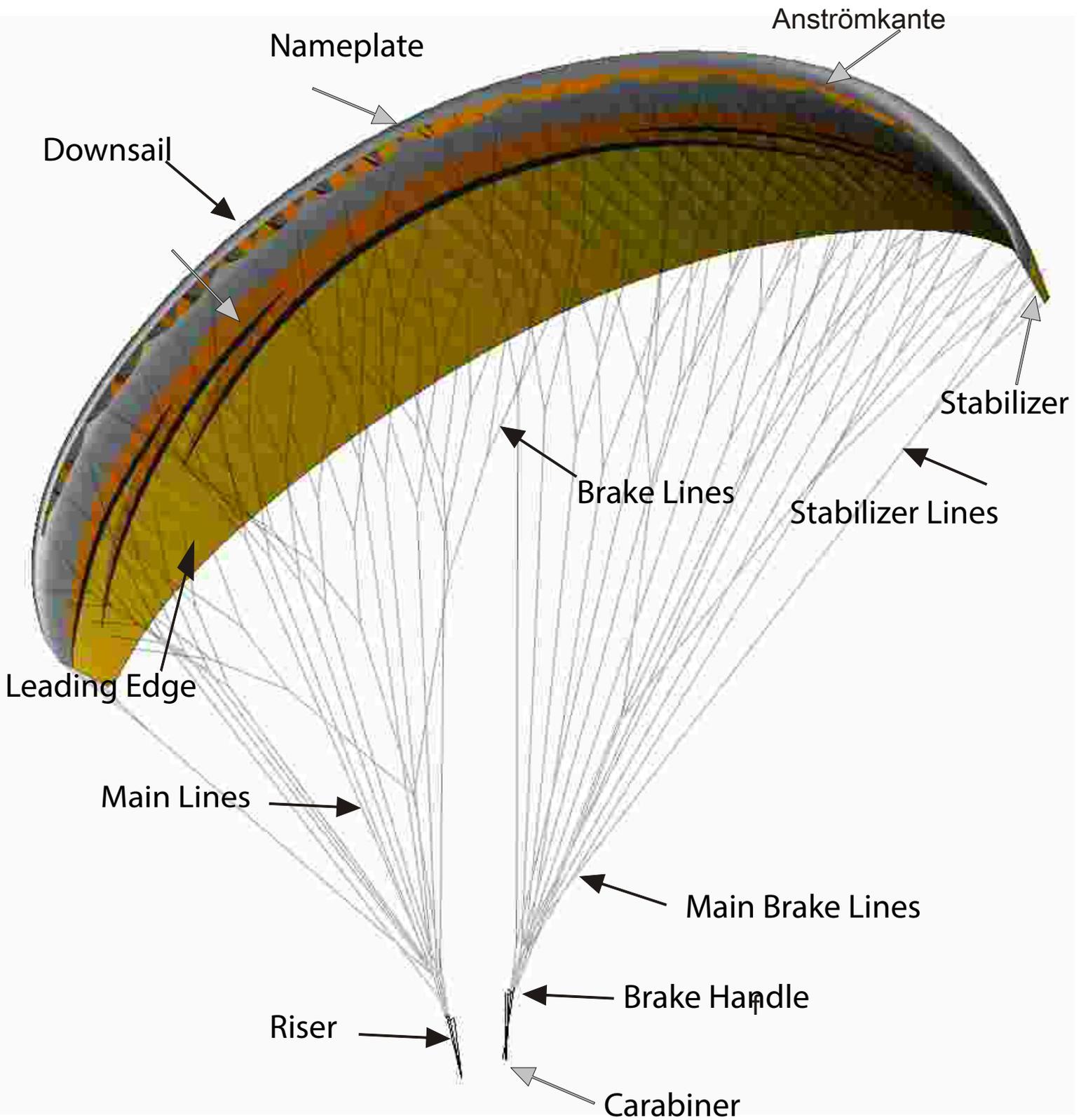




# Manual

# Relax 22/25





## 1. Dear Relax Pilot

We are happy to welcome you in the circle of relax pilots. The Relax was developed for those pilots who enjoy a very good direction, high speed and a high maneuverability and do not want to give up safety. The Relax is characterized by an excellent handling, its directional stability while circling and in the straight trip and its performance.

## 2. Important notes:

Reading this manual is mandatory!

The Relax paraglider may not be put into operation without careful reading of this manual to avoid incorrect operation.

It should be noted that the structure is now a component of the entire aircraft (trike)

By air law, only a combination of all required components is permitted. This must be explained by a routine test of the manufacturer.

This is especially important when exchanging individual components.

All information and properties of the Relax necessary for flight operation are to a considerable extent influenced by the trike used. For this reason, also the manual of the trike must be considered.

We hereby expressly point out that in the case of improper operation of the entire device (as described in the manual), no liability can be accepted.

At the time of delivery, this paraglider meets the requirements of the German Airworthiness Claim LTF.

New paragliders must have flown in by the seller.

Any change to the paraglider will invalidate the operating permission.

The pilot is responsible for the airworthiness of his entire aircraft and himself (aircraft, license, insurance, inspections, fitness).

The use of the paraglider is at your own risk! A liability of the manufacturer or distributor is excluded.

This manual has been prepared to the best of our knowledge and belief. However, from time to time you have to look for updates under [www.fresh-breeze.de](http://www.fresh-breeze.de)



### 3. Target Group:

The RelaX is a paraglider that has been specially developed for powered gliding with trike.  
The RelaX was tested for the German airworthiness LTF.  
The RelaX is not approved for free flight.

### 4. Technical Description:

#### Construction:

The material is made of air-impermeable ripstop nylon fabric D 40.  
In this synthetically produced fabric a reinforced thread network is woven. This prevents tearing and increases the tensile strength.  
The coating makes the fabric water repellent, UV resistant and impermeable to air.  
The Relax consists of 54 cells. The wing end is pulled down and integrated seamlessly into the cap.  
The ventilation of the cap takes place via openings on the underside of the profile nose.  
The transverse ventilation takes place through exactly sized holes (cross ports) in the rib.  
Each supporting profile rib is hung on 4 line connections.  
Tension bands are sewn in between the main line groups, which regulate the sail tension.  
In the profile nose reinforcements are sewn in, which ensure high dimensional stability and stability.  
At the inflow and outflow edge a stretch-poor band is sewn in. This ensures a uniform distribution of stress throughout the cap.

#### Suspension:

Depending on the installation location, the lines of the RelaX are made of polyester-coated HMA aramid and polyester-coated PES / Dynema. The strengths of the individual lines depend on the installation location and vary between 100 and 340 daN.  
The lines in the paraglider are divided into gallery lines, fork lines, main lines, stabilizer lines and brake lines, as well as the main brake line.  
The suspension lines are divided into A, B, C and D levels.  
The lines of each level are different in color for ease of control.  
In order to halve the braking forces at higher suspension weights (MTOW), the brake line is equipped with a pulley. But attention. This also doubles the brake length by 100%.  
The linen locks are made of stainless steel and secured with an insert made of plastic against unintentional opening.  
The individual lines are shown in the lines plan.

### Trim´s System:

The Relax has a trimmer system that changes the angle of attack of the glider and thus increases the speed.

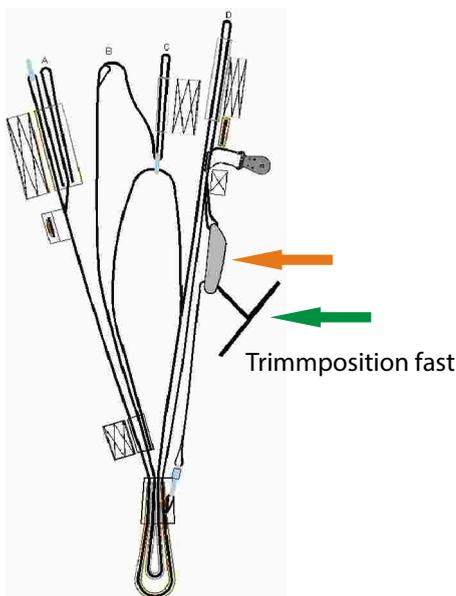
The trim system extends the C and D risers and thus reduces the angle of attack of the paraglider.

In normal flight, all straps are the same length (38 cm with linen locks). When the trim system was activated, the B straps would extend up to 2.5 cm, C straps by up to 6 cm, and the D straps by up to 12 cm. A-straps will not last longer.

It is recommended to set the trimmers symmetrically at the start. At the instruction of the individual trike manufacturer is to be paid in any case.

### Function of the trimmer

The trimmer can easily be operated even under high loads. The built-in pulley allows this.



The illustration shows the strap in the accelerated position.

To bring the strap to the unaccelerated position, the handle / ball (green arrow) is pulled down. Then all 4 straps are the same length.

For acceleration, the clamp buckle (orange arrow) is released slowly. The rear straps are longer and the paraglider flies faster.

## 5. Technical info´s

		Relax 25	Relax 22
Area	m <sup>2</sup>	29,32	26,39
Span flat	m	12,35	11,71
Streckung ausgelegt	A/R	5,2	5,2
Cells	Nr	54	54
Size projected	m <sup>2</sup>	25	22
Span projected	m	9,67	9,17
A.R.	A/R	3,74	3,73
MTOW min.	Kg	120	
MTOW max.	Kg	300	
Nachgewiesene Tragwerksfestigkeit	Kg	430 bei 8 g Lastspitze	
	Kg	400 bei 6 g über 3 Sek unden	
	Kg	300 bei 8 g über 3 Sek unden	
V-Trim	Km/h	50**	
V-Max.	Km/h	>60**	

\* abhängig von technischen Daten des Trikeherstellers

\*\* Abweichung aufgr und unterschiedlicher Abflugmasse möglich



## 6. Check the Paraglider

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Each paraglider is surveyed and checked several times before delivery. Nevertheless, new paragliders or those subjected to heavy duty should be examined according to the following criteria.

- Are all lines free of damage and correctly sewn?
- Are all linen locks screwed properly
- Are all webs sewn correctly and without damage?

Any damage, however inconspicuous it may be, must be assessed by the specialist and, if necessary, repaired. A damaged paraglider is not able to fly.

## 7. Adjusting the steering lines

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The two main brake lines lead to a multi-branched line group, which are attached to the trailing edge of the paraglider. On the risers, the two brake lines run through a pulley and are each connected to a brake lever. These control handles are attached during transport by means of two magnets on the strap. The steering lines are set correctly at the factory. This set point is permanently marked on the brake line. It must have at least 5 cm freewheel.

## 8. Flight Operation

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The following pages are not intended to be a guide to flying, and certainly not to replace flight instructor training.

### 8.1 Prepare for Take Off

Before each start a thorough pre-flight check must be completed.  
Check the riser, lines and cap for damage.  
The lines locks must be closed and secured.  
If a defect is detected, it must not be started.  
The Relax start best against the wind like an arc shape.

All lines must be well sorted and not devoured. Linen should not be under the sail.



## Check list

### Glider

- Glider without damage
- Riser without damage and not hung twisted
- Linen locks firmly screwed
- Lines without damage
- Carabiner closed correctly

## 8.2 Start

The RelaX is easy to start. The trimmer can also be open when starting, depending on the conditions.

The trim's should be symmetrical adjusted.

When the trimmers are fully closed, the glider is in trim position.

The further the trimmers are opened, the higher the overshoot tendency.

Also increases thereby the speed of departure and rolling distance.

## 8.3 Straight Flight

The speed in trim position is (depend on the load) 50km / h. In quiet air, the RelaX achieves the minimum speed with 50-60 cm brake line operation.

In turbulent air we recommend to keep the brakes 5-15 cm pulled. This makes it difficult to undercut the cap.

All cm specifications apply from the moment when the brake lines begin to grip.

## 8.4 Accelerated Flight

When the trimmer system is activated, the angle of attack changes. The speed increases up to 15 km / h.

With opened trimmers, the cap is more unstable and collapses lighter and heavier.

For safety reasons, the trimmers should be closed in case of turbulence. Never let the brake handles out of your hand.

Actuating the control lines should always be done carefully with the trimmer open. The brake line operation should be reduced to a minimum length.

If the paraglider collapses once, the acceleration system must be deactivated immediately.

The paraglider then has to be stabilized via the brake lines.

## 8.5. Turning Flight's

The RelaX is very agil, especially at high load. Brake pulses are converted directly without delay.

Excessive brake operation may cause a stall. Especially under full throttle or flying into a thermals



A one-sided stall announces itself early on.  
The wing inside curve becomes soft and stops almost.  
The brake is to be released on this side immediately.

## 8.6. Active Flying

Through active flying, collapses can often be prevented!  
Active flying means braking impulses to keep the paraglider stable. The glider should be in the best position if the glider is in the center above you.  
When you fly into thermals, the angle of attack increases. The brakes should now be opened.  
When flying in downwind (falling out of the thermals) the brakes should be pulled.

## 8.7. Landing

The Relax is easy to land.  
The landing should always be against the wind direction.  
In the final approach, keep the paraglider calm with little braking work. Do not start braking too soon.  
The kinetic energy in the aircraft is only once available when landing and is used so that the sinking speed and the speed can be maximally reduced.  
Do not drop the paraglider on the front edge after touch down.

## 9. Extreme Situations

### 9.1. Asymmetric collapse

The lateral collapse is probably the most common disturbance in paragliding.  
This usually only occurs on the outer wing of the Relax.  
In order not to turn away, the brake must be countered on the other side.  
The speed of the engine should be drastically reduced.  
If it is a strong lateral Einklapper, may be countered only very metered. Heavy braking could cause a stall  
By pumping on the folded side, the opening of the cap can be accelerated.  
If the driver does not intervene on the lateral collapse, the paraglider usually recovers automatically after 1 revolution.  
However, one should not rely on this, because in strong turbulence, an independent unfolding can also be prevented, and the paraglider goes over into a steep spiral. That should be prevented in any case.

### 9.2. Cravat

If the paraglider does not open again by itself, a hangover could be the cause.  
If that can not be changed and you are in low altitude, the rescue device should be triggered.  
To solve a Cravat the following possibilities are possible:



Sensitive counter-braking, and through very fast and deep pull of the steering lines to reach the reopening of the Pagarglider

Pull the color-coded stabilizer line

Attention!

The above maneuvers are very demanding and require a lot of height and skill. If insufficient altitude is available or the pilot feels overwhelmed, the rescue device should be triggered immediately.

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### 9.3. Frontstall

The collapse of the entire front is usually done by sudden strong downdrafts.

Although this disruption looks spectacular, it is often not dangerous.

This does not cause any rotational movements and the paraglider opens quickly again by itself.

By metered braking the reopening can be accelerated.

### 9.4. Constant Stall

In a constant stall, the paraglider has no forward drive with simultaneous strong sinking.

A constant stall can be caused by:

- Too much engine thrust
- Einflug in strong thermals

Strong air permeability of the paraglider fabric

- Tighten the C or D lines
- Wet paraglider

If you are in a stable stable, the thrust of the engine must be stopped. Also, the brakes must be released.

Do not use the brake lines. A full stall can happen in result

Under normal circumstances, the Relax start to flight within 2-3 seconds again at himself.

### 9.5. Full Stall

A fullstall is a complete stall with an uncontrollably collapsed cap.

This flight condition is very dangerous. Under no circumstances should you consciously fly this maneuver.

This maneuver is caused by bilateral braking to total stall.

### 9.6. Spin

By pulling hard on a brake line, the flow on the half wing can break off.

This rear edge is then approached from behind and flies in reversed direction.

The paraglider then turns around the vertical axis.



There are several causes for spinning. For example:

A brake line is pulled too fast and too deep.

In slow flight is braked too much at the same time high engine thrust.

If a spin ends early, the paraglider goes into the normal flight without much loss of altitude.

If the spin is held longer, a one-sided collapse of the paraglider could be the result.

Also, the paraglider tends to overshoot to the front.

## 9.7. Wingover

If alternately tight curves are flown left and right, this is called wing over. It is so easy to reduce a little height.

If the wingover is flown too hard, the glider can get a large lateral collapse.

Aerobatics and maneuvers over 60 ° are not allowed and dangerous. Absolutely avoid!

## 9.8. Control without brake

Should the brake be out of action on the Relax, it can be controlled with the rear risers (D).

The way to the stall is of course much shorter and is 5-10 cm.

## 10. Descents

### 10.1. Deep Spiral

The deep spiral is the safest way to quickly reduce altitude. However, there are large loads on material and pilot.

The high G-load significantly increases the risk of losing consciousness.

If consciousness becomes cloudy or eyesight narrows, the spiral must be led out immediately.

You initiate the spiral by pulling the brake on one side. A shift of weight to the inside of the curve facilitates the process.

Lateral position and sinking speed increase rapidly.

Slight brake on the other side prevents folding in of the outer wing tip.

To release the brake is carefully opened again.

Should the spiral be stable, it must be braked on the opposite side.

A quick escape of the spiral leads to strong commuting of the paraglider.

A deep spiral always results in a big loss of height. Be careful of sufficient height.



Almost every paraglider eventually reaches the rate of descent, where the cap aligns with the openings down and remains here in a stable position.

From such a stable situation, the paraglider then comes out only by dosed counter-braking.

A stable deep spiral creates high G loads and requires a great deal of effort to escape.

## 10.2. Big Ears

The so-called "Big Ears" is a simple, not too effective descent aid, for non-motorized paragliders

in which the forward speed is higher than the descent speed. It is more suitable for that

to reduce glide performance and to get distance horizontally from a hazard source rather than descend quickly.

For motorized trikes this maneuver makes no sense and must not be flown.

## 10.3. B Stall

The B-stall is not to fly for Trike structures by the high wing loading in principle. For this reason

this flight maneuver may not be flown.

## 11. Care, storage, repairs, disposal

Life in the air depends on the condition of the structure. A well-maintained and properly treated paraglider can reach twice the age. So that the Relax carries his pilot as long as possible and safely through the air, the following points must be observed:

### Maintenance

UV rays of the sun cause the material to age prematurely

Check the entire paraglider after tree and water landings

Do not pull the paraglider over the ground. The surface coating suffers.

Wetness damages the coating and shortens the lifespan of the paraglider

Do not step on the lines

Do not kink the lines

When in contact with salt water, rinse immediately with fresh water

Only clean the paraglider with water. Do not use any chemicals, as they can damage the surface



## Storage

The paraglider must always be stored dry.

The paraglider must not be stored together with chemical gases and vapors.

The paraglider must not be exposed to high temperatures. For example, the interior of a car in the summer.

## Repairs

Small damages in the fabric, which do not run along the seam, can be repaired provisionally with the supplied adhesive tape.

All other repairs and check's may only be carried out by an authorized specialist company.

Only original spare parts may be used

Any changes to the structure will invalidate the operating permit.

The RelaX must be checked every 2 years or every 100 operating hours.

## Disposal

Please return disused paraglider to the manufacturer. The disposal happens here professionally.

For the sake of the environment.

## 12. Environment

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Let's do this sport as much as possible in harmony with nature.

## 13. Line lengths

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### Name of the lines

All lines are described by Independence according to the same scheme.

Lines are ordered according to the explanation below, indicating the model and size.

The first digit indicates the Lines level. (A, B, C, D K = brake)

The numbering starts from the middle and continues until the stabilizer

The top-lines are called starting from the middle as for example A5.

The Stabilizer line has the additional designation „E“

"For example: B4E = B Stabilizer at the top of the cap (RelaX 25 71.5 cm)

The middle lines have the designation "M".

Example: CM4 = 4th centerline at C level. (Relax 25 M: 155 cm)

The main lines (Stammleine) have the attachment designation "R". Example: AR3 = A-Line from the middle of the Paraglider





## Relax 22

No	A	B	C	D	E	Brake
1	7280	7220	7265	7360	7430	7880
2	7195	7130	7190	7285	7360	7735
3	7185	7120	7165	7270	7345	7640
4	7230	7165	7215	7325	7385	7515
5	7185	7120	7170	7265		7515
6	7120	7055	7100	7200		7430
7	7100	7030	7080	7175		7290
8	7130	7065	7110	7200		7250
9	7065	7010	7045	7120		7195
10	6995	6945	6970	7040		7155
11	6925	6885	6905	6970		7215
12	6845	6810	6820	6860		7165
13	6470	6470	6435	6505		7105
14	6390	6395				7130
15						7110
16						7055
17						7040

### b.I Tragegurtlängen Relax 22

	mm	normal	beschleunigt
A		375	375
A`		375	375
B		375	400
C		375	435
D		375	495

Längen gemessen vom Einhängepunkt Tragegurt bis Unterkante Schraubschäkel



## 13.2.Total Length RelaX 25

No	A	B	C	D	E	Brake
1	7650	7605	7715	7890	7965	8230
2	7570	7515	7635	7820	7890	8085
3	7560	7510	7615	7800	7875	8000
4	7610	7570	7665	7855	7920	7885
5	7560	7515	7625	7805		7900
6	7485	7450	7550	7730		7810
7	7470	7430	7525	7705		7680
8	7505	7470	7555	7730		7640
9	7430	7400	7490	7570		7600
10	7355	7325	7415	7485		7560
11	7280	7265	7350	7410		7630
12	7190	7180	7250	7305		7575
13	6830	6820				7510
14	6730	6745	6785	6865		7575
15						7570
16						7525
17						7525

All lengths are measured from the shoulder strap to the bottom sail

## 13.3.Riser Lengths

mm	normal	beschleunigt
A	375	375
A`	375	375
B	375	400
C	375	435
D	375	495

All lengths are measured from the point of attachment to shackles



## Inspections

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Checks must be carried out by a specialist company. This is responsible for their work itself. Fresh Breeze is not responsible for any checks it has not performed by itself.

### 14.1. Check

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Every paraglider is subject to the inspection obligation

The test is carried out by the manufacturer or an authorized person.

It is also allowed by law to check the paraglider itself. However, we do not recommend this, because neither expertise nor the necessary equipment is usually available.

If the paraglider itself is tested, third persons may not fly with it.

If a defect is found, it must be repaired by the manufacturer before the next flight.

### 14.2. Check Intervals

Commercial:

Each year

or

every 100 hours

Privately used:

Every 24 months

or

every 100 h

### 14.3. Personnel requirement for check

Possession of a valid license

Type-related training on the paraglider

Vocational training related to this matter

2 years of professional experience in the production and testing of paragliders



## 14.4. Necessary documents

- Device data sheet
- Routine test certificate
- Maintenance and calibration records of measuring instruments
- Airworthiness directive of the manufacturer

## 14.5. test steps

### Identification of the paraglider

Visual inspection and identification of the paraglider

Check the type chart

### Visual inspection of the cap

Examination of:

- topsail
- Bottom sail, leading edge
- ribs
- cell walls
- Flares and line-loops
- coating
- and enter in the log

### Visual inspection of the lines

Check the lines for damage, creases and chafing, as well as the seams of the linen

### Visual inspection of the risers

Check by:

- shackles
- chafing
- Trim's
- wear
- Maximum length difference of the two risers max + - 5 mm



The individual lines are laid out and loaded with 5 daN. The measurement is made from the mount point of the carrying strap up to the cap including the leash loop. The rib numbering starts in each case in the Wing center with the wing sides are seen in the direction of flight. The determined total line lengths are documented in the inspection report and the target line lengths of the corresponding type rating sheet compared. The measurement of the opposite wing side can, assuming equal conditions, can be performed by a symmetry check. Compliance with the manufacturer's instructions The tolerances to be taken shall be documented in the verification report.

- Limit values (tolerance values) may deviate a maximum of +/- 15 mm from the type designation sheet, whereby due to the tolerances no significant trimming shift is allowed. The tolerances of the brake lines are +/- 25 mm deviation from the type rating sheet.
- It is restrictive that a fine trimming must be made in 2 cases (the procedure must be followed in the case of Manufacturer):

- o if more than 50% of the lines reach the tolerance limit, with the tolerance limit may only differ in either + or - direction (all values of 10-15 mm).

- o or 25% of the lines deviate from the tolerance limits in both directions (+ or -) (Example: A / B lines are 10-15mm longer, while the C / D lines are 10-15 mm shorter than in the type label (trim shift to the rear due to aging)

## Control of the linen strength

- Main line: From each line level (A, B, C), one main line is removed from the middle of the screen and determine the breaking load with the tensile tester. The removed lines are in the inspection report to rename (e.g., A1, B1, C1, D1 in the left direction). This is important for a later review does not test the line replaced in the previous test. At the 3rd and 4th inspection Chests are checked next to the middle stem line (i.e., A2, B2, C2). From the 5th inspection begins the turn again from the beginning (for example, A1, B1, C1 in the direction of flight left, according to the first inspection).

- Galerieleinen: Above the main lines a further leash is extended up to the cap and also determines the breaking load. Is the determined breaking load of the upper A-plane or middle A level at 1.5 times the setpoint (for example, setpoint 60 daN, determined breaking load > 90 daN), then one can

Testing of further levels above the main lines at the B / C / D / E levels is omitted.

- Limits of individual lines for the Relax 25:

Main lines: A / B: 220 daN; C / D: 200 daN

Middle level: A / B: 120 daN; C / D: 80 daN

Upper level: A / B: 60 daN; C / D: 45 daN



## Control of cap strength:

- The cap strength test is carried out using the Bettometer (B.M.A.A. approved patent No. GB 2270768 Clive Betts Sales). In this test is in the top and bottom sail in the area of A-lines bumped a needle-thick hole and tested the cloth for its tear propagation resistance. The limit of the measurement is set at 800 g and a crack length of 5 mm.
- The exact test procedure is specified by the operating instructions of the bedometer. The determined measurement value is entered in the verification log.

Control of the air permeability of the cloth:

- Using a JDC textile watch, a porosity measurement is made on at least 5 points of the top sail (with at least 2 measurement points in the middle third of the screen) and at least 3 points of the Untersegels performed. The determined values are documented in the verification report. The measuring Points on the upper / lower sail are distributed over the span about 20-30 cm behind the inflow edge.
- Limit values: no measuring point may reach a value of less than 10 seconds. Returns a measurement a value less than 10 seconds, the paraglider loses its operability.

## Control of trim and adjustment:

- All lines are to be checked according to the linen overview plan, if they were also properly lulled, and that also all linen levels are free. Likewise, the brake lines are to check that everything is properly tucked in and is free.
- The visual inspection must correspond exactly to the linen overview plan.

Check flight:

- Check flights are only required for major repairs.
- During check flight it must be determined if the flight characteristics of the structure to be checked have changed compared to a brand new device.
- The examiner must be able by his flying skills and experience to be able to comply with the building regulations to compare the flight behavior of the structure to be checked and possibly changed properties determine. This includes above all things:
  - that the pattern and its characteristics / flight behavior are known to the examiner.
  - Also, the building codes in force at the time of approval of the design be known.
- A check flight must have at least the points Winding up, Tipping, Ten to negative curves, control path lengths, > 50% unilateral folding.
- If the device under test does not behave properly in any way, you may use this device Device can no longer be flown and must be checked by the manufacturer. under no circumstances You may try to fix the error yourself.

Other scheduled examinations:

- control of the linen stretch:

All innermost leashes should first be measured under a load of 6 daN and then for 5 sec. to charge customers with 20 daN and then again under 6 daN to measure. This activity is conditionally before the measurement of the line lengths and the elongation values in the verification protocol hold.