

# EMOTION 2 <sup>AFS</sup><sub>PPN</sub>



**U-TURN**  
your airline...

- Manual - English Rev. 1.5

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All technical details in this manual have been carefully checked by U-Turn. However we like to mention that we don't take any liability for possible mistakes, neither in legal responsibility, nor in liability cases that derive from mistakable details. We preserve the right to change this manual in any way to achieve technical improvements.

You`ve got the stuff to fly!

The U-Turn team would like to congratulate you on the purchase of your new U-Turn paraglider. You have made an excellent choice. We wish you long and enjoyable flights and many happy landings with your U-Turn EMOTION 2.

The research and Development team at U-Turn can proudly look back at many successful years in the flight sport industry. Our own concepts not only meet but exceed industry standards. The combination between the latest computer based technology and the know-how of experienced test pilots and professional competition pilots provides an excellent basis for quality. We certainly keep our customers need in mind, and always appreciate your input and constructive criticism. Should any questions occur, please don't hesitate to ask your U-Turn dealer or the U-Turn team.

In order to provide you with the latest information on technical development and innovations at U-Turn, we ask you to complete the questionnaire attached. Please mail it to the following address:



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Please read the entire handbook carefully before using your U-Turn EMOTION 2 for the first time. We composed this handbook, in order to make the handling of your new U-Turn EMOTION 2 as safe and easy for you as possible.



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NAME: .....

FIRST NAME: .....

STREET: .....

ZIP CODE / CITY: .....

TELEPHONE: .....

E-MAIL: .....  
.....  
.....

PARAGLIDER TYPE: .....

SERIAL NUMBER: .....

Date of purchase: .....

Dealership: .....  
.....

Tested by: .....

Flying hours: .....

Paraglider since: .....

Miscellaneous: .....  
.....  
.....  
.....



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## Introduction

U-Turn paragliders are in a class of their own. U-Turn doesn't compromise on safety, and uses the best quality components and hallmark flight characteristics. Congratulations on your purchase of U-Turn glider, as it is the brand for those who appreciate the difference.

The laws of physics are well defined. We aspire to achieve to possible within the framework of its laws. We admit this is ambitious but you will always find U-Turn at the cutting edge of technology. As Oscar Wilde once said in this very British understatement: "His taste is very basics; only always the best is good enough." The U-Turn team embodies this attitude; "We always want to deliver the best possible glider." Nothing more and most certainly nothing less.

U-Turn staff takes notice of its customers wishes, so we appreciate any comments or feedback!

Please feel free to contact your competence center or U-Turn directly for any advice or direction.

## General Description EMOTION 2

The EMOTION by U-Turn allows you to enjoy generous safety margins combined with optimum free flight fun. Countless pilots have already been convinced of this promise.

The EMOTION 2 is now available with many new features, including a world first LC - Launch Control.

In U-Turn's range of gliders in EN Class A (those with maximum safety) the EMOTION 2 is placed in between the good-natured BODYGUARD 3 and the more sporty INFINTY 3. All these feature automatic flight stabilization (AFS).

The EMOTION is exceptionally well-suited for training because of its dynamic reserves and high-performance margins. Tailored to novice and leisure pilots, it premieres the world's first LC - or launch control, making takeoff even easier. This latest innovation by U-Turn offers a set of advantages to pilots of various experience levels. Because LC reduces the change of mistakes at launching, it allows for a safer and less stressful take-off at an unfamiliar site. Since the system can be disengaged, it is up to the pilot individually whether or not to use it. Also LC allows the pilot to adjust the inflation speed of the wing according to the launch conditions.

The system is ingeniously simple: A piece of webbing with velcro attaches by a loop onto the front of the A risers, to which the B risers can be coupled as well. The pressure point increases and prevents the pilot from pulling the A risers too far down in more stressful situations. Thus the chance of a full frontal collapse is nearly impossible during take off.

"Two sets of D-rings on the front of the A risers provide two settings that can be used to adjust the LC. The gives the pilot control over the inflation speed of the wing," explains technical designer Ernst Strobl. An additional benefit of LC is that it further reduces the tendency of the glider to overshoot during take off. "U-turn wings in the EN A class already have minimal susceptibility to overshoot during launch. The ability to engage the LC where the A and B risers are connected makes this even less of an issue." Strobl states. The two D-rings on the A's are spaced 3 cm apart, the pilot can select this way with which intensity LC affects the launch speed. Since this way the angle of attach can be varied easily, it also means the take-off speed can be adjusted just as easy. Therefore take-off speed can be set to slower at launches on a steep slope or with a short runway.

## General Description EMOTION 2

Besides LC, the introduction of the Precision Profile Nose (PPN) is the most remarkable improvement featured in the EMOTION 2. Instead of the heavier Mylar panels in the cell walls of the leading edge, thin synthetic rods are built in and reinforce the shape of the glider's nose. This reduces the weight of the glider considerably.

In flight, the EMOTION 2 handles easily and is naturally forgiving. The canopy also performs well in an accelerated state. In thermal flying the EMOTION 2 climbs with ease and efficiency, which makes it a top performer in its class. More than ever the EMOTION 2 is distinguished by safe, fun flying that the pilot can feel confident about. The latest AFS technology spans all cells of the glider and therefore prevents unpleasant collapses before they even occur. The EMOTION 2 is available in attractive colors within the weight ranges of XS (50-80kg), S (65-90kg), M (80-110 kg) to L (100-130kg) all are EN-A classified.

### PPN description

PPN technology provides unprecedented stability, superior take of behavior, and ideal flying qualities. For several years, now synthetic rods have served as a replacement to the Mylar panels in the cell walls of the wing at the leading edge. This reinforces the shape of the nose. U-Turn has taken this a step further in teaming this technology up with AFS and work together in concert.

The synthetic rods in the seams of the leading edge sustain the shape of the nose, optimizing the airflow along the profile. Even under extreme flying conditions the small PPN rods keep the cells at the leading edge open in a way Mylar would not be able to do. These characteristics give the glider an unmatched stability. Internal pressure is maintained noticeably longer and the shape of the nose is held up. Even if the internal pressure diminishes, the AFS kicks in by equalizing with the providing the necessary sail tension. The complimentary interaction of these two systems provide this line of gliders with an unparalleled collapse-resistance.

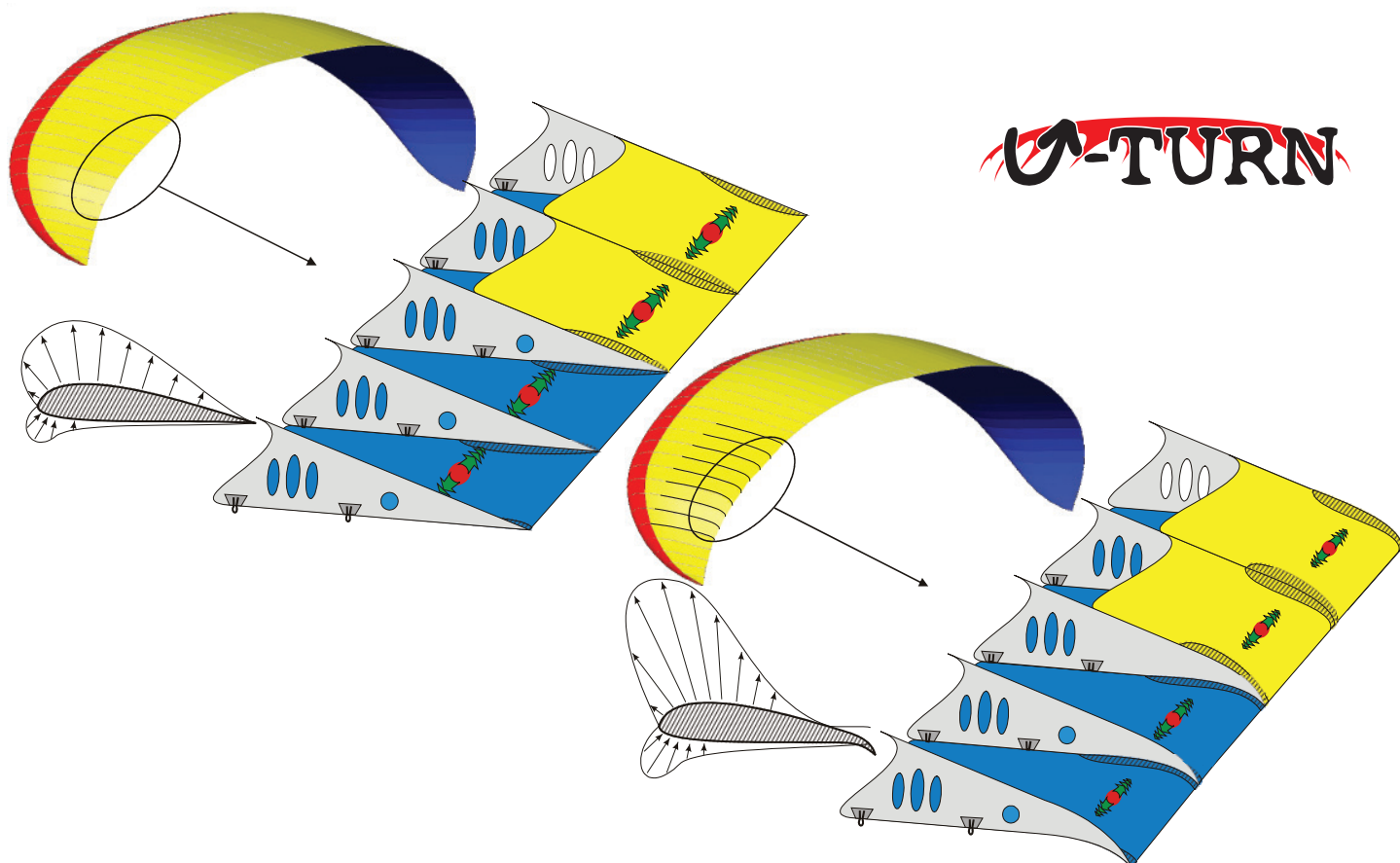
Unlike Mylar, if handled carefully PPN technology will retain the shape of the nose for the entire lifetime of the glider. In order to provide the greatest possible protection when folding the glider, U-Turn recommends the optional U-Turn Tubebag. This inner packsack enables you to fold and store the EMOTION 2 with ease in accordion fold, even on windy days and/or by yourself. The Tubebag preserves the excellent take-off and flight qualities of the glider, thus favorably influencing its resale value. PPN technology also means that the canopy is lighter weight than with Mylar reinforcement. This reduced canopy weight made possible by the PPN technology increases the performance and improves the handling of the glider. The Tubebag itself is produced with the workmanship you would expect from U-Turn and lives up to the highest demands in use. It features many functional details and ensures that the EMOTION 2 preserves the launch and flight qualities for many years to come - an advantage that can increase the resale value. The glider has become lighter ever since abandoning the use of Mylar in the cell openings and replacing them with synthetic rods. Its handling advantages and increased performance can be also attributed to PPN technology.

The U-Turn EMOTION 2 has become more than ever an uncomplicated wing with a broad margin of leeway since all the aforementioned, new technology has been introduced. It is forgiving and good natured in behavior. The EMOTION 2 is suitable for training and at the same time an agile glider which dares to climb thermals. It suits first class pilots who refuse to make compromises on passive security during high performance flying. Of course the EMOTION 2 is fitted with top shelf Liros lines.

With the AFS-system U-Turn provides an innovative feature. To fly safely means to fly actively - the system employed on the U-Turn EMOTION 2 allows this to happen automatically to a certain level. The secret of the AFS-system is based on a pre-tensioning principle. In the area of the brake attachment points the undersurface is pre-tensioned. Whilst the sail is gliding through smooth air, there is enough pressure inside and the pre-tensioning is neutralized: The effect of internal pressure is more powerful than the pre-tensioning and the trailing edge stays aerodynamically perfect in the air like a conventional glider. When entering turbulent air with the EMOTION 2 the system adjusts immediately, even the slightest drop of internal pressure allows the system to react. The pre-tensioning at the trailing edge is effectively like pulling the brakes.

Ernst Strobl recalls the fine-tuning: "Our computer-based calculations were impressively confirmed during our tests". The system is extremely responsive so that a top-quality manufacturing is key. U-Turn Cofounder Thomas Vosseler adds: "We guarantee a strongly supervised manufacturing process".

The AFS works like the Electronic Stability Programs known in the automotive industry, you could call it an "ESP for the air". It intervenes for the benefit of safety when an inexperienced pilot, or a pilot in trouble, enters turbulence and is unable to fly actively. Experienced flight-instructors confirm: "This is a major step as far as safety is concerned. The main reason for accidents, the full collapse of the canopy, is minimized dramatically". Even without AFS the U-Turn EMOTION 2 would be a very safe glider says Strobl. Due to the extremely pulled down wingtips and the resulting spread of the wingloading the U-Turn EMOTION 2 has far more than average resistance to collapses. The EMOTION 2 gliders stably ahead even after an accelerated asymmetric collapse, a situation that may happen after leaving a thermal, even with 50% of the wing area collapsed. This is unprecedented. The computer optimised wing layout leads to very good thermal lift and maximizes the stall characteristics, both improving safety.





### General

“Launch control” sounds a lot like formula 1 and a lot of speed. But for U-Turn the abbreviation LC stands still more comfort when the wing is inflating and a large step to still more security during launch / take off.

This latest innovation by U-Turn offers a set of advantages to pilots of various experience levels. Because LC reduces the chance of mistakes at launching, it allows for a safer and less stress at take-off, at for instance an unfamiliar site. Since the system can be disengaged, it is up to the pilot individually whether or not to use it. Also LC allows the pilot to adjust the inflation speed of the wing according to the launch conditions.

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“U-Turn wings in the EN-A class already have minimal susceptibility to overshoot during launch. The ability to engage the LC where the A- and B-risers are connected makes this even less of an issue.” Strobl states.

The two D-rings on the A's are spaced 3 cm apart, the pilot can select this way with which intensity LC affect the launch speed. Since this way the angle of attach can be varied easily, it also means the take-off speed can be adjusted just as easy. Therefore take-off speed can be set to slower at launches on a steep or with a short runway.

### Manual

The U-Turn Emotion 2 is the first glider in the World to feature the option of being able to adjust its inflation speed, and individually tailor it to the launch conditions. The best way to develop the feel for this, is to try the different adjustment settings in a variety of launch situations (slope angle and wind strengths).

Take off with launch control is very easy. Instead of having your thumb on top of the A-risers, it goes through the loop of the Launch Control. You do this whilst normally holding the brake toggles in you hand, pulling the glider up as usual. Because of a lower point attack on the A-riser, the inflation speed is reduced. It therefore eliminates the possibility of an inadvertent pulling down of one or both A-risers. This improves the launch behavior and safety considerably.

## Launch Control

In general the settings can be summarized

Launch with Launch Control with the traditional A-risers in hand

- light wind
- light drain
- gentle slope

Launch with Launch Control  
(Attached to the lower D-ring,  
position B)

- winds from 15km/h
- average slope angels



Launch with Launch Control  
(Attached to the lower D-ring,  
position B)

- Windspeeds greater than 20km/h



## Approved features: B-flight help and assistance for Big-Ears

Reasons for mistakes in doing fast descents by B-stall or Big-Ears should be eliminated by appropriate design. B-stall and Big-Ears both have potential for error if they are not performed properly. Tucking in the wing tips, known as Big-Ears, leads normally to a very stable flight attitude. The canopy stays steerable with a sink rate of around 5-8 meters/second (depending on the number of pilots often mix up the outer A-lines with the outer B-lines, the stabilo line, or with the most serious results, the outer D-lines.

The U-Turn EMOTION 2 comes remedies these dangers with the "Big-Ears Assistant". A long, thin and easy to distinguish webbing, attached to the risers, ensure safe and efficient Big-Ears. Flight instructors explained: "During our traing we notice again and again, that unexperienced pilots in stressful situations don` t know which line to pull". With the new assistant this issue is history. The same goes for the B-flight-help. B-stall is initiated by pulling the B-risers, the airflow at the top-surface detaches and the canopy folds in a span wise direction, the glider is sinking 5-8 meters/second without any forward speed. In case of pulling the C-risers by mistake, the whole flight attitude becomes unstable, the canopy enters deep stall and violent oscillation arisers - this is the simply impossible with the distinctive B-flight Help. The B-flight-system provides the possibility for sink rates of approx. 5m/s with a fully steerable canopy. In additon to these safety features the U-Turn EMOTION 2 provides several pracitcal features, making it very user friendly.



**IMPORTANT:** Having the necessary level of experience can never substitute the need to familiarize yourself with the glider before leaving the ground. Please carefully read the handbook and take advantage of the support from your flight school, or U-Turn directly for that matter.

Please always remember that aviation can be potentially dangerous and your safety is in your own hands. We strongly encourage you to fly conservatively; this includes the judgement concerning conditions as well as the choices you make in flight.

## New Features

Using the Easy-Fix you can secure the risers when packing the glider and eliminating the tangling of lines in the risers. Every time you get to launch leave out and your lay out is hassle free, when folding your glider at the end of each flight: you will love Easy-Fix. Last but not least are the Dirt-Outs which ease the effort of removing dirt or leave out of the canopy.

In the literal sense, the U-Turn EMOTION 2 is not only setting the bar as far as safety is concerned, it is introducing a paradigm shift in glider design. Although the whole design process was primarily focussed on safety, Ernst Strobl managed to design a piece of sports equipment, whose characteristics guarantee untroubled fun.

## Lines and risers

We use DC60, DSL70, PPSL120 Liros Lines as well as Tajin GIN Lines TGL140, TGL160, TGL200, TGL280, TGL400, with a special waved Dyneema core. This stretch resistance prevents changes in flight characteristics caused by different stretching after a short time of use. An optimum of safety and strength in proportion to drag is achieved by the use of different line diameters. The whole line system consists of single elements that are sewn and looped on both ends. All suspension and brake lines are forked in the upper cascade. The different color of the lines guarantee ease of handling and control. All suspension lines are looped separately in maillons and connected to the risers.

The maillons have clips built in to prevent slipping of the lines. The main brake line is looped through a pulley at the D-riser with a color marking where a brake toggle has to be tied off.



The manufacturer settings is 0 travel plus 5 cm. Shortening more than 5 cm is not allowed and results in a "brake" condition in flight which is extremely dangerous for takeoff, flight and landing. The factory settings provides sufficient brake travel on landing and in extreme flight conditions, as well as a comfortable arm position on trim speed.



Please note that with the height of the harness mounting also the relative distance changes. When adjusting the setting, both sides have to be symmetric and a permanent knot has to be used. Optimum solution is the so called "Spierenstich" knot which doesn't slip or affect the lines adversely.

## Speed System

The U-Turn EMOTION 2 is equipped with a very effective leg-actuated speedsystem that increases the speed btw. 13 and 17 km/h depending on model and pilots weight area load respectively. During extreme manoeuvres the speedsystem should not be activated, when entering an extreme manoeuvres it should be immediately deactivated. All extreme manoeuvres (i.e. stalls...) get more dynamically at higher speed.

Because the maximal adjustment of the accelerator is related to the safety characteristics of the canopy it may happen, that - using certain harnesses - the broad accelerator adjustment is not available.

## Suitable Harness

All officially approved harness systems with mounting about the breast height are suitable for the EMOTION 2 (they have to be DHV rated GH). The lower the mounting, the better is the steering by shifting of the bodyweight. U-Turn recommends the new IQ4 harness for its highest level of safety and convenience. The positioning of the mounting also changes the relative brakedistance. If you have any questions about the usage of your harness with the EMOTION 2, ask your U-Turn dealer or directly contact U-Turn. We assist you in any possible way.

## Risers

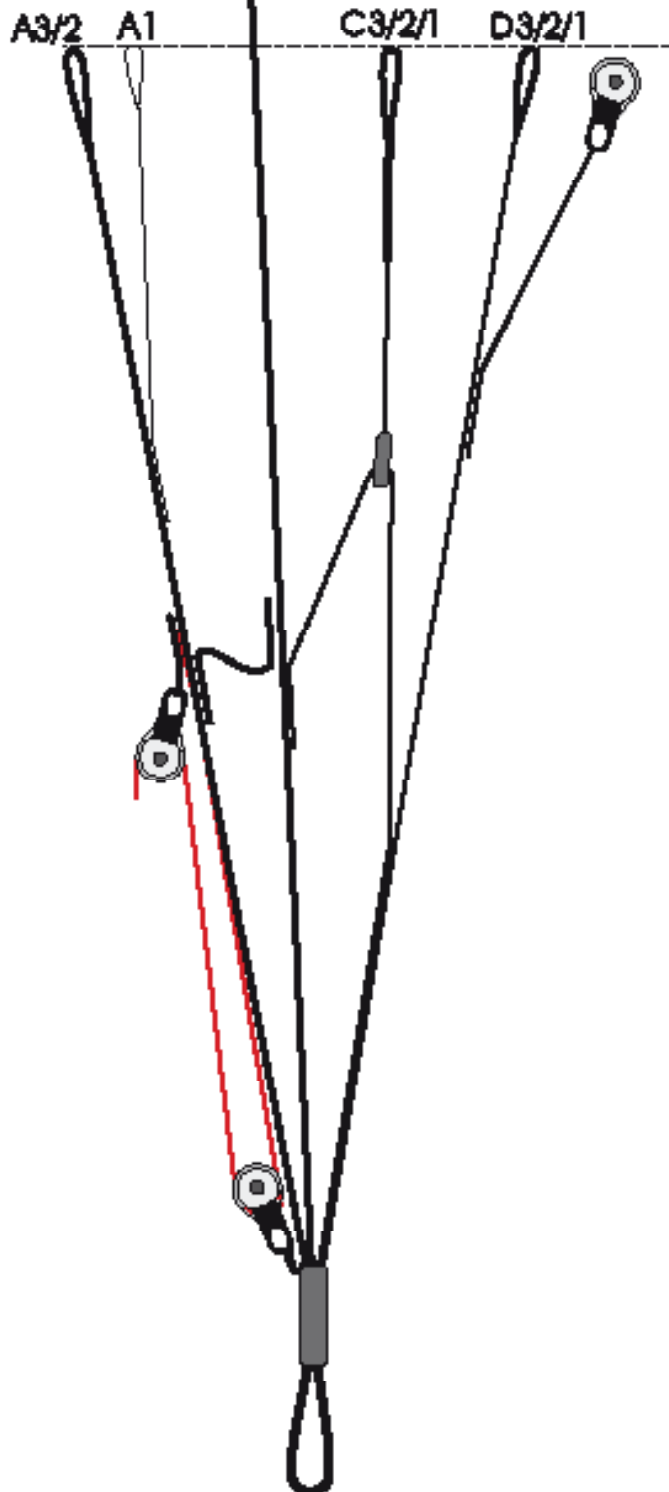
The A- and B-risers have a different colour to ensure positive identification at take off and during a B-stall descent. The length of all risers has been chosen in a way to get easy access to all and lineshacksles in flight for special manoeuvres.

Made of rigid and stretch resistant Polyester-webbing, the EMOTION 2 risers guarantee a long term, stable trim.

B3/2/1/Stablo

# U-TURN EMOTION TRAGEGURT / RISER

REV2 25.09.2007





## Suitable Rescue System

It is required by law and absolutely necessary for safe operation of your paraglider that you always carry a rescue system with you. When choosing a rescue system, watch out that it is approved and suitable for the intended takeoff weight. With the innovative rescue systems of the SECURE-series by U-Turn light-weight, convenient and safe reserves are available.

## Operation



This instruction manual only pays attention to those points of flying technique which are important for the EMOTION 2. It is not meant to substitute a basic flying education in an approved flying school! If a flying education and the appropriate experience is missing, paragliding is dangerous to life.

## Range of Operation

The EMOTION 2 has been developed and tested for ordinary takeoffs, winching, and is also well suitable for motorized operations. An unauthorized or unapproved use of the EMOTION 2, or operation out of its operational limits is improper and dangerous.

## Aerobatics

Aerobatics are illegal and dangerous. There is a danger of unpredictable flight conditions that could result in overstressing both material and pilot.

## Motorised Paragliding



The U-Turn EMOTION 2 is suitable due to its outstanding launching characteristics, its wide weight range and its unproblematic handling particularly well for the motorized paragliding. Please note that for the motorized use its own permission of the combination is necessary for engineunit and glider. If you intend to operate the EMOTION 2 motorized, please contact the motor manufacturer, U-Turn and the DULV (Deutscher Ultraleichtflug Verband) for official approval.

Use only approved motor / glider combinations and adhere to the regulations as well as the training requirements.

## Preflight Check

A careful pre flightcheck is absolutely mandatory. Double-check everything when you don't fly yourself and make sure the person flying your EMOTION 2 does the same. Also ensure that the pilot flying your EMOTION 2, knows its operational limits and has the required license.

All lines, risers and the canopy have to be carefully checked for damage before every takeoff. Even in case of minor damages takeoff is not an option. After the glider is unpacked and layed on the ground in a halfcircle-shape, check following items:

- Lay down the canopy to draw on the middle line before the outer lines, when pulling up the glider with the A-risers, to get an easy and stable takoff.
- Set yourself up into the wind to get a symmetrical load on both sides when pulling up the canopy
- The risers may not be twisted to enable smooth looping of the brakelines.
- Make sure no lines are under the canopy to avoid a dangerous situation on takeoff.
- Preflight all other equipment after the check of the glider carefully.

## Take off

The U-Turn EMOTION 2 has a very easy take off.

It is important to evenly lay out the canopy with care. The middle of the glider is determined by the U-Turn EMOTION 2 logo at the leading edge. It is sufficient to only hold the A-main harnesses. Being that the U-Turn EMOTION 2 shows no tendencies to overshoot forward it only needs to be slowed down minimally in the take-off phase. Necessary correction in direction using the brakes should only be performed once the canopy is above the pilot, otherwise the glider might fall back due to excessive braking.

The remaining risers should not be held during take off. The canopy will fill up with evenly distributed pull but altogether very light startimpulse. Unlike other gliders it is not necessary to fill the U-Turn EMOTION 2 with strong inflation motion or even several fast steps. This is also true for very little wind and even zero wind. The easiest and safest way to start the U-Turn EMOTION 2 is moderate inflate. Once the pilot ensures that the canopy is fully opened above him, the final decision for take off can be made. After several forceful steps they take off.

## Turning

The U-Turn EMOTION 2 has a normal agility and reacts directly and instantly to steering inputs. You can fly flat turns with little altitude loss by shifting of bodyweight. A combination of appropriate pull on the inner brakeline and shift of bodyweight is the best way for a coordinated turn. The Turn radius depends on the amount of pull on the brakeline.

At about 75% of brakeline travel, the EMOTION 2 increases bank significantly and performs a fast steep turn that can be continued to a diving spiral. The diving spiral has to be initiated and terminated slowly. The bank angle is controlled by increasing and decreasing the pull on the inner brakeline.



**WARNING:** A rapid pull on the the brakeline may cause a spin.


## Active Flying

The U-Turn EMOTION 2 should be flown with light braking on both sides when there is turbulent air. An increase in angle of attack provides better stability. When entering heavy thermals or strong turbulences be mindful of that the canopy does not get behind the pilot. To avoid that, release the brakes a bit to get an increase in speed when entering the updraft.

If the canopy gets in front of the pilot when leaving a updraft or entering a downdraft the brakes have to be applied to counter that. Accelerated flight however is advisable when flying through a downdraft zone. The EMOTION 2 is very stable overall, never the less is active flying a big flight safety factor. Collapsing and deforming of the canopy can be avoided by active flying (as above mentioned) in turbulent air.

## Landing


Start your landing preparation at sufficient altitude. Due to its excellent flaring characteristics, the EMOTION 2 is very easy to land. Glider in fairly normal to a straight-in final against the wind and get up in the harness early enough. According to the wind, the brakes have to be pulled firmly and dynamically, about one meter above ground, beyond the stalling point. If there is a strong headwind, be careful with the amount of braking. Don't perform landings out of steep turns and big directional changes short prior landing, to avoid PLF.



During a strong wind takeoff attempt, ground handling and landing the leading edge can hit the ground with high speed. Avoid this! Otherwise the ribs, the sewings or the fabric can be damaged.


## Winching

Because of its excellent starting characteristics, the U-Turn EMOTION 2 is well suitable for winching operations. Take the following points into account:

- 
- maximum line tension for winching is 100kp.
  - if not operating at your usual winch, get acquainted with the local procedures and get a good briefing by a local pilot.
  - body position and pulling up the canopy does not differ from a normal takeoff. The canopy has to be completely over the pilot at takeoff. No early steering inputs to avoid falling back of the canopy or being pulled off with a non flyable glider. Never give the takeoff-command before you have total control over your glider. Don't turn too much during the takeoff-phase and before reaching the minimum safe altitude.
  - never winch the EMOTION 2 with loads outside the allowable weight range
  - all involved persons, machines and accessories have to have the appropriate licenses, approvals, certifications for winching.

## Advanced Handling

Even with its high stability and good flight characteristics it is possible that the EMOTION 2 gets into an extreme flight condition due to pilot mistakes or turbulent air. To be prepared for such situations and able to handle them in a calm and superior manner it is best to take part in a flight safety course. Advanced manoeuvres may only be flown at sufficient altitude, in calm air and with professional supervision (i.e. during a safety course). Once again we mention that a rescue system is required by the law.



The following extreme manoeuvres can be either caused intentionally, by pilot mistakes or by bad weather conditions. Every pilot can get in such a situation! All mentioned extreme manoeuvres are dangerous if they are performed without the appropriate knowledge or enough altitude or the necessary introduction. A wrong execution of these manoeuvres may have fatal consequences!

## Wingovers

The pilot has to perform right and left turns with increasing bank until the desired angle is reached. Appropriate brake pressure during up or down swing will prevent the wing tips from folding. Collapsing is only a factor when the bank angle is very high.

## Full Frontal

A negative AoA caused by turbulences or the simultaneous pulldown of the A-risers by the pilot, results in a frontal collapse of the leading edge. The EMOTION 2 normally comes out of a frontstall by itself very quickly. Smooth and symmetric applying of the brakes assists the opening of the canopy positively.

## Deep Stall

The EMOTION 2 is not stall sensitive. If in a stall, caused by overpulling on the brakes, the rear risers or a delayed B-stall exit, the release of the brakes or the rear risers, recovers the stall. Should the stall be caused by an extreme flight condition or configuration ( i.e. takeoff weight to low), a symmetric forward push on the A-risers or step the speed system recovers the stall.



**Warning:** Practicing stalls should be done with enough safe altitude. Never apply asymmetric brakes during a stall, it could cause a spin.

## Fullstall

To enter a fullstall pull both brakes full travel (ensure no twisted or wrapped lines). The canopy has to be stabilized before recovering the fullstall. Rise both brakes slowly and symmetrically to recover. If done right, the canopy overshoots a little forward without collapsing. Avoid an asymmetric recovery by all means. The dynamic forces drive the canopy to overreact and a collapse could occur.



**Caution:** Never release the brakes at the beginning of the recovery when the canopy tilts forward, the canopy may accelerate forward in a way that makes contact or even falling into the canopy possible.

The fullstall is a dangerous manoeuvre and should not be performed intentionally except during a flight safety course.

## Emergency Piloting

In any situation where normal steering with the brakelines is not possible, the EMOTION 2 can be steered with the back risers easily.

## Negative Turn

To enter a spin the pilot has to fully and quickly pull one of the brakelines when he is near the stallpoint. The glider rotates fast around its center while the inner wingtip flies backwards. For recovery just release the applied brake to let the glider accelerate.



**Warning:** The spin is a dangerous manoeuvres and should not be performed intentionally except during a flight safety course.

## Collapses



Even with its high stability and very responds well in turbulence, strong turbulences can cause the EMOTION 2 to collapse. That situation is not really dangerous and clears itself automatically, without any further input required. To support the recovery, firmly apply brakes on the affected side and simultaneously steer opposite on the open side. When a large part of the canopy is collapsed be careful and smooth when applying opposite steering to avoid a complete disruption of airflow and entering a fullstall.

## How to avoid collapses

Single side collapses close to the ground are the number one reason for accidents with paragliders. To avoid them, or how to handle the situation when it happened, some tips and tricks from U-Turn test- and competition pilot Ernst Strobl:

The best way to avoid collapses upfront is the right choice of the paraglider. A lot of pilots fly a glider that is a little too hot to handle for them. So why don't you get a glider with a lower rating but in the end fly better and higher in the updrafts and have a lot more fun and by the way be safer, too. To optimize the feeling for your glider on the ground, try the following:

Practise on the ground with the right wind at a suitable location. Slowly pull up the canopy and try to hold it up as long as possible without looking towards it. That is a good way to improve the feeling for your glider and is a prerequisite for „active flying“ (the key to avoid collapses). Very important is also a close look at the terrain. Watch for obstacles that could cause turbulences ( buildings, trees, ...). On certain days, for example a freshly mowed madow as landing field, could cause a lot of thermal activity. Fly very alert on a thermal active day. Watch your canopy, collapses most of the time, announce themself. Light braking in turbulences mostly avoids a collapse. You should have already practised that on the ground. Should a collapse occur close to the ground don't always try to prevent a turn away. There is a danger when the braking on the open side is too strong, to lose the airflow on this side and stall the glider. Rather use the turn away motion to try to open the collapsed side.

Apply smooth braking on the open side, depending on the size of the collapse, and maybe a little pumping action. Some canopies open a lot better when the brakes are fully applied once on the according side, but that depends on the brakeline adjustment and your armlength. Wrapped lines are cleared by braking the opposite side at enough altitude and pumping the affected side a couple of times. Watch out for a possible stall. If that does not clear the situation, try to pull down the outer line as much as possible. If you are too low for that, stabilize the canopy on the opposite side to avoid turning away, and leave the lines like they are. Instead of any -risky manoeuvres rather concentrate on the landing. In the end one more advice in order to have all kinds of situations under control.

Visit a safety-training above water. There is no better way to practice the right behaviour than simulating a dangerous situation. Don't get caught off guard by your first collapse. In addition, during safety-training you can familiarize yourself with the particulars of your equipment and you gain confidence in your glider as well as your own abilities.

Thus far the expert advise concerning collapses, by Ernst Strobl



## Rapid Descent

In any situation where you have to get down ASAP for different reasons (weather, extreme updraft, or other dangers,) there are a couple of techniques that are described in this chapter.



**Caution:** The described manoeuvres stress you paraglider more than normal and should only be performed for practise or in a real emergency!

## Spiral Dive

Like a normal turn, it is very easy to get the EMOTION 2 into a spiral dive. The spiral dive gets you a descent rate up to 20 m/s. To prepare oneself in case of, practise it in optimum conditions. The diving spiral gets the pilot down faster than other techniques and is therefore best suited for an emergency descent. They move down vertically within the airmass. Don't forget the G-forces when diving down, and take that into consideration before initiating a rapid descent.

**Caution:** If initiation is too fast there is a danger of a spin, in this case release the brake and try a smoother initiation.



**Warning:** Never fly a spiral dive while "big earing" the glider. It is illegal aerobatics and may over stress the both pilot and material.

## Big Ears

Pull both on the outer A-risers one after the other (grab the line shackles) about 15-20cm to fold the wingtips. Whilst holding the braketoggles together with the A-risers. The glider stays fully steerable and descends with 4-7m/s straight forward. If you release the A-risers, the folded wingtips open automatically. Should there be any problem with the reopening, you may pump the brakes gently.

„Big earing“ is due to the high wingload a very stable flight condition and well suited for turbulent air. Be aware that you reduce the trimspeed, but that can be compensated by accelerating with your legs.



**Warning:** Don't fly extreme manoeuvres in this configuration, it is dangerous due to the danger of overstressing your glider. Fullstalls and spins are dangerous for a rapid descent because a wrong termination could have fatal consequences no matter what glidertype you are flying.

## B-Stall

Another very efficient descent method is the B-Stall. It allows for a rate of descent of 6 to over 9 meters per second. Check the airspace under and behind you prior to initiating a B-Stall. To initiate it you hold the two B-risers above the lines carabiner. While you hold the brakes in your hands at all times, pull them down progressively and symmetrically. Hold this position. Your sail will stop flying forward, partially empty, and stabilize itself above your head. Exit B-stall flight by returning the risers symmetrically into their original position.

We recommend not to simply let the risers snap shut as this puts a lot of pressure on the material.

In the paragraph titled "advanced handling" you can read what to do if you get caught unexpectedly in a stall.



ALL KINDS OF RAPID DESCENTS SHOULD BE PRACTISED IN SMOOTH AIR AND WITH ENOUGH ALTITUDE TO BE PREPARED FOR EXTREME SITUATIONS WHEN YOU NEED THEM



## Maintenance and Care

Because U-Turn only uses high quality materials, your EMOTION 2 will be airworthy for many years if you take good care. The aging of your EMOTION 2 depends on the total flying time, the conditions you fly in, the amount of UV radiation it is exposed to and the intensity and quality of care.

A couple of tips for maintenance and care:

Long lasting exposure to UV radiation and normal use stress the material

- Don't expose your glider to the sun when there is no need to.
- Consider the choice of terrain where you lay out the glider for takeoff.
- Assymmetrical and changing folding patterns prolong the lifetime of the material especially in the middle section.

Please take following points into consideration:

- regular checks for damage
- no unnecessary bending
- lines after overloads (tree landings, water landings, etc.) for its strength and correct length to be checked and exchanged if necessary.
- in case of changing inflight handling characteristics, the lines have to be checked for their correct length
- don't tie the brakelines on the grips if not needed, it weakens the lines



To clean the canopy use warm water and a soft sponge.

If you use a detergent for hard stains, make sure that you rinse intensively afterwards. Never apply any chemicals for cleaning, they weaken the material and damage the coating. Store your glider at a dry and dark location away from any chemicals. After two years or 300 flight hours, whichever occurs first, your EMOTION 2 has to be inspected by the manufacturer, in case of extreme use we are glad to do that earlier. Only you know about the condition of your glider. Should there be a need for any repairs they are to be done by the manufacturer.



U-Turn cannot be hold responsible for any 2-year inspection and any repairs not performed by U-Turn or an U-Turn authorized dealer. Any checking or repairing performed by people not authorized by U-Turn will cause denial of any warranty!



## Safety Advices and Liability

This glider complies with EAPR, AFNOR (SHV and ACPUL) regulations, for the tested type, at time of delivery (see appendix).

The operation of the glider is at your own risk. The manufacturer and the dealer don't take any liability for accidents and follow on damages. Please consider all safety notes, cautions and warnings for safe flying. Further, we assume that the pilot has the necessary certifications and that the legal limitations are being followed. Use of the equipment is at your own risk. Follow the safety instructions for a safe flight. Special emphasis on following points:



- stick to the rules and regs of the country you fly in
- required licenses and actual experience
- use only suitable, approved and certified accessories (helmet, harness, safety systems...)
- appropriate weather condition
- suitable terrain
- all required checks done and airworthiness of the glider
- personal shape of the pilot
- know your manual and stay within the published limits

## Nature and environment friendly behaviour

We ask you to perform our sport in a manner, that impacts nature and environment with minimum intensity. Please do not walk beside marked paths, don't leave any waste, please be not noisy and respect the sensitive biological equilibrium in the mountains. Especially at starting areas maximum care for nature is necessary.


## Removal

The synthetic materials your U-Turn glider is build must be depolluted appropriately. Please send your U-Turn glider at the end of its life-cycle back to U-Turn. We will take care for recycling and removal.

Marking of components	Material / product name	Technical data / Dimension weight / strength	Producer
Attachment loops	Nylon	7,2 g/m / breaking strength 110 kg / 13 mm spreads	Kolon Industrial Co, Korea
Accelerator lines	Nylon	Ø 4,0 mm = breaking strength 350 daN	
Accelerator - brakeroll	GIN Rolle		Gin Glider Korea
Accelerator lock	Brummelhook		Gin Glider Korea
brake attachments	Nylon	7,2g/m breaking strength 110 kg / 13mm spreads	Kolon Industrial Co, Korea
brake handhold	High Tanacity Poliester Yam 22mm	25 g/m / 1000 kg breaking strength	Techni Sangles, France
brake handhold attachment	High Tanacity Poliester Yam 22mm	25 g/m / 1000 kg breaking strength	Techni Sangles, France
brake handhold attachment	Magnet		Gin Glider Korea
Break main line 2,3 mm Ø	Dynema Lines	2,3 mm = 250 daN	Gin Teijin Korea
Lines: DC60, DSL 70, PSSL 120, 160, 200, 275			Rosenberger Tauwerke Gin Gliders Korea
belt direction	Liros Lines		
lines lock	Stainless Steel	8g/Ø 3,8 mm / breaking strength 800kg	Ansung Precision CO, Korea
Top sai -A-B-C	Stainless Steel	12g / Ø 4,3 mm / breaking strength 1000kg	Ansung Precision CO, Korea
V-Tape	Skytex 36 / Skytex 27	36 g/m <sup>2</sup> / 27g/m <sup>2</sup> (PA 6,6 HT)	Porcher Marine, NCV, France
Nose reinforcement	Skytex 27	27 g/m <sup>2</sup> (PA 6,6 HAT)	Paratex, Germany
Rips, Profile	P 260	283 g/m <sup>2</sup>	Dimension-Polyant, Germany
Riser	Skytex 36 / Skytex 27	36 g/m <sup>2</sup> / 27g/m <sup>2</sup> (PA 6,6 HT)	Paratex, Korea
Bottom sail - A-B-C	High Tanacity Poliester Yam 22mm	25 g/m / 1000 kg breaking strength	Techni Sangles, France
Reinforcement pivot point B/C/D	Skytex 27	27 g/m <sup>2</sup> (PA 6,6 HT)	Porcher Marine, NCV, France
sewing thread canopy	W 420	180 g/m <sup>2</sup>	Porcher Marine, NCV, France
sewing thread lines	High Tanacity Poliester Yam 150 D/2	0,05 g/m <sup>2</sup> / 2,9 kg breaking strength	Amann & Söhne GmbH, Germany
	High Tanacity Poliester Yam 150 D/3	0,083 g/m <sup>2</sup> / 3,2 kg breaking strength	Amann & Söhne GmbH, Germany

Startgewicht / Take off weight (kg)	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125
Emotion 2 XS	2,1	2,3	2,5	2,7	2,9	3,1	3,3									
Emotion 2 S				2,5	2,7	2,9	3,1	3,3	3,5							
Emotion 2 M								3,0	3,2	3,3	3,5	3,7	3,9			
Emotion 2 L										3,3	3,4	3,6	3,8	3,9	4,1	



 <b>EMOTION 2</b>		XS	S	M	L
Take off weight		50 - 80 kg	65 - 90 kg	85 - 110 kg	100 - 130 kg
Wing area flat		24,5 m <sup>2</sup>	26,5 m <sup>2</sup>	28,7 m <sup>2</sup>	31,0 m <sup>2</sup>
Wing area project		21,85 m <sup>2</sup>	23,63 m <sup>2</sup>	25,63 m <sup>2</sup>	27,65 m <sup>2</sup>
Wing span flat		11,0 m	11,44 m	11,91 m	12,38 m
Wing span project		9,3 m	9,67 m	10,07 m	10,46 m
Aspect ratio flat		4,94	4,94	4,94	4,94
Aspect ratio project		3,95	3,95	3,95	3,95
Number of chambers		41	41	41	41
V-Trim		37-38 Km/h	37-38 Km/h	37-38 Km/h	37-38 Km/h
V-Min		~ 22 Km/h	~ 22 Km/h	~ 21 Km/h	~ 20 Km/h
V-Max		~ 48 Km/h	~ 48 Km/h	~ 48 Km/h	~ 48 Km/h
Features		AFS, BFS** , Dirt Out, Launch control, Tension Stripes	AFS, BFS** , Dirt Out, Launch control, Tension Stripes	AFS, BFS** , Dirt Out, Launch control, Tension Stripes	AFS, BFS** , Dirt Out, Launch control, Tension Stripes
Number of risers		5	5	5	5
Number of lines storeys		3	3	3	3
Accelerator / Trimmer		Accelerator	Accelerator	Accelerator	Accelerator
Glider weight		5,2 kg	5,6 kg	6,2 kg	6,5 kg
Certification		EAPR-GS-7449/11	EAPR-GS-7389/11	EAPR-GS-7384/11	EAPR-GS-7390/11

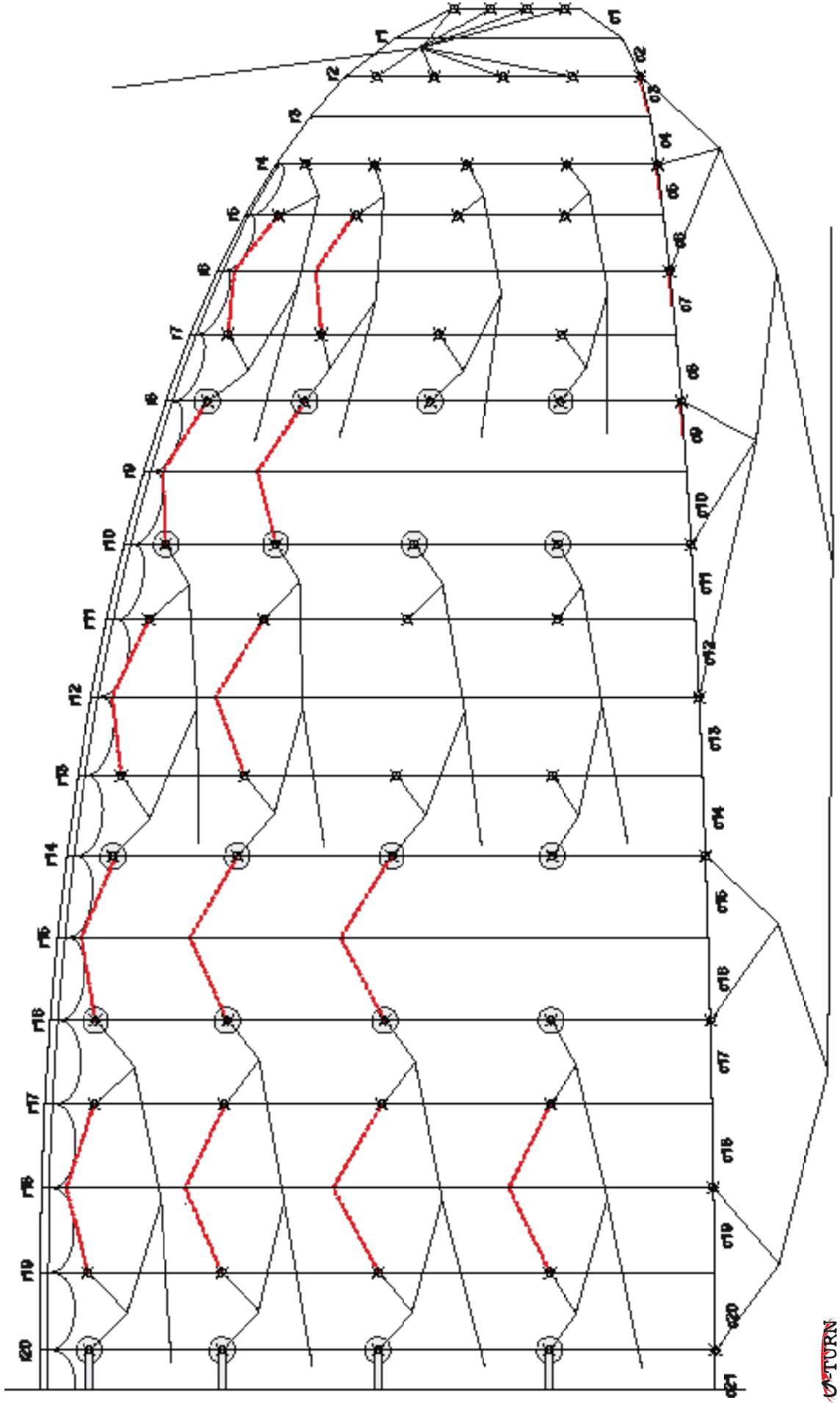
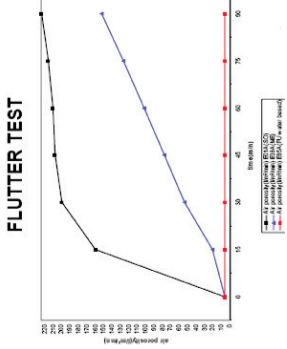
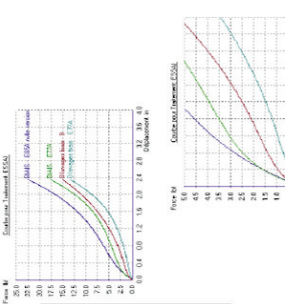
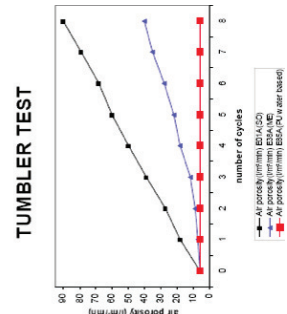
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You will find further details regarding the construction and measurement of the U-Turn EMOTION 2 in the "Typenkennblatt" or, in case of equipment with example registration, in the "Luftsportgerätekennblatt" in accordance with paragraph four of the "Luftverkehrsulassung". (See attachments) You can find possible technical changes in the attachment to this manual.

**Important:** any self inflicted changes to the construction that go beyond the allowed adjustment options, void the operating license and are potentially life threatening. Use of this paraglider is at your own risk. The producer and distributor cannot be held liable.



Welches NCV Material Nylon wo verwendet wird, findest du auf Page 5, Materialliste.





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**Instruction leaflet for repairs and 2 annual Check**

Name:	
Address:	
Land:	Telephone Number:
E-Mail:	
Paraglider type and Color:	Serial number:
comments/notes:	

- |   |   |
|---|---|
| <input type="checkbox"/> 2 annual Check                         | <input type="checkbox"/> Line Check incl. strength test |
| <input type="checkbox"/> Air permeability check                 | <input type="checkbox"/> Repair of the marked damage    |
| <input type="checkbox"/> Recall with sighting of the paraglider |   |



Please, pretend the repair-describe place in the upper sail and / or under sail.





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LINE ORDER SHEET / BESTELLMFORMULAR FÜR LEINEN

Name	
Adress / Adresse	
E-mail	
Telephone Number / Telefon Nummer	
Paragliding name / Gleitschirm Name	
Size / Größe	
Other / Sonstiges	

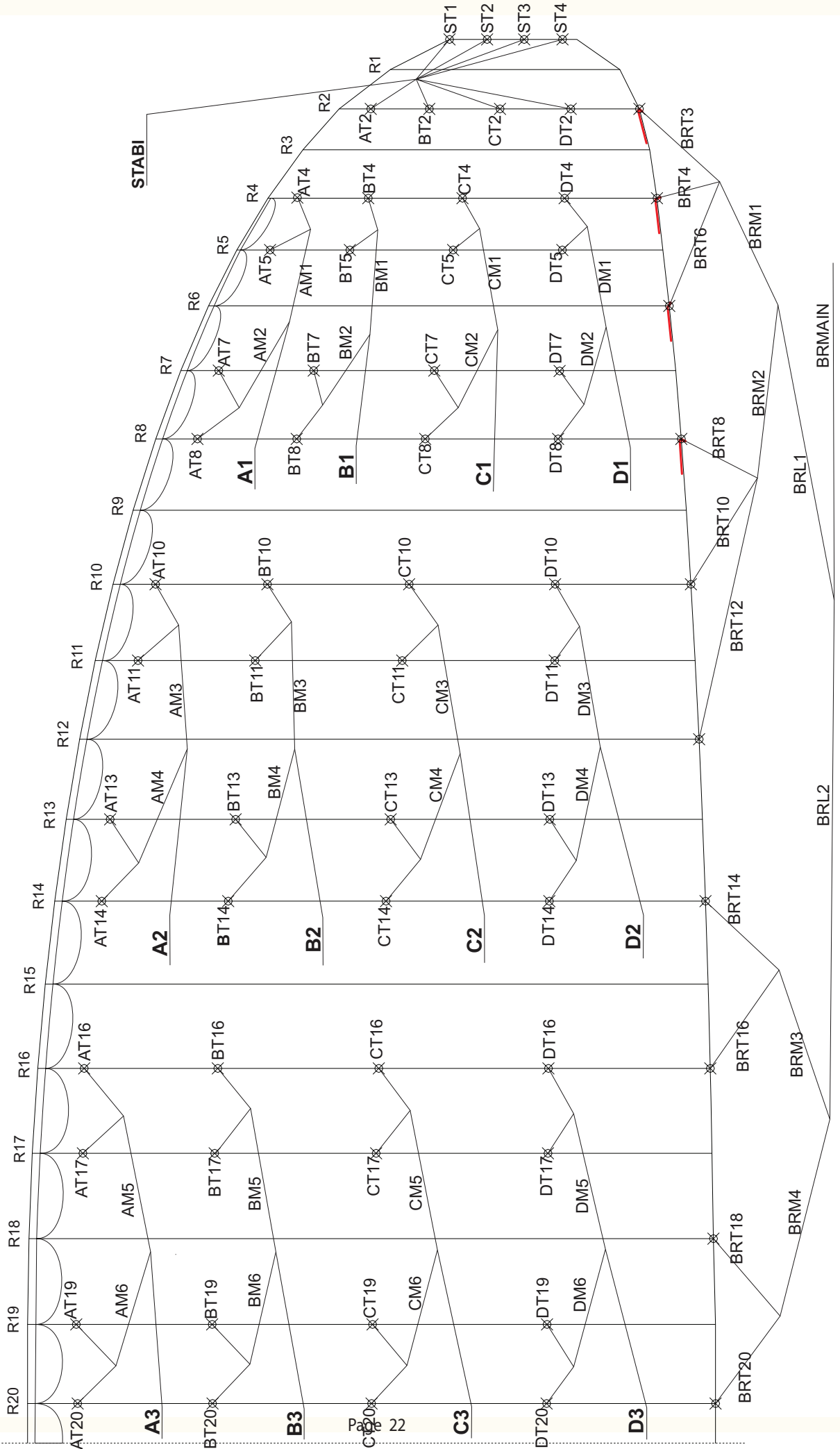
Serial Number / Serien Nummer: \_\_\_\_\_

Line ID / Bezeichnung	Quantity/ Stückzahl	Line ID / Bezeichnung	Quantity/ Stückzahl





# EMOTION 2



EMOTION 2 M		rev 4	18.12.2010	
<b>A-Lines</b>				
r 20	DSL 70	TGL 140	TGL 280	
r 19	DSL 70			
r 17	DSL 70	TGL 140		
r 16	DSL 70			
r 14	DSL 70	TGL 140	TGL 280	
r 13	DSL 70			
r 11	DSL 70	TGL 140		
r 10	DSL 70			
r 8	DSL 70	TGL 140	TGL 220	
r 7	DSL 70			
r 5	DSL 70	TGL 140		
r 4	DSL 70			
r 2	DSL 70			
Stabilo	DSL 70			
<b>B-Lines</b>				
r 20	DSL 70	TGL 140	TGL 280	
r 19	DSL 70			
r 17	DSL 70	TGL 140		
r 16	DSL 70			
r 14	DSL 70	TGL 140	TGL 280	
r 13	DSL 70			
r 11	DSL 70	TGL 140		
r 10	DSL 70			
r 8	DSL 70	TGL 140	TGL 220	
r 7	DSL 70			
r 5	DSL 70	TGL 140		
r 4	DSL 70			
r 2	DSL 70			
Stabilo	DSL 70		TGL 140	
<b>C-Lines</b>				
r 20	DSL 70	TGL 140	TGL 280	
r 19	DSL 70			
r 17	DSL 70	TGL 140		
r 16	DSL 70			
r 14	DSL 70	TGL 140	TGL 280	
r 13	DSL 70			
r 11	DSL 70	TGL 140		
r 10	DSL 70			
r 8	DSL 70	TGL 140	TGL 220	
r 7	DSL 70			
r 5	DSL 70	TGL 140		
r 4	DSL 70			
r 2	DSL 70			
Stabilo	DSL 70			
<b>D-Lines</b>				
r 20	DSL 70	TGL 140	TGL 220	
r 19	DSL 70			
r 17	DSL 70	TGL 140		
r 16	DSL 70			
r 14	DSL 70	TGL 140	TGL 220	
r 13	DSL 70			
r 11	DSL 70	TGL 140		
r 10	DSL 70			
r 8	DSL 70	TGL 80	TGL 140	
r 7	DSL 70			
r 5	DSL 70	TGL 80		
r 4	DSL 70			
r 2	DSL 70			
Stabilo	DSL 70			
<b>Brake</b>				
r 20	DSL 70	DSL 70	TGL 140	200
r 18	DSL 70			
r 16	DSL 70	DSL 70		
r 14	DSL 70			
r 12	DSL 70	DSL 70	TGL 140	
r 10	DSL 70			
r 8	DSL 70			
r 6	DSL 70	DSL 70		
r 4	DSL 70			
r 2	DSL 70			



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<http://www.liros.de>

Line ID	diameter	strength after 5000 bending	strength cat.
TGL 140	1.4mm	78,2	140 kg
TGL 200	Brake line		200 kg
TGL 220	1.6mm	138,1	220 kg
TGL 280	1.8mm	158,1	280 kg
TGL 400	2.1mm	181,9 kg	400 kg
DC 100	0.8mm	kg	110kg
DSL 70	0.95mm	85kg	82kg
PPSL 120	1.15mm	135 kg	150kg