
Makalu 5

**Operating manual
and service booklet**

Serial number: _____

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Important

Where necessary, we use the following words and symbols to draw attention to important issues:



WARNING!

These instructions draw attention to dangers that can lead to injury or death if ignored.



CAUTION!

These instructions draw attention to dangers that can lead to damage to the paraglider or premature wear.



NOTE

This is a note that is considered helpful or additional information.

Welcome to UP

Congratulations on the purchase of your new UP Makalu 5. UP International is known worldwide for the development and production of first-class paragliders - paragliders that focus on maximum safety, optimum performance and top quality. UP wings are designed and developed based on the demands our customers place on UP products. We are therefore open to all suggestions and ideas for improvement from you. With your suggestions and constructive criticism, you can play an active role in the continuous development process of our products. We want to be able to provide you with the latest technical innovations for your UP paraglider and information about the latest developments at UP at all times. However, we can only do this if your glider is registered with us after purchase. Product registration also guarantees you preferential treatment in all service matters in the unlikely event of any irregularities. You can register your UP Makalu 5 online at:

<http://www.up-paragliders.com/de/service/product-registration>

If you have any questions, please contact your UP dealer or UP International directly:

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Have fun and enjoy your UP Makalu 5 - Your UP International Team

Safety instructions

Please read this manual before your first flight with the UP Makalu 5 to familiarize yourself with your new wing. The manual provides you with information about all the important features and characteristics of the UP Makalu 5, but is not a substitute for attending a flying school. Please pay particular attention to the following points:

- At the time of delivery, this paraglider corresponds to the type tested in accordance with EN 926-1: 2015, EN 926-2:2013+A1:2021 and LTF NFL HG/GS 2-565-20. Any unauthorized modification beyond the permissible adjustment options will result in the invalidation of the operating license!
- The use of this paraglider is exclusively at your own risk. Any liability on the part of the manufacturer and distributor is excluded.

- Every pilot is responsible for their own safety and must also ensure that the aircraft they are flying is checked for airworthiness before every take-off.
- We also assume that the pilot is in possession of the required certificate of competence and complies with the applicable legal regulations.

Nature and landscape-friendly behavior

Paragliding is a very natural and environmentally friendly sport. For this reason, respectful treatment of the environment should be a matter of course for every (paraglider) athlete. When practicing our sport, care must be taken to protect nature and the landscape. We therefore ask you not to make noise, not to go off the marked hiking trails and not to leave any garbage behind in order to preserve the ecological balance of our nature for our children. Please inform yourself before each flight about the valid nature conservation regulations in the respective flight area or on the planned flight route in order not to unnecessarily annoy hunters, landscape conservation authorities and landowners.

Technical description

The UP Makalu 5 was developed by UP International to meet the special requirements of a safe intermediate performance paraglider with excellent launch characteristics and a remarkable performance spectrum. Like all UP products, all materials used are of a high quality standard. To ensure a long service life, they are carefully selected and subjected to extensive testing before use. Further details of the design and dimensions, including the dimensions of the lines of the UP Makalu 5, can be found on the type approval data sheet or in this manual. Any technical changes can be found in the appendix to this operating manual or on our website

Intended use

According to LTF-HG/GS 2-565-20, the Makalu 5 can be used as a "light aircraft" with an empty mass of less than 120 kg in the paraglider category

LTF and EN classification

The UP Makalu 5 was classified in the final classification in EN 926-2:2013+A1:2021 / EN B.

Target group and recommended flying experience

The UP Makalu 5 is suitable both for pilots after training and for advanced pilots who are looking for a wing with high passive safety but high performance.

Requirements in normal flight

The flight and control behavior of paragliders in this class requires mastery of the basic flight techniques taught in the A-license flight training. Mastery of the basic techniques of active flying is required for safe thermal flights.

Requirements in the event of malfunctions

The behavior of the device after malfunctions does not require above-average skill and reaction speed on the part of the pilot. However, the basic knowledge of pilot behavior to avoid and control malfunctions must be available. With a higher load, a correspondingly higher dynamic response can be observed.

Requirements for rapid descent

Flight maneuvers, such as spiral dives or B-stalls, place higher demands on the pilot due to the overall more demanding control characteristics. Good practical knowledge of these maneuvers should be available. If this is not the case, special instruction on the respective glider type is recommended, ideally in a safety training course.

Suitability for training

The UP Makalu 5 is generally suitable for training, unless national regulations require the use of an EN/LTF-A certified wing for the respective training section.

Tandem and paramotor license

The UP Makalu 5 is certified as a solo glider. Suspension is only provided for one harness. The UP Makalu 5 is not paramotor certified. There are no trimmers on the risers.

Recommended weight range

The UP Makalu 5 must be flown within the permitted take-off weight. This can be found under "Technical data UP Makalu 5". The weight refers to the take-off weight (pilot weight plus clothing, glider, harness equipment, etc.). The easiest way to determine your take-off weight is to stand on a scale with your rucksack and equipment.

UP International offers the UP Makalu 5 in five different sizes, each optimized for the medium weight range. Each size can be flown within the permitted weight range without any problems. To help you find the size that best suits your personal needs, here are a few practical tips.

Pilots who are within the middle third of the weight of a size are ideal when traveling. They should opt for this size. Within this weight range, they can center the thermals more closely and fly the Makalu 5 with slightly less dynamics. This version of the UP is particularly recommended for pilots from the lowlands.

Pilots who can choose between two sizes because they are either in the upper third of a smaller size or in the lower third of a larger size should proceed as follows: Experienced LTF/EN B pilots should assess for themselves how they prefer to travel, with a buffer upwards or loaded high.

Pilots who prefer a high wing loading should fly the UP Makalu 5 in the upper weight range. This makes your Makalu 5 a little faster and more dynamic.

The UP Makalu 5 reacts to weight changes with a slight increase or decrease in trim speed, with hardly any effect on glide performance. The size can therefore be selected to suit your personal flying style.

Operating limits

For the commissioning of the Makalu 5, compliance with the operating limits for the entire flight duration, including preparation and post-processing, must be ensured. These are exceeded as soon as one of the following points applies:

- Flying with an incorrect number of seats
- Failure to comply with the respective upper and lower weight limits of the starting weight
- Temperatures of more than -30°C or more than 50°C
- Flying in rain, snow, clouds or fog or with a wet canopy for any other reason
- Unauthorized modifications to the canopy, lines or risers
- Acrobatic flying and manoeuvres with more than 90° bank angle
- Wind speeds at the take-off site and expected wind speeds in flight that are higher than $2/3$ of the achievable speed with the take-off weight intended for the flight
- Turbulent weather conditions that are expected to cause extreme flight conditions outside the flight conditions tested in the certification

Technical data of the UP Makalu 5

Size	XS	S	SM	M	L
Surface area flat [m ²]	20,8	23,1	25,3	27,3	29,1
Surface area projected [m ²]	17,8	19,8	21,6	23,4	24,9
Flat span [m]	10,5	11,1	11,6	12,0	12,4
Projected span [m]	8,3	8,7	9,1	9,5	9,8
Flat aspect ratio	5,3	5,3	5,3	5,3	5,3
Projected aspect ratio	3,9	3,9	3,9	3,9	3,9
Number of Chambers	46	46	46	46	46
Total line length incl. Brake [m]	256	270	283	294	303
Total # of lines incl.Brake	164	164	164	164	164
Glider weight [kg]	4,1	4,3	4,6	4,9	5,3
Takeoff weight [kg] with LTF/EN Category certified	55-75: B*	65-90: B	75-100: B	85-110: B	100-130: B
maximum symmetrical steering travel at maximum weight [cm]	60	60	65	65	65
Accelerator travel [mm]	130	140	140	150	150
Number of risers (split A-risers)	3 + 1	0	3 + 1	3 + 1	3 + 1
Trimmer	no	no	no	no	no
Description	Basis Intermediate				

* Certification pending

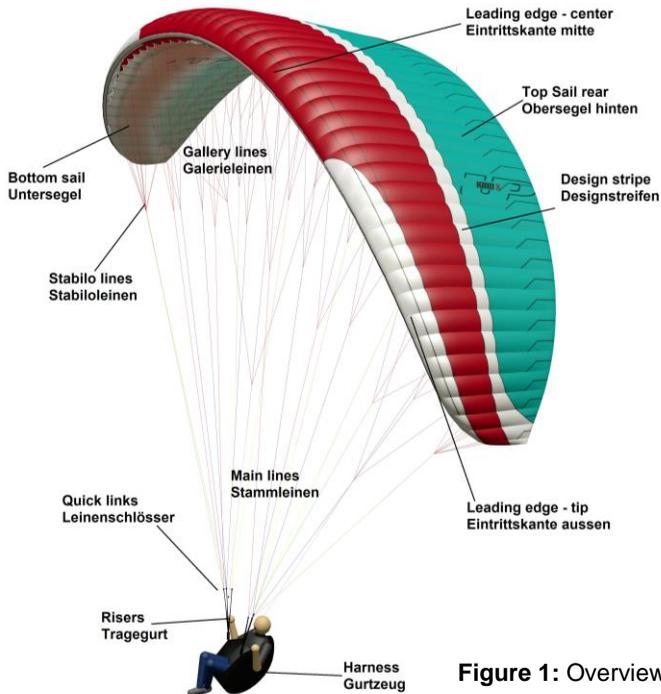


Figure 1: Overview

Construction

Our MSA (Maximum Suspension Airfoil) profile was used as the basis for the Makalu 5, which was developed for maximum passive safety and easy handling in all conditions. D3D (Double 3D panel shaping), i.e. individual, concave segments at the leading edge, reduce inflation and thus significantly improve airflow in the leading edge area. This significantly improves performance by reducing the induced air resistance. Air Intake Pockets (AIP), small pockets at the lower leading edge, keep the air intake dimensionally stable, which is particularly noticeable during accelerated flight. There are also miniribs (MRS) on the trailing edge to reduce inflation for maximum performance. Of course, all line diameters on the Makalu 5 are also optimized and the number of lines is limited to the minimum necessary to keep drag low. In addition, our brake tension system (BTS) ensures a clean trailing edge when centering the thermals and therefore better climb rates. If your wing has collected some dirt inside the canopy, you can easily remove it from the outside of the wing by opening the Easy Clean Pockets (ECP).

Sail material

- Topsail /bottom sail: Dominico D30
- Ribs/horizontal belts: Skytex 40 Hard Finish
- Secondary ribs: Dominico D30

Linen material

The UP Makalu 5 uses sheathed Dyneema® from Edelrid and Cousin.

Linen system

The lines of one half of the canopy are combined into three groups and the brake lines:

A-level: AI, AII, AIII

B level: BI, BII, BIII, STI

C-level: CI, CII, CIII

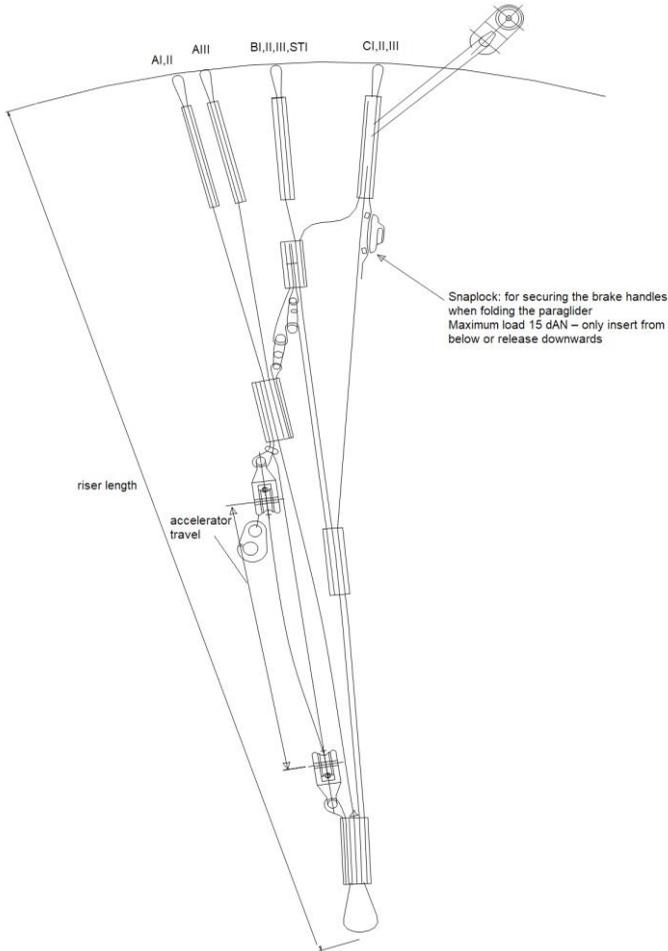
Brake lines: BRI

The individual brake lines are each connected to a main brake line. This main brake line is guided through a pulley on the C-riser. There is a marking on it at the height of which the brake handle is knotted. All main lines on one level are looped separately into line locks and connected to the risers. There are special line collectors in the line locks to prevent the lines from slipping.

Risers

The risers of the Makalu 5 are supplied in different lengths for XS, S/SM and M/L. This improves the ergonomics of the different sizes and facilitates manoeuvres such as take-off, big ears, B-stall, etc. in particular. It also optimizes the accelerator travel for different wing sizes. When the speed bar is activated, the length of the A- and B-

risers is changed at the same time. The largest change in angle of attack is achieved when the front upper speed bar pulley of the riser meets the lower speed bar pulley.



Riser length [mm]	XS	XS accel.	S	S accel.	SM	SM accel.	M	M accel.	L	L accel.
A I, II	475	345	495	355	495	355	520	370	520	370
A III	475	345	495	355	495	355	520	370	520	370
B I, II, III, STI	475	388	495	402	495	402	520	420	520	420
C I, II, CIII	475	465	495	487	495	487	520	510	520	510
Accelerator travel	130		140		140		150		150	

Figure 2: Risers

Accessories

The UP Makalu 5 is supplied with a FlexBag and repair material. The manual is available to download from the UP homepage. Every UP Makalu 5 is subjected to a precise routine test at the factory and checked for conformity with the test sample.

Before the first flight



CAUTION! The UP Makalu 5 must be inflated on a flat field before the first flight and a complete pre-flight check must be carried out (visual check for damage, check the line locks). The first flight should be carried out by a flying school or an authorized person before the glider is delivered .

Settings

During its development process, the UP Makalu 5 was adjusted by the test pilots and designers so that the series product has the optimum trim in terms of safety, handling and flight performance. Due to the high quality standard that UP International applies to all its products, all line and harness lengths are manufactured with the utmost precision. Each wing is fully measured and cataloged before delivery. The line lengths and riser settings of the UP Makalu 5 are extremely precise and must not be altered under any circumstances!



WARNING! Any unauthorized modification to the aircraft will invalidate the operating license! Only the adjustment of the brake handle position allows individual modification.

Positioning the brake levers

The UP Makalu 5 is delivered from the factory with a brake setting that offers optimal use for most pilots when flying. However, for very tall or short pilots and when using harnesses with high or low pilot suspension, it may be necessary to change the position of the brake handles.

If the brake setting is shortened, particular care must be taken to ensure that the UP Makalu 5 is not slowed down by brake lines that are too short when trimming and accelerating. In addition to a deterioration in performance and take-off characteristics, safety problems can also occur if the brakes are too short. There should therefore always be a "free travel" of a few centimeters to prevent the glider from braking unintentionally. It should also be noted that the brake already causes a pulling force due to its air resistance. If the brake setting is extended, it must be ensured that the pilot is able to reach the stall point without winding the brakes in extreme flight

situations and when landing. Changes to the brake travel should only ever be made in small steps (3 to 4 centimeters) and should be checked on the practice slope. Make sure that the left and right brake lines are set symmetrically! An individually correctly adjusted brake is the prerequisite for active and fatigue-free flying. If you have any questions about your body size and harness in relation to the brake settings, these must always be clarified before making any changes. Please contact a UP dealer or UP International directly for personal advice.

To prevent unintentional release of the brake handles, it is essential to ensure that the brake line knot is correctly designed and securely fastened.



Caution! Loose or unsuitable brake line knots can lead to serious accidents due to a temporary loss of controllability of the paraglider due to brake handles coming loose!

Acceleration system

Correct attachment and adjustment of the speed system is an important prerequisite for later smooth use in flight. The length should therefore be individually adjusted and the cable routing checked before the first launch.

The connection between the foot accelerator and the riser is made using special Brummel hooks or screw carabiners. The accelerator itself usually consists of one or more steps, two cords and two Brummel hooks. Starting from the steps, the two cords are pulled through the eyelets and pulleys provided.

If problems or questions arise regarding attachment and rope routing, you should contact the respective harness manufacturer.

Suitable harnesses

All tested and approved harnesses with a suspension point at about chest height are suitable for the UP Makalu 5. The lower the suspension point of the harness, the easier it is to steer the UP Makalu 5 by shifting your weight.

The recommended carabiner distance depends on the pilot's weight:

<50kg: 38cm

50-80kg: 42cm

>80kg: 46cm

The harness should ensure that the UP Makalu 5 can be accelerated to its maximum speed via the pulleys of the speed system (both Riley pulleys of the riser lie on top of each other).

It should also be noted that the relative braking distance changes with the height of the harness suspension. Please note that different harnesses can lead to different extreme flight behavior (e.g. increased risk of twisting with recumbent harnesses). If you have any questions or doubts regarding the use of your harness with the UP Makalu 5, please contact an UP dealer or UP International directly. We will be happy to advise you.

Harness dimensions for approval

Harnesses with the following dimensions are used for the type test:

Total weight	flight	Width: horizontal distance between the attachment points of the risers (measured from the center lines of the carabiners)	Height: normal distance from the attachment points of the risers (measured from the center lines of the carabiners) to the seat board surface
< 80 kg		40 +/- 2 cm	40 +/- 2 cm
80 - 100 kg		44 +/- 2 cm	42 +/- 2 cm
> 100 kg		48 +/- 2 cm	44 +/- 2 cm

Rescue parachute

Carrying a suitable rescue parachute is not only required by law in most countries, it is absolutely vital for the safe operation of a paraglider. When selecting a rescue parachute, make sure that it is suitable and approved for the intended take-off weight.

The prescribed rescue system must be attached in accordance with the manufacturer's instructions. The reserve parachute bridle is normally passed over the pilot's back and hooked into the shoulder strap loops.

Field of application

The UP Makalu 5 has been developed and tested exclusively for use as a paraglider for foot and winch launch. Any use other than the intended use is not permitted.

Aerobatics

The UP Makalu 5 was not built and tested for aerobatics. It is not suitable or approved for this purpose.



WARNING! Performing aerobatics with the UP Makalu 5 puts your life in danger. Performing aerobic maneuvers can lead to unpredictable flight attitudes as well as the risk of overloading the equipment and pilot!

Flight practice and flight safety

The following two chapters, Flight practice and Flight safety, describe basic aspects of paragliding. They serve to make this manual complete, but should be a matter of course for pilots who have decided to fly with a glider like the Makalu 5.

Flight practice

Pre-flight check

A thorough pre-flight check is required for every aircraft, including the UP Makalu 5. Please ensure that you carry out each check with the same care. The take-off check (five-point check) is necessary before every take-off. In order not to forget anything, it is advantageous to always do it in the same order.

1. The paraglider should be laid out in an arc so that when pulling up with the middle A-risers (red), the lines in the middle of the glider are tensioned slightly earlier than those at the wing tips. This ensures an easy and directionally stable take-off. When laying out the canopy, please note the wind direction so that both halves of the paraglider are filled symmetrically when pulling up into the wind and the canopy does not break out sideways.
2. Then carefully sort all lines and risers. Particular attention should be paid to the A-lines. They must run freely and without entanglement from the A-riser to the canopy. It is equally important that the brake lines are free and cannot get caught during take-off. Make sure that no lines run under the canopy. A line overthrow during take-off can have serious consequences.
3. Then make sure that all the straps on the harness are fastened. This should be checked from bottom to top in the same order by touching the respective buckles. Also check that the helmet is closed, the reserve parachute is attached (when using a front container) and the carabiners are secured.
4. Immediately before take-off you must check that the airspace is clear (also behind you).
5. The last step is to check the wind direction. If everything fits, you can take off.

Take-off phases

The Makalu 5 is characterized by very good launch behavior. Even a slight pull on the middle A-lines (AI, All - risers, red) is enough for the canopy to inflate evenly and immediately rise above the pilot. The Makalu 5 has no tendency to hang up during the inflation phase.

During the inflation phase, the pilot holds the middle A-risers (red) and the brake handles in his hands. A final check of the deployed wing is obligatory. The center of the Makalu 5 canopy is indicated by the UP logo on the leading edge. Careful deployment of the canopy according to the wind direction and a take-off run in line with the center of the canopy make the inflation phase easier.

The canopy is filled with a consistent and even pull. The arms are held slightly bent in extension of the A-lines. As soon as the pull on the canopy is released - the canopy is above you at this point - look up and make sure that the canopy is fully open above you. Depending on the initial impulse, wind strength and slope inclination, it may be necessary to brake the UP Makalu 5 slightly at the apex.

Any directional corrections with the brakes should only be made when the canopy is already above you, otherwise the glider could fall back again if the brakes are applied too hard.

The final decision to take off is only made at the end of the control phase. During the acceleration and take-off phase, you take off from the ground at an appropriate speed, which can be supported by controlled use of the brakes depending on the take-off terrain. After a swing-free take-off and reaching the safety altitude, take a seat in your harness without letting go of the brake handles. If you are unable to get into the upright sitting position without additional help, transfer the brake handles to one hand. Use your free hand to get into the desired sitting position.

Speed control

By means of brake lines

The Makalu 5 has a very high speed range combined with great aerodynamic stability. The speed can be adjusted using the brake lines so that the optimum performance and safety can be selected for every flying situation.

The Makalu 5 achieves its best glide speed in calm air when it is unbraked. If the brake lines are pulled up about 10 to 15 centimeters on both sides, the wing will sink as little as possible. If the pull on the brakes is increased further, the sink rate is no longer reduced, the steering forces increase noticeably and the pilot reaches the minimum speed.



CAUTION! Flying too slowly close to stall speed carries the risk of an unintentional stall or spin, so this speed range must be avoided at all costs.

By means of an acceleration system

The UP Makalu 5 is equipped with a very efficient acceleration system that is activated by a foot stretcher. When activated, this speed system increases the speed very effectively by around 11 to 13 km/h. Using the speed system is very useful in some situations and should be part of an active flying style.

If the speed is increased to the maximum via the leg extension, you can fly out of downwind zones faster, achieve a better glide angle in headwinds or still arrive against the wind. The action radius of the UP Makalu 5 increases considerably when fully accelerated and noticeably increases the performance potential that can be achieved. When using the speed system, it is important to ensure that the speed system is deactivated immediately in extreme flight situations or is not activated in extreme flight situations. The advantage of using the speed system is that fluctuations in lift and the resulting collapse of the glider can be detected by sudden differences in pressure on the leg extensions. If the pilot senses that the back pressure is suddenly reduced, the speed must be immediately reduced to trim speed in order to avoid possible collapses in advance.



CAUTION! All extreme flight conditions (e.g. collapses) are more dynamic at higher speeds. For this reason, the speed system should be operated

only a little or not at all in low ground clearance or very turbulent conditions.

Turning

By shifting weight, flat turns can be flown very well with minimal loss of altitude. A combined steering technique - weight shift and pulling the brake line inside the turn - is ideal for flying turns in any situation, whereby the radius of the turn is determined by the amount of brake line pulled. If it is necessary to turn the UP Makalu 5 in a tight space, it is advisable to control the pre-braked glider by releasing the outside brake line and pulling the inside brake line sensitively (opposite movement of the brake lines). From approx. 50 percent brake line pull on one side, the UP Makalu 5 takes a clear sideways turn and flies a fast and steep turn, which can be extended into a spiral dive (see chapter "Spiral dive").

Landing

The UP Makalu 5 is easy to land. From a straight, pendulum-free final approach into the wind, let the glider glide out at normal speed and then apply the brakes decisively and quickly at a height of about one meter above the ground. If there is a strong headwind, slow down accordingly. Landings out of steep turns and rapid turn changes before landing should be avoided due to the associated pendulum movements.

Winch towing

The UP Makalu 5 has no special features for winch towing. To ensure safe and accident-free towing, the following points must be observed:

- Unless you are towing on your "home winch", where you know both the towing winch and the towing area as well as the way of towing, it is absolutely necessary to familiarize yourself with the local conditions. Every "guest" at an unfamiliar flying site will certainly be instructed by the local pilots.
- When launching, make sure that the canopy is completely over the pilot before giving the launch command. Any directional corrections with the brakes should only be made when the canopy is already above the pilot, as otherwise the glider may fall back again if the brakes are applied too hard, or the glider may be dragged away when not yet airworthy.
- Under no circumstances should the launch command be given before the glider is fully under control. Strong directional corrections during the take-off phase and before reaching the safety altitude must be avoided.
- Make sure you descend at a flat angle from the start to the safety height.
- The UP Makalu 5 must not be towed with a towline pull of more than 90 daN.
- All persons and equipment involved in winch operation must be in possession of the relevant prescribed certificates of competence or approvals in order to ensure safe towing operations. This applies to the pilot, towing device, towing pawl and winch operator, as well as all other equipment for which a special certificate of operational capability is required.

Handle attachment for paraglider towing

The optimum towing point for the tow rope should be as close as possible to the system's center of gravity. In the case of a paraglider, the ideal pulling point is at the height of the riser attachments or directly on the risers. When using spreader bar pawls, the pawl/shackle distance should be sufficiently extended (cord or webbing) and the pawl must be secured with a hold-down rubber to prevent it from kicking back. The distance between the risers must not become narrower when using the ratchet attachment (risk of twisting)!



CAUTION! If towing with a chest container, it must be ensured before the first launch that the release of the reserve parachute is unhindered at all times. If this is not the case, you may only tow with a webbing release.

Flight safety

A development has taken place from the rectangular parachute to the low-drag high performance wing, which offers new flying possibilities, but at the same time demands a forward-looking and sensitive flying style from the pilot. Every wing, whether beginner or high performance, can collapse in turbulent conditions or if the pilot reacts incorrectly. This makes it all the more important to master the paraglider, have a feel for the controls and recognize natural processes.

Today, pilots can choose from a wide range of different types of UP wings. The main difference within the individual classes lies in the aerodynamic stability of the canopies. Beginner wings react less dynamically to disturbances and have a largely forgiving flight behavior, while high performance wings only allow a very small margin for pilot error. Choosing the right glider is therefore crucial for flight safety. Pilots should therefore self-critically check their skills and level of knowledge before deciding on a glider.

Ground training is a safe and effective method of familiarizing yourself with your new paraglider. On a suitable meadow and in light to moderate winds, control impulses can be practiced very well and glider reactions can be observed. Take-off can be practiced as well as flight manoeuvres (e.g. folding in the outer wings or other minor disturbances).

Before and during the flight, it is important to plan your route with foresight. Very little turbulence occurs suddenly, but has a causal origin. If you think about the day's weather conditions and the flying area in advance, you can avoid many dangers later on.

Flying in thermals and turbulent conditions

In turbulent air, the UP Makalu 5 should be flown with a light brake line pull. This increases the angle of attack and thus the stability of the canopy. When flying into strong thermals or torn thermals, make sure that the canopy does not lag behind the pilot. This can be prevented by loosening the brake line when flying into the thermal to pick up some speed. Conversely, the paraglider must be slowed down if the

canopy gets in front of the pilot by flying into a downwind area or flying out of a thermal.

Alternatively, experienced pilots can also use the C-risers to control the glider in thermals.

Flying faster is useful for crossing downwind zones. The UP Makalu 5 has a very high stability due to its design. However, an active flying style in turbulent air, as described above, contributes to additional safety. A collapse and deformation of the canopy can be largely prevented by an active flying style on the part of the pilot.

Descent aids

All descent aids should be practiced in calm air and at a sufficient height in order to be able to use them effectively in extreme conditions! There are essentially three different ways of safely and controllably increasing your descent speed.



WARNING! All other flight maneuvers, such as full stalls and negative turns, should be avoided as descent aids, as they do not achieve higher sink rates and incorrect recovery can have dangerous consequences regardless of the glider type!

Steep spiral

The highest sink rates of over 15 m/s can be achieved using the spiral dive. However, it is advisable to approach the high sink rates slowly.

Initiating a spiral dive is easy with the UP Makalu 5 and has already been described in the chapter "Turning". It is important that the transition from the turn to the spiral dive is flown slowly and steadily. If the brake lines are pulled too abruptly, there is a risk of spinning. In this case, the brakes must be released immediately so that the glider can pick up speed again.

The bank angle and sink rate are controlled by pulling and releasing the brake line on the inside of the turn. The brake on the outer wing can also be used to stabilize the canopy at very high sink rates.

The exit of the spiral dive is performed in the same way as the entry, slowly and steadily. The brake on the inside of the turn is released in a controlled manner. You can support the exit by braking slightly on the outside of the turn. Excessive oscillation can be prevented by controlled and soft counter-braking.

As the sink rate increases, the outer wing of the Makalu 5 deforms, which is intentional and improves safety in the spiral dive.

The pilot must know that high forces act on him and the material during a spiral dive with high sink rates.



WARNING! In spiral dives with high sink rates, very high forces can act on the pilot and material. The high centrifugal forces can cause the pilot to lose consciousness and lose control of the paraglider. This flight condition can have life-threatening consequences! Never fly a spiral dive with your ears up! There is a risk of overloading the paraglider, pilot and equipment

B-stall

The launch is made from an unaccelerated straight flight by pulling down the two B-risers (blue) quickly and simultaneously by about 20-25 centimeters. The pilot can keep the brakes in his hands. For the first few centimeters, a relatively high amount of force is required to pull the B-risers. Once the airflow at the top of the profile is largely torn away, the glider enters a stall-like flight state without forward motion. The surface area can be reduced and the sink rate increased by pulling the B-risers further. After approx. 25 cm the sink rate reaches its maximum at 7-9 m/s. The risers should then not be pulled down any further, otherwise the glider may become unstable or form a front rosette. If the B-risers have been pulled down too far, they must be released immediately so that the glider can return to a stable flying position and the B-stall can then be flown again. If you release the B-risers at the same time, quickly and without using the brakes, the glider will regain speed on its own and go into a stationary glide. It is normal for the canopy to pitch approx. 30-50 degrees in front of the pilot. The glider must not be braked during this phase! If the UP Rimo goes into a stall due to the B-risers being released too slowly, which is not normally the case, this is ended by a standard recovery (see the section on stalls in the description of extreme flight situations).



WARNING! An incorrectly executed B-stall can lead to dangerous flight conditions! Inexperienced pilots should practice this maneuver under supervision in a safety training course

Big Ears

After preparing the speed system, the outermost A-lines (AIII risers) on both sides of the line lock are pulled down simultaneously by approx. 20 to 30 centimeters, causing the outer wings to collapse. Hold the brake handles together with the pulled down A-risers in your hand. After folding in the outer wings, the angle of attack of the Makalu 5 should be reduced again using the speed bar. The glider remains fully controllable by shifting your weight and flies straight ahead at an increased sink rate (3-5 m/s depending on the number of folded cells and the use of the speed system). After releasing the A-lines, the pilot deactivates the speed system and the collapsed cells open automatically. If this is not the case, the flight condition can be actively exited by applying the brakes alternately and gently. No extreme flight maneuvers may be flown in this configuration!

If the UP Makalu 5 is flown at the lower weight limit, the canopy can enter a deep stall if the outer wings are folded in over a very large area and the brakes are applied. If this happens, which is not normally the case, the stall is terminated by a standard recovery (see the chapter on stalls in the description of extreme flight attitudes).

Extreme flight maneuvers

Behavior in extreme flight situations

Although the UP Makalu 5 has very high aerodynamic stability, turbulence or pilot error can lead to an extreme flight situation. The best way to react calmly and correctly in such a situation is to attend a safety training course. Here you learn to master extreme flight situations under professional guidance.

Extreme flight maneuvers should be performed in calm air, at sufficient altitude and only during safety training over water under professional guidance. We would like to draw your attention once again to the existing reserve parachute obligation.

The extreme flight maneuvers and flight conditions described in the following section can be caused either intentionally, by turbulence, or by pilot error. Any pilot who flies in turbulence or makes a mistake when controlling their paraglider can get into these flight conditions. All extreme flight maneuvers and flight conditions described here are dangerous if they are performed without adequate knowledge, without sufficient safety altitude, or without appropriate instruction.



WARNING! Incorrect execution of the flight maneuvers and flight conditions described here can be life-threatening!

Collapses

Asymmetrical collapse

As with all paragliders, strong turbulence can cause the UP Makalu 5 canopy to collapse. This is normally not critical. The UP Makalu 5 re-inflates quickly and reliably and can be easily controlled by experienced pilots. If the UP Makalu 5 collapses on one side, the pilot should stabilize and control the flight direction on the "healthy side" by adjusting the weight and applying the brake lines. If the wing is braked too hard on the intact half of the wing, there is a risk of a spin (see chapter Spins).

If the wing tip of the collapsed side of the paraglider threads itself between the lines after a very large collapse, large hang-ups can occur in extreme cases. (see the following sub-item).

Cravattes

During the extensive test phase of the Makalu 5, our test pilots were unable to detect any tendency to hang up. However, should a hang-up occur, the glider must be prevented from turning away **IMMEDIATELY** or the rotation must be slowed down . You can then pull on the specially marked stabilo line (orange) in an attempt to free the tangled end of the wing. Short braking impulses can also help to release the tangled wing tip.

Other maneuvers to release hang-ups are the "full stall" or "short negative turning of the wing". However, these maneuvers should only be practiced in a special safety training course.



WARNING: If you are unable to prevent the glider from spinning away, the rescue system must be activated **IMMEDIATELY!** Otherwise a very dangerous, uncontrolled spiral dive may occur. This flight condition can have life-threatening consequences - also for third parties!

Front stable

A negative angle of attack due to turbulence or the pilot pulling down the A-risers on both sides causes a frontal collapse of the leading edge. The UP Makalu 5 normally ends a frontal stall quickly and automatically. Short, even, light symmetrical braking on both sides can support the re-opening. Braking too hard can lead to a stall.

Types of stall

A laminar and turbulent boundary layer zone is always created as the air flows around the paraglider. Extremely dangerous flight conditions can occur if the laminar boundary layer separates, causing practically the entire flow on the upper side of the wing to break off. This mainly occurs at large angles of attack of the wing. There are three different types of stall in paragliders.



CAUTION! Spins and full stalls are dangerous and sometimes unpredictable flight maneuvers. They should therefore not be flown intentionally. Rather, it is important to know the beginnings of a stall so that it can be prevented by the pilot's immediate reaction!

Deep stall

The UP Makalu 5 is not sensitive to stalls. It will automatically end a possible stall caused by pulling the brake lines or the rear risers too hard, or by a B-stall that is too slow, as soon as the brakes or the rear risers are released. Should the UP Makalu 5 enter a stall due to a particular flight situation or configuration (e.g. too low take-off weight), this can be terminated by symmetrically pushing the A-risers forward on both sides. Flight exercises in which you intentionally approach a stall should only be carried out with sufficient safety altitude and always under professional guidance (safety training). If you think you have entered a stall, do not brake under any circumstances! This could result in a spin or a full stall.

Fullstall

Flying a full stall only makes sense for very experienced pilots. This is a complete stall. If the speed falls below the minimum speed, the airflow breaks off. The pilot and paraglider will accelerate backwards. Under no circumstances should the brakes be released in this situation, as a recovery will cause the canopy to shoot far forward. In extreme cases, the glider can accelerate to below the pilot and the pilot can then fall into the canopy. After tipping backwards, the canopy forms a rosette and the outer wings begin to flap. These flapping movements are transmitted to the pilot via the brakes. A great deal of force is required to keep the canopy in a stalled position.

Before releasing the full stall, the canopy must be stabilized. To recover, both brakes are then released slowly and symmetrically until the glider has pre-inflated over its entire span. During this phase, the glider will pitch slightly around its lateral axis. When the canopy is in front of the pilot, the remaining brake travel is released. If the canopy is released symmetrically, it will accelerate forward without collapsing. However, it must always be taken into account that the glider can collapse sideways or head-on if it is pushed forward too much.

The asymmetric recovery of the full stall carried out by test pilots is only used to check the glider and, like the full stall, should not be flown intentionally. Due to the dynamic forces involved, the reactions of the canopy during recovery are very demanding. An impulsive, large-scale collapse of the wing is possible.



CAUTION! When minimum speed is reached, this is indicated by a noticeable reduction in driving noise and an increase in steering forces. Up to this point, the glider can be started by simply releasing the brakes.

Spin

The spin (negative turn/vrille) is a one-sided stall and occurs when the pilot applies the brakes quickly and completely at high speed. Asymmetric braking close to the stall has the same effect. The wing turns quickly during a spin. The inner wing flies backwards. To stop the spin, both brakes must be opened. This allows the wing to regain speed. The canopy can shoot forward on one side and collapse sideways.



WARNING! Spins followed by folding the wing halves in on one side can lead to hang-ups!

Wingover

In a wingover, the pilot flies alternating turns with increasing bank angles until the desired degree of rocking is reached.



CAUTION! Due to its high maneuverability, the UP Makalu 5 reaches a high bank angle after just a few turns. We recommend approaching this maneuver slowly, as parts of the sail can collapse if the angle of attack is too high. A bank angle of more than 135 degrees is illegal aerobatics in Germany!

Further information

Rail bag flight in the rain

In general, there are two different reasons why a paraglider can stall in the rain:

Case 1: When flying for longer periods in the rain, the canopy weight increases and the center of gravity and angle of attack shift. This can lead to a stall. The following

applies: the more water a wing has already absorbed (e.g. older wings, because they lose their water-repellent coating over the years), the less water absorption is required to bring the wing into stall.

Case 2: In very rare cases, when it starts to rain, just as many drops of water can adhere to the upper sail of a paraglider that almost the entire surface of the glider is covered, but there is no closed water surface. This phenomenon is also known from hang gliding and gliding. This droplet formation makes the surface so rough that the flow becomes detached. The newer a glider is (the drops are absorbed less quickly by the cloth on newer gliders), the more drops adhere to the upper sail and the larger these drops are, the greater the risk of a stall or stall. This phenomenon was reconstructed in practical tests and by means of computer simulation.

In both cases, the control and braking distances are first significantly reduced and then the stall is triggered, usually by a change in braking or angle of attack, for example by a gust or a thermal separation.

If you are surprised by a rain shower in the air, maneuvers involving heavy braking must be avoided at all costs. You should also avoid maneuvers such as putting your ears back or B-stalls! Avoid turbulent areas, accelerate the glider and do not brake too hard on landing.



WARNING! Flying in extremely humid air or in the rain should always be avoided. A wet canopy can massively impair flight behavior and significantly increase the risk of a premature stall.

Advertising and adhesive sails

Before attaching advertising and adhesive sails, every pilot should make sure that there are no changes to the flight characteristics. If in doubt, adhesive sails should not be attached.



CAUTION! If the glider is covered with large, heavy or unsuitable adhesive sails (e.g. for advertising purposes), the operating license will expire. This will render your paraglider unairworthy.

Overload

Extreme flight maneuvers such as steep spiral dives as well as acro and freestyle maneuvers such as SAT or tumbling do not normally pose an acute risk to the structure of the UP Makalu 5. However, frequent overloading of the material accelerates the ageing process considerably. Gliders that are subjected to these maneuvers above the normal level must be sent for inspection sooner.

Flying by the sea

If the glider is flown for long periods by the sea or in salty air, this will lead to premature ageing of the material. In this case, the glider should be sent for inspection at an early stage.

Care of the paraglider

How quickly a paraglider ages depends on how often and where it is flown, how many UV hours it accumulates and the care and attention with which it is treated. Below are some tips on how best to care for, maintain and store your paraglider.

Packing the paraglider

The Makalu 5 is supplied with a FlexBag in the right size for the respective canopy size. The canopy is laid out flat with the suspension points facing upwards, then fold the ends together towards the middle. The riser can be packed with the supplied riser bag and should protrude slightly beyond the rear edge in the middle. Finally, fold the strips so that the resulting package corresponds to the size of the FlexBag. Now open the zipper of the FlexBag and insert the package. The Makalu 5 has short but stiff rods at the leading edge. If you also fold in the leading edge, make sure that the rods are not kinked. However, it is also possible not to fold in the leading edge. As soon as the package has been inserted into the FlexBag, the remaining air can be pressed out of the FlexBag and the zipper closed. Then roll up the open end and close it with the buckles.



Figure 3: UP FlexBag (scope of delivery: 1 piece in the corresponding size)

Paraglider cloth

To build our paragliders, we use a high-quality polyamide cloth with special protection for improved UV resistance and air impermeability. Prolonged UV exposure and normal use reduce the strength of any paraglider cloth. Therefore, do not leave your paraglider in the sun unnecessarily, unpack it just before take-off and pack it up again immediately after landing. Even though modern paraglider fabrics are increasingly better protected against the effects of sunlight, UV radiation in particular is still one of the decisive factors in cloth ageing. First the colors fade, then the coating and the fibers begin to age.

During production of the UP Makalu 5, the coated side of the fabric is placed on the inside. This protects the coating, which is crucial for the cloth's properties, from mechanical damage. When choosing a launch site, however, you should still select a surface that is as free as possible from sharp-edged and protruding objects.

Do not step on the glider. Kicking weakens the fabric, especially on hard and stony ground. Pay attention to the behavior of spectators at the launch site, especially children and dogs: Do not hesitate to draw attention to the sensitivity of the cloth.

Please make sure that there are no insects in the canopy when packing the paraglider. Some species produce acids during decomposition which can etch holes in the cloth. Grasshoppers bite through the material with their mouthparts and cause holes. They also secrete a dark, strongly staining sap. Scare the animals away before folding. Incidentally, insects are not particularly attracted to any particular color - even if this misconception is widespread.

If the paraglider has become damp or wet, it should be dried as quickly as possible in a well-ventilated place (but never in the sun!). If it remains damp when packed, this can lead to the formation of mold and - especially in warm conditions - to the fibres decomposing!

A brand new glider is often heavily compressed on delivery. This compression is only for initial transportation. From the first use, the glider should not be packed too tightly. You should also not sit on a packing bag in which a glider is packed.

If the glider has come into contact with salt water, it should be rinsed thoroughly with fresh water immediately (see chapter Cleaning).

Paraglider lines

The UP Makalu 5 uses extremely high-quality Dyneema and Aramid lines. Please note the following points when handling your paraglider lines:

- Check the lines regularly for damage
- Make sure that the surface of the lines is not chafed by friction
- Avoid unnecessary bending
- Do not knot the brake line on the brake handle unnecessarily. Every knot weakens the line.
- After overloading (e.g. tree landings, water landings or other extreme situations) all lines must be checked for strength and length and replaced if necessary. Send your glider directly to UP International or a UP Service Center for inspection
- If the flying behavior changes, the length of the lines must be checked and, if necessary, re-looped or replaced. Send your glider directly to UP International or a UP Service Center for inspection

Storage and transportation

Even if your glider was completely dry when you packed it after the last flight of the season, you should remove it from the FlexBag if possible for longer periods of storage and spread the canopy out slightly in a clean, dry place protected from light. If you do not have a suitable space, avoid compressing the paraglider too much and open the FlexBag as wide as possible for ventilation. The UP quick pack sack is also suitable for this purpose. Also make sure that no animals, such as mice or cats, use the glider as a place to sleep during longer periods of storage. No chemical substances such as fuels should be stored in the immediate vicinity of the material. Petrol dissolves the fabric and can cause serious damage to your glider. Store the pack sack in the trunk as far away as possible from reserve canisters or oil containers. The permanent storage temperature must be between 10° and 25° C with a relative humidity of between 50 and 75%.

The UP Makalu 5 should not be exposed to extreme heat (e.g. in the trunk of a parked car in summer). The heat will force any remaining moisture through the fabric, which can damage the coating. Especially in combination with moisture, high temperatures accelerate the hydrolysis process, which damages the fibers and coating. Do not store your glider near radiators or other heat sources. Heat-related changes to the material occur after a short time at temperatures as low as 60° Celsius.

Cleaning

To clean the UP Makalu 5, it is best to use lukewarm fresh water and a soft sponge. For more stubborn cases, a mild detergent is recommended, which must then be rinsed out carefully and thoroughly. Then leave your glider to dry in a shady and well-ventilated place.



CAUTION! Never use chemicals, brushes or hard sponges to clean the glider. They could damage the coating and strength of the fabric. This will cause the sail to become porous and lose its tear resistance.

Never put an glider in the washing machine: even without detergent, the mechanical stress would severely damage the fabric. Never immerse the canopy in a swimming pool either: The chlorinated water attacks the fabric. If you absolutely have to rinse your canopy, for example after landing in the sea, spray it inside and out with a gentle jet of water. Frequent rinsing accelerates the ageing process!

Inspection and repairs

Major repairs and inspections may only be carried out by UP International or a recognized service company. Failure to do so will invalidate the operating license. See also the Service section at: www.up-paragliders.com

UP International not only contributes its know-how to the development of paragliders and accessories, but also offers a range of services to ensure the safety of your paraglider. All services must be carried out at an authorized UP service center as recommended by UP International. In order for the warranty to remain valid for new

UP wings, the conditions listed in the section "UP International Warranty" must be met. Current conditions can be found at www.up-paragliders.com in the *Service* section.

Maintenance and minor repairs

Adhesive sail

Minor damage such as tears or small holes up to a size of 2 x 2 cm, which can be carried out without special equipment, may be carried out by the pilot himself. Each glider is supplied with adhesive tape for this purpose. The adhesive sail must protrude at least 2 cm over the damaged area on all sides. The adhesive sail must be applied on both sides; rounding off the corners can prevent it from coming off.

Airworthiness review

If one of the following conditions occurs, the Makalu 5 must be checked for airworthiness:

- 2 years after the first routine test
- every further 2 years or earlier if prescribed by the UP Service Center
- after 150 flying hours

Of course, we are also happy to carry out the prescribed inspection earlier if you consider it necessary due to extreme use. You will receive the inspection instructions separately from this manual.



CAUTION! If you notice any changes in the flight behavior of your Makalu 5, please have it checked immediately by UP or an UP Service Center

Professional competence

To ensure that your UP Makalu 5 offers maximum functionality and safety at all times, you should entrust its maintenance and repair to UP International. Our service staff are fully trained to carry out any work on your glider professionally and correctly. UP International is also equipped with all the special tools and equipment required for quick and flawless repairs.

Airworthiness check

Thanks to its many years of experience in paragliding, UP International can guarantee a professional airworthiness check. The canopy including the "inner workings", the entire line system, the risers and all connecting parts are checked for damage of any kind. Our service workshop is specially equipped to carry out precise airworthiness checks. In addition to specially developed suspension devices, calibrated and regularly maintained measuring devices are used, which are essential

for determining airworthiness. Our computer-aided laser measurement of the line system is the final step in recording the measured values.

In addition to the measured values obtained in this way, the assessment of the tester is decisive for the overall evaluation of the paraglider. This requires a high level of expertise and experience. Individual wings, where the tester suspects a change in flight characteristics based on the data obtained, are reflown and checked by the UP test pilots. In this way, UP International can always guarantee high quality in the testing of paragliders. Only through a careful and professional airworthiness check can the certification regulations be complied with and the safety of the glider guaranteed. In your own interest, you should therefore only have your UP glider checked by the specialists of the UP Service Team or a recognized service company. You can find a list of these approved service centers in the *Service* section at www.up-paragliders.com



ATTENTION: If your UP paraglider is not serviced and checked by an approved service company or UP International GmbH, its operating license will expire!

Original parts

Your UP glider consists of many high-quality components with a long service life. When replacing parts (lines, risers, cloth panels etc.), only original parts may be used. In addition to maintaining the airworthiness of your paraglider, this is also very important for your safety. The following spare parts can be ordered from your dealer or directly from UP International GmbH:

- Complete risers or their individual components such as Brummel hooks, snaplocks, line locks, O-rings, brake handles
- Single lines according to line plan
- Cloth material
- Adhesive sail

Delivery service

Before your UP glider left the workshop, all the work carried out was checked again and carefully tested. In addition, a comprehensive inspection was carried out by the UP service team or a recognized service company before the glider was delivered to ensure that your Makalu 5 complies with UP International standards and the type-approved device.

International UP guarantee

The voluntary, internationally valid UP guarantee covers material- and manufacturing defects for all EN and LTF-tested paragliders and is valid for a period of 2 years from

the delivery date of the new paraglider. The international UP guarantee includes reimbursement of the costs for required spare parts and the working time incurred in connection with the replacement or repair of the defective parts, provided that UP International has recognized a material or manufacturing defect as such. The international UP guarantee does not cover paragliders that have been involved in an accident or that have been rebuilt or modified. The guarantee does not cover parts that have to be replaced due to normal wear and tear. In addition, changes in the color of the fabric material used and damage caused by solvents, chemicals, fuels, sand and/or salt water as well as by improper handling of the paraglider and by force majeure are excluded from the guarantee. UP reserves the right to decide how the manufacturing or material defect is to be remedied (supply of spare parts, repair or equivalent replacement).

In Germany, Austria and Switzerland, the voluntary UP guarantee is extended to 36 months if the first check is carried out directly by UP International or our Swiss service company (see UP homepage). In addition to this voluntary guarantee, the statutory warranty of the country in which the paraglider was purchased also applies. The use of statutory rights in the event of defects is free of charge and is not restricted by this voluntary guarantee. UP International does not accept any liability or compensation beyond the obligations mentioned above. However, a goodwill arrangement is possible.

The guarantee is valid under the following conditions

- The glider was used within the permissible operating limits according to the manual and cared for and maintained in accordance with the applicable specifications issued by UP International. This includes, in particular, careful drying, cleaning and storage.
- The glider was only used within the applicable guidelines. All applicable approval regulations were complied with.
- All flights carried out must be fully documented using the flight log, including the respective flight duration and the flight area.
- Only UP original spare parts were used and inspections, replacements and/or repairs were carried out exclusively by UP International or by approved maintenance companies and properly documented.
- The voluntary guarantee is only granted to the first owner of the glider for exclusively private use.
- The glider was registered within 14 days of delivery at: <http://www.up-paragliders.com/de/service/product-registration>

The defect is reported in writing to the guarantor UP Paragliders immediately after it occurs or is discovered by the customer. If a defect occurs within one year of the delivery date of the paraglider, the customer must prove that the defect is due to a material and/or manufacturing defect. To do so, use the form currently available for download on the website www.up-paragliders.com. Address of the guarantor: UP International GmbH Kreuzeckbahnstraße 7 D-82467 Garmisch-Partenkirchen info@up-paragliders.com

Inspection of new devices

According to § 1 Para. 5 LuftGerPV, the owner can inspect his device himself or commission a third party, such as the manufacturer/importer, to carry out the inspection.

UP International requires instruction for an independent inspection. Instruction is given by arrangement directly at UP International and is only valid for the corresponding device sample. The inspection instructions will be handed over to the owner after the instruction.

If the owner inspects his device himself or commissions a third party to carry out the inspection, it must be ensured under all circumstances that the specifications of UP International regarding the inspection are observed. The operating license expires if the inspection is carried out incorrectly or incompletely.

You can find current regulations in the *Service* section under www.up-paragliders.com

Sending in the UP glider and other UP products

Please use the form that you can download from our website to send us your return. If you live outside Germany, please use our service telephone to find out about the nearest UP Service Center in your area.

UP International GmbH
Kreuzeckbahnstrasse 7
D-8267 Garmisch-Partenkirchen

E-mail: info@up-paragliders.com
Phone: +9 (0) 88 21-7 30 99-0
Fax: +9 (0) 88 21-7 30 99-16

Waste disposal

Despite careful material selection, even the best product only has a limited service life. The plastic material used in a paraglider requires proper disposal. Please have your paraglider disposed of properly. You can also send it back to us for disposal.

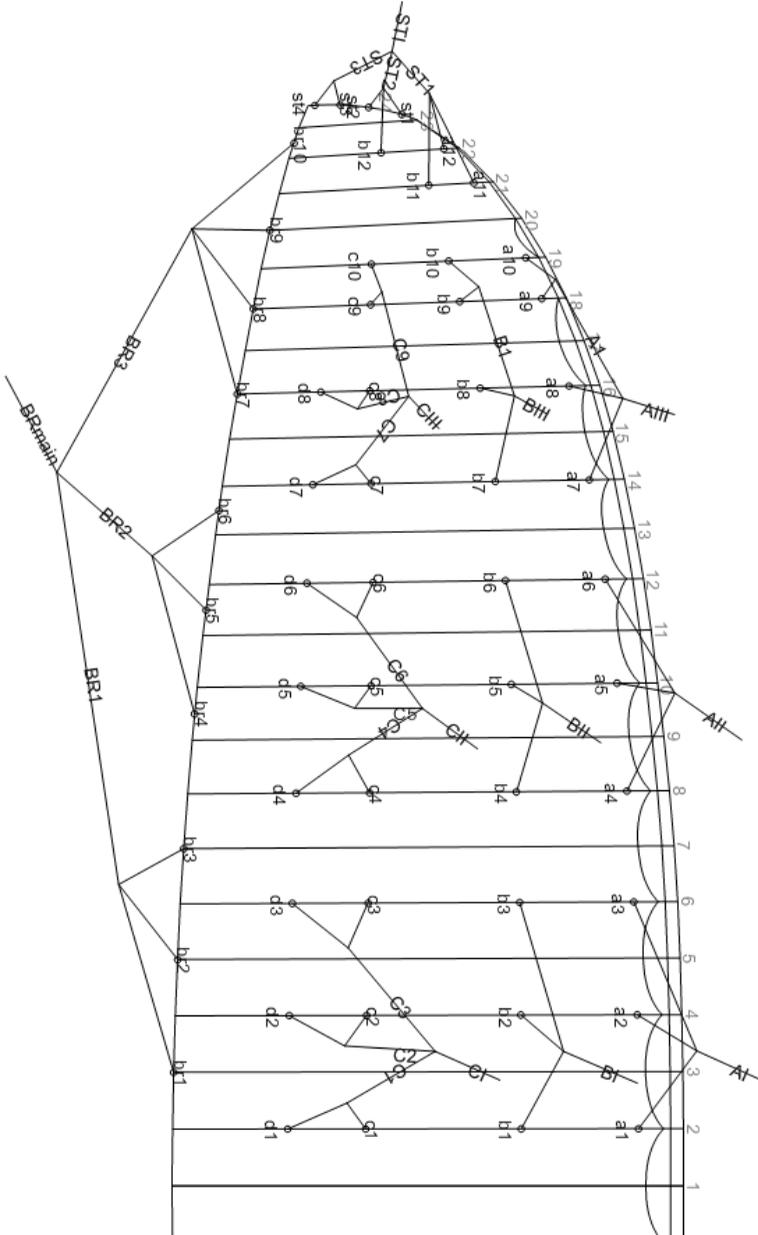
Closing words

We at UP wish you lots of fun and wonderful, accident-free flights with your UP Makalu 5.

See you UP in the sky - Your UP-International team

Appendix

Line plan



Line lengths

line	MAKALU 5 L	MAKALU 5 M	MAKALU 5 SM	MAKALU 5 S
	lines including risers			
a1	7748	7514	7232	6906
a2	7654	7422	7147	6822
a3	7698	7465	7186	6863
a4	7649	7415	7136	6817
a5	7564	7334	7057	6740
a6	7592	7359	7082	6764
a7	7515	7280	7010	6696
a8	7394	7165	6896	6588
a9	7329	7110	6841	6539
a10	7323	7106	6839	6534
sa1	7044	6819	6561	6271
sa2	6945	6720	6471	6185
b1	7632	7402	7123	6804
b2	7538	7311	7036	6720
b3	7589	7360	7084	6766
b4	7556	7325	7051	6734
b5	7479	7249	6978	6664
b6	7519	7288	7014	6700
b7	7455	7226	6958	6647
b8	7345	7119	6852	6548
b9	7295	7078	6809	6508
b10	7285	7069	6803	6501
sb1	7011	6789	6536	6244
sb2	6938	6718	6468	6180
c1	7680	7447	7168	6850
c2	7589	7357	7084	6766
c3	7635	7402	7125	6805
c4	7602	7368	7089	6773
c5	7525	7295	7021	6703
c6	7564	7331	7057	6740
c7	7496	7266	6995	6682
c8	7389	7162	6893	6584

line	MAKALU 5 L	MAKALU 5 M	MAKALU 5 SM	MAKALU 5 S
c9	7337	7111	6847	6540
c10	7326	7103	6835	6532
d1	7819	7580	7295	6972
d2	7726	7489	7211	6888
d3	7764	7529	7246	6923
d4	7727	7493	7206	6889
d5	7646	7415	7136	6814
d6	7670	7432	7156	6834
d7	7603	7368	7091	6775
d8	7476	7244	6972	6662
	Brakes including BTS			
br1	7943	7704	7430	7113
br2	7678	7450	7188	6884
br3	7590	7367	7111	6813
br4	7421	7199	6947	6650
br5	7287	7068	6820	6528
br6	7315	7095	6847	6553
br7	7219	7002	6756	6467
br8	7102	6886	6644	6359
br9	7040	6827	6588	6305
br10	7050	6837	6597	6314

Single line lengths Makalu 5 L

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
a1	2172	140	6480/D-090	Yellow	
a2	2078	140	6480/D-090	Yellow	
a3	2124	140	6480/D-090	Yellow	
a4	2077	140	6480/D-090	Yellow	
a5	1993	140	6480/D-090	Yellow	
a6	2021	140	6480/D-090	Yellow	
a7	1946	140	6480/D-090	Yellow	
a8	1826	140	6480/D-090	Yellow	
a9	397	140	6480/D-090	Yellow	
a10	391	140	6480/D-090	Yellow	
a11	925	140	6480/D-090	Yellow	
a12	828	140	6480/D-090	Yellow	
AI	5041	260	7950-200	Red	+
AII	5041	260	7950-200	Red	+
A1	1376	140	6480/D-090	Yellow	
AIII	5041	260	7950-150	Red	+
b1	2062	140	6480/D-090	Yellow	
b2	1969	140	6480/D-090	Yellow	
b3	2023	140	6480/D-090	Yellow	
b4	1987	140	6480/D-090	Yellow	
b5	1911	140	6480/D-090	Yellow	
b6	1952	140	6480/D-090	Yellow	
b7	1890	140	6480/D-090	Yellow	
b8	1779	140	6480/D-090	Yellow	
b9	360	140	6480/D-090	Yellow	
b10	355	140	6480/D-090	Yellow	
b11	895	140	6480/D-090	Yellow	
BI	5041	260	7950-200	Blue	+
BII	5041	260	7950-200	Blue	+
B1	1376	140	6480/D-090	Yellow	
BIII	5041	260	7950-150	Blue	+
c1	1058	140	6480/D-090	Yellow	
c2	965	140	6480/D-090	Yellow	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
c3	1014	140	6480/D-090	Yellow	
c4	980	140	6480/D-090	Yellow	
c5	905	140	6480/D-090	Yellow	
c6	943	140	6480/D-090	Yellow	
c7	877	140	6480/D-090	Yellow	
c8	767	140	6480/D-090	Yellow	
c9	403	140	6480/D-090	Yellow	
c10	394	140	6480/D-090	Yellow	
b12	822	140	6480/D-090	Yellow	
C1	1067	200	6480/D-090	Yellow	
C2	1067	200	6480/D-090	Yellow	
C3	1067	200	6480/D-090	Yellow	
C4	1067	200	6480/D-090	Yellow	
C5	1067	200	6480/D-090	Yellow	
C6	1067	200	6480/D-090	Yellow	
C7	1067	200	6480/D-090	Yellow	
C8	1066	200	6480/D-090	Yellow	
C9	1376	200	6480/D-090	Yellow	
CI	5041	260	7950-200	Yellow	+
CII	5041	260	7950-200	Yellow	+
CIII	5041	260	7950-150	Yellow	+
d1	1195	140	6480/D-090	Yellow	
d2	1103	140	6480/D-090	Yellow	
d3	1144	140	6480/D-090	Yellow	
d4	1107	140	6480/D-090	Yellow	
d5	1025	140	6480/D-090	Yellow	
d6	1048	140	6480/D-090	Yellow	
d7	979	140	6480/D-090	Yellow	
d8	851	140	6480/D-090	Yellow	
br1	2035	140	989/1,1	Pink	
br2	1770	140	989/1,1	Pink	
br3	1682	140	989/1,1	Pink	
br4	1668	140	989/1,1	Pink	
br5	1534	140	989/1,1	Pink	
br6	1563	140	989/1,1	Pink	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
br7	1958	140	989/1,1	Pink	
br8	1838	140	989/1,1	Pink	
br9	1778	140	989/1,1	Pink	
br10	1788	140	989/1,1	Pink	
BR1	3252	200	989/1,1	Pink	
BR2	3097	200	989/1,1	Pink	
BR3	2606	200	989/1,1	Pink	
BRmain	2606	300	989/1,9	Red	
st1	775	140	6480/D-090	Yellow	
st2	773	140	6480/D-090	Yellow	
st3	426	140	6480/D-090	Yellow	
st4	482	140	6480/D-090	Yellow	
ST1	1063	200	6480/D-090	Yellow	
ST2	1063	200	6480/D-090	Yellow	
ST3	1427	200	6480/D-090	Yellow	
STI	4532	260	7950-100	Orange	+

Single line lengths Makalu 5 M

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
a1	2089	140	6480/D-090	Yellow	
a2	1997	140	6480/D-090	Yellow	
a3	2041	140	6480/D-090	Yellow	
a4	1995	140	6480/D-090	Yellow	
a5	1912	140	6480/D-090	Yellow	
a6	1939	140	6480/D-090	Yellow	
a7	1867	140	6480/D-090	Yellow	
a8	1749	140	6480/D-090	Yellow	
a9	366	140	6480/D-090	Yellow	
a10	362	140	6480/D-090	Yellow	
a11	878	140	6480/D-090	Yellow	
a12	784	140	6480/D-090	Yellow	
AI	4883	260	7950-200	Red	+
AII	4883	260	7950-200	Red	+
A1	1333	140	6480/D-090	Yellow	
AIII	4883	260	7950-150	Red	+
b1	1983	140	6480/D-090	Yellow	
b2	1891	140	6480/D-090	Yellow	
b3	1943	140	6480/D-090	Yellow	
b4	1908	140	6480/D-090	Yellow	
b5	1833	140	6480/D-090	Yellow	
b6	1873	140	6480/D-090	Yellow	
b7	1813	140	6480/D-090	Yellow	
b8	1705	140	6480/D-090	Yellow	
b9	332	140	6480/D-090	Yellow	
b10	328	140	6480/D-090	Yellow	
b11	848	140	6480/D-090	Yellow	
BI	4883	260	7950-200	Blue	+
BII	4883	260	7950-200	Blue	+
B1	1333	140	6480/D-090	Yellow	
BIII	4883	260	7950-150	Blue	+
c1	1010	140	6480/D-090	Yellow	
c2	918	140	6480/D-090	Yellow	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
c3	966	140	6480/D-090	Yellow	
c4	933	140	6480/D-090	Yellow	
c5	859	140	6480/D-090	Yellow	
c6	896	140	6480/D-090	Yellow	
c7	832	140	6480/D-090	Yellow	
c8	725	140	6480/D-090	Yellow	
c9	373	140	6480/D-090	Yellow	
c10	367	140	6480/D-090	Yellow	
b12	778	140	6480/D-090	Yellow	
C1	1033	200	6480/D-090	Yellow	
C2	1033	200	6480/D-090	Yellow	
C3	1033	200	6480/D-090	Yellow	
C4	1033	200	6480/D-090	Yellow	
C5	1033	200	6480/D-090	Yellow	
C6	1033	200	6480/D-090	Yellow	
C7	1033	200	6480/D-090	Yellow	
C8	1033	200	6480/D-090	Yellow	
C9	1333	200	6480/D-090	Yellow	
CI	4883	260	7950-200	Yellow	+
CII	4883	260	7950-200	Yellow	+
CIII	4883	260	7950-150	Yellow	+
d1	1144	140	6480/D-090	Yellow	
d2	1053	140	6480/D-090	Yellow	
d3	1093	140	6480/D-090	Yellow	
d4	1057	140	6480/D-090	Yellow	
d5	977	140	6480/D-090	Yellow	
d6	999	140	6480/D-090	Yellow	
d7	932	140	6480/D-090	Yellow	
d8	808	140	6480/D-090	Yellow	
br1	1967	140	989/1,1	Pink	
br2	1713	140	989/1,1	Pink	
br3	1630	140	989/1,1	Pink	
br4	1612	140	989/1,1	Pink	
br5	1481	140	989/1,1	Pink	
br6	1508	140	989/1,1	Pink	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
br7	1890	140	989/1,1	Pink	
br8	1774	140	989/1,1	Pink	
br9	1715	140	989/1,1	Pink	
br10	1725	140	989/1,1	Pink	
BR1	3150	200	989/1,1	Pink	
BR2	3000	200	989/1,1	Pink	
BR3	2525	200	989/1,1	Pink	
BRmain	2537	300	989/1,9	Red	
st1	733	140	6480/D-090	Yellow	
st2	732	140	6480/D-090	Yellow	
st3	396	140	6480/D-090	Yellow	
st4	451	140	6480/D-090	Yellow	
ST1	1030	200	6480/D-090	Yellow	
ST2	1030	200	6480/D-090	Yellow	
ST3	1382	200	6480/D-090	Yellow	
STI	4389	260	7950-100	Orange	+

Single line lengths Makalu 5 SM

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
a1	2016	140	6480/D-090	Yellow	
a2	1929	140	6480/D-090	Yellow	
a3	1971	140	6480/D-090	Yellow	
a4	1927	140	6480/D-090	Yellow	
a5	1847	140	6480/D-090	Yellow	
a6	1873	140	6480/D-090	Yellow	
a7	1804	140	6480/D-090	Yellow	
a8	1691	140	6480/D-090	Yellow	
a9	360	140	6480/D-090	Yellow	
a10	355	140	6480/D-090	Yellow	
a11	852	140	6480/D-090	Yellow	
a12	761	140	6480/D-090	Yellow	
AI	4700	260	7950-200	Red	+
AII	4700	260	7950-200	Red	+
A1	1283	140	6480/D-090	Yellow	
AIII	4700	260	7950-150	Red	+
b1	1914	140	6480/D-090	Yellow	
b2	1826	140	6480/D-090	Yellow	
b3	1877	140	6480/D-090	Yellow	
b4	1843	140	6480/D-090	Yellow	
b5	1771	140	6480/D-090	Yellow	
b6	1810	140	6480/D-090	Yellow	
b7	1752	140	6480/D-090	Yellow	
b8	1648	140	6480/D-090	Yellow	
b9	326	140	6480/D-090	Yellow	
b10	322	140	6480/D-090	Yellow	
b11	824	140	6480/D-090	Yellow	
BI	4700	260	7950-200	Blue	+
BII	4700	260	7950-200	Blue	+
B1	1283	140	6480/D-090	Yellow	
BIII	4700	260	7950-150	Blue	+
c1	978	140	6480/D-090	Yellow	
c2	890	140	6480/D-090	Yellow	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
c3	936	140	6480/D-090	Yellow	
c4	904	140	6480/D-090	Yellow	
c5	833	140	6480/D-090	Yellow	
c6	869	140	6480/D-090	Yellow	
c7	807	140	6480/D-090	Yellow	
c8	705	140	6480/D-090	Yellow	
c9	366	140	6480/D-090	Yellow	
c10	359	140	6480/D-090	Yellow	
b12	756	140	6480/D-090	Yellow	
C1	994	200	6480/D-090	Yellow	
C2	994	200	6480/D-090	Yellow	
C3	994	200	6480/D-090	Yellow	
C4	994	200	6480/D-090	Yellow	
C5	994	200	6480/D-090	Yellow	
C6	994	200	6480/D-090	Yellow	
C7	994	200	6480/D-090	Yellow	
C8	994	200	6480/D-090	Yellow	
C9	1283	200	6480/D-090	Yellow	
CI	4700	260	7950-200	Yellow	+
CII	4700	260	7950-200	Yellow	+
CIII	4700	260	7950-150	Yellow	+
d1	1107	140	6480/D-090	Yellow	
d2	1020	140	6480/D-090	Yellow	
d3	1057	140	6480/D-090	Yellow	
d4	1023	140	6480/D-090	Yellow	
d5	947	140	6480/D-090	Yellow	
d6	968	140	6480/D-090	Yellow	
d7	903	140	6480/D-090	Yellow	
d8	784	140	6480/D-090	Yellow	
br1	1891	140	989/1,1	Pink	
br2	1649	140	989/1,1	Pink	
br3	1572	140	989/1,1	Pink	
br4	1552	140	989/1,1	Pink	
br5	1425	140	989/1,1	Pink	
br6	1452	140	989/1,1	Pink	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
br7	1819	140	989/1,1	Pink	
br8	1707	140	989/1,1	Pink	
br9	1651	140	989/1,1	Pink	
br10	1660	140	989/1,1	Pink	
BR1	3032	200	989/1,1	Pink	
BR2	2888	200	989/1,1	Pink	
BR3	2430	200	989/1,1	Pink	
BRmain	2457	300	989/1,9	Red	
st1	713	140	6480/D-090	Yellow	
st2	711	140	6480/D-090	Yellow	
st3	387	140	6480/D-090	Yellow	
st4	440	140	6480/D-090	Yellow	
ST1	991	200	6480/D-090	Yellow	
ST2	991	200	6480/D-090	Yellow	
ST3	1330	200	6480/D-090	Yellow	
STI	4225	260	7950-100	Orange	+

Single line lengths Makalu 5 S

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
a1	1909	140	6480/D-090	Yellow	
a2	1823	140	6480/D-090	Yellow	
a3	1863	140	6480/D-090	Yellow	
a4	1819	140	6480/D-090	Yellow	
a5	1741	140	6480/D-090	Yellow	
a6	1767	140	6480/D-090	Yellow	
a7	1699	140	6480/D-090	Yellow	
a8	1591	140	6480/D-090	Yellow	
a9	320	140	6480/D-090	Yellow	
a10	317	140	6480/D-090	Yellow	
a11	790	140	6480/D-090	Yellow	
a12	704	140	6480/D-090	Yellow	
AI	4493	260	7950-200	Red	+
All	4493	260	7950-200	Red	+
A1	1226	140	6480/D-090	Yellow	
Alll	4493	260	7950-150	Red	+
b1	1810	140	6480/D-090	Yellow	
b2	1724	140	6480/D-090	Yellow	
b3	1772	140	6480/D-090	Yellow	
b4	1739	140	6480/D-090	Yellow	
b5	1669	140	6480/D-090	Yellow	
b6	1707	140	6480/D-090	Yellow	
b7	1651	140	6480/D-090	Yellow	
b8	1551	140	6480/D-090	Yellow	
b9	290	140	6480/D-090	Yellow	
b10	288	140	6480/D-090	Yellow	
b11	763	140	6480/D-090	Yellow	
BI	4493	260	7950-200	Blue	+
Bll	4493	260	7950-200	Blue	+
B1	1226	140	6480/D-090	Yellow	
Blll	4493	260	7950-150	Blue	+
c1	916	140	6480/D-090	Yellow	
c2	830	140	6480/D-090	Yellow	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
c3	874	140	6480/D-090	Yellow	
c4	843	140	6480/D-090	Yellow	
c5	773	140	6480/D-090	Yellow	
c6	809	140	6480/D-090	Yellow	
c7	749	140	6480/D-090	Yellow	
c8	650	140	6480/D-090	Yellow	
c9	328	140	6480/D-090	Yellow	
c10	324	140	6480/D-090	Yellow	
b12	698	140	6480/D-090	Yellow	
C1	950	200	6480/D-090	Yellow	
C2	950	200	6480/D-090	Yellow	
C3	950	200	6480/D-090	Yellow	
C4	950	200	6480/D-090	Yellow	
C5	950	200	6480/D-090	Yellow	
C6	950	200	6480/D-090	Yellow	
C7	950	200	6480/D-090	Yellow	
C8	950	200	6480/D-090	Yellow	
C9	1226	200	6480/D-090	Yellow	
CI	4493	260	7950-200	Yellow	+
CII	4493	260	7950-200	Yellow	+
CIII	4493	260	7950-150	Yellow	+
d1	1040	140	6480/D-090	Yellow	
d2	955	140	6480/D-090	Yellow	
d3	991	140	6480/D-090	Yellow	
d4	957	140	6480/D-090	Yellow	
d5	883	140	6480/D-090	Yellow	
d6	904	140	6480/D-090	Yellow	
d7	841	140	6480/D-090	Yellow	
d8	727	140	6480/D-090	Yellow	
br1	1803	140	989/1,1	Pink	
br2	1574	140	989/1,1	Pink	
br3	1503	140	989/1,1	Pink	
br4	1478	140	989/1,1	Pink	
br5	1356	140	989/1,1	Pink	
br6	1381	140	989/1,1	Pink	

line	Length length	Loop length loop length	Material material	Color color	Loop on Maillon
br7	1731	140	989/1,1	Pink	
br8	1623	140	989/1,1	Pink	
br9	1569	140	989/1,1	Pink	
br10	1578	140	989/1,1	Pink	
BR1	2898	200	989/1,1	Pink	
BR2	2760	200	989/1,1	Pink	
BR3	2324	200	989/1,1	Pink	
BRmain	2362	300	989/1,9	Red	
st1	658	140	6480/D-090	Yellow	
st2	657	140	6480/D-090	Yellow	
st3	348	140	6480/D-090	Yellow	
st4	399	140	6480/D-090	Yellow	
ST1	948	200	6480/D-090	Yellow	
ST2	948	200	6480/D-090	Yellow	
ST3	1272	200	6480/D-090	Yellow	
STI	4039	260	7950-100	Orange	+

Service booklet

Glider and pilot data

Model:	Makalu 5
Size:	<input type="checkbox"/> XS <input type="checkbox"/> S <input type="checkbox"/> SM <input type="checkbox"/> M <input type="checkbox"/> L
Serial number:	_____
Color:	_____
Purchase date:	_____
First flight:	_____
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;">Dealer's stamp and signature</div>	

Pilot (1st holder)
First name: _____
Surname: _____
Street: _____
Place of residence: _____
ZIP CODE: _____
Country: _____
Phone: _____
Fax: _____
Email: _____



Pilot (2nd holder)

First name: _____

Surname: _____

Street: _____

Place of residence: _____

ZIP CODE: _____

Country: _____

Phone: _____

Fax: _____

Email: _____

Pilot (3rd holder)

First name: _____

Surname: _____

Street: _____

Place of residence: _____

ZIP CODE: _____

Country: _____

Phone: _____

Fax: _____

Email: _____



Please make sure that your UP Service Center stamps and signs after each inspection.

Service 1

Executed on _____

Order no.
Stamp

Type of service

Service 2

Executed on _____

Order no.
Stamp

Type of service

Service 3

Executed on _____

Order no.
Stamp

Type of service



Please make sure that your UP Service Center stamps and signs after each inspection.

Service 4

Executed on _____

Order no.
Stamp

Type of service

Service 5

Executed on _____

Order no.
Stamp

Type of service

Service 6

Executed on _____

Order no.
Stamp

Type of service