2[4] is ideally suited for both recreational pilots who want to enjoy relaxed thermal and cross-country flights with passenger as well as for professional commercial use. Regular flight experience and advanced technical flight knowledge with at least 20-30 flight hours per year are required.

## Necessary skills for normal flights

Due to the somewhat shorter brake line travel (compared to EN A wings)*, the reduced roll dampening and the dynamic handling, the flying and handling behavior of paraglider in this class requires advanced, precise skills along with the ability to fly instinctively and intuitively.

## Necessary skills for dealing with disturbances

The glider behavior in connection with disturbances requires somewhat higher skills than what is the case on LTF/EN A wings. The pilot must possess a certain amount of automated reactions and be able to react quickly to incidents. We recommend making sure that you have the skills to sense disturbances before they happen, and to deal with them correctly once they do. Of particular importance here are adequate skills for dealing with asymmetrical or frontal collapses. Should you not feel fully up to the task we recommend visiting a SIV clinic with your new wing

## Necessary skills for dealing with rapid descent methods

The behavior during maneuvers for rapid descents in this class can be demanding. The pilot should possess adequate skills for the safe execution of these rapid descent maneuvers. In case of insufficient skills or experience in this department we strongly recommend partaking in an SIV course with the new wing.

## Suitability for training

The UP K2[4] is suitable for the training of future tandem pilots who have already completed training as a solo pilot and who have already acquired the nationally valid requirements for training as a tandem pilot.

## Recommended weight range

The UP K2[4] should be flown within the stipulated takeoff weight limits, found in the “Technical data” section of this manual. The weights mentioned are total launch values, including glider, pilot, passenger, harness, all clothing etc. The easiest way to find your own total launch weight is to jump onto your scales with the complete backpack containing all your kit on your back, then weighing the passenger and adding the two numbers. The UP K2[4] responds to load changes by flying either marginally faster or slower, depending on whether you in- or decrease the load. The glide ratio in still air is not affected, and the minimum sink rate only insignificantly so.

## Operating limits

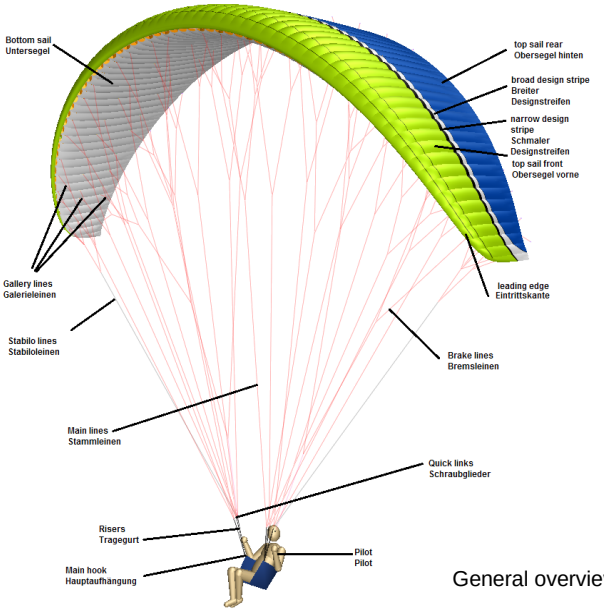
For the commissioning of the K2[4], compliance with the operating limits must be ensured for the entire duration of the flight, including preparation and follow-up. These are exceeded as soon as one of the following points applies:

- Flying with a number of seats that does not correspond to the certification
- Failure to comply with the respective upper and lower TOW
- Temperatures of more than -30° C or more than 50° C
- Flying in rain, snowfall, in clouds or fog or with a wet canopy for any other reason
- Impermissible modifications to the canopy, lines or risers
- Acrobatics and maneuvers with a bank angle of more than 90°
- Wind speeds at the take-off site and expected wind speeds in flight that are higher than 2/3 of the usable speed with the take-off weight intended for the flight
- Turbulent weather conditions that lead to extreme flight conditions outside the flight conditions tested in the certification

# Technical Data UP K2[4]

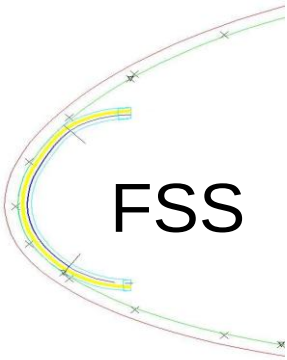
| Size | SM | ML |
|---|---|---|
| Surface area flat [m²] | 37,2 | 41,2 |
| Surface area projected [m²] | 31,8 | 35,2 |
| Flat span [m] | 14,2 | 14,9 |
| Projected span [m] | 10,9 | 11,5 |
| Flat aspect ratio | 5,4 | 5,4 |
| Projected aspect ratio | 3,8 | 3,8 |
| Number of Chambers | 52 | 52 |
| Total line length incl. Brake [m] | 253 | 269 |
| Total # of lines incl.Brake | 266 | 266 |
| Glider weight [kg] | 7,2 | 7,7 |
| Takeoff weight [kg] | 110-200 | 130-230 |
| maximum symmetrical steering travel at maximum weight [cm] | 65 | 65 |
| Accelerator travel [cm] | | |
| Number of risers (split A-risers) | 4+1 | 4+1 |
| Trimmer | Yes | Yes |
| Maximum trimmer travel [mm] | 80 | 80 |
| LTF/EN Category | B * | B |
| Description | Solo&Tandem | Tandem |

* pending




General overview

## Front Section Support




UP was first with the Aerofoil Stabilising System, an idea that has since been widely accepted in the industry. The K24 uses a modified version of the same, and we have chosen to call this the FSS. Instead of Mylar® the FSS comprises a Nylon® batten that defines the leading edge curvature and helps keeping the cell opening open at all times. This Nylon® batten is insusceptible to bending damage and has no ageing properties – it will normally outlast the rest of the canopy by a good margin. This means that the UP K24 will retain its perfect launching characteristics all through its service life. In the unlikely event that a batten should break it can be replaced in a few easy steps – please refer to the chapter "Replacing FSS battens" for guidelines.

## Canopy material

The K2[4] consists of a mixture of Porcher and Dominico fabrics:

| | |
|---|---|
| Top Sail Front/Leading Edge | Skytex 42 Everlast |
| Designs stripes small/wide | Skytex 38 Universal |
| Top sail rear | Skytex 38 Universal |
| Bottom sail | Dominico 20 DMF |
| Ribs, V-Ribs, H-stripes | Skytex 40 Hard |

## Line material

The lines used on the UP K2[4] are sheathed and unsheathed Dyneema®- lines made by Edelrid, Liros and Cousin in different diameters. Details can be found on the website in the current line plan.

## Line system

The lines of each wing section consist of four groups and the brake lines:

A-Level: Amain1, Amain2, Amain3
B-Level: Bmain1, Bmain2, Bmain3, STI
C-Level: Cmain1, Cmain2, Cmain3
D-Level: Dmain1, Dmain2, Dmain3
Brake lines : BRKI

The brake lines are collected at one main control line per side. This control line runs through a pulley attached to the C-Riser and is marked with a black dot at the point where it should be tied to the brake handle swivel. The brake is pre-set so that the glider is at 0 degree brake when the toggle is free. Please don't change the main brake lines without checking the new length carefully at a suitable training hill before flying! The line bundles (AI-II, AIII, B,C and D) are colour coded for easy identification and handling. All main lines of each level are looped together and attached to delta quick links, which are connected to the risers. The quick links have special line collectors to prevent lines slipping.

## Risers

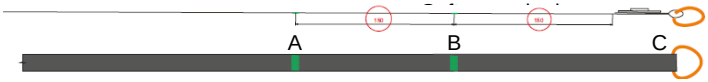
The split A and B risers are color-coded to ensure clear identification for take-off, big ears and when descending using the B-stall.

A / A3 riser: red
B-riser: black
C -belt: black
D-riser: yellow

UP has equipped the UP K2[4] with a newly developed riser with trimmers on D. This allows the angle of attack of the canopy to be changed. The trimmer setting is described in more detail in the chapter "Speed control using a trimmer".

## Soft spreader bar (optional)

Upon request, the K2[4] can be supplied with a height-adjustable soft spreader. This can be used to compensate the height difference between pilot and passenger. Therefore green markings are applied to the adjustment device at a distance of 150mm. By pulling on the red loop, the length of the distance between the pilot and the main suspension can be varied as follows:

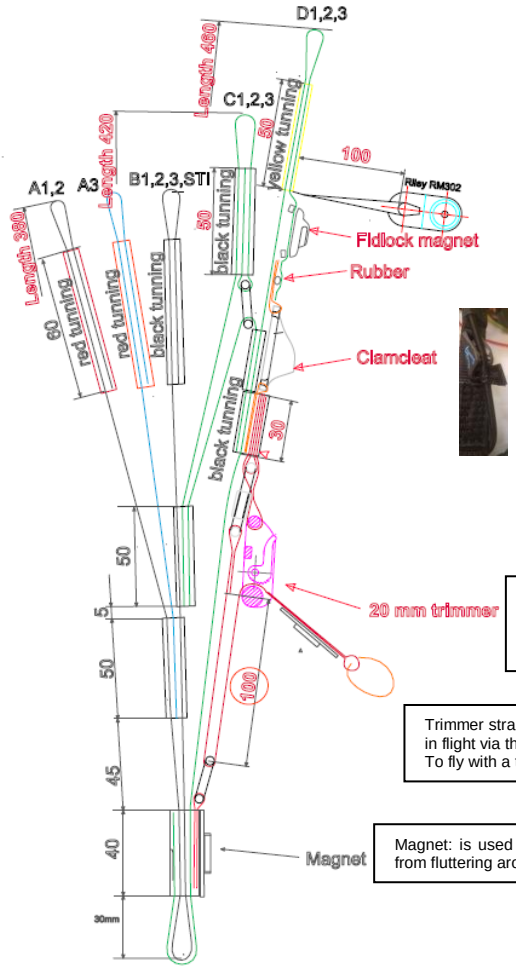




More details about the use can be found in the chapters below.

| Dimensions and adjustment range | Position C | Position B | Position A |
|---|---|---|---|
| Distance pilot (blue) - main suspension (red) - [mm] | 370 | 295 | 220 |
| Distance passenger suspension 1 (Green) - main suspension (red) | 320 | 320 | 320 |
| Distance passenger suspension 2 (Green) - main suspension (red) | 420 | 420 | 420 |
| Adjustment path of the height adjustment [mm] | 0 | 150 | 300 |

| Height difference Pilot - Passenger | | | |
|---|---|---|---|
| Height difference pilot suspension to passenger suspension 1 [mm] | - 50 | 25 | 100 |
| Height difference pilot suspension to passenger suspension 2 [mm] | 50 | 125 | 200 |




Fidlock: to fix the brake handles when folding the glider
Maximum load 15 dAN - only insert from below or loosen from below



Rubber / Clamcleat: The rubber is clamped into the clamcleat before the start in order to avoid the lines getting caught during the start
For big ears remove the rubber to fix the Am3-0 leash (for details see section "Big Ears")

Trimmer: to release the trimmer, press the clamp buckle with your thumb
To fly with a trimmer, see section "Speed control"

Trimmer strap: The trimmer can also be put on with gloves in flight via the red loop
To fly with a trimmer see section "Speed control"

Magnet: is used to fix the trimmer tape in flight to prevent it from fluttering around

| Riser length [mm] | SM, ML closed Trimmer | SM, ML open Trimmer |
|---|---|---|
| A I, II | 380 | 380 |
| A III | 380 | 380 |
| B I, II, III, STI | 380 | 380 |
| C I, II, III | 370 | 420 |
| D I, II, III | 360 | 460 |
| Trimmer Travel | | 100 |
| Measurement with 5dAN on each riser - tolerance +/-5mm | | |

Risers of UP K2[4]

# Before the first flight

The UP K2[4] is delivered with an inner bag and compression strap and repair material. The manual must be downloaded from the UP website. Every K2[4] delivered has been minutely checked at the factory, and corresponds exactly to the wing certified by DHV.

**ATTENTION!** The K2[4] must be test-inflated on flat ground, and the first flight must be carried out by a professional, before the wing is delivered to its new owner.

## Adjustments

The UP K2[4] has undergone an extensive development program and series of flight tests to ensure that the production model exhibits the optimum characteristics with regard to safety, handling and flight performance. As with all products from UP International, the UP K2[4] is manufactured to the highest quality and precision. The line lengths of each glider are individually checked and recorded before dispatch. Under no circumstances should the lengths of the lines or risers of the UP K2[4] be altered in any way.

**WARNING!** Any change to the configuration of the wing will invalidate certification! The only change allowed is to the length of the lower brake line. This should only be done by an experienced person.

## Position of the brakes

The UP K2[4] 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 wraps the brake line. If you do feel the need to change the brake line lengths, do so a little (3-4 cm) at a time, and preferably whilst at an easy training slope. Check especially that both lines are the same length, as any asymmetry will lead to tiring and possible dangerous flying characteristics.
If you have any questions or concerns with reference to the brake line lengths then seek advice from either your UP dealer or directly from UP International.

**BEWARE!** Loose or incorrect brake knots can cause serious accidents through loss of the steering of the glider!

## Suitable harnesses

The K24 can be flown with any harness with the main suspension point at around chest height. The lower the suspension points the more the harness will respond to weight shift.

The recommended distance between the karabiners depends on the pilot weight:

<50kg: 38cm

50-80kg: 42cm

>80kg: 46cm

These dimensions were also used during the EN/LTF certification flights. The harness design should also guarantee that it is possible to accelerate the UP K24 up to the maximum speed.

Please note that different harnesses can cause very different wing characteristics in extreme situations (like increased risk of twists with cocoon harnesses).

Note that the height of the hang point also affects the brake line length. If you have a question about your harness, contact your dealer.

## Rescue system

It is strongly recommended that you have a rescue system (reserve parachute) fitted at all times. In some countries it is mandatory, so check if you plan to travel. Make sure that the reserve system you have is the correct size, and that you are fully conversant with its use. For fitting the reserve system, follow the instructions of the harness manufacturer.

The rescue attachment line of the reserve parachute must be attached to the connection between the riser and the spreader bar in order to enable an emergency landing with the passenger as controlled as possible when the reserve parachute opens. When using the UP soft spreader, this is done using a quick link with a minimum breaking load of 2400 dAN, which is attached to the bottom of the main suspension. To do this, the connecting line to the harness is led through the neoprene cover on the underside of the spreader by opening the Velcro fastener. The mandatory two-seater rescue system must be attached in such a way that it cannot be unintentionally triggered by the passenger or the pilot. Furthermore, the instructions of the rescue system and harness manufacturer must be observed.


**WARNING!** Under no circumstances the rescue device may be attached on the pilot's harness only, since if the reserve parachute is deployed, the passenger swings under the pilot and is therefore exposed to an extreme risk of injury when landing.

## Use of the UP K2$^4$

The UP K2$^4$ has been developed and tested solely for foot launched and winch launched paragliding flights. It is not allowed and potentially dangerous to use the glider for any other purpose.

## Aerobatics

The UP K2$^4$ has not been developed, tested or built for aerobatics use.

**WARNING!** The glider has not been certified for aerobatics. Performing aerobatics with the UP K2[4] or any other paraglider can be very dangerous. Doing aerobatics can induce flying configurations well beyond the tested flight envelope, and can lead to total loss of control. Aerobatics can also overload your glider and break it in flight.

## PPG

The UP K2[4] has not been tested for use with any kind of engine. If you wish to fly your UP K2[4] with an engine please get in touch with the manufacturer of the engine unit, with UP International GmbH and with the governing body for ultralight flying in your area, to check on certification of this configuration.

## Flying with passenger

The UP K2[4] is designed for two-seat operation. The size SM is also approved for single-seat operation. This paraglider is not approved for multi-seat (more than two people) operation.

All persons and items of equipment involved in flight operations must have the required certificates of qualification or approvals - especially for two-seater flying paragliders - in order to be able to guarantee safe flight operations. This applies to the pilot, passenger, both harnesses, rescue system and two-seater spreader.

Flying with a passenger is one of the most demanding tasks that paragliding has to offer. The pilot shares the fascination of paragliding with his passengers in a simple way. In addition to the technical and prescribed requirements (see above), he should also be aware of the responsibility for the passenger and take the individuality of each passenger into consideration. Those who meet these requirements will provide passengers with an unforgettable flight experience and share the joy of flying with them.

# Flight practice and safety

Both of the following chapters (Flight practise and Flight safety) describe fundamental aspects of flying paragliders. In no way do they substitute proper training, nor should any of the content therein be unknown to any pilot who has chosen to fly a paraglider like the UP K2[4].

# Flight practice

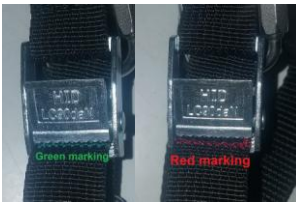
## Pre-flight check

Make sure whenever you get your UP K24 back from somebody else to check the glider very carefully if you are not the only pilot flying it. Ask if there was anything that could have damaged any part of the glider, if the pilot has found any part that needs to be replaced or if they noticed any strange flight behaviour. Make sure you do the same when you lend your glider to somebody else. A thorough pre-flight inspection should be performed prior to each flight. A careful pre-flight check is a must for any and all airplanes – also the UP K24 . Please apply the same care and attention before EVERY flight!
Before every launch you should carry out the standard 5-point checking procedure. It is a good idea to do the checks following the same sequence every time to minimize the risk of omitting something.

1. Unpack and arrange your glider in a semi-circular manner. This shape ensures that the centre cells inflate before the tips. When unfolding your glider, observe the wind direction and arrange your glider so that it is pointed directly into the wind.

2. The lines must be arranged so that there are no tangles and the A-lines are uppermost. Once the lines are free and untangled, check to make sure that they all go directly from the riser to the glider without going over the top of the wing. Launching with a line over the wing is extremely dangerous! It is also important that the brake lines are free and not tangled.
3. The seat of the rubber in the clamcleat (see picture on page 11) must be checked. This prevents unintentional tangling of lines.

   The trimmer is closed for takeoff on a hill. The green marking can be seen on the clamp and all risers are the same length. For winch towing, it is recommended to open the trimmer (red marking). The glider is then 50% accelerated.



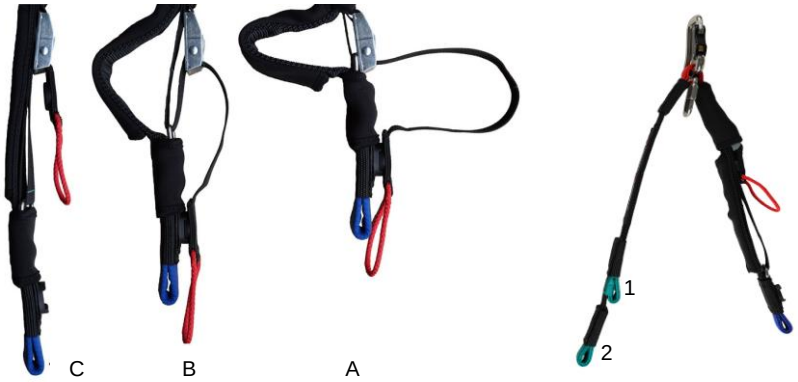

4. Next check that you have put the harness on correctly, and ensure that both leg straps and the chest strap are closed and adjusted. Also check the rescue system pins and deployment handle. Check also the harness of the passenger and the correct attachment of the spreader bar.
5. Right before the launch you should check the air space (also behind you).
6. Once again check the wind direction before take-off.

## Attachment to spreader bar

The UP K2[4] was tested and approved together with the K2[4] tandem spreader (soft spreader). When using other, untested tandem suspension systems, both the flight behavior and the behavior in extreme flight positions can change significantly.

### Soft spreader bar

When using the UP soft spreader, the difference in size between passenger and pilot can be compensated by using the adjustment strap.




The adjustment range varies between -50 mm when passenger is connected to passenger suspension # 1 and adjustment strap is in position C (fully opened, use this setting when the pilot is smaller than the passenger) and +200 mm when passenger is connected to passenger suspension # 2 and adjustment strap is in position A (fully closed, use this setting when the pilot is significantly taller than the passenger). After adjusting the strap, make sure the loose part of the webbing is attached to the pilot suspension with the magnet and the clamp buckle is closed tight. You can check this by pulling on the adjustment lever of the clamp buckle.

**WARNING!** Please note that the karabiner suspension points must be used correctly. Failing to do so will cause risk of injury. The correct suspension points are marked with colours to avoid confusion. Never connect the karabiners to the spreader bars outside the designated suspension points. The bar is not designed for it and it may lead to material failures due to unintended distribution of forces.

## Take-Off

The take-off characteristics of the UP K2[4] are extremely straightforward. Only a gentle forward pressure on the inner A risers is necessary and the glider will inflate evenly and climb above your head. The glider has no tendency to hang back behind you or to overshoot over your head.

With the A risers and the brakes in your hands, have another look at your unfolded glider. Make sure that you are centrally positioned in the middle of the wing, and that the wing is facing into wind. The middle of the canopy is marked by the UP logo at the leading edge.

Inflate the glider with a steady run and remember to position your arms so that they are a continuation of the A risers. As the glider comes above your head, you should glance up to see that the entire canopy is inflated and flying. The UP K2[4] has a low surge tendency, so there is usually no necessity to brake to stop the glider from over-flying you.

Directional control should only be attempted when the glider is above your head. Excessive braking will cause the wing to drop back. After checking that the wing is properly inflated apply slight brake pressure and accelerate rapidly down the hill. After a few steps you will reach flying speed and become airborne.

## Speed control

### Using the brakes

The UP K2[4] has a wide useable speed range, coupled with excellent stability at all speeds. The speed can be set with the brakes to optimise performance in any situation.

Maximum glide speed is achieved with the brakes released completely, whereas minimum sink speed is with approximately 15-20cm of brake applied. Further braking will not improve the sink rate, but the brake pressure increases noticeably as the glider reaches minimum speed.

**BEWARE!** Flying close to the stall point is very dangerous and should be avoided. At speeds below minimum sink the danger of entering an unintentional stall or spin is increased dramatically.

### Using the trimmers

The UP K2[4] is equipped with trimmers on D risers.

Trimmer neutral: The neutral position is marked with a green marking on the trimmer webbing. We recommend this normal position for hill take-off and as normal flight position in light winds.

Trimmer open: Open trimmers and the associated higher speed are suitable in strong winds, winch towing takeoff, flying with big ears or light passengers. UP recommends to open trimmers for flying in the lower and medium weight range. With the red marking the glider is accelerated to 50%. The glider can be fully accelerated by opening the trimmer completely. This can be seen when the trimmer strap is completely relieved and the C / D risers have reached the maximum length.

**BEWARE!** Any unintended flying configuration (collapse etc.) will be aggravated by higher airspeeds. For this reason the trimmers should not be used, or used with great care close to the ground or in turbulent conditions.

## Turning

Die The UP K2[4] has been developed to meet the demands of tandem pilots. The brakes have been designed so that the first 10 centimetre of travel will cause a soft and direct turning, whereas larger movements will give the glider an agile and nimble feel.

Brake input and amount of weight shift induced will define the radius and bank angle on the UP K2[4], and will allow it to be controlled with ease. Using weight shift in combination with brake input will result in flat turns with minimum height loss and is in fact always the most efficient control method. The radius of the turn is then controlled with the brake line whereas the bank is controlled through weight shift.

If needed the UP K2[4] will turn very tight. To do this, apply some brake input on both sides, then release the outside brake whilst applying further brake on the inside – this will reduce turning radius to a minimum.

When brake input is increased beyond approximately 50% on one side, the UP K2[4] begins a fast and steep turn, which can be made into a steep spiral (refer to chapter heading "steep spiral").

## Landing

The UP K2[4] is easy to land. While pointing into the wind, the pilot should fly the wing fast until approximately one meter above the ground, and then apply both brakes completely. When landing in stronger wind, less brake is required. Landing from steep turns should be avoided due to the risk of an uncontrolled pendulum reaction.

## Winch towing

The UP K2[4] tows easily. There are no special techniques that need to be employed, but consideration should be given to the following points:

- It is recommended to open the trimmers 50% for towing (red marking, see previous sections). Doing this reduces the angle of attack during the tow so that the glider flies more above the pilots, as opposed to hanging back. It also makes inflating the glider easier.
- Especially when you are towing at an unknown field, make sure that you are fully aware of any local conditions and peculiarities. Ask the local pilots if you are at all unsure.
- During the launch, ensure that the glider is completely inflated and over your head before giving the 'start towing' signal. If the glider is not central over your head do not continue with the tow. Any corrections attempted through the brakes during this critical phase may result in the canopy deflating again, or in the tow progressing with a non-flying wing; if tow tension is applied when the glider is not correctly positioned then a 'lock out' or a stall could occur.
- Try to avoid large brake inputs until you are reasonably high. Emphasize weight shift if any course correction is necessary close to the ground.
- Do not try to climb steeply during the first part of the tow. Good airspeed is essential.
- Do not use a towline tension greater than 150 daN at any time during the tow.
- All persons involved with the towing operation should be suitably qualified and experienced. All equipment used should, where necessary, be certified, and a tow permit should be valid for the field being used.

### Attaching the towline release system

For tandem paragliders it is not necessary to use the tow-release adapter now recommended for solo towing. We recommend hooking into the passenger harness main karabiners, even if the harness is equipped with tow-release loops. For tandem towing these are placed too low and will result in an unsuitable load distribution, with the pilot/passenger being pulled too far forward.

## Flight safety

The development of high performance paragliders from square parachutes has meant vast improvements in speed, sink rate and handling. But, at the same time, it has also led to a requirement on behalf of the pilot for accurate, sensitive control and an acute anticipation of possible flying conditions. Any glider, whether beginner or competition class, may collapse in turbulent conditions and you must be able to react accordingly.

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A safe and efficient way to get used to your new paraglider is by practicing your ground handling skills. We suggest finding a suitable area, like a playing field, and with light to medium wind it is quite easy to practice inflating the glider and feel the reaction to brake input, b-line stall, collapses etc.

Before takeoff and whilst flying it is very important to anticipate any likely turbulence and fly accordingly. Look well ahead, and as well as looking for areas of likely lift, try and predict, and avoid, areas of sink and rough air. If you do find yourself in turbulence then look for the cause, and adjust your flight plan to avoid other similar places.

## Thermals and Turbulence

In turbulent air, the UP K2[4] should be flown with a little brake to increase the angle of attack and provide greater stability. While flying in strong or broken thermals, it is important that you concentrate on keeping the wing centrally above your head. Do this by allowing the glider to fly faster while entering a thermal, and by dampening the surge of the canopy while exiting the thermal by braking gently. Flying fast is useful for getting through sink or when flying into a headwind. The UP K2[4] possesses a high inherent stability due to its construction and design, however an active flying style in turbulence will help increase safety by preventing unnecessary collapses and deformation of the canopy.

## Getting down fast

All rapid descent manoeuvres should be practiced initially in smooth conditions with plenty of altitude before you need to use them 'for real'. It is important to distinguish between the three techniques, and to know the merits of each.
You should inform your passenger before the flight about all planned manoeuvres..
ahead, and as well as looking for areas of likely lift, try and predict, and avoid, areas of sink and rough air. If you do find yourself in turbulence then look for the cause, and adjust your flight plan to avoid other similar places.

**WARNING!** All other manoeuvres, such as full stalls and spins, should be avoided as fast descent techniques. They are not very efficient, and incorrect recovery can have dangerous consequences (as with any paraglider)!

## Steep Spiral Dive

A maximum sink rate of over 15 meters per second can be achieved in a steep spiral dive, but it is advisable to build up gradually to these sink rates when you first practice spiralling.

Getting the UP K2[4] into a spiral dive is very simple and has already been described in the chapter regarding turning. When entering the spiral it is essential to induce the turn gradually; if you apply the brake too quickly you may enter a spin. If this happens, release the brake immediately and let the glider recover before trying again. Keep a steady tension on the inside brakes and observe the increased angle of bank and sink rate. A little brake on the outer wing will help stabilize the glider at a high sink rate.

As the sink rates increase the inner (lower) wing tip will begin to deform; this is a design feature that improves the passive safety during the manoeuvre.

To recover from a spiral, simply release the inside brake. Do this gradually to prevent an uncontrolled steep climb caused by the excess energy built up during the dive. Be prepared for the glider to climb a little and to damp out the subsequent dive. Be warned that steep spiral dives are equal to high G loading on both you and your glider!

**WARNING!** Spiral dives with high sink rates expose the pilot and material to very high centrifugal forces – incidents caused by pilots falling unconscious during spiral dives are not unheard of. Approach this manoeuvre with caution. NEVER fly a spiral dive with BigEars engaged – this could lead to a catastrophic material failure!

## B- Stalls

To induce a B-line stall, start with minimum 50% trimmers opened accelerated flight (Red marker on the trimmer webbing). Reach up and take hold of both B risers, still with your hands in the brake loops, and pull down simultaneously by approximately 15 centimetres. The first few centimetres of travel will be quite hard, but as the glider settles into the stall so the effort becomes less.

The glider will drop back a little as it stalls, and then centralize over your head. With 15 centimetres or so of pull a sink rate of up to 9 meters per second can be achieved. With less pull you will get a decrease in sink rate. The B-risers should not be pulled beyond this point, as it may result in the canopy entering an unstable phase or going into a frontal rosette. Should you inadvertently have pulled too far down on the B-risers, simply release them a little again until the wing is again stable above you, showing the characteristic deep crease along the B-level and being fully stretched out span wise. Please note that the K2[4] has a tendency to flutter and the manoeuvre is very harmful for the material. The B-stall should only be established when any other fast descend method cannot be applied.

To recover from a B-line stall, the risers should be released abruptly and simultaneously. Doing so will allow the wing to re-inflate completely and resume normal flight. It is not unusual for the canopy to dive in front of the pilot as the wing regains speed, angles of up to 30-45° are not perfectly normal. In this phase the pilot should NOT engage the brakes!

**WARNING!** Releasing the B-stall too slowly or asymmetrically can lead to dangerous situations. Always practise manoeuvres under professional guidance and over water!

## Big Ears

This is the best quick descent method for tandem paragliding due to the gentleness of the manoeuvre – your passenger will be grateful!

To pull the ears in, reach up and get hold of the outermost A line (red small riser) on both front risers and pull them down, simultaneously, by about 20 to30 cm until the tips collapse. Keep these two lines in your hands, to prevent the wing re-inflating.

We suggest keeping the brake toggles in your hands while inducing Big Ears. The glider will remain fully steer-able through weight shifting during the manoeuvre. The sink rates will be around 2 to 3 meters per second.

For longer flying with big ears, the gray Dyneema line (Am3-0, see picture) can be inserted into the clamcleat. To do this, remove the protective rubber line inwards and lash the gray line in the clamcleat. To release the big ears, release the gray leash by pulling it downwards

Releasing the two A-lines will normally have the tips re-inflating on their own, otherwise light braking will assist the re-inflation. Do not perform other manoeuvres whilst using Big Ears, as the structure of the canopy could become overloaded.

Inducing large Big Ears on the UP K2[4] when flying near its lower weight limit requires great caution on the amount of brake input used, as it may deep stall in extreme cases. Should this happen use the recovery technique described in the 'Deep Stall' section.

# Flying outside the normal flight envelope

## Behaviour in extreme situations

The UP K2[4] is designed to be aerodynamically stable. However as with all paragliders extreme turbulence or piloting error may induce unwanted behaviour from the canopy. To ensure that you are able to handle these situations correctly we strongly recommend that you attend a safety-training (SIV) clinic, where you can learn to master your wing outside the normal flying envelope under professional guidance.

Safety training manoeuvres should only be practiced in calm air with sufficient altitude, and under the instruction of qualified instructors. We would like to use this occasion to once again remind you to never fly without a reserve parachute!

The manoeuvres and possible flight configurations described in the following may occur following a conscious effort on the part of the pilot, through turbulence or through pilot input error. Any pilot flying in turbulent air or making piloting mistakes may end up experiencing these flight configurations and therefore find themselves in danger, particularly if they are not adequately trained to master them.

**WARNING!** Mistakes during the execution of the following manoeuvres may seriously compromise the safety of the pilot.

## Collapsing the paraglider

As with all paragliders extreme turbulence may lead to the canopy partly or fully collapsing. This is normally not critical. The K2[4] will reinflate quickly and reliably and is easy to control during the incident.

### Asymmetric collapse

The UP K2[4] belongs to the new generation of paragliders that, as well as having very good performance, also exhibit a high degree of stability. Wing tip collapses can almost always be pre-

vented through active flying. Once an asymmetric collapse has occurred the pilot aims to maintain flying direction through weight shift and careful application of brake input on the open side.

If the open side is braked too much it may stall, and the wing will enter a spin – this is the classical recipe for cascading events (see the Spin chapter). In rare instances a wingtip may catch in the lines during asymmetric collapses (see Cravattes here below).

### Cravatte

Our test pilots have found absolutely NO tendency towards cravatting in all the test flights the K2[4] has been subjected to. But under extraordinary circumstances any paraglider may cravatte, and if this happens the pilot should know how to deal with the situation.

The first step is to STOP any rotation, or, if this is not possible, to slow down the rotation as much as possible – a cravatted wing that is left to its own devices may very quickly enter into a spiral dive of such vehemence that the pilot cannot stop the rotation any more. Once the rotation is under control the pilot attempts to free the cravatte by pulling on the (purple) stabilo line, perhaps in combination with pumping action through the brake lines.

If neither of these approaches work then the experts may decide to try either a full stall or a brief spin on the cravatted side – please note that these measures should ONLY be practised during an SIV training over water.

**WARNING!** Should the pilot be unable to control the rotation it is normally best to deploy the reserve parachute immediately. Uncontrolled and cravatted spiral dives are among the most dangerous canopy configurations in paragliding

### Full frontal collapse

A negative angle of attack occurring through turbulence or from simultaneously pulling down both A-risers results in a full frontal collapse of the leading edge of the canopy. The UP K2[4] will normally reinflate quickly on its own, but can be assisted through the application of a light double-sided symmetrical brake input.

## The stalls

When a paraglider flies through the air, a laminar and a turbulent airflow forms around the surface of the wing. When the laminar airflow along the top surface is interrupted, dangerous flight configurations follow – we say that the wing stalls. This is most often the consequence of attempting to fly with too high angle of attack. In more detail we differ between three different forms of stall.

**BEWARE!** Spin and full stall are both dangerous and somewhat unpredictable manoeuvres. Do not stall or spin your paraglider on purpose. However it is very important to learn how to recognize the symptoms of a glider about to stall or spin so that you can take correct action to avoid it happening.

### Deep Stall

The UP K2[4] has no inherent tendency towards deep stall. It will recover from a deep stall brought about by over braking, by pulling on the rear risers, or by releasing the B-risers too slowly after a B-stall, on its own without any pilot input as soon as the brakes or the risers are released.

Should you however find yourself in a deep stall (as described above this could happen through flying too light on the wing and pulling big ears) the situation can be rectified by simultaneously pushing both A-risers forward until the glider resumes normal flight. Avoid applying brake to one side if you think that you are in a deep stall as this could lead to a spin.

Always remember that practicing manoeuvres where you fly close to minimum airspeed must only be carried out under professional supervision and with plenty of altitude.

## Full Stall

Wilfully induced full stalls remains the realm of the true experts of our sport.

The full stall is when there is no more laminar airflow along the surface of the canopy, and the wing has gone from being a wing to being just a bunch of material at the end of some lines.

Once the airspeed has been reduced to below the minimum speed for the canopy the wing will stall. To the pilot it feels like dropping backwards, not unlike the sensation felt when a jester removes your chair from under you when you sit down. In this phase it is important to avoid releasing the brakes again, as this may lead to uncontrollable shooting forward of the canopy. In extreme cases pilots have fallen into the canopy through poor timed full stall releases.

In the next phase the canopy stabilises somewhat above the pilot again. The wing tips will often tend to try to reinflate quite violently, and it requires considerable force to maintain the wing in the stalled configuration.

It is important to stabilise the wing above the pilots' head before releasing the brake lines. The pilot accomplishes this by slowly releasing the brakes until the wing is all but reinflated across the entire span. In this phase the wing will be moving somewhat along the cross axis. The pilot attempts to release the last bit of brake input as the wing is surged forward – this will cause the wing to resume flight with the least possible diving tendency. Pilots should note that timing the release wrongly may cause the wing to dive quite aggressively and be prepared to catch the dive.

Test pilots have also tested the asymmetric release of full stalls on the K2[4]. This manoeuvre is ONLY for reference and should not be emulated by owners.

**CAREFUL!** The approach of the minimum speed is recognised through the notable lack of forward speed and thereby winds noise and the extreme increase in brake line tension. Up until the wing starts to fall back the pilot may resume normal flight by simply releasing the brakes.

## Spin

The negative spin occurs when one side of the wing is stalled whilst the other is still flying. This can happen when, if flying very slowly, one brake is pulled quickly to below the seat. When the glider starts to spin, it will turn quickly around the vertical axis, with the stalled side flying backwards. To recover from a spin, simply release the brake on the stalled side. The glider will immediately speed up and, most likely, suffer an asymmetric collapse. Recover as described above.

If you suspect that a spin is imminent then immediately release the inside brake. The glider will accelerate smoothly and resume normal flight with little altitude loss.

# Wingovers

Wingovers are induced by flying alternating turns; each time letting the pendulum effect increase the bank angle.

**BEWARE!** The UP K2[4] is a 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. Also notice that a wingover flown with more than 145 degrees bank angle is classified as illegal aerobatics in some countries!

## Emergency Steering

If for some reason the UP K2[4] cannot be controlled with the brakes, for example if the brake handle has come off the main brake line, it can be steered and landed with the rear risers. Be aware that, when rear riser steering, the glider is a great deal more responsive to pilot input, and the stall happens very suddenly.

## Further references

### Rain-induced deep stall

There are two reasons why flying with a wet wing increases the risk of deep stalling:
irst reason: A paraglider flying in heavy rain will soon grow significantly heavier and thereby undergo changes in the centre of gravity and the angle of incidence. This may lead to deep stalls. Note that older wings will absorb more water than newer ones due to the coating on older wings being more permeable – this means that the critical mass may be reached sooner on older wings.
Second reason has to do with the actual rain drops on the top surface – if enough large rain drops form that the entire top surface is covered, but they don't join together to either flow off or become a homogenous mass, the surface will become so rugged that the airflow separates and the wing stalls. This phenomenon has been observed on hang gliders and gliders for years but only recently have we discovered that paragliders may also be affected. It is more likely to happen with new wings where the cloth is still highly hydrophobic and the drops thus do not penetrate but remain on the surface. We know from computer simulations and practical tests that this is physically possible but we also suspect that it occurs very seldom in real life flying.
In both cases the brake line travel becomes very short and even small input may suddenly induce an airflow separation; in some cases even a gust or a sudden thermal may change the angle of incidence enough to cause the deep stall. 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 BigEars or B-stall, and that you steer clear of turbulence and avoid a deep flare on landing.

**WARNING!** 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!

### Adhesive logos

Always make sure that your intended logo will not in any way influence the glider behaviour. If in doubt we suggest avoiding the attachment of advertising logos on the wing. UP cannot be held responsible for any mishaps caused by intentional after-sales changes done to the wing.

**NOTE!** The use of heavy and/or unsuitable sticky material for logo work on the canopy may compromise the certification and lead to the aircraft becoming unsafe to fly

### Overloading

The UP K2[4] is a very strong paraglider, and flying all the usual SIV and acro manoeuvres will not normally pose a structural problem. However, frequent acro training does accelerate the ageing process dramatically, and UP recommends having wings that are often used for acro or SIV-type manoeuvres subjected to checkups at shorter intervals than normally stipulated.

### Salt water

If you do most of your flying near the sea, where the air is humid and salty, the wing will age faster. In this case we suggest you have it checked more often than prescribed in this manual.

# Maintenance and cleaning

## Taking care of your paraglider

The wear and tear that your paraglider suffers depends on a number of factors; how frequently it is flown, whereabouts in the world you fly it, how much UV it gets and how well you look after it. Bear in mind the following maintenance points.

### Packing the wing

The FSS battens are insusceptible to bending damage. This means the K2[4] may be folded as per pilot preference in the spanwise direction. The pilot may opt to fold the wingtips towards the centre, to fold along each cell wall, or to use the now ubiquitous accordion method (see illustrations). Regardless of pilot preference we recommend alternating the packing methods a little every time, especially around the middle of the canopy, as this area is particularly exposed to mechanical abrasion in the folding process.





## Paraglider fabric

We use a top grade polyamide fabric to build our paragliders. The fabric has a special protective coating against UV radiation and air permeability. The fabric may suffer if it is exposed to large amounts of UV radiation (i.e. bright sunlight). Do not leave your glider lying in the sun for any longer than absolutely necessary, only unpack and rig right before launching and do yourself the favour of repacking right after landing. Modern paraglider textiles have improved much in terms of UV durability but UV exposure remains the deciding factor of a paragliders' life expectancy. First the colours start to fade, then the coating and the structural integrity of the synthetic fibres begins to deteriorate.

On UP gliders the coated side of the cloth is facing inwards. This means that the coating is subjected to less mechanical abrasion while the porosity-limiting capabilities remain the same

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 it lies on the ground.

Never step on your glider – stepping on it will weaken the cloth, especially if the surface beneath it is hard or contains sharp objects. We recommend keeping an eye on spectators on launch. Many, especially children, do not fully appreciate the fragility of the lines and cloth. It is usually easy to explain this to spectators and parents.

When folding your wing please make sure that there are no insects caught inside. Many insect species contain acids that could damage the cloth. Grasshoppers may use their sharp mandibles to attempt to gnaw their way out of a folded canopy, making it full of holes in the process. Further they exude a dark and strong colourant that will stain the cloth if grasshoppers are packed inside. Shoo them off before packing. Note that, contrary to popular belief these particular insects are not attracted to any particular colours.

If the glider gets wet, then dry it as soon as possible, but not in direct sunlight! If you pack your wing away wet it may grow mildew and, if also subjected to heat, the fabric fibres may begin to decompose.

A new wing straight off the shelves 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. Also note that, in spite of it being a comfortable seat, the glider bag should not be used as such.

Should you accidentally put your UP K24 into seawater, rinse it out thoroughly with fresh water and dry it slowly in the shade (see Chapter Cleaning).

## Paraglider lines

The lines used on the UP K24 are high grade sheeted Dyneema® lines. Keep the following points in mind:

- The lines should be checked regularly for damage,
- Please take care to avoid abrasion and damage to the lines' protective sheeting,
- The lines should not be knotted or bent unnecessarily,
- The main brake line at the handle should not have too many knots. Each knot weakens the line,
- After any line over-stressing (tree landings, water landings and other extreme situations) all lines must be checked for condition and length and should be replaced where necessary,
- If any change in flying characteristics is noticed then the lines should be checked and possibly exchanged. Immediately send your wing to UP International or to a UP certified checking facility if you feel that something is wrong!

### Storage and transport

A paraglider should always be dry when packed, but this is particularly important after the last flight of the season. But even a completely dry wing should still be stored open in a dry, clean and dark place. If you do not have room for such winter storage we recommend you open all compression straps on the bag as much as possible and leave the bag lid off so that air can circulate around the packed canopy. Make sure no mice or cats make their sleeping quarters in you wing, and keep it well distant from solvents and acids. Petrol and other petrochemicals is especially abrasive for nylon and will dissolve the cloth if allowed near.
The long-term storage temperature should remain approximately constant between 10 and 25 degrees Celsius, and the relative humidity between 50 and 75%.

Do not expose your UP K24 to extreme heat (storing it in the boot of a car parked in the sun). The heat may cause moisture to be pressed through the fabric, thereby damaging the coating. High temperatures in combination with moisture are a particularly volatile mix that will accelerate the hydrolysis process where the fibres and the coating are decomposed. The chemical composition of the canopy material may begin to change from temperatures as low as 60 degrees Celsius !

## Cleaning

If you feel it necessary to clean your UP K24 at any time then use lots of lukewarm water and a soft sponge. More stubborn stains can be cleaned with a weak soap solution, and rinsed thoroughly. Then leave it to dry in a shady but well-ventilated area.

**BEWARE!** 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. Also avoid dipping it in a swimming pool; the chlorine will damage the cloth. If you MUST rinse the parachute, e.g. following a sea water landing, do so with a gentle spray of fresh water. Frequent spraying will accelerate the ageing process.

# Checks and repairs

Repairs and periodic checks should ONLY be carried out by UP, or by UP approved checking centres. Failure to comply with this will forfeit the certification. Consult: www.up-paragliders.com under Service to find a check centre near you. At UP we invest our entire knowhow in paragliding into making the sport safer for you. We offer a variety of services all centred around safety to our customers. Small damages on the sail up to a size of 2 x 2 cm can be repaired by the pilot with the repair cloth that is delivered with any glider. The sticky cloth must overlap at least 2 cm to each side of the damage.

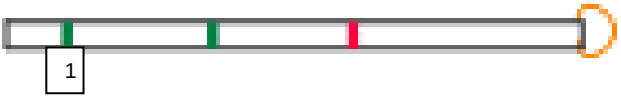
## Maintenance

All care and maintenance must be carried out in accordance with UP recommendations. To ensure that this happens we strongly advise you to only let UP recognised service centres touch your wing – this is also a prerequisite for the UP warranty to be valid. So there's a lot speaking for letting UP, or a UP affiliate, look after your K24!

### Change of trimmer webbing

The trimmer webbing can be replaced if they show the signs of wear and tear. A pair of replacement trimmer webbing is supplied with the K24. The worn trimmer strap can be removed after opening the rectangular screw shackle on the riser. The new trimmer tape is then to be guided through the clamping buckle and the rectangular deflector. Then the trimmer tape is turned over at

the outermost green marking (position 1, see picture) and must be sewn according to the old trimmer tape. Insert the resulting loop into the screw shackle. This exchange should only be carried out by an approved service company.




## Airworthiness Check

In Germany and Austria all paragliders must be checked according to the following time schedule:

- 2 years after the first flight
- Every 2 years after that, or sooner if prescribed by the UP checking facility during the last check
- After 150 hours of flying

These limits have been set by the legal regulations and make no less sense for wings flown outside of Germany/Austria. Contact your local dealer for information about the nearest UP approved checking facility. We will happily service the glider more often, if you feel that it is necessary.

**CAREFUL!** If you notice new or unusual behaviour from your wing please hand it in for immediate inspection at a UP Service centre.

## UP Craftsmanship

In order to ensure that your UP K24 maintains its very high inherent performance and safety we highly recommend that you employ UP, or a UP affiliate, with any repairs or maintenance. Our service staff is trained and skilled, and knows the UP wings better than anyone.

## Spare parts

Your UP glider consists of many high-quality components. Only original parts may be used for replacing (lines, risers, cloths, etc.). In addition to maintaining the airworthiness of your paraglider, this is also of great importance for your safety. Following spare parts can be ordered by your dealer:

- Complete risers or their components such as clam cleat, trimmer webbing, snap lock or magnets, quickl links, O-rings, buckles, brake handles
- Single lines according tot he line plan
- Fabric or sticky cloth in original colors

# UP Warranty

Conditions and extent of the UP International Warranty can be found in the following pages. For further information please ask UP International directly, or you local representative. The UP importer in your country is always delighted to clear any questions with you.

## National warranty conditions

In some countries the local laws stipulate different warranty rules than those outlined here. Please note that these local rules only apply in the country where you have purchased your wing. Information about local rules and conditions are available from your local dealer.

## International UP warranty

**Warranty conditions:**

The international UP warranty covers material- and workmanship faults and is valid for 24 months from the delivery date. The UP warranty covers the cost of materials and workmanship on gliders accepted by UP to fall under the warranty. The UP warranty does not cover damage caused by accidents, or by changes made to the glider. Likewise, parts that are damaged due to normal wear and tear are exempt from warranty coverage. Fabric colour changes that do not influence the behaviour or safety of the wing are not covered by the warranty, and neither are faults caused by the exposure to solvents or salt water, or plain incorrect handling of the wing.

**For any warranty claim to be accepted the following conditions must be adhered to:**

- The paraglider was used under normal circumstances and was maintained according to the instructions given by UP International. Note that these include instruction for the correct packing, storing and cleaning.
- The paraglider was only used in accordance with its EN/LTF certification.
- A complete logbook showing all flights, with duration and location, must be presented upon request.
- Only original UP spares have been used, and only UP, or a UP affiliate service centre, has performed repairs or service jobs on the paraglider
- Glider has been registered within 14 days under: http://www.up-paragliders.com/en/service/product-registration

UP reserves the right to refuse any claims not honouring one or several of these conditions. However, in some cases an “ex gratia” settlement may be offered.

## Checking the UP K2[4]

According to German and Austrian aeronautical legislation (§ 14 Abs. 5 LuftGerP) the owner of a glider can check the airworthiness by his own, or authorise a third person (for example manufacturer/importer) to do this. To perform your own airworthiness check, UP International must give you a briefing. This briefing could be done after an agreement with UP International and is only valid for the UP K24. The owner gets the so-called "Nachprüfanweisung" after completing a successful checking at UP International.

Should the owner decide to check the wing by himself, or employ a 3rd party to do so, they must make sure that UP’s guidelines are adhered to. Failing to do so will void the certification.

UP International highly recommends that you let the manufacturer/importer or an accepted service company do the check of airworthiness.

## Sending the UP glider and other UP products

The best way to send your paraglider, rescue parachute, harness etc. to our service team is in a stable box. Please append the goods delivery form from the website. Should you require any further information about the services we offer, please contact us at the address and phone number below. We are also able to give you information about your nearest Authorised Service Centre, as well as other manufacturers who are authorised to check and repair UP gliders and equipment.

UP International GmbH
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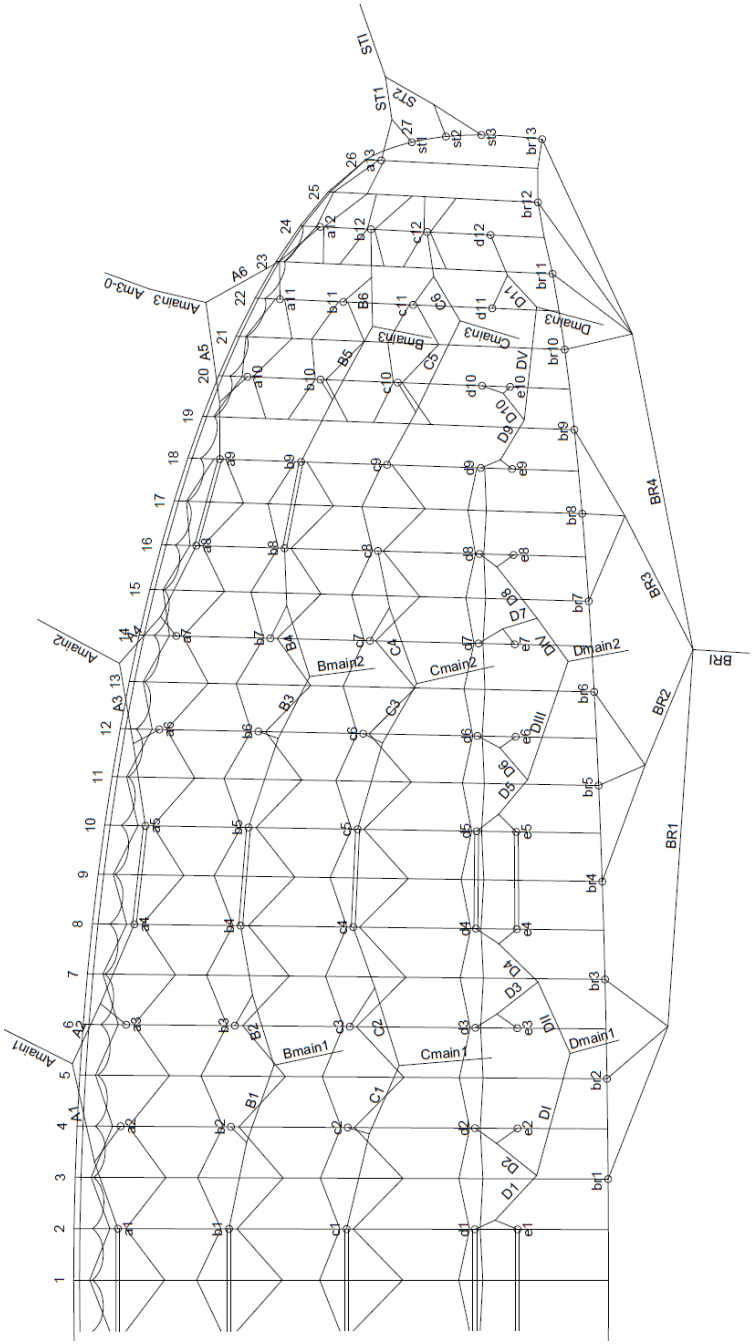
D-82467 Garmisch-Partenkirchen
GERMANY
Email: info@up-international.com Phone: +49 (0) 88 21-7 30 99-0

## Attachment

### Line map



## K2[4] ML revision 4 single line lengths

| Name | 3d Length | Loops length | Cutting length | Material | Colour | Loop protection (on the top end of main lines) |
|---|---|---|---|---|---|---|
| a1 | 1364 | 200 | 1564 | 6480/D-130 | Yellow | |
| a2 | 1265 | 200 | 1465 | 6480/D-130 | Yellow | |
| a3 | 1243 | 200 | 1443 | 6480/D-130 | Yellow | |
| a4 | 1301 | 200 | 1501 | 6480/D-130 | Yellow | |
| a5 | 1243 | 200 | 1443 | 6480/D-130 | Yellow | |
| a6 | 1151 | 200 | 1351 | 6480/D-130 | Yellow | |
| a7 | 1110 | 200 | 1310 | 6480/D-130 | Yellow | |
| a8 | 1129 | 200 | 1329 | 6480/D-130 | Yellow | |
| a9 | 983 | 200 | 1183 | 6480/D-130 | Yellow | |
| a10 | 832 | 200 | 1032 | 6480/D-090 | Yellow | |
| a11 | 827 | 200 | 1027 | 6480/D-090 | Yellow | |
| a12 | 734 | 200 | 934 | 6480/D-090 | Yellow | |
| a13 | 496 | 200 | 696 | 6480/D-090 | Yellow | |
| | | | | | | |
| A1 | 2000 | 200 | 2200 | 7950-200 | Red | |
| A2 | 2000 | 200 | 2200 | 7950-200 | Red | |
| A3 | 2000 | 200 | 2200 | 7950-200 | Red | |
| A4 | 2000 | 200 | 2200 | 7950-200 | Red | |
| A5 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| A6 | 1850 | 200 | 2050 | 6480/D-090 | Yellow | |
| | | | | | | |
| Amain1 | 5500 | 260 | 5760 | 7343-420 | Red | + |
| Amain2 | 5500 | 260 | 5760 | 7343-420 | Red | + |
| Amain3 | 4900 | 260 | 5160 | 7343-230 | Red | + |
| Am3-0 | 600 | 260 | 860 | D-PRO 3mm | Grey | |
| | | | | | | |
| b1 | 1257 | 200 | 1457 | 6480/D-130 | Yellow | |
| b2 | 1157 | 200 | 1357 | 6480/D-130 | Yellow | |
| b3 | 1139 | 200 | 1339 | 6480/D-130 | Yellow | |
| b4 | 1205 | 200 | 1405 | 6480/D-130 | Yellow | |
| b5 | 1157 | 200 | 1357 | 6480/D-130 | Yellow | |
| b6 | 1074 | 200 | 1274 | 6480/D-130 | Yellow | |
| b7 | 1043 | 200 | 1243 | 6480/D-130 | Yellow | |
| b8 | 1074 | 200 | 1274 | 6480/D-130 | Yellow | |
| b9 | 934 | 200 | 1134 | 6480/D-130 | Yellow | |
| b10 | 799 | 200 | 999 | 6480/D-090 | Yellow | |
| b11 | 806 | 200 | 1006 | 6480/D-090 | Yellow | |
| b12 | 717 | 200 | 917 | 6480/D-090 | Yellow | |
| | | | | | | |
| B1 | 2000 | 200 | 2200 | 7950-200 | Blue | |
| B2 | 2000 | 200 | 2200 | 7950-200 | Blue | |
| B3 | 2000 | 200 | 2200 | 7950-200 | Blue | |
| B4 | 2000 | 200 | 2200 | 7950-200 | Blue | |
| B5 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| B6 | 1850 | 200 | 2050 | 6480/D-090 | Yellow | |
| | | | | | | |
| Bmain1 | 5500 | 260 | 5760 | 7343-420 | Blue | + |
| Bmain2 | 5500 | 260 | 5760 | 7343-420 | Blue | + |
| Bmain3 | 5500 | 260 | 5760 | 7343-230 | Blue | + |
| | | | | | | |
| c1 | 1265 | 200 | 1465 | 6480/D-090 | Yellow | |
| c2 | 1168 | 200 | 1368 | 6480/D-090 | Yellow | |
| c3 | 1151 | 200 | 1351 | 6480/D-090 | Yellow | |
| c4 | 1219 | 200 | 1419 | 6480/D-090 | Yellow | |
| c5 | 1191 | 200 | 1391 | 6480/D-090 | Yellow | |
| c6 | 1112 | 200 | 1312 | 6480/D-090 | Yellow | |
| c7 | 1084 | 200 | 1284 | 6480/D-090 | Yellow | |
| c8 | 1116 | 200 | 1316 | 6480/D-090 | Yellow | |
| c9 | 985 | 200 | 1185 | 6480/D-090 | Yellow | |
| c10 | 853 | 200 | 1053 | 6480/D-090 | Yellow | |
| c11 | 863 | 200 | 1063 | 6480/D-090 | Yellow | |
| c12 | 758 | 200 | 958 | 6480/D-090 | Yellow | |
| | | | | | | |
| C1 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| C2 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| C3 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| C4 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| C5 | 2000 | 200 | 2200 | 6480/D-130 | Yellow | |
| C6 | 1850 | 200 | 2050 | 6480/D-090 | Yellow | |
| | | | | | | |
| Cmain1 | 5500 | 260 | 5760 | 7343-230 | Yellow | |
| Cmain2 | 5500 | 260 | 5760 | 7343-230 | Yellow | |
| Cmain3 | 5500 | 260 | 5760 | 7343-190 | Yellow | |

| Name | 3d Length | Loops length | Cutting length | Material | Colour |
|---|---|---|---|---|---|
| d1 | 546 | 200 | 746 | 6480/D-090 | Yellow |
| d2 | 500 | 200 | 700 | 6480/D-090 | Yellow |
| d3 | 483 | 200 | 683 | 6480/D-090 | Yellow |
| d4 | 499 | 200 | 699 | 6480/D-090 | Yellow |
| d5 | 501 | 200 | 701 | 6480/D-090 | Yellow |
| d6 | 442 | 200 | 642 | 6480/D-090 | Yellow |
| d7 | 411 | 200 | 611 | 6480/D-090 | Yellow |
| d8 | 437 | 200 | 637 | 6480/D-090 | Yellow |
| d9 | 406 | 200 | 606 | 6480/D-090 | Yellow |
| d10 | 332 | 200 | 532 | 6480/D-090 | Yellow |
| d11 | 927 | 200 | 1127 | 6480/D-090 | Yellow |
| d12 | 812 | 200 | 1012 | 6480/D-090 | Yellow |
| | | | | | |
| D1 | 800 | 200 | 1000 | 6480/D-090 | Yellow |
| D2 | 750 | 200 | 950 | 6480/D-090 | Yellow |
| D3 | 750 | 200 | 950 | 6480/D-090 | Yellow |
| D4 | 800 | 200 | 1000 | 6480/D-090 | Yellow |
| D5 | 770 | 200 | 970 | 6480/D-090 | Yellow |
| D6 | 750 | 200 | 950 | 6480/D-090 | Yellow |
| D7 | 750 | 200 | 950 | 6480/D-090 | Yellow |
| D8 | 750 | 200 | 950 | 6480/D-090 | Yellow |
| D9 | 630 | 200 | 830 | 6480/D-090 | Yellow |
| D10 | 580 | 200 | 780 | 6480/D-090 | Yellow |
| D11 | 1850 | 200 | 2050 | 6480/D-090 | Yellow |
| | | | | | |
| DI | 2000 | 200 | 2200 | 6480/D-130 | Yellow |
| DII | 2000 | 200 | 2200 | 6480/D-130 | Yellow |
| DIII | 2000 | 200 | 2200 | 6480/D-130 | Yellow |
| DIV | 2000 | 200 | 2200 | 6480/D-130 | Yellow |
| DV | 2000 | 200 | 2200 | 6480/D-130 | Yellow |
| | | | | | |
| Dmain1 | 5550 | 260 | 5810 | 7343-230 | Yellow |
| Dmain2 | 5550 | 260 | 5810 | 7343-230 | Yellow |
| Dmain3 | 5550 | 260 | 5810 | 7343-190 | Yellow |
| | | | | | |
| e1 | 599 | 200 | 799 | 6480/D-090 | Yellow |
| e2 | 556 | 200 | 756 | 6480/D-090 | Yellow |
| e3 | 539 | 200 | 739 | 6480/D-090 | Yellow |
| e4 | 550 | 200 | 750 | 6480/D-090 | Yellow |
| e5 | 552 | 200 | 752 | 6480/D-090 | Yellow |
| e6 | 492 | 200 | 692 | 6480/D-090 | Yellow |
| e7 | 460 | 200 | 660 | 6480/D-090 | Yellow |
| e8 | 481 | 200 | 681 | 6480/D-090 | Yellow |
| e9 | 448 | 200 | 648 | 6480/D-090 | Yellow |
| e10 | 371 | 200 | 571 | 6480/D-090 | Yellow |
| | | | | | |
| br1 | 2062 | 200 | 2262 | 989/1.1 | Magenta |
| br2 | 1830 | 200 | 2030 | 989/1.1 | Magenta |
| br3 | 1764 | 200 | 1964 | 989/1.1 | Magenta |
| br4 | 1881 | 200 | 2081 | 989/1.1 | Magenta |
| br5 | 1733 | 200 | 1933 | 989/1.1 | Magenta |
| br6 | 1743 | 200 | 1943 | 989/1.1 | Magenta |
| br7 | 1670 | 200 | 1870 | 989/1.1 | Magenta |
| br8 | 1573 | 200 | 1773 | 989/1.1 | Magenta |
| br9 | 1591 | 200 | 1791 | 989/1.1 | Magenta |
| br10 | 1492 | 200 | 1692 | 989/1.1 | Magenta |
| br11 | 1369 | 200 | 1569 | 989/1.1 | Magenta |
| br12 | 1299 | 200 | 1499 | 989/1.1 | Magenta |
| br13 | 1269 | 200 | 1469 | 989/1.1 | Magenta |
| | 0 | | 0 | | |
| BR1 | 3700 | 200 | 3900 | 989/1.3 | Magenta |
| BR2 | 3450 | 200 | 3650 | 989/1.3 | Magenta |
| BR3 | 3450 | 200 | 3650 | 989/1.3 | Magenta |
| BR4 | 3450 | 200 | 3650 | 989/1.3 | Magenta |
| | | | | | |
| BRI | 3900 | 200 | 4100 | 989-2,1 | Red |
| | 0 | | 0 | | |
| st1 | 438 | 200 | 638 | 6480/D-090 | Yellow |
| st2 | 431 | 200 | 631 | 6480/D-090 | Yellow |
| st3 | 525 | 200 | 725 | 6480/D-090 | Yellow |
| | | | | | |
| ST1 | 900 | 200 | 1100 | 6480/D-090 | Yellow |
| ST2 | 900 | 200 | 1100 | 6480/D-090 | Yellow |
| STI | 6300 | 260 | 6560 | 7343-190 | Red |

**Service booklet**

# Glider- and pilot data

**Model:** **K2[4]**

Size: ❒ SM ❒ ML

Serial number:

Colour: _____

Date of purchase: _____

First flight date: _____

Dealer stamp and signature

**Pilot (1. owner)**

Name: _____

Family name: _____

Street: _____

Town: _____

Postal code: _____

Country: _____

Telephone: _____

Fax: _____

Email: _____

**Pilot (2. owner)**

Name: _____

Family name: _____

Street: _____

Town: _____

Postal code: _____

Country: _____

Telephone: _____

Fax: _____

Email: _____

**Pilot (3. owner)**

Name: _____

Family name: _____

Street: _____

Town: _____

Postal code: _____

Country: _____

Telephone: _____

Fax: _____

Email: _____

Please verify that your UP Service Centre has correctly filled in the form!

## 1st Service

Performed date: _____

Service jobs undertaken:

Assignment Nr.
Stamp

## 2nd Service

Performed date: _____

Service jobs undertaken:

Assignment Nr.
Stamp

## 3rd Service

Performed date: _____

Service jobs undertaken:

Assignment Nr.
Stamp

Please verify that your UP Service Centre has correctly filled in the form!

## 4th Service

Performed date: _____

Service jobs undertaken:

Assignment Nr.
Stamp

## 5th Service

Performed date: _____

Service jobs undertaken:

Assignment Nr.
Stamp

## 6th Service

Performed date: _____

Service jobs undertaken:

Assignment Nr.
Stamp